



# Year 8 Knowledge Book 2023-2024



Saint Benedict  
A Catholic Voluntary Academy

Sticker Name



*Love, Belief, Integrity, Knowledge*





# OUR VALUES

**BE WHO GOD MEANT YOU TO BE AND YOU  
WILL SET THE WORLD ON FIRE.**

## LOVE

As we know we are loved by God, we will learn to love ourselves and care for our own body mind and soul.

We will show love to one another by being patient and kind, not by being rude, boastful or proud.

As one body in Christ, we will ensure that no member of our community is left out or left behind

## BELIEF

We will encourage one another and build each other up.

We will let our light shine, making the world a better place for all.

## KNOWLEDGE

We will value knowledge: intelligent hearts acquire knowledge, the ears of the wise seek knowledge.

## INTEGRITY

We will always strive to make the right choice even when this is the harder path to take.

We will live and work sustainably.

**AT SAINT BENEDICT  
WE DEVELOP THE  
CHARACTER OF OUR  
COMMUNITY THROUGH  
OUR CURRICULUM AND  
CULTURE.**





# Respect

## What is Respect?

Showing respect is an important part of life, and how you maintain relationships.

Three types of respect:

1. Respect Yourself
2. Respect Others
3. Respect the Planet

## Why is respect important?

Receiving respect from others is important because it helps us to feel safe and to express ourselves. Respecting others helps maintain a peaceful world and encourages others to be better people. Showing respect to our planet allows us to maintain it for future generations.

Key words	Definitions
Respect	Due regard for the feelings, wishes and rights of others
Honour	The quality of knowing and doing what is morally right
Dignity	Sense of pride and self respect
Relationships	The way two or more people or groups connect and behave towards each other
Worthiness	The quality of being good enough

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# Rules and Sanctions

## Build up a loving community

Key word	
Conduct	The way in which a person behaves.
Unacceptable	Something that is not suitable or appropriate.
Boundaries	The limits of something.
Sanction	A penalty or action taken when a rule or law has been broken.
Consistent	Acting in the same way overtime to be fair.

## Behaviour

Rules and sanctions are things which guide our behaviour. We follow rules and regulations to be fair and consistent. Sanctions occur if we do not follow rules or deliberately break them.

## Preparation for life

All aspects of life require us to follow rules. There are rules in school; rules in your family and home; rules to follow when crossing the road and using the bus and so on. Structure and rules allow us all to know what is acceptable and how to conduct ourselves. Rules reassure us

## The law

We are all bound by the rules of the law. If we break the law, we face a raft of different sanctions. Ultimately, having rules in schools is about a lifelong understanding about what is right and what is wrong.

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# Kindness

Key word	
Empathy	Understand and share feelings of others
Compassion	Concern for misfortune of others
Compliment	Praise or congratulate others
Considerate	Thoughtfulness and sensitivity to others
Generous	Being liberal with things

**Treat others how you would want to be treated yourself.**

## What is Kindness?

The quality of being friendly, generous and considerate

## What does it mean to be kind?

To have empathy/sympathy, be compassionate, looking for good in people.

## Why is it important to be kind?

Makes you feel happy, feel good about yourself

Builds strong relationships

Inspires others

## How can we show kindness?

Smile

Hold the door open for somebody

Say something nice (compliment)

Invite somebody sat on their own to join you

Manners

Listen to somebody

# Emotions

Key Words	
Feelings	An emotional state or reaction.
Relationships	The state of being connected with someone else.
Instinct	A fixed pattern of behaviour.
Intuitive	Using what you feel to be true even without conscious reasoning.
Reaction	Something done, felt or thought in response to a situation or event.
Identification	The act or process of identifying someone or something.

## Work and play in harmony

## What are emotions?

Emotions are biological states associated with the nervous system.

Thoughts, feelings, behavioural responses, and relationships all generate emotions.

An instinct or, intuitive reaction or feeling can create emotions

## Identifying feelings

Making sense of what and how you feel is not always easy. To do this, we need to regularly check in with ourselves, making time to think about the feelings we are having and naming them. To do this, we need to think about our daily lives which may help us to see patterns of behaviour.

## Not all feelings or emotions are bad or negative!

It is important to recognise when you feel happy; relaxed and good about yourself. Knowing what has led to these feelings can help us identify things we do not like which may cause us negative feelings.

# Verbal Communication

**Treat each other with dignity and justice**

Key Words	
Clarity	Vocal clarity means you do not speak too fast or too slowly. You consider carefully the words you mean and whether your listener can understand you.
Honesty	Honesty is speaking the truth.
Respect	Respect means that you accept somebody for who they are, even when they are different from you or you do not agree with them.
Appropriate	fitting the practical or social requirements of the situation.
Tone	a quality in the voice that expresses your feelings or thoughts, often towards the person being spoken to or the subject being spoken about
Courtesy	politeness, good manners, or consideration for other people.

## What is verbal communication?

Verbal communication is the use of words to share information with other people.

## What does it mean to communicate effectively?

Every time you verbally interact with someone you are aiming to develop your understanding of the world; you may be wishing to obtain information, respond to a request or offer support or guidance to another. In every one of these exchanges you are representing your tutor, your family and most importantly yourself.

## Why is it important to communicate effectively?

All young people need to develop good speech, language and communication skills to reach their full potential.

Speech, language and communication underpin the basic skills of literacy and numeracy and are essential for you to understand and achieve in all subjects.

## How can we communicate effectively?

Make eye contact

Speak honestly

Consider your role within the school

Consider the role of the person you are speaking to

Think carefully why you need to speak to the person you are addressing

Where necessary adapt as your conversation develops

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# Manners

Key Words	
Manners	A person's words or way of behaving towards others.
Respect	A regard for the feelings, wishes, or rights of others.
Listen	To take in what you hear.
Harmony	A time of behaving in one way to produce a pleasing effect.
Vocabulary	The range of words that we know and use.
Gratitude	The quality of being thankful; readiness to show appreciation for and to return kindness.

## Loving...harmony...dignity

### Treat your neighbour as yourself

The way in which we behave and speak towards others, reflects in their actions and words towards us.

### Show the best side of yourself

When you speak to others, always show respect; be polite and thankful. Use the words 'please, thank you, sorry and pardon' when communicating with others.

### Manners are for every situation

Every interaction has space for the use of manners: speech, emails, messages. Often when we get upset or angry we don't use manners.

However it does calm a situation if you do.

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# Change

Key Words	Definition
Change	Make or become different
Organised	Make arrangements or preparations for an event or activity
Opportunity	A time set of circumstances that make it possible to do something
Coping	To deal effectively with something difficult
Embrace	Accept (a belief, theory or change) willingly and enthusiastically
Strategies	A plan of action designed to achieve a long term or overall aim

## Develop potential to the full

### Find the positive

Don't allow yourself to become negative about the changes in your life. Change is good, keep repeating it.

### Feeling vulnerable

Facing change can be very overwhelming, leaving you feeling very emotional. Make it your mission to be proactive and respond to it positively.

### Talk about it

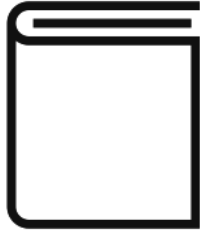
It's good to talk about change in your life. Focus on problems, solutions and the positives that change will bring. Try to avoid focussing on the negatives and letting emotions take over.

## Study Skills – Ways to learn and remember

### Self quizzing (look, cover, write)



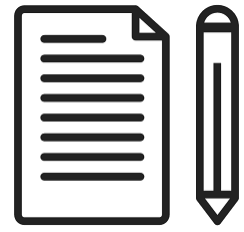
Read through the information in the knowledge book that you want to learn



Cover the information up



Write down as much as you can remember



Use the knowledge book to;

- a) Correct any mistakes
- b) Add any information that you forgot

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## Study Skills – Ways to learn and remember

### Spacing



Complete a self quiz of the information you want to learn



Wait for a day or 2 (depending on the deadline)



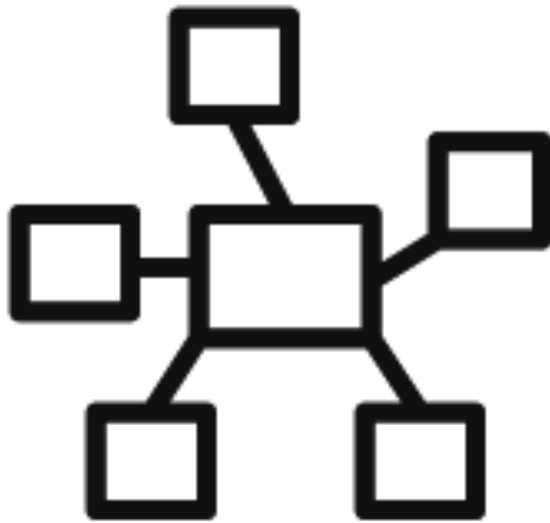
Repeat the self quiz.

**The more times you can repeat this process, the more you will be able to remember without the book**

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## Study Skills – Ways to learn and remember

### Elaboration



Think about the topic that you are studying

Ask questions such as who, what, why, where, when how. Try to find the answers

See how these ideas connect - a mind map will be useful for this

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## Study Skills – Ways to learn and remember

### Concrete Examples

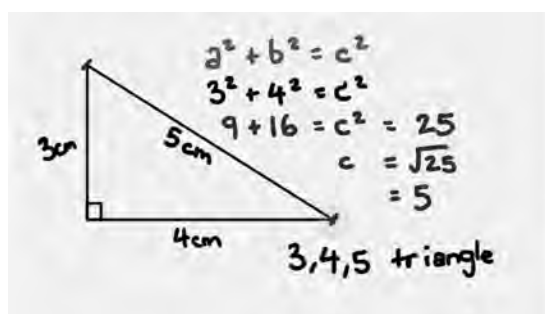


#### Pythagoras theorem example

If you tried to explain Pythagoras's theorem to someone verbally, it would be quite hard to understand.

By using a concrete example that shows exactly how to use Pythagoras theorem, it is much easier to remember, understand and use

A concrete example is an clear example of an abstract idea

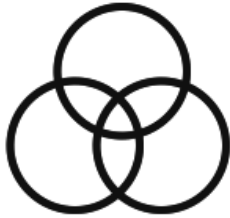


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## Study Skills – Ways to learn and remember

### Interleaving



Research says we will actually learn more effectively if we mix our study skills up rather than using the same techniques all the time

1. Try to use different study skills rather than just one technique.

2. When revising for exams, prepare a revision timetable and try to revise more than one subject during a session

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## Study Skills – Ways to learn and remember

### Dual Coding



As well as **writing** information down, **create an icon/ drawing** too for individual facts. This helps your brain to remember the information

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INDEPENDENCE: DIAGNOSE

NAME: CLASS:

SUBJECT:

Be clear about what you know and what you don't know before you begin.

**First**, use a contents page or a topic list for the subject you are going to revise.

**Then**, fill in the following table – the topics, and how well you know them.

**Next**, prioritise. Which topics will you revise first? Spend time studying the topics which will make the biggest difference to your results.

Topic	Knowledge	Priority
	Know it/Sort of know it/Don't know it	
	Know it/Sort of know it/Don't know it	
	Know it/Sort of know it/Don't know it	
	Know it/Sort of know it/Don't know it	
	Know it/Sort of know it/Don't know it	
	Know it/Sort of know it/Don't know it	
	Know it/Sort of know it/Don't know it	
	Know it/Sort of know it/Don't know it	
	Know it/Sort of know it/Don't know it	
	Know it/Sort of know it/Don't know it	
	Know it/Sort of know it/Don't know it	
	Know it/Sort of know it/Don't know it	

**Finally**, use the **diagnosis – therapy – test** worksheet to plan your independent study.



INDEPENDENCE: DIAGNOSIS – THERAPY – TEST

NAME: CLASS:

TOPIC:

**DIAGNOSIS:** The thing I don't understand

**THERAPY:** Where am I going to learn about this?

Which of the templates will I use to transform the information?

**TEST:** 5 questions someone can ask me about my new understanding.

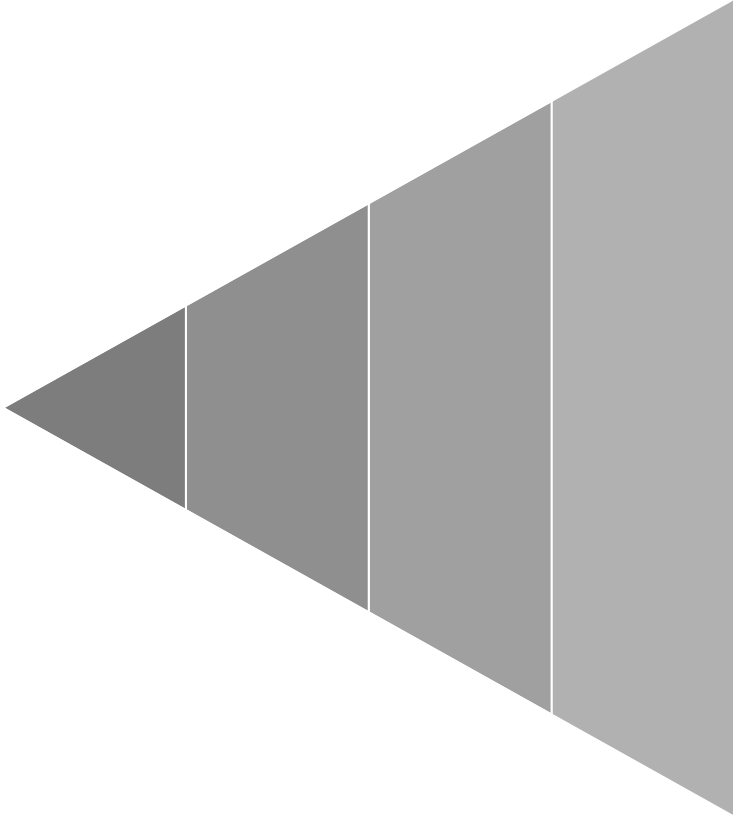


INDEPENDENCE: RANKING TRIANGLE	
NAME:	CLASS:
TOPIC:	

The most important information goes at the top.

The least important information goes at the bottom.

Justify WHY. Why is it the most important? Why is it the least important?



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INDEPENDENCE: PRIORITISE, REDUCE, CATEGORISE, EXTEND	
NAME:	CLASS:
TOPIC:	

Take a section of text and do the following:

<b>Prioritise:</b> write out the three most important sentences. Rank 1-3 in terms of importance. Justify your decision.
<b>Reduce:</b> reduce the key information to 20 words.
<b>Categorise:</b> sort out the information into three categories. Give each category a title which sums up the information.
<b>Extend:</b> write down three questions you would like to ask an expert in this subject.



## INDEPENDENCE: BOXING UP

NAME:	CLASS:
TOPIC:	

Take a section of text. Read it and put your thoughts about the text into different boxes.

<b>Needs a boost:</b> 3 things I did not know:
<b>Almost there:</b> 3 things I understand better now:
<b>I've got these:</b> 3 things I already knew:



## INDEPENDENCE: QUIZZING

NAME:	CLASS:
TOPIC:	

Read the text and transform it into 10 questions to ask someone.

	Question	Answer
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Question stems:

- |             |             |            |
|-------------|-------------|------------|
| State...    | Explain...  | Suggest... |
| Describe... | Evaluate... | Compare... |



INDEPENDENCE: OTHER IDEAS

- Steps → flow chart** Transform a sequence of steps into a flow chart or a diagram.
- Flow chart → steps** Transform a flow chart or a diagram into a sequence of steps.
- Look, cover, write, check** Cover a list of key words. Write them down. Check which ones you have got right. Repeat until you get them all right.
- Link key words** Take three words from a topic. Link them together in a sentence or a diagram. Repeat until all the key words have been linked.



INDEPENDENCE: Pictionary

NAME:

CLASS:

TOPIC:

Transform the material into 6 pictures – one per paragraph or one per key piece of information. The pictures should represent the information so that they can act as a reminder of what the text said. Underneath each picture, explain your thinking.

1.	2.	3.	

4.	5.	6.	



# Year 8 Personal Development Curriculum

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| 16. How to recognise and challenge racism and religious discrimination | 36. How to use social networking sites safely                       |
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## Year 8 Personal Development Curriculum

### Health and Well-Being

#### Topic; Medicinal & Recreational Drugs

Key Vocabulary	
Drug	A chemical substance that affects the way that your body works
Medicinal drug	A drug used to cure illness or relieve symptoms.
Recreational drug	A drug used to for pleasure
Illegal	Doing something that is forbidden in law
Addictive	A substance or activity that will cause people to become addicted (dependent on it)
Stimulants	A substance that raises levels of physiological or nervous activity in the body.
Sedatives	A drug taken for its calming or sleep-inducing effect.

#### Key Knowledge

Drugs can be both good and bad.

Medicinal drugs include paracetamol, ibuprofen, aspirin, anti-depressants & antibiotics

Recreational drugs include heroin, cocaine, cannabis, ecstasy, amphetamine & ketamine.

Drugs are very addictive and can have various impacts on the body such as stimulants, depressives & pain relief.

Taking drugs can lead to serious illnesses such as:

respiratory depression,  
constricted pupils  
nausea.  
slow and shallow breathing,  
clammy skin,  
convulsions,  
coma,  
possible death.

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## Year 8 Personal Development Curriculum

### Health and Well-Being

#### Topic: Habit & Dependence

Key Vocabulary	
Habit	Something you do regularly that is hard to give up. It can have a positive or negative impact
Dependence	Being mentally or physically addicted (or dependent) to a substance.
Addiction	Relying on or being controlled by someone or something else.
Rational addictions	Addictions that are socially acceptable, such as the consumption of coffee or chocolate
Gambling	To play games for money
Substance	A type of matter with common traits - e.g. the drug addict took the substance...
Craving	A powerful desire for something.
Routine	A sequence of actions regularly followed.
Chemical addiction	This refers to addiction that involves the use of substances.
Behavioural addiction	This refers to addiction that involves compulsive behaviours. These are persistent, repeated behaviours that you carry out even if they don't offer any real benefit.

#### Key Knowledge

Habits are formed over time by **repeatedly** doing the same action. This forms a **routine**.

When habits are negative they can become an addiction.

Addiction to different substances can include:

alcohol  
opioids, (including both heroin as well as prescription pain medication like oxycodone and morphine)  
cannabis  
nicotine  
amphetamines  
cocaine  
methamphetamine

**Addiction can lead to the following types of behaviour:**

spending large amounts of time engaging in the behaviour

urges to engage in the behaviour even if it negatively affects daily life, responsibilities, or relationships

using the behaviour to manage unwanted emotions

hiding the behaviour or lying to other people about time spent on it

difficulty avoiding the behaviour

irritability, restlessness, anxiety, depression, or other withdrawal symptoms when attempting to quit

feeling compelled to continue the behaviour even when it causes distress

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## Year 8 Personal Development Curriculum

### Health and well being

#### Topic: The over-consumption of energy drinks

Key Vocabulary	
Energy Drink	A soft drink with a high percentage of sugar, caffeine, or other stimulants
Caffeine	A compound found in tea and coffee plants and is a stimulant for the central nervous system
Stimulant	A substance that raises the heart rate and nervous system activity in your body
Sugar	A sweet substance obtained from various plants
Addiction	A condition of being addicted to a particular substance or activity
Beverage	A drink other than water
Allowance	The amount of something that is permitted
Ingredients	Any food or substances that are mixed together to make something
Consumption	Something we use, eat or drink

### Key Knowledge

Research suggests that more than half of energy drink users experience negative effects, such as racing heart, rapid speech, gastrointestinal upset, sleep disturbance, anxiety and tremors.

Some studies also have reported serious events such as seizures, stroke, suicidal ideation, hallucinations, manic psychosis, arrhythmias, cardiac ischemia, aneurysm, myocardial infarction and cardiac arrest related to energy drink consumption.

Chronic energy drink use is associated with increased stress, decreased sleep, anxiety and depression.

Using energy drinks in early adolescence may be a harbinger for increased risk of alcohol use later in life.

The energy drink market is the fastest-growing segment of the beverage industry, and marketing for these drinks is mainly targeted to teens and young adults.

A significant number of adolescent energy drink consumers exceed the recommended amount for adults of no more than two energy drinks per day

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## Year 8 Personal Development Curriculum

### Health and well being

#### Topic: Relationship between habit and dependence

Key Vocabulary	
Habit	A regular activity that is repeated and is hard to give up
Dependence	The state of being reliant or influenced by something
Addiction	A condition of being addicted to a particular substance or activity
Symptoms	A feature of a medical and physical condition
Side-effects	An effect from drug or medical treatment
Reliance	Dependant on someone or something

### Key Knowledge

Addiction is defined as not having control over doing, taking or using something to the point where it could be harmful to you.

It's possible to be addicted to just about anything.

There are lots of reasons why addictions begin.

Substances can affect the way you feel, both physically and mentally.

These feelings can be enjoyable and create a powerful urge to use the substances again.

Being addicted to something means that not having it causes withdrawal symptoms, or a "come down".

This can be unpleasant, so often it is easier to carry on having or doing what you crave, and so the cycle continues.

An addiction gets out of control because you need more and more to satisfy a craving and achieve the "high".

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## Year 8 Personal Development Curriculum

### Health and Well-Being

#### Topic; Risks of tobacco, nicotine and e-cigarettes & alcohol

Key Vocabulary	
Addiction	Means not having control over doing, taking or using something harmful.
Passive smoking	Is also known as second-hand smoke (SHS) or Environmental smoke.
Lung cancer	Uncontrolled cell growth (a tumour) in the lungs
Emphysema	Chronic lung disease also known as lung rot
Heart attack	When a part of the heart muscle dies
Stroke	Blood clot in the brain
Gangrene	When a part of the body becomes starved of oxygen and starts to rot
Unit	An alcoholic unit of measurement
Depressant	The effect alcohol has on your system
Intoxication	When the body is poisoned and the person's physical and mental control is reduced.
Alcohol abuse	Excessive use of alcohol
Binge drinking	Drinking 5 or more alcoholic units in one go

#### Key Knowledge

Smoking and alcohol are both legal but extremely addictive.

Smoking can cause:

Lung disease  
Cancer  
Emphysema  
Gangrene  
Stroke  
Heart disease

#### Alcohol

Is also very addictive and is a depressant.

It is recommended that men should drink no more than 3-4 units per day and women should drink no more than 2-3 units per day.

The negative impact of alcohol can include:

Anti-social behaviour  
Throat cancer  
Cirrhosis of the liver  
Alcoholism  
Debt  
Injuries  
Family breakdown  
Stress  
Underage sex  
Violence

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## Year 8 Personal Development Curriculum

### Values for Life in Modern Britain

#### Topic; Equality of opportunity in life and work

Key Vocabulary	
Opportunity	Something that enables you to achieve your goals given to you by someone or something
Equality	Being treated fairly and the same as others.
Work	an activity, such as a job that a person uses physical or mental effort to do.
Discrimination	the way people are treated differently due to race, age, gender or disability.
School	A place where young people go to receive an education

#### Key Knowledge

Everyone has the same rights whatever their background and everyone has the same chances to be successful throughout their education and life

You should not treat people differently due to race, religion, gender or ethnicity. This is called Discrimination and is illegal.

Equality in working life is promoted particularly in pay, working conditions, terms of employment, and career development.

The Act on Equality Between Men and Women prohibits discrimination based on gender and requires the promotion of gender equality.

The law also prohibits discrimination based on gender identity and gender expression

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## Year 8 Personal Development Curriculum

### Values for Life in Modern Britain

Topic; Challenging stereotypes and discrimination in work and pay

Key Vocabulary	
Stereotypes	How a person or situation is viewed by society
Discrimination	The way people are treated differently due to race, age, gender or disability
Pay gap	The difference between what men and women are paid
Work	An activity, such as a job that a person uses physical or mental effort to do.
Equal Pay	Where men and women are paid the same amount of money. This is based on qualifications and not the gender of the worker.

### Key Knowledge

Stereotyping of people is wrong and no one should be prejudged

There is no such thing as a male job and a female jobs or jobs are gender neutral and can be completed by anyone.

In terms of gender, common stereotypes might be that women will display collaboration, empathy and diplomacy; while men demonstrate strength, competitiveness and logic. Which is equally unhelpful to both sexes!

Women who don't conform to the stereotype can be judged as aggressive or pushy which could impact career progression.

Achieving true gender equality in the workplace requires sustained commitment and vigilance from all on both an individual and organisational level. We all need to be prepared to question our own beliefs and to challenge and be challenged on biased behaviour

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## Year 8 Personal Development Curriculum

### Values for life in Modern Britain

Topic; Employees, Workers, Self Employed and Voluntary Workers

Key Vocabulary	
Work	Activity involving physical or mental effort done in order to achieve something
Employment	The state of having paid work, working for someone else
Self-Employment	Working for yourself or owning a business
Voluntary Work	Working without payment
Unemployed	(of a person) without a paid job but available to work
Redundant	(of a person) no longer employed because there is no more work available

### Key Knowledge

Employment is where you work for someone else or someone's company.

Employment comes with a salary from the employer.

Employment often comes with benefits such as holiday pay or sick pay.

Self employment is where you work for yourself.

In Self Employment, the money you earn after paying taxes and national insurance is yours.

Voluntary work is when you work but don't receive payment.

Voluntary work is often for a charitable cause.

Voluntary work can allow you to build up skills that are useful for employment.

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Key Vocabulary	
Career	An occupation that takes up a significant period of a person's life
Occupation	A job or profession
Profession	A job that usually requires further training
Careers Advisor	Someone who can help with choices for your future.
Careers Fair	A place where employers and educators can show what careers are available and the routes into them
Aspiration	a hope or ambition of achieving something.

## Key Knowledge

A career advisor is someone who can help you decide what to do after school.

Our careers advisor is Lydia Gretton - you can email her [lgretton@saintben.derby.sch.uk](mailto:lgretton@saintben.derby.sch.uk)

A careers fair is somewhere you can go to talk to employers and educators about career choice.

It is always best to start to think about careers early and pick subjects that will help.

There are many different types of career available so you should research these now to be able to think about your GCSE subject options.

Key Vocabulary	
Decision	A conclusion or resolution reached after consideration.
Peer pressure	Influence from members of one's peer group
Influence	The capacity to have an effect on the character, development, or behaviour of someone or something, or the effect itself
Internal Influences	<b>Internal influences</b> are elements that influence an individual's behaviour from the <b>inside</b>
External influences	<b>External influences</b> are elements that <b>influence</b> an individual's behaviour from the <b>outside</b> .
Consequence	A result or effect
Peer group	A group of people of approximately the same age, status, and interests.

## Key Knowledge

Behaviour is a product of both the situation (e.g., cultural influences, social roles, and the presence of bystanders) and of the person (e.g., personality characteristics).

**Situationism** is the view that our behaviour and actions are determined by our immediate environment and surroundings.

In contrast, **dispositionism** holds that our behaviour is determined by internal factors

Often, like the story of the new Emperor from Year 7, you are required to control and moderate your behaviour even when you are not being watched/observed.

At times you will be directed to follow a set of instructions or guidelines so as to reach success, stay safe, achieve a goal or for any number of reasons.

The consistent factor in all of this is you, so this is your time to hold a mirror up to yourself and assess the impact of internal and external influences.



## Year 8 Personal Development Curriculum

### Relationships

Topic; How to develop self worth and confidence

Key Vocabulary	
Self-worth	Confidence in one's own worth or abilities; <i>synonym: self-respect</i>
Confidence	A feeling of self-assurance arising from an appreciation of one's own abilities or qualities
Mindset	The established set of attitudes held by someone
Positive self-talk	Makes you feel good about yourself and the things that are going on in your life. It's like having an optimistic voice in your head that always looks on the bright side.
Optimism	Hopefulness and confidence about the future or the success of something
Inner voice	The result of certain brain mechanisms that cause you to "hear" yourself talk in your head without actually speaking and forming sounds

### Key Knowledge

**Self Worth** and **Confidence** are attributes that you develop in your life.

Depending on your upbringing, you will learn to tackle events and situations in your life in many different ways.

Sometimes, you will feel good about what you did and achieved; other times, you will not experience this same feeling.

Sometimes, your self worth and your confidence are 'damaged' by others in the course of your life.

Dealing with such experiences can be difficult and you have to learn or learn again how to feel good about yourself and what you can do.

Always remember to be kind to yourself too, you are worth it!

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## Year 8 Personal Development Curriculum

### Relationships

Topic; Bullying and positive relationships

Key Vocabulary	
Relationships	The way in which two or more people or groups regard and behave towards each other.
Bullying	Seek to harm, intimidate, or coerce (someone perceived as vulnerable).
Upstander	A person who speaks or acts in support of an individual or cause, particularly someone who intervenes on behalf of a person being attacked or bullied.
Bystander	A person who is present at an event or incident but does not take part.

### Key Knowledge

**Bullying** is habitually cruel, insulting, or threatening behaviour towards others who are weaker, smaller, or in some way vulnerable.

It is "STOP" – behaviour that is done **Several Times On Purpose**.

Bullying can have a very negative impact on your self-worth, relationships with others and friendships.

It's important to recognise that being a bystander can be just as bad as being a bully because you are allowing bullying to happen.

By standing up against bullying, we can help to make our community safer and more pleasant for everyone.

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Relationships

Topic; How to recognise and challenge homophobia and Biphobia

Key Vocabulary	
Phobia	An extreme or irrational fear of or aversion to something
Gender	Either of the two sexes (male and female), especially when considered with reference to social and cultural differences rather than biological ones. The term is also used more broadly to denote a range of identities that do not correspond to established ideas of male and female.
Homophobia	Dislike of or prejudice against gay people
Biphobia	Dislike of or prejudice against bisexual people
Stereotypes	A widely held but fixed and oversimplified image or idea of a particular type of person or thing.
Bystander	A person who is present at an event or incident but does not take part
Upstander	A person who speaks or acts in support of an individual or cause, particularly someone who intervenes on behalf of a person being attacked or bullied.

Key Knowledge

This is the bullying, persecution or harassment of people perceived to be lesbian, gay, bisexual or transgender, irrespective of their actual sexual orientation or gender identity.

Like other forms of bullying, homophobic bullying can be physical, verbal or indirect.

It can happen in person or online.

Often it is the language that can distinguish it from other forms of bullying and the motivation of the bullies is specific.

It is not only the pupils who become the targets of homophobic bullying but school staff too.

Homophobic bullying is a hate crime which should be reported to the Police.

Saint Benedict School does not tolerate Homophobic behaviour or language and it will be treated very seriously.

Relationships

Topic; How to recognise and challenge racism and religious discrimination

Key Vocabulary	
Racism	Prejudice, discrimination, or antagonism by an individual, community, or institution against a person or people on the basis of their membership of a particular racial or ethnic group, typically one that is a minority or marginalized.
Religion	The belief in and worship of a superhuman controlling power, especially a personal God or gods.
Discrimination	The unjust or prejudicial treatment of different categories of people, especially on the grounds of race, age, sex, or disability.
Challenge	A call to prove or justify something.
Acceptance	Agreement with or belief in an idea or explanation
Tolerance	The ability or willingness to tolerate the existence of opinions or behaviour that one dislikes or disagrees with.
Prejudice	Prejudice is an assumption or an opinion about someone simply based on that person's membership to a particular group
Equality	The state of being equal, especially in status, rights, or opportunities.

Key Knowledge

Prejudice and discrimination still exist within our society today.

Prejudice and discrimination are attitudes and resulting actions that cause people to be treated differently.

The treatment could be a one-off action or as a result of a rule or policy.

It does not have to be intentional to be unlawful.

Acceptance is the ability to see that others have a right to be their own unique persons.

That means having a right to their own feelings, thoughts and opinions.

When you accept people for who they are, you let them feel the way they want to feel, you let them be different and think differently from you.

Everyone is different in one way or another. Once you understand this truth, you can stop trying to change them into the people you want them to be and start accepting them for who they are.

Acceptance of others' feelings is not easy when people act differently than we do. We all have trouble accepting those who are different. By learning the skill of empathy, we will be better able to understand ourselves and those who are different from us.

## Year 8 Personal Development Curriculum

### Health and Well-Being

#### Topic: Attitudes towards mental health

Key Vocabulary	
Wellbeing	The state of being comfortable, healthy, or happy.
Attitude	A settled way of thinking or feeling about something.
Discrimination	The unjust or prejudicial treatment of different categories of people.
Misconception	A view or opinion that is incorrect because based on faulty thinking or understanding.
Support	To give assistance to.
Factors	A circumstance, fact, or influence that contributes to a result.
Stigma	A mark of disgrace associated with a particular circumstance, quality, or person.

### Key Knowledge

All people have mental health, but some people might have a better mental health than others.

It is important to take care of our mental health and recognise some of the factors that can affect poor mental health.

We all need to work together to remove the stigma surrounding mental health – especially allowing people to freely discuss their mental health.

People with poor mental health can sometimes feel discriminated against or misunderstood by wider society.

We should aim to be supportive friends to everyone around us, and take care of those who are visibly struggling, seeking help where needed.

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## Year 8 Personal Development Curriculum

### Health and wellbeing

#### Topic: How to Challenge Myths and Stigma

Key Vocabulary	
Discrimination	The unjust treatment of different categories of people (e.g those with mental health issues.)
Myth	A widely held, but false, belief or idea.
Stigma	A mark of disgrace associated with a particular circumstance, quality or person.
Emotional Invalidating	Someone communicates to you that your emotions (or mental health issue) are not valid, irrational or should be hidden and concealed.

### Key Knowledge

Over recent years, mental health has slowly moved out of the shadows. After centuries of being sidelined, our state of mental well-being is gradually receiving more of the attention that it deserves. However, many myths persist – **Here are some common misconceptions;**

**Mental health problems are uncommon**

**People with mental health conditions cannot work**

**Mental health problems are a sign of weakness**

**Mental health problems are permanent**

**Eating disorders only affect females**

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## Year 8 Personal Development Curriculum

### Health and wellbeing

#### Topic; Daily wellbeing

Key Vocabulary	
Wellbeing	The state of being comfortable, healthy, or Tappy
Mindfulness	A mental state achieved by focusing one's awareness on the present moment, while calmly acknowledging and accepting one's feelings, thoughts, and bodily sensations
Coping strategies	Psychological patterns that individuals use to manage thoughts, feelings, and actions encountered during various stages of ill health and treatments
Boosting your confidence	Promoting feelings of well-being, acceptance of your body and mind (your self-esteem) and belief in your own ability, skills and experience

### Key Knowledge

It is important to take the time to look after ourselves.

By taking the time to do something just for you and to slow down in your life, you can see great benefits for yourself, such as feeling focused, managing your emotions more calmly, organising yourself and having better relationships with others.

It is important to recognise the times where you need to look after yourself and have a range of coping strategies readily available.

There is only one of you, start by making yourself feel good so you can help others too!

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## Year 8 Personal Development Curriculum

### Health and Well - Being

#### Topic: How to Manage Emotions

Key Vocabulary	
Emotions	A strong feeling derived from one's circumstances, mood or relationship with others.
Personality	The combination of characteristics and qualities that form an individual's distinctive character.
Realism	The attitude or practice of accepting a situation as it is and being prepared to deal with it accordingly.
Positivity	The practice of being or tendency to be positive or optimistic in attitude.

### Key Knowledge

Your emotions are the way that you feel. It is possible to regulate and manage our emotions, even during difficult and stressful times.

#### 1. Take a look at the impact of your emotions

Emotions that regularly get out of hand might lead to:

relationship or friendship conflict  
difficulty relating to others  
trouble at work or school  
an urge to use substances to help manage your emotions  
physical or emotional outbursts

#### 2. Identify what you're feeling

Taking a moment to check in with yourself about your mood can help you begin gaining back control.

#### 3. Take a deep breath

There's much to be said for the power of a deep breath. Deep breathing exercises can help you ground yourself and take a step back from the first intense flash of emotion and any extreme reaction you want to avoid.

#### 4. Know when to express yourself

There's a time and place for everything, including intense emotions. Being mindful of your surroundings and the situation can help you learn when it's OK to let feelings out and when you might want to sit with them for the moment.

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Key Vocabulary	
<b>Resilience</b>	Resilience is the ability to recover from setbacks.
<b>Digital resilience</b>	Digital resilience is the ability to bounce back from difficult experiences online, over time.
<b>Influence</b>	Online influences and pressures can be positive and negative, and you can feel forced to respond to this by acting in certain ways.
<b>Adapt</b>	The ability to change your online habits and routines for a more positive experience.
<b>Recover</b>	Understanding that change will happen over time and knowing that you will feel better because of that change.
<b>Support</b>	Know the people and places you can go to for help

## Key Knowledge

Understanding what resilience is and isn't – it isn't being so "tough" that nothing impacts on us. It is the ability to recover from setbacks, over time.

Recognising that going online is a varied experience for everyone. Everyone will react differently and feel a range of emotions from even just one incident

Appreciating that there is a huge range of both positive and negative experiences that affect us online, and the product of that is they influence our thoughts and behaviour.

To know when you or others need to develop digital resilience – recognising symptoms: feeling alone, insecure, helpless, upset, under pressure, judged or becoming obsessed.

How to become digitally resilient:  
 Build a support network  
 Give yourself a break  
 Look after your physical health  
 Make some lifestyle changes

Key Vocabulary	
<b>Disorder</b>	A disturbance of normal functioning of the mind or body.
<b>Trigger</b>	(Especially of something read, seen, or heard) distress (someone), typically as a result of arousing feelings or memories associated with a particular traumatic experience.
<b>Cope</b>	To invest one's own conscious effort, to solve personal and interpersonal problems
<b>Strategy</b>	A plan of action designed to achieve a long-term or overall aim.
<b>Opinions</b>	A view or judgement formed about something, not necessarily based on fact or knowledge.

## Key Knowledge

We all find ways of coping with stress. Some coping strategies are not as helpful as others. For example, negative coping responses often make your stress worse, because they wear you down over time or are temporary distractions.

Some unhelpful strategies for coping;

**Denial.** Avoidance of the issue altogether may lead to denying that a problem even exists. Denial is usually maintained by distractions, such as excessive alcohol consumption, overworking, or sleeping more than usual.

**Self-blame.** Internalizing the issue, and blaming oneself (beyond just taking responsibility for one's actions), leads to low-self esteem and sometimes depression.

**Venting.** An externalizing coping technique, venting is the outward expression of emotions, usually in the company of friends or family. In moderation it can be healthy; however, ruminating on the negative can lead to strained relationships over time

Some unhealthy coping strategies could be also self-harm and eating disorders.

## Year 8 Personal Development Curriculum

### Health and Well-Being

#### Topic: Healthy coping strategies

Key Vocabulary	
Disorder	A disturbance of normal functioning of the mind or body.
Trigger	(Especially of something read, seen, or heard) distress (someone), typically as a result of arousing feelings or memories associated with a particular traumatic experience.
Cope	To invest one's own conscious effort, to solve personal and interpersonal problems
Strategy	A plan of action designed to achieve a long-term or overall aim.
Stress	A state of mental or emotional strain or tension resulting from adverse or demanding circumstances
Mindset	The established set of attitudes held by someone
Resilience	The capacity to recover quickly from difficulties; toughness

#### Key Knowledge

Positive coping responses keep you in the present moment and give you chances to actively work toward solving your problems. Not all positive coping responses will work for every person. Try several until you find one that works for you.

**Humor.** Pointing out the amusing aspects of the problem at hand, or "positive reframing," is thought to help deal with small failures.

**Seeking support.** Asking for help, or finding emotional support from family members or friends, can be an effective way of maintaining emotional health during a stressful period.

**Problem-solving.** As described above, problem solving is an instrumental coping mechanism that aims to locate the source of the problem and determine solutions. This coping mechanism is often helpful in work situations.

**Relaxation.** Engaging in relaxing activities, or practicing calming techniques, can help to manage stress and improve overall coping.

**Physical recreation.** Regular exercise, such as running, or team sports, is a good way to handle the stress of given situation. This may involve yoga, meditating, progressive muscle relaxation, among other techniques of relaxation.

**Adjusting expectations.** Anticipating various outcomes to scenarios in life may assist in preparing for the stress associated with any given change or event.

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## Year 8 Personal Development Curriculum

### Relationships

#### Topic: Different types of relationships

Key Vocabulary	
Relationships	The way in which two or more people or groups regard and behave towards each other.
Type	A category of people or things having common characteristics.
Familial	Relating to or occurring in a family or its members
Romantic	Conducive to or characterized by the expression of love.
Platonic	Friendship; intimate and affectionate

#### Key Knowledge

We are learning about friendships and how to deal with some of the challenges that can arise.

**You know when you're in a healthy relationship because you feel happy to see and spend time with certain people.**

No relationship is ever perfect and you'll definitely have moments when minor disagreements will rise to the surface causing frustration with others.

This is all part of managing our relationships with people around us.

There are many factors that contribute to the development and maintenance of healthy relationships including:

- commitment;
- trust;
- respect;
- responsibility.

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Relationships

Topic; Friendship – what makes a good friend?

Key Vocabulary	
Friend	A person with whom one has a bond of mutual affection, typically one exclusive of sexual or family relations
Positive	Happy or hopeful, or giving cause for happiness or hope
Respect	The feeling you show when you accept that different customs or cultures are different from your own and behave towards them in a way that would not cause offence
Help	To make it possible or easier for someone to do something, by doing part of the work yourself or by providing advice, money, support etc.
Qualities	A characteristic or feature of someone or something
Peer pressure	The strong influence of a group, especially of children, on members of that group to behave as everyone else does

Key Knowledge

- Understand the fundamentals of a good friendship;
  - Acceptance (be yourself)
  - Respect (value your opinions)
  - Listening (care about what is being said and not talking over someone)
  - Trust (being able to confide in someone)
  - Honesty (but be mindful of someone's feelings)
- Appreciate that friendships can change and evolve over time

Relationships

Topic: Healthy Relationships

Key Vocabulary	
Equity	The quality of being fair
Loyalty	Strong level of support for someone
Trust	Firm belief in the reliability, truth, or ability of someone or something.
Honesty	Being truthful
Respect	Regard for the feelings, wishes, or rights of others.
Healthy	Normal, natural, and desirable. self-esteem- confidence in one's own worth or abilities
Toxic	Very harmful or unpleasant
Acceptance	When you are welcomed for who you are
Compassionate	Feeling or showing sympathy and concern for others.

Key Knowledge

- Relationships of all types have a big influence on our lives.
- It is important to recognise the features of healthy relationships and what to do if you think you are part of an unhealthy relationship.
- Healthy relationships should make you feel valued, important and loved. Your opinion should be respected and the other person should accept you for who you are.
- Unhealthy relationships will make you feel sad or angry. They might involve the other person saying hurtful things to you, hurting you physically or making you feel unworthy.
- If you think you are in an unhealthy relationship, you should seek help from a trusted adult.

## Year 8 Personal Development Curriculum

### Relationships

Topic; How to demonstrate positive behaviours in healthy relationships

Key Vocabulary	
Relationship	A person who speaks or acts in support of an individual or cause, particularly someone who intervenes on behalf of a person being attacked or bullied.
Friendship	The emotions or conduct of friends; the state of being friends.
Supportive	Providing encouragement or emotional help
Demonstrate	Show (a feeling or quality) by one's actions
Positive	Constructive, optimistic, or confident

## Key Knowledge

Relationships play a key part in every child or young person's wellbeing.

Healthy relationships are enjoyable and respectful and provide opportunities for many positive experiences that affect self-esteem.

We can develop healthy relationships with anyone, including family, friends, and dating partners. It takes time, energy, and care to develop positive, healthy relationships.

Relationships made during the teenage years can become very special and may form an important part of life. There are also many lessons to be learned from the relationships we have.

Healthy dating relationships should start with the same ingredients that healthy friendships have, such as effective communication, honesty, and respect.

Our psychological health and physical well-being depend heavily on our ability to form close relationships.

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## Year 8 Personal Development Curriculum

### Identity and relationships

Topic: Forming new partnerships and developing relationships

Key Vocabulary	
Friendship	When two people choose to trust each other and share personal thoughts and moments because they trust each other
Partnership	This is a relationship in which two or more people, organizations, or countries work together closely
Frenemy	A person who is, or pretends to be a friend, and who you might have a lot of fun with, but who is also in some ways an enemy or rival or a negative influence
Peer pressure	The pressure that people in the same circle of friends can have on you and then make you feel you need to do certain things. These feelings of pressure are usually not positive or helpful.
Acceptance	In a friendship, liking someone for who they are
Respect	Showing admiration for someone because of their abilities, qualities or achievements.
Listening	Taking time to properly hear what your friend is saying – this shows that you care and are interested in them.
Trust	To believe in a friend and know that they will be there for you. They are totally reliable and your personal thoughts are safe with them
Honesty	Being open, trustworthy and truthful. When people are honest, they can be relied on not to lie, cheat, or steal.

## Key Knowledge

Meeting new people can be difficult, but you just have put yourself out there and be your charming self. This involves being brave and approaching new people and maybe even stepping outside of your comfort zone a little bit

Some so called friends are unfortunately **frenemies**. These are people who might initial seem to be your friends but turn out to be a deliberate rival or someone who isolates you or turns you against other people.

It is important that you work at building relationships. This may not always be easy but relationships that you invest in will last and become stronger

### Build your self-confidence

Liking yourself before going off in search of friends is an important step to building healthy relationships.

**Find something you feel passionate about**  
Join a language class if you love languages or volunteer outdoors if you love nature.

### Put yourself out there

Remember, nothing ventured, nothing gained.

### Ask questions

If you want to be popular, ask people about themselves and listen sincerely when they answer.

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## Year 8 Personal Development Curriculum

### Identity and relationships

#### Topic: Consent

Key Vocabulary	
Consent	Permission for something to happen or agreement to do something
Agree	Have the same opinion about something; concur.
No	Used to indicate that something is quite the opposite of what is being specified.
Permission	The action of officially allowing someone to do a particular thing; consent or authorization.
Willing	Ready, eager, or prepared to do something.

#### Key Knowledge.

Consent is an agreement which is given willingly and freely without exploitation, threat or fear, and by a person who has the capacity to give their agreement.

Sexual consent is an agreement to participate in a sexual activity. Before being sexual with someone, you need to know if they want to be sexual with you too. It's also important to be honest with your partner about what you want and don't want. Consenting and asking for consent are all about setting your personal boundaries and respecting those of your partner — and checking in if things aren't clear. Both people must agree to sex — every single time — for it to be consensual. Without consent, sexual activity (including oral sex, genital touching, and vaginal or anal penetration) is sexual assault or rape.

Communication, honesty and respect make sexual relationships better. Asking for and obtaining consent shows respect for yourself and your partner. It eliminates the entitlement that one partner might feel over the other. Neither your body nor your sexuality belongs to someone else.

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## Year 8 Personal Development Curriculum

### Relationships

#### Topic: Sexting

Key Vocabulary	
Sexting	Sending sexually explicit photographs or messages via mobile phone.
Pornography	Visual material containing the explicit description or display of sexual activity.
Self-esteem	Confidence in one's own worth or abilities
Peer pressure	Influence from members of one's peer group
Frigid	Unable to be sexually aroused

#### Key Knowledge

It is important to be aware of the pressures and dangers around sexting:

##### The Law

It is an offence for a person to take, distribute, possess, or publish indecent photographs of a child under 18.

This law was created to **protect** young people.

The police work under clear guidance that young people should not be criminalised for sending nude images of **themselves**.

However, it's always wrong to share nude images of another young person without their consent and in cases like this, there is the possibility that the police may get involved.

Other dangers include having the image shared among your peer group without your permission. This could make you feel embarrassed.

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Key Words	
<b>Breadwinner/ head of the household</b>	The person who earns the most money in the house and therefore covers more of the household expenses eg. bills
<b>Patriarch</b>	Male head of a family or tribe
<b>Equality</b>	Being equal in status, rights and responsibilities
<b>Gender</b>	Male or Female when considered with reference to social and cultural differences rather than biological ones.
<b>Traditional</b>	Customs or beliefs passing from generation to generation, existing in the long-establish tradition
<b>Modern</b>	Present or recent times, a departure from tradition

## Key Knowledge

Gender roles within relationships have changed over the last 100 years

### 'Traditional' Gender Roles

Males are the head of the household/breadwinner

Males go to work

Females stay home and look after the household

Females raise the children and look after the husband

Males make the final decisions for the house

### 'Modern' Gender Roles

Males and Females take more equal roles within the household

More equal share of chores and childcare

Females may be the breadwinner

Females may wait longer to have children or not have any

Some households still hold onto some of the traditional gender roles

Key Words	
<b>Change</b>	Making someone or something different, to alter or modify something
<b>Cope</b>	To deal with something effectively
<b>Divorce</b>	The legal dissolution of a marriage by a court or other competent body.
<b>Separation</b>	The action or state of moving or being moved apart.
<b>Bereavement</b>	The action or condition of being bereaved
<b>Vulnerable</b>	Exposed to the possibility of being attacked or harmed, either physically or emotionally.

### How change can influence us

Struggle to come to terms with the change

Make us feel vulnerable

Can make people anxious

Acceptance that life is full of change

Change can be positive and make things better

People who do not accept change do not live a healthy lifestyle

## Key knowledge

### How to cope with change

Bereavement

Use your support network

Talk to someone

Express your feelings

Go through the process at your pace

### Divorce/Separation

Use your support network

Ask for help if you need it, it may be an anxious time

You can write about your feelings

Know that it's not your fault and has nothing to do with their love for you

### Where to access support

Childline - <https://www.childline.org.uk/> or call 0800 1111

Divorce/Separation - <https://www.childline.org.uk/info-advice/home-families/family-relationships/divorce-separation/>

Bereavement - <https://www.childline.org.uk/info-advice/your-feelings/feelings-emotions/when-someone-dies/>

NHS – eg. Doctor (GP)

Responsible adult – eg. Parents, teachers, school staff

Faith leader

School Chaplain

Topic: Marriage

Key Words	
Exclusive	Restricted between two people
Sacrament	An outward sign of inward grace
Witness	A person who has seen an event
Vows	Set of solemn promises committing one to a prescribed role

Key Knowledge

What is marriage?

A formal union and legal contract between two people  
 A public sign of giving yourself to another  
 Uniting two people in a lifelong bond  
 Links two people together emotionally, economically and legally

Why do people get married?

To show dedication and commitment to another person  
 Provide a secure environment for children

Marriage is a sacrament

Catholics believe marriage is a sacrament made between two people  
 God is present throughout the marriage and is a witness  
 Vows are witnessed by God  
 Rings are exchanged by the couple  
 Rings symbolise endless love  
 Marriage is lifelong, life-giving, exclusive and freely undertaken

Topic: Marriage 2

Key Words	
Cohabitation	Living together before marriage
Covenant	Restricted between two people
Sacrament	An outward sign of inward grace

Key Knowledge

Other Christian attitudes to marriage

Most Christians believe marriage is a gift from God  
 Marriage is a covenant between the two people and God  
 Marriage is a suitable environment to start a family  
 A few Church of England Christians accept cohabitation before marriage  
 Exchanging of rings and vows occurs in many denominations

Other types of marriage

Arranged marriage

In some cultures, the bride and groom are chosen by others  
 The final decision is made by those getting married  
 This choice is freely made and supported by parents of those getting married

Forced marriage

A marriage where one, or both, participants are pressured into the marriage  
 Free consent has not been given  
 This is not the same as an arranged marriage  
 Forced marriages are illegal in the UK

Values for life in Modern Britain

Topic: Online Communication

Key Vocabulary	
<b>Legacy</b>	Something which is left behind linked to you
<b>Digital Footprint</b>	The information about a particular person that exists on the internet as a result of their online activity.
<b>Responsible</b>	Being the primary cause of something and so able to be blamed or credited for it.
<b>Appropriate</b>	Suitable or proper in the circumstances.
<b>Search</b>	Try to find something by looking or otherwise seeking carefully and thoroughly.
<b>Image</b>	The general impression that a person, organisation, or product presents to the public
<b>Privacy</b>	A state in which one is not observed or disturbed by other people.

As with most potential online dangers, the problems can start if you don't look after your personal information properly.

The risks you need to be aware of are:

cyberbullying (bullying using digital technology)  
 invasion of privacy  
 identity theft  
 Seeing offensive images and messages  
 the presence of strangers who may be there to 'groom' other members

The following guidelines will help make sure you stay safe while on social media:

Don't publish ANY personal information

Be very careful about what images and messages you post, even among trusted friends – once they are online they can be shared widely and are almost impossible to get removed

Talk to a trusted adult if you come across anything offensive or upsetting

Keep a record of anything abusive or offensive you receive and report any trouble to a trusted adult and site management (most sites have a simple reporting procedure, normally activated by clicking on a link on the page)

If you have any online worries you can contact the police or Child Exploitation and Online Protection Centre (CEOP)

Values for life in Modern Britain

Topic: How to use social networking sites safely

Key Vocabulary	
<b>Online profile</b>	is the digital DNA of a person and it also displays information that helps to understand the characteristics and interests that they have.
<b>To go viral</b>	When something is popular and spreads quickly, we can say it has 'gone viral'.
<b>Clickbait</b>	Links and adverts that have headlines that make you want to click on them. They often don't live up to expectations
<b>Troll</b>	In social media, a troll is a person who deliberately starts arguments in the comments sections of sites.
<b>Hater</b>	This is someone who voices negative opinions about other people.
<b>FOMO</b>	This is an acronym that stands for Fear of Missing Out and a technique used to pressure people into feeling that they must be part of something.

**Key Knowledge - Staying safe on social media - Simple steps**

**Set your profiles to private**

Think carefully about what you post online and who you want to see it. Consider setting your profiles to 'friends/followers' only. Remember anything you post can be shared. Even with strong privacy settings in place, it is important that you come to terms with the fact that what you post online is never really private and can be shared.

**Recognise the fakes**

Not everyone on social media will be who they say they are. There can be young people and adults who pretend to be someone else and could cause you harm. For example they may want to trick you into sharing private or personal information that they could use against you. It's important that you never meet up with someone you don't know.

**Spring clean your contacts**

Once you make a friend online, it doesn't have to be permanent. Regularly review and clean up your contacts - particularly anyone who spreads negative content or doesn't make you feel good about yourself. Block anyone who bothers you

**Protect your identity**

Your phone number, address, bank details and any information that may hint to your personal passwords should never be shared online.

**Avoid the big risks**

One of the hardest things you can go through is having a very private image or video shared with others.

## Year 8 Personal Development Curriculum

### Values for life in Modern Britain

#### Topic: How to recognise online grooming

Key Vocabulary	
Trust	Firm belief in the reliability, truth, or ability of someone or something
Online	Controlled by or connected to a computer.
grooming	The action by a paedophile of preparing a child for a meeting, especially via an internet chat room, with the intention of committing a sexual offence.
Propaganda	Information, especially of a biased or misleading nature, used to promote a political cause or point of view.
radicalisation	The action or process of causing someone to adopt radical positions on political or social issues.
Contact	The action of communicating or meeting
exploit	To take advantage of (a person, situation, etc), esp unethically or unjustly for one's own ends

### Key Knowledge

The world wide web is a great platform that lets anyone share information and ideas.

When you are browsing the web, you need to think about whether the things you are viewing are **reliable**.

Is it content that you can trust?

Online grooming is where someone befriends a child online and builds up their trust with the intention of exploiting them and causing them harm.

Harm caused by grooming can be sexual abuse, both in person and online, and exploitation to obtain sexually explicit images and videos of the child.

Grooming techniques could also be used as part of the radicalisation process or to obtain financial information from the child or their family.

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## Year 8 Personal Development Curriculum

### Values for life in Modern Britain

#### Topic: How to recognise biased or misleading information online

Key Vocabulary	
Bias	Is being prejudiced for or against something, especially in a way considered to be unfair.
Misleading	Is giving the wrong idea or impression.
Disinformation	Is false or misleading information that is spread deliberately to deceive.
Fake news	False stories that appear to be <b>news</b> , spread on the internet or using other media, usually created to influence political views or as a joke

### Key Knowledge

Bias is present in all the media and people we encounter- even you and I are biased! Bias is about liking or not liking something, not necessarily fairly.

We need to be able to recognise when other people or sources are biased so that our opinions aren't influenced by misleading or false information.

Media sources can deliberately use misleading information to trick us into giving people money, or make us think something that isn't true.

People might spread misinformation by accident, because they don't know better

People might spread disinformation on purpose, to make others agree with their political opinion

Believing the wrong thing online can have serious consequences- it can lead to prejudice, believing something incorrect or being conned out of money.

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Key Vocabulary	
<b>Critically</b>	Thoughtful analysis of the positives and negatives of a source
<b>Dependable</b>	Trustworthy and reliable.
<b>Credible</b>	Able to be believed; convincing.
<b>Bias</b>	Is being prejudiced for or against something, especially in a way considered to be unfair.
<b>Corroboration</b>	Evidence which confirms or supports a statement, theory, or finding; confirmation.
<b>Parody</b>	A piece of art or media that copies or makes fun of another style of art or media

## Key Knowledge

It is important to be able to develop the skills and ability to explore a media source and work out if it is dependable. This helps you be analytical and builds critical thinking skills as well as ensuring you don't easily believe false information and get lead astray.

The 5 C's can help you- when looking at a media source ask:

**Context**- where is it from? Who created the source and why? When was it written?

**Credibility**- are they reliable? Are they an expert? Is it as real site?

**Construction** – what is the bias? Is anything left out? Are there facts or just opinion?

**Corroboration**- do other credible news sources agree with it?

**Compare**- compare to other sources to get a bigger picture.

Key Vocabulary	
<b>Identity Fraud</b>	Is when a fraudster uses someone else's identity (or creates a fake identity) to access a product or service so they get out of paying for it themselves.
<b>Social Media</b>	Websites and applications that enable users to create and share content or to participate in social networking. Online Data- the practice of storing electronic data with a third party service accessed via the Internet.
<b>Social Engineering</b>	A method of manipulating people to reveal personal information about themselves
<b>Cyber crime</b>	A type of crime that is committed using information technologies such as a computer and a network
<b>Phishing</b>	An attempt to gain personal information through the use of email communications
<b>Malware</b>	Software which is specifically designed to disrupt or damage a computer system

## Key Knowledge

Identify theft can involve people using your private information to pretend to be you and get products and money in your name.

This can cause financial difficulties such as being unable to get a loan or a mortgage.  
Scammers can use information you put on social media to steal your identity .

It is important to keep personal information like your full name, date of birth and address private.

Scammers can also trick you into giving them information through websites and email.



Values for life in Modern Britain

Topic: Age restrictions when accessing different forms of media

Key Vocabulary	
<b>Restrictions</b>	A limiting condition or measure, especially a legal one
<b>Responsible</b>	Being the cause of something and so able to be blamed or credited for it
<b>Decisions</b>	A conclusion or resolution reached after careful thought
<b>Appropriate</b>	Suitable or proper in the circumstances.
<b>Judgement</b>	The ability to make considered decisions or come to sensible conclusions.
<b>Suitable</b>	Right or appropriate for a particular person, purpose, or situation

## Key Knowledge

The law for using social media sites in the UK is 13

According to The Social Age Study by knowthenet.org.uk, approximately 59% of children have already used a social network by the time they are 10. Facebook has the most users under the age of 13— 52 per cent of 8 to 16-year-olds admit they ignore Facebook's age restriction.

### Disadvantages of Social media

Lacks Emotional Connection  
 Gives People a License to be Hurtful  
 Decreases Face-to-Face Communication Skills  
 Conveys Inauthentic Expression of Feelings  
 Diminishes Understanding and Thoughtfulness  
 Causes Face-to-Face Interactions to Feel Disconnected  
 Facilitates Laziness  
 Creates a Skewed Self-Image  
 Reduces Family Closeness  
 Causes distractions

### Advantages of social media

Develop better social skills.  
 Feel less isolated.  
 Learn about new cultural and societal ideas and issues.  
 Bond with their friends.  
 Have fun.  
 Be creative and share own ideas with friends.  
 Be better equipped to be active citizens in society



# Year 8 English Knowledge Organiser

Full academic year

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## Vocabulary



Full academic year

### CONTENTS

<b>Page 3</b>	Tier Two Vocabulary- William Blake
<b>Page 3</b>	Tier Two Vocabulary- Women's Literature
<b>Page 4</b>	Tier Two Vocabulary- Private Peaceful
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<b>Page 6-7</b>	Tier Three Vocabulary

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## TIER TWO VOCABULARY

### William Blake

WORD	DEFINITION
<b>Childhood</b>	The state of being a child.
<b>Industrial</b>	Relating to or characterised by industry.
<b>Inequality</b>	A lack of equality.
<b>Morality</b>	Principles concerning the distinction between right and wrong or good and bad behaviour.
<b>Poverty</b>	The state of being extremely poor.
<b>Revolution</b>	A forcible overthrow of a government or social order, in favour of a new system.
<b>Romanticism</b>	An artistic and philosophical movement that redefined the ways people think about themselves and the world.
<b>Vengeance</b>	Getting revenge on someone who has wronged you

### Women's Literature

WORD	DEFINITION
<b>Discrimination</b>	The unjust or prejudicial treatment of different categories of people, especially on the grounds of race, age, sex, or disability.
<b>Empowerment</b>	The process of becoming stronger and more confident.
<b>Equality</b>	The state of being equal, especially in status, rights, or opportunities.
<b>Feminism</b>	The belief in women's rights on the ground of the equality of the sexes.
<b>Misogyny</b>	A hatred towards women.
<b>Patriarchy</b>	A society where men have more power than women.
<b>Prejudice</b>	A preconceived opinion that is not based on reason or actual experience.
<b>Society's norms</b>	The informal rules that govern behaviour in groups and societies.
<b>Suffrage</b>	The right to vote.

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## TIER TWO VOCABULARY

### Private Peaceful

WORD	DEFINITION
<b>Alliance</b>	A union or association formed for mutual benefit, especially between countries.
<b>Conflict</b>	A serious disagreement or argument.
<b>Cowardice</b>	A lack of bravery.
<b>Justice</b>	Just, true and right behaviour.
<b>Nationalism</b>	A person who strongly identifies with their own nation and supports its interests to the exclusion of other nations.
<b>Nostalgia</b>	A sentimental longing or wistful affection for a period in the past.
<b>Patriotism</b>	A person who has or expresses devotion to their country.
<b>Society</b>	People living together in a more or less ordered community.

### Shakespeare's Comedy

WORD	DEFINITION
<b>Expectation</b>	A strong belief that something will happen or be the case.
<b>Gender</b>	Gender is the range of characteristics relating to, and differentiating between, femininity and masculinity.
<b>Hierarchy</b>	A system in which members of an organisation or society are ranked according to relative status or authority.
<b>Patriarchy</b>	A society in which men hold more power than women.
<b>Renaissance</b>	The revival of European art and literature under the influence of classical models in the 14th–16th centuries.
<b>Stereotype</b>	A widely held but fixed and oversimplified image or idea of a particular type of person or thing.

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## TIER THREE VOCABULARY

WORD	DEFINITION
<b>Adjective</b>	A word describing or naming an attribute of a noun.
<b>Adverb</b>	A word that describes how a verb is being done.
<b>Alliteration</b>	The repetition of the same sound in a sequence of words beginning with the same letter.
<b>Allusion</b>	A reference to another literary text, event or person.
<b>Foreshadowing</b>	A warning or indication of (a future event).
<b>First person narrative</b>	When a narrator recounts events from their own point of view using the first person such as "I", "us", "our" and "ourselves".
<b>Genre</b>	A style or category of art, music, or literature.

WORD	DEFINITION
<b>Metaphor</b>	A figure of speech in which something is directly compared to something else by saying it is that thing.
<b>Noun</b>	A word used to identify a person, place or thing.
<b>Pathetic fallacy</b>	The attribution of human feelings and responses to inanimate things or animals
<b>Personification</b>	The attribution of human attributes to inanimate things or animals.
<b>Simile</b>	A figure of speech involving the comparison of one thing with another thing of a different kind using 'like' or 'as'.
<b>Symbolism</b>	The use of symbols to represent ideas or qualities.
<b>Third person narrative</b>	When the writer writes about a character who isn't the speaker.
<b>Verb</b>	A word describing an action or how something is done.

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## TIER THREE VOCABULARY

WORD	DEFINITION
<b>Ellipsis</b>	Intentionally leaving out a word, sentence, or whole section from a text for effect.
<b>Emotive language</b>	Words which elicit a powerful emotional response.
<b>Exaggeration</b>	Representing something as being larger, better, or worse than it really is.
<b>Direct address</b>	Referring to the reader directly using the pronouns 'we' or 'you'.
<b>Facts</b>	Something which can be proven to be true.
<b>Knowledge</b>	Knowing the topic/subject you are writing or speaking about.

WORD	DEFINITION
<b>Onomatopoeia</b>	Using a word that resembles the sound it describes.
<b>Opinion</b>	A belief which cannot be proven to be true.
<b>Oxymoron</b>	A figure of speech in which apparently contradictory terms appear beside each other.
<b>Pun</b>	A joke using the different possible meanings of a word or the fact that there are words which sound alike but have different meanings.
<b>Repetition</b>	When a word or phrase is used more than once across a text for effect.

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# Grammar



Full academic year

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Page 8

Simple Sentences  
Compound Sentences  
Complex Sentences

Page 9

Comma  
Semi-Colon  
Colon

Page  
10-12

ISPACED  
Apostrophes  
Paragraphs

7

## TERM 1

### Explanation

### Example



A **simple sentence** is a complete piece of information. It contains a subject, a verb and sometimes an object.

**The pen fell on the floor.**



A **compound sentence** contains two main clauses (like two simple sentences). These are joined with a conjunction: *and, but, so, because*.

**Miss Kelly was tired, so she bought a large coffee.**



A **complex sentence** contains a main clause and a subordinate clause.

**Whilst it was raining, Mr Thornhill enjoyed a cup of tea in his office.**

## TERM 2



### Explanation

A **comma** indicates a pause between parts of a sentence or separates items in a list.

### Example

**I went to Morrisons and bought linguine, king prawns, garlic and chilli flakes.**



A **semi-colon** can be used between two closely related independent clauses, provided they are not already joined by a coordinating conjunction.

**Miss Kureczko was busy; she wouldn't even answer the phone.**



A **colon** is used to precede a list of items, a quotation, or an expansion or explanation.

**Monday: the worst day of the week.**

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## TERM 3



**ISPACE** indicates the various ways you can start a sentence.

It stands for –ING verbs, Simile, Preposition, Adverb, Connective, -ED verbs.

### –ING verb

-ING verb example: Flying proudly in the wind, the flag reigned over the castle

### Simile

Simile example: Like a predator, the child caught the escaping balloon.

### Preposition

Preposition example: Turning to my right, I saw the corridor I was meant to walk down.

### Adverb

Adverb example: Nervously, the cat padded its way across the room.

### Connective

Connective example: Finally, she arrived at her front door.

### -ED verb

-ED verb example: Withered, the trees stood like ancient guards.

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## TERM 3



An apostrophe is used to indicate either **possession** or the **omission** of letters.

When to use	Explanation	Example
Apostrophes for possession	Using an apostrophe + s ('s) shows that one person/thing owns or is a member of something.	Reece's ballet class Iqra's bike Jake's pen Jess' room
Apostrophes for contractions	When you combine two words to make a contraction, you will always take out some letters. In their place, use an apostrophe.	they + have = they've are + not = aren't they + will = they'll

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## TERM 3



A paragraph is a distinct section of a piece of writing, usually dealing with a single theme and indicated by a new line.

New paragraphs should start with a topic sentence, and information within the paragraph should stay focused on that topic.



**Ti** - stands for **Time**, so start a new paragraph for a different time period.



**P** - stands for **Place**, so start a new paragraph for each new place.



**To** - stands for **Topic**, so start a new paragraph for each new topic, idea or subject.

A helpful way to remember when to start a new paragraph is to learn **TiToP**.



**P** - stands for **Person**, so start a new paragraph for each new person or change of speaker in a dialogue.

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# Reading Skills

## CONTENTS



Page 14 Responding to a text

Page 15 Comparing two texts

Page 16 Finding connotations

Full academic year

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## RESPONDING TO A TEXT

### Ask yourself:

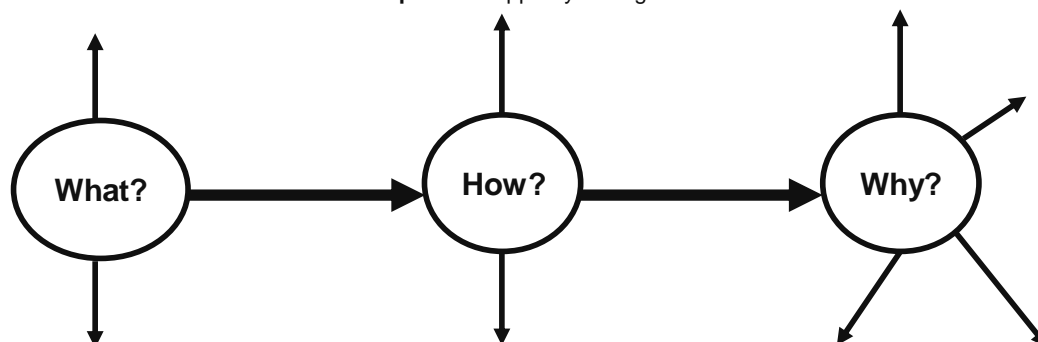
Do you **agree or disagree** with the statement?  
Does the text **support** or go against the question?

### Ask yourself:

How did you reach that decision?  
Which **words or phrases** from the text made you agree or disagree with the question?  
Find a **quote** to support your argument.

### Ask yourself:

**Zoom** into one word.  
What are the **connotations** of a word?  
What other words or **ideas** do they make you think of?



### Ask yourself:

How does the text **link** to the question?  
Use the **key words** from the question in the answer.

### Ask yourself:

Which **techniques** can you see in your quote?  
Which word is **most important**?  
How does this quote **link** to your original point?

### Ask yourself:

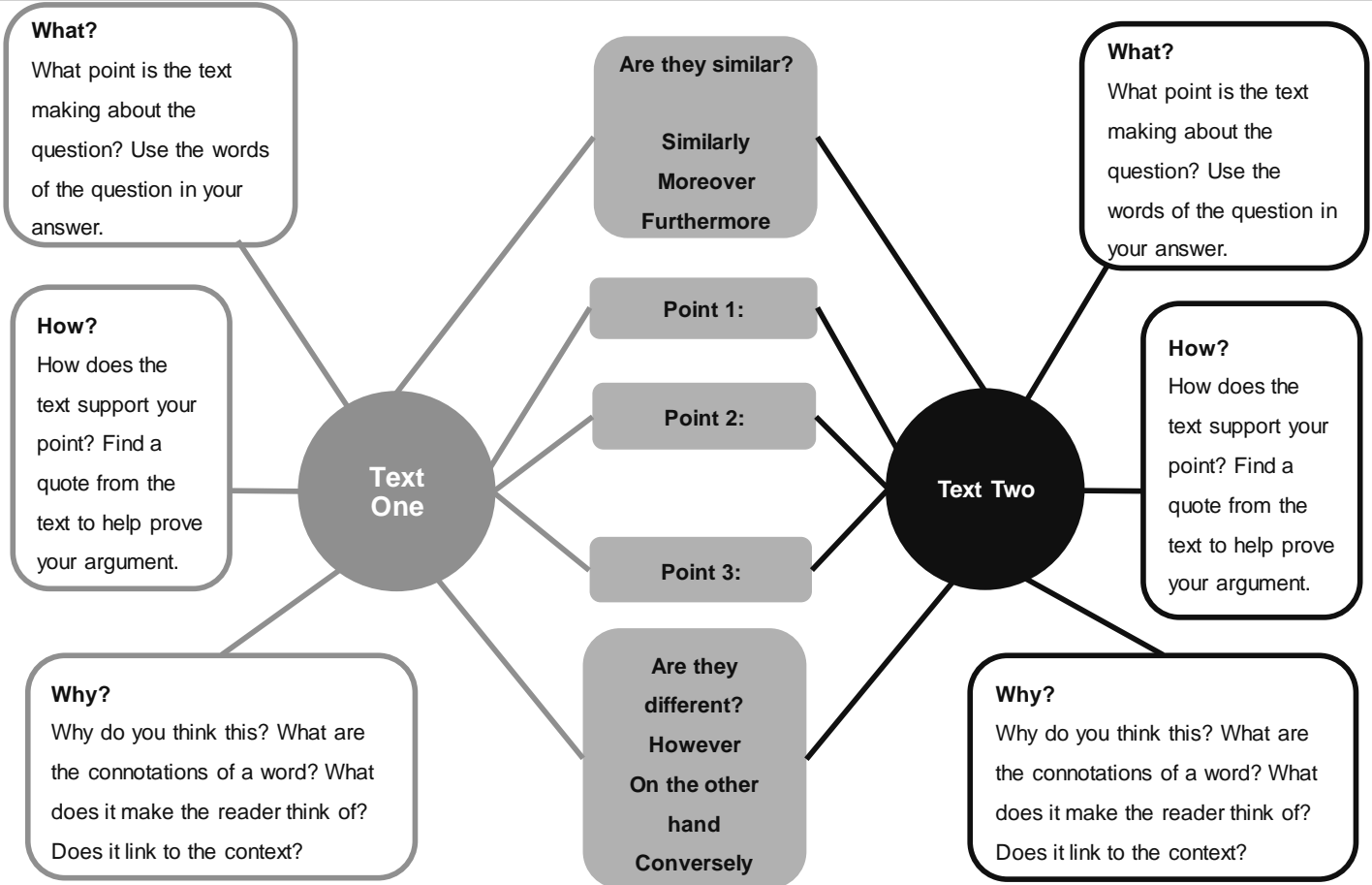
How does your analysis **link** back to the original question?

### Ask yourself:

What **themes** or **contextual** ideas do the words link to?

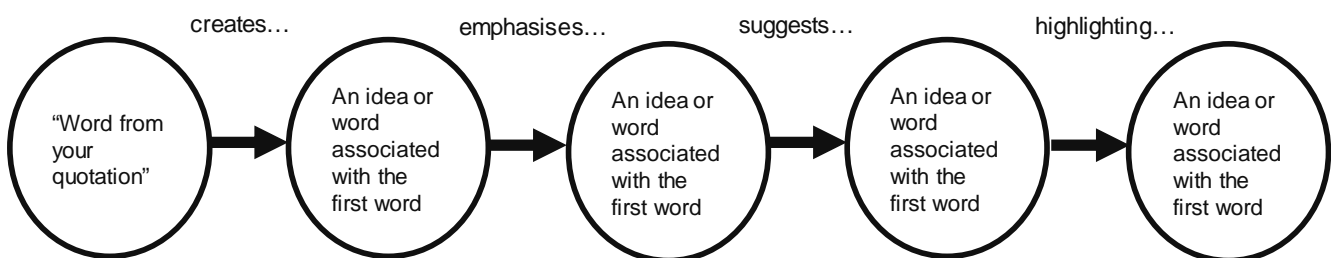
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## COMPARING TWO TEXTS



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## FINDING CONNOTATIONS



The word "\_\_\_\_\_" creates an image of \_\_\_\_\_.

It emphasises \_\_\_\_\_ because it suggests \_\_\_\_\_.

This highlights \_\_\_\_\_ and therefore makes the reader feel \_\_\_\_\_ about \_\_\_\_\_.

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# Year 8 Texts



Full academic year

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## Life, Labour and Loss: A Victorian Childhood

### CONTENTS



Page 19 & 20 Tier 2 Vocabulary

Page 21 19<sup>th</sup> Century  
Themes and Context

Page 22 19<sup>th</sup> Century Life

Autumn Term 1

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## TIER TWO VOCABULARY- LIFE, LABOUR AND LOSS

WORD	DEFINITION
<b>Capitalism</b>	An economic or political system where a country's trade and industry is controlled by private owners for profit.
<b>Capital Punishment</b>	The legally authorised killing of someone as punishment for a crime.
<b>Charity</b>	The voluntary giving of help, typically in the form of money, to those in need.
<b>Child Labour</b>	The employment of children in an industry or business.
<b>Control</b>	The power to influence or direct people's behaviour or the course of events.
<b>Corporal Punishment</b>	Physical punishment, such as caning or flogging.
<b>Despair</b>	The complete loss or absence of hope.

WORD	DEFINITION
<b>Desperation</b>	A state of despair, typically one which results in rash or extreme behaviour.
<b>Despondent</b>	In low spirits from a loss of hope or courage.
<b>Destitution</b>	Extremely poor and lacking the means to provide for oneself.
<b>Dilapidated</b>	In a state of disrepair or ruin as a result of age or neglect.
<b>Exploitation</b>	The action or fact of treating someone unfairly in order to benefit from their work.
<b>Industrial</b>	Economic activity concerned with the processing of raw materials and manufacture of goods in factories.
<b>Inequality</b>	Lack of equality.

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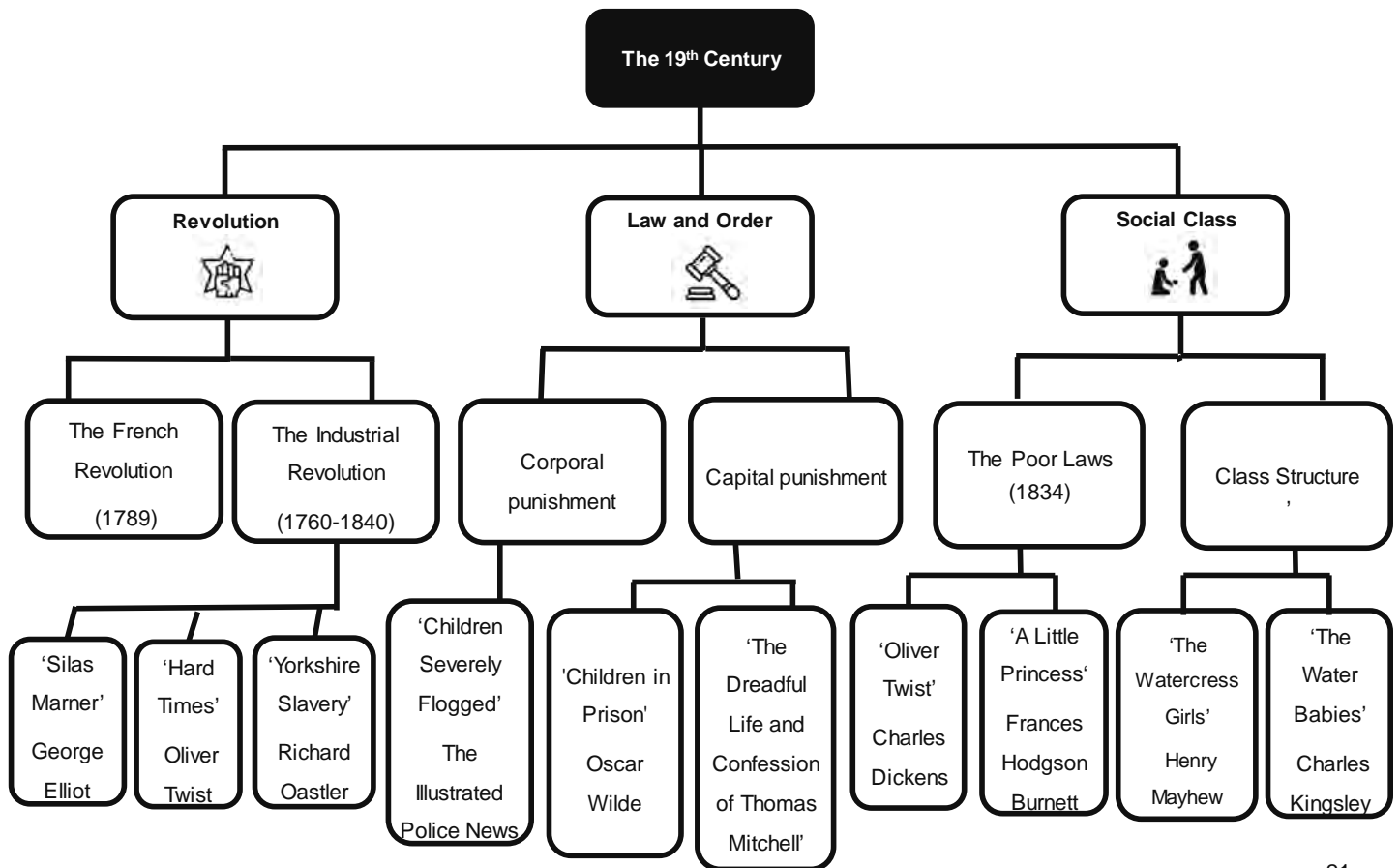
## TIER TWO VOCABULARY- LIFE, LABOUR AND LOSS

WORD	DEFINITION
<b>Labour</b>	Employment in an industry or business.
<b>Malnutrition</b>	Lacking proper nutrition.
<b>Neglect</b>	The failure to provide care for property or people.
<b>Oppression</b>	The prolonged cruel or unjust treatment or exercise of authority.
<b>Pauper</b>	A recipient of relief under the provisions of the Poor Law or public charity.
<b>Poverty</b>	The state of being extremely poor.

WORD	DEFINITION
<b>Redemption</b>	The action of saving or being saved from sin, error or evil.
<b>Reform</b>	Make changes in (something, especially an institution or practice) in order to improve it.
<b>Superiority</b>	Higher ranking in status or quality.
<b>Voracious</b>	Wanting great quantities of food.
<b>Welfare</b>	The state system designed to promote the basic physical and material well-being of people in need.

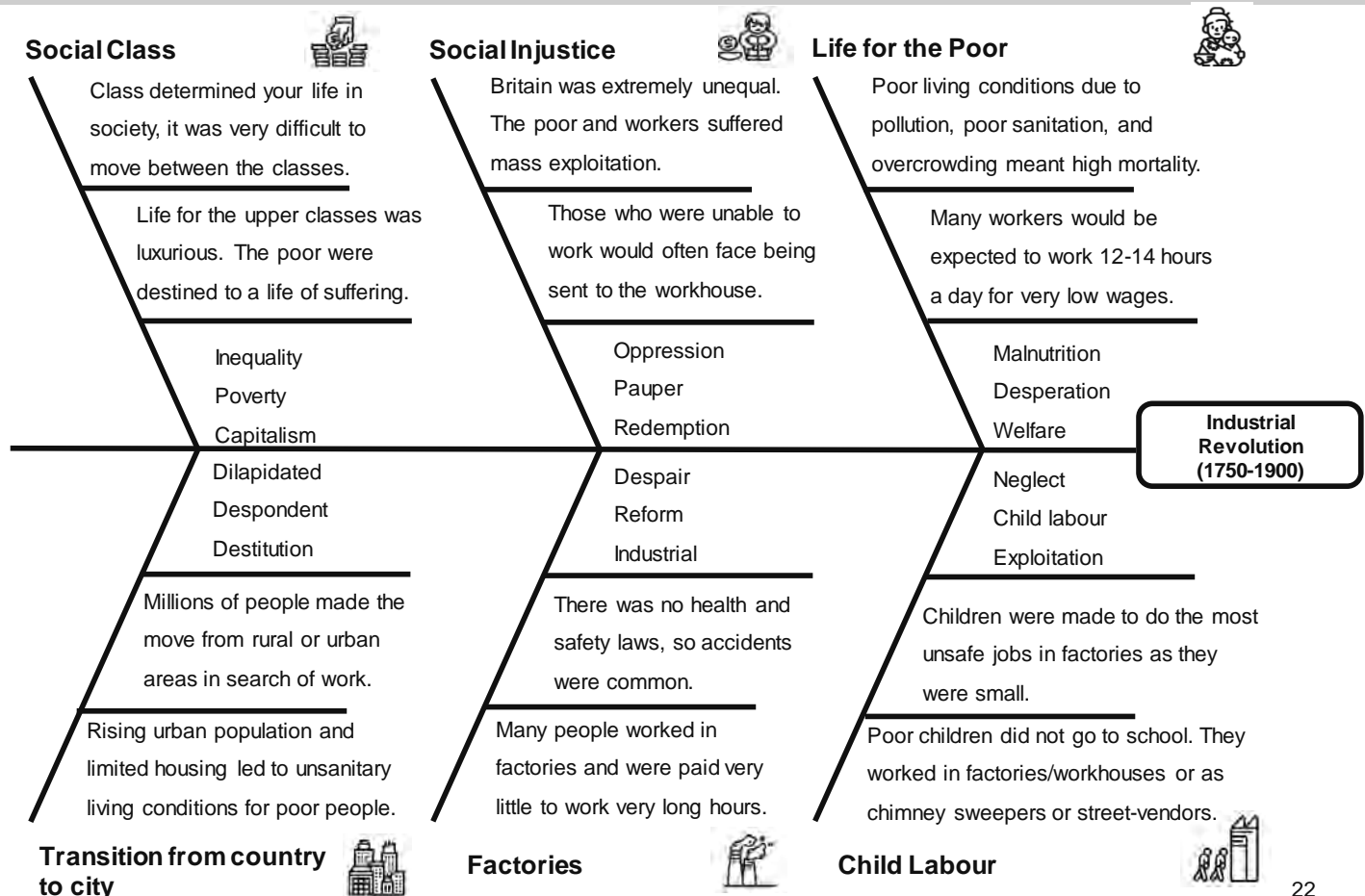
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## 19<sup>th</sup> CENTURY THEMES AND CONTEXT



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## 19<sup>TH</sup> CENTURY LIFE



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# Pride not Prejudice Poetry



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**24 & 25**

**Page 26** Pride Not Prejudice  
Themes and Influences

**Page 27** Pride Not Prejudice  
Key Themes

Autumn Term 2

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## TIER TWO VOCABULARY- PRIDE NOT PREJUDICE

WORD	DEFINITION
<b>Bilingual</b>	The ability to speak two languages fluently.
<b>Culture</b>	The ideas, customs, and social behaviour of a particular people or society.
<b>Empowerment</b>	The process of becoming stronger and more confident.
<b>Ethnicity</b>	The state of belonging to a social group that has a common national or cultural tradition.
<b>Expectations</b>	A strong belief that something will happen or be the case.
<b>Discrimination</b>	The unfair or prejudicial treatment of people and groups based on characteristics such as race, gender, age or sexual orientation.

	DEFINITION
<b>Family</b>	A group of people related by blood or marriage.
<b>Gender</b>	The range of characteristics pertaining to, and differentiating between, masculinity and femininity.
<b>Hierarchy</b>	A system in which members of an organization or society are ranked according to relative status or authority.
<b>History</b>	The whole series of past events connected with a particular person or thing.
<b>Justice</b>	Fair behaviour or treatment.
<b>Language</b>	The method of human communication, either spoken or written, consisting of the use of words in a structured and conventional way.

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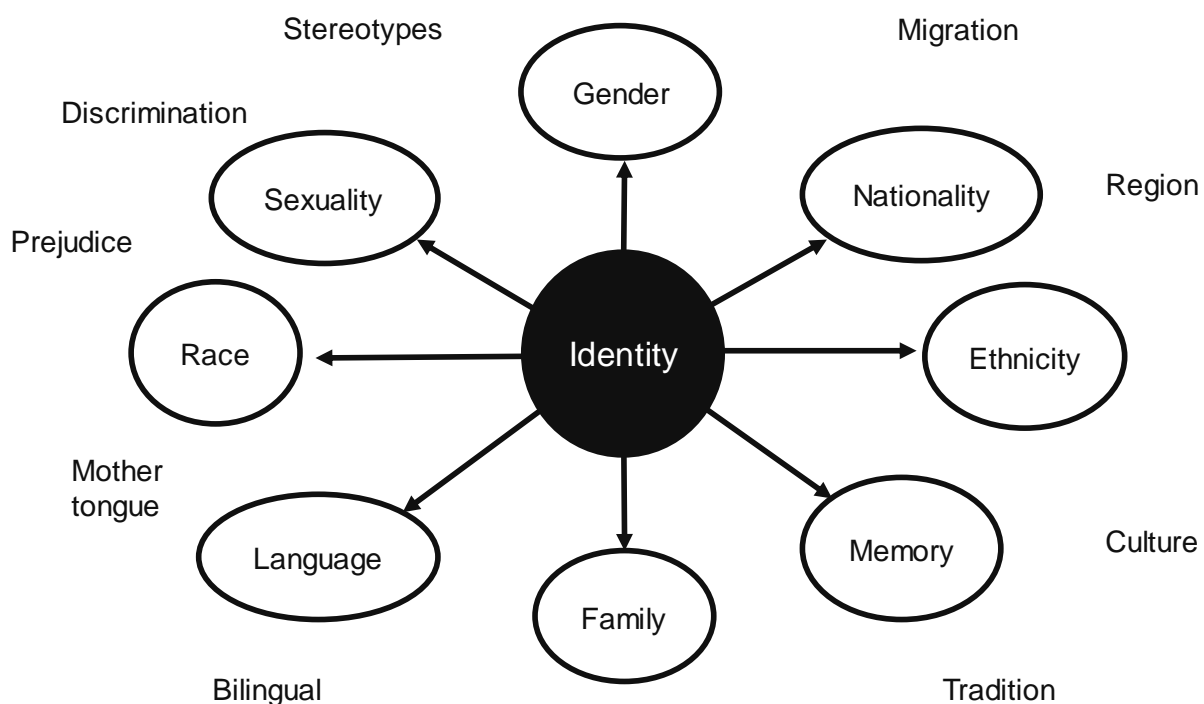
## TIER TWO VOCABULARY- PRIDE NOT PREJUDICE

WORD	DEFINITION
<b>Memory</b>	Something remembered from the past.
<b>Morality</b>	The difference between right and wrong.
<b>Mother tongue</b>	The language which a person has grown up speaking from early childhood.
<b>Nationality</b>	The status of belonging to a particular nation.
<b>Region</b>	An area, especially part of a country or the world having definable characteristics, but not always fixed boundaries.
<b>Revolution</b>	A forcible overthrow of a government or social order, in favour of a new system.

	DEFINITION
<b>Patriarchy</b>	A society where men hold more power than women.
<b>Sexuality</b>	A person's sexual orientation or preference.
<b>Society's norms</b>	The informal rules which govern people's behaviour in groups.
<b>Stereotypes</b>	A widely held but fixed and oversimplified image or idea of a particular type of person or thing.
<b>Tradition</b>	The transmission of customs or beliefs from generation to generation, or the fact of being passed on in this way.

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## PRIDE NOT PREJUDICE THEMES AND INFLUENCES



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# PRIDE NOT PREJUDICE POETRY KEY THEMES

## Migration



The experience of immigrants and the barriers they face when settling in a new country.

**Migration**= the movement of a person from one country to another with the intention of settling there.

**Dual identity**= identifying with the country you were born in and the country you live in.

### Key Words

Nationality Bilingual  
Ethnicity Hierarchy  
Region  
Mother tongue

### Key Texts

*The Weight of Water*  
*Hurricane Hits England*  
*And Still I Rise*

## Gender and Sexuality



The experiences of female and gay writers as they celebrate the progress they have made.

**Sexuality**= a person's identity in relation to the gender or genders to which they are attracted to.

**Gender**= the range of characteristics relating to femininity and masculinity.

### Key Words

Stereotypes Memory  
Empowerment Patriarchy  
Oppression  
Societal norms

### Key Texts

*I Come From*  
*A Litany for Survival*  
*And Still I Rise*

## Race



The experience of black writers as they fight back against past discrimination and injustices.

**Race**= a grouping of humans based on shared physical or social qualities, viewed as distinct by society.

**Prejudice**= preconceived opinion that is not based on reason or actual experience.

### Key Words

Discrimination History  
Revolution Justice  
Expectations  
Morality

### Key Texts

*Half-Caste*  
*A Litany For Survival*  
*And Still I Rise*



# The Lie Tree and The Gothic Genre



Spring Term

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Page 31	The Lie Tree Characters
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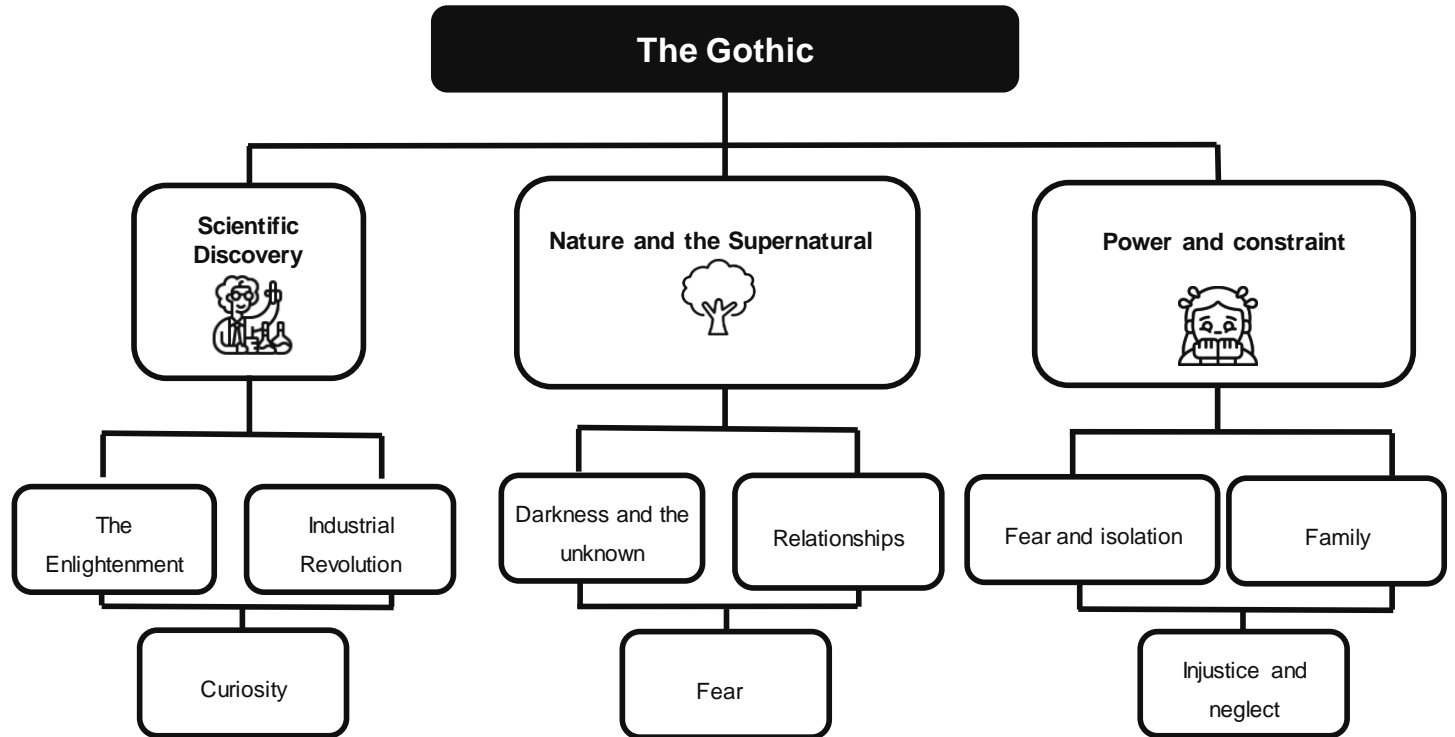
## TIER TWO VOCABULARY

WORD	DEFINITION
<b>Curiosity</b>	A strong desire to know or learn something.
<b>Femme Fatale</b>	An attractive and seductive woman, especially one who is likely to cause distress or disaster for a man who becomes involved with her.
<b>Gothic</b>	A genre of literature and film that combines fiction and horror, death and, at times, romance.
<b>Grotesque</b>	Comically or repulsively ugly or distorted.
<b>Injustice</b>	Lack of fairness or justice.
<b>Isolation</b>	Being on your own away from others.

WORD	DEFINITION
<b>Monstrous</b>	Having the ugly or frightening appearance of a monster.
<b>Neglect</b>	Failure to care for property or people.
<b>Paranormal</b>	Denoting to events or phenomena which are beyond the scope or normal scientific understanding.
<b>Resurrection</b>	The action or fact of rising from the dead.
<b>Supernatural</b>	Manifestations or events considered to be of supernatural origin, such as ghosts.
<b>Telepathic</b>	Able to read the minds of other people.

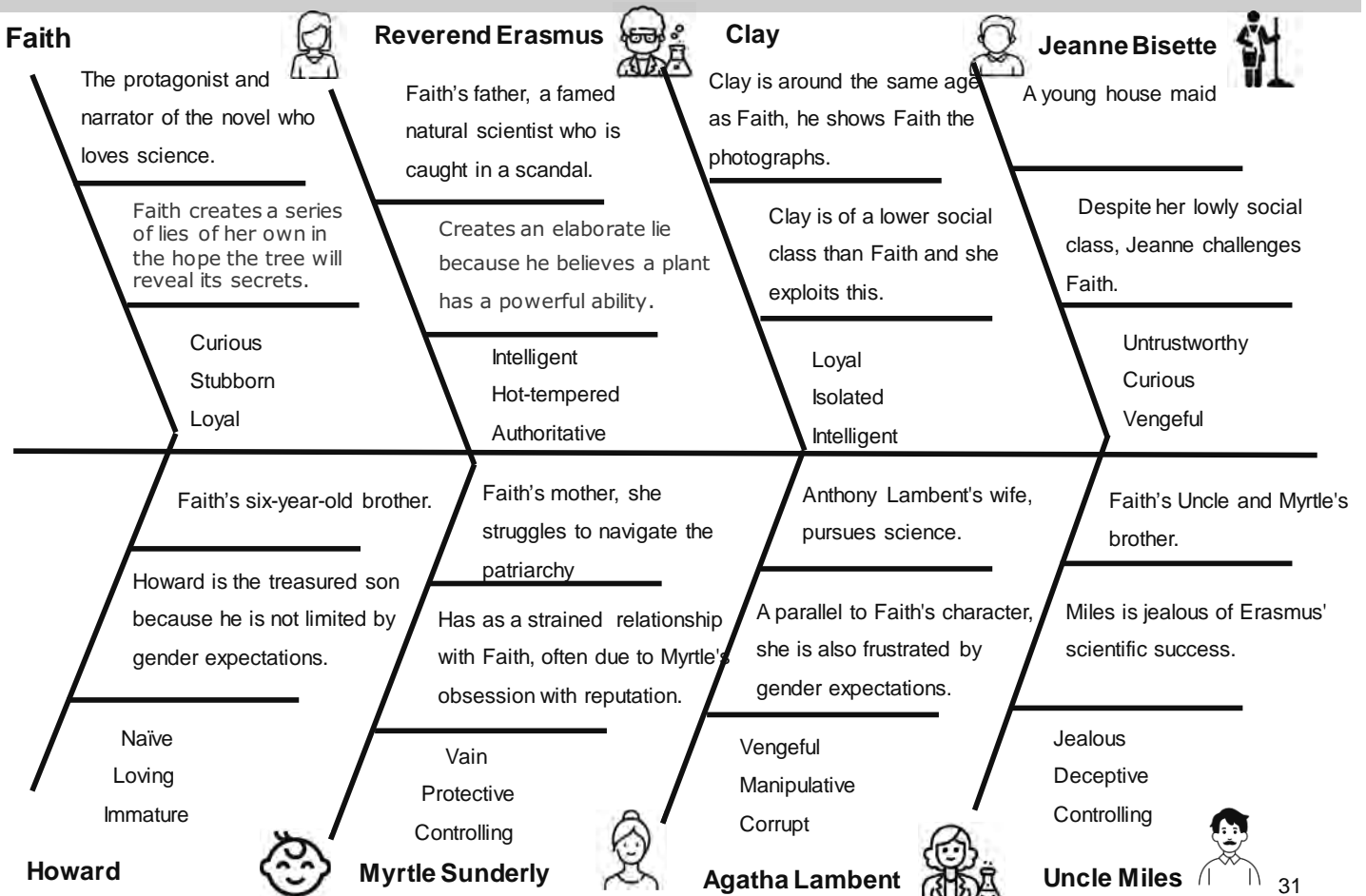
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## THE GOTHIC THEMES AND INFLUENCES



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## The Lie Tree CHARACTERS



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## The Lie Tree: historical context.



### Scientific discovery

In the **1860s**, the scientific community was still coming to terms with the theory of **evolution** which contradicted the long-standing religious belief that God had created everything.

**Religious beliefs** in the Victorian Period may seem old fashioned now. For example, Howard is forced to keep his left arm in a sling out of a religious belief that the right hand should be dominant. Nonetheless, **it was expected that you would adhere to these beliefs.**



### The Lie Tree

**A magical tree that consumes people's whispered lies, converting them into truths.**

The tree only flowers and bears fruit if it is fed whispered lies, which the whisperer must then spread to other people.

**Archaeology:** The study of human history through the excavation of burial sites.

**Dig sites:** Areas where numerous fossils are found and analysed.

**Gin traps:** small traps designed for catching birds or small mammals.



### Gender

Faith experiences sexism throughout the novel, she is resentful of having spent her fourteen years alive treated as **incompetent, weak, and stupid.**

**Gender expectations** meant young girls were expected to be **meek and quiet**, whilst boys were expected to be strong and opinionated.

These limitations prevent Faith from pursuing her love of Science. Myrtle also struggles to effect change in this **male-dominated society.**



### Reputation

Victorian society had a **rigid and stifling class system, reputations were everything** and families must keep up their appearances at all costs. **Gossip and rumours** could lead to a loss in reputation.

Linking to reputation, attitudes to suicide were negative, it was viewed as a sin to take your own life because it went against the Bible and would bring shame upon the family.

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## The Lie Tree: Exposition



### PLOT

The book begins with a damp and bleak journey through the English channel to the Island of Vane. The characters travel by boat.



Faith Sunderly, the fourteen-year-old protagonist, is reluctantly travelling with her parents to Vane, to allow her father to help with an archaeological site



In their 1860s world, the scientific community is still coming to terms with the theory of evolution, trying in different ways to fit it in with its adamant Creationist religious beliefs.



We learn that Faith's father Reverend Erasmus has recently landed a place in the spotlight for his discovery of the fossil of a winged man.



Faith's father becomes increasingly mysterious and horrid towards Faith when she enters his study.

### KEY QUOTES

"The boat moved with a nauseous, relentless rhythm, like someone chewing on a rotten tooth (CH 1)

"On Myrtle's orders, Faith was sitting on the family's largest crate, to stop anybody dragging it out again" (CH 1)

"Lamarck and Darwin are leading the world into a great error! He declared. If we say that species change, then we say that they were created imperfect! We criticise God himself!" (CH 5 Clay)

"Get out." It was a whisper, but with more venom than Faith had ever heard in her father's voice.(CH 6 Erasmus)

33

## The Lie Tree: Rising Action



The family struggle to adjust to their new lives in Vane, the island is isolated and full of mystery.



We soon learn that Faith is a curious character, despite expectations of women to be submissive, Faith's scientific curiosity leads her to doubt some of her father's work.



Rumours begin to circulate on the island concerning the Reverend's work. Rather than moving solely to explore a dig site, the family has moved to evade questions about the authenticity of his fossil.



Suddenly, her father is discovered dead, and Faith's mother and Uncle Miles rush to prevent public accusations of suicide from getting to the media.



Meanwhile, Faith believes he has been murdered and resolves to find out why, she will stop at nothing to find the answer.

### PLOT

### KEY QUOTES

"The first early-morning movements in the house nudged her from her dreams." (CH 7)

"It felt blasphemous seeing him asleep." (CH 7)

"The scandal surrounding her father had arrived on Vane, formally and in print." (CH 7)

"It was a man who was draped over a tree. The cold air was a knife in Faith's throat." (CH 11)

"Not an accident. Not suicide. Murder" (CH 13)

34

## The Lie Tree: Climax



Faith first traces her father's footsteps to his most recent discovery. The specimen is a strange tree whose fruit is supposed to induce visions in the people who consume it..



Even stranger, the tree only flowers and bears fruit if it is fed whispered lies, which the whisperer must then spread to other people. She remains resolute in the fact of her father's murder.



Faith creates a lie that the ghost of her father is haunting the island because he is angry with the village residents who keep appealing to the coroner to ascertain whether he committed suicide.



In place of suicide, Faith plants the suggestion that the archaeological site is actually the site of buried treasure from a past smuggler, and that someone else wanted to get at it first.



As Faith nurtures these fictions, they spread throughout the whole island, causing turmoil and violence among its people.

### PLOT

### KEY QUOTES

"Her thoughts slid to the shrouded plant pot that her father had been so desperate to conceal." (CH 15)

"If the tree could deliver secrets, then perhaps it would unravel for her the mystery of her father's death." (CH 15)

"I have a lie for you. My father's ghost walks, seeking revenge on those who wronged him." (CH 16)

"They are all looking for smuggler's treasure and they want to keep it for themselves." (CH 21)

"A lie was like a fire, Faith was discovering. At first it needed to be nursed and fed." (CH 25)

35

## The Lie Tree: Falling Action



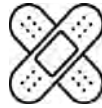
The Lie Tree soon becomes a tool for Faith to express her most malicious impulses. Yet, her usage of the tree is presented as human given the discrimination she continues to suffer as a girl.

"Miss Hunter had poisoned the islanders' minds against the Sunderly family. Now Faith had the chance to return the favour."  
(CH 26)



Faith terrorises a young servant girl who was the first to suggest that Erasmus committed suicide. She also blackmails a village boy into assisting with her murder mystery.

"No! Paul gripped his own hair, closed his eyes for a moment and let out a breath. You win." (CH 26 clay)



Then, in one of her worst rumors, she convinces the islanders to hurt Miss Hunter, who is in charge of the post office.

"People were animals, and animals were nothing but teeth. You bit first, and you bit often."  
(CH 27)



The morality of Faith's actions is ambiguous: she is causing harm to her community, but in doing so, is enabled to see and understand more about the world.

"You must be ruthless, said the voice in her head. You have come too far to turn back now," (CH 28)



Through the Lie Tree, she meets people she would normally never be allowed to talk to, gaining exposure to the darker parts of her seemingly polite world. In some ways she becomes empowered.

"A tree that could give you secrets nobody else possessed and unpeel the mysteries of the World." (CH 28)

36

## The Lie Tree: Resolution



Faith ultimately finds that the perpetrator of the murder was Agatha, a brilliant scientist and naturalist who found it impossible to succeed in her place and time despite her brilliant mind.

"Now you little viper" (Agatha Lambert to Faith CH 33)



Ironically, Faith sympathises with her father's murderer, having felt the same misogyny and oppression throughout her young life.

"A clever and vengeful woman." (Faith on Agatha CH 34)



However, Faith's goal is to better understand a confusing external world, Agatha's downfall is in her decision to get rich by committing murder and stealing the Lie Tree from Erasmus.

"Here was the mythical beast that everybody had told her could not exist: a female natural scientist." (CH 34)



As the novel progresses, Agatha contracts malaria and falls into deep alcoholism. By the end of the novel, she has committed suicide, Agatha's suicide foreshadows how Faith's life could end.

"And then spread her arms as she took her longest stride into eternity."  
(CH 35)



Avoiding that path, Faith reconciles with her mother and brother, learning to internalise the values of the family in order to furnish an identity and gain some semblance of freedom and self-determination.

"I want to help evolution." (CH 36)

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# Shakespearean Genres: History



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## Summer Term 1

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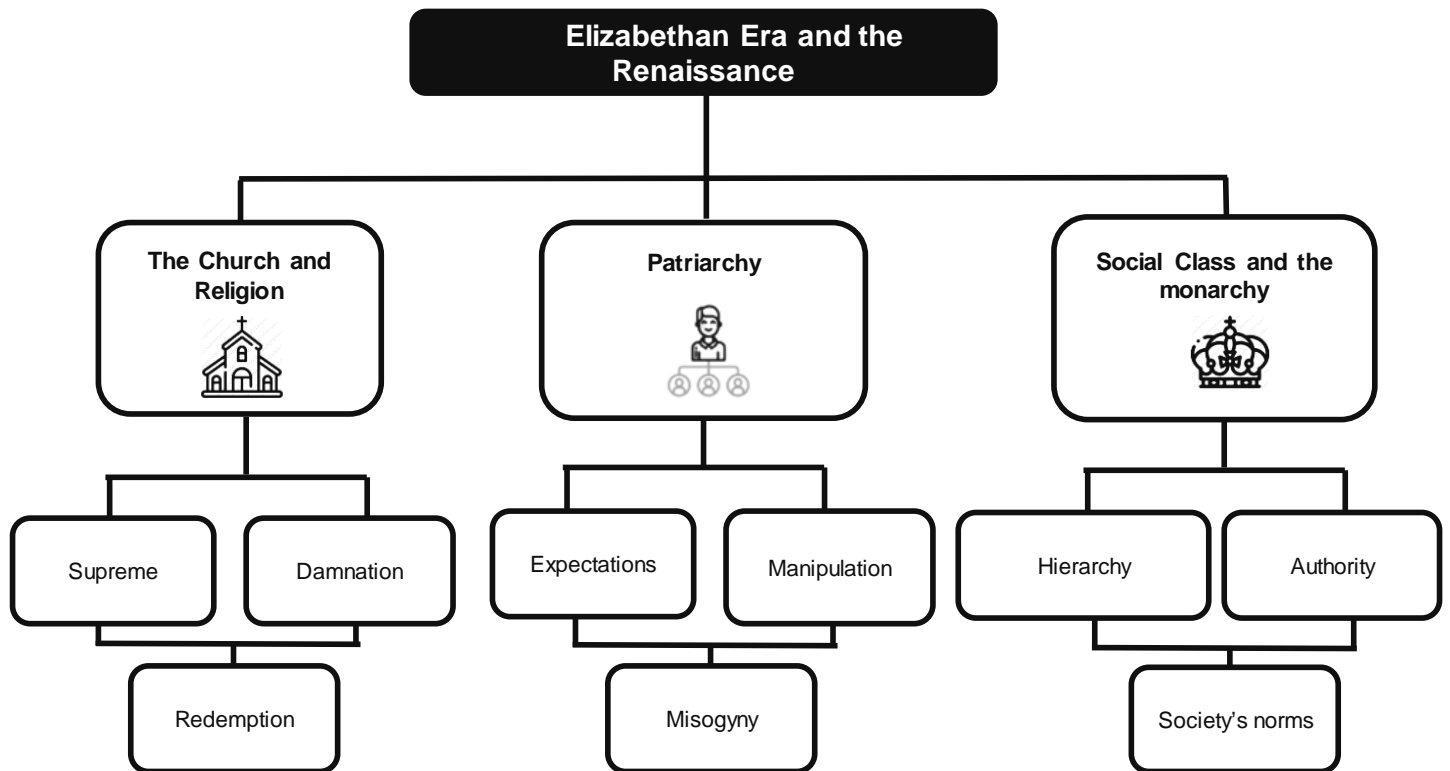
### TIER TWO VOCABULARY

WORD	DEFINITION
<b>Authority</b>	The power or right to give orders, make decisions, and enforce obedience.
<b>Expectations</b>	A strong belief that something will happen or be the case.
<b>Damnation</b>	Condemnation to eternal punishment in hell.
<b>Hierarchy</b>	A system in which members of an organisation or society are ranked according to relative status or authority.
<b>Manipulation</b>	To control or influence (a person or situation) cleverly or unscrupulously.

WORD	DEFINITION
<b>Misogyny</b>	A hatred of women.
<b>Monarchy</b>	A form of government with a king or queen at the head.
<b>Patriarchy</b>	A society where men hold more power than women.
<b>Redemption</b>	The action of saving or being saved from sin, error, or evil.
<b>Society's norms</b>	The informal rules that govern behaviour in group.
<b>Supreme</b>	Having great power and influence.









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## SHAKESPEAREAN TRAGEDY THEMES AND CONTEXT



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## SHAKESPEARE HISTORY CHARACTERS

<p><b>Richard III</b> </p> <p>The central character and villain of the play.</p> <p>Richard plots against his brother Clarence to get a step closer to the throne.</p> <p>Evil Corrupt Manipulative</p> <p>Gentle Trusting Deserving</p> <p>Richard has Clarence executed and then passes the blame to his other brother.</p> <p>Richard's older brother who is closer in line to the throne.</p> <p><b>Clarence</b> </p>	<p><b>Henry VIII</b> </p> <p>King of England, famous for having 6 wives.</p> <p>King Henry has met the French King and their peace agreement has broken.</p> <p>Hot-headed Misogynistic Patriarchal</p> <p>Beautiful Empathetic Objectified</p> <p>Anne dazzles King Henry with her beauty. He divorces his current wife to marry her.</p> <p>Anne begins the play single but ends up married to King Henry.</p> <p><b>Anne Boleyn</b> </p>	<p><b>Brutus</b> </p> <p>The tragic hero of the play.</p> <p>Brutus must choose between his love for his friend Julius and country.</p> <p>Conflicted Powerful Idealistic</p> <p>Persuasive Impulsive Eloquent</p> <p>Antony is an excellent orator, tailoring his words and actions to his audiences' desires.</p> <p>A friend of Julius Caesar who gives powerful speeches throughout the play.</p> <p><b>Antony</b> </p>	<p><b>Mark Anthony</b> </p> <p>An army general lives in Egypt after falling in love with Cleopatra.</p> <p>Mark Anthony blames Cleopatra for the betrayal of the Egyptian army fleet.</p> <p>Passionate Betrayed Angry</p> <p>Powerful Awe-inspiring Dramatic</p> <p>Cleopatra resolves to kill herself rather than be taken prisoner. .</p> <p>The queen of Egypt and Mark Anthony's lover</p> <p><b>Cleopatra</b> </p>
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# Opinion Writing

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## Summer Term 2

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## GENRES

### Letter

Letters can be formal and informal, a means of communication and a store of information. They should contain:

- **The Heading:** this contains the return address (usually two or three lines) with the date on the last line.
- **The inside address:** this is the address you are sending your **letter** to.
- **The greeting:** is also called the salutation.
- **The body.**
- **The complimentary close and the signature** I...S.



### Article

An article is a written work published in a print or electronic medium. It may be for the purpose of propagating news, research results, academic analysis, or debate.

- **Headline and subheading**
- In the first sentence sum up what the story is about.
- Write your report in the third person and the past tense.
- Fill your newspaper report with both facts and opinions, using the 5 Ws.



### Speech

Speech writing is the art of conveying a message to your audience. Speech writing has the same function as normal writing. Features include:

- Clarity. Clarity is an essential feature of a good speech. ...
- Definiteness of message or opinion
- Conciseness.
- Considering the Audience.
- Use of rhetoric.
- Clear ending to summarise main message.



### Leaflet

A **leaflet** is a small sheet of printed paper that puts across a short message clearly and concisely. Businesses use **leaflets** to advertise their products and services. They're often also **used** to let people know about new stores, special offers and events.






- **Heading**
- **Imperative language** to give the reader a direct command
- **Sub-headings** guide the reader through each section
- Use of **bullet points**
- Clear **sections** and paragraphs
- Factual information



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## AUDIENCE

<b>Formal</b>	The formal register is more appropriate for professional writing. You should not apply contractions or slang.	Generally used when writing for:	
			
		Headteacher	Local MP
<b>Informal</b>	The informal register (also called casual or intimate) is conversational and appropriate when writing to friends and people you know very well.		
		School/college peers	Parents
<b>Neutral</b>	The neutral register is non-emotional and sticks to facts. It is most appropriate for technical writings.		
		Local community	When explaining a process

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## PURPOSE

<p><b>Argue</b></p> <p>An <b>argumentative essay</b> is a type of <b>essay</b> that presents arguments about both sides of an issue.</p> <ul style="list-style-type: none"><li>• Make your claim or viewpoint clear</li><li>• Use counterarguments to disprove your opposers</li><li>• Give logical reasons</li><li>• Provide factual evidence.</li></ul> 	<p><b>Persuade</b></p> <p>Persuasive writing intends to convince readers to believe in an idea or opinion and to do an action.</p> <ul style="list-style-type: none"><li>• Use repeated words</li><li>• Use emotional language</li><li>• Create a strong argument</li><li>• Apply rhetorical questions</li></ul> 	<p><b>Advise</b></p> <p>Advice writing offers opinions or recommendation as a course of action, or formally provide information.</p> <ul style="list-style-type: none"><li>• The tone is reassuring to the reader</li><li>• Give step-by-step advice</li><li>• Use <b>personal pronouns</b></li><li>• Be enthusiastic with the rule of three</li></ul> 
<p><b>Inform</b></p> <p>An informative essay educates your reader on a topic. They can have one of several functions: to define a term or provide a how-to. They do <b>not</b>, however, present an opinion or try to persuade your reader.</p> <ul style="list-style-type: none"><li>• clear opening and summarising conclusion.</li><li>• general and more specific information.</li><li>• present tense.</li><li>• connectives to make it clear and coherent.</li></ul> 	<p><b>Explain</b></p> <p>An explanation text is a non-fiction piece of writing which is meant to describe a process. They include specific features that include:</p> <ul style="list-style-type: none"><li>• Written in the present tense</li><li>• The text is arranged into numbered points</li><li>• Use of time connectives</li><li>• Clear understanding of process being explained.</li></ul> 	

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# GCSE Mathematics Knowledge Organiser

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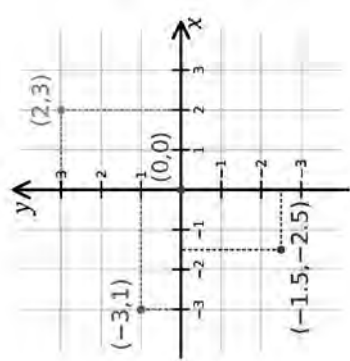


## A1: Algebra Notation

### Plot Coordinates

#### Collect Like terms

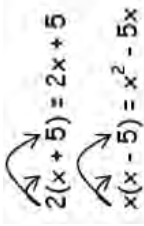
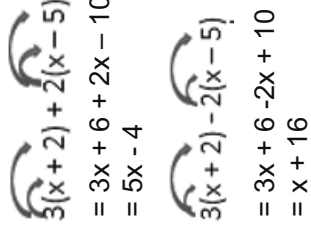
#### Simplify Expressions

<p>A1.1</p> <p>Plot coordinates in four quadrants</p> <p>e.g.</p> <p>Plot the origin (0,0)</p> <p>Plot the point (2,3)</p> <p>Plot the point (-3,1)</p> <p>Plot the point (-1.5, -2.5)</p>	<p>(x coordinate, y coordinate)</p> <p>For x, move right for positive values and left for negative.</p> <p>For y, move up for positive values and down for negative.</p> <p>e.g.</p> 
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<p>A1.2</p> <p>Collect like terms by adding and subtracting</p> <p>e.g.</p> <p><math>a + 2a</math></p> <p><math>a + 2b</math></p> <p><math>5a^2 - 2a^2</math></p> <p><math>a^2 - 2a</math></p>	<p>Only like terms can be added or subtracted.</p> <p>e.g.</p> <p><math>a + 2a = 3a</math></p> <p><math>a + 2b</math> cannot be added</p> <p><math>5a^2 - 2a^2 = 3a^2</math></p> <p><math>a^2 - 2a</math> cannot be subtracted</p>
<p>A1.3</p> <p>Simplify simple expressions by multiplying</p> <p>e.g.</p> <p><math>a \times b</math></p> <p><math>2a \times 3a</math></p>	<p>Terms can be simplified when multiplying.</p> <p>Multiply any numbers first, then write the letters including any powers that result.</p> <p>e.g.</p> <p><math>a \times b = ab</math></p> <p><math>2a \times 3a = 6a^2</math></p>

## A1: Algebra Notation

- Expand a single bracket
- Factorise into a single bracket
- Substitute into an expression

<p>A1.4</p> <p>Expand a single bracket</p> <p>e.g.</p> <p>Expand <math>2(x + 5)</math></p> <p>Expand <math>x(x - 5)</math></p> <p>Expand and simplify expressions with more than one bracket</p> <p>e.g.</p> <p>Expand <math>3(x + 2) + 2(x - 5)</math></p> <p><math>3(x + 2) - 2(x - 5)</math></p>	<p>Multiply everything in the bracket by what is outside.</p>  <p><math>2(x + 5) = 2x + 5</math></p> <p><math>x(x - 5) = x^2 - 5x</math></p> <p>Expand each bracket and then simplify the expression. Take care with negative numbers.</p>  <p><math>3(x + 2) + 2(x - 5)</math>  <math>= 3x + 6 + 2x - 10</math>  <math>= 5x - 4</math></p> <p><math>3(x + 2) - 2(x - 5)</math>  <math>= 3x + 6 - 2x + 10</math>  <math>= x + 16</math></p>
---	--

<p>A1.5</p> <p>Factorise into a single bracket.</p> <p>e.g.</p> <p><math>4y - 12</math></p> <p><math>y^2 + 7y</math></p>	<p>Divide by the highest common factor of each part of each term.</p> <p>e.g.</p> <p>4 is the HCF of 4 and 12. y is not common to both terms.</p> <p><math>4y - 12 = 4(y - 3)</math></p> <p>Y is common to both terms.</p> <p><math>y^2 + 7y = y(y + 7)</math></p>
<p>A1.6</p> <p>Substitute into an expression.</p> <p>e.g.</p> <p>Find the value of <math>3a - b</math> when <math>a = 6</math> and <math>b = -2</math>.</p>	<p>Replace the letters with the given numbers, then carry out the calculation. Remember BIDMAS and the rules for negative numbers.</p> <p>e.g.</p> <p><math>3a - b</math>  <math>= 3 \times 6 - (-2)</math>  <math>= 18 + 2</math>  <math>= 20</math></p>



## A1: Algebra Notation

Use a formula by substituting numbers

Expand two brackets

<p>A1.7</p> <p>Use a formula by substituting numbers</p> <p>e.g.</p> <p>Use the formula <math>v = u + at</math> to work out <math>v</math> when <math>u = 5</math>, <math>a = 10</math>, <math>t = 6</math>.</p> <p>Use the formula <math>v = u + at</math> to work out <math>a</math> when <math>v = 32</math>, <math>u = 7</math>, <math>t = 5</math>.</p> <p>Use the formula <math>v = u + at</math> to work out <math>t</math> when <math>v = 5</math>, <math>u = 17</math>, <math>a = -4</math>.</p>	<p>Replace the letters with the given numbers, then carry out the calculation.</p> <p>Remember BIDMAS and the rules for negative numbers.</p> <p>e.g.</p> $v = u + at$ $v = 5 + 10 \times 6$ $v = 5 + 60$ $v = 65$ $v = u + at$ $32 = 7 + 5a$ $25 = 5a$ $a = 5$ $v = u + at$ $5 = 17 - 4t$ $-12 = -4t$ $t = 3$
---	--

A1.8

Expand two brackets.

e.g.

$$(x + 3)(x - 2)$$

$$(2x - 1)(x + 4)$$

Use a grid to expand two brackets.

Take care with negative numbers.

Add together the four terms in the grid.

Simplify the two x terms.

e.g.

	x	+3
x	$x^2$	$+3x$
-2	$-2x$	-6

$$x^2 + 3x - 2x - 6$$

$$= x^2 + x - 6$$

	2x	-3
x	$2x^2$	$-3x$
+4	$+8x$	-12

$$2x^2 - 3x + 8x - 12$$

$$= 2x^2 + 5x - 12$$

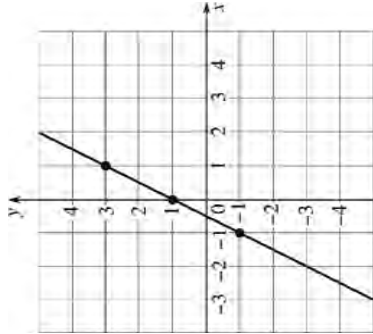
## A1: Algebra Notation

- Plot a linear graph from a sequence or formula
- Use the index rules for multiplication and division
- Use the index laws for raising to a power

A1.9	Draw a table of values by substituting values of $x$ into the formula.
Plot a linear graph from a sequence or formula	Plot the points in pencil.
e.g.	Join the points with a ruler and pencil.
Plot the graph of $y = 2x + 1$	They should be in a straight line.

$x$	-1	0	1
$y$	-1	1	3

e.g.



The graph shows a straight line on a Cartesian coordinate system. The x-axis is labeled from -3 to 4, and the y-axis is labeled from -4 to 4. The line passes through the points (-1, -1), (0, 1), and (1, 3), which are marked with dots. The line has a positive slope of 2 and a y-intercept of 1.

<p>A1.10</p> <p>Use the index rules for multiplication and division</p> <p>e.g.</p> <p><math>3a^2 \times 2a^3</math></p> <p><math>10a^6 \div 5a^2</math></p>	<p>Deal with the numbers first.</p> <p>When multiplying add the indices.</p> <p>When dividing subtract the indices.</p> <p>e.g.</p> <p><math>3 \times 2 = 6</math></p> <p><math>a^2 \times a^3 = a^{2+3} = a^5</math></p> <p><math>3a^2 \times 2a^3 = 6a^5</math></p> <p><math>10 \div 5 = 2</math></p> <p><math>a^6 \div a^2 = a^{6-2} = a^4</math></p> <p><math>10a^6 \div 5a^2 = 2a^4</math></p>
<p>A1.11</p> <p>Use the index rules for raising to a power</p> <p>e.g.</p> <p><math>(a^2)^4</math></p> <p><math>(2a^6)^3</math></p>	<p>Raise any numbers to the power outside the brackets first.</p> <p>Multiply the indices when raising a power to a power.</p> <p>e.g.</p> <p><math>(a^2)^4 = a^{2 \times 4} = a^8</math></p> <p><math>2^3 = 8</math></p> <p><math>(a^6)^3 = a^{6 \times 3} = a^{18}</math></p> <p><math>(2a^6)^3 = 8a^{18}</math></p>

## A2: Formulae, Functions and Expressions

Use a formula by substituting numbers

Change the subject of a simple formula

Expand two brackets




<p>A2.1</p> <p>Use a formula by substituting numbers</p> <p>e.g.</p> <p>Use the formula <math>v = u + at</math> to work out <math>v</math> when <math>u = 5</math>, <math>a = 10</math>, <math>t = 6</math>.</p> <p>Use the formula <math>v = u + at</math> to work out <math>a</math> when <math>v = 32</math>, <math>u = 7</math>, <math>t = 5</math>.</p> <p>Use the formula <math>v = u + at</math> to work out <math>t</math> when <math>v = 5</math>, <math>u = 17</math>, <math>a = -4</math>.</p>	<p>Replace the letters with the given numbers, then carry out the calculation. Remember BIDMAS and the rules for negative numbers.</p> <p>e.g.</p> <p><math>v = u + at</math>  <math>v = 5 + 10 \times 6</math>  <math>v = 5 + 60</math>  <math>v = 65</math></p> <p><math>v = u + at</math>  <math>32 = 7 + 5a</math>  <math>25 = 5a</math>  <math>a = 5</math></p> <p><math>v = u + at</math>  <math>5 = 17 - 4t</math>  <math>-12 = -4t</math>  <math>t = 3</math></p>
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<p>A2.2</p> <p>Change the subject of a simple formula</p> <p>e.g.</p> <p>Make <math>t</math> the subject of the formula</p> $v = u + at$	<p>Use the same balancing steps as when you solve equations to change the subject of the formula.</p> <p>e.g.</p> $v = u + at \quad (\text{Minus } u \text{ from both sides of the equation})$ $v - u = at \quad (\text{divide both sides of the equation by } a)$ $\frac{v-u}{a} = t$									
<p>A2.3</p> <p>Expand two brackets.</p> <p>e.g.</p> $(x + 3)(x - 2)$	<p>Use a grid to expand two brackets. Take care with negative numbers. Add together the four terms in the grid.</p> <p>Simp e.g.</p> <table border="1"> <tr> <td></td> <td><math>x</math></td> <td><math>+3</math></td> </tr> <tr> <td><math>x</math></td> <td><math>x^2</math></td> <td><math>+3x</math></td> </tr> <tr> <td><math>-2</math></td> <td><math>-2x</math></td> <td><math>-6</math></td> </tr> </table> $x^2 + 3x - 2x - 6$ $= x^2 + x - 6$		$x$	$+3$	$x$	$x^2$	$+3x$	$-2$	$-2x$	$-6$
	$x$	$+3$								
$x$	$x^2$	$+3x$								
$-2$	$-2x$	$-6$								

A2: Formulae, Functions and Expressions

Substitute into an expression

Use a function machine to find input and output

<p>A2.4</p> <p>Substitute into an expression.</p> <p>e.g.</p> <p>Find the value of <math>3a - b</math> when <math>a = 6</math> and <math>b = -2</math>.</p>	<p>Replace the letters with the given numbers, then carry out the calculation.</p> <p>Remember BIDMAS and the rules for negative numbers.</p> <p>e.g.</p> $3a - b = 3 \times 6 - (-2) = 18 + 2 = 20$ <p>e.g.</p> $abc + 3b = 5 \times 3 \times 7 - 3 \times 3 = 105 - 9 = 96$	<p>A2.5</p> <p>Use a function machine to find input or output</p> <p>e.g.</p> <p>find the output for the function machine below when the input is 4</p>  <p>e.g.</p> <p>find the input for the function machine below when the output is 7</p> 	<p>To find the output follow the instructions from left to right. To find the input, reverse the function machine by using inverse functions and follow it from right to left</p> <p>e.g.</p> <p>Input is 4  <math>= 4 \times 4 - 5</math>  Output = 11</p> <p>e.g.</p> <p>Reverse function machine is</p>  <p>Output is 7  <math>= 7 - 5 \times 3</math>  Input is 6</p>
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## A2: Formulae, Functions and Expressions

Evaluate formulae in a calculator including fractions and negative numbers

Rearrange formulae with fractions

Expand and simplify an expression involving brackets

<p><b>A2.6</b></p> <p>Evaluate formulae in a calculator including fractions and negative numbers</p> <p>e.g. Find the value of <math>5a-3b</math> when <math>a = \frac{2}{3}</math> and <math>b = -2</math>.</p>	<p>Rewrite the formula, replacing the letters with numbers. When putting into a calculator remember to use the fraction key and put any negative numbers into brackets</p> <p>e.g. Rewrite the formula to be <math>5 \times \frac{2}{3} - 3 \times (-2)</math></p> <p>Type into calculator so it looks exactly like this <math>=\frac{28}{3}</math> or 9,3</p>	<p><b>A2.8</b></p> <p>Expand and simplify an expression involving brackets</p> <p>e.g. Expand and simplify <math>3(x+2) + 2(x-5)</math></p>	<p>To expand brackets multiply each term in the bracket by the term outside the bracket. Collect like terms together. Take care with negative signs.</p> <p>e.g.</p> $\begin{array}{l} 3(x+2) + 2(x-5) \\ = 3x + 6 + 2x - 10 \\ = 5x - 4 \end{array}$
<p><b>A2.7</b></p> <p>Rearrange formulae with fractions</p> <p>e.g. Make x the subject of the formula <math>y = \frac{x}{5} + k</math></p>	<p>Multiply each term by the denominator then use the same balancing method as when solving equations</p> <p>e.g.</p> $y = \frac{x}{5} + k \quad (\text{Multiply every term by 5})$ $5y = x + 5k \quad (\text{Subtract } 5k \text{ from both sides})$ $5y - 5k = x$	<p>e.g. Expand and simplify <math>3(x+2) - 2(x-5)</math></p>	<p>e.g.</p> $\begin{array}{l} 3(x+2) - 2(x-5) \\ = 3x + 6 - 2x + 10 \\ = x + 16 \end{array}$

## A2: Formulae, Functions and Expressions

Factorise a quadratic expression where  $a=1$

Use index rules for multiplying and Dividing

Use index rules for raising to a power

<p>A2.9 Factorise a quadratic expression where <math>a=1</math></p> <p>e.g factorise <math>x^2 + 5x + 4</math></p> <p>e.g Factorise <math>x^2 - 3x - 4</math></p>	<p>Work out two numbers that: Add to make the number in front of <math>x</math>; Multiply to make the number on its own. Write each bracket with an <math>x</math> and one of the numbers.</p> <p>Take care with negative numbers.</p> <p>e.g <math>x^2 + 5x + 4</math> Add to make 5 Multiply to make 4 <math>(x + 4)(x + 1)</math></p> <p>e.g <math>x^2 - 3x - 4</math> Add to make -3 Multiply to make -4 <math>(x - 4)(x + 1)</math></p>
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<p>A2.10 Use Index rules for multiplying and dividing</p> <p>e.g Simplify <math>3a^2 \times 5a^7</math></p> <p>e.g Simplify <math>20c^8 \div 4c^3</math></p>	<p>When multiplying the same base number with different indices, ADD the indices When dividing the same base number with different indices subtract the indices</p> <p>e.g Multiply the coefficients together and add the powers <math>=15a^9</math></p> <p>e.g Divide the coefficients and subtract the powers <math>=5c^5</math></p>
<p>A2.11 Use index rules for raising to a power</p> <p>e.g simplify <math>(3y^2)^4</math></p>	<p>Rewrite the calculation using the usual rules of indices then use the rules of multiplication to simplify</p> <p>e.g Rewrite as <math>3y^2 \times 3y^2 \times 3y^2 \times 3y^2</math> Multiply the coefficients together and add the powers <math>=81y^8</math></p>

## A2: Formulae, Functions and Expressions

### Rearrange formulae with factorisation

#### Simplify algebraic fractions by factorisation

<p>A2.12 Rearrange formulae with factorisation</p> <p>e.g. Make x the subject of the formula <math>ax = by + cx</math></p>	<p>If there is more than one of the variable you're making the subject you will need to factorise. Move all of that variable to one side of the equation then factorise it out to leave you with only one of that variable</p> <p>e.g. Move all the terms with x in them onto the same side <math>ax - cx = by</math></p> <p>Factorise out the x variable <math>x(a - c) = by</math></p> <p>Divide both sides by the created brackets <math>x = \frac{by}{a - c}</math></p>
<p>A2.13 Simplify algebraic fractions by factorisation</p> <p>e.g. Simplify <math>\frac{6x - 15}{9}</math></p> <p>e.g. Simplify <math>\frac{x^2 + 7x + 12}{x^2 - 2x - 15}</math></p>	<p>Start by factorising the numerator and denominator of the fraction. Then look for common factors that can be cancelled, these may be brackets or coefficients of brackets</p> <p>e.g. Factorise the numerator <math>\frac{3(2x - 5)}{6}</math></p> <p>Cancel the common factor of 3 from the denominator and the multiplier of the brackets on the numerator <math>\frac{2x - 5}{2}</math></p> <p>e.g. Factorise the numerator and denominator <math>\frac{(x + 3)(x + 4)}{(x + 3)(x - 5)}</math></p> <p>Cancel the matching brackets <math>\frac{(x + 4)}{(x - 5)}</math></p>

## A2: Formulae, Functions and Expressions

### Adding/Subtracting Algebraic fractions

### Multiplying/Dividing algebraic fractions

### Expand Triple Brackets

### Substitute into a function using function notation

<p>A2.14</p> <p>Adding/Subtracting Algebraic Fractions</p> <p>e.g</p> $\frac{2x-4}{3} + \frac{3x+4}{5}$	<p>Form a common denominator by using cross multiplication. Then add/subtract the numerator using the rules of algebra</p> <p>e.g</p> <p>Form a common denominator in the usual way</p> $\frac{10x-20}{15} + \frac{9x+12}{15}$ <p>Add the numerators together</p> $\frac{19x-8}{15}$
<p>A2.15</p> <p>Multiplying/Dividing algebraic fractions</p> <p>e.g</p> $\frac{x^2+2x-3}{x^2+5x+6} \div \frac{x^2+4x+4}{x^2-6x-16}$	<p>Factorise the numerator/denominator of all fractions then follow the usual rules for multiplying/dividing, remembering to cross cancel</p> <p>e.g</p> <p>Factorise numerator and denominator and keep change flip</p> $\frac{(x+3)(x-1)}{(x+2)(x+2)} \times \frac{(x+2)(x-8)}{(x+2)(x+3)}$ <p>Cross cancel matching brackets</p> $\frac{(x-1)(x-8)}{(x+2)(x+2)}$

<p>A2.16</p> <p>Expand triple brackets</p> <p>e.g</p> <p>Expand and simplify <math>(x + 3)(x + 4)(x - 2)</math></p>	<p>Expand two of the brackets using a grid then multiply the answer by the third bracket in another grid</p> <p>e.g</p> <p>Expand the first two brackets using a grid</p> <table border="1"> <tr> <td>x</td> <td>x</td> <td>+3</td> </tr> <tr> <td>x</td> <td><math>x^2</math></td> <td><math>+3x</math></td> </tr> <tr> <td>+4</td> <td><math>+4x</math></td> <td><math>+12</math></td> </tr> </table> <p><math>=x^2 + 7x + 12</math></p> <p>Then put this answer into another grid and expand with the third</p> <table border="1"> <tr> <td>x</td> <td>x</td> <td><math>+7x</math></td> <td><math>+12</math></td> </tr> <tr> <td>x</td> <td><math>x^3</math></td> <td><math>+7x^2</math></td> <td><math>+12x</math></td> </tr> <tr> <td>-2</td> <td><math>-2x^2</math></td> <td><math>-14x</math></td> <td><math>-24</math></td> </tr> </table> <p><math>=x^3 + 5x^2 - 2x - 24</math></p>	x	x	+3	x	$x^2$	$+3x$	+4	$+4x$	$+12$	x	x	$+7x$	$+12$	x	$x^3$	$+7x^2$	$+12x$	-2	$-2x^2$	$-14x$	$-24$
x	x	+3																				
x	$x^2$	$+3x$																				
+4	$+4x$	$+12$																				
x	x	$+7x$	$+12$																			
x	$x^3$	$+7x^2$	$+12x$																			
-2	$-2x^2$	$-14x$	$-24$																			
<p>A2.17</p> <p>Substitute into a function using function notation</p> <p>e.g</p> <p>If <math>f(x) = x^2 - 5</math> evaluate <math>f(4)</math></p>	<p>Replace the letter in the bracket with the number in the bracket and calculate using BIDMAS</p> <p>e.g</p> <p>Replace the x ('s) in the formula with 4 and calculate</p> $= 4^2 - 5$ $= 11$																					



## A2: Formulae, Functions and Expressions

### Find the Inverse of a function



#### Find a compound function






<p>A2.18 Find the inverse of a function</p> <p>e.g Find <math>f^{-1}(x)</math> where <math>f(x) = 3x + 5</math></p> <p>e.g Find <math>f^{-1}(x)</math> where <math>f(x) = x^2 - 6</math></p>	<p>Replace the <math>f(x)</math> notation with a y then rearrange the formula to make x the subject of the formula. Finally replace all y's in the formula with x's</p> <p>e.g Replace <math>f(x)</math> with y <math>y = 3x + 5</math> Rearrange the formula to make x the subject <math>x = \frac{y - 5}{3}</math> Replace all y's with x's <math>f^{-1}(x) = \frac{x - 5}{3}</math></p> <p>e.g Replace <math>f(x)</math> with y <math>y = x^2 - 6</math> Rearrange the formula to make x the subject <math>x = \sqrt{y + 6}</math> Replace all y's with x's <math>f^{-1}(x) = \sqrt{x + 6}</math></p>	<p>A2.19 Find a compound function</p> <p>e.g Find <math>f g(x)</math> where <math>f(x) = 3x + 5</math> and <math>g(x) = x^2 - 6</math></p> <p>e.g Find <math>gf(x)</math> where <math>f(x) = 3x + 5</math> and <math>g(x) = x^2 - 6</math></p>	<p>Work from right to left replacing the x's with the stated function.</p> <p>e.g Working from right to left <math>g(x)</math> needs to be substituted into <math>f(x)</math> <math>f g(x) = 3(x^2 - 6) + 5</math> Expand the brackets and simplify <math>f g(x) = 3x^2 - 13</math></p> <p>e.g Working from right to left <math>f(x)</math> needs to be substituted into <math>g(x)</math> <math>g f(x) = (3x + 5)^2 - 6</math> Expand the brackets and simplify <math>g f(x) = 9x^2 + 30x + 19</math></p>
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### A3: Solving Equations and Inequalities

- Solve Simple and two step linear equations
- Solve Linear equations with brackets
- Solve Linear equations with unknowns on both sides
- Solve a linear inequality

<p>A3.1</p> <p>Solve simple and two step linear equations</p> <p>e.g.</p> $2x - 3 = 7$ $\frac{x}{2} + 1 = 5$	<p>e.g. <math>2x - 3 = 7</math> (add 3 to each side)</p> $2x = 10$ (divide both sides by 2) $x = 5$ <p>e.g. <math>\frac{x}{2} + 1 = 5</math> (subtract 1 from each side)</p> $\frac{x}{2} = 4$ (multiply both sides by 2) $x = 8$
<p>A3.2</p> <p>Solve linear equations with brackets</p> <p>e.g.</p> $3(4x + 1) = 15$ $2(5x - 4) = 12$	<p>e.g. <math>3(4x + 1) = 15</math> (expand the bracket)</p> $12x + 3 = 15$ (subtract 3 from both sides) $12x = 12$ (divide both sides by 12) $x = 1$ <p>e.g. <math>2(5x - 4) = 12</math> (expand the bracket)</p> $10x - 8 = 12$ (add 8 to each side) $10x = 20$ (divide both sides by 10) $x = 2$

<p>A3.3</p> <p>Solve linear equations with unknowns on both sides</p> <p>e.g.</p> $2a + 5 = a + 8$ $4a - 3 = 2a + 11$	<p>e.g.</p> $2a + 5 = a + 8$ (subtract a from both sides) $a + 5 = 8$ (subtract 5 from both sides) $a = 3$ <p>e.g.</p> $4a - 3 = 2a + 11$ (subtract 2a from both sides) $2a - 3 = 11$ (add 3 to both sides) $a = 7$
<p>A3.4</p> <p>Solve a linear inequality</p> <p>e.g.</p> $2x - 4 < 2$ $3x + 5 > 11$	<p>e.g.</p> $2x - 4 < 2$ (add 4 to both sides) $2x < 6$ (divide both sides by 2) $x < 3$  <p>e.g.</p> $3x + 5 > 11$ (add 4 to both sides) $3x > 6$ (divide both sides by 3) $x > 2$ 

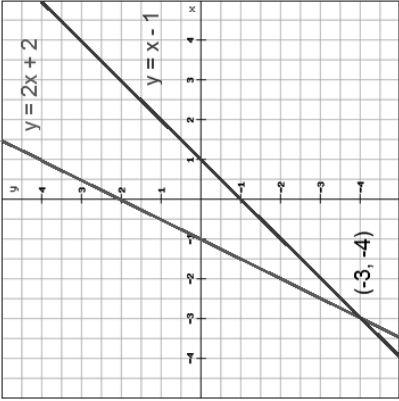
<p>A3: Solving Equations and Inequalities</p> <p>Display an inequality on a number line</p> <p>Solve Linear Simultaneous Equations</p>	<p>A3.5 Display an inequality on a number line</p> <p>e.g.  <math>x &gt; -1</math>  <math>x &lt; 4</math>  <math>x &lt; 4</math>  <math>x \leq 7</math>  <math>x \geq 5</math>  <math>4 &lt; x \leq 9</math></p> <p>A circle represents the number in the inequality. If the sign is <math>&gt;</math> or <math>&lt;</math> then the circle is not coloured in. If the sign is <math>\geq</math> or <math>\leq</math> then the circle is coloured in.</p> <p> <math>x &gt; -1</math> (x is greater than -1)  <math>x &lt; 4</math> (x is less than 4)  <math>x \leq 7</math> (x is less than or equal to 7)  <math>x \geq 5</math> (x is greater than or equal to 5)  <math>4 &lt; x \leq 9</math> (x is greater than 4 and less than or equal to 9)  e.g.  <math>x &gt; -1</math> </p>     
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<p>A3.6 Solve linear simultaneous equations</p> <p>e.g. Solve  <math>2x - 3y = 11</math>  <math>5x + 2y = 18</math></p>	<p><b>Make the number in front of the y the same by multiplying the whole linear equation.</b></p> $2x - 3y = 11 \quad (\times 2)$ $5x + 2y = 18 \quad (\times 3)$ <p><b>Add or subtract to eliminate y.</b></p> <p><b>Same signs subtract.</b></p> <p><b>Different signs add.</b></p> $4x - 6y = 22$ $15x + 6y = 54$ <p><b>Solve the equation to find the value of x.</b></p> $19x = 76$ $x = 4$ <p><b>Substitute the value of x into one of the equations to find the value of y.</b></p> $5(4) + 2y = 18$ $20 + 2y = 18$ $2y = -2$ $y = -1$
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### A3: Solving Equations and Inequalities

Solving simultaneous equations graphically

Solve a quadratic equation by factorising when  $a=1$

<p>A3.7 Solving simultaneous equations graphically</p> <p>e.g. Solve</p> $y = 2x + 2$ $y = x - 1$	<p>Draw the graphs of the equations. Find out where they cross. The solution is the coordinates of the intersection point.</p>  <p><math>x = -3</math> <math>y = -4</math></p>
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<p>A3.8 Solve a quadratic equation by factorising when <math>a = 1</math></p> <p>e.g. Solve</p> $x^2 + 7x + 12$	<p><b>Write the equation in the form <math>ax^2 + bx + c = 0</math>.</b></p> $x^2 + 7x + 12 = 0$ <p><b>Factorise the left-hand side. Find two values that add to make b and multiply to make c.</b></p> <p>Add to make 7 Multiply to make 12. Factors of 12 (12&amp;1, 6&amp;2, 3&amp;4)</p> $(x + 3)(x + 4) = 0$ <p><b>Equate each factor to 0 and solve for the values of x.</b></p> <p><math>x + 3 = 0</math> (subtract 3 from both sides) <math>x = -3</math></p> <p><math>x + 4 = 0</math> (subtract 4 from both sides) <math>x = -4</math></p> <p><b><math>x = -3</math> or <math>x = -4</math></b></p>
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### A3: Solving Equations and Inequalities

Solve a quadratic equation by factorising when a does not equal 1

Solve a quadratic equation using the quadratic formula

<p>A3.9 Solve a quadratic equation by factorising when a does not equal 1</p> <p>e.g. Solve <math>2x^2 + 7x + 3 = 0</math></p>	<p><b>Write the equation in the form <math>ax^2 + bx + c = 0</math>.</b></p> <p><math>2x^2 + 7x + 3 = 0</math></p> <p><b>Factorise the left-hand side. Find two values that add to make b and multiply to make (c x a).</b></p> <p>Add to make 7 Multiply to make <math>3 \times 2</math> Multiply to make 6 Factors of 6 (6&amp;1, 3&amp;2)</p> <p><math>6 + 1 = 7</math></p> <p>As a = 2, we must divide 6 by 2 to get 3.</p> <p><math>(2x + 1)(x + 3) = 0</math></p> <p><b>Equate each factor to 0 and solve for the values of x.</b></p> <p><math>2x + 1 = 0</math> (subtract 1 from both sides)  <math>2x = -1</math> (divide both sides by 2)  <math>x = -\frac{1}{2}</math>  <math>x + 3 = 0</math> (subtract 3 from both sides)  <math>x = -3</math>  <b><math>x = -\frac{1}{2}</math> or <math>x = -3</math></b></p>
<p>A3.10 Solve a quadratic equation using the quadratic formula</p> <p><math display="block">x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}</math></p> <p>e.g. Solve <math>x^2 + 4x - 2 = 0</math></p>	<p><b>Write the equation in the form <math>ax^2 + bx + c = 0</math>.</b></p> <p><math>x^2 + 4x - 2 = 0</math></p> <p><b>Write the values for a, b and c (including the sign)</b></p> <p><math>a = 1, b = 4, c = -2</math></p> <p><b>Substitute the values for a, b and c into the formula</b></p> <p><math display="block">x = \frac{-4 \pm \sqrt{4^2 - 4 \times 1 \times -2}}{2 \times 1}</math></p> <p><b>Simplify to get the two values of x</b></p> <p><math display="block">x = \frac{-4 \pm \sqrt{24}}{2}</math></p> <p><math display="block">x = \frac{-4 + \sqrt{24}}{2} = 0.45 \text{ (2dp)}</math></p> <p>or</p> <p><math display="block">x = \frac{-4 - \sqrt{24}}{2} = -4.45 \text{ (2dp)}</math></p>

### A3: Solving Equations and Inequalities

Solve a quadratic equation by completing the square

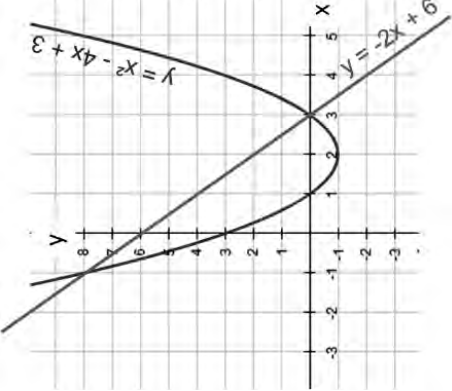
Solve linear /quadratic simultaneous equations using substitution

<p>A3.11 Solve a quadratic equation by completing the square</p> <p>e.g. Solve <math>x^2 + 8x - 40</math></p>	<p><b>Write the equation in the form</b> <math>ax^2 + bx + c = 0</math>.</p> $x^2 + 8x - 40 = 0$ <p><b>Write x + half the coefficient of x in brackets then square</b></p> $(x + 4)^2 - 40 = 0$ <p><b>Square and subtract the coefficient of x</b></p> $4^2 = 16$ $(x + 4)^2 - 16 - 40 = 0$ $(x + 4)^2 - 56 = 0$ <p><b>Now solve by adding the constant to both sides</b></p> $(x + 4)^2 - 56 = 0$ $(x + 4)^2 = 56$ <p><b>Square root both sides</b></p> $(x + 4)^2 = 56$ $x + 4 = \pm \sqrt{56}$ <p><b>Solve to find the two values of x</b></p> $x = -4 - \sqrt{56} = -11.48 \text{ (2dp)}$ <p>or</p> $x = -4 + \sqrt{56} = 3.48 \text{ (2dp)}$
<p>A3.12 Solve linear/quadratic simultaneous equations using substitution</p> <p>e.g. Solve</p> $\begin{cases} x + y = 4 \\ x^2 + y^2 = 40 \end{cases}$	<p><b>Rearrange the linear equation</b></p> $\begin{aligned} x + y &= 4 \\ y &= 4 - x \end{aligned}$ <p><b>Substitute the linear equation into the quadratic.</b></p> $x^2 + (4 - x)^2 = 40.$ <p><b>Expand and simplify.</b></p> $\begin{aligned} (4 - x)^2 &= x^2 - 8x + 16 \\ x^2 + x^2 - 8x + 16 &= 40. \\ 2x^2 - 8x + 16 &= 40 \end{aligned}$ <p><b>Solve the quadratic by an appropriate method.</b></p> $\begin{aligned} 2x^2 - 8x + 16 &= 40 \\ 2x^2 - 8x - 24 &= 0 \\ (2x - 12)(x + 2) &= 0 \\ 2x &= 12 \\ x &= 6 \end{aligned}$ <p>or</p> $x = -2$ <p><b>Substitute the values found into the linear equation.</b></p> <p><u>When <math>x = 6</math>, <math>y = 4 - 6 = -2</math></u>  <u>When <math>x = -2</math>, <math>y = 4 - (-2) = 6</math></u></p>

A3: Solving Equations and Inequalities

Solve linear/quadratic simultaneous equations graphically

Use iteration to solve an equation

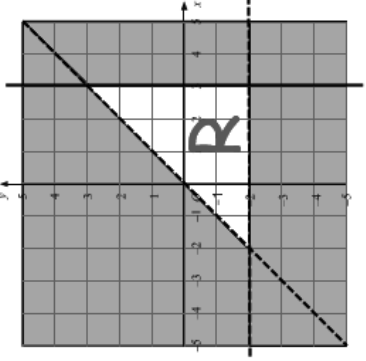
<p>A3.13</p> <p>Solve linear/quadratic simultaneous equations graphically</p> <p>e.g. Solve</p> $y = x^2 - 4x + 3$ $y = -2x + 6$	<p>Draw the graphs of the equations. Find out where they cross. The solutions are the coordinates of the intersection points.</p>  <p>When <math>x = -1</math> <math>y = 8</math> or When <math>x = 3</math> <math>y = 0</math></p>
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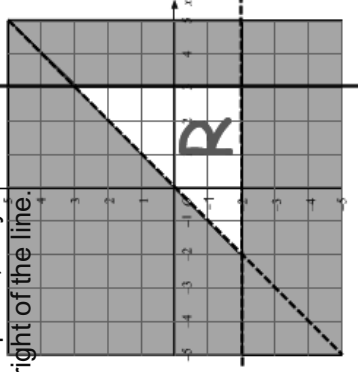
<p>A3.14</p> <p>Use iteration to solve an equation</p> <p>e.g.</p> <p>Using</p> $x_{n+1} = 8 - \frac{5}{x_n^2}$ <p>With <math>x_0 = 1</math></p> <p>Find the values of:</p> $x_1, x_2, x_3 \text{ and } x_4$	<p>Input the value for <math>x_0</math> into the formula to find the value for <math>x_1</math>.</p> $8 - \frac{5}{1^2} = 3$ $x_1 = 3$ <p>Input the value for <math>x_1</math> into the formula to find the value for <math>x_2</math>.</p> $8 - \frac{5}{3^2} = \frac{67}{9}$ $x_2 = \frac{67}{9}$ <p>Input the value for <math>x_2</math> into the formula to find the value for <math>x_3</math>.</p> $8 - \frac{5}{(\frac{67}{9})^2} = 7.909779461$ $x_3 = 7.909779461$ <p>Input the value for <math>x_3</math> into the formula to find the value for <math>x_4</math>.</p> $8 - \frac{5}{(7.909779461)^2} = 7.920082617$ $x_4 = 7.920082617$ $x_1 = 3$ $x_2 = \frac{67}{9}$ $x_3 = 7.909779461$ $x_4 = 7.920082617$
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### A3: Solving Equations and Inequalities

Represent an inequality graphically

Find a region on a graph defined by more than one inequality

<p><b>A3.15</b> Represent an inequality graphically</p> <p>e.g. Represent the following inequalities graphically:</p> $x < y$ $y > -2$ $x \leq 3$	<p>Plot each straight line. Use a broken line for <math>&lt;</math> or <math>&gt;</math>. Use a solid line for <math>\leq</math> or <math>\geq</math>. Decide which side of the line to shade. Leave the required region unshaded.</p> 
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<p><b>A3.16</b> Find a region on a graph defined by more than one inequality</p> <p>e.g. Find the region defined by the following inequalities:</p> $x < y$ $y > -2$ $x \leq 3$	<p><b>Decide which side of the line to shade – shade the section you do not want and leave the required region unshaded.</b></p> <p><math>x &lt; y</math> (<math>x</math> is less than <math>y</math>) Area below the line is required, so you shade above the line. <math>y &gt; -2</math> (<math>y</math> is greater than <math>-2</math>) Area above the line is required, so you shade below the line. <math>x \leq 3</math> (<math>x</math> is less than or equal to <math>3</math>) Area to the left of the line is required, so you shade to the right of the line.</p> 
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### A3: Solving Equations and Inequalities

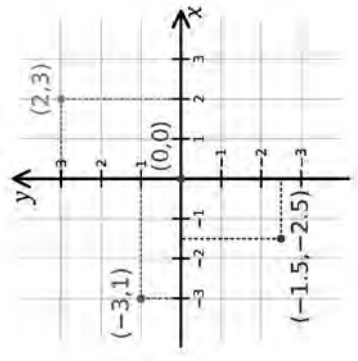
Use trial and improvement to solve an equation

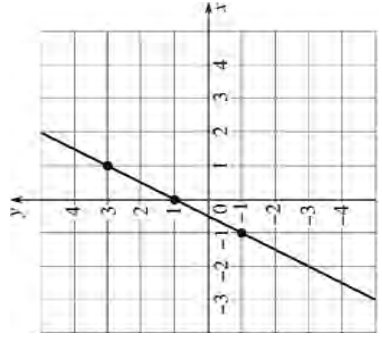
<p>A3.17 Use trial and improvement to solve an equation</p> <p>e.g. Use trial and improvement to solve the following equation to 1dp.</p> $x^2 + 3x + 2 = 86$ <p>has a solution between 7 and 8.</p>	<p><b>Substitute different values for x into the equation until a value closest to the solution is found to the required degree of accuracy.</b></p> <p>Solution between 7 and 8. Start with the midpoint of 7.5.</p> $(7.5)^2 + 3(7.5) + 2 = 80.25 \text{ too small}$ $(7.6)^2 + 3(7.6) + 2 = 82.56 \text{ too small}$ $(7.7)^2 + 3(7.7) + 2 = 84.39 \text{ too small}$ $(7.8)^2 + 3(7.8) + 2 = 86.24 \text{ too big}$ <p><u>Solution is between 7.7 and 7.8</u></p> $(7.75)^2 + 3(7.75) + 2 = 85.3125 \text{ too small}$ <p>The solution is between 7.75 and 7.8. Therefore to 1dp the solution is 7.8.    <b>x = 7.8 to 1dp</b></p>
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# A4: Graphs 1

Plot coordinates in four quadrants

Plot a linear graph from a sequence or formula

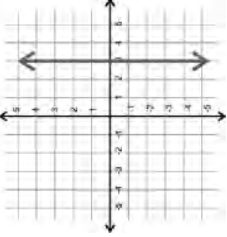
<p>A4.1</p> <p>Plot coordinates in four quadrants</p> <p>e.g.</p> <p>Plot the origin (0,0)</p> <p>Plot the point (2,3)</p> <p>Plot the point (-3,1)</p> <p>Plot the point (-3,1)</p> <p>Plot the point (-1.5, -2.5)</p>	<p>(x coordinate, y coordinate)</p> <p>For x, move right for positive values and left for negative.</p> <p>For y, move up for positive values and down for negative.</p> <p>e.g.</p> 
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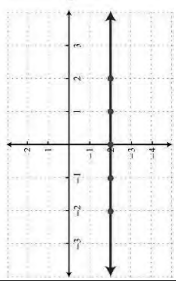
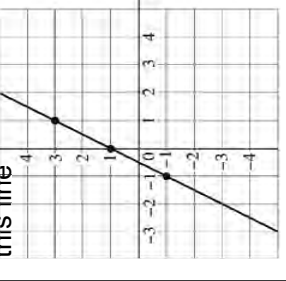
<p>A4.2</p> <p>Plot a linear graph from a sequence or formula</p> <p>e.g.</p> <p>Plot the graph of <math>y = 2x + 1</math></p>	<p>Draw a table of values by substituting values of x into the formula.</p> <p>Plot the points in pencil.</p> <p>Join the points with a ruler and pencil.</p> <p>They should be in a straight line.</p> <p>e.g. <math>y = 2x + 1</math></p> <table><tr><td>x</td><td>-1</td><td>0</td><td>1</td></tr><tr><td>y</td><td>-1</td><td>1</td><td>3</td></tr></table> 	x	-1	0	1	y	-1	1	3
x	-1	0	1						
y	-1	1	3						

## A4: Graphs 1

Find the equation of vertical and horizontal lines

Find the equation of a line by considering the coordinates

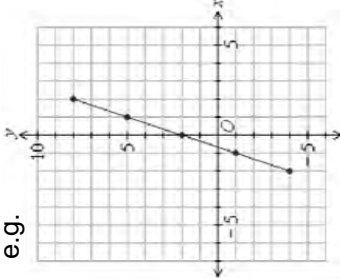
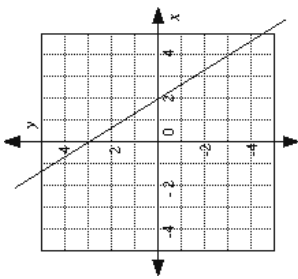
<p><b>A4.3</b> Find the equation of vertical and horizontal lines</p> <p>e.g. Write the equation of this line</p> 	<p>Vertical lines have the form '<math>x = n</math>' where <math>n</math> is the value where the line crosses the <math>x</math> axis.</p> <p>e.g. this line is <math>x = 3</math>.</p> <p>Horizontal lines have the form '<math>y = n</math>' where <math>n</math> is the value where the line crosses the <math>y</math> axis.</p> <p>e.g. this line is <math>y = 5</math>.</p>
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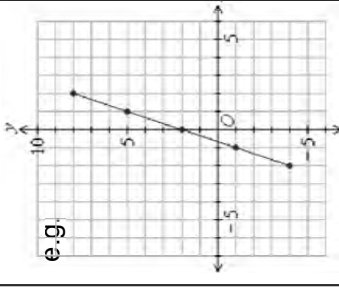
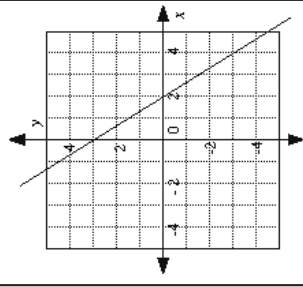
<p><b>A4.4</b> Find the equation of a line by considering the coordinates</p> <p>e.g. Find the equation of</p> 	<p>Select a set of coordinates from the line and compare the <math>x</math> and <math>y</math> values. Use these to determine the equation of the line.</p> <p>e.g. from this line you can get the coordinates <math>(-2, -2)</math>, <math>(-1, -2)</math>, <math>(0, -2)</math>, <math>(1, -2)</math>, <math>(2, -2)</math> In all of these the <math>y</math> coordinate is <math>-2</math> so the equation of the line is <math>y = -2</math>.</p>
<p>Find the equation of this line</p> 	<p>From this line you can get the coordinates <math>(-2, -3)</math>, <math>(-1, -1)</math>, <math>(0, 1)</math>, <math>(1, 3)</math> In all of these the <math>y</math> coordinate is found by multiplying the <math>x</math> coordinate by 2 and adding 1. So the equation of the line is <math>y = 2x + 1</math>.</p>

## A4: Graphs 1

Identify the intercept of a graph

Calculate the gradient of a linear graph

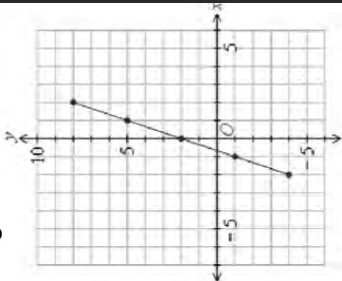
<p>A4.5</p> <p>Identify the intercept of a graph</p> <p>e.g.</p> 	<p>The intercept of a graph is the value where the line crosses the y axis</p> <p>e.g.</p> <p>this line crosses the y axis at 2, so the intercept of the graph is 2.</p>
	<p>This line crosses the y axis at 3, so the intercept of the graph is 3.</p>

<p>A4.6</p> <p>Calculate the gradient of a linear graph</p> <p>e.g.</p> 	<p>Identify the coordinates of two points on the graph. The gradient is calculated using the formula</p> $\text{Gradient} = \frac{\text{Change in } y \text{ coordinates}}{\text{Change in } x \text{ coordinates}}$ <p>e.g. from this line you can get the coordinates (2,7) and (1,5).</p> $\text{Gradient} = \frac{7-5}{2-1} = \frac{2}{1} = 2.$
	<p>From this line you can get the coordinates (0,3) and (2,0).</p> $\text{Gradient} = \frac{3-0}{0-2} = \frac{3}{-2} = -1.5.$

# A4: Graphs 1

- Calculate the gradient of a line segment between two points
- Construct the equation of a line

<p>A4.7</p> <p>Calculate the gradient of a line segment between two points</p> <p>e.g.</p> <p>Find the gradient of the line segment between the points (0,3) and (2,9)</p> <p>Find the gradient of the line segment between the points (2,7) and (5,1)</p>	<p>The gradient is calculated using the formula</p> $\text{Gradient} = \frac{\text{Change in } y \text{ coordinates}}{\text{Change in } x \text{ coordinates}}$ <p>e.g.</p> $\text{Gradient} = \frac{9-3}{2-0} = \frac{6}{2} = 3.$ $\text{Gradient} = \frac{7-1}{2-5} = \frac{6}{-3} = -2.$

<p>A4.8</p> <p>Construct the equation of a line</p> <p>e.g.</p> 	<p>The equation of a straight line is given by <math>y = mx + c</math>.  <math>m</math> is the gradient.  <math>c</math> is the intercept.</p> <p>e.g.</p> $\text{Gradient} = \frac{5-2}{1-0} = \frac{3}{1} = 3.$ <p>Intercept = 2.  <math>y = mx + c</math>.  <math>y = 3x + 2</math>.</p>
<p>A4.9</p> <p>Find the gradient of a line parallel to a given line</p> <p>e.g.</p> <p>Find a line parallel to <math>y = 3x - 1</math></p>	<p>Parallel lines have the same gradient.  Give the equation of a line with same gradient.  The intercept can be any value.</p> <p>e.g.</p> <p>Any line with a gradient of 3  <math>y = 3x</math>  <math>y = 3x + 6</math></p>

# A4: Graphs 1

## Plot a quadratic Graph Plot and Use Distance Time Graphs

A4.11

Plot a quadratic graph

Draw a table of values by substituting values of x into the formula.  
 Plot the points in pencil.  
 Join the points with a ruler and pencil.  
 They should be in a smooth curve

e.g.  $y = x^2 - 4x + 5$ 

x	-1	0	1	2	3	4	5
y	10	5	2	1	2	5	10

e.g.

Plot the graph of  $y = x^2 - 4x + 5$

A4.12

Plot and use distance time graphs

From the graph explain what happens between:  
 A and B;  
 B and C;  
 E and F.

Where is the speed the greatest?

Plot distance on the vertical axis.

Plot time on the horizontal axis.

Speed is calculated using  $\text{Speed} = \frac{\text{Distance Travelled}}{\text{Time taken}}$ .

e.g.

Between A and B, 3 km are travelled in 5 hours.

Between B and C, no distance is travelled during the 3 hour period.

Between E and F, 12 km are travelled in 6 hours.

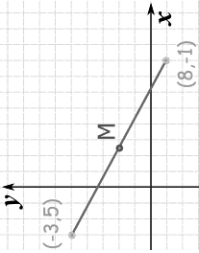
The greatest speed occurs where the line is the steepest. This between C and D.

You can also calculate speed:  
 A to B  $3 \div 5 = 0.6$  km per hour;  
 C to D  $9 \div 4 = 2.25$  km per hour;  
 E to F  $12 \div 6 = 2$  km per hour;

#### A4: Graphs 1

Find the coordinates of the midpoint of a line segment

Find the equation of a line passing through a given point, parallel to a given line

<p><b>A4.13</b> Find the coordinates of the midpoint of a line segment</p> <p>e.g. Find the midpoint of this line segment</p> 	<p>Draw the line segment and identify the coordinates of the point at the halfway position.</p> <p>Alternatively, use the coordinates of the ends of the line segment.</p> <p>x coordinate of the midpoint is the mean average of the x coordinates of the end points, i.e. <math>(-3 + 8) \div 2 = 2.5</math>.</p> <p>y coordinate of the midpoint is the mean average of the y coordinates of the end points, i.e. <math>(5 + -1) \div 2 = 2</math>.</p>
<p><b>A4.14</b> Find the equation of a line passing through a given point, parallel to a given line</p> <p>e.g. Find the equation of the line parallel to <math>y = 3x - 1</math> that passes through the point (2, 7)</p>	<p>If the lines are parallel, the gradient is the same for both.</p> <p>Use <math>y = mx + c</math>.</p> <p>e.g. Gradient = 3. When <math>x = 2</math>, <math>y = 7</math>. <math>y = mx + c</math>. <math>7 = 3 \times 2 + c</math> <math>c = 1</math> <math>y = 3x + 1</math>.</p>

#### A4: Graphs 1

Plot and use speed time graphs

Find the gradient of a line perpendicular to another line

<p>A4.15 Plot and use speed time graphs</p> <p>e.g.</p>	<p>Plot speed on the vertical axis. Plot time on the horizontal axis. Acceleration is calculated using <math display="block">\text{Acceleration} = \frac{\text{Change in speed}}{\text{Time}}</math>.</p> <p>e.g.</p> <p>Between 0 and 10 seconds, speed increased from 0 to 16 m/s in 10 seconds. Acceleration = <math>16 \div 10 = 1.6</math> m/s<sup>2</sup>.</p> <p>Between 10 and 20 seconds, speed remains constant. Acceleration = 0 m/s<sup>2</sup>.</p> <p>Between 20 and 25 seconds, speed decreased from 16 to 0 m/s in 10 seconds. Acceleration = <math>-16 \div 5 = -3.2</math> m/s<sup>2</sup>.</p>
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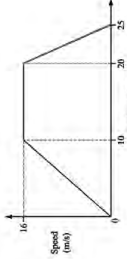
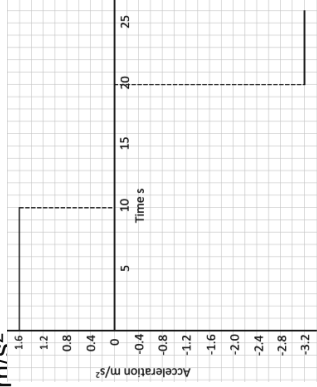
<p>A4.16 Find the gradient of a line perpendicular to another line</p> <p>e.g.</p> <p>Find the gradient of a line perpendicular to the line <math>y = 5x + 4</math></p> <p>Find the gradient of a line perpendicular to the line <math>y = -2x + 4</math></p>	<p>When two lines are perpendicular, the product of their gradients is -1.</p> <p>Find the gradient of the given line.</p> <p>Find the reciprocal and change the sign. This is the gradient of the perpendicular line.</p> <p>e.g.</p> <p>Gradient of <math>y = 5x + 4</math> is 5. Negative reciprocal is <math>-1/5</math> or -0.2. Gradient of perpendicular is -0.2.</p> <p>Gradient of <math>y = -2x + 4</math> is -2. Negative reciprocal is <math>1/2</math> or 0.5. Gradient of perpendicular is <math>1/2</math>.</p>
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#### A4: Graphs 1

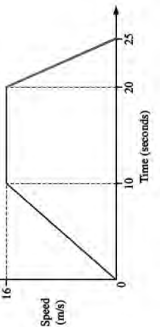
- Find the equation of a line passing through a given point, perpendicular to a given line
- Find the equation of a perpendicular bisector to a line segment
- Plot and use acceleration time graphs

<p>A4.17</p> <p>Find the equation of a line passing through a given point, perpendicular to a given line</p> <p>e.g.</p> <p>Find the equation of the line perpendicular to <math>y = \frac{1}{2}x + 3</math> that passes through the point (2, 7)</p>	<p>If the lines are perpendicular, the product of their gradients is <math>-1</math>. Use <math>y = mx + c</math>.</p> <p>e.g.</p> <p>Gradient of given line = <math>\frac{1}{2}</math> . Gradient of perpendicular = <math>-2</math>. When <math>x = 2</math>, <math>y = 7</math>. <math>y = mx + c</math>. <math>7 = -2 \times 2 + c</math> <math>c = 11</math> <math>y = -2x + 11</math>.</p>
<p>A4.18</p> <p>Find the equation of a perpendicular bisector to a line segment</p> <p>e.g.</p> <p>Find the equation of the perpendicular bisector of the line segment joining the points (0, 7) and (4,5).</p>	<p>Find the gradient and midpoint of the line segment. Find the gradient of a line perpendicular to the line segment. Use <math>y = mx + c</math>.</p> <p>e.g.</p> <p>Gradient of line = <math>\frac{7-5}{0-4} = -\frac{1}{2}</math> . Gradient of perpendicular = 2. Midpoint of given line is (2, 6). <math>y = mx + c</math>. <math>6 = 2 \times 2 + c</math> <math>c = 2</math> <math>y = 2x + 2</math>.</p>

<p>A4.19</p> <p>Plot and use acceleration time graphs</p> <p>e.g.</p> <p>Plot an acceleration time graph for this speed time graph</p>	<p>Plot acceleration on the vertical axis. Plot time on the horizontal axis.</p> <p>e.g.</p> <p>Between 0 and 10 seconds, acceleration = <math>16 \div 10 = 1.6 \text{ m/s}^2</math>.</p> <p>Between 10 and 20 seconds, acceleration = <math>0 \text{ m/s}^2</math>.</p> <p>Between 20 and 25 seconds, acceleration = <math>-16 \div 5 = -3.2 \text{ m/s}^2</math></p>
	

#### A4: Graphs 1

Relate gradient of a line or curve to rate of change  
Relate the area under a speed time graph to distance

<p>A4.20 Relate gradient of a line or curve to rate of change.</p>	<p>The gradient of a line gives the rate of change of the variables.</p> <p>On a distance time graph, it shows the rate of change of distance with respect to time, i.e. speed.</p> <p>On a speed time graph, it shows the rate of change of speed with respect to time, i.e. acceleration.</p>
<p>A4.21 Relate the area under a speed time graph to distance.</p>	<p>The area under a speed time graph gives the distance travelled.</p>  <p>In the example, the distance travelled in the first 10 seconds is the area of the triangle.</p> <p>Distance travelled = <math>(16 \times 10) \div 2 = 80\text{m}</math>.</p>

## A5: Sequences

- Continue a sequence using a term to term rule
- Generate a linear sequence using a term to term rule
- Generate a linear sequence using nth term
- Find the nth term of a linear sequence

<p><b>A5.1</b> <b>Continue a sequence using a term to term rule</b></p> <p>1 5 9 13</p> <p>This is the start of a sequence.</p> <p>Each individual digit is called a term.</p> <p>Using a term to term rule carry on the sequence.</p> <p>What are the next two numbers of this sequence?</p>	<p>1 5 9 13</p> <p>+4 +4 +4</p> <p>Term to term rule = +4</p> <p>The sequence can be carried On by adding 4.</p> <p>The next two numbers are 17 and 21</p>
<p><b>A5.2</b> <b>Generate a linear sequence using term to term rule</b></p> <p>(i) A sequence has a starting term of 8 and a term to term rule of +3. Generate the sequence</p> <p>(ii) A sequence has a starting term of 8 and a term to term rule of -3. Generate the sequence</p>	<p>(i) 8 11 14 17 20</p> <p>.... +3 +3 +3</p> <p>(ii) 8 5 2 -1</p> <p>-4 -3 -3 -3 -3</p>

<p><b>A5.3</b> <b>Generate a linear sequence using nth term</b></p> <p>If the nth term of a sequence is <b>5n+1</b> what are the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> terms of the sequence?</p> <p>Replace n by each of the numbers 1, 2 and 3 in turn.</p>	<p>If the nth term is <b>5n+1</b></p> <p>1<sup>st</sup> term (<math>n=1</math>) = <math>5 \times 1 + 1 = 6</math></p> <p>2<sup>nd</sup> term (<math>n=2</math>) = <math>5 \times 2 + 1 = 11</math></p> <p>3<sup>rd</sup> term (<math>n=3</math>) = <math>5 \times 3 + 1 = 16</math></p> <p>The sequence begins 6, 11, 16</p> <p>The terms have a difference of 5 which matches the 5n in the formula.</p>										
<p><b>A5.4</b> <b>Find the nth term of a linear sequence</b></p> <p>The position to term rule allows us to write a rule for any term in the sequence from its position.</p> <p>Find the nth term for the sequence 4, 10, 16, 22</p>	<table border="1"> <tr> <td>Position</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>Term</td> <td>4</td> <td>10</td> <td>16</td> <td>22</td> </tr> </table> <p>+6</p> <p>+6 means that the rule for this sequence contains 6n.</p> <p><math>1 \times 6 - 2 = 4</math></p> <p><math>2 \times 6 - 2 = 10</math></p> <p><math>3 \times 6 - 2 = 16</math></p> <p>Term = position <math>\times 6 - 2</math></p> <p>Term = <math>n \times 6 - 2</math></p> <p>nth term = <math>6n - 2</math></p>	Position	1	2	3	4	Term	4	10	16	22
Position	1	2	3	4							
Term	4	10	16	22							

## A5: Sequences

Continue sequence of square numbers

Continue sequence of cube numbers

<p>A5.5</p> <p>Continue sequence of square numbers</p> <p>A square number is obtained by multiplying a number by itself e.g. <math>1 \times 1 = 1</math>  <math>2 \times 2 = 4</math></p> <p>1, 4, 9, 16, 25  is the start of a sequence of square numbers.  How can this sequence be continued?</p>	<div style="text-align: center;"> <math display="block">  \begin{array}{ccccccc}  1 &amp; 4 &amp; 9 &amp; 16 &amp; 25 \\  \uparrow &amp; \uparrow &amp; \uparrow &amp; \uparrow &amp; \uparrow \\  +3 &amp; +5 &amp; +7 &amp; +9 &amp; +11 \\  \uparrow &amp; \uparrow &amp; \uparrow &amp; \uparrow &amp; \uparrow \\  +2 &amp; +2 &amp; +2 &amp; +2 &amp; +2  \end{array}  </math> </div> <p>The first line of differences is the set of odd numbers beginning with 3.  The second line of differences is a constant 2.  Each term is the square of its term number.</p>
<p>A5.6</p> <p>Continue sequence of cube numbers</p> <p>A cube number is obtained by multiplying a number by itself three times e.g. <math>1 \times 1 \times 1 = 1</math>  <math>2 \times 2 \times 2 = 8</math></p> <p>1, 8, 27, 64, 125  is the start of a sequence of cube numbers.  How can this sequence be continued?</p>	<div style="text-align: center;"> <math display="block">  \begin{array}{ccccccc}  1 &amp; 8 &amp; 27 &amp; 64 &amp; 125 \\  \uparrow &amp; \uparrow &amp; \uparrow &amp; \uparrow &amp; \uparrow \\  +7 &amp; +19 &amp; +37 &amp; +61 &amp; +91 \\  \uparrow &amp; \uparrow &amp; \uparrow &amp; \uparrow &amp; \uparrow \\  +12 &amp; +18 &amp; +24 &amp; +30 &amp; +36 \\  \uparrow &amp; \uparrow &amp; \uparrow &amp; \uparrow &amp; \uparrow \\  +6 &amp; +6 &amp; +6 &amp; +6 &amp; +6  \end{array}  </math> </div> <p>If we calculate the first line of differences and continue with the second we find that the third line of differences is a constant 6.  Each term is the cube of its term number.</p>

### A5.7

Relate sequences to patterns

This is a sequence of diagrams showing black tiles  $b$  and white tiles  $w$ .

How many white tiles are there when there are 8 black tiles?

Find a formula for  $w$  in terms of  $b$

$b$	1	2	3
$w$	5	6	7

Using the rule for sequences  $w = b + 4$

Therefore when  $b = 8$   
 $w = 8 + 4$   
 $w = 12$

### A5.8

Plot a linear graph from a sequence or formula

Plot the graph of the formula  $y = 2x + 1$

First make a table of values +  
 $y = 2 \times -1 + 1 = -1$   
 $y = 2 \times 0 + 1 = 1$  etc

$y = 2x + 1$

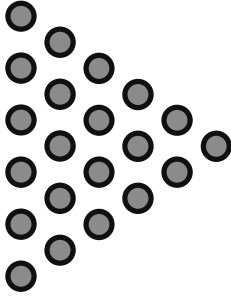
$x$	-1	0	1	2	3
$y$	-1	1	3	5	7

Now plot  $x$  and  $y$  values as co-ordinate points and join with a straight line.

## A5: Sequences

### Recognise and continue sequence of triangular numbers

#### Recognise and continue Fibonacci type sequences

<p>A5.9 Recognise and continue sequence of triangular numbers</p> 	<p>1, 3, 6, 10, 15, .... is the start of the sequence of triangular numbers.</p> <p>The difference between the terms is +2, +3, +4, +5 and this can be used to continue the sequence.</p> <p>The 1st row of the triangle is 1, the 1<sup>st</sup> triangle number. Adding the 1<sup>st</sup> + 2<sup>nd</sup> rows of the triangle gives <math>1 + 2 = 3</math> which is the 2<sup>nd</sup> triangle number Adding the 1<sup>st</sup>+2<sup>nd</sup>+3<sup>rd</sup> rows gives <math>1 + 2 + 3 = 6</math> which is the 3<sup>rd</sup> triangle number and so on.</p>
<p>A5.10 Recognise and continue Fibonacci type sequences</p> <p>0, 1, 1, 2, 3, 5, 8, 13, ...</p> <p>This is the Fibonacci sequence. How can this sequence be continued?</p>	<p>To continue the Fibonacci sequence add each term to the previous term to generate the next one e.g.</p> $0 + 1 = 1$ $1 + 1 = 2$ $1 + 2 = 3$ $2 + 3 = 5$ $3 + 5 = 8$ $5 + 8 = 13$ $8 + 13 = 21 \text{ which is the next term in the sequence.}$

### Identify arithmetic and geometric type sequences

#### Identify a quadratic sequence

<p>A5.11 Identify arithmetic and geometric type sequences</p> <p>In an <b>Arithmetic sequence</b> the same amount (common difference) is added on to each term to continue the sequence.</p> <p>In a <b>Geometric sequence</b> every term is multiplied by the same amount (common ratio) to continue the sequence.</p>	<p>Are the following arithmetic or geometric sequences?</p> <p>(i) 2, 6, 18, 54, .... (ii) 5, 8, 11, 14, 17 .... (iii) 256, 128, 64, 32, ..... (iv) 42, 38, 34, 30, 26, .....</p> <p>(i) Geometric: common ratio x3 (ii) Arithmetic: common difference +3 (iii) Geometric: common ratio x 0.5 (iv) Arithmetic: common difference -4 (v) -4</p>
<p>A5.12 Identify a quadratic sequence</p> <p>3    6    11    18    27</p> <p>This sequence does not have a common difference on the first line of Differences so we continue to the second row of differences.</p>	<p>3    6    11    18    27</p> <p>+3    +5    +7    +9</p> <p>+2    +2    +2</p> <p>The 1<sup>st</sup> row of differences has a common difference of 2 so this is a quadratic sequence.</p>

## A5: Sequences

Use the  $n$ th term to write a quadratic sequence

<p>A5.13</p> <p>Use the <math>n</math>th term to write a quadratic sequence</p> <p>A <b>quadratic</b> sequence always contains a squared term.</p> <p>The <math>n</math>th term of a quadratic sequence is <math>2n^2 + n + 1</math>.</p> <p>Write down the first 5 terms of this sequence.</p>	$2n^2 + n + 1.$ $2 \times 1^2 + 1 + 1 = 4$ $2 \times 2^2 + 2 + 1 = 11$ $2 \times 3^2 + 3 + 1 = 22$ $2 \times 4^2 + 4 + 1 = 37$ $2 \times 5^2 + 5 + 1 = 56$ <p>So the sequence is</p> <p>4, 11, 22, 37, 56</p> <p>....</p>
<p>A5.14</p> <p>Find the <math>n</math>th term of a quadratic sequence</p> <p>Find the <math>n</math>th term of the sequence 4, 13, 26, 43, 64</p> <p>If the 2<sup>nd</sup> line of differences is 2 rule is <math>n^2</math></p> <p>is 4 rule is <math>2n^2</math></p> <p>is 6 rule is <math>3n^2</math></p> <p>is 8 rule is <math>4n^2</math></p>	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <math>4 \quad 13 \quad 26 \quad 43 \quad 64</math>  <math>+9 \quad +13 \quad +17 \quad +21</math>  <math>+4 \quad +4 \quad +4 \quad +4</math> </div> <div> <p>The 2<sup>nd</sup> line of differences is 4 so the rule contains <math>2n^2</math></p> <p>Term no: 1 2 3 4</p> <p>Term: 4 13 26 43</p> <p><math>2n^2</math>: 2 8 18 32</p> <p>Subtract: 2 5 8 11</p> <p>This sequence has a rule <math>3n-1</math> so the whole rule is <math>2n^2 + 3n - 1</math></p> </div> </div>

# A6: Graphs 2

Plot a graph of a cubic function  
Identify and plot a reciprocal graph

A6.1  
Plot a graph of a cubic function

Draw a table of values by substituting values of x into the formula.  
Plot the points in pencil.  
Join the points with a ruler and pencil.  
They should be in a smooth curve

e.g.  $y = x^3 + 2x^2 - 5x - 6$ .

x	-3	-2	-1	0	1	2
y	0	4	0	-6	-8	0

A6.2  
Identify and plot a reciprocal graph

Draw a table of values by substituting values of x into the formula.  
Plot the points in pencil.  
Join the points with a ruler and pencil.  
They should be in smooth curves as in the example,  $y = \frac{1}{x}$ .

The axes are asymptotes.

x	-4	-2	-1	-0.5	0.5	1	2	4
y	-0.25	-0.5	-1	-2	2	1	0.5	0.25

# A6: Graphs 2

Identify and plot a exponential graph

Know the graph of sine

Know the graph of cosine

A6.3

Identify and plot an exponential graph

Draw a table of values by substituting values of x into the formula.  
 Plot the points in pencil.  
 Join the points with a ruler and pencil.  
 They should be in a smooth curve  
 e.g.  $y = 2^x$ .

x	-3	-2	-1	0	1	2	3
y	1/8	1/4	1/2	1	2	4	8

A6.4

Know the graph of sine

For the Sine function between 0 and 360°, the main values are
 

x	0	90	180	270	360
y	0	1	0	-1	0

 giving this curve

For the Cosine function between 0 and 360°, the main values are
 

x	0	90	180	270	360
y	1	0	-1	0	1

 giving this curve



# A6: Graphs 2

Know the graph of tangent

Translate a graph  $f(x+a)$  and  $f(x) + a$

A6.5

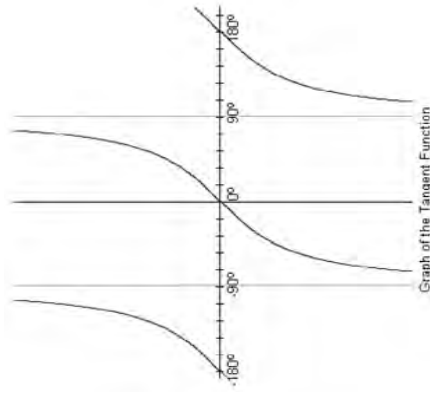
Know the graph of tangent

For the Tangent function between  $-180^\circ$  and  $180^\circ$ , the main values are

x	-180	-135	-45	0	45	135	180
y	0	1	-1	0	1	-1	0

There are asymptotes at  $-90^\circ$  and  $90^\circ$ .

The graph of tangent is



A6.6

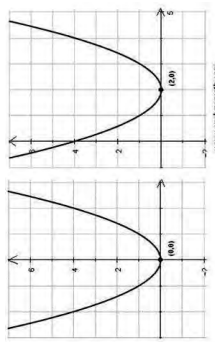
Translate a graph  $f(x + a)$  and  $f(x) + a$

e.g.  $y = f(x - 2)$

$y = f(x) + a$ .

Translate the graph  $(-a)$  steps along the x-axis.

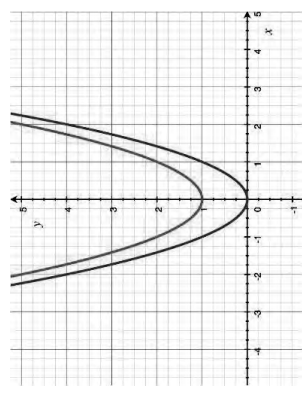
e.g.  $y = f(x - 2)$  translates  $y = f(x)$  2 units along the x axis, to the left.



$y = f(x) + a$ .

Translate the graph a steps along the y-axis.

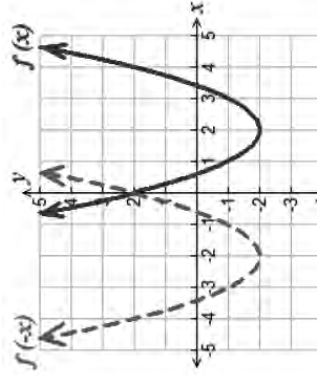
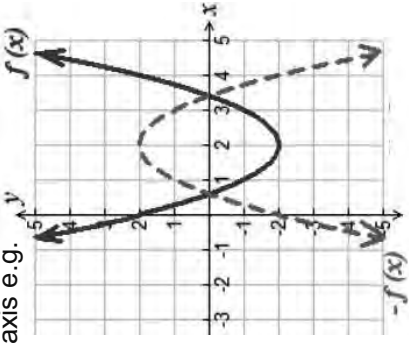
e.g.  $y = f(x) + 1$  translates  $y = f(x)$  1 unit up along the y=axis.

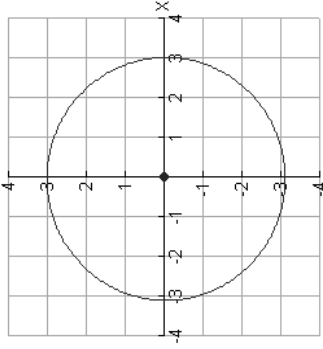


## A6: Graphs 2

Reflect a graph  $f(-x)$  and  $-f(x)$

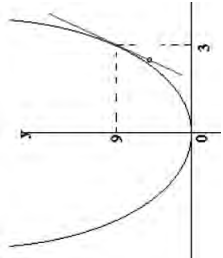
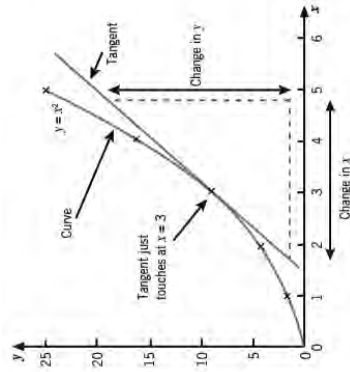
Know and plot the graph of a circle

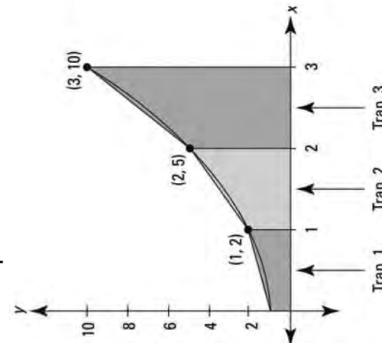
<p>A6.7</p> <p>Reflect a graph <math>f(-x)</math> and <math>-f(x)</math></p> <p>e.g. <math>y = f(-x)</math></p>	<p><b><math>y = f(-x)</math>.</b></p> <p>Reflects the graph of <math>f(x)</math> in the y-axis e.g.</p> 
<p><math>y = -f(x)</math></p>	<p><b><math>y = -f(x)</math>.</b></p> <p>Reflects the graph of <math>f(x)</math> in the x-axis e.g.</p> 

<p>A6.8</p> <p>Know and plot the graph of a circle</p> <p>e.g.</p> <p>plot the graph of the circle <math>x^2 + y^2 = 9</math>.</p>	<p>The graph of a circle is of the form:</p> $x^2 + y^2 = r^2$ <p>where <math>r</math> is the radius and the centre is <math>(0,0)</math>.</p> <p>e.g.</p> $x^2 + y^2 = 9$ $x^2 + y^2 = 3^2$ <p>This a circle of radius 3 and centre <math>(0,0)</math>.</p>
	

## A6: Graphs 2

Estimate the gradient of a curve using a tangent  
Estimate the area under a curve using trapezia

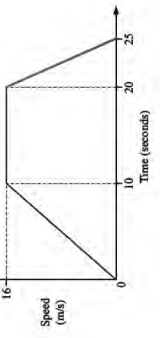
<p>A6.9 Estimate the gradient of a curve using a tangent</p> <p>Find the gradient of the curve <math>y = x^2</math> at the point (3, 9).</p> 	<p>To estimate the gradient of a curve at a given point, draw a tangent to the curve at that point. Find the gradient of the tangent.</p> <p>e.g. estimate the gradient of the curve <math>y = x^2</math> at the point (3, 9).</p>	
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<p>A6.10 Estimate the area under a curve using trapezia</p> <p>e.g. estimate the area under the curve <math>y = x^2 + 1</math> between <math>x = 0</math> and <math>x = 3</math>.</p>	<p>Divide the area under the curve into trapezia of equal width. More accuracy is gained by using more trapezia.</p>	 <p>Calculate the area of each trapezium and add them for the area under the curve.</p> <p>Trap 1: <math>\frac{1}{2} (1 + 2)1 = 1.5</math> square units. Trap 2: <math>\frac{1}{2} (2 + 5)1 = 3.5</math> square units. Trap 3: <math>\frac{1}{2} (5 + 10)1 = 7.5</math> square units.</p> <p>Area = <math>1.5 + 3.5 + 7.5</math> = <math>12.5</math> square units.</p>
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## A6: Graphs 2

Relate gradient of a line or curve to rate of change






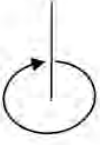
Relate the area under a speed time graph to distance

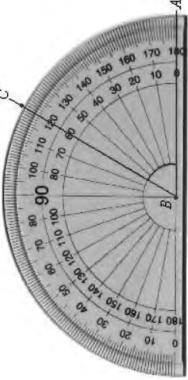
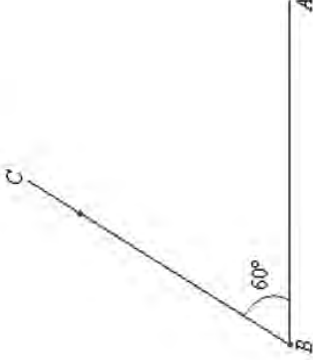
<p>A6.11 Relate gradient of a line or curve to rate of change.</p>	<p>The gradient of a line gives the rate of change of the variables.</p> <p>On a distance time graph, it shows the rate of change of distance with respect to time, i.e. speed.</p> <p>On a speed time graph, it shows the rate of change of speed with respect to time, i.e. acceleration.</p>
<p>A6.12 Relate the area under a speed time graph to distance.</p>	<p>The area under a speed time graph gives the distance travelled.</p>  <p>In the example, the distance travelled in the first 10 seconds is the area of the triangle.</p> $\text{Distance travelled} = (16 \times 10) \div 2 = 80\text{m.}$

G1: Angles, Similarity and Congruency

Identifying types of angle

Drawing an angle

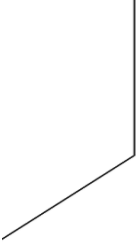
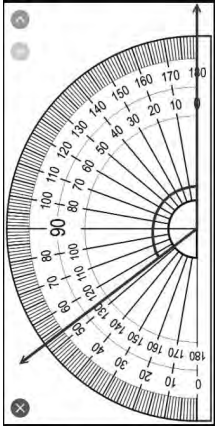
<p>G1.1</p> <p>Identifying types of angle</p>	<div> <div> <div>Acute</div> <div>(less than 90°)</div>  </div> <div> <div>Right</div> <div>(Exactly 90°)</div>  </div> </div> <div> <div> <div>Obtuse</div> <div>(Between 90° &amp; 180°)</div>  </div> <div> <div>Straight line</div> <div>(180°)</div>  </div> </div> <div> <div> <div>Reflex</div> <div>(Between 180° &amp; 360°)</div>  </div> <div> <div>Complete turn</div> <div>(360°)</div>  </div> </div>
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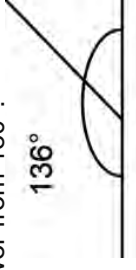
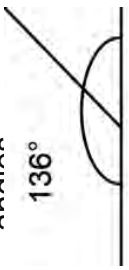

<p>G1.2</p> <p>Drawing an angle</p> <p>e.g. Draw an angle of 60°</p>	<p>Draw a straight line</p> <p>Place your protractor on either end of the line and using the appropriate scale find 60 degrees and put a dot</p>  <p>Join the end of the line you measured from and the dot you drew.</p> 
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## A6: Graphs 2

### Measuring angles

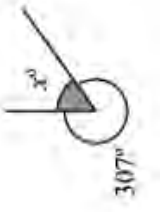
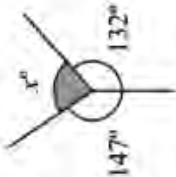
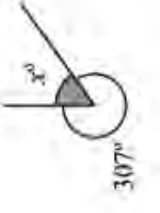
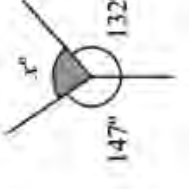
Know and use angles on a straight line

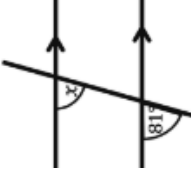
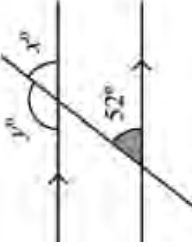
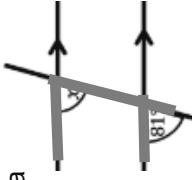

<p>G1.2</p> <p>Measuring angles</p> <p>e.g. measure the following angle.</p>	<p>Place the midpoint of the protractor on the <b>VERTEX</b> of the <b>angle</b>.</p> <p>Line up one side of the <b>angle</b> with the zero line of the protractor (where you see the number 0).</p> <p>Read the degrees where the other side crosses the number scale.</p>
	 <p>= 126°</p>

<p>G1.3</p> <p>Know and use angles on a straight line.</p> <p>e.g.</p> <p>Find the missing angles</p>	<p><b>Angles on a straight line add up to 180°</b></p> <p>Find the total of the given angles and subtract your answer from 180°.</p> <p>136°</p>  <p><math>180 - 136 = 44^\circ</math></p>
 <p>124°</p> <p>42°</p> <p><math>124 + 42 = 166</math>  <math>180 - 166 = 14^\circ</math></p>	 <p>124°</p> <p>42°</p>

## A6: Graphs 2

- Know and use angle sums of a point
- Know and use the corresponding angle rule

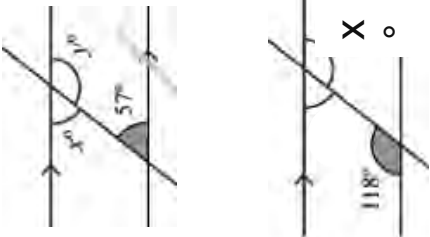
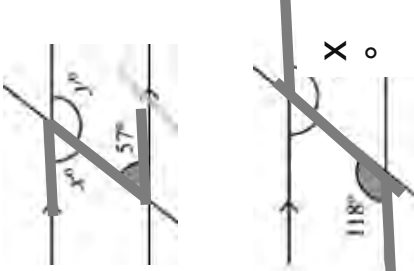
<p><b>G1.4</b></p> <p>Know and use angle sums at a point</p> <p>e.g. Find the missing angles</p>  	<p><b>Angles at a point add up to 360°</b></p> <p>Find the total of the given angles and subtract your answer</p>  <p><math>360 - 307 = 53^\circ</math></p>  <p><math>147 + 132 = 279</math>  <math>360 - 279 = 81^\circ</math></p>
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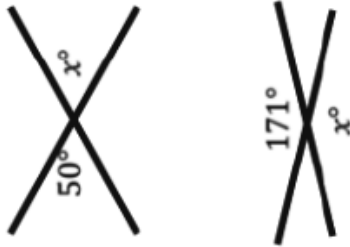
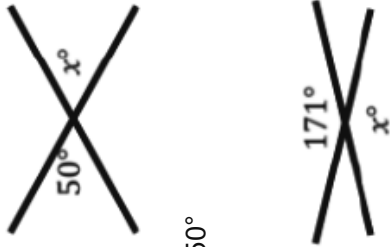
<p><b>G1.5</b></p> <p>Know and use the corresponding angle rule</p> <p>e.g. find the x in each of the following questions</p>  	<p><b>Corresponding angles are equal.</b></p> <p>You need to be able to join the angles with an <b>F</b> shape. It can be a <b>F</b>.</p>  <p><math>x = 81^\circ</math></p>  <p><math>x = 52^\circ</math></p>
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## A6: Graphs 2

Know and use the alternate angle rule

Know and use the vertically opposite angle rule

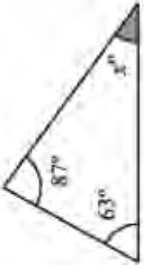
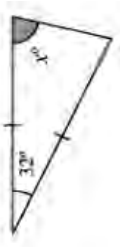
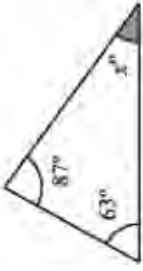
<p>G1.6</p> <p>Know and use the alternate angle rule</p> <p>e.g. Find the <math>x</math> in the following questions</p> 	<p><b>Alternate angles are equal.</b></p> <p>You need to be able to join the angles with an <b>Z</b> shape. It can be any orientation of an <b>Z</b>.</p>  <p><math>x = 57^\circ</math></p> <p><math>x = 118^\circ</math></p>
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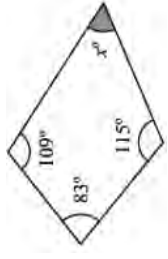

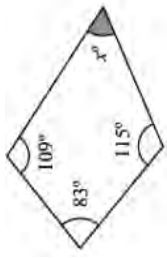
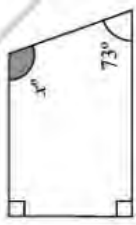
<p>G1.7</p> <p>Know and use the vertically opposite angle rule</p> <p>e.g. Find the missing angle in each of these</p> 	<p><b>Vertically opposite angles are equal.</b></p> <p>The <b>angles opposite</b> each other when two lines cross. They are always equal.</p>  <p><math>x = 50^\circ</math></p> <p><math>x = 171^\circ</math></p>
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## A6: Graphs 2

- Know and use the interior angles in a triangle
- Know and use the sum of interior angles in a quadrilateral

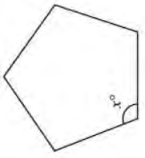
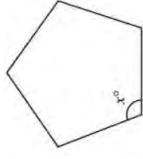
<p><b>G1.8</b></p> <p>Know and use the sum of interior angles in a triangle</p> <p>e.g. Calculate the missing angle in each of the following questions.</p>  	<p><b>Angles in a triangle add up to 180°</b></p> <p>Find the total of the given angles and subtract your answer from 180°.</p>  $63 + 87 = 150$ $180 - 150 = 30^\circ$ <p>This is a special triangle called an Isosceles triangle. In an Isosceles triangle the base angles are equal. We still take the given angles away from 180, but we halve the answer afterward.</p> $180 - 32 = 148$ $148 \div 2 = 74^\circ$
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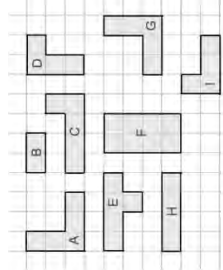
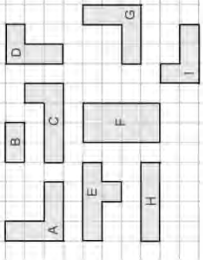
<p><b>G1.9</b></p> <p>Know and use the sum of interior angles in a quadrilateral</p> <p>e.g. Calculate the missing angle in each of the following questions.</p>  	<p><b>Angles in a quadrilateral add up to 360°</b></p> <p>Find the total of the given angles and subtract your answer from 360°.</p>  $109 + 83 + 115 = 307$ $360 - 307 = 53^\circ$  $73 + 90 + 90 = 253$ $360 - 253 = 107^\circ$
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## A6: Graphs 2

Know and use the sum of internal angles of a polygon

Identify congruent shape using the simple definition of congruency

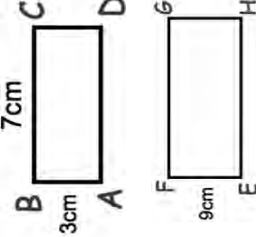
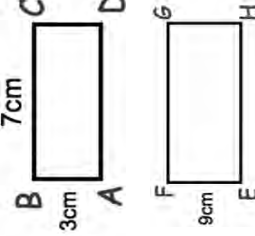
<p>G1. 10</p> <p>Know and use the sum of internal angles of a polygon</p> <p>e.g.</p> <p>Calculate the sum of internal angles of the following shape.</p>  <p>Calculate the sum of interior angles in a Hexagon</p>	<p>A <b>polygon</b> is a 2d shape formed by straight lines. The formula for finding the sum of the <b>measure</b> of the <b>interior angles</b> is <math>(n - 2) \times 180</math>.</p> <p>n represents the number of sides the shape has.</p>  <p><math>(5 - 2) \times 180 = 540^\circ</math></p> <p>Calculate the sum of interior angles in a Hexagon</p> <p>A hexagon has 6 sides.</p> <p><math>(6 - 2) \times 180 = 720^\circ</math></p>
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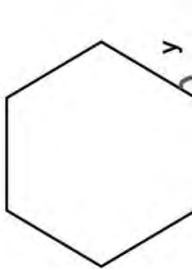

<p>G1. 11</p> <p>Identify congruent shapes using the simple definition of congruency.</p> <p>e.g.</p> <p>List all the congruent pairs of shapes.</p> 	<p><b>Congruent shapes</b> have the same size and <b>shape</b>. This means that the sides and segments of two <b>shapes</b> have the same length. And, the angles possess the same measurements</p> <p>If one shape can be made from another using Rotations, Reflections, or Translations then the shapes are Congruent.</p> <p>e.g. List the congruent pairs of shapes.</p>  <p>A and D D and I</p>
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## A6: Graphs 2

Use similarity to find missing lengths

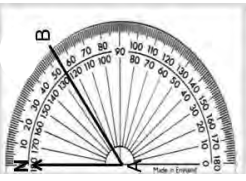
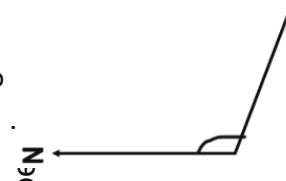
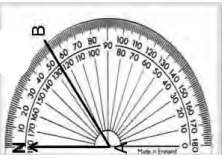

Know and use the sum of external angles of a regular polygon


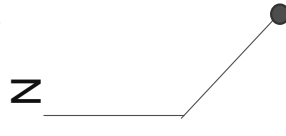
<p>G1. 12</p> <p>Use similarity to find missing lengths.</p> <p>e.g. Rectangle ABCD and EFGH are mathematically similar.</p>  <p>Calculate the length of FG</p>	<p>When two shapes are <b>similar</b>, the ratios of the lengths of their corresponding sides are equal. Similar shapes are enlargements of each other.</p> <p>e.g.</p>  <p>Rectangle ABCD and EFGH are mathematically similar. Calculate the length of FG.</p> <p>The scale factor to get from 3cm to 9cm is 3. Which means you must multiply the other sides by 3 also.</p> <p>Therefore <math>7 \times 3 = 21\text{cm}</math></p> <p>FG=21cm</p>
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<p>G1. 13</p> <p>Know and use the sum of external angles of a regular polygon</p> <p>e.g.</p>  <p>Calculate the size of angle y</p>	<p>The sum of <b>exterior angles</b> of <b>any polygon</b> is <math>360^\circ</math>. The formula for calculating the size of an <b>exterior angle</b> of a <b>regular polygon</b> is:</p> <p><b>exterior angle of a regular polygon</b> = <math>360 \div</math> number of sides.</p> <p>e.</p>  <p><math>y = 360 \div 6 = 60^\circ</math></p>
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## A6: Graphs 2

Read a bearing  
Draw a bearing

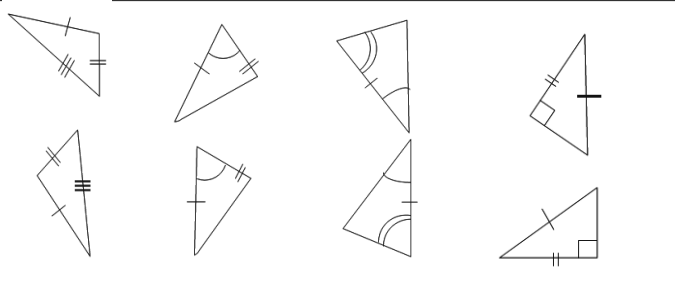
<p>G1. 14</p> <p>Read a bearing</p> <p>e.g. Measure the bearing from A to B</p>  <p>Measure the following bearing</p> 	<p>A <b>bearing</b> is used to represent the direction of one point relative to another point</p> <p>There are 3 rules to follow when measuring a bearing:</p> <ul style="list-style-type: none"> <li>• Measure from north</li> <li>• Measure clockwise</li> <li>• Writing using 3 digits</li> </ul> <p>e.g. Measure the bearing from A to B.</p>  <p>= 054°</p> <p>Measure the following bearing</p>  <p>= 110°</p>
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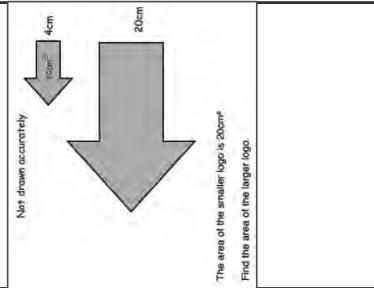
<p>G1. 15</p> <p>Draw a bearing</p> <p>e.g. Draw a bearing of 130°</p>	<p>A <b>bearing</b> is used to represent the direction of one point relative to another point.</p> <p>To draw a bearing of 130° you need to;</p> <ul style="list-style-type: none"> <li>• Draw a North line</li> </ul>  <ul style="list-style-type: none"> <li>• Measure 130° from the north line and join.</li> </ul> 
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## A6: Graphs 2

Prove Congruency using ASA SAS SSS and RHS

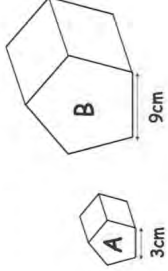
Use similarity to find missing areas

<p>G1. 16</p> <p>Prove congruency using ASA,SAS,SSS and RHS</p>	
<p>Congruent shapes have the same size and shape. One will fit exactly over the other. 2 triangles are congruent if any of these 4 conditions are satisfied on each triangle.</p>	<p>The corresponding sides are equal, SSS</p> <p>2 sides and the included angle are equal, SAS</p> <p>2 angles and the included side are equal, ASA</p> <p>Both triangles are right angled, the hypotenuses are the same length and another pair of sides are equal, RHS.</p>

<p>G1. 17</p> <p>Use similarity to find missing areas e.g. find the missing area</p>	
<p>Similar figures are identical in shape, but not necessarily in size. A missing length, area or volume on a reduction/enlargement figure can be calculated by first finding the scale factor.</p> <p>We already know that if two shapes are similar their corresponding sides are in the same ratio and their corresponding angles are equal. When calculating a missing area, we need to calculate the Area Scale Factor.</p> <p>Area Scale Factor (ASF) = (Linear Scale Factor)<sup>2</sup></p> <p>Area Scale Factor (ASF) = 5<sup>2</sup></p> <p>Area scale factor = 25</p>	<p>So the area of the new shape is;</p> <p>area of old shape x area scale factor</p> <p>= 20 x 25 = 500cm<sup>2</sup></p>

## A6: Graphs 2

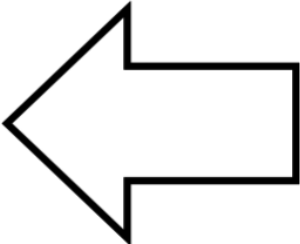
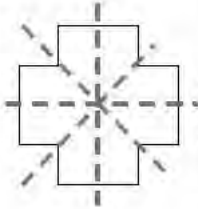
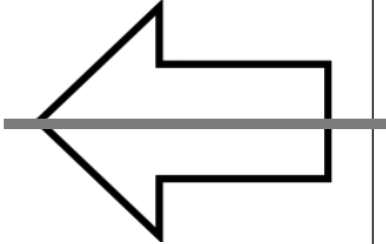
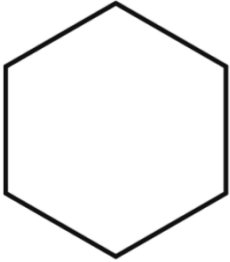

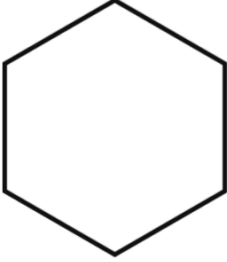
Use similarity to find missing volumes

<p>G1. 19</p> <p>Use similarity to find missing volumes</p> <p>e.g. Calculate the missing volume</p> <p>Below are two similar pentagonal prisms.</p>  <p>The volume of prism A is <math>15\text{cm}^3</math> Work out the volume of prism B.</p>	<p>Similar figures are identical in shape, but not necessarily in size. A missing length, area or volume on a reduction/enlargement figure can be calculated by first finding the scale factor.</p> <p>We already know that if two shapes are similar their corresponding sides are in the same ratio and their corresponding angles are equal.</p> <p>When calculating a missing volume, we need to calculate the Volume Scale Factor.</p> <p>Volume Scale Factor (VSF) = (Linear Scale Factor)<sup>3</sup></p> <p>Volume Scale Factor (VSF) = <math>3^3</math></p> <p>VSF = 27</p> <p>So the volume of the new shape is;</p> <p>Volume of old shape x Volume scale factor</p> <p><math>15 \times 27 = 405\text{cm}^3</math></p>
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## G2: 2D Shapes

### Identify Line Symmetry

### Identify Rotational Symmetry

<p><b>G2.1</b></p> <p>Identify line symmetry</p> <p>e.g.</p> <p>Draw the lines of symmetry on the following shape.</p> 	<ul style="list-style-type: none"> <li>• <b>Order of Line Symmetry</b> this is the number of times a shape can be folded so that one side falls exactly onto the other side</li> </ul>  <p>This shape has line symmetry <b>ORDER 4</b></p> <p>e.g. Draw the lines of symmetry on the following shape</p> 	<p><b>G2.2</b></p> <p>Identify rotational symmetry</p> <p>e.g.</p> <p>State the order of rotational symmetry of the following shape (regular hexagon)</p> 	<ul style="list-style-type: none"> <li>• <b>Order of Rotational Symmetry</b> this is the number of times a shape falls into its outline in one complete turn</li> </ul>  <p>A parallelogram has rotational symmetry order 2</p> <p>e.g. State the order of rotational symmetry of the following shape (regular hexagon)</p>  <p><b>Rotational symmetry order 6</b></p>
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## G2: 2D Shapes

### Reflect a Shape

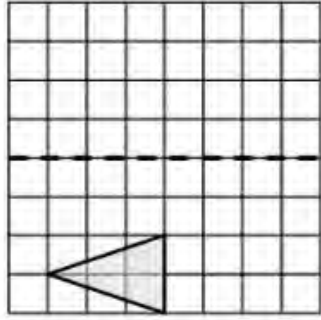
#### Describe a reflection

G2.3

Reflect a shape

e.g.

Reflect the shape in the given mirror line



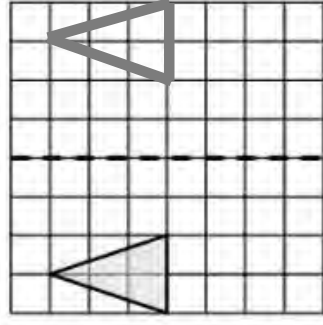
A shape can be **reflected** across a line of reflection to create an image.

The line of reflection is also called the mirror line.

Reflection is an example of a **transformation**. A transformation is a way of changing the size or position of a shape.

Every point in the image is the same distance from the mirror line as the original shape.

e. g. Reflect the shape in the given mirror line

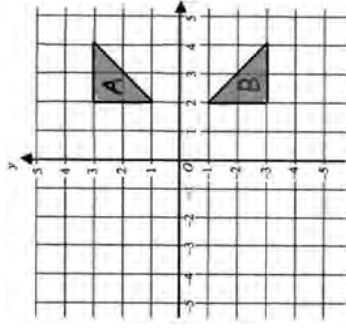


G2.4

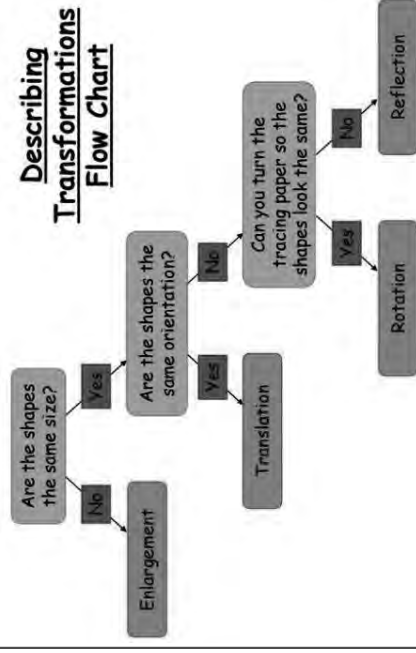
Describe a reflection

e.g.

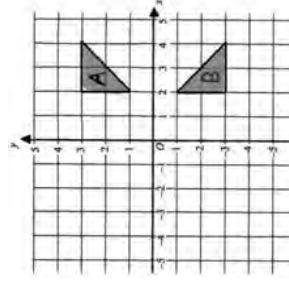
Describe fully the single transformation that maps A onto B.



### Describing Transformations Flow Chart



e.g. Describe fully the single transformation that maps A onto B.



Using the flow chart you can work out that it is a **reflection**, you then need to calculate where the mirror line is. To do this you need to find the line that is equidistant from each shape. In this case the mirror line is the **x-axis**. **So it is a reflection in the x-axis.**



## G2: 2D Shapes

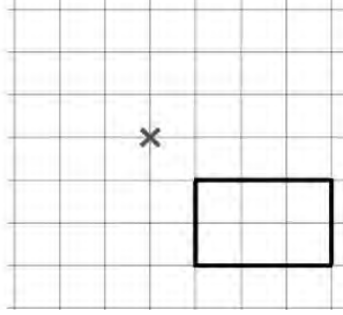
Rotate a shape  
Describe a rotation

G2.5

Rotate a  
shape

e.g.

Rotate the  
following  
shape  $90^\circ$   
clockwise

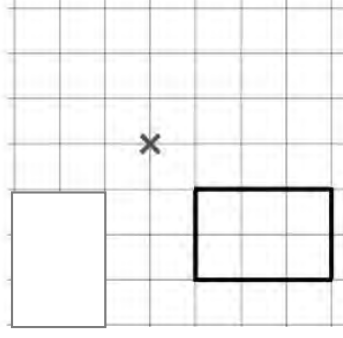


A **rotation** is a turn of a shape.

A rotation is described as the angle of **rotation**, and the direction of the turn.

- $90^\circ$  is a quarter turn
- $180^\circ$  is a half turn
- Clockwise is the same direction a clock turns
- The opposite to clockwise

e.g. Rotate the following shape  $90^\circ$  clockwise

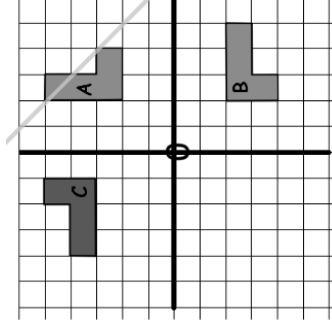


G2.6

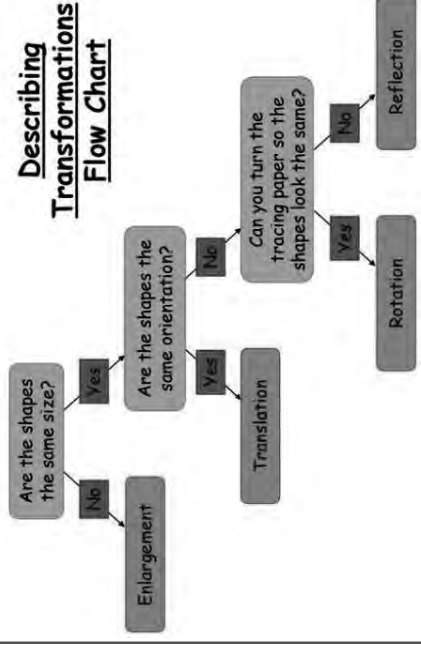
Describe a  
Rotation

e.g.

Describe the  
following  
transformation



A to B:  
A to C:



Follow the flow diagram to see which of the transformations it is:  
Rotation

Calculate the angle and direction of rotation:

**A to B: Rotation,  $90^\circ$  clockwise**

**A to C: Rotation  $90^\circ$  anti clockwise**

## G2: 2D Shapes

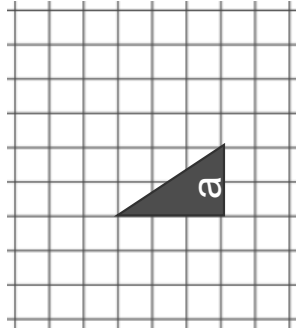
### Translate a shape

#### Describe a translation

G2.7

Translate a shape

e.g. Translate the following shape 2 left and 1 up



A **translation** moves a shape up, down or from side to side but it does not change its appearance in any other way.

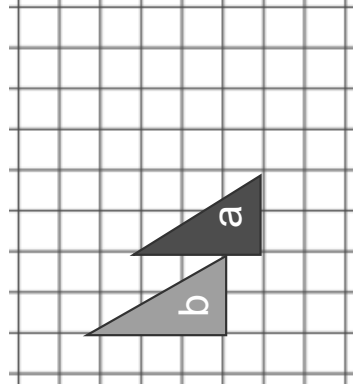
Translation is an example of a **transformation**. A transformation is a way of changing the size or position of a shape.

Every point in the shape is translated the same distance in the same direction.

You are given to instructions to move the shape;

- Left or right
- Up or down

Translate the following shape 2 left and 1 up

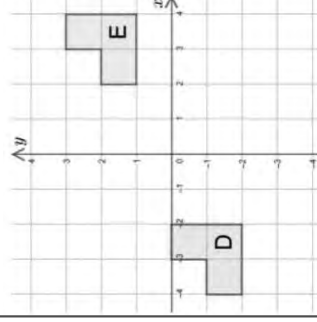


G2.8

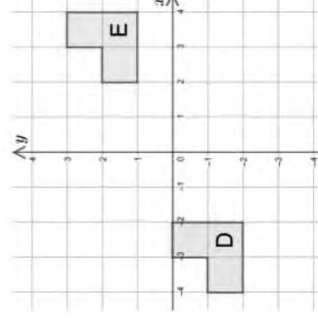
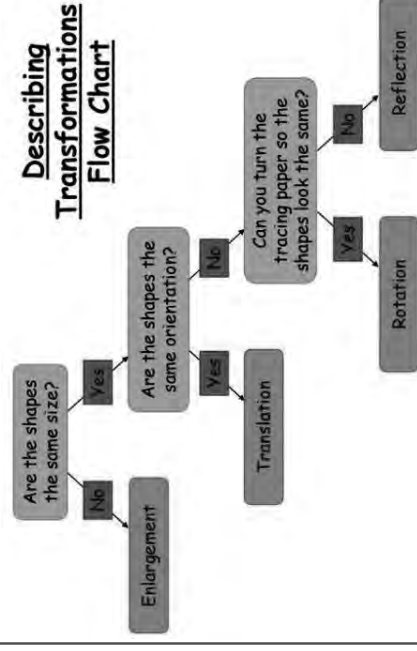
Describe a Translation

e.g.

Describe the following translation to map shape d to shape e.





#### Describing Transformations Flow Chart

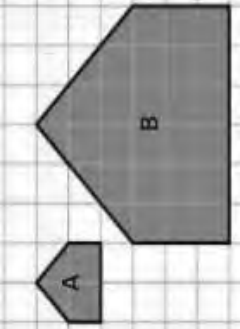
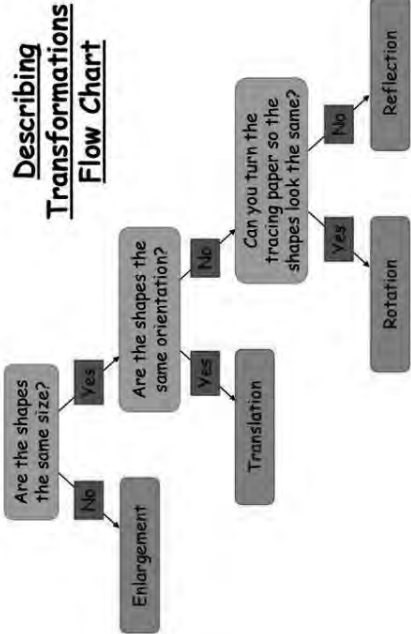


e.g. describe the following translation to map shape d to shape e.  
6 right and 3 up

## G2: 2D Shapes

Enlarge a shape by an integer scale factor  
Describe an enlargement by an integer scale factor



<p>G2.9</p> <p>Enlarge a shape by an integer scale factor</p> <p>e.g. Enlarge the following shape by a scale factor of 2</p>	
<p><b>Enlarging</b> a shape changes its size.</p> <p>When enlarging a shape you need to know by how much. This is called the <b>scale factor</b>. For example, a <b>scale factor</b> of 2 means that you multiply each side of the shape by 2.</p> <p>An enlargement with positive scale factor greater than 1 increases the size of the enlarged shape.</p>	<p>e.g. Enlarge 1 scale factor 2</p>  <p>Multiply each of the sides of the shape by 2 and re-draw.</p>



<p>G2.10</p> <p>Describe an enlargement by an integer scale factor</p> <p>e.g. Describe the following transformation that maps A to B.</p>	
<p><b>Describing Transformations Flow Chart</b></p>  <p>e.g. Describe the following transformation that maps A to B</p>	<p>Follow the flow diagram to see which of the transformations it is. <b>Enlargement.</b></p> <p>To find the Scale Factor you see what each side has been multiplied by. In this case it's <b>3</b>.</p> <p>The transformation is <b>Enlargement SF. 3</b>.</p>

## G2: 2D Shapes

Calculate the perimeter of a rectangle

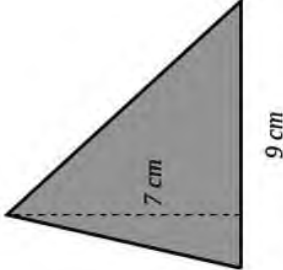
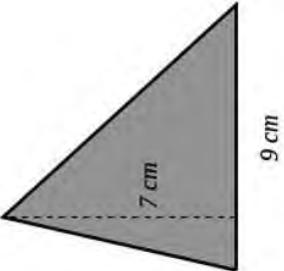
Calculate the area of a rectangle

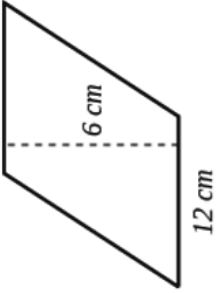
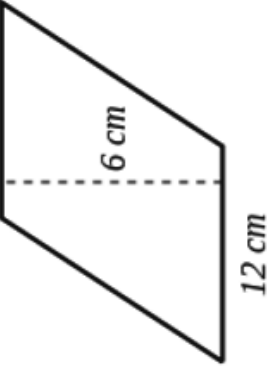
<p>G2.11</p> <p>Calculate the perimeter of a rectangle</p> <p>e.g.</p> <p>Calculate the perimeter of the following rectangle</p> 	<p>The <b>perimeter</b> is the length of the outline of a shape. To find the <b>perimeter</b> of a rectangle or square you have to add the lengths of all the four sides</p> <p>e.g.</p> <p>Calculate the perimeter of the following rectangle</p>  <p>Perimeter = <math>5+5+3+3= 16\text{in}</math></p>
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<p>G2.12</p> <p>Calculate the area of a rectangle</p> <p>e.g. Calculate the area of the following rectangle</p> 	<p>A shape's <b>area</b> is the number of square units it takes to completely fill it. In a rectangle you find it by multiplying the width by the height.</p> <p>Formula: Width <math>\times</math> Height</p> <p>e.g. Calculate the area of the following rectangle</p>  <p>Area = width <math>\times</math> height</p> <p>Area = <math>6 \times 3</math></p> <p>Area = <math>18\text{m}^2</math></p>
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## G2: 2D Shapes

### Calculate the area of a triangle Calculate the area of a parallelogram

<p>G2.13</p> <p>Calculate the area of a triangle</p> <p>e.g.</p> <p>Calculate the area of the following triangle</p>	<p>A shapes <b>area</b> is the number of square units it takes to completely fill it. In a triangle you find it by multiplying the base by the height (perpendicular), then dividing your answer by 2.</p> <p>Area of a triangle = <math>\frac{\text{base} \times \text{height}}{2}</math></p> <p>e.g. Calculate the area of the following triangle</p>
	 <p>Area of triangle = <math>\frac{9 \times 7}{2}</math></p> <p>Area of triangle = <math>\frac{63}{2}</math></p> <p>= 31.5cm<sup>2</sup></p>

<p>G2.14</p> <p>Calculate the area of a parallelogram</p> <p>e.g.</p> <p>Calculate the area of the following parallelogram</p>	<p>A shapes <b>area</b> is the number of square units it takes to completely fill it. In a parallelogram you find it by multiplying the width by the height.</p> <p>Area of a parallelogram = width x height</p> <p>e.g. Calculate the area of the following parallelogram</p>
	 <p>Area of parallelogram = 12 x 6</p> <p>Area of parallelogram = 72cm<sup>2</sup></p>

## G2: 2D Shapes

### Calculate missing sides from areas

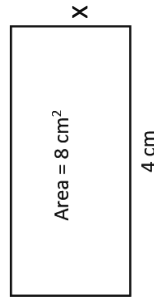
#### Read a timetable

G2.15

Calculate missing sides from areas

e.g.

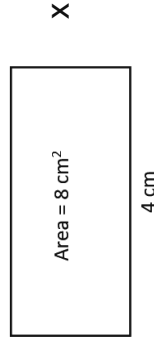
Calculate the missing side of the following shape.



To find missing lengths of rectangles you first need to remember the formula to find the area which is:

Area = width x length

What you need to do is rearrange the formula, so what you are looking for is the subject.



In this case you are looking for the length so you rearrange the formula to make it the subject.

$$\begin{aligned}\text{Length} &= \text{area} \div \text{width} \\ \text{Length} &= 8 \div 4 \\ &= 2\text{cm}\end{aligned}$$

Shortcut:

With a rectangle or square you just divide the area by the side that you are given.

G2.16

Read a timetable

e.g. Read & interpret timetables

Station	Time of leaving
Peterborough	08 44
Huntingdon	09 01
St Neots	09 08
Sandy	09 15
Biggleswade	09 19
Arlesey	09 24

e.g. Time taken to travel from Peterborough to Sandy

0844      0900      0915

16min      +      15min      = 31min

To read a timetable such as the one in the example, you look at the “time of leaving” column. This states the time that the particular mode of transport leaves that particular place.

# G2: 2D Shapes

## Use Metric measures of length

### Convert metric units of length

<p>G2.17</p> <p>Use metric measures of length</p>	<p>We can measure how long things are, or how tall, or how far apart they are. Those are all examples of length measurements.</p> <p>Small units of length are called <b>millimetres</b>. A <b>millimetre</b> is about the thickness of a plastic id card (or credit card).</p> <p>When we have 10 millimetres, it can be called a <b>centimetre</b>. 1 centimetre = 10 millimetres A fingernail is about <b>one centimetre wide</b>.</p> <p>We can use millimetres or centimetres to measure how tall we are, or how wide a table is, but to measure the length of a football pitch it is better to use <b>metres</b>.</p> <p>A <b>metre</b> is equal to 100 centimetres. 1 metre = 100 centimetres</p> <p>The length of a guitar is about 1 <b>metre</b> <b>Metres</b> can be used to measure the length of a house, or the size of a playground.</p> <p>A <b>kilometre</b> is equal to 1000 metres. The distance from one city to another or how far a plane travels can be measured using <b>kilometres</b>.</p>
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<p>G2.18</p> <p>Convert metric units of length</p> <p>e.g.</p> <p>Convert:</p> <p>100mm to cm 170cm to m 6700m to km</p>	<table> <tr> <td>10mm</td><td>1cm</td></tr> <tr> <td>100cm</td><td>1m</td></tr> <tr> <td>1000</td><td>1km</td></tr> </table> <p>e.g. convert:</p> <p>100mm to cm Divide by 10 =10cm</p> <p>170cm to m Divide by 100 =1.7m</p> <p>6700m to km Divide by 1000 =6.7km</p> <p>To work the other way i.e. cm to mm you do the inverse i.e. multiply by 10.</p>	10mm	1cm	100cm	1m	1000	1km
10mm	1cm						
100cm	1m						
1000	1km						

G2: 2D Shapes

Use Metric measures of mass

Convert metric units of mass

<p>G2.19</p> <p>Using metric units for mass</p>	<p>Mass: how much matter is in an object.</p> <p>We measure mass by weighing, but weight and mass are not really the same thing.</p> <p>These are the most common measurements:</p> <ul style="list-style-type: none"><li>• Grams</li><li>• Kilograms</li><li>• Tonnes</li></ul> <p>Grams are the smallest, Tonnes are the biggest.</p> <p>Grams are often written as g (for short), so "300 g" means "300 grams".</p> <p>A loaf of bread weighs about 700 g</p> <p>When we have 1000g, we have 1kilogram, written short as 1kg.</p> <p>Scales measure our mass using kilograms. An adults mass can be about 70 kg.</p> <p>But when it comes to things that are very heavy, we need to use the tonne.</p> <p>Once we have 1,000 kilograms, we will have 1 tonne.</p> <p>Some cars can have a mass of around 2 tonnes</p>
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<p>G2.20</p> <p>Convert metric units of mass</p> <p>e.g.</p> <p>Convert:</p> <p>5500g into kg</p> <p>9870kg into tonnes</p>	<table><tr><td><b>1000g</b></td><td><b>1kg</b></td></tr><tr><td>1000kg</td><td>1 tonne</td></tr></table> <p>e.g. convert:</p> <p>5500g to kg Divide by 1000 = 5.5kg</p> <p>9870kg to tonnes Divide by 1000 =9.87 tonnes</p> <p>To work the other way i.e. kg to g you do the inverse i.e. multiply by 1000.</p>	<b>1000g</b>	<b>1kg</b>	1000kg	1 tonne
<b>1000g</b>	<b>1kg</b>				
1000kg	1 tonne				



G2: 2D Shapes

Use Metric measures of volume or capacity

Convert metric units of volume or capacity (litres only)

<p>G2.21</p> <p>Use metric units of volume or capacity</p>	<p>Volume is the amount of 3-dimensional space something takes up.</p> <p>The two most common measurements of volume are:</p> <ul style="list-style-type: none"><li>• Millilitres</li><li>• Litres</li></ul> <p>A <b>millilitre</b> is a very small amount of liquid, 5 ml can be held within a teaspoon.</p> <p>A <b>litre</b> is just a bunch of millilitres put all together. In fact, 1000 millilitres makes up 1 litre:</p> <p>1 litre = 1,000 millilitres</p>	<p>G2.22</p> <p>Convert metric units of volume or capacity (litres only)</p> <p>Convert:</p> <p>5000ml to L</p> <p>7L to ml</p> <p>700ml to L</p>	<table><tr><td>1000ml</td><td>1L</td></tr></table> <p>e.g. convert:</p> <p>5000ml to L</p> <p>Divide by 1000</p> <p>=5L</p> <p>7L to ml</p> <p>Multiply by 1000</p> <p>= 7000ml</p> <p>700ml to L</p> <p>Divide by 1000</p> <p>=0.7L</p> <p>To work the other way i.e. L to ml you do the inverse i.e. multiply by 1000</p>	1000ml	1L
1000ml	1L				

G2: 2D Shapes

Use simple conversions of imperial to metric

Enlarge a shape by an integer factor with a centre of enlargement

G2.23

Use simple conversions of imperial to metric

• Imperial units

Length	Weight	Capacity
1 inch=2.5cm	2.2 pounds≈1kg	1gallon≈4.5litres
1 foot=30cm		
1 mile≈1.6km		

Convert:

3 inches to cm

Multiply by 2.5

=7.5cm

5 feet to cm

Multiply by 30

= 150cm

4 miles to km

Multiply by 1.6

≈ 6.4km

180 pounds to kg

Divide by 2.2

≈ 82kg

7 gallons to litres

Multiply by 4.5

≈31.5L

To work the other way i.e. cm to feet you do the inverse i.e. divide by 30

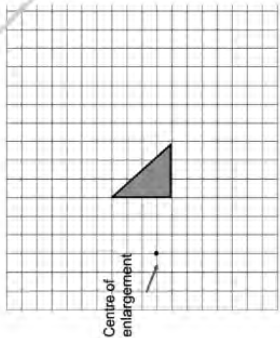
G2.24

Enlarge a shape by an integer scale factor with a centre of enlargement

e.g.

Enlarge the following shape by the given factor and from the given centre of enlargement

Scale factor 2

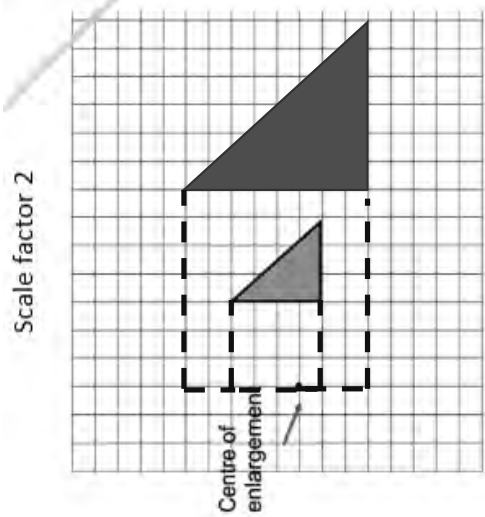


You sometimes can be asked to enlarge from a specific **centre of enlargement**. When a shape is **enlarged** from a **centre of enlargement**, the distances from the **centre** to each point are multiplied by the scale factor.

e.g. Enlarge the following shape by the given scale factor and from the given centre of enlargement

To enlarge using a centre of enlargement, you count the distance from of each point from the centre of enlargement, then multiply that distance by the scale factor.

Scale factor 2



## G2: 2D Shapes

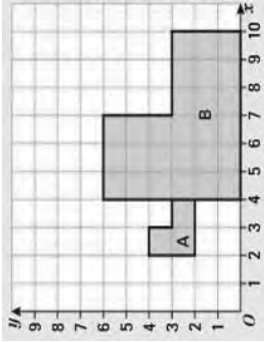
Describe an enlargement by an integer scale factor and a centre of enlargement  
 Enlarge a shape using a fractional scale factor

**G2.25**

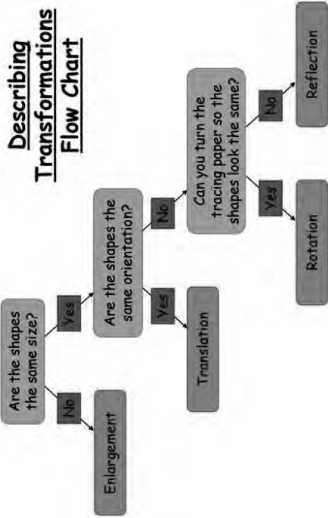
Describe an enlargement by an integer scale factor and a centre of enlargement

e.g.

Describe fully the single transformation that maps A onto B



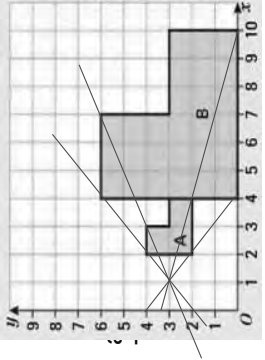
**Describing Transformations Flow Chart**



First of all use the flow chart to decide which of the transformations it is.

When you have found that it is an enlargement, you need to find the scale factor. To do this you must count the length of the sides and see what you multiply by to get from A to B.

To work out the centre of enlargement you join the vertices of both shapes and see where the lines intersect, this is the centre of enlargement.



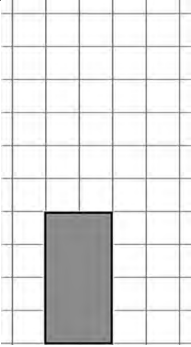
This is an enlargement, with scale factor of 3. centre of enlargement is (1,3)

**G2.26**

Enlarge a shape using a fractional scale factor

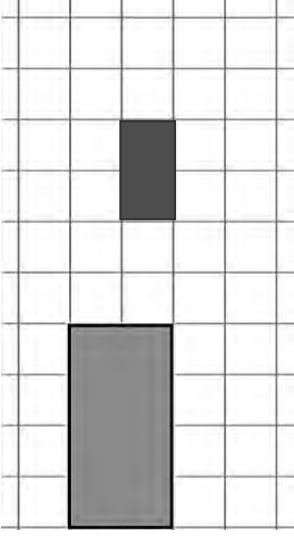
e.g.

Enlarge the following shape with a scale factor of a  $\frac{1}{2}$



To enlarge a shape with a fractional scale factor, you follow the same steps as when you enlarge with an integer.

e.g. enlarge the following shape with a scale factor of a  $\frac{1}{2}$ .



## G2: 2D Shapes

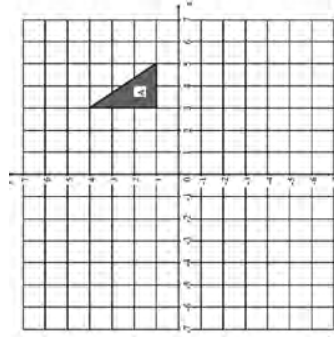
### Translate a shape

#### Describe a translation

G2.27

Translate a shape

e.g. Translate the following shape in the shape in the vector  $\begin{bmatrix} 2 \\ 1 \end{bmatrix}$



A **translation** moves a shape up, down or from side to side but it does not change its appearance in any other way.

Translation is an example of a **transformation**. A transformation is a way of changing the size or position of a shape.

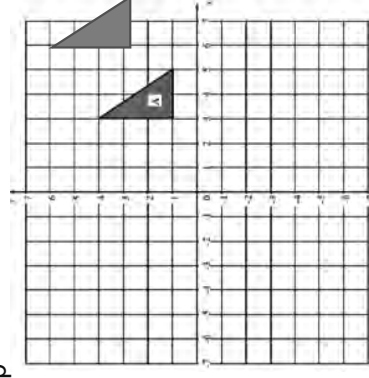
Every point in the shape is translated the same distance in the same direction.

Column **vectors** are used to describe translations.

$\begin{bmatrix} 4 \\ -2 \end{bmatrix}$  Means that you move the shape 4 to the right and 2 down

$\begin{bmatrix} -2 \\ 5 \end{bmatrix}$  Means that you move the shape 2 to the left and 5 up

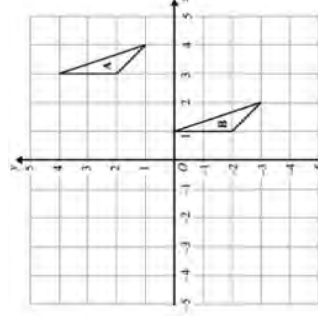
e.g. Translate the following shape in the vector  $\begin{bmatrix} 2 \\ 1 \end{bmatrix}$



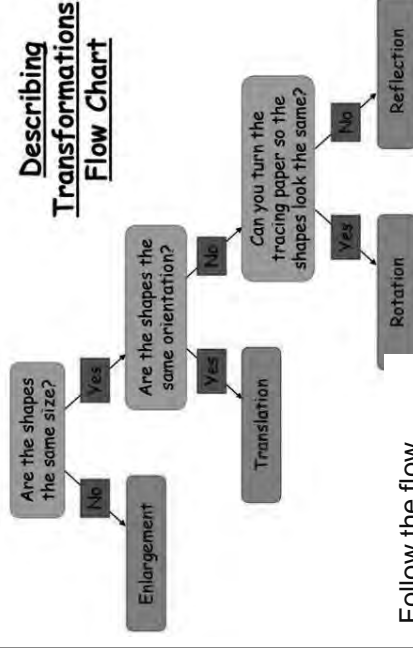
G2.28

Describe a Translation

Describe the transformation that fully maps A onto B



#### Describing Transformations Flow Chart

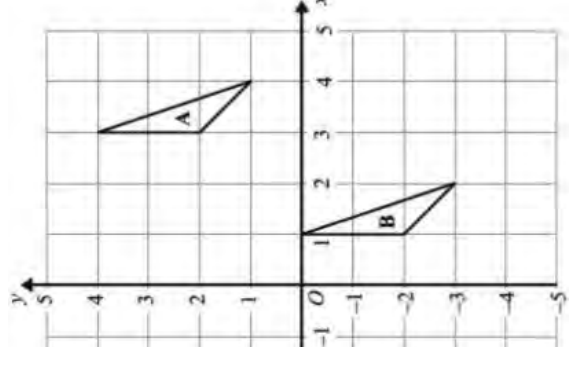


Follow the flow diagram to see which of the transformations it is.

Translation

Find the vector by counting the squares. This shape has moved 2 left and 4 down. So the vector is  $\begin{bmatrix} -2 \\ -4 \end{bmatrix}$

So the single transformation is a **translation in the vector  $\begin{bmatrix} -2 \\ -4 \end{bmatrix}$**



## G2: 2D Shapes

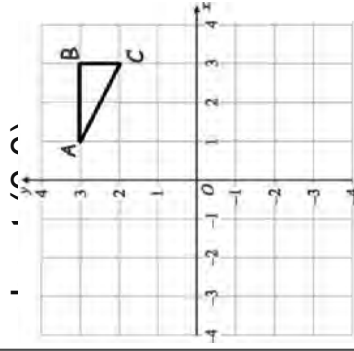
Rotate a shape with a given centre of rotation  
Describe a rotation through a centre of rotation

G2.29

Rotate a shape with a given centre of rotation

e.g.

Rotate the following shape  $90^\circ$  clockwise



**Rotation** turns a shape around a fixed point called the **centre of rotation**.

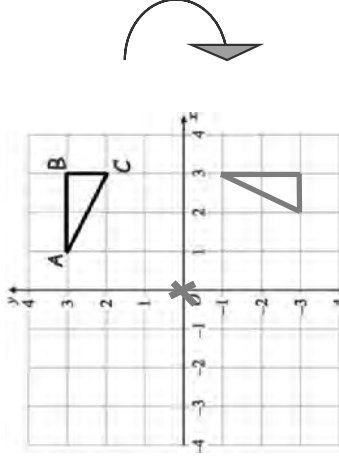
Rotation is an example of a **transformation**. A transformation is a way of changing the size or position of a shape.

**Three pieces of information are needed to rotate a**

**shape:**

- the centre of rotation
- the angle of rotation
- the direction of rotation

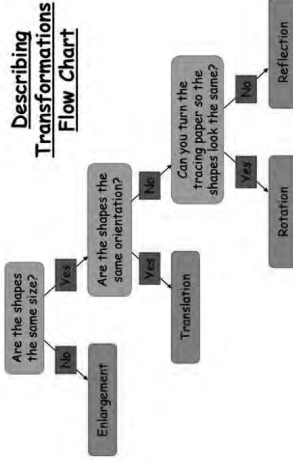
e.g. Rotate the following shape  $90^\circ$  clockwise about (0,0)



In this particular question you rotate the shape a quarter turn clockwise (using tracing paper) with your pencil on the given coordinate.

G2.30

Describe a rotation through a centre of rotation



First of all decide which of the transformations it is by using the flow chart.

Find two corresponding points on the original shape and the shape that's been rotated — typically, the pointy end of the triangle, or a convenient right angle. Draw a line between them.

At each of the points, draw a line at  $45^\circ$  towards where you think the centre of rotation ought to be.

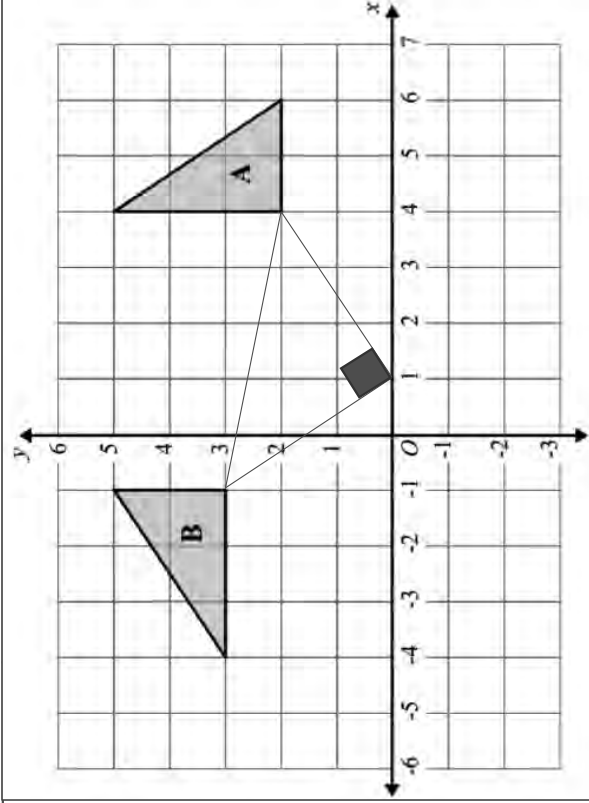
Where these lines cross is the centre of rotation. Check you've gone the right way: measure the distance from your centre to two other corresponding points and check they're the same.

Otherwise, you need to draw your  $45^\circ$  lines on the other side of your line  
Continued on the next page.

## G2: 2D Shapes

Describe a rotation through a centre of rotation (continued)

Reflect a shape using a diagonal or horizontal line



G2.30

Continued

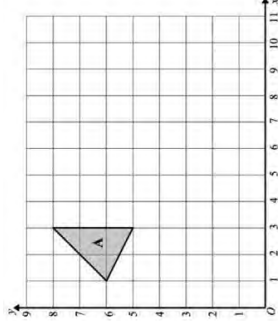
This is a rotation,  $90^\circ$   
anticlockwise, from (1,0)

G2.31

Reflect a shape  
using a diagonal line  
or horizontal line

e.g.

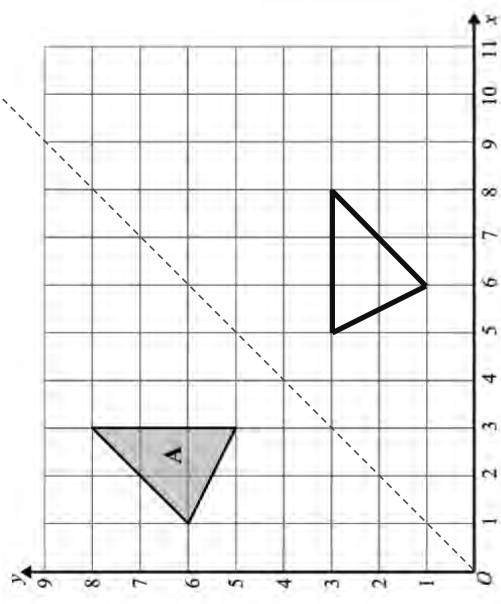
Reflect the following  
shape in the line  $y =$   
 $x$



Firstly, you must find the mirror line. In the line  $y = x$  the  $y$  coordinate is the same as the  $x$  coordinate.

This means if you  $y$  coordinate is 1 your  $x$  coordinate is 1. This creates a diagonal line from the origin.

You then count the distance from each vertex to the mirror line and replicate it on the other side of the mirror line.



## G2: 2D Shapes

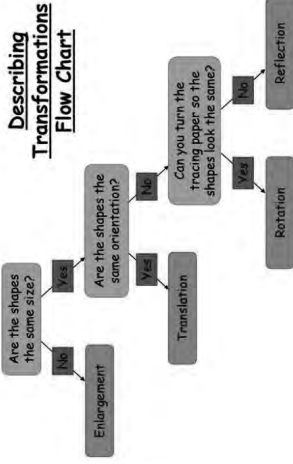
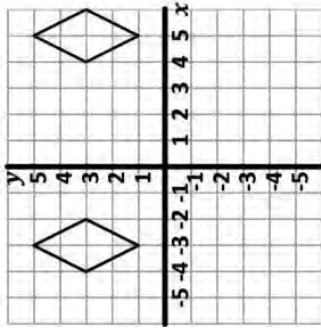
Describe a reflection using the equation of a line  
Calculate the area of a trapezium

G2.32

Describe a reflection using the equation of a line

e.g.

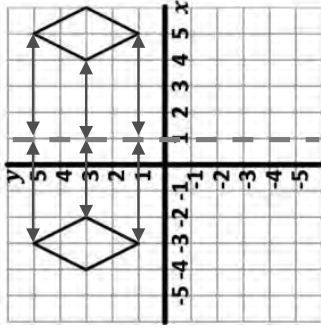
Describe the single transformation that maps shape A to B.



Firstly you need to decide which of the transformations it is.

When you have found that it is a reflection, you need to find the mirror line.

To do this you need to find a line in which all the points of each shape will be equidistant to the corresponding point.



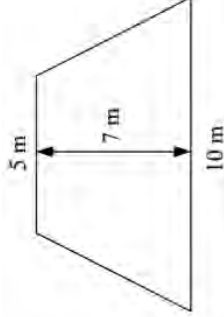
So this is a reflection in the line  $x=1$

G2.33

Calculate the area of a trapezium

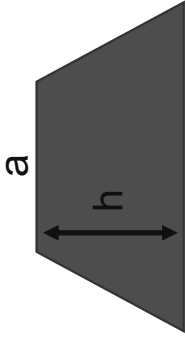
e.g.

Calculate the area of the following shape



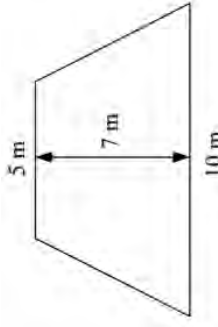
To find the area of a trapezium you need to use a specific formula.

$$A = \frac{(a+b)}{2} \times h$$



b

e.g. Calculate the area of the following shape



$$\text{Area} = \frac{(5+10)}{2} \times 7$$

$$\text{Area} = \frac{15}{2} \times 7$$

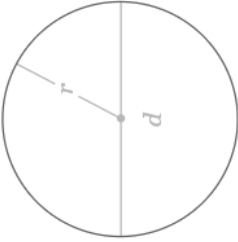
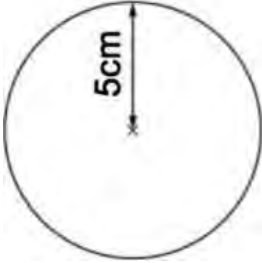
$$\text{Area} = 7.5 \times 7$$

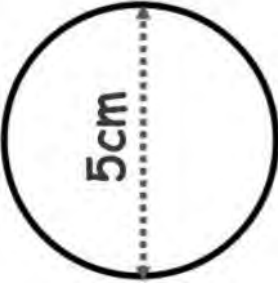
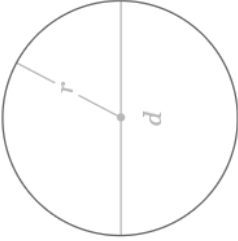
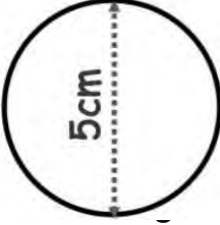
$$\text{Area} = 52.5 \text{ m}^2$$

## G2: 2D Shapes

Calculate the area of a circle

Calculate the circumference of a circle

<p>G2.34</p> <p>Calculate the area of a circle</p> <p>e.g.</p> <p>Work out the area of the following circle</p>	<p>To find the area of a circle you need to follow a specific formula.</p> $A = \pi r^2$  <p>e.g. work out the area of the following circle</p>  <p>Area = <math>\pi r^2</math>  Area = <math>\pi \times 5^2</math>  Area = 78.5398163...  Area = 78.5 cm<sup>2</sup> 1dp</p>
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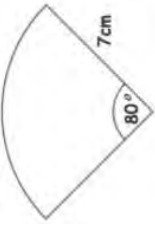
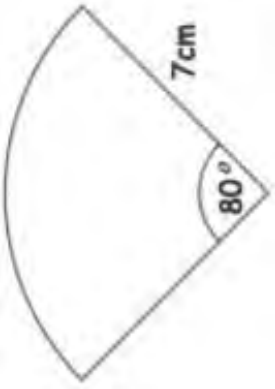
<p>G2.35</p> <p>Calculate the circumference of a circle</p> <p>e.g.</p> <p>Work out the circumference of the following circle</p> 	<p>To find the circumference of a circle you need to follow a specific formula.</p> $C = 2 \pi r \quad \text{or} \quad C = \pi d$  <p>e.g. Work out the circumference of the following circle</p>  <p>Circumference = <math>\pi d</math>  Circumference = <math>\pi \times 5</math>  Circumference = 15.707...  Circumference = 15.7 cm 1dp</p>
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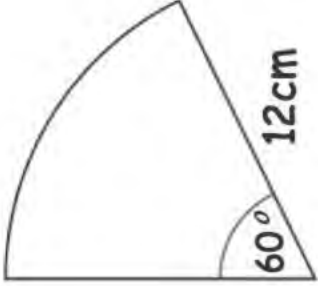
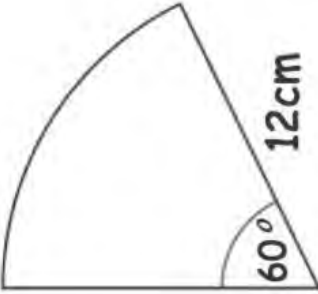


## G2: 2D Shapes

Calculate the area of a sector

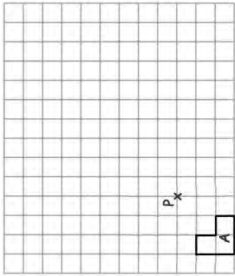
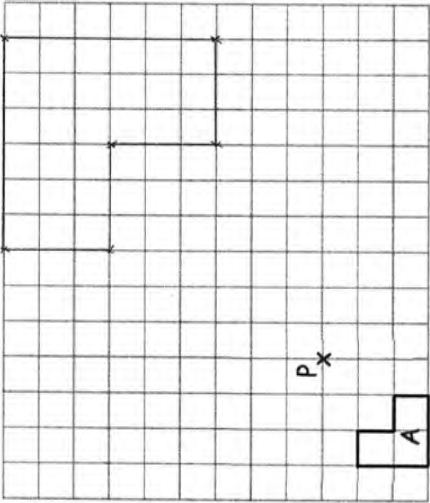
Calculate arc length

<p>G2.36</p> <p>Calculate the area of a sector</p> <p>e.g.</p> <p>Find the area of the following sector</p> 	<p>We can find the area of a sector using the formula:</p> $\frac{\theta}{360} \times \pi r^2$ <p><math>\theta</math> is the angle of the sector <math>r</math> is the radius</p> <p>e.g. Find the area of the following sector</p> 
<p>Area = <math>\frac{80}{360} \times \pi \times 7^2</math></p> <p>Area = 34.208...</p> <p>Area = 34.2cm<sup>2</sup> 1dp</p>	

<p>G2.37</p> <p>Calculate arc length</p> <p>e.g.</p> <p>Evaluate the length of the following arc</p> 	<p>To calculate arc length you use</p> $\text{Arc length} = \frac{\text{angle}}{360} \times \pi \times d$ <p>e.g. Find the length of the following arc</p> 
	<p>Arc length = <math>\frac{60}{360} \times \pi \times 24</math></p> <p>Arc length = 12.566...</p> <p>Arc length = 12.6 cm</p>

# G2: 2D Shapes

Enlarge a shape using a negative scale factor  
Convert metric units of area and volume

<p>G2.38</p> <p>Enlarge a shape using a negative scale factor</p> <p>e.g. Enlarge the following shape with a scale factor of -3 from point P</p> 	<p>An <b>enlargement</b> using a <b>negative scale factor</b> will cause the <b>enlargement</b> to appear on the other side of the centre of <b>enlargement</b>; and will be inverted (upside down). The <b>shape</b> will also change size depending on the value of the <b>enlargement</b>.</p>  <p>To enlarge by a negative scale factor, you need to work out the vector from P to each corner of the shape.</p> <p>You then multiply each vector by the scale factor.</p> <p>You will end up with new vectors that you draw from p.</p> <p>In this example you multiply each vector by -3.</p>
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<p>G2.39</p> <p>Convert metric units of area or volume</p> <p>e.g. Convert 5m<sup>2</sup> to cm<sup>2</sup></p>	<p>The method for converting between units works the same as the one for converting units of area and volume.</p> <p>When you are converting one sort of unit to another, you need to know how many smaller units are needed to make 1 larger unit.</p> <p><b>Area</b> Convert 5m<sup>2</sup> to cm<sup>2</sup></p> <div> <div> <div>5m</div> <div>Area = 5x1 = 5m<sup>2</sup></div> </div> <div> <div>1m</div> <div>Area = 100x100 = 10000cm<sup>2</sup></div> </div> <div>=</div> <div>500</div> </div> <p><b>Volume</b> Convert 5,000 mm<sup>3</sup> to cm<sup>3</sup></p> <div> <div> <div>20mm</div> <div>Volume = 20x25x10 = 5000mm<sup>3</sup></div> </div> <div>=</div> <div> <div>2cm</div> <div>Volume = 2x2.5x1 = 5cm<sup>3</sup></div> </div> </div>
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## G2: 2D Shapes

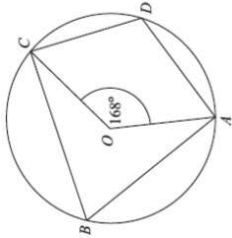
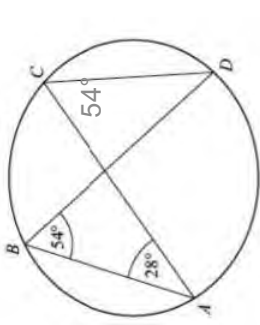
### Recognise the circle theorems

<p>G2.40</p> <p>Recognise the circle theorems</p> <p>e.g. What are the eight circle theorems?</p>	<div></div> <div> <p>The angle at the centre = 2 x angle at the a circumference</p> </div> <div></div> <div> <p>The angle in a semi-circle is a right angle</p> </div> <div></div> <div> <p>Angles in the same segment are equal quadrilateral add up to 180°</p> </div> <div></div> <div> <p>Opposite angles cyclic</p> </div>
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	<div></div> <div> <p>The perpendicular from the centre to the chord equal bisects the chord</p> </div> <div></div> <div> <p>Tangents from a point to a circle are equal</p> </div> <div></div> <div> <p>The angle between a tangent and a chord is equal to the angle in the alternate segment</p> </div> <div></div> <div> <p>The angle between a tangent and a radius is always 90°</p> </div>
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## G2: 2D Shapes

### Use circle theorems to solve problems

<p>G2.41</p> <p>Use circle theorems to solve problems</p>  <p>e.g. Work out angle ADC</p>  <p>Work out the angle ADC, give reasons for your answer</p> <p>e.g. Work out the angle ACD, give reasons for your answer</p> <p>ACD = 54° because angles in the same segment are equal.</p>	<p>Work out angle ADC</p> <p>Angle ABC = 84°    Angle at the centre is 2x the angle at the circumference. Angle ADC = 96°    Opposite angles in a cyclic quadrilateral add up to 180°</p> <p>Work out the angle ADC, give reasons for your answer</p> <p>ACD = 54° because angles in the same segment are equal.</p>
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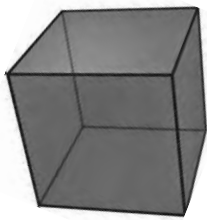

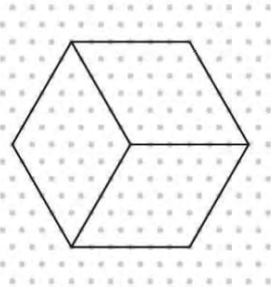
G3: 3D Shapes

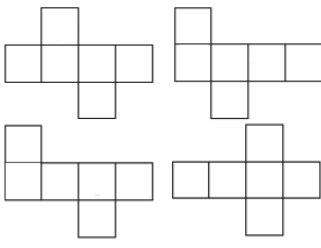
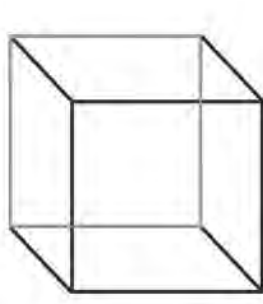
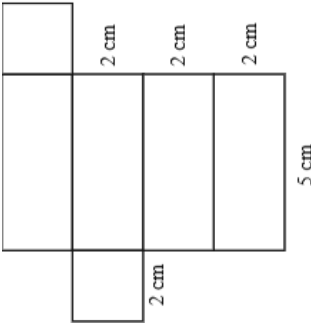
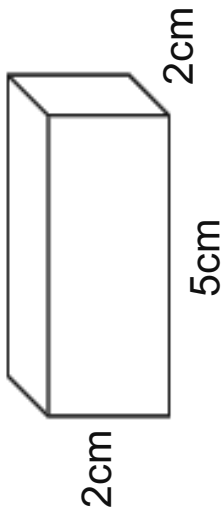
Identify properties of a 3D shape

Represent a 3D shape on an isometric grid

Identify a net of a cube

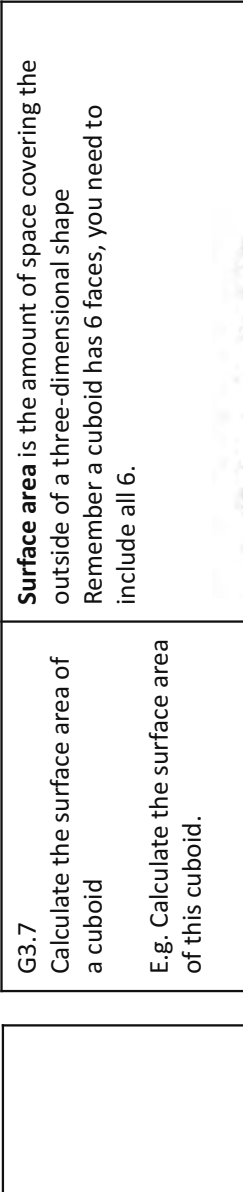
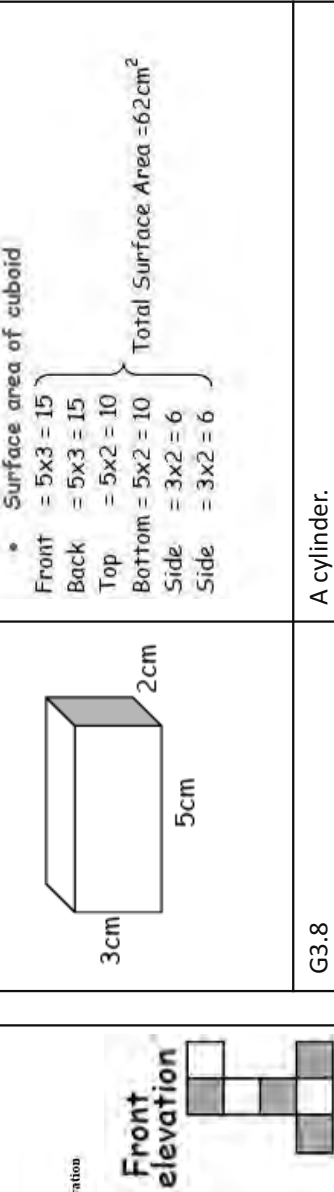
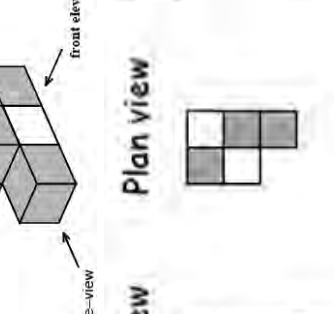
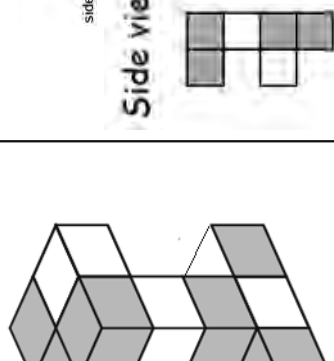

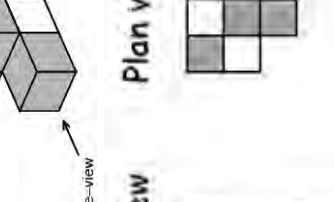
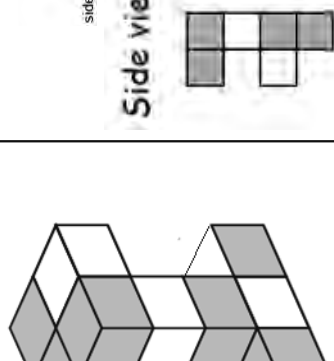
Identify a net of other 3D cuboids

<p>G3.1</p> <p>Identify properties of a 3D shape</p> <p>E.g. Name the properties of a Cube.</p> 	<p><b>3D shapes have faces (sides), edges and vertices (corners).</b></p> <p><b>Faces</b> A face is a flat or curved surface on a 3D shape. E.g. a cube has 6 faces, a cylinder has 3 and a sphere 1.</p> <p><b>Edges</b> An edge is where two faces meet. E.g. a cube has 12 edges, a cylinder has 2 and a sphere has none.</p> <p><b>Vertices</b> A vertex is a corner where edges meet. The plural is vertices. E.g. a cube has 8 vertices, a cone has 1 vertex and a sphere has none.</p> <p><b>A cube has 6 identical faces, 12 edges and 4 vertices.</b></p>
<p>G3.2</p> <p>Represent a 3D shape on an isometric grid</p> <p>E.g. Create an isometric drawing of a cube measuring 6cm x 6cm x 6cm.</p>	<p>Isometric paper is used to accurately draw 3D shapes.</p>  <p>Never join the dots horizontally</p> 

<p>G3.3</p> <p>Identify a net of a cube. E.g. What 3D shape do all of these nets form?</p> 	<p>A cube</p> 
<p>G3.4</p> <p>Identify a net of other 3D cuboids. E.g. Draw and name the shape this would create and include the measurements.</p> 	<p>A cuboid.</p> 

G3: 3D Shapes

Identify a 3D shape from plans and elevations  
Calculate the volume of a cuboid

<p>G3.5</p> <p>Interpret a 3D shape from plans and elevations</p> <p>E.g. Draw the Side view, Plan View and Front Elevation of this shape.</p> 		<p>G3.7</p> <p>Calculate the surface area of a cuboid</p> <p>E.g. Calculate the surface area of this cuboid.</p> 	<p><b>Surface area</b> is the amount of space covering the outside of a three-dimensional shape</p> <p>Remember a cuboid has 6 faces, you need to include all 6.</p> <ul style="list-style-type: none"><li>• <b>Surface area of cuboid</b> Front = <math>5 \times 3 = 15</math> Back = <math>5 \times 3 = 15</math> Top = <math>5 \times 2 = 10</math> Bottom = <math>5 \times 2 = 10</math> Side = <math>3 \times 2 = 6</math> Side = <math>3 \times 2 = 6</math> Total Surface Area = <math>62\text{cm}^2</math></li></ul>
<p>G3.6</p> <p>Calculate the volume of a cuboid</p> <p>E.g. Calculate the volume of this cuboid.</p> 	<p><b>Volume</b> is the amount of space a 3D shape takes up.</p> <ul style="list-style-type: none"><li>• <b>Volume of cuboid</b> <math>\text{Volume} = l \times w \times h</math> <math>= 5 \times 3 \times 2</math> <math>= 30\text{cm}^3</math></li></ul> 	<p>G3.8</p> <p>Recognise the net of a cylinder</p> <p>E.g. What 3D shape does this net form?</p> 	<p>A cylinder.</p> 

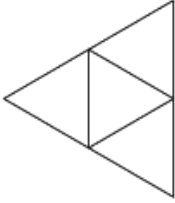
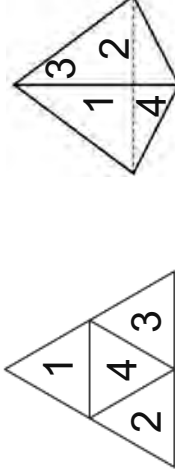
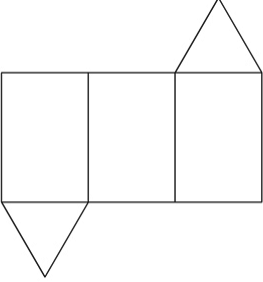
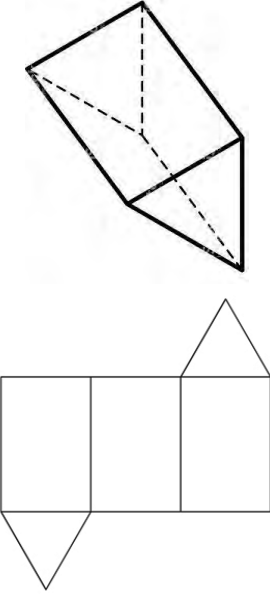
## G3: 3D Shapes


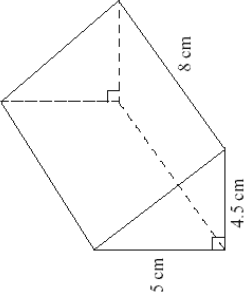
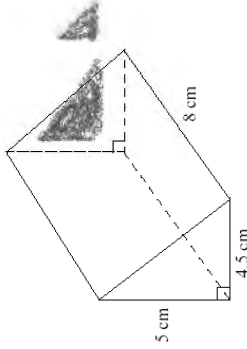
### Recognise the net of a tetrahedron

### Recognise the net of prisms

### Calculate the volume of a prism

### Calculate the volume of a prism

<p>G3.9 Recognise the net of a tetrahedron</p> <p>E.g. What 3D shape does this net create?</p> 	<p><b>A Tetrahedron.</b> also known as a triangular pyramid, is a polyhedron composed of four triangular faces, six straight edges, and four vertex corners.</p> 
<p>G3.10 Recognise the net of prisms</p> <p>E.g. What 3D Shape would this net form?</p> 	<p>A Triangular Prism. A triangular prism is a prism composed of two triangular bases and three rectangular sides.</p> 

<p>G3.11 Calculate the volume of a prism</p> <p>E.g. What is the formula for working out the volume of any prism?</p>	<p>To find the volume of any prism, calculate the area of the cross-section and multiply by the length.</p> <p>Volume = Area of cross-section x length</p> <p>With any prism there is a shape which is repeated throughout the length - this is the cross section.</p> 
<p>G3.12 Calculate the volume of a prism</p> <p>E.g. Calculate the volume of this Triangular Prism</p> 	<p>Volume = Area of cross-section x length</p> <p>Area of cross section</p> $= \frac{5 \times 4.5}{2} = 11.25 \text{ cm}^2$ <p>Volume =</p> $11.25 \times 8 = 90 \text{ cm}^3$ 

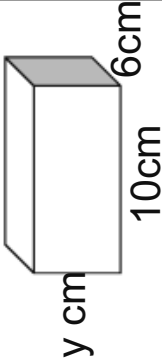

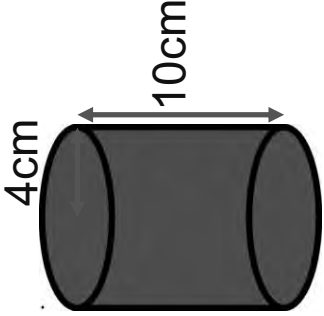
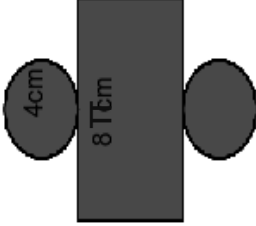
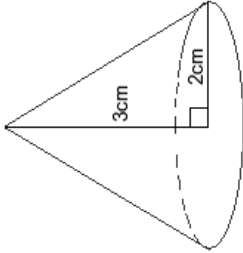
G3: 3D Shapes

Calculate missing sides from volume

Use the formula for volume of a sphere

Calculate the surface area of a cylinder

Use the formula for the volume of a cone

<p>G3.13</p> <p>Calculate missing sides from volumes</p> <p>E.g. The volume of this cube is 420cm<sup>3</sup>. What is the length the missing side?</p> 	<p>Volume of a cuboid = Length x Height x Width</p> <p>420 = 10 x 6 x y</p> <p>420 = 60y</p> <p>Y = 7cm</p>	<p>G3.15</p> <p>Use the formula for volume of a sphere</p> <p>E.g. Calculate the volume of this sphere to one decimal place.</p> 	<p>Volume of sphere = <math>\frac{4}{3} \pi r^3</math></p> <p><math>= \frac{4}{3} \times \pi \times 4^3</math></p> <p><math>= \frac{4}{3} \times \pi \times 4^3</math></p> <p><math>\frac{256\pi}{3} = 85.3\text{cm}^3</math></p>
<p>G3.14</p> <p>Calculate the surface area of a cylinder</p> <p>E.g. Calculate the surface area of this cylinder.</p> 	 <p>Circle = 4<sup>2</sup> x π</p> <p>10cm x Circle = 32π</p> <p>Rectangle = 8π x 10 = 80π</p> <p>Total Surface area = 32π + 80π = 112πcm<sup>2</sup> (351.86cm<sup>2</sup>)</p> <p>Length of the rectangle = the circumference of the circle.</p> <p>C= πd</p> <p>= 8 π</p>	<p>G3.16</p> <p>Use the formula for the volume of a cone</p> <p>E.g. Calculate the volume of this cone to one decimal place.</p> 	<p>Volume = <math>\frac{1}{3} \pi r^2 h</math></p> <p><math>v = \frac{1}{3} \times \pi \times 2^2 \times 3</math></p> <p><math>v = 4\pi</math></p> <p><math>v = 12.6\text{cm}^3</math></p>

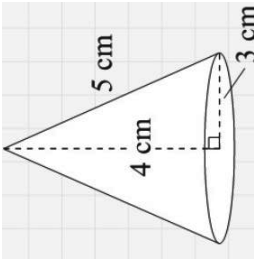
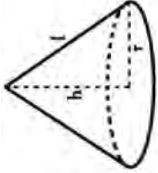
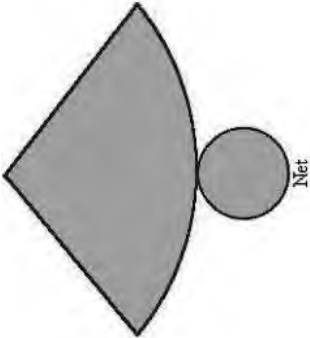
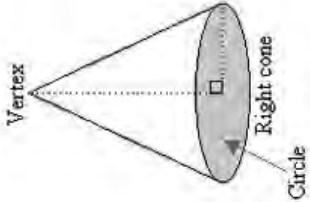
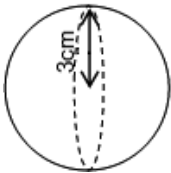
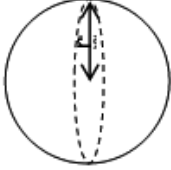


# G3: 3D Shapes

Use the formula for curved surface area of a cone

Use the formula to find the surface area of a sphere

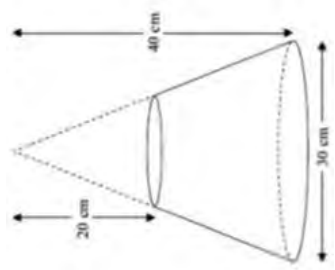
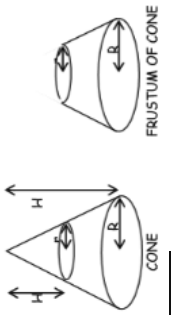
Recognise the net of a cone

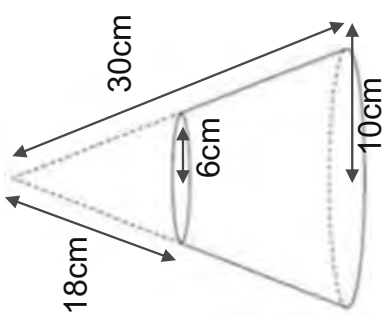
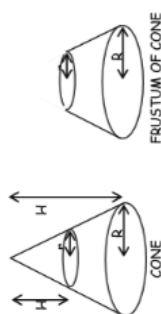
<p>G3.17</p> <p>Use the formula for curved surface area of a cone</p> <p>E.g. Work out the area of the curved surface of this cone. Leave in terms of pi.</p> 	<p>The area of the curved (lateral) surface of a cone</p> $= \pi r l$ <p>Where,</p> <p><math>r</math> is the radius</p> <p><math>h</math> is the height</p> <p><math>l</math> is the slant height</p>  $SA = \pi r l$ $= \pi \times 3 \times 5$ $= 15\pi$	<p>G3.19</p> <p>Recognise the net of a cone</p> <p>E.g. What 3D shape does this net create?</p> 	<p>A Cone.</p>  <p>The net of a cone consists of the following two parts:</p> <ul style="list-style-type: none"> <li>• a <u>circle</u> that gives the base, and</li> <li>• a <u>sector</u> that gives the curved surface</li> </ul>
<p>G3.18</p> <p>Use the formula to find the surface area of a sphere</p> <p>E.g. Calculate the surface area of this sphere. Leave your answer in terms of pi.</p> 	<p>Curved surface area of a sphere = <math>4\pi r^2</math></p> $SA = 4\pi r^2$ $= 4 \times \pi \times 3^2$ $= 4 \times \pi \times 9$ $= 36\pi$ 		

## G3: 3D Shapes

### Calculate the volume of a frustum

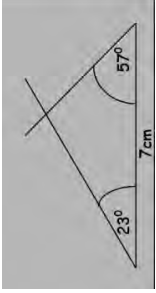
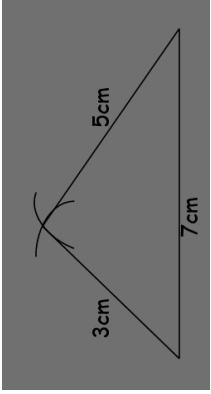
### Calculate the curved surface area of a frustum

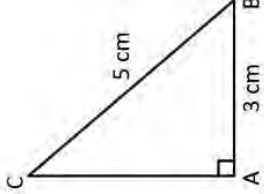
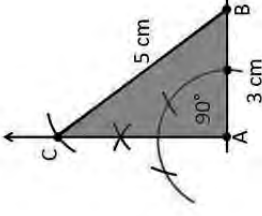
<p>G3.20</p> <p>Calculate the volume of a frustum</p> <p>E.g. Below is the frustum of a cone.</p> <p>The height of the small cone is 20cm.</p> <p>The height of the large cone is 40cm.</p> <p>The diameter of the base of the large cone is 30cm.</p> <p>Work out the volume of the frustum. Leave your answer correct to 3.s.f.</p> 	<p>A frustum is a cone that has had a smaller cone removed from the top</p>  <p>Volume of a Cone = <math>\frac{\pi r^2 \times h}{3}</math></p> <p>Radius is half of diameter</p> <p>Large cone = <math>\frac{\pi 15^2 \times 40}{3}</math></p> <p>= 3000<math>\pi</math></p> <p>To find the radius of the small cone we have to remember it is in proportion. The height goes from 40cm to 20cm ..It has halved.</p> <p>So we can half the radius too.</p> <p>Small cone = <math>\frac{\pi 7.5^2 \times 20}{3}</math></p> <p>= 375<math>\pi</math></p> <p>Large cone - small cone = 2625 <math>\pi</math></p> <p>= 8250cm<sup>3</sup></p>
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<p>G3.21</p> <p>Calculate the curved surface area of a frustum</p> <p>E.g. Work out the curved surface area of the frustum of the cone below. Leave your answer in terms of pi.</p> 	<p>A frustum is a cone that has had a smaller cone removed from the top</p>  <p>So we want to find the curved surface area of the large cone and take away the curved surface area of the small cone.</p> <p>Curved surface area of a cone = <math>\pi r l</math> Where <math>l</math> is the slanted height of the cone.</p> <p>Large cone = <math>\pi \times 10 \times 30</math> = 300<math>\pi</math></p> <p>Small cone = <math>\pi \times 6 \times 18</math> = 108<math>\pi</math></p> <p>Total surface area of the frustum = large cone - small cone 300<math>\pi</math> - 108<math>\pi</math> = 192<math>\pi</math></p>
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## G4: Constructions and Loci

- Construct a triangle given two angles and a side
- Construct a triangle given two sides and an angle
- Construct a triangle given all three sides
- Construct a right angled triangle given the hypotenuse

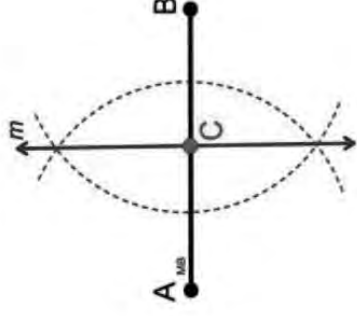
G4.1 Construct a triangle given two angles and a side (ASA)	<p>Measure out the base using a ruler Use a protractor to construct the angles Leave construction lines</p> 
G4.2 Construct a triangle given two sides and an angle (SAS)	<p>Draw the base using a ruler Use a protractor and draw in the angle Measure second side using a ruler and draw it in. Complete the triangle</p>
G4.3 Construct a triangle given all three sides (SSS)	 <p>Use a compass and leave the arcs.</p>

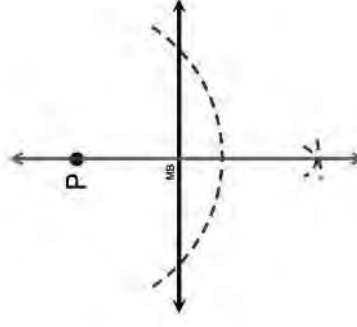
G4.4 Construct a right angled triangle given the hypotenuse	<p><b>Example:</b></p>  <p>Draw line segment of 3cm to form the base Construct a perpendicular bisector from A Using a compass construct an arc from B, crossing the perpendicular bisector at C Draw in the sides of your triangle, leaving the construction marks.</p> 
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## G4: Constructions and Loci

Construct a perpendicular bisector

Construct a perpendicular bisector from a point to a line

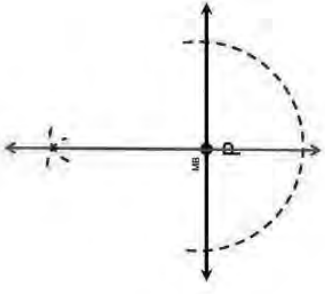
<p>G4.5 Construct a perpendicular bisector</p>	<p>Using a compass construct arcs from points A &amp; B. Make sure the distance between your pencil and the compass point is the same for both. Complete your bisection by drawing a line through the intersecting points of the two arcs, going through C on the diagram</p> 
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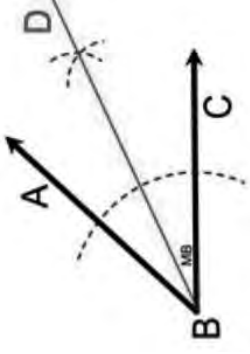
<p>G4.6 Construct a perpendicular bisector from a point to a line segment</p>	<p>Using a compass construct a semicircle below the line segment, placing your compass point at P. Construct a perpendicular as you did before, using the points where the semicircle crosses the line segment as point A &amp; B as in the example given in G4.5</p> 
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## G4: Constructions and Loci

Construct a perpendicular bisector through a point on a line segment

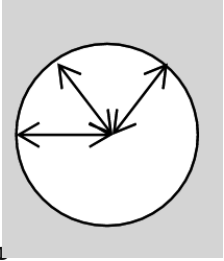
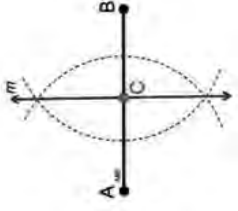
Construct an angle bisector

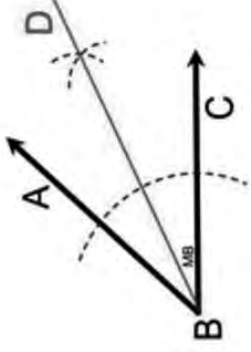
<p>G4.7 Construct a perpendicular bisector through a point on a line segment</p>	<p>Using a compass construct a semicircle below the line segment, placing your compass point at P.</p> <p>Construct a perpendicular as you did before, using the points where the semicircle crosses the line segment as point A &amp; B as in the example given in G4.5</p> 
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<p>G4.8 Construct an angle bisector</p>	<p>Using a compass construct an arc from B, passing through both AB and BC.</p> <p>Draw an arc, placing the compass point at the intersection on AB. Repeat for the intersection on BC.</p> <p>The arcs will intersect at D.</p> <p>Draw a line segment through D to B as shown in the diagram.</p> 
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## G4: Constructions and Loci



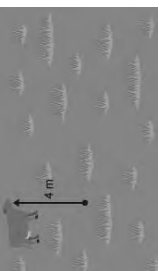
- Draw a locus of points a given distance from a point (circle)
- Draw a locus of points equidistant from two points
- Draw a locus of points equidistant from two lines

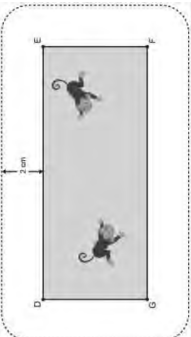
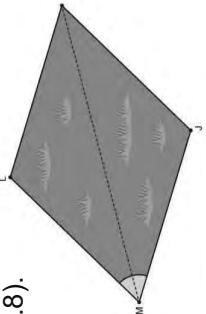
<p>G4.9 Draw a locus of points a given distance from a point (circle)</p>	<p>A <b>locus</b> is the path or region a point covers as it moves according to a rule.</p> <p>A series of points a fixed distance (equidistant) from a point is a circle</p> 
<p>G4.10 Draw a locus of points equidistant from two points</p>	<p>The locus of points equidistant from two points is a perpendicular bisector (see G4.5, G4.6, G4.7)</p> 

<p>G4.11 Draw a locus of points equidistant from two lines</p>	<p>The locus of points equidistant from two intersecting lines is an angle bisector (see G4.8)</p> 	
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G4: Constructions and Loci

Apply loci techniques to more complex problems


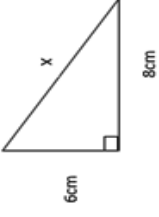
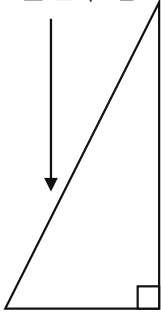
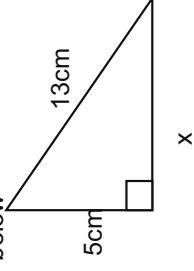
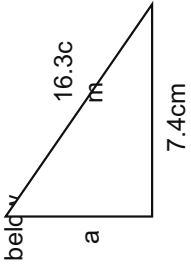
<p>G4.12 Apply loci techniques to more complex loci problems</p>	<p>Some <b>examples</b> of more complex loci problems. Remember that loci is the plural of locus.</p> <p>The runner is following a path. The path is a locus.</p>  <p>The hands of a clock move around the clock and create a locus.</p>  <p>A cow is tied to a post by a 4m length of rope. The area of grass she can reach is a locus.</p> 
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<p>G4.12 Apply loci techniques to more complex loci problems</p>	<p>Some <b>examples</b> of more complex loci problems. Remember that loci is the plural of locus.</p> <p>Visitors must stand 2m away from the walls of a monkey enclosure. The diagram shows where visitors may stand.</p>  <p>The path is equidistant between the edges of the field, MJ and ML.</p> <p>The locus is an angle bisector (G4.8).</p> 
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# G5: Pythagoras and Trigonometry

Use Pythagoras' theorem to find a missing side

Use Pythagoras' theorem to calculate a missing side

<p>G5.1 Use Pythagoras' theorem to find a missing hypotenuse</p> <p>e.g</p> <p>Find a in the triangle below</p>  <p>e.g</p> <p>Find x in the triangle below</p> 	<p>The hypotenuse DOESN'T touch the right angle</p>  <p>If you are finding the hypotenuse, square the two shorter sides, add them together and square root the number you get</p> <p>e.g</p> $3^2 + 4^2 = a^2$ $9 + 16 = a^2$ $\sqrt{25} = a$ $5 = a$ <p>e.g</p> $6^2 + 8^2 = x^2$ $36 + 100 = x^2$ $\sqrt{136} = x$ $11.7 = x$	<p>G5.2 Use Pythagoras' theorem to calculate a missing side</p> <p>e.g</p> <p>Find x in the triangle below</p>  <p>e.g</p> <p>Find a in the triangle below</p> 	<p>If you are finding one of the two shorter sides (not the hypotenuse), square the two sides you have, subtract the shorter from the longer and square root the answer</p> <p>e.g</p> $5^2 + x^2 = 13^2$ $x^2 = 13^2 - 5^2$ $x^2 = 169 - 25$ $x = \sqrt{144}$ $x = 12$ <p>e.g</p> $7.4^2 + a^2 = 16.3^2$ $a^2 = 16.3^2 - 7.4^2$ $a^2 = 265.69 - 54.76$ $a = \sqrt{210.93}$ $a = 14.5 \text{ 1dp}$
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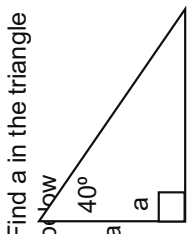
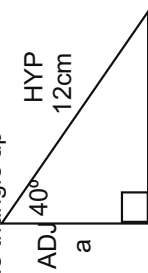
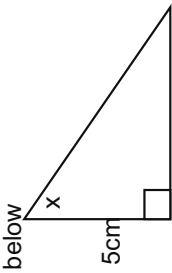
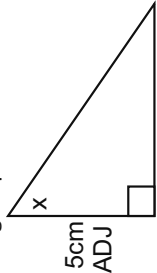
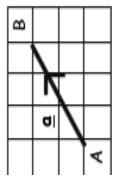


## G5: Pythagoras and Trigonometry

Use trigonometry for right angle triangles to find a missing side

Use trigonometry for right angle triangles to find missing angles

Use vector column notation

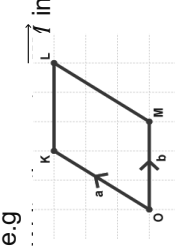
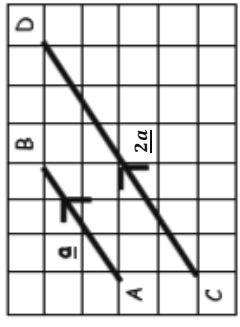
<p>G5.3 Use Trigonometry for right angled triangles to find a missing side</p> <p>e.g</p>  <p>Find a in the triangle below</p> <p>Remember SOHCAHTOA.</p> <p>Label the sides of the triangle you have with Opposite, Adjacent or Hypotenuse.</p> <p>Choose the correct trigonometric ratio to use. Substitute into the relevant formula and solve the equation</p> <p>e.g</p> <p>Label the triangle up</p>  <p>We have adj and hyp so use Cosine</p> $\cos(40) = \frac{a}{12}$ $12 \times \cos(40) = a$ $9.19cm = a$	<p>G5.4 Use Trigonometry for right angled triangles to find missing angles</p> <p>e.g</p>  <p>Find x in the triangle below</p> <p>Remember SOHCAHTOA</p> <p>Label the sides of the triangle you have with Opposite, Adjacent or Hypotenuse.</p> <p>Choose the correct trigonometric ratio to use. Substitute into the relevant formula and solve the equation using inverse functions</p> <p>e.g</p> <p>Label the triangle up</p>  <p>We have opp and adj so use Tan</p> $\tan(x) = \frac{13}{5}$ $x = \tan^{-1}\left(\frac{13}{5}\right)$ $x = 69.0^\circ$	<p>G5.5 Use Vector column notation</p> <p>e.g</p> <p>Give the vector that represents a</p>  <p>In your vector the top value indicates spaces right or left (+ means right, - means left) and the bottom value means up or down (+ means up, - means down)</p> <p>e.g</p> <p>Moves 3 spaces right and 2 spaces up so vector is <math>\begin{pmatrix} 3 \\ 2 \end{pmatrix}</math></p>
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## G5: Pythagoras and Trigonometry

Add and subtract two column vectors

Use unknown vector notation

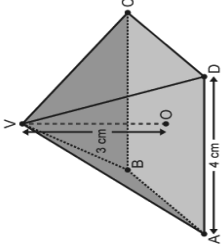
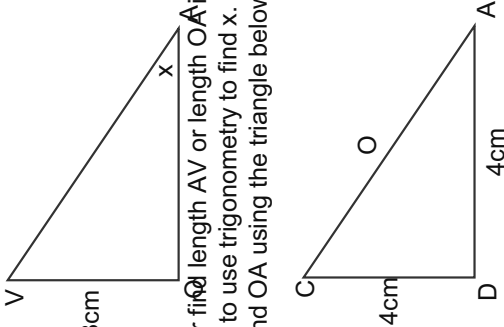
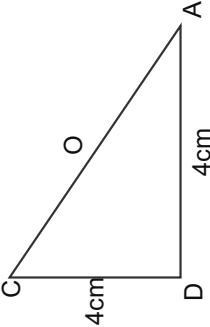
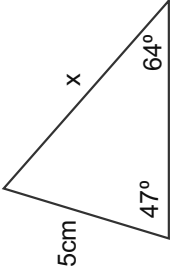
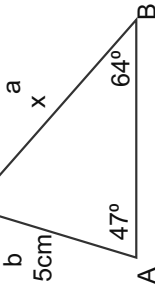
Know how to show two vectors are parallel

<p>G5.6 Add and Subtract two column vectors</p> <p>e.g If <math>a = \begin{pmatrix} 4 \\ 7 \end{pmatrix}</math> and <math>b = \begin{pmatrix} 2 \\ -3 \end{pmatrix}</math> calculate <math>a + b</math></p> <p><math>a - b</math></p>	<p>Vectors must have the same number of elements in them to be added or subtracted from each other. Match up each corresponding element and do the required calculation</p> <p>e.g</p> $a + b \text{ gives } \begin{pmatrix} 4 \\ 7 \end{pmatrix} + \begin{pmatrix} 2 \\ -3 \end{pmatrix} = \begin{pmatrix} 4+2 \\ 7+(-3) \end{pmatrix} = \begin{pmatrix} 6 \\ 4 \end{pmatrix}$ $a - b \text{ gives } \begin{pmatrix} 4 \\ 7 \end{pmatrix} - \begin{pmatrix} 2 \\ -3 \end{pmatrix} = \begin{pmatrix} 4-2 \\ 7-(-3) \end{pmatrix} = \begin{pmatrix} 2 \\ 10 \end{pmatrix}$
<p>G5.7 and 5.8 Use unknown vector notation</p> <p>e.g</p> 	<p>Vectors are often represented simply using letters rather than numbers. These can be added and subtracted to find expressions for other unknown vectors</p> <p>e.g</p> $\overrightarrow{KM} = \overrightarrow{KO} + \overrightarrow{OM}$ $\overrightarrow{KO} = -a \text{ and } \overrightarrow{OM} = b$ <p>So <math>\overrightarrow{KM} = -a + b</math> or <math>b - a</math></p>
<p>G5.9 Know how to show two vectors are parallel</p>	<p>If two vectors are parallel one will be a multiple of the other</p> <p>e.g</p>  <p><math>\overrightarrow{AB} = a</math> and <math>\overrightarrow{CD} = 2a</math> as <math>2a</math> is a multiple of <math>a</math> <math>\overrightarrow{AB}</math> and <math>\overrightarrow{CD}</math> ARE parallel</p>

## G5: Pythagoras and Trigonometry

Use Pythagoras and trigonometry in 3D

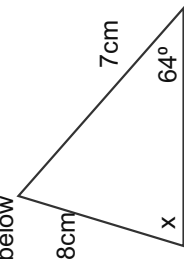
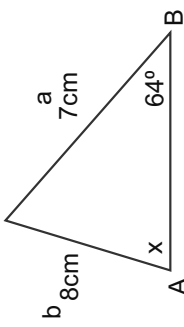
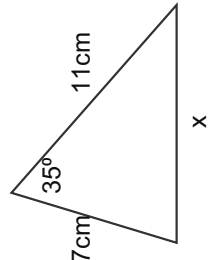
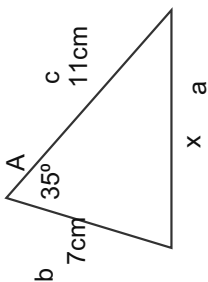
Use the sine rule to find a missing side

<p>G5.10 and G5.11 Use Pythagoras and Trigonometry in 3D</p> <p>e.g ABCDV is a square based pyramid. O is the <b>midpoint</b> of the square base ABCD. Lengths AD, DC, BC and AB are all 4 cm. The <b>perpendicular</b> height of the pyramid (OV) is 3 cm.</p> <p>Find the angle between AV and the plane ABCD</p> 	<p>Draw out 2D triangles that represent the lengths or angles that you are trying to calculate and apply Pythagoras and/or trigonometry as you would in a 2D shape e.g: The angle between AV and ABCD is represented by the triangle below</p>  <p>Either find length AV or length OA in order to use trigonometry to find x. We will find OA using the triangle below</p>  <p>Using Pythagoras' theorem from 5.1 AC is 5.66cm. As O is the midpoint of this line OA is 2.83cm. Use trigonometry to find an angle from section 5.4 on the top triangle the angle is 46.7°</p>	<p>G5.12 Use the sine rule to find a missing side</p> <p>e.g Find the missing side in the triangle below</p> 	<p>In order to find a missing side using Sine rule label the side you are trying to find as a and the angle that is opposite that as A. Then label the other side you know as b and the angle opposite that as B. Following that substitute into the below formula and solve for a</p> $\frac{a}{\sin(A)} = \frac{b}{\sin(B)}$ <p>e.g</p> <p>First relabel the triangle using the instructions from above</p>  <p>Then substitute into the formula and solve</p> $\frac{x}{\sin(47)} = \frac{5}{\sin(64)}$ <p>Multiply both sides by sin 47</p> $x = \frac{5 \times \sin(47)}{\sin(64)}$ $x = 4.07 \text{ cm}$
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## G5: Pythagoras and Trigonometry

Use the sine rule to find a missing angle

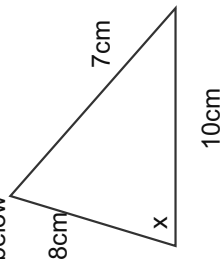
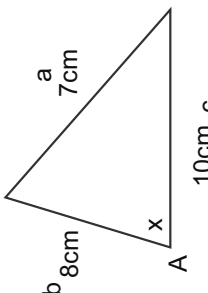
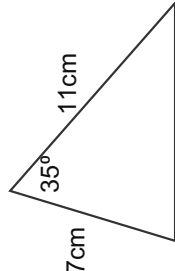
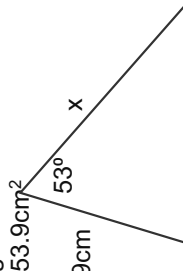
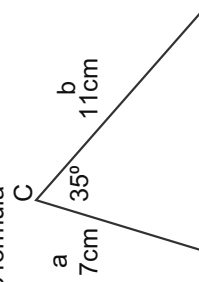
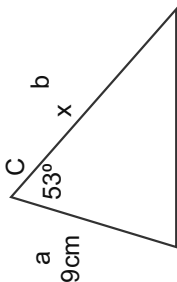
Use cosine rule to find a missing side

<p>G5.13 Use the sine rule to find a missing angle</p> <p>e.g</p>  <p>Find the missing angle in the triangle below</p>	<p>In order to find a missing angle using Sine rule label the angle you are trying to find as A and the side that is opposite that as a. Then label the other angle you know as B and the side opposite that as b.</p> <p>Following that substitute into the below formula and solve for A</p> $\frac{\sin(A)}{a} = \frac{\sin(B)}{b}$ <p>e.g</p> <p>First relabel the triangle using the instructions from above</p>  <p>Then substitute into the formula and solve</p> $\frac{\sin(x)}{7} = \frac{\sin(64)}{8}$ <p>Multiply both sides by 7</p> $\sin(x) = \frac{7 \times \sin(64)}{8}$ <p>Take <math>\sin^{-1}</math></p> $x = 51.9^\circ$
<p>G5.14 Use the cosine rule to find a missing side</p> <p>e.g</p> <p>Find the missing side in the triangle below</p> 	<p>In order to find a missing side using Cosine rule label the side you are trying to find as a and the angle that is opposite that as A. Then label the other two sides you know as b and c (it doesn't matter which is which). Following that substitute into the below formula and solve for a</p> $a^2 = b^2 + c^2 - 2bc\cos(A)$ <p>e.g</p> <p>First relabel the triangle using the instructions from above</p>  <p>Then substitute into the formula and solve</p> $x^2 = 7^2 + 11^2 - 2 \times 7 \times 11 \times \cos(35)$ <p>Square root both sides</p> $x = \sqrt{43.85}$ $x = 6.62\text{cm}$

## G5: Pythagoras and Trigonometry

Use the cosine rule to find a missing angle

Find the area of a triangle of unknown height or find a side or angle when given the area of a triangle

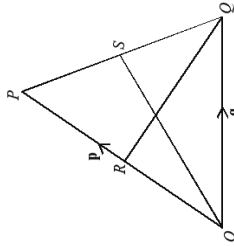
<p>G5.15 Use the cosine rule to find a missing angle</p> <p>e.g Find the missing angle in the triangle below</p> 	<p>In order to find a missing angle using Sine rule label the angle you are trying to find as A and the side that is opposite that as a. Then label the other two sides you know as b and c (it doesn't matter which is which.) Following that substitute into the below formula and solve for A</p> $\cos(A) = \frac{b^2 + c^2 - a^2}{2bc}$ <p>e.g</p> <p>First relabel the triangle using the instructions from above</p>  <p>Then substitute into the formula and solve</p> $\cos(A) = \frac{8^2 + 10^2 - 7^2}{2 \times 8 \times 10}$ <p>Take <math>\cos^{-1}</math></p> $x = 44.0^\circ$
<p>G5.16 and G5.17 Find the area of a triangle of unknown height or find a side or angle when given the area of a triangle e.g Find the area of the triangle below</p>  <p>e.g Find the length of the unknown side given the area is <math>53.9\text{cm}^2</math></p> 	<p>The formula for finding the area of a non- right angled triangle is <math>\text{Area} = \frac{1}{2}ab\sin(C)</math> where a and b are known sides and C is a known included angle.</p> <p>e.g Label up the triangle and substitute into the formula</p>  $\text{Area} = \frac{1}{2} \times 7 \times 11 \times \sin(35)$ $\text{Area} = 22.1\text{cm}$ <p>e.g Label up the triangle as previously</p>  <p>Substitute into formula and solve for x using inverse functions</p> $53.9 = \frac{1}{2} \times 9 \times x \times \sin(53)$ $x = 15.0\text{cm}$

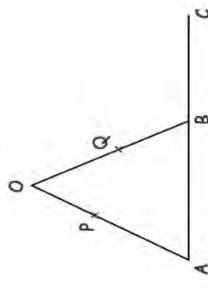
## G5: Pythagoras and Trigonometry

Calculate the length of a vector

Prove that two vectors are parallel

Prove that two vectors are co-linear

<p>G5.18 Calculate the length of a vector</p> <p>e.g Find the length of the vector <math>\begin{pmatrix} 3 \\ -4 \end{pmatrix}</math></p>	<p>To calculate the length of a vector you use a simplified version of pythagoras' theorem. For a vector <math>\begin{pmatrix} x \\ y \end{pmatrix}</math> you calculate <math>\sqrt{x^2 + y^2}</math> to find the length</p> <p>e.g <math>\sqrt{3^2 + -4^2}</math></p> <p><i>vector length = 5 units</i></p>
<p>G5.19 Prove that two vectors are parallel</p> <p>e.g</p> <p>OPQ is a triangle</p> <p><math>\overrightarrow{OQ} = q</math> and <math>\overrightarrow{OR} = p</math></p> <p>R is the midpoint of <math>\overrightarrow{OP}</math> and S is the midpoint of <math>\overrightarrow{PQ}</math></p> <p>Prove that <math>\overrightarrow{RS}</math> and <math>\overrightarrow{OQ}</math> are parallel</p> 	<p>Use the skills built in G5.7/G5.8 and G5.9 to prove that two unknown vectors are parallel. Firstly by using vector notation to combine the vectors you require then showing that they are multiples of each other</p> <p>e.g</p> <p>For <math>\overrightarrow{RS}</math> to be parallel to <math>\overrightarrow{OQ}</math> it will need to be a multiple of q</p> <p><math>\overrightarrow{PQ} = \overrightarrow{PO} + \overrightarrow{OQ} = q - p</math></p> <p><math>\overrightarrow{RS} = \overrightarrow{RP} + \overrightarrow{PS} = q - p</math></p> <p>of <math>\overrightarrow{OP}</math> and S is the midpoint of <math>\overrightarrow{PQ}</math> then <math>\overrightarrow{RP} = \frac{p}{2}</math> and <math>\overrightarrow{PS} = \frac{q-p}{2}</math></p> <p>That means that <math>\overrightarrow{RS} = \frac{p}{2} + \frac{q-p}{2} = \frac{q}{2}</math></p> <p>Therefore <math>\overrightarrow{OQ} = \frac{\overrightarrow{RS}}{2}</math> so <math>\overrightarrow{RS}</math> and <math>\overrightarrow{OQ}</math> are parallel</p>

<p>G5.20 Prove that two vectors are co-linear (lie in a straight line)</p> <p>e.g</p> <p>AOB is a triangle</p> <p>P is a point on <math>\overrightarrow{AO}</math></p> <p><math>\overrightarrow{AB} = 2a</math>, <math>\overrightarrow{AO} = 6b</math> and <math>\overrightarrow{AP} : \overrightarrow{PO} = 2:1</math></p> <p>B is the midpoint of <math>\overrightarrow{AC}</math></p> <p>Q is the midpoint of <math>\overrightarrow{OB}</math></p> <p>Prove that PQC is a straight line</p>	<p>To prove that two vectors are co-linear, or make a straight line you need to prove that two vectors are parallel as in G5.19 but also that they both go through a common point</p> <p>e.g</p> <p>To prove that PQC is a straight line we will show that <math>\overrightarrow{PQ}</math> and <math>\overrightarrow{PC}</math> are parallel and as they both go through P they will make a straight line</p> <p><math>\overrightarrow{OB} = \overrightarrow{OA} + \overrightarrow{AB} = 2a - 6b</math></p> <p><math>\overrightarrow{PQ} = \overrightarrow{PO} + \overrightarrow{OQ}</math> where <math>\overrightarrow{PO} = \frac{\overrightarrow{AO}}{3} = 2b</math> and <math>\overrightarrow{OQ} = \frac{\overrightarrow{OB}}{2} = \frac{2a-6b}{2} = a - 3b</math></p> <p>Therefore <math>\overrightarrow{PQ} = 2b + a - 3b = a - b</math></p>
	<p><math>\overrightarrow{PC} = \overrightarrow{PA} + \overrightarrow{AC}</math> where</p> <p><math>\overrightarrow{PA} = -\frac{2\overrightarrow{AO}}{3} = -4b</math> and <math>\overrightarrow{AC} = 2\overrightarrow{AB} = 4a</math></p> <p>Therefore <math>\overrightarrow{PC} = -4b + 4a</math> or <math>4a - 4b</math></p> <p>That means that <math>\overrightarrow{PC} = 4\overrightarrow{PQ}</math> which proves that these two vectors are parallel. As they also both go through the common point P that proves that PQC is a straight line</p>

N1: Calculating with Numbers

- Understand the use of place value
- Multiply by a two digit number
- Multiply by 10, 100, 1000 etc,
- Divide by a one digit number

N1.1 Understand the use of place value e.g. What value is the 6 in the number 6700	Th H T U. 6 7 0 0  The '6' is in the thousands column. Therefore the value of the 6 is six thousand.												
N1.2 Multiply by a two-digit number e.g. 152 x 34	<p>Draw a grid.</p> <p>Write the hundreds, tens and units across the top.</p> <p>Write the tens and units down the side.</p> <p>Multiply each number together.</p> <p>Add all the numbers from inside the box.</p> <table><tr><td></td><td>100</td><td>50</td><td>2</td></tr><tr><td>30</td><td>3000</td><td>1500</td><td>60</td></tr><tr><td>4</td><td>400</td><td>200</td><td>8</td></tr></table> <p>152 x 34 = 3400 + 1700 + 68 = <u>5168</u></p>		100	50	2	30	3000	1500	60	4	400	200	8
	100	50	2										
30	3000	1500	60										
4	400	200	8										

N1.3 Multiply by 10, 100, 1000 etc.  e.g. 3.52 x 10 3.52 x 100 3.52 x 1000	<p>To multiply by powers of ten, move all the digits to the left by the same number of places as the power</p> <p>3.52 x 10 = 35.2 (move 1 place) 3.52 x 100 = 352 (move 2 places) 3.52 x 1000 = 3520 (move 3 places)</p> <p>Draw a bus stop.</p> <p>The number you divide by goes on the outside.</p> <p>Divide the number into the first number underneath.</p> <p>If it does not go, write 0 on top and carry the number underneath.</p> <p>Divide into the next number.</p> <div><div>2252</div><div>3</div><div>7556</div><div>-6</div><div>15</div><div>15</div><div>06</div></div> <p>e.g. 756 ÷ 3 = 252</p>
N1.4 Divide by a one-digit number  e.g. 756 ÷ 3	

N1: Calculating with Numbers

- Divide by a two digit number
- Use BIDMAS to order operations
- Add and subtract decimals
- Multiply decimals

<p>N1.5</p> <p>Divide by a two-digit number</p> <p>e.g. <math>4928 \div 32</math></p>	<p>Draw a bus stop.</p> <p>The number you divide by goes on the outside.</p> <p>Divide the number into the first number underneath.</p> <p>If it does not go, write 0 on top and carry the number underneath.</p> <p>Divide into the next number.</p> <div><div>32</div><div><div>0154</div><div><div>4928</div><div><div>-32</div><div>172</div><div>-160</div><div>128</div><div>-128</div><div>0</div></div></div></div></div> <p><math>4928 \div 32 = 154</math></p>
<p>N1.6</p> <p>Use BIDMAS to order operations</p> <p>e.g. <math>3 + 4 \times 6 - 5</math></p>	<div><div>Bracket</div><div>Indices</div><div>Divide</div><div>Multiply</div><div>Add</div><div>Subtract</div></div> <div><div>Do these in the order they appear</div><div>Do these in the order they appear</div></div> <p>e.g. <math>3 + 4 \times 6 - 5 = 22</math></p> <p>first</p>

<p>N1.7</p> <p>Add and subtract decimals</p> <p>e.g. <math>4.32 + 5.6</math></p>	<div><div><div>4.32</div><div>+ 5.60</div><div>9.92</div></div><div>Line up the decimal point.</div><div>Fill any blank spaces with 0.</div><div>Add the numbers starting from the right.</div><div><math>4.32 + 5.6 = 9.92</math></div></div>
<p>N1.8</p> <p>Multiply Decimals</p> <p>e.g. <math>2.5 \times 1.1</math></p>	<div><div>Take out the decimal points.</div><div>Multiply as with long multiplication.</div><div>Put the decimal back in.</div><div>e.g. <math>2.5 \times 1.1</math></div><div><math>25 \times 11 = 275</math></div><div>There are 2 decimal places in the question, so the answer is 2.75</div><div><math>2.5 \times 1.1 = 2.75</math></div></div>



# N1: Calculating with Numbers

- Divide by decimals
- Order negative numbers
- Add and subtract negative numbers
- Multiply and divide by negative numbers

<p>N1.9</p> <p>Divide by decimals</p> <p>e.g. <math>2.84 \div 0.2</math></p>	<p>Make the divisor into a whole number.</p> <p>Multiply both numbers.</p> <p>e.g.</p> <p><math>2.84 \div 0.2</math> (multiply both by 10)</p> <p><math>28.4 \div 2</math></p> <p><math>= 14.1</math></p> <p><math>2.84 \div 0.2 = 14.1</math></p>
<p>N1.10</p> <p>Order negative numbers</p> <p>e.g. order the numbers in ascending order:</p> <p>-3, 5, -1, -2, 0</p>	<div> <div>                     </div> <div> -3 -2 -1 0 1 2 3 </div> </div> <p><math>2 &gt; -2 \rightarrow</math> We say 2 is bigger than -2</p> <p><math>-1 &lt; 3 \rightarrow</math> We say -1 is less than 3</p> <p>-3, -2, -1, 0, 5</p>

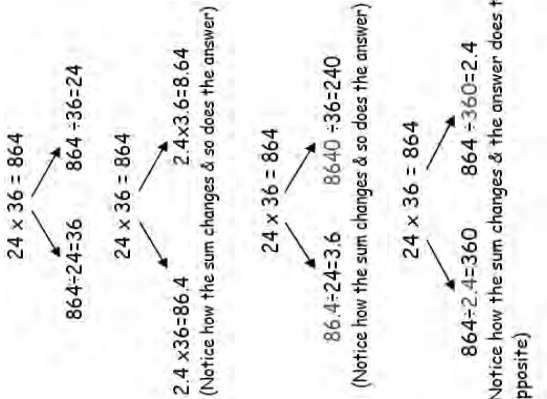
<p>N1.11</p> <p>Add and subtract negative numbers</p> <p>e.g. <math>8 + -2</math></p> <p><math>8 - +2</math></p> <p><math>8 - -2</math></p>	<p>Remember the rules:</p> <ul style="list-style-type: none"> <li>When subtracting go down the number line</li> <li>When adding go up the number line</li> <li><math>8 + - 2</math> is the same as <math>8 - 2 = 6</math></li> <li><math>8 - + 2</math> is the same as <math>8 - 2 = 6</math></li> <li><math>8 - - 2</math> is the same as <math>8 + 2 = 10</math></li> </ul>
<p>N1.12</p> <p>Multiply and divide by negative numbers</p> <p>e.g. <math>-8 \times -2</math></p> <p><math>-8 \div -2</math></p>	<p>When multiplying negatives remember:</p> <p><math>+ \times + = +</math></p> <p><math>+ \times - = -</math></p> <p><math>- \times + = -</math></p> <p><math>- \times - = +</math></p> <p>When dividing negatives remember:</p> <p><math>+ \div + = +</math></p> <p><math>+ \div - = -</math></p> <p><math>- \div + = -</math></p> <p><math>- \div - = +</math></p> <p><math>8 \times -2 = -16</math></p> <p><math>-8 \div -2 = 4</math></p>

## N1: Calculating with Numbers

Use one calculation to work out another

Use a calculator efficiently for simple calculations

Use a calculator efficiently for powers, roots and more complex calculations

<p>N1.13</p> <p>Use one calculation to work out another e.g.  <math>24 \times 36 = 864</math>,            what is <math>2.4 \times 3.6</math>?</p>	
<p>N1.14</p> <p>Use a calculator efficiently for simple calculations</p>	<p>Know your keys</p> <p>Addition: +</p> <p>Subtraction: -</p> <p>Multiply: x</p> <p>Divide: ÷</p> <p>Equals: =</p> <p>Brackets: ()</p>

<p>N1.15</p> <p>Use a calculator efficiently for powers, roots and more complex calculations</p>	<p>Know your keys</p> <p><math>x^2</math> Square key</p> <p><math>x^3</math> Cube key</p> <p><math>x^\square</math> Power key</p> <p><math>\sqrt{\phantom{x}}</math> Square root key</p> <p><math>\sqrt[3]{\phantom{x}}</math> Cube root key</p> <p>(-) Negative key</p> <p><math>\frac{\square}{\square}</math> Fraction key</p>
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## N2: Fractions, Decimals and Percentages

Write equivalent fractions

Simplify a fraction

Add and subtract fractions (same denominator)

Add fractions (different denominators)

Subtract fractions (different denominators)

<p>N2.1 Write equivalent fractions</p> <p>e.g. write equivalent fractions for:</p> $\frac{4}{5}$	<p>To write an equivalent fraction you must multiply the numerator and denominator by the same number.</p> $\frac{4}{5} = \frac{16}{20} \quad (\text{multiply by } 4)$ $\frac{4}{5} = \frac{40}{50} \quad (\text{multiply by } 10)$ $\frac{4}{5} = \frac{8}{10} \quad (\text{multiply by } 2)$
<p>N2.2 Simplify a fraction</p> <p>e.g. simplify:</p> $\frac{8}{12}$ $\frac{15}{40}$	<p>See what number divides exactly into both the numerator and denominator</p> $\text{e.g. } \frac{8}{12} \xrightarrow[\div 4]{\div 4} \frac{2}{3}$ $\text{e.g. } \frac{15}{40} \xrightarrow[\div 5]{\div 5} \frac{3}{8}$

<p>N2.3 Add and subtract fractions ( same denominator)</p> <p>e.g.</p> $\frac{2}{3} + \frac{2}{3}$	<p>Add &amp; subtract with same denominator</p> <p>e.g.</p> $\frac{2}{3} + \frac{2}{3} = \frac{4}{3} = 1\frac{1}{3}$
<p>N2.4 Add fractions (different denominators)</p> <p>e.g.</p> $\frac{1}{5} + \frac{7}{10}$	<p>Make denominators the same then add the numerators</p> <p>e.g.</p> $\frac{1}{5} + \frac{7}{10} = \frac{2}{10} + \frac{7}{10} = \frac{9}{10}$
<p>N2.5 Subtract fractions (different denominators)</p> $\frac{4}{5} - \frac{2}{3}$	<p>Make denominators the same then subtract the numerators</p> $\frac{4}{5} - \frac{2}{3} = \frac{12}{15} - \frac{10}{15} = \frac{2}{15}$

## N2: Fractions, Decimals and Percentages

Multiply fractions

Find a fraction of a quantity

Divide a fraction by a whole number

Order fractions

Convert common fractions, decimals and percentages

<p>N2.6</p> <p>Multiply fractions</p> <p>e.g. <math>\frac{2}{7} \times \frac{2}{3}</math></p>	<p>When multiplying fractions, multiply the numerators and multiply the denominators. Cancel down if possible before or after the calculation.</p> $\frac{2}{7} \times \frac{2}{3} = \frac{4}{21}$
<p>N2.7</p> <p>Find fraction of a quantity</p> <p>e.g. Find <math>\frac{4}{5}</math> of £40</p>	<p><math>\frac{4}{5}</math> means <math>\div 5 \times 4</math>.</p> <p>e.g. To find <math>\frac{4}{5}</math> of £40  <math>\text{£}40 \div 5 \times 4 = \text{£}32</math></p>
<p>N2.8</p> <p>Divide a fraction by a whole number</p> <p>e.g. <math>\frac{2}{7} \div 3</math></p>	<p>Make the whole number a fraction e.g. 3 becomes <math>\frac{3}{1}</math>  Then Keep Change Flip:  Keep first fraction the same  Change <math>\div</math> to <math>\times</math>  Flip the second fraction and calculate <math>\frac{2}{7} \times \frac{1}{3} = \frac{2}{21}</math></p>

<p>N2.9</p> <p>Order fractions</p> <p>e.g. order: <math>\frac{5}{6}, \frac{7}{12}, \frac{2}{3}, \frac{3}{4}</math></p>	<p>Fractions must have the same denominator  They must have the same denominator</p> <p>e.g. <math>\frac{5}{6} \rightarrow \frac{10}{12}</math>, <math>\frac{7}{12} \rightarrow \frac{7}{12}</math>, <math>\frac{2}{3} \rightarrow \frac{8}{12}</math>, <math>\frac{3}{4} \rightarrow \frac{9}{12}</math></p> $\frac{10}{12}, \frac{7}{12}, \frac{8}{12}, \frac{9}{12}$ $\frac{7}{12}, \frac{2}{3}, \frac{3}{4}, \frac{5}{6}$
<p>N2.10</p> <p>Convert common fractions, decimals and percentages</p> <p>e.g. 0.5, 0.25</p>	<p>LEARN THESE</p> <p><math>= 0.25 = 25\% = \frac{1}{4}</math></p> <p><math>= 0.5 = 50\% = \frac{1}{2}</math></p> <p><math>= 0.75 = 75\% = \frac{3}{4}</math></p>

## N2: Fractions, Decimals and Percentages

Order decimals

Find a percentage of a quantity

Converting fractions to decimals

<p>N2.11 Order decimals</p> <p>e.g. order: 0.3, 0.304, 0.32, 0.33</p>	<p>Decimals need the same number of digits</p> <p>Give them all the same number of digits</p> <p>e.g. 0.3, 0.304, 0.32, 0.33</p> <p>↓ ↓ ↓ ↓ ↓</p> <p>0.300 0.304 0.320 0.330</p> <p>Now the decimals can be ordered</p> <p>0.3, 0.304, 0.32, 0.33</p>
<p>N2.12 Find percentage of a quantity</p> <p>e.g. 8% of £240 12.5% of 80kg 80% of 52</p>	<p>e.g. 8% of £240      12½ % of 80kg</p> <p>= 0.08 × 240      = 0.125 × 80</p> <p>= <u>£19.20</u>              = <u>10kg</u></p> <p>80% of 52 litres</p> <p>= 0.8 × 52</p> <p>= <u>41.6 litres</u></p>
<p>N2.13 Converting fraction to decimal</p> <p>e.g.</p> $\frac{4}{5} = \frac{8}{10}$ $\frac{9}{12} = \frac{3}{4} = 0.75$ $\frac{3}{8} = 3 \div 8 = 0.375$	<p>Fractions to decimals - by changing</p> <p>e.g. <math>\frac{4}{5} = \frac{8}{10} = 0.8</math></p> <p>e.g. <math>\frac{9}{12} = \frac{3}{4} = 0.75</math></p> <p>Fractions to decimals - by dividing</p> <p>e.g. <math>\frac{3}{8} = 3 \div 8 = 0.375</math></p>

Convert a decimal to a fraction

Convert from a percentage to a decimal to a fraction

Convert from a decimal to a percentage to a fraction

Convert fractions to decimals to percentages

<p>N2.14 Convert decimal to a fraction</p> <p>e.g. 0.74</p>	<p>To convert see what column the number ends in. In this case the hundredths. Therefore put the number over 100 and simplify.</p> $0.74 = \frac{74}{100} = \frac{37}{50}$
<p>N2.15 Convert from percentage to decimal to fraction</p> <p>e.g. 27%</p> <p>7%</p> <p>70%</p>	<p><math>27\% = 0.27 = \frac{27}{100}</math></p> <p><math>7\% = 0.07 = \frac{7}{100}</math></p> <p><math>70\% = 0.7 = \frac{70}{100} = \frac{7}{10}</math></p>
<p>N2.16 Convert from decimal to percentage to fraction</p> <p>e.g. 0.3</p> <p>0.03</p> <p>0.39</p>	<p><math>0.3 = 30\% = \frac{3}{10}</math></p> <p><math>0.03 = 3\% = \frac{3}{100}</math></p> <p><math>0.39 = 39\% = \frac{39}{100}</math></p>
<p>N2.17 Convert fractions to decimals to percentages</p> <p>e.g.</p> $\frac{4}{5} = \frac{80}{100} = 80\%$ $\frac{3}{8} = 3 \div 8 = 0.375 = 37.5\%$	<p><math>\frac{4}{5} = \frac{80}{100} = 80\% = 0.8</math></p> <p><math>\frac{3}{8} = 3 \div 8 = 0.375 = 37.5\%</math></p>

## N2: Fractions, Decimals and Percentages

Divide fractions

Increase by a percentage

Decrease by a percentage

Order fractions, decimals and percentages

<p>N2.18</p> <p>Divide fractions</p> <p>e.g. <math>\frac{2}{7} \div \frac{2}{3}</math></p>	<p>Invert fraction after ÷</p> <p>Multiply numerator</p> <p>Multiply denominators.</p> <p>Keep Change Flip</p> $\frac{2}{7} \div \frac{2}{3} = \frac{2}{7} \times \frac{3}{2}$ $= \frac{6}{14} = \frac{3}{7}$
<p>N2.19</p> <p>Increase by a percentage</p> <p>e.g. Increase £12 by 5%</p>	<ul style="list-style-type: none"> <li>To increase £12 by 5%            10% of £12 = £1.20            5% of £12 = £0.60 (OR 0.05 x 12 = 0.6)            <i>Increased amount = £12 + £0.60 = £12.60</i> </li> </ul> <p>If using a calculator:</p> <p>Multiplier needed to increase a quantity.</p> <p>To increase a quantity by 5% Multiply the quantity by 1.05 (100 + 5 = 105)</p> <p>12 x 1.05 = £12.60</p>

<p>N2.20</p> <p>Decrease by a percentage.</p> <p>e.g. Decrease £50 by 15%</p>	<ul style="list-style-type: none"> <li>To decrease £50 by 15%            10% of £50 = £5            5% of £50 = £2.50            15% of £50 = £7.50 (OR 0.15 x 50 = 7.5)            <i>Decreased amount = £50 - £7.50 = £42.50</i> </li> </ul> <p>If using a calculator:</p> <p>Multiplier needed to decrease a quantity.</p> <p>To decrease a quantity by 15%. Multiply the quantity by 0.85 (100 - 15)</p> <p>50 x 0.85 = £42.50</p>
<p>N2.21</p> <p>Order Fractions, Decimals, Percentages</p> <p>e.g. Order:</p> <p>0.3, <math>\frac{3}{5}</math>, 40%, 0.56</p>	<p>You need to convert them all to the same form. In this case it is easier to convert all to decimals and then order</p> <p>0.3</p> <p><math>\frac{3}{5} = 0.6</math></p> <p>40% = 0.4</p> <p>0.56</p> <p>Therefore the correct order in ascending order is:</p> <p>0.3, 40%, 0.56, <math>\frac{3}{5}</math></p>

## N2: Fractions, Decimals and Percentages

Change a recurring decimal into a fraction

Prove that a recurring decimal is equal to a fraction

<p>N2.22</p> <p>Change a recurring decimal into a fraction</p> <p>e.g. Convert = <math>0.444444444444</math> into a fraction</p>	<p>Set the recurring decimal = x.</p> <p>Multiply by a power of 10. The power is the same as the number of digits recurring.</p> <p>Subtract the smaller decimal from the larger. This will give an equation.</p> <p>Solve the equation, leaving your answer as a fraction in its simplest terms.</p> <p>Let x = <math>0.444444444444 \dots</math></p> $10x = 4.4444444444 \dots$ $9x = 4$ $x = \frac{4}{9}$
<p>N2.23</p> <p>Prove that a recurring decimal is equal to a fraction</p> <p>e.g. prove that <math>0.44444 = \frac{4}{9}</math></p>	<p>A proof will need every step clearly written.</p> <p>Use the method shown in N2.22.</p>

### N3: Accuracy and Measures

Round to the nearest 1, 10, 100 etc

Round to 1 decimal place.

Round to 1 or more decimal places

Round to 1 significant figure

N3.1 Round to the nearest 1, 10, 100 etc.	Numbers can be <b>rounded to the nearest whole number, the nearest ten, the nearest hundred, the nearest thousand</b> , the <b>nearest million</b> , and so on. If the digit you are <b>rounding</b> is followed by a 5, 6, 7, 8, or 9, <b>round</b> the number up. If the number you are <b>rounding</b> is followed by a 0, 1, 2, 3, or 4, <b>round</b> the number down.								
Round 2548.6 to the nearest 1, 10, 100 & 1000.	<table><tr><td>1</td><td>10</td><td>100</td><td>1000</td></tr><tr><td>2549</td><td>2550</td><td>2500</td><td>3000</td></tr></table>	1	10	100	1000	2549	2550	2500	3000
1	10	100	1000						
2549	2550	2500	3000						
N3.2 Round to 1 decimal place.	Numbers can be <b>rounded to one decimal place</b> . If the digit in the 2nd decimal place is a 5, 6, 7, 8, or 9, <b>round</b> the number up. If it is a 0, 1, 2, 3, or 4, <b>round</b> the number down.								
Round to 1 decimal place: a) 34.64 b) 53.271 c) 102.956	a) 34.6 b) 53.3 c) 103.0								

N3.3 Round to 1 or more decimal places.	<ul style="list-style-type: none"> <li>Look at the digit required</li> <li>Look at the first digit NOT required</li> </ul> <p>e.g. To round 5.47 to 1dp</p> <p>Answer 5.5</p> <p>increase this by 1</p> <p>digit NOT required</p> <p>Is this 5 or more? YES</p> <p>a) 43.57 b) 5.674 c) 4.80</p>
a) Round 43.568 to 2dp. b) Round 5.6741 to 3dp. c) Round 4.7955 to 2dp.	
N3.4 Round to 1 significant figure. The first s.f. is the first non-zero digit from the left.	<p>Look at the first non-zero digit. Look at the next digit. If this next digit is <b>5 or more</b>, increase the previous digit by one If this next digit is <b>4 or less</b>, keep the previous digit the same Replace all the digits after the first non-zero digit with zeros, stopping at the decimal point if there is one.</p> <p>Round to 1 significant figure: a) 289.6 b) 4489 c) 0.000763</p>
	<p>a) 300 b) 4000 c) 0.0008</p>



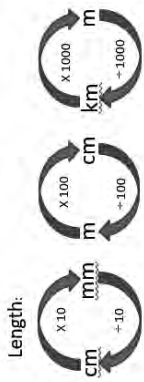
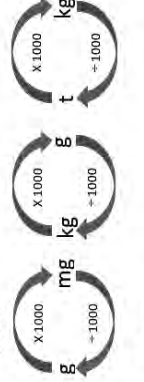
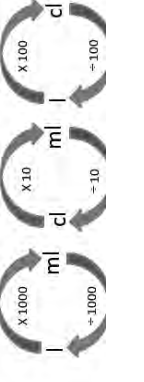
## N3: Accuracy and Measures

Round to 2 or more significant figures

Estimate a calculation using rounding

Calculate with metric units

<p><b>N3.5</b> Round to 2 or more significant figures.</p> <p>a) Round 65590 to 2sf. b) Round 674.82 to 3sf. c) Round 0.01362 to 2sf.</p>	<p>Look at the digit after the first non-zero digit. Look at the next digit. If this next digit is <b>5 or more</b>, increase the previous digit by one. If this next digit is <b>4 or less</b>, keep the previous digit the same. Replace all these other digits with zeros, stopping at the decimal point if there is one</p> <p>a) 66000 b) 675 c) 0.014</p>
<p><b>N3.6</b> Estimate a calculation using rounding.</p> <p>Estimate: a) <math>423 \times 28</math> b) <math>1589 \div 0.473</math></p>	<p>When estimating always round each number to 1 significant figure first.</p> <p>a) <math>400 \times 30 = 12000</math> b) <math>2000 \div 0.5 = 4000</math></p>

<p><b>N3.7</b> Calculate with metric units.</p>	<p>Length:</p>  <p>Mass:</p>  <p>Volume:</p>  <p>Convert :</p> <p>a) 6m to cm b) 7200g to kg c) 34cl to l</p> <p>a) <math>6 \times 100 = 600\text{cm}</math> b) <math>7200 \div 1000 = 7.2 \text{ kg}</math> c) <math>34 \div 100 = 0.34 \text{ l}</math></p>
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## N3: Accuracy and Measures

Calculate with time

Calculate with money

Convert units of time

N3.8 Calculate with time.	<p>For adding time:</p> <ol style="list-style-type: none"> <li>1) Add the hours</li> <li>2) Add the minutes</li> <li>3) If the minutes are 60 or more subtract 60 from the minutes and add 1 hour.</li> </ol> <p>Add the hours, <math>2 + 1 = 3</math>. Add the minutes <math>45 + 20 = 65</math>. The minutes are more than 60, so subtract 60 from the minutes, <math>65 - 60 = 5</math>, and add 1 to the hours, <math>3 + 1 = 4</math>. The answer is 4:05.</p> <p>For subtracting time:</p> <ol style="list-style-type: none"> <li>1) Subtract the hours</li> <li>2) Subtract the minutes</li> <li>3) If the minutes are negative add 60 to the minutes and subtract 1 hour.</li> </ol> <p>Subtract the hours, <math>9 - 3 = 6</math> Subtract the minutes <math>15 - 35 = -20</math> The minutes are negative, so add 60 to the minutes, <math>-20 + 60 = 40</math>, and subtract 1 from the hours, <math>6 - 1 = 5</math>. The answer is 5:40.</p>
What is 2:45 + 1:20?	
What is 9:15 - 3:35?	

N3.9 Calculate with money.	<p>Richard buys a notebook that costs £6.78 and a pen that costs £4.19. Work out the total cost.</p> $\begin{array}{r} 6.78 \\ + 4.19 \\ \hline 10.97 \\ 1 \\ \hline \end{array}$ <p>Total cost = £10.97</p>
N3.10 Convert units of time.	<p>Use the same method of adding numbers that have 2 decimal places.</p> <p>1 century = 100 years 1 decade = 10 years 1 year = 365 days (except leap years) 1 day = 24 hours 1 hour = 60 minutes 1 minute = 60 seconds</p> <p>7 x 24 x 60 x 60 = 604,800 seconds</p>
How many seconds are there in 1 week?	

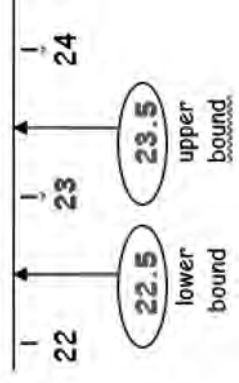
### N3: Accuracy and Measures

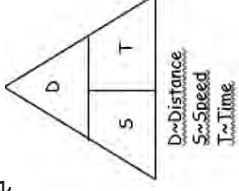
Write the upper bound and lower bound of a number or measurement

State an error interval for a rounded number

State an error interval for a truncated number

Calculate using the compound measure speed

<p>N3.11</p> <p>Write the upper bound and lower bound of a number or measurement</p> <p>What is the lower and upper bound of 23cm if rounded to the nearest centimetre?</p>	<p>Bounds tell us the largest possible value of a number and the smallest possible value.</p> 
<p>N3.12</p> <p>State an error interval for a rounded number</p> <p>The mass <math>m</math> of a table is 45.7kg rounded to 1dp. Write the error interval for this.</p>	<p>Lower and upper bounds can be written as error intervals with the use of inequalities.</p> <p>Look out for the word “rounded” when doing this type of error interval.</p> <p><math>45.65 \leq m &lt; 45.75</math> kg</p>

<p>N3.13</p> <p>State an error interval for a truncated number.</p> <p>The volume <math>v</math> of a tank is 78.7 litres truncated to 1dp. Write the error interval for this.</p>	<p>Lower and upper bounds can be written as error intervals with the use of inequalities.</p> <p>Look out for the word “truncated” when doing this type of error interval.</p> <p><math>78.7 \leq v &lt; 78.8</math> litres</p>
<p>N3.14</p> <p>Calculate using the compound measure speed.</p> <p>How long does a journey last if a car travels 180 miles at an average speed of 40 mph?</p>	<p>Use this triangle to help you to remember the different formulae. Cover up the quantity that you want to calculate</p> <div style="text-align: center;">  <p> <math>S = D \div T</math>  <math>D = S \times T</math>  <math>T = D \div S</math> </p> </div> <p>Time taken = <math>180 \div 40 = 4.5</math> hours</p>

### N3: Accuracy and Measures

Calculate using the compound measure density

Use bounds to find the upper limit or lower limit of a calculation

<p>N3.15</p> <p>Calculate using the compound measure density.</p> <p>What is the density of a rod of aluminium that has a mass of 575.4g and a volume of 210cm<sup>3</sup></p>	<p>Use this triangle to help you to remember the different formulae. Cover up the quantity that you want to calculate.</p> <div style="text-align: center;"> <p> <math>D = M \div V</math>  <math>M = D \times V</math>  <math>V = M \div D</math> </p> <p> <u>M=Mass</u>  <u>D=Density</u>  <u>V=Volume</u> </p> </div> <p>Density = <math>575.4 \div 210 = 2.74</math> g/cm<sup>3</sup></p>
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<p>N3.16</p> <p>Use bounds to find the upper limit or lower limit of a calculation</p> <p>If a is rounded to the nearest x1.8 is rounded to 1 dp. Upper bound = <math>1.8 + \frac{1}{2}(0.1)</math> = 1.85 Lower bound = <math>1.8 - \frac{1}{2}(0.1)</math> = 1.75</p> <p>Calculating using bounds.</p> <p>Adding: Maximum = upper + upper Minimum = lower + lower</p> <p>Subtracting: Maximum = upper – lower Minimum = lower – upper</p> <p>Multiplying: Maximum = upper x upper Minimum = lower x lower</p> <p>Dividing: Maximum = upper ÷ lower Minimum = lower ÷ upper</p>	<p>Upper bound = <math>1.8 + \frac{1}{2}(0.1)</math> = 1.85 Lower bound = <math>1.8 - \frac{1}{2}(0.1)</math> = 1.75</p> <p>1.85 + 1.85 = 3.70 1.75 + 1.75 = 3.50</p> <p>1.85 – 1.75 = 0.10 1.75 – 1.85 = -0.10</p> <p>1.85 x 1.85 = 3.4225 1.75 x 1.75 = 3.0625</p> <p>1.85 ÷ 1.75 = 1.06 (2 dp) 1.75 ÷ 1.85 = 0.95 (2 dp)</p>
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## N4: Factors, Multiples and Primes

- Understand the term factor
- Understand the term Prime
- Understand the term multiples
- Understand the term square

N4.1 Understand the term 'factor'.  e.g. define a factor.	<b><u>FACTORS</u> are what divides exactly into a number</b>  Factors of 12 are: 1 12 2 6 3 4
N4.2 Understand the term 'prime'.  e.g. define a prime.	<b><u>PRIMES</u> have exactly TWO factors</b> Factors of 7 are 1 and 7 <b>7 is PRIME</b>
N4.3 Understand the term 'multiple'.  e.g. define a multiple.	<b><u>Multiples</u> are what you get when you multiply a number by successive numbers</b>  Multiples of 12 are: 12 (= 12 x 1), 24 (= 12 x 2), 36 (= 12 x 3), and so on.
N4.4 Understand the term 'square'.  e.g. define a square number.	<b><u>SQUARES</u> are the result of multiplying a number by itself</b> $3 \times 3 = 3^2 = 9$ $8 \times 8 = 8^2 = 64$  <b>9 &amp; 64 are square numbers</b>

- Understand the term cube
- Calculate the power of a number
- Calculate the root of a number

N4.5 Understand the term 'cube'.  e.g. define a cube number.	<b><u>Cubes</u> are the result of multiplying a number by itself and by itself again</b> $2 \times 2 \times 2 = 2^3 = 8$ $4 \times 4 \times 4 = 4^3 = 64$  <b>8 &amp; 64 are cube numbers</b>
N4.6 Calculate the power of a number.  e.g. Calculate $4^2$ . Calculate $5^3$ . Calculate $3^4$ .	$4^2$ is 4 <b>squared</b> , or the square of 4. It means $4 \times 4 = 16$  $5^3$ is 5 <b>cubed</b> , or the cubes of 5. It means $5 \times 5 \times 5 = 125$  $3^4$ is 3 <b>to the power of 4</b> . It means $3 \times 3 \times 3 \times 3 = 81$
N4.7 Calculate the root of a number.  e.g. Calculate $\sqrt{16}$ $\sqrt[3]{125}$ $\sqrt[4]{81}$	The <b>inverse</b> operation for 'power' is 'root'  $\sqrt{16} = 4$ $\sqrt[3]{125} = 5$ $\sqrt[4]{81} = 3$  <b>There are keys on the calculator to all of these</b>

## N4: Factors, Multiples and Primes

Find factors of a number

Find multiples of a number

Identify a prime number

<p>N4.8 Find Factors of a number. e.g. find the factors of 24.</p>	<p><b><u>FACTORS</u> are what divides exactly into a number</b></p> <p>You can find factors using factor pairs:</p> <p><u>Factors of 24</u></p> <p>1 x 24 2 x 12 3 x 8 4 x 6</p> <p>1, 2, 3, 4, 6, 12 and 24 are all factors of 24</p>
<p>N4.9 Find Multiples of a number. e.g. list the first 6 multiples of 5.</p>	<p><b><u>Multiples</u> are the numbers in a times table</b></p> <p>The first 6 multiples of 5 are...</p> <p>5, 10, 15, 20, 25, 30</p>

<p>N4.10 Identify a Prime Number. e.g. list the prime numbers less than 30.</p>	<p><b><u>Prime numbers</u> only have two factors, 1 and themselves.</b> These are the only numbers you can divide into a prime number</p> <p><u>Factors of 17</u></p> <p>1 x 17 only <math>17 \div 1 = 17</math> <math>17 \div 17 = 1</math></p> <p>This means 17 is a prime number.</p> <p>2 is the only even prime number. 1 isn't a prime number</p> <p>The prime numbers less than 30 are...</p> <p>2, 3, 5, 7, 11, 13, 17, 19, 23, 29</p>
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## N4: Factors, Multiples and Primes

Find the highest common factor of two or more numbers

Find the lowest common multiple of two or more numbers

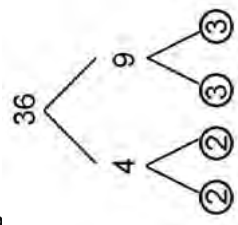
<p>N4.11</p> <p>Find the Highest Common Factor (HCF) of two or more numbers.</p> <p>e.g. find the HCF of 36 and 54.</p>	<p>Find the factors of the numbers. The <b>highest common factor (HCF)</b> is the biggest factor that is common to both.</p> <p><b><u>HCF of 36 and 54</u></b></p> <table><tr><td>Factors of 36</td><td>1 x 36</td><td>2 x 18</td><td>3 x 12</td><td>4 x 9</td><td>6 x 6</td></tr><tr><td>Factors of 54</td><td>1 x 54</td><td>2 x 27</td><td>3 x 18</td><td>6 x 9</td><td></td></tr></table> <p>18 is the biggest factor of both, and so...</p> <p><b>the HCF of 36 and 54 is 18</b></p> <p>You would never be asked to find the lowest common factor as 1 is a factor of all numbers.</p> <p>This means there will always be an HCF for two or more numbers.</p>	Factors of 36	1 x 36	2 x 18	3 x 12	4 x 9	6 x 6	Factors of 54	1 x 54	2 x 27	3 x 18	6 x 9	
Factors of 36	1 x 36	2 x 18	3 x 12	4 x 9	6 x 6								
Factors of 54	1 x 54	2 x 27	3 x 18	6 x 9									

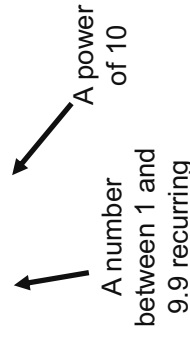
<p>N4. 12 Find the Lowest Common Multiple (LCM) of two or more numbers.</p> <p>e.g. find the LCM of 9 and 12.</p>	<p>List the multiples (times tables) of the numbers. The <b>Lowest Common Multiple (LCM)</b> is the first number common to both (in both lists).</p> <p><b>LCM of 9 and 12</b></p> <table> <tr> <td>Multiples of 9</td><td>9, 18, 27, 36, 45, 54, 63, 72, 90...</td></tr> <tr> <td>Multiples of 12</td><td>12, 24, 36, 48, 60, 72, 84....</td></tr> </table> <p><b>The LCM of 9 and 12 is 36</b></p> <p>(note that 72 is also common to both, but this isn't the lowest)</p> <p>You would never be asked for the highest common multiple, as there are an infinite number of common multiples.</p>	Multiples of 9	9, 18, 27, 36, 45, 54, 63, 72, 90...	Multiples of 12	12, 24, 36, 48, 60, 72, 84....
Multiples of 9	9, 18, 27, 36, 45, 54, 63, 72, 90...				
Multiples of 12	12, 24, 36, 48, 60, 72, 84....				

## N4: Factors, Multiples and Primes

Write a number as its product of prime factors

Write large numbers in standard form

<p>N4.13</p> <p>Write a number as its product of prime factors.</p> <p>e.g. write 36 as the product of its prime factors.</p>	<p>To find the <b>product of prime factors</b> for a number, produce a factor tree. Stop when you get to prime numbers, which you circle</p> <p><u>Product of prime factors for 36</u></p>  <p><math>36 = 2 \times 2 \times 3 \times 3</math> (product of prime factors)</p> <p><math>36 = 2^2 \times 3^2</math> (index form)</p>
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<p>N4.14</p> <p>Write large numbers in standard form.</p> <p>e.g.</p> <p>Write 50000 in standard form</p> <p>Write 320000 in standard form</p>	<p><b>Standard Form</b> is a shorthand method for writing large and small numbers.</p> <p><u>Large Numbers in Standard Form</u></p> <p><math>5 \times 10^4 = 5000</math></p>  <p><math>3.2 \times 10^5 = 320\,000</math></p> <p><math>46 \times 10^3</math> not standard form</p> <p><math>= 4.6 \times 10^4</math></p> <p><math>= 46\,000</math></p>
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## N4: Factors, Multiples and Primes

Write small numbers in standard form  
Write a number in standard form as a regular number

<p>N4.15</p> <p>Write small numbers in standard form.</p> <p>e.g.</p> <p>Write 0.005 in standard form</p> <p>Write 0.000041 in standard form</p>	<p><b>Standard Form</b> is a shorthand method for writing large and small numbers.</p> <p><b><u>Small Numbers in Standard Form</u></b></p> <p><math>5 \times 10^{-3} = 0.005</math></p> <p>3 zeros before the 5</p> <p>A number between 1 and 9.9 recurring</p> <p>A power of 10</p> <p><math>4.1 \times 10^{-5} = 0.000041</math></p> <p><math>32 \times 10^{-4}</math> not standard form</p> <p><math>= 3.2 \times 10^{-3}</math></p> <p><math>= 0.0032</math></p>
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<p>N4.16</p> <p>Write a number given in standard form as a regular number</p> <p>e.g.</p> <p>Write <math>5 \times 10^4</math> as a number</p> <p>Write <math>5 \times 10^{-3}</math> as a number.</p>	<p><b>Positive Powers</b></p> <p><math>5 \times 10^4</math></p> <p><math>= 5 \times 10000</math></p> <p><math>= 50000</math></p> <p>The digit 5 has moved 4 places to the left.</p> <p>Positive power moves to the left by the number of places equal to the index number</p> <p><b>Negative Powers</b></p> <p><math>5 \times 10^{-3} =</math></p> <p><math>0.005</math></p> <p>The digit moves 3 places to the right.</p> <p>Negative power moves to the left by the number of places equal to the number in the index.</p>
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## N4: Factors, Multiples and Primes

Apply the law of indices for multiplying powers

Apply the law of indices for dividing powers

Apply the law of indices for powers of powers

Evaluate fractional indices

<p>N4.17</p> <p>Apply the law of indices for multiplying powers.</p> <p>e.g. simplify</p> $5^3 \times 5^6$ $4^7 \times 4^{-2}$	<p>When <b>multiplying</b> indices add the powers</p> $5^3 \times 5^6 = 5^9$ $4^7 \times 4^{-2} = 4^5$
<p>N4.18</p> <p>Apply the law of indices for dividing powers.</p> <p>e.g. simplify</p> $\frac{8^7}{8^2}$ $\frac{6^2}{6^9}$	<p>When <b>dividing</b> indices subtract the powers</p> $\frac{8^7}{8^2} = 8^5$ $\frac{6^2}{6^9} = 6^{-7}$ <p>When applying the laws of indices the base number (the 8 and the 6 in the above examples) must be the same.</p>

<p>N4.19</p> <p>Apply the law of indices for powers of powers</p> <p>e.g. simplify</p> $(4^6)^2$ $(6^3)^5$ $(7^5)^4$	<p>Multiply out the brackets</p> $(4^6)^2 = 4^6 \times 4^6 = 4^{12}$ $(6^3)^5 = 6^{15}$ $(7^5)^4 = 7^{20}$
<p>N4.20</p> <p>Evaluate fractional indices</p> <p>e.g. evaluate</p> $16^{\frac{1}{2}}$ $8^{\frac{1}{3}}$ $25^{\frac{3}{2}}$	<p><b>Fractional indices</b> are roots. 'Evaluate' means to show your answer as a number value, and not as an index power.</p> $16^{\frac{1}{2}} = \sqrt{16} = 4$ $8^{\frac{1}{3}} = \sqrt[3]{8} = 2$ <p>Denominator is the root, numerator the power.</p> $25^{\frac{3}{2}} = (\sqrt{25})^3 = 125$

## N4: Factors, Multiples and Primes

Evaluate negative indices

Evaluate indices involving both negative and fractional  
Simplify a surd

Simplify a surd expression

<p>N4.21 Evaluate negative indices</p> <p>e.g. evaluate</p> $4^{-2}$ $10^{-3}$	<p><b>Negative indices</b> are equivalent to fractions and decimals.</p> $4^{-2} = \frac{1}{4^2} =$ $\frac{1}{16}$ $10^{-3} = \frac{1}{10^3} =$ $\frac{1}{1000} = 0.001$ <p>Give your answer as a fraction unless told otherwise.</p>
<p>N4.22 Evaluate indices involving both negative and fractional</p> <p>e.g. evaluate</p> $16^{-\frac{3}{2}}$	<p><math>16^{-\frac{3}{2}}</math> Turn into a fraction. Denominator is the root, numerator the power.</p> $\frac{1}{\sqrt{16}} = \frac{1}{4}$ $\left(\frac{1}{4}\right)^3 = \frac{1}{64}$

<p>N4.23 Simplify a surd</p> <p>e.g. simplify</p> $\sqrt{18}$ $\sqrt{75}$	<p><math>\sqrt{25}</math> is <u>NOT</u> a surd because it is exactly 5. <math>\sqrt{3}</math> is a surd because the answer is not exact.</p> <p><b>A surd is an irrational number</b></p> <p><b>To simplify surds look for square number factors</b></p> $\sqrt{18} = \sqrt{9 \times 2} = 3\sqrt{2}$ $\sqrt{75} = \sqrt{25 \times 3} = 5\sqrt{3}$
<p>N4.24 Simplify a surd expression</p> <p>e.g. simplify</p> $5\sqrt{3} + 2\sqrt{3}$ $5\sqrt{3} \times 2\sqrt{3}$	<p><math>5\sqrt{3} + 2\sqrt{3} = 7\sqrt{3}</math></p> <p>When adding the root stays the same</p> $5\sqrt{3} \times 2\sqrt{3} = 10\sqrt{9}$ $= 10 \times 3 = 30$

## N4: Factors, Multiples and Primes

Rationalise the denominator of a fraction  
Multiply two surd brackets together

<p>N4.25</p> <p>Rationalise the denominator of a fraction (simple surd)</p> <p>e.g. Rationalise <math>\frac{3}{\sqrt{2}}</math></p>	<p><b>Rationalising the denominator</b> of a surd is removing the surd from the denominator of a fraction by multiplying the numerator and denominator of that fraction by the denominator.</p> <p>In general:</p> $\frac{a}{\sqrt{b}} \times \frac{\sqrt{b}}{\sqrt{b}} = \frac{a\sqrt{b}}{b}$ <p><b>Example:</b></p> $\frac{3}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{3\sqrt{2}}{2}$ <p>These are equivalent fractions</p>
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N4.26

Multiply two surd brackets together

e.g. simplify fully

$$(5 - \sqrt{3})(1 + \sqrt{3})$$

Multiply **surd brackets**

together in the same way you would in algebra with double brackets to form a quadratic expression. Using the grid method is the most straightforward way.

**Example:**

Simplify fully

$$(5 - \sqrt{3})(1 + \sqrt{3})$$

$\times$	$1$	$\sqrt{3}$
$5$	$5$	$5\sqrt{3}$
$-\sqrt{3}$	$-\sqrt{3}$	$-3$

$$= 5 - \sqrt{3} + 5\sqrt{3} - 3$$

Collecting terms  
gives...

$$= 4\sqrt{3} + 2$$

## N4: Factors, Multiples and Primes

Rationalise the denominator of a fraction (surd expression)

Calculate with numbers in standard form

<p>N4.27</p> <p>Rationalise the denominator of a fraction (surd expression)</p> <p>e.g. rationalise this surd <math>\frac{5}{3 - \sqrt{2}}</math></p>	<p><b>Rationalising the denominator</b> of a surd is removing the surd from the denominator of a fraction by multiplying the numerator and denominator of that fraction by the denominator.</p> <p><b>Example:</b></p> <p>Rationalise this surd <math>\frac{5}{3 - \sqrt{2}}</math></p> $\frac{5}{3 - \sqrt{2}} \times \frac{(3 + \sqrt{2})}{(3 + \sqrt{2})}$ $= \frac{5(3 + \sqrt{2})}{(3 - \sqrt{2})(3 + \sqrt{2})}$ $= \frac{15 + 5\sqrt{2}}{9 + 3\sqrt{2} - 3\sqrt{2} - 2}$ $= \frac{15 + 5\sqrt{2}}{7}$
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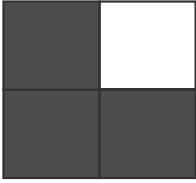
<p>N4.28</p> <p>Calculate with numbers in standard form (1)</p> <p>e.g. calculate, giving your answer in standard form,</p> <p><math>(3 \times 10^4) \times (2 \times 10^6)</math></p> <p><math>(4 \times 10^4) \times (6 \times 10^6)</math></p>	<p>When <b>multiplying in standard form</b>, use the laws of indices for the powers, while multiplying the whole numbers as usual.</p> $(3 \times 10^4) \times (2 \times 10^6) = 6 \times 10^{10}$ $(4 \times 10^4) \times (6 \times 10^6) = 24 \times 10^{10}$ $= 2.4 \times 10^{11}$ <p>Make sure numbers are in standard form.</p> <p>When <b>dividing in standard form</b>, use the laws of indices for the powers, while dividing the whole numbers as usual.</p> $(8 \times 10^9) \div (4 \times 10^3) = 2 \times 10^6$
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# N4: Factors, Multiples and Primes

Calculate with numbers in standard form continued	
<p>N4.28</p> <p>Calculate with numbers in standard form (2)</p> <p>e.g. Calculate, giving your answer in standard form</p> <p>sta <math>\frac{1.2 \times 10^{12}}{2.4 \times 10^4}</math></p>	<p>When <b><u>dividing in standard form</u></b>, use the laws of indices for the powers, while dividing the numbers as usual.</p> $\frac{1.2 \times 10^{12}}{2.4 \times 10^4} = 0.5 \times 10^8$ $= 5 \times 10^7$ <p>Make sure numbers are in standard form.</p> <p>When <b><u>adding and subtracting in standard form</u></b>, turn the numbers given in standard form back into ordinary numbers first, add or subtract them, then convert your answer to standard form.</p> $(3.5 \times 10^4) + (6.2 \times 10^5)$ $= 35\,000 + 620\,000$ $= 655\,000$ $= 6.55 \times 10^5$

## P1: Ratio and Proportion

Use proportion to describe a part of a whole  
 Use a ratio and a quantity to find another quantity  
 Simplify a ratio  
 Write a ratio in the form 1:n

<p>P1.1 Use proportion to describe a part of a whole.</p>  <p>Describe the proportion of the shape that is white</p>	<p>One white square out of 4 squares altogether.          So as a fraction</p> <p><math>\frac{1}{4}</math> Part is the numerator          Whole is the denominator</p> <p>Proportion can also be a decimal or percentage.          The fraction needs to be converted.          As a decimal 0.25          As a percentage 75%</p>
<p>P1.2 Use a ratio and a quantity to find another quantity          e.g. The ratio of squash to water is 1:7. How much squash do I need for 50ml of squash</p>	<p>Ratio</p> <p>Water X 50 on this side</p> <p>Squash : 1:7</p> <p>Multiply by the same number on this side</p> <p>50:350 side</p>

<p>P1.3 Simplify a ratio          e.g. simplify 12:15</p> <p>Simplify 30cm:1m</p>	<p>e.g. <math>12 : 15</math>  <math>\Rightarrow \underline{4 : 5}</math></p> <p>e.g. <math>30\text{cm} : 1\text{m}</math>  <math>\Rightarrow 30 : 100</math>  <math>\Rightarrow \underline{3 : 1}</math></p> <p>Divide both sides by a common factor.          Convert the amounts to the same units if required,</p>
<p>P1.4 Write a ratio in the form 1:n</p> <p>e.g. Write 2:5 in the form 1:n</p>	<p>e.g. <math>2 : 5</math> (<math>\div</math> both parts by 2)  <math>\Rightarrow \underline{1 : 2.5}</math></p>

## P1: Ratio and Proportion

Use a ratio to solve a problem, turning one ratio into another equivalent ratio

Changing an amount in proportion. The unitary method  
Change an amount to compare two values

<p>P1.5</p> <p>Use ratio to solve a problem, turning one ratio into another equivalent ratio.</p> <p>e.g.</p> <p>A model ship is made using scale 1:600.</p> <p>The model ship length is 40cm.</p> <p>What is the real length of the ship?</p>	<p>e.g.</p> <p>A model ship is made using scale 1:600.</p> <p>The model ship length is 40cm.</p> <p>What is the real length of the ship?</p>
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<p>P1.6</p> <p>Changing an amount in proportion. The unitary method.</p> <p>e.g.</p> <p>If 6 books cost £22.50, how much will 11 books cost?</p>	<p>6 books cost £22.50</p> <p>1 book costs £3.75</p> <p>11 books costs £41.25</p> <p>It is called the unitary method because you find what 1 would be before multiplying up to find the amount you need.</p>
<p>P1.7</p> <p>Change an amount to compare two values.</p> <p>A best buy problem.</p> <p>e.g.</p> <p>A pack of 5 pens cost £6.10</p> <p>A pack of 8 pens cost £9.20</p> <p>Which is the best value?</p>	<p>Find the cost or value of one item in each case. Divide the cost by how many.</p> <p>5 cost £6.10, so 1 costs <math>£6.10 \div 5</math></p> <p>So 1 pen costs £1.22</p> <p>8 cost £9.20, so 1 costs <math>£9.20 \div 8</math></p> <p>So 1 pen costs £1.15</p> <p>The pack of 8 pens is the best value as the price of 1 pen is lower than in a pack of 5</p>

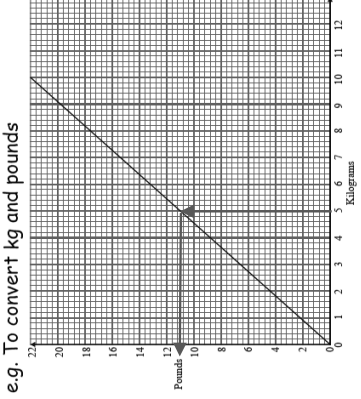


## P1: Ratio and Proportion

Reading a conversion graph

Dividing into a given ratio

Use multiplier to increase by a percentage

<p>P1.8 Reading a conversion graph</p> <p>One unit will be on the x-axis, the other unit will be on the y-axis.</p> <p>Find the unit value on one axis draw a line to the graph's line and another to the other axis. Read off your value.</p> <p>e.g. Convert 5kg into pounds.</p>	<p>e.g. To convert kg and pounds</p>  <ul style="list-style-type: none"> <li>• Draw lines on to take readings</li> <li>• Read the scale carefully</li> </ul> <p>e.g. Convert 5kg into pounds. From the line we can see 5kg = 11lbs</p>
<p>P1.9 Dividing into a given ratio</p> <p>Finding different amounts given a total and different ratios</p> <p>e.g. Divide £40 in the ratio 1:3:4</p>	<p>e.g. Divide £40 in the ratio of 1 : 3 : 4 Total number of shares = 1+3+4 = 8 1 share = £40 ÷ 8 = £5 3 shares = 3 x £5 = £15 4 shares = 4 x £5 = £20 1:3:4 = £5:£15:£20</p>

<p>P1.10 Dividing into a given ratio</p> <p>Using a quantity and a number of shares to find another quantity.</p> <p>e.g. A and B share some sweets in ratio 3:2 A gets 12 sweets, how many sweets does B get?</p>	<p>e.g. A and B share some sweets in ratio 3:2 A gets 12 sweets, how many sweets does B get? so 3 shares = 12 1 share = <math>12 \div 3 = 4</math> B gets <math>2 \times 4 = 8</math> sweets</p>
<p>P1.11 Use multiplier to increase by a percentage.</p> <p>e.g. What is the multiplier to increase an amount by 5%?</p>	<p>e.g. To increase a quantity by 5% Amount Increased from 100% by 5% so <math>100 + 5 = 105</math> 105% as a decimal = 1.05 Multiply the quantity by 1.05</p>

## P1: Ratio and Proportion

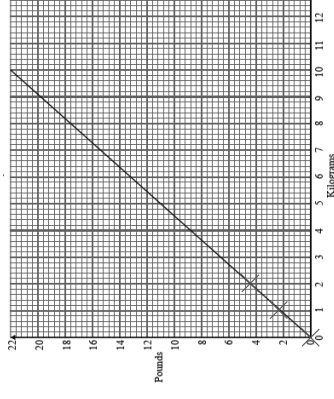
Use multiplier to decrease by a percentage

Calculate the original amount before a percentage change (Reverse percentage)

Plotting a conversion graph

<p>P1.12</p> <p>Use multiplier to decrease by a percentage.</p> <p>e.g.</p> <p>What is the multiplier to decrease an amount by 5%?</p>	<p>e.g.</p> <p>To decrease a quantity by 5% Amount decreases from 100% by 5% so <math>100 - 5 = 95</math> 95% as a decimal = 0.95 Multiply the quantity by 0.95</p>
<p>P1.13</p> <p>Calculate the original amount before a percentage change.</p> <p>(Reverse Percentage)</p> <p>e.g.</p> <p>A bag costs £40 in a sale where everything has 20% off</p> <p>What was the original price of the bag?</p>	<p>e.g.</p> <p>A bag costs £40 in a sale where everything has 20% off What was the original price of the bag?</p> <p>If 20% has been taken off, then the bag is 80% of its original value. (<math>100 - 20 = 80</math>) So the original multiplier was 0.8 for 80% Original <math>\times 0.8 = 40</math> So Original = <math>40 \div 0.8 = £50</math></p>

<p>P1.14</p> <p>Plotting Conversion Graphs</p> <p>e.g.</p> <p>Plot a conversion graph for Kilograms to pounds.</p> <p>If 1kg = 2.2lbs</p> <p>Draw suitable axes with Kilograms on one axis and Pounds on the other axis.</p> <p>As 1kg = 2.2lbs, plot this point on your graph.</p> <p>You need two more points.</p> <p>Double both values 2kg = 4.4lbs, plot this point</p> <p>Make one value zero, what happens to the other? 0kg = 0lbs, plot this point</p> <p>Draw a straight line through the three points with a ruler.</p>	<p>e.g.</p> <p>Plot a conversion graph for Kilograms to pounds.</p> <p>If 1kg = 2.2lbs</p>
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## P2 Proportion and Repeated Percentage Change

Understand how direct proportion affects two variables

Understand how inverse proportion affects two variables

Solve problems of direct proportion


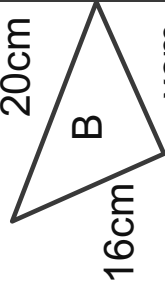
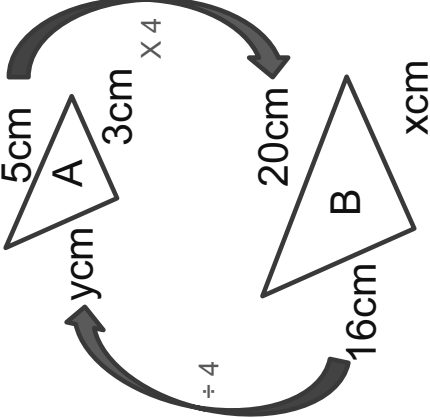
<p>P2.1</p> <p>Understand how direct proportion affects two variables e.g. if two variables A and B are in direct proportion to one another what happens as A increase?</p>	<p>If A and B are in direct proportion. Then If A increases then B increases If A decreases then B decreases If A is multiplied by 2 then B is multiplied by 2.  If 1 worker costs £200 to hire Then 2 workers cost £400 to hire The cost to hire is in direct proportion to how many workers are hired</p>
<p>P2.2</p> <p>Understand how inverse proportion affects two variables e.g. if two variables A and B are in direct proportion to one another what happens as A increase?</p>	<p>If A and B are in inverse proportion. Then If A increases then B decreases If A decreases then B increases If A is multiplied by 2 then B is divided by 2.  If 1 worker takes 2 hours to complete a job Then 2 workers will take 1 hour to complete the same job. The time taken to complete a job is inversely proportional to the amount of workers..</p>

<p>P2.3</p> <p>Solve Problems of Direct Proportion e.g. The distance you walk is directly proportional to the time you spend walking. If I can walk 9 miles in 3 hours, how far can I walk in 5 hours?</p>	<div> <div> <p>Use Unitary Method to find how far in one hour. Divide by three then multiply by 5</p> <p>9 miles : 3 hours 3 miles : 1 hour 15 miles : 5 hours</p> </div> <div> <p>Or recognise the scale factor from one value to the other. Multiply the number of hours by 3</p> </div> </div>
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## P2 Proportion and Repeated Percentage Change

Solve problems of inverse proportion  
Use similarity to find missing lengths

<p><b>P2.6</b> Solve Problems of Inverse Proportion</p> <p>The amount of time you spend on a job is inversely proportional to the amount of people doing the job. If it takes 5 workers 6 days to build a shed. How long will it take 2 workers?</p>	<p>Find how long it will take for 1 worker.</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <math>\div 5</math>  <math>\times 2</math> </div> <div style="margin-right: 10px;"> <math>\left. \begin{array}{l} 5 \text{ Workers : 6 Days} \\ 1 \text{ Worker: 30 Days} \end{array} \right\}</math> </div> <div style="margin-right: 10px;"> <math>\times 5</math>  <math>\div 2</math> </div> </div> <p style="text-align: center;">Days</p> <p>Because it is inverse proportion what you do to one value, you do the inverse to the other. So when you divide the number of workers to find 1 worker, you multiply the time by 5</p>
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<p><b>P2.7</b> Use Similarity to Find Missing Lengths</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Triangle A</p> </div> <div style="text-align: center;">  <p>Triangle B</p> </div> </div> <p>e.g. Triangle A and B are similar. What are the lengths of the missing sides?</p>	<div style="display: flex; justify-content: space-around; align-items: center;">  </div> <p>The multiplier from one shape to the other is the same for every corresponding side From A to B you go from 5 cm to 20cm <math>20 \div 5 = 4</math>. So you multiply by 4 <math>3 \times 4 = 12\text{cm}</math>, so <math>x = 12\text{cm}</math> To go from B to A you do the inverse and divide by 4. <math>16 \div 4 = 4\text{cm}</math> so <math>y = 4\text{cm}</math></p>
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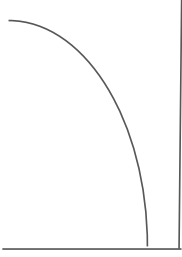
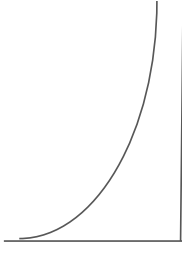
## P2 Proportion and Repeated Percentage Change

Write the formula for a repeated percentage change

Use calculations of repeated percentage change

Recognise graphs of exponential growth and decay

<p>P2.8</p> <p>Write the formula for a repeated percentage change</p>	<p>Find the multiplier for the percentage increase or decrease. Remember Increase by 20% then multiplier is 1.2 Decrease by 20% the multiplier is 0.8</p> <p>Final amount = (multiplier)<sup>number of years</sup> x initial amount</p>
<p>P2.9</p> <p>Use calculations of repeated percentage change</p> <p>e.g. £400 is placed in a savings account that pays 5% interest PA. How much money will be in the savings account after 5 years? Round your answer to 2d.p.</p>	<p>Use the formula: Final amount = (multiplier)<sup>number of years</sup> x initial amount</p> <p>PA stands for per annum which means every year. So there is a 5% increase every year. The multiplier for a 5% increase is 1.05 Using the formula Final Amount = <math>1.05^5 \times 400</math> = 510.512625.... =£510.51 to 2d.p.</p>

<p>P2.10</p> <p>Recognise Graphs of Exponential Growth and Exponential Decay</p> <p>e.g. What would a graph of bacteria growth look like?</p> <p>e.g. What would a graph of radioactive decay look like?</p>	<p>e.g. What would a graph of bacteria growth look like? This would be a repeated percentage increase.</p> 
	<p>e.g. What would a graph of radioactive decay look like? This would be a repeated percentage decrease</p> 

## P2 Proportion and Repeated Percentage Change

To find a formula for two variables in direct proportion

To find a formula for two variables in inverse proportion

<p>P2.11</p> <p>To Find a Formula for Two Variables in Direct Proportion</p> <p>e.g. <math>y</math> is directly proportional to <math>x</math>. When <math>y = 21</math>, <math>x = 3</math>.</p> <p>Find a formula for <math>y</math> in terms of <math>x</math></p>	<p>The symbol <math>\propto</math> means 'varies as' or 'is proportional to'.</p> <p>Direct proportion</p> <p>If <math>y \propto x</math> then <math>y = kx</math>  If <math>y \propto x^2</math> then <math>y = kx^2</math>  If <math>y \propto x^3</math> then <math>y = kx^3</math></p> <p>e.g.  <math>y</math> is directly proportional to <math>x</math>. When <math>y = 21</math>, <math>x = 3</math>.  <math>y \propto x</math> therefore <math>y = kx</math>  <math>21 = k \times 3</math>  <math>k = 7</math>  so, <math>y = 7x</math></p>
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<p>P2.12</p> <p>To Find a Formula for Two Variables in Inverse Proportion</p> <p>e.g. <math>a</math> is inversely proportional to <math>b</math>. When <math>a = 12</math>, <math>b = 4</math>.</p> <p>Find a formula for <math>a</math> in terms of <math>b</math></p>	<p>The symbol <math>\propto</math> means 'varies as' or 'is proportional to'.</p> <p>Inverse proportion</p> <p>If <math>y \propto \frac{1}{x}</math> then <math>y = \frac{k}{x}</math>  If <math>y \propto \frac{1}{x^2}</math> then <math>y = \frac{k}{x^2}</math>  If <math>y \propto \frac{1}{x^3}</math> then <math>y = \frac{k}{x^3}</math></p> <p>e.g. <math>a</math> is inversely proportional to <math>b</math>.  When <math>a = 12</math>, <math>b = 4</math>.  Find a formula for <math>a</math> in terms of <math>b</math></p> <p><math>a \propto \frac{1}{b}</math> therefore <math>a = \frac{k}{b}</math>  <math>12 = \frac{k}{4}</math>  <math>k = 48</math>  so, <math>a = \frac{48}{b}</math></p>
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## P2 Proportion and Repeated Percentage Change

Finding the multiplier or percentage change for a repeated change  
Use trial and error to find the year term of a repeated change

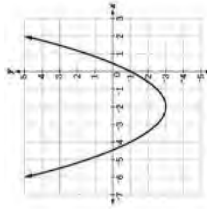
<p>P2.13 Finding the multiplier or percentage change for a repeated percentage change.</p> <p>e.g. A savings account had £2000 in it, after three years of interest, the amount in the account was £2315.25. What was the percentage interest rate on the savings account?</p>	<p>Formula for repeated percentage change is Final amount = <math>(\text{multiplier})^{\text{number of years}} \times \text{initial amount}</math> e.g. A savings account had £2000 in it, after three years of interest, the amount in the account was £2315.25. What was the percentage interest rate on the savings account?</p> <p>Initial amount = 2000 Final amount = 2315.25 Number of years = 3 Substitute into the formula <math>2315.25 = (\text{multiplier})^3 \times 2000</math> Divide by 2000 <math>1.157625 = (\text{multiplier})^3</math> Take cube root of both sides to undo the power <math>1.05 = \text{multiplier}</math> <math>1.05 = 105\%</math> So increase has been 5% each year.</p>
<p>P2.14 Use Trial and Error to find the year term of a repeated percentage change</p> <p>e.g. A savings account had £2000 in it, after x years of interest of 5% PA, the amount in the account was £2315.25. How long were the savings in the account?</p>	<p>Formula for repeated percentage change is Final amount = <math>(\text{multiplier})^{\text{number of years}} \times \text{initial amount}</math> e.g. A savings account had £2000 in it, after x years of interest of 5% PA, the amount in the account was £2315.25. How long were the savings in the account?</p> <p>Initial Amount = 2000 Percentage interest per year = 5% <math>100 + 5 = 105</math> So multiplier = 1.05</p> <p>Substitute these into the formula Keep trying the next value of x. Final amount = <math>1.05^x \times 2000</math> Try x=1, then <math>1.05 \times 2000 = 2100</math> (not the final amount) so try x=2 <math>1.05^2 \times 2000 = 2205</math> (not the final amount) so try x=3 <math>1.05^3 \times 2000 = 2315.25</math> 9correct amount) So x=3 years</p>

## P2 Proportion and Repeated Percentage Change

Find the average or instantaneous rate of change from graph  
What is the rate of change where  $x=0$

P2.15  
Find the average or instantaneous rate of change from a graph

What is the average rate of change between  $x = -1$  and  $x = 2$ ?



The rate of change is represented on a graph by the gradient.  
The average gradient of a curve between two points is the gradient of the chord joining the two points

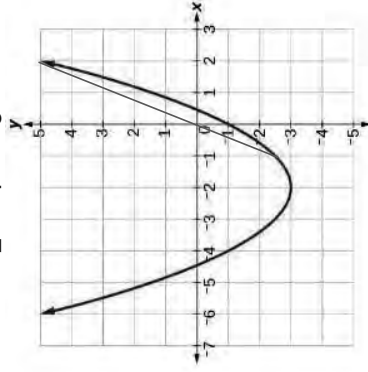
What is the average rate of change between  $x = -1$  and  $x = 2$ ?

Draw a chord on the graph between  $x = -1$  and  $x = 2$ .

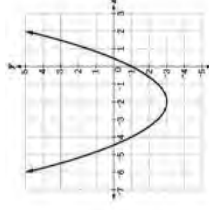
Find the gradient of the chord.

The chord passes through  $(-1, -2.5)$  and  $(2, 5)$

$$\text{Gradient} = \frac{5 - (-2.5)}{2 - (-1)} = \frac{7.5}{3} = 2.5$$



P2.16  
What is the rate of change where  $x = 0$ ?



The instantaneous rate of change is the gradient at a point on the curve.  
Rate of change at a point on a curve = gradient of the tangent

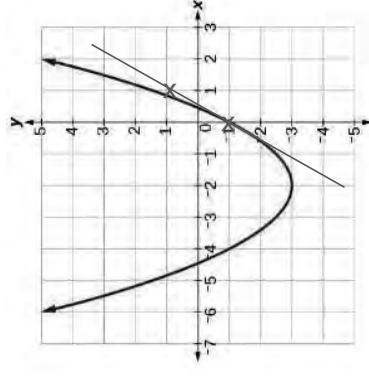
Draw a tangent to the curve at that point and find the gradient of the tangent.

Two points on the tangent are  $(0, -1)$  and  $(1, 1)$

Calculate Gradient

$$= \frac{1 - (-1)}{1 - 0} = 2$$

Rate of change at  $x = 0$  is 2





## P2 Proportion and Repeated Percentage Change

Interpret the rate of change of graph

Using similarity to find missing areas

Using similarity to find missing volumes

<p>P2.17</p> <p>Interpret the rate of change of graph</p> <p>e.g.</p> <p>What would the rate of change represent on</p> <p>A) A graph of number of bacteria against time.</p> <p>B) A graph of the number of radioactive atoms in a substance against time.</p> <p>C) A Distance / Time graph</p> <p>D) A Speed / Time graph</p>	<p>The rate of change of a graph is its gradient.</p> <p>A gradient is how much the y-axis value changes for every one value on the x-axis.</p> <p>e.g.</p> <p>What would the rate of change represent on</p> <p>A) A graph of number of bacteria against time.</p> <p>B) A graph of the number of radioactive atoms in a substance against time.</p> <p>C) A Distance / Time graph</p> <p>D) A Speed / Time graph</p> <p>Answers</p> <p>A) The rate of growth of the bacteria</p> <p>B) The rate of decay of the radioactive substance</p> <p>C) The rate of change of distance over time which is SPEED</p> <p>D) The rate of change of speed over time which is ACCELERATION</p>
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<p>P2.18</p> <p>Using similarity to find missing areas.</p> <p>If height of shape A is 4cm, height of shape B is 6cm</p> <p>A and B are similar shapes. If the surface area of A is <math>20\text{cm}^2</math> what is the surface area of B?</p>	<p>If Length scale factor = <math>k</math></p> <p>Then Area scale factor = <math>k^2</math></p> <p>If height of shape A is 4cm, height of shape B is 6cm</p> <p>A and B are similar shapes. If the surface area of A is <math>20\text{cm}^2</math> what is the surface area of B?</p> <p>Length scale factor = <math>6 \div 4 = 1.5</math></p> <p>Area scale factor = <math>1.5^2 = 2.25</math></p> <p>Surface area of B = <math>20 \times 2.25 = 45\text{cm}^2</math></p>
<p>P2.19</p> <p>Using similarity to find missing volumes.</p> <p>If height of shape A is 4cm, height of shape B is 6cm</p> <p>A and B are similar shapes. If the surface area of A is <math>10\text{cm}^2</math> what is the volume of B?</p>	<p>If Length scale factor = <math>k</math></p> <p>Then Volume scale factor = <math>k^3</math></p> <p>If the surface area of A is <math>10\text{cm}^2</math> what is the volume of B?</p> <p>Length scale factor = <math>6 \div 4 = 1.5</math></p> <p>Volume scale factor = <math>1.5^3 = 3.375</math></p> <p>Volume of B = <math>10 \times 3.375 = 33.75\text{cm}^3</math></p>

## S1: Data Handling

Understand how to collect data

Understand the concept of bias when collecting data

Reading data from a table

<p>S1.1</p> <p>Understand how to collect data</p> <p>e.g. describe different methods of data collection.</p>	<p>Ways to collect data:</p> <p><b>Data collection sheets</b> which are also called tally charts. (see S1.4)</p> <p><b>Two-way tables</b> are a way of sorting data from more than one category, so that the frequency of each category can be seen quickly and easily.</p> <p><b>Questionnaires</b> are used for most surveys. They have questions and choices of responses.</p>
<p>S1.2</p> <p>Understand the concept of bias when collecting data</p> <p>e.g. explain what is meant by bias.</p>	<p><b>Bias</b> occurs when one answer is favoured over another.</p> <p>It can lead to unreliable results.</p> <p>Data collection should be planned to minimise <b>bias</b>.</p> <p>Random samples minimise <b>bias</b>.</p>

S1.3

Reading data from a table

e.g. using the table, answer the questions.

Country	Gold	Silver	Bronze
Spain	7	4	6
France	10	18	14
Germany	17	10	15
Italy	8	12	8
Japan	12	8	21
Australia	8	11	10

(a) How many Gold medals did Australia win?

(b) Which country won the most Silver medals?

(c) Which countries won more than 12 Bronze medals?

Read the table carefully.

Cross reference the columns and rows to find the values you are looking for.

a) Australia won 8 gold medals

b) France won the most silver medals (18)

c) France, Germany and Japan won more than 12 Bronze medals

# S1: Data Handling










































- Collect data in a tally chart
- Draw a bar chart
- Interpret a bar chart
- Draw a pictogram

<p>S1.4</p> <p>Collect data in a tally chart</p> <p>e.g. 10 students were asked which type of movie they preferred. Their responses were horror, action, comedy, action, action, romance, comedy, action, action, horror.</p> <p>Show this data in a tally chart.</p>	<p>On a tally chart each occurrence is shown by a tally mark.</p> <p>Every fifth tally is drawn across to make a “gate”.</p> <p>The tallies are counted to give the frequency (f).</p> <table border="1"> <thead> <tr> <th>Movie Type</th> <th>Tally</th> <th>f</th> </tr> </thead> <tbody> <tr> <td>Action</td> <td>    </td> <td>5</td> </tr> <tr> <td>Horror</td> <td>  </td> <td>2</td> </tr> <tr> <td>Romance</td> <td>I</td> <td>1</td> </tr> <tr> <td>Comedy</td> <td>  </td> <td>2</td> </tr> </tbody> </table>	Movie Type	Tally	f	Action		5	Horror		2	Romance	I	1	Comedy		2
Movie Type	Tally	f														
Action		5														
Horror		2														
Romance	I	1														
Comedy		2														
<p>S1.5</p> <p>Draw a bar chart</p> <p>e.g. draw a bar chart from this table</p> <table border="1"> <thead> <tr> <th>Customers</th> <th>f</th> </tr> </thead> <tbody> <tr> <td>5 – 10</td> <td>6</td> </tr> <tr> <td>11 – 15</td> <td>14</td> </tr> <tr> <td>16 – 20</td> <td>9</td> </tr> <tr> <td>21 – 25</td> <td>1</td> </tr> </tbody> </table>	Customers	f	5 – 10	6	11 – 15	14	16 – 20	9	21 – 25	1	<p>On a <b>bar chart</b> the height of the bar is the frequency.</p> <p>A bar chart is used for discrete data. There must be gaps between the bars.</p>					
Customers	f															
5 – 10	6															
11 – 15	14															
16 – 20	9															
21 – 25	1															

<p>S1.6</p> <p>Interpret a bar chart</p> <p>e.g. how many people went on 1 holiday?</p>	<p>The x axis shows the category.</p> <p>The y axis shows the frequency.</p> <p>The number of people who went on 1 holiday was 7.</p>												
<p>S1.7</p> <p>Draw a pictogram</p> <p>e.g. draw a pictogram for this table.</p> <table> <tr> <th>Movie Genre</th><th>f</th></tr> <tr> <td>Horror</td><td>3</td></tr> <tr> <td>Action</td><td>7</td></tr> <tr> <td>Romance</td><td>4</td></tr> <tr> <td>Comedy</td><td>5</td></tr> <tr> <td>Other</td><td>1</td></tr> </table>	Movie Genre	f	Horror	3	Action	7	Romance	4	Comedy	5	Other	1	<p>A <b>pictogram</b> shows frequency using pictures.</p> <p>A key shows what each picture is worth.</p>
Movie Genre	f												
Horror	3												
Action	7												
Romance	4												
Comedy	5												
Other	1												

S1: Data Handling

- Interpret a pictogram
- Calculate a mean from a list of numbers
- Find the mode of a list of numbers
- Find the median for a list of numbers

<p>S1.8</p> <p>Interpret a pictogram</p> <p>e.g. how many Golden Delicious were there?</p> <table><tr><th colspan="2">Varieties of Apples in a food store</th></tr><tr><td>Red Delicious</td><td>  </td></tr><tr><td>Golden Delicious</td><td> </td></tr><tr><td>Red Rome</td><td>  </td></tr><tr><td>McIntosh</td><td> </td></tr><tr><td>Jonathan</td><td>  </td></tr></table> <p> = 10 apples     = 5 apples</p>	Varieties of Apples in a food store		Red Delicious	  	Golden Delicious	 	Red Rome	  	McIntosh	 	Jonathan	  	<p>Use or interpret part of a symbol to count quantities.</p> <p>For Golden Delicious: 2 whole apples = 20; 1 half apple = 5; 25 apples in total.</p>
Varieties of Apples in a food store													
Red Delicious	  												
Golden Delicious	 												
Red Rome	  												
McIntosh	 												
Jonathan	  												
<p>S1.9</p> <p>Calculate a mean from a list of numbers</p> <p>e.g. calculate the mean of 3, 4, 6, 7.</p>	<p>Add all the numbers. Divide by how many there are.</p> <p>Mean of 3, 4, 6, 7</p> $\frac{3 + 4 + 6 + 7}{4} = 5$ <p>The mean is 5</p>												

<p>S1.10</p> <p>Find the mode of a list of numbers</p> <p>e.g. what is the mode of 1, 2, 3, 3, 3, 3, 5, 5?</p> <p>1, 1, 2, 2, 4, 6, 7, 8, 9?</p> <p>1, 2, 3, 4, 5?</p>	<p>The Mode is the most common number or object.</p> <p>3 occurs the most so 3 is the mode.</p> <p>1 and 2 occur twice, so they are the modes. The data set is bimodal.</p>
<p>S1.11</p> <p>Find the median for a list of numbers.</p> <p>e.g. find the Median of 2, 7, 4, 3, 5</p> <p>2, 6, 4, 7, 5, 3</p>	<p>All occur once so there is no mode.</p> <p>The Median is the middle number, or middle value of a middle pair, in an ordered list.</p> <p>Order the numbers - 2, 3, 4, 5, 7. 4 is in the middle, so 4 is the median.</p> <p>Order the numbers – 2, 3, 4, 5, 6, 7. 4 and 5 are in the middle. The middle of 4 and 5 is 4.5, so 4.5 is the median.</p>

# S1: Data Handling

- Find the range of a list of numbers
- Compare data distributions using averages and range
- Draw a stem and leaf chart
- Interpret a stem and leaf chart

<p>S1.12</p> <p>Find the range of a list of numbers</p> <p>e.g. what is the range of 1, 2, 3, 4?</p> <p>-4, 2, 7, 8?</p>	<p>The Range is the difference between the largest and smallest value. It is the largest value minus the smallest value.</p> <p><math>4 - 1 = 3</math>, so the range is 3.</p> <p><math>8 - -4 = 8 + 4 = 12</math>, so 12 is the range.</p>									
<p>S1.13</p> <p>Compare data distributions using averages and range</p> <p>e.g. compare the heights of boys and girls using this table.</p> <table border="1"><thead><tr><th></th><th>B</th><th>G</th></tr></thead><tbody><tr><td>Mean</td><td>1.75m</td><td>1.69m</td></tr><tr><td>Range</td><td>32cm</td><td>25cm</td></tr></tbody></table>		B	G	Mean	1.75m	1.69m	Range	32cm	25cm	<p>To compare two or more data sets you <u>must</u>:</p> <p>Compare an average for each data set,</p> <p>Compare the spread of each data set.</p> <p>Comments should relate to the context of the data sets.</p> <p>The boys are taller, on average, than the girls since the mean is larger for the boys.</p> <p>The heights of the girls are more consistent since the range for the girls is lower.</p>
	B	G								
Mean	1.75m	1.69m								
Range	32cm	25cm								

<p>S1.14</p> <p>Draw a stem and leaf chart</p> <p>e.g. draw a stem and leaf chart for these data;</p> <p>8, 8, 9, 11, 12, 13, 14, 14, 18, 19, 20, 23, 25, 25, 27, 27, 28, 32, 32, 33, 33, 36, 36, 38, 38, 41, 42, 43, 43, 45</p>	<p>Make sure data is in order.</p> <p>Include a key.</p> <pre> 0   8 8 9 1   1 2 3 4 4 8 9 2   0 3 5 5 7 7 8 3   2 2 3 3 6 6 8 8 4   1 2 3 3 5                                 Key: 1   3 = 13                                 </pre> <p>This number here is 42.</p>																								
<p>S1.15</p> <p>Interpret a stem and leaf chart.</p> <p>e.g. find the median, range and mode from this stem and leaf.</p> <pre>                                 Key: 3   1 means 31                                 </pre> <table border="1"> <thead> <tr> <th>Stem</th><th>Leaf</th></tr> </thead> <tbody> <tr> <td>1</td><td>9 9</td></tr> <tr> <td>2</td><td>0 4 7 8</td></tr> <tr> <td>3</td><td>1 2 2 2 6</td></tr> <tr> <td>4</td><td>0 5 5</td></tr> <tr> <td>5</td><td>5</td></tr> </tbody> </table> <p>Median = middle number = 32.</p> <p>Mode = 32 (this occurs three times)</p> <p>Range = <math>55 - 19 = 36</math>.</p>	Stem	Leaf	1	9 9	2	0 4 7 8	3	1 2 2 2 6	4	0 5 5	5	5	<pre> Key: 3   1 means 31                                 </pre> <table border="1"> <thead> <tr> <th>Stem</th><th>Leaf</th></tr> </thead> <tbody> <tr> <td>1</td><td>9 9</td></tr> <tr> <td>2</td><td>0 4 7 8</td></tr> <tr> <td>3</td><td>1 2 2 2 6</td></tr> <tr> <td>4</td><td>0 5 5</td></tr> <tr> <td>5</td><td>5</td></tr> </tbody> </table>	Stem	Leaf	1	9 9	2	0 4 7 8	3	1 2 2 2 6	4	0 5 5	5	5
Stem	Leaf																								
1	9 9																								
2	0 4 7 8																								
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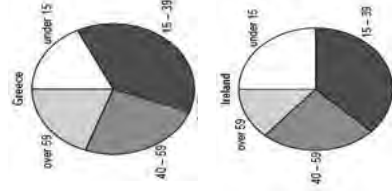
## S1: Data Handling

Construct a pie chart

Interpret a pie chart

Understand the different types of data

<p>S1.16</p> <p>Construct a pie chart</p> <p>e.g. if the frequency is 60, what is the angle that represents each person?</p>	<p>Divide 360 degrees by the total frequency</p> <p>Multiply each frequency by this number to find the angle of each sector.</p> <p>Number of people = 60.</p> <p><math>360^\circ \div 60 = 6^\circ</math> so each person = <math>6^\circ</math>.</p>
<p>S1.17</p> <p>Interpret a pie chart</p> <p>e.g. which country has more people under 15?</p>	<p>Pie charts show proportion.</p> <p>Without information on the size of the survey, actual numbers are not known.</p> <p>Here we are not told how many people are in each population. We can only comment on proportion by comparing the sizes of sectors in each pie chart.</p> <p>There is a larger proportion of the population under 15 in Ireland than there is in Greece.</p>



<p>S1.18</p> <p>Understand the different types of data</p> <p>e.g. describe the following data types.</p>	<p><b>Data</b> is a collective name for information recorded for statistical purposes.</p> <p>There are many types of data.</p>
Qualitative	<b>Qualitative data</b> can only be written in words, e.g. the colours of cars.
Quantitative	<b>Quantitative data</b> can be written in numbers, e.g. heights of children.
Discrete	<b>Discrete data</b> is numerical data that are usually integer values, e.g. the number of children in a classroom.
Continuous	<b>Continuous data</b> is numerical data that can be shown in decimals, e.g. the weights of babies.
Primary	<b>Primary data</b> is data collected from the original source, e.g. via a survey.
Secondary	<b>Secondary data</b> is data collected from other sources, e.g. national statistics.

## S1: Data Handling

Understand how to take and use a sample of data  
Find the median and quartiles from a list of data

<p>S1.19</p> <p>Understand how to take and use a sample of data.</p> <p>e.g. describe how to take a sample.</p>	<p>A sample should be: a small group of the population, an adequate size, representative of the population.</p> <p><u>Simple random sampling</u> Everyone has an equal chance of being part of the sample.</p> <p><u>Systematic sampling</u> Arranged in some sort of order. e.g. every 10<sup>th</sup> item in the population.</p>
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<p>S1.20</p> <p>Find the median and quartiles from a list of data</p> <p>e.g. find the median, lower quartile, upper quartile and interquartile range from the data set; 1, 4, 7, 8, 9, 13, 16</p>	<p>n is the number of items in the data set (in this case 7 items). Write the values in order.</p> <p><b>Median</b> is the <math>\frac{(n+1)}{2}th</math> value. <math>\frac{7+1}{2} = 4</math>. 4<sup>th</sup> item is 8.</p> <p><b>Lower Quartile (LQ)</b> is the <math>\frac{(n+1)}{4}th</math> value. <math>\frac{7+1}{4} = 2</math>. 2<sup>nd</sup> item is 4.</p> <p><b>Upper Quartile (UQ)</b> is the <math>\frac{3(n+1)}{4}th</math> value. <math>\frac{3(7+1)}{4} = 6</math>. 6<sup>th</sup> item is 13.</p> <p><b>Interquartile Range (IQR)</b> IQR = UQ – LQ = 13 – 4 = 9.</p>
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## S1: Data Handling

Compare distributions by comparing mean and range in context of the distributions

Draw a two way table

Interpret a two way table

<p><b>S1.21</b></p> <p>Compare distributions by comparing the mean and the range in context of the distributions</p> <p>e.g. compare the heights of boys and girls</p> <table><tr><th></th><th><b>B</b></th><th><b>G</b></th></tr><tr><td>Median</td><td>1.65m</td><td>1.54m</td></tr><tr><td>IQR</td><td>33cm</td><td>27cm</td></tr></table>		<b>B</b>	<b>G</b>	Median	1.65m	1.54m	IQR	33cm	27cm	<p>To compare two or more data sets you <u>must</u>:</p> <ul style="list-style-type: none"><li>Compare an average for each data set,</li><li>Compare the spread of each data set,</li><li>Comments should relate to the context of the data sets.</li></ul> <p>The boys are taller on average than the girls since the median is higher for the boys.</p> <p>The heights of the girls are more consistent since the IQR is lower.</p>											
	<b>B</b>	<b>G</b>																			
Median	1.65m	1.54m																			
IQR	33cm	27cm																			
<p><b>S1.22</b></p> <p>Draw a two-way table</p> <p>e.g. draw a two way table for data about how boys and girls travel to school.</p>	<p>The IQR covers the middle 50%.</p> <p>Two-way tables are a way of sorting data with two variables, showing the frequency of each category quickly and easily.</p> <p>To sort data by category e.g. how students travel to school</p> <table><tr><th></th><th>Bus</th><th>Walk</th><th>Cycle</th><th>Total</th></tr><tr><td>Boys</td><td></td><td></td><td></td><td></td></tr><tr><td>Girls</td><td></td><td></td><td></td><td></td></tr><tr><td>Total</td><td></td><td></td><td></td><td></td></tr></table>		Bus	Walk	Cycle	Total	Boys					Girls					Total				
	Bus	Walk	Cycle	Total																	
Boys																					
Girls																					
Total																					

S1.23

Interpret a two way table

e.g. from the table: what is the probability a student walks?

What is the probability of walking given you are a girl?

	Walk	Bus	Other	Total
Boys	20	10	25	55
Girls	12	17	29	58
Total	32	27	54	113

Complete the information in the table

From the completed two way table:

$P(\text{Walk}) = \frac{36}{100} = \frac{9}{25}$

$P(\text{Walk given you are a girl}) = \frac{16}{45}$



S1: Data Handling

Understand how to take a stratified sample

<p>S1.24</p> <p>Understand how to take a stratified sample</p> <p>e.g. given the table below, show how to take a stratified</p> <table><tr><th>Language</th><th>Number of students</th></tr><tr><td>Greek</td><td>145</td></tr><tr><td>Spanish</td><td>121</td></tr><tr><td>German</td><td>198</td></tr><tr><td>French</td><td>186</td></tr><tr><td>Total</td><td>650</td></tr></table>	Language	Number of students	Greek	145	Spanish	121	German	198	French	186	Total	650	<p>Sample is divided into groups according to criteria. These groups are called strata.</p> <p>A simple random sample is taken from each group in proportion to its size using the formula:</p> <p>Number from each group = <math>\frac{\text{stratum size}}{\text{population}} \times \text{sample size}</math>.</p> <p>Number from Greek</p> $= \frac{145}{650} \times 70 \approx 16$ <p>Number from Spanish</p> $= \frac{121}{650} \times 70 \approx 13$ <p>Number from German</p> $= \frac{198}{650} \times 70 \approx 21$ <p>Number from French</p> $= \frac{186}{650} \times 70 \approx 20$ <p>This only tells us 'how many' to take. Take a random sample from each Language.</p>
Language	Number of students												
Greek	145												
Spanish	121												
German	198												
French	186												
Total	650												

## S2: Grouped Frequency

To be able to group data into a grouped frequency table  
 Draw and interpret a frequency polygon  
 Find mean from a frequency table

S2.1

To be able to group data into a grouped frequency table

e.g. put these number of customers in a grouped frequency table.

13	8	16	12	12	16
7	18	11	16	15	7
11	12	13	21	17	19
11	14	10	19	13	12
7	16	6	14	12	18

S2.2

Draw and interpret a frequency polygon.

e.g. draw a frequency polygon for the following information.

Science Mark	Frequency
0 - 10	4
10 - 20	13
20 - 30	16
30 - 40	19
40 - 50	7

When a lot of **data** needs to be sorted, use a **grouped frequency table**.

Consider class width carefully. The smallest number is 6 and the biggest number is 21, so groups with a width of 5 are reasonable.

Customers	Tally	Frequency
6 - 10	I	6
11 - 15		14
16 - 20		9
21 - 25	I	1

A **frequency polygon** shows the frequencies for different groups.

To plot a frequency polygon of grouped data, plot the frequency at the midpoint of each group.

S2.3

Find mean from a frequency table

e.g. find the mean from this table.

Goals (x)	Frequency (f)
0	2
1	2
2	5
3	1
	10

The **mean** is found by adding up all the numbers and dividing by how many numbers there are.

The total amount of goals can be worked by multiplying goals (x) by the frequency (f), to give fx.

Goals (x)	Frequency (f)	fx
0	2	$0 \times 2 = 0$
1	2	$1 \times 2 = 2$
2	5	$2 \times 5 = 10$
3	1	$3 \times 1 = 3$
	10	15

The total number of goals is 15.  
There were 10 football games.  
 $15 \div 10 = 1.5$ , so the mean is 1.5.

## S2: Grouped Frequency

- Find median from a frequency table
- Find range from a frequency table
- Find the mode from a frequency table
- Construct a scatter graph

S2.11

Find median from a frequency table

e.g. find the median from this table.

Goals (x)	Frequency (f)
0	2
1	2
2	5
3	1
	10

The **median value** is the middle value when all items are in order.

Median =  $\frac{n+1}{2}$ th value.

n (total frequency) is 10.

Median =  $\frac{10+1}{2} = \frac{11}{2} = 5.5^{\text{th}}$  value.

The median is halfway between the 5th and 6th items of data.

Goals (x)	Frequency (f)	Cumulative
0	2	2
1	2	2 + 2 = 4
2	5	4 + 5 = 9
3	1	9 + 1 = 10

The 5th item of data is 2.

The 6th item of data is 2.

The median number of goals is 2.

2.4

Find range from a frequency table

e.g. find the range from this table.

Goals (x)	Frequency (f)
0	2
1	2
2	5
3	1
	10

The **range** is the highest value take away the lowest value.

The highest value in the table is 3 goals.

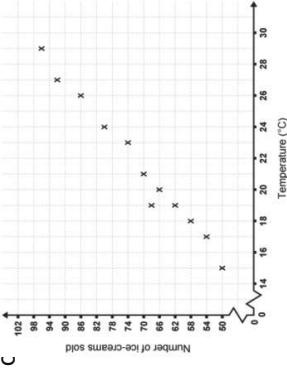
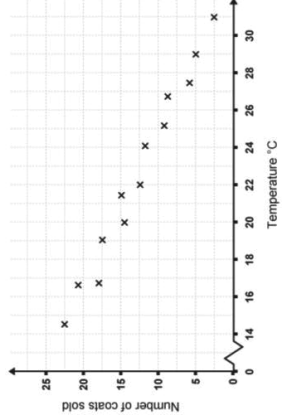
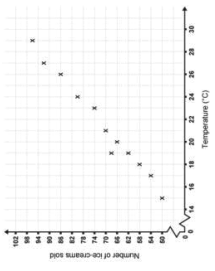
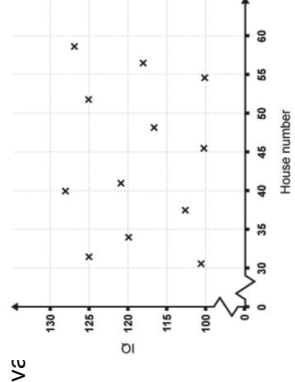
The lowest value is 0 goals.

The range is 3 – 0 = 3 goals.

<p>2.5</p> <p>Find the mode from a frequency table</p> <p>e.g. find the mode from this table.</p> <table border="1"> <thead> <tr> <th>Goals (x)</th> <th>Frequency (f)</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>2</td> </tr> <tr> <td>1</td> <td>2</td> </tr> <tr> <td>2</td> <td>5</td> </tr> <tr> <td>3</td> <td>1</td> </tr> <tr> <td></td> <td>10</td> </tr> </tbody> </table>	Goals (x)	Frequency (f)	0	2	1	2	2	5	3	1		10	<p>The <b>modal value</b> is the value with the highest <b>frequency</b>.</p> <p>There were five football matches where 2 goals were scored, which is a higher frequency than any other amount of goals.</p> <p>The modal amount of goals scored is 2.</p>								
Goals (x)	Frequency (f)																				
0	2																				
1	2																				
2	5																				
3	1																				
	10																				
<p>2.6</p> <p>Construct a scatter graph</p> <p>e.g. construct a scatter graph from this data.</p> <table border="1"> <thead> <tr> <th>Rainfall (mm)</th> <th>Umbrellas Sold</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>1</td> </tr> <tr> <td>2</td> <td>10</td> </tr> <tr> <td>4</td> <td>25</td> </tr> <tr> <td>0</td> <td>0</td> </tr> <tr> <td>0</td> <td>1</td> </tr> <tr> <td>5</td> <td>32</td> </tr> <tr> <td>6</td> <td>47</td> </tr> <tr> <td>1</td> <td>8</td> </tr> <tr> <td>1</td> <td>15</td> </tr> </tbody> </table>	Rainfall (mm)	Umbrellas Sold	3	1	2	10	4	25	0	0	0	1	5	32	6	47	1	8	1	15	<p><b>Scatter graphs</b> are used to see if there is a <b>correlation</b> between two sets of data.</p>
Rainfall (mm)	Umbrellas Sold																				
3	1																				
2	10																				
4	25																				
0	0																				
0	1																				
5	32																				
6	47																				
1	8																				
1	15																				

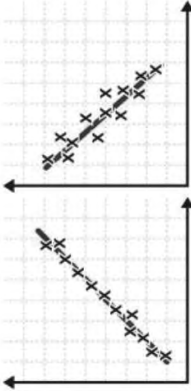
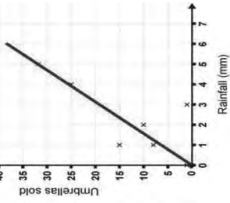
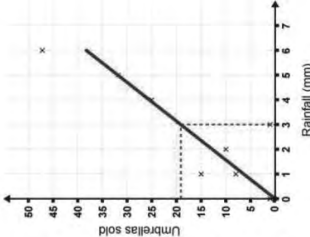
## S2: Grouped Frequency

Identify the correlation of a scatter graph  
Describe the relationship presented by a scatter graph

<p>2.7</p> <p>Identify the correlation of a scatter graph</p> <p>e.g. sketch a scatter graph showing positive correlation and a scatter graph showing negative correlation.</p>	<p>Graphs can either have positive correlation, negative correlation or no correlation.</p> <p><b>Positive correlation</b> means as one variable increases, so does the other.</p>  <p><b>Negative correlation</b> means as one variable increases, the other decreases.</p> 
<p>2.8</p> <p>Describe the relationship presented by a scatter graph</p> <p>e.g. describe the relationship shown in this scatter graph.</p> 	<p><b>No correlation</b> means there is no connection between the two variables.</p>  <p>The relationship presented by a scatter graph is described by its correlation.</p> <p>It is important that you mention both variables in your description of the relationship.</p> <p>There is a positive correlation between sales of ice cream and the temperature, so temperatures rises so does the sale of ice cream.</p>

## S2: Grouped Frequency

- Find Draw a line of best fit for a scatter graph
- Use a scatter graph to estimate results
- Estimate the mean from a grouped frequency table

<p>2.9</p> <p>Draw a line of best fit for a scatter graph.</p> <p>e.g. draw a line of best fit for positive and negative correlation.</p>	<p>A <b>line of best fit</b> is a sensible straight line that goes as centrally as possible through the coordinates plotted.</p> <p>There should roughly be the same</p> 
<p>2.10</p> <p>Use a scatter graph to estimate results</p> <p>e.g. estimate how many umbrellas will be sold given 3mm of rainfall?</p> 	<p>Estimate results using the line of best fit.</p> <p>Find 3 mm of rainfall on the graph. Draw a line going up from 3 mm, then draw a line across to the y axis.</p> 

<p>2.12</p> <p>Estimate the mean from a grouped frequency table.</p> <p>e.g. estimate the mean from this table.</p> <table border="1"> <thead> <tr> <th>Minutes Late (m)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>0 &lt; m ≤ 4</td> <td>11</td> </tr> <tr> <td>4 &lt; m ≤ 8</td> <td>13</td> </tr> <tr> <td>8 &lt; m ≤ 12</td> <td>7</td> </tr> <tr> <td>12 &lt; m ≤ 16</td> <td>9</td> </tr> <tr> <td>16 &lt; m ≤ 20</td> <td>4</td> </tr> </tbody> </table>	Minutes Late (m)	Frequency	0 < m ≤ 4	11	4 < m ≤ 8	13	8 < m ≤ 12	7	12 < m ≤ 16	9	16 < m ≤ 20	4	<p>We don't know the exact value of each item of data in each group.</p> <p>The best estimate we can make is to use the midpoint of each group.</p> <table border="1"> <thead> <tr> <th>Minutes Late (m)</th> <th>Frequency</th> <th>Midpoint</th> </tr> </thead> <tbody> <tr> <td>0 &lt; m ≤ 4</td> <td>11</td> <td>2</td> </tr> <tr> <td>4 &lt; m ≤ 8</td> <td>13</td> <td>6</td> </tr> <tr> <td>8 &lt; m ≤ 12</td> <td>7</td> <td>10</td> </tr> <tr> <td>12 &lt; m ≤ 16</td> <td>9</td> <td>14</td> </tr> <tr> <td>16 &lt; m ≤ 20</td> <td>4</td> <td>18</td> </tr> </tbody> </table> <p>The total number of minutes late can be found by multiplying the frequencies by the midpoints.</p>	Minutes Late (m)	Frequency	Midpoint	0 < m ≤ 4	11	2	4 < m ≤ 8	13	6	8 < m ≤ 12	7	10	12 < m ≤ 16	9	14	16 < m ≤ 20	4	18
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## S2: Grouped Frequency

Identify the modal class of a grouped frequency table  
Identify the class containing the median from a grouped frequency table

<p>2.13</p> <p>Identify the modal class of a grouped frequency table.</p> <p>e.g. find the modal class from this frequency table.</p> <table border="1"> <thead> <tr> <th>Minutes Late (m)</th><th>Frequency</th></tr> </thead> <tbody> <tr> <td><math>0 &lt; m \leq 4</math></td><td>11</td></tr> <tr> <td><math>4 &lt; m \leq 8</math></td><td>13</td></tr> <tr> <td><math>8 &lt; m \leq 12</math></td><td>7</td></tr> <tr> <td><math>12 &lt; m \leq 16</math></td><td>9</td></tr> <tr> <td><math>16 &lt; m \leq 20</math></td><td>4</td></tr> </tbody> </table>	Minutes Late (m)	Frequency	$0 < m \leq 4$	11	$4 < m \leq 8$	13	$8 < m \leq 12$	7	$12 < m \leq 16$	9	$16 < m \leq 20$	4	<p>The modal class is the group with the highest frequency.</p> <p>The group with the highest frequency is <math>4 &lt; m \leq 8</math> which occurs 13 times.</p> <p>The modal class is <math>4 &lt; m \leq 8</math>.</p>
Minutes Late (m)	Frequency												
$0 < m \leq 4$	11												
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<p>2.14</p> <p>Identify the class containing the median from a grouped frequency table</p> <p>e.g. find the class containing the median from this table.</p> <table border="1"> <thead> <tr> <th>Minutes Late (m)</th><th>Frequency</th></tr> </thead> <tbody> <tr> <td><math>0 &lt; m \leq 4</math></td><td>11</td></tr> <tr> <td><math>4 &lt; m \leq 8</math></td><td>13</td></tr> <tr> <td><math>8 &lt; m \leq 12</math></td><td>7</td></tr> <tr> <td><math>12 &lt; m \leq 16</math></td><td>9</td></tr> <tr> <td><math>16 &lt; m \leq 20</math></td><td>4</td></tr> </tbody> </table>	Minutes Late (m)	Frequency	$0 < m \leq 4$	11	$4 < m \leq 8$	13	$8 < m \leq 12$	7	$12 < m \leq 16$	9	$16 < m \leq 20$	4	<p>The <b>median value</b> is the middle value when all items are in order.</p> <p>Median = <math>\frac{n+1}{2}</math> the value.</p> <p>n (total frequency) is 44.</p> <p>Median = <math>\frac{44+1}{2} = \frac{45}{2} = 22.5^{\text{th}}</math> value.</p> <p>The median is halfway between the 23rd and 24th items of data.</p> <p>Using cumulative frequency, the 24<sup>th</sup> item is at the end of the <math>4 &lt; m \leq 8</math> class, so the 23<sup>rd</sup> item is also in that class.</p> <p>The median value is in the <math>4 &lt; m \leq 8</math> class.</p>
Minutes Late (m)	Frequency												
$0 < m \leq 4$	11												
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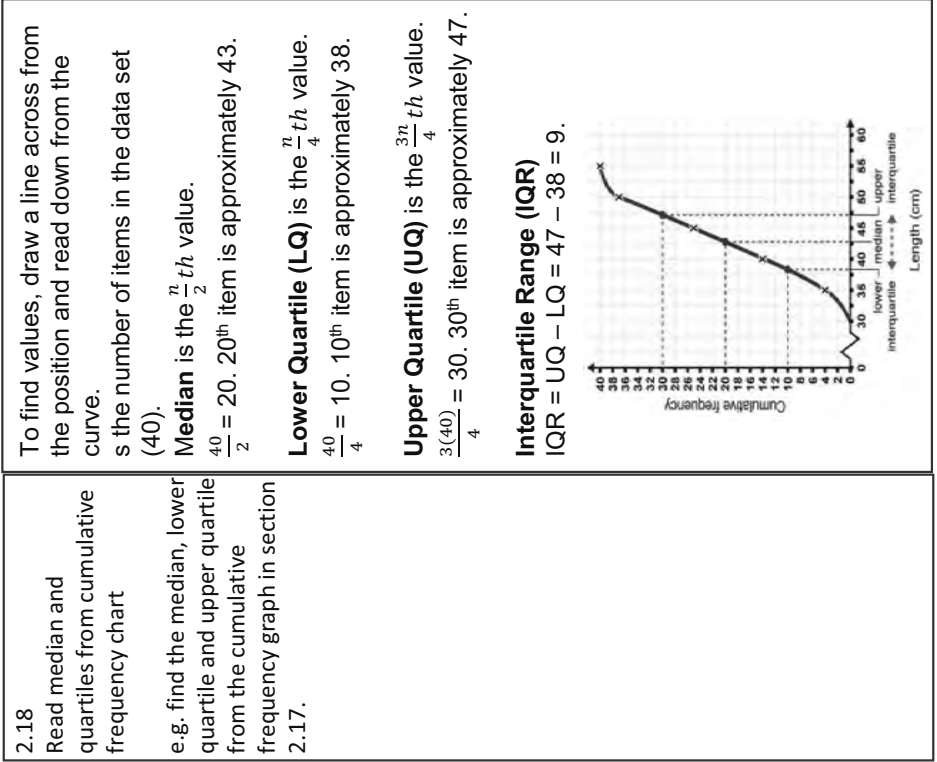
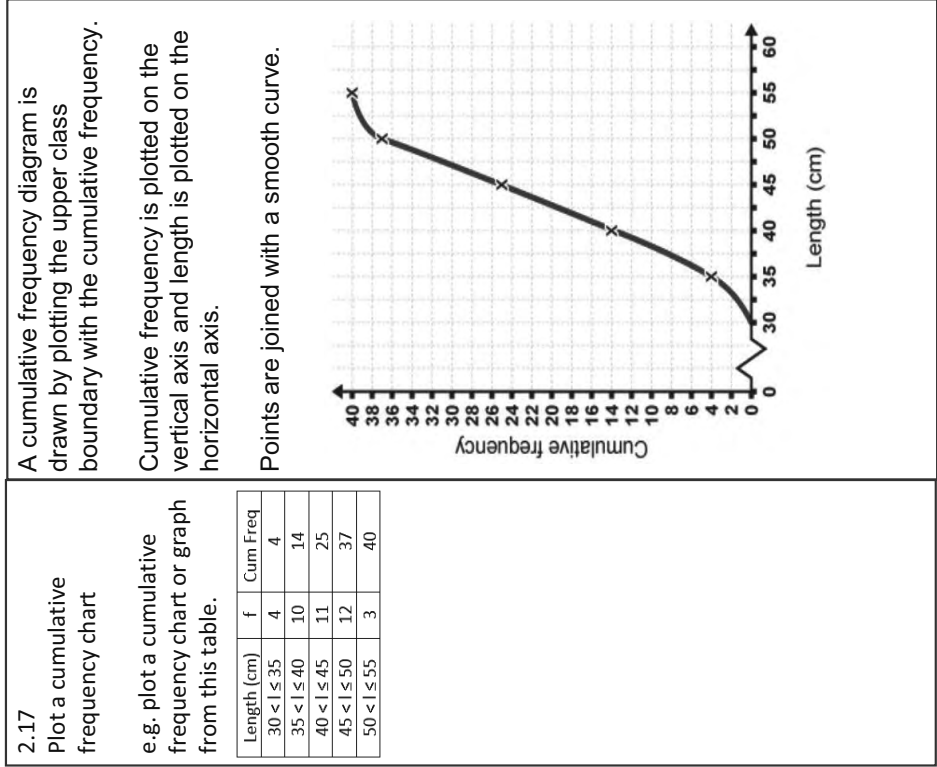
Understand the terms extrapolation and interpolation related to scatter graphs  
Calculate cumulative frequency

<p>2.15</p> <p>Understand the terms extrapolation and interpolation related to scatter graphs</p>	<p><b>Interpolation</b> is predicting within the range of the data. This is seen as a reliable estimation.</p> <p><b>Extrapolation</b> is predicting from outside of the range of the data. It is subject to greater uncertainty.</p>																														
<p>2.16</p> <p>Calculate cumulative frequency</p> <p>e.g. use this table to calculate cumulative frequency.</p> <table><tr><th>Length (cm)</th><th>Frequency</th></tr><tr><td><math>30 &lt; l \leq 35</math></td><td>4</td></tr><tr><td><math>35 &lt; l \leq 40</math></td><td>10</td></tr><tr><td><math>40 &lt; l \leq 45</math></td><td>11</td></tr><tr><td><math>45 &lt; l \leq 50</math></td><td>12</td></tr><tr><td><math>50 &lt; l \leq 55</math></td><td>3</td></tr></table>	Length (cm)	Frequency	$30 < l \leq 35$	4	$35 < l \leq 40$	10	$40 < l \leq 45$	11	$45 < l \leq 50$	12	$50 < l \leq 55$	3	<p>To calculate the cumulative frequencies, add the frequencies together.</p> <table><tr><th>Length (cm)</th><th>Frequency</th><th>Cum Freq</th></tr><tr><td><math>30 &lt; l \leq 35</math></td><td>4</td><td>4</td></tr><tr><td><math>35 &lt; l \leq 40</math></td><td>10</td><td>14</td></tr><tr><td><math>40 &lt; l \leq 45</math></td><td>11</td><td>25</td></tr><tr><td><math>45 &lt; l \leq 50</math></td><td>12</td><td>37</td></tr><tr><td><math>50 &lt; l \leq 55</math></td><td>3</td><td>40</td></tr></table>	Length (cm)	Frequency	Cum Freq	$30 < l \leq 35$	4	4	$35 < l \leq 40$	10	14	$40 < l \leq 45$	11	25	$45 < l \leq 50$	12	37	$50 < l \leq 55$	3	40
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## S2: Grouped Frequency

Plot a cumulative frequency chart

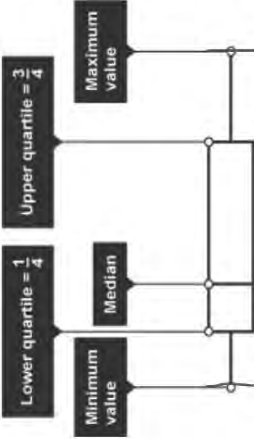
Read median and quartiles from cumulative frequency chart

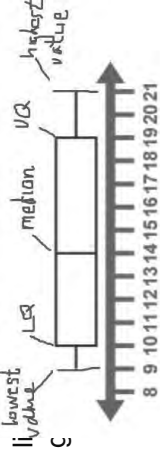


S2: Grouped Frequency

Draw a box plot

Draw a box plot from a list of numbers

2.19 Draw a box plot  e.g. show the values required to draw a box plot.	<p>A <b>box plot</b> is a visual representation of the <b>median</b> and <b>quartiles</b> of a set of <b>data</b>.</p> <p>To draw a box plot, the following values are needed:</p> <p><b>lower quartile;</b> median; <b>upper quartile;</b></p> 
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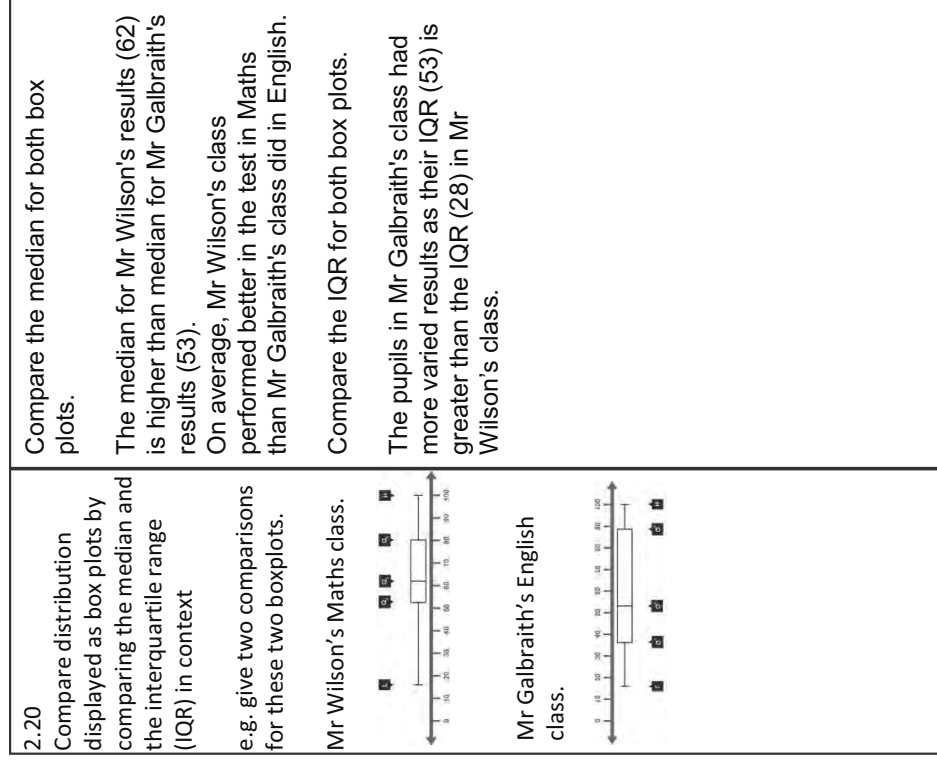
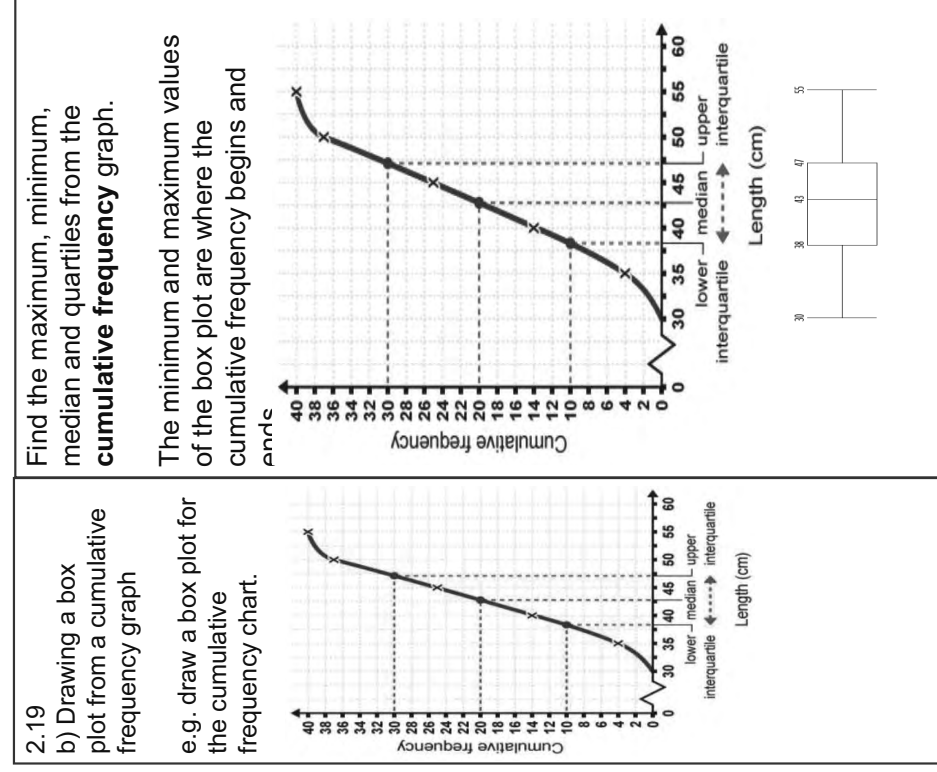
2.19 a) Draw a box plot from a list of numbers.  e.g. draw a box plot from this list of numbers: 9, 10, 10, 12, 13, 14, 17, 18, 19, 21, 21.	<p>Box plots can be created from a list of numbers by finding the median, lower and upper quartiles.</p> <p>Minimum value = 9. Maximum value = 21.</p> <p><b>Median</b> is the <math>\frac{n+1}{2}</math>th value. <math>\frac{11+1}{2} = 6</math>. 6th item is 14.</p> <p><b>Lower Quartile (LQ)</b> is the <math>\frac{n+1}{4}</math>th value. <math>\frac{11+1}{4} = 3</math>. 3rd item is 10.</p> <p><b>Upper Quartile (UQ)</b> is the <math>\frac{3(n+1)}{4}</math>th value. <math>\frac{3(11+1)}{4} = 9</math>. 9th item is 19.</p> <p>Drawing these points on a number line</p> 
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## S2: Grouped Frequency

Drawing a box plot from a cumulative frequency graph

Compare distributions displayed as box plots by comparing the median and the interquartile range in context



S2: Grouped Frequency

Know how to calculate frequency density for a histogram of unequal widths

Calculate frequencies from a histogram of unequal widths

2.21

Know how to calculate frequency density for a histogram of unequal widths

e.g. calculate the frequency density from these values.

Age (a)	Frequency
$5 \leq a < 11$	6
$11 \leq a < 16$	15
$16 \leq a < 17$	4

On a **histogram** the area of the bar shows the frequency of the **data**.

Histograms are typically used when the data is in groups of unequal width.

Frequency density is used instead of frequency.

Frequency density (FD) =  $\frac{\text{frequency}}{\text{class width}}$

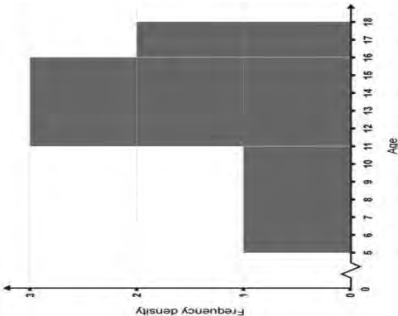
Age (a)	Frequency	Class Width	FD
$5 \leq a < 11$	6	6	1
$11 \leq a < 16$	15	5	3
$16 \leq a < 17$	4	2	2

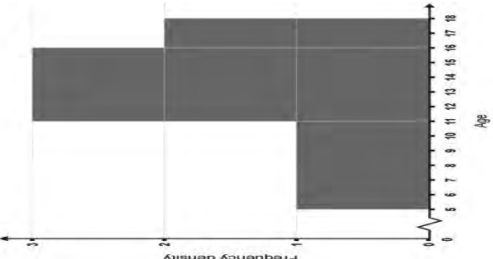
2.22

Plot a histogram of unequal widths.

e.g. plot a histogram from this table in section 2.21.

Plot Frequency Density on the y axis.



<p>2.23</p> <p>Calculate frequencies from a histogram of unequal widths</p> <p>e.g. calculate the frequency for each category from the histogram.</p> 	<p>Frequency = Frequency Density x Class Width</p> <p>Children aged 5 – 11: Frequency = 1 x 6 = 6.</p> <p>Children aged 11 – 16: Frequency = 3 x 5 = 15.</p> <p>Children aged 16 – 18: Frequency = 2 x 2 = 4.</p>
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## S3: Probability

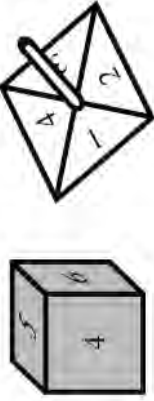
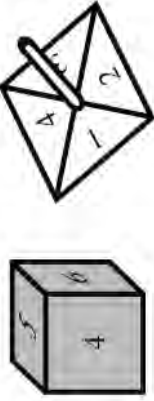
Calculate the theoretical probability of an event

Use the exhaustive rule of probability,

Use a sample space to find the probability of a combined event

Use the property that the sum of mutually exclusive probabilities is 1

<p>S3.1</p> <p>Calculate the theoretical probability of an event</p> <p>e.g. What is the theoretical probability of rolling a 6 on a single die?</p>	<ul style="list-style-type: none"> <li><b>Calculate probability</b></li> </ul> $P(\text{event}) = \frac{\text{No. of outcomes which give the event}}{\text{Total number of outcomes}}$ <p>Probability of rolling a 6</p> <p>There is only one 6 on the die</p> <p>There are 6 numbers on the die</p> $P(6) = \frac{1}{6}$
<p>S3.2</p> <p>Use the exhaustive rule of probability, the probability of an event + the probability of that event not happening = 1</p> <p>e.g. The probability it will rain today is 0.7. What is the probability it won't rain today?</p>	<p><b>Probability of an event NOT happening</b></p> <p>If <math>P(\text{event}) = p</math></p> <p><math>P(\text{event NOT happening}) = 1 - p</math></p> <p>e.g. <math>P(\text{rain}) = 0.7</math></p> <p><math>P(\text{not rain}) = 1 - 0.7 = 0.3</math></p>

<p>S3.3</p> <p>Use a sample space to find the probability of a combined event</p> <p>e.g. A dice is rolled and a spinner is spun and the scores are added together. Create a sample space diagram to show all possible outcomes from spinning a spinner and rolling a dice.</p> 	 <table border="1"><tr><th></th><th colspan="6">Dice</th></tr><tr><th>+</th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th></tr><tr><th>1</th><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><th>2</th><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><th>3</th><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr><tr><th>4</th><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr></table>		Dice						+	1	2	3	4	5	6	1	2	3	4	5	6	7	2	3	4	5	6	7	8	3	4	5	6	7	8	9	4	5	6	7	8	9	10
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3	4	5	6	7	8	9																																					
4	5	6	7	8	9	10																																					
<p>S3.4</p> <p>Use the property that the sum of mutually exclusive probabilities is 1</p> <p>e.g. If outcomes A and B are mutually exclusive and the probability of A occurring is 0.47 ... what is the probability of B occurring?</p>	<p>If 2 outcomes cannot occur together they are mutually exclusive</p> <p>If 2 outcomes A and B are mutually exclusive</p> $P(A) + p(B) = 1$ $1 - P(A) = P(B)$ $1 - 0.47 = P(B)$ $P(B) = 0.53$																																										

## S3: Probability

### Calculate relative frequency

Understand the limitations and use of relative frequency

Draw a tree diagram for independent events

<p>S3.5</p> <p>Calculate relative frequency</p> <p>e.g. St Benedict's Football Club has won 7 matches out of the 10 this season. What is the probability they will win their next match?</p>	<p>Relative frequency =</p> $\frac{\text{Number of times outcome occurs}}{\text{Total number of trials}}$ $= \frac{7}{10}$ $= 0.7$
<p>S3.6</p> <p>Understand the limitations and use of relative frequency</p> <p>e.g. Lily scored 4 out of the 10 shots during netball training. Lily says "The probability of me scoring is 40%". Is Lily correct? How could Lily improve the accuracy of her estimate?</p>	<p>Yes Lily is correct.</p> $\frac{4}{10} = 40\%$ <p>Increase the amount of trials. The more times that an experiment has been carried out, the more reliable the relative frequency is as an estimate of the probability.</p>

<p>S3.7</p> <p>Draw a tree diagram for independent events</p> <p>e.g. The probability Jane is late for school is 0.2. What is the probability she is only late one day on Monday and Tuesday next week?</p>	<p>The probability that Jane is late = 0.2</p> <div style="display: flex; justify-content: space-around;"> <div> <p>Day 1</p> <p>late 0.2</p> <p>not late 0.8</p> </div> <div> <p>Day 2</p> <p>late - 0.2 x 0.2 = 0.04</p> <p>(1 - 0.2 = 0.8)</p> <p>not - 0.2 x 0.8 = 0.16</p> <p>late - 0.8 x 0.2 = 0.16</p> <p>not - 0.8 x 0.8 = 0.64</p> </div> </div> <p>To find the probability of late on only one day:</p> <div style="display: flex; justify-content: space-around;"> <div> <div style="border: 1px solid black; padding: 5px; display: inline-block;">             day1 &amp; day2 late not late           </div> <div>OR</div> <div style="border: 1px solid black; padding: 5px; display: inline-block;">             day1 &amp; day2 not late late           </div> </div> <div style="text-align: right;"> <p>= 0.16 + 0.16</p> <p>= <u>0.32</u></p> </div> </div>
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### S3: Probability

Draw a tree diagram for dependent events

Add two probabilities using the OR rule

Multiply two probabilities using the AND rule

<p><b>S3.8</b> Draw a tree diagram for dependent events</p> <p><b>And</b></p> <p><b>S3.11</b> Calculate probabilities from a tree diagram</p> <p>e.g. A jar consists of 21 sweets. 12 are green and 9 are blue. William picked one sweet and then picked another without replacing the first.</p> <p>Draw a tree diagram to represent the experiment and find the probability that both sweets are blue.</p>	<p><b>First sweet</b>      <b>Second sweet</b>      <b>Outcomes</b>      <b>Probability</b></p> <p> <math>\frac{12}{21}</math> (G)      <math>\frac{11}{20}</math> (G, G)      <math>\frac{12}{21} \times \frac{11}{20} = \frac{11}{35}</math>  <math>\frac{9}{21}</math> (B)      <math>\frac{9}{20}</math> (G, B)      <math>\frac{12}{21} \times \frac{9}{20} = \frac{9}{35}</math>  <math>\frac{9}{21}</math> (B)      <math>\frac{12}{20}</math> (B, G)      <math>\frac{9}{21} \times \frac{12}{20} = \frac{9}{35}</math>  <math>\frac{8}{20}</math> (B, B)      <math>\frac{9}{21} \times \frac{8}{20} = \frac{6}{35}</math> </p> <p>After 1 green sweet is taken, we have 20 sweets left of which 11 are green and 9 are blue.</p> <p>After 1 blue sweet is taken, we have 20 sweets left of which 12 are green and 8 are blue.</p> <p><b>P(both sweets are blue) = P(B, B)</b></p> $= \frac{9}{21} \times \frac{8}{20} = \frac{6}{35}$
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<p><b>S3.9</b> Add two probabilities using the OR rule.</p> <p>e.g. The probability of picking a spade from a deck of cards is <math>\frac{1}{4}</math>. The probability of picking a club from a deck of cards is <math>\frac{1}{4}</math>. What is the probability of picking a spade or a club?</p>	<p><math>P(A \text{ or } B) = P(A) + P(B)</math></p> <p>Use this addition rule to find the probability of either of two mutually exclusive events occurring.</p> $P(S \text{ or } C) = P(S) + P(C)$ $= \frac{1}{4} + \frac{1}{4}$ $= \frac{2}{4} = \frac{1}{2}$
<p><b>S3.10</b> Multiply two probabilities using the AND rule.</p> <p>e.g. A fair die is rolled. What is the probability that the number is even and less than 4?</p>	<p><math>P(A \text{ and } B) = P(A) \times P(B)</math></p> <p>Use this multiplication rule to find the probability of both of two independent events occurring.</p> $P(E \text{ and } <4) = P(E) \times P(<4)$ $= \frac{1}{3} \times \frac{1}{2}$ $= \frac{1}{6}$

## S3: Probability

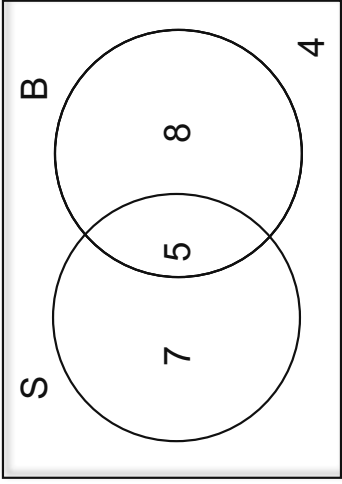
Draw a Venn diagram from given information or probabilities

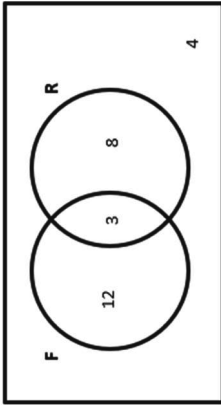
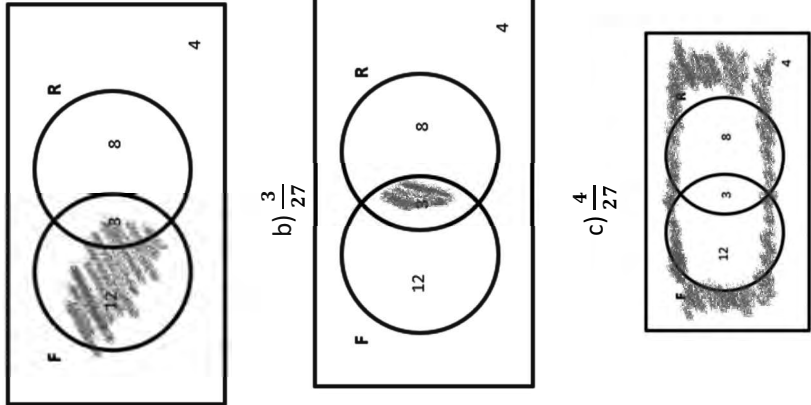
Use set notation

<p>S3.12</p> <p>Draw a Venn diagram from given information or probabilities.</p> <p>e.g. Draw a Venn diagram to show categories of “Things that fly” and “Animals” for the following;</p> <ul style="list-style-type: none"> <li>• Pig</li> <li>• Hot Air Balloon</li> <li>• Pen</li> <li>• Bat</li> <li>• Lion</li> <li>• Kite</li> <li>• Duck</li> </ul>	<p>1. Draw a rectangle</p> <p>2. Draw two or three circles according to how many categories you have. There are two categories in the sample question: Make sure the circles overlap.</p> <p>3. Write your items in the relevant circle. If items fit both categories, write those where the circles overlap (the “intersection”).</p> <p>4. If you have something which doesn’t fit a category (pen) write it within the rectangle but outside the circles.</p> <div> </div>	<p>S3.13</p> <p>Use set notation</p> <p>e.g. Write the three areas shaded set notation.</p> <div> </div>	<p><b>U: Union of two sets.</b> Things that are in either set A <u>or</u> set B</p> <p><math>\cap</math>: <b>Intersection of two sets.</b> Things that are in set A <u>and</u> also in set B.</p> <p><b>A': Complement of a set.</b> The elements <u>not</u> in Set A.</p> <p>1. <math>A \cap B</math></p> <p>2. <math>A \cup B</math></p> <p>3. <math>A'</math></p>
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### S3: Probability

Use intersection, union and complement with sets and Venn diagrams  
Find probabilities using a Venn diagram

<p>S3.14</p> <p>Use intersection, union and complement with sets and Venn diagrams.</p> <p>e.g. Mr Peake asks 24 pupils in his class about their families. He sorts them into: S - Has sisters B - Has brothers</p> <p>He then displays his findings in a Venn diagram.</p> <p>Using this Venn diagram, work out:</p> <ol style="list-style-type: none"> <li>1. <math>S \cap B</math></li> <li>2. <math>S' \cap B</math></li> </ol>	
<p>(See previous page for Set Notation)</p> <ol style="list-style-type: none"> <li>1. Means <math>S \cap B</math> so people who have sisters and brothers - the intersection.</li> </ol> <p>= 5</p> <ol style="list-style-type: none"> <li>2. <math>S'</math> means NOT S. <math>\cap B</math> Means AND B</li> </ol> <p>There are 12 people who do not have sisters but only 8 of those don't have a brother.</p> <p>= 8</p>	

<p>S3.15</p> <p>Find probabilities using Venn diagrams</p> <p>e.g. The Venn Diagram below shows if students play Football or Rugby.</p> <p>A pupil is chosen at random. What is the probability:</p> <ol style="list-style-type: none"> <li>a) They play football</li> <li>b) They play football and rugby</li> <li>c) The don't play either</li> </ol>	
<p>Total number of students = <math>12 + 3 + 8 + 4 = 27</math> This is the denominator!</p> <p>a) <math>12 + 3 = 15</math> <math>\frac{15}{27}</math></p> <p>b) <math>\frac{3}{27}</math></p> <p>c) <math>\frac{4}{27}</math></p>	

### S3: Probability

Calculate conditional probability

Use formula to prove two events are independent

<p>S3.16</p> <p>Calculate conditional probability.</p> <p>e.g. The probability that a tennis player wins the first set of a match is <math>\frac{3}{5}</math>.</p> <p>If she wins the first set, the probability that she wins the second set is <math>\frac{9}{10}</math>.</p> <p>If she loses the first set, the probability that she wins the second set is <math>\frac{1}{2}</math>.</p> <p>Given that the tennis player wins the second set, find the probability that she won the first set.</p>	<p>First, represent the information on a tree diagram:</p> <p>From the tree diagram, the probability of winning the second set = <math>\frac{27}{50} + \frac{10}{50} = \frac{37}{50}</math>.</p> <p>This means that in every 50 matches, she may win the second set 37 times (37 becomes the denominator of the conditional probability). Out of those 37 times, on 27 occasions she won the first set and on 10 occasions she lost the first set.</p> <p>Therefore, given that she wins the second set, the probability she won the first set is <math>\frac{27}{50}</math>.</p> <p>There is also a formula that can be used for conditional probability:</p> $P(A \text{ given } B) = \frac{P(A \text{ and } B)}{P(B)} = \frac{\frac{27}{50}}{\frac{37}{50}} = \frac{27}{37}$
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<p>S3.17</p> <p>Use formula to prove two events are independent</p> <p>e.g.</p> <p>You toss a coin and roll a dice. Are these events independent?</p>	<p>An independent event is an event that has <b>no connection</b> to another event's chances of happening.</p> <p>Events A and B are independent if:</p> $P(A \cap B) = P(A) \times P(B).$ <p>P (5 on the dice) = <math>\frac{1}{6}</math></p> <p>P (Heads) = <math>\frac{1}{2}</math></p> <p>P (5 and Head) = <math>\frac{1}{12}</math> (a sample space would show this)</p> <p>Since <math>\frac{1}{6} \times \frac{1}{2} = \frac{1}{12}</math> they are independent.</p>
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### S3: Probability

#### Find combinations and permutations

<p>S3.18</p> <p>Find combinations and permutations.</p> <p>e.g. A pizza restaurant offers a choice of toppings: ham (H), pepperoni (P), mushroom (M) and chicken (C). How many ways can two different toppings be chosen?</p> <p>e.g. A man owns three cars: 1 red, 1 blue and 1 white. How many ways can they be parked on his drive?</p>	<p>When you make a selection of items from a group and the order doesn't matter, it is a <b>Combination</b>. Like ingredients in a smoothie - they're all getting blended together!</p> <p>List the combinations: HP, HM, HC, PM, PC, MC. There are 6 combinations.</p> <p>When you select all the items in a group and the order <b>does</b> matter it is a <b>Permutation</b>. Like the code to a safe - it only works if you put the numbers in in the right order.</p> <p>List the permutations: RBW, RWB, BWR, BRW, WRB, WBR. There are 6 permutations.</p>
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## Year 8 Religious Studies

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Catholic Social Teaching (CST)

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## 1. What is faith?

Key Words	
<b>Faith</b>	Complete trust in someone or something
<b>Discipleship</b>	Teaching rules and morals for life Modelling the rules and guiding others
<b>Justice</b>	Working for the rights of others to be met Being driven to an action by a lack of equality
<b>Prophet</b>	A person God has chosen Delivers a message or information to other humans
<b>Idolatry</b>	Worshiping items in place of God Devoted to items that represent God
<b>Omnipotence</b>	All powerful nature of God Nothing is beyond God's ability
<b>Prayer</b>	A submission to God's will and authority A religious observance to connect with God
<b>Surrender</b>	To give all your being to another To make yourself vulnerable

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## 2. What is faith?

### Abraham

#### Who was he?

First called Abram (The Father is exalted)

Later called Abraham (Father of Many Nations)

Lived in Ur, Mesopotamia

God called him to move to a new land

God granted him a son – Isaac

#### Showed faith because:

Believed all promises God made to him.

Trusted in God's voice.

Built two altars for God;

Entered a covenant relationship with God.

### Blessing

I will bless those who bless you, and whoever curses you I will curse; and all peoples on earth will be blessed through you."

**Genesis 12**

### Promised land

"I am the LORD, who brought you out of Ur of the Chaldeans to give you this land to take possession of it."

**Genesis 15**

### Descendants

"Look up at the sky and count the stars—if indeed you can count them." Then he said to him, "So shall your offspring be."

**Genesis 15**

### Covenant

An agreement between two people or groups

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### 3. What is faith?

#### **Elijah**

##### **Who was he?**

Name means "Yahweh is my God"

Lived alone in the desert

Sent to guide people out of corruption and suffering

Performs 'miraculous acts' because of his faith in God

##### **Showed faith because:**

Challenged Ahab to demonstrate Baal (a god) against his God

Covered his sacrifice in water and prayed to God

God set the sacrifice on fire

God ended the drought

The people turned away from Ahab and back to God

Answer me, O Lord,  
answer me, so these people will know that you, O Lord, are  
God,  
and that you are turning their hearts back again.

**1 Kings 18**

#### **Elijah**

A prophet of God

#### **Ahab**

A king driven by greed and power

#### **Baal**

The god of Ahab

#### **Yahweh**

The God of Israel

#### **Sacrifice**

An offering made to a god  
Normally animals

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### 4. What is faith?

#### **Amos**

##### **Who was he?**

A prophet of the Old Testament

Lived a simple and humble life

A shepherd and farmer

Had a heart for the voiceless and oppressed

##### **Showed faith because:**

Did not know how to be a prophet, just did it

Spoke about the corruption of people directly to them

Holds people accountable for their actions

He went to a foreign country to speak God's word

He risked his life questioning people's actions

"I'm not a professional prophet...

...I'm just a shepherd, and I take care of sycamore-fig trees...  
...the Lord called me away from my flock and told me, 'Go and  
prophecy to my people in Israel.'

**Amos 7**

"The people of Israel have sinned again and again,  
and I will not let them go unpunished!  
They sell honourable people for silver  
and poor people for a pair of sandals.

**Amos 2**

#### **Meaning of Amos**

God has called Christians not only to be in relationship with  
Him but also to be in relationships with others

Both the physical and the spiritual needs of people matter  
in God's scheme of justice

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## 5. What is faith?

### What is a Saint?

A saint is someone who has been perfected and is in Heaven with God.

A saint is a person who is recognised by the Catholic Church as having lived a life of **heroic virtue** while on earth.

Saints were not always perfect people on earth – they are human beings, too!

The process of **canonization** is how a person becomes a saint.

After death, a **bishop** opens a **cause for canonization** for a candidate. This is when a person becomes known as a **Servant of God**.

The person is then investigated to see if they have lived a life of **heroic virtue**. This allows the person to be declared 'Venerable'.

Once a Venerable, the person must have a **miracle** attributed to their intercession of prayers. When this is confirmed, the person is declared **Blessed** by the Pope.

After **beatification** (becoming **Blessed**), a **second miracle** must have occurred in order for the person to be declared **Saint**. The person may then be venerated as a Saint.

### The Communion of Saints

The **communion of saints** is the spiritual union of the members of the Christian Church, living and the dead

Each member contributes to the good of all and shares in the welfare of all.

Catholics profess their belief in the Communion of Saints in the **Nicene Creed**.

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## 6. What is faith?

### Mary

Mary was a young woman betrothed to Joseph, a carpenter of Nazareth. Her family came from the line of King David, a person of great faith in God.

When living at her parent's house and before her wedding to Joseph, Mary was visited by the Angel Gabriel, according to the Gospel of Luke.

The Angel told her that she was highly favoured by God and was to bear his child, who was to be named Jesus and was the promised Messiah.

Mary could not understand this, as she was a virgin. She is known as the Virgin Mary as she conceived via the Holy Spirit.

Mary only is mentioned at two events later on in the Gospels – at the Wedding at Cana, where she influenced Jesus' first miracle, and at the foot of the cross when Jesus was crucified.

### Mary as a role model

Mary is seen as a role model for the Church, thanks to her showing the ideal characteristics:

#### Faith

"Blessed are you who believed", Mary shows great faith when the angel tells her she will be the mother of God's child.

#### Charity

Mary supported her cousin Elizabeth, when she too was pregnant.

Mary encouraged Jesus to perform his first miracle at the Wedding in Cana, when the wine had run out.

#### Discipleship

"Behold, I am the handmaid of the Lord. May it be done to me according to your word."

Mary confronted her own fears and she entered into a new way of living, following God and Jesus.

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## 7. What is faith?

### The Rosary

A prayer seeking the intercession of Mary

Recognises the **role and importance** of Mary

Uses mysteries (parts of Jesus' life) to meditate on

Hail Mary full of grace The Lord is with thee.

**Luke 1:28**

Blessed art thou amongst women and Blessed is the fruit of thy womb, Jesus.

**Luke 1:42**

Holy Mary, mother of God,

**Luke 1:43**

Pray for us sinners now, and at the hour of our death.

**James 5:16**



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## 8. What is faith?

### Joyful Mystery of the Rosary

#### The Annunciation of the Lord to Mary

Mary is chosen to be the mother of Jesus.

#### The Visitation of Mary to Elizabeth

Elizabeth recognizes Mary as the mother of our Lord.

#### The Nativity of our Lord Jesus Christ

Jesus is born and laid in a manger.

#### The Presentation of our Lord

Jesus is presented in the Temple of Jerusalem.

#### Finding Jesus in the Temple at age 12

Jesus is found discussing God's laws in the temple.

### Sorrowful Mystery of the Rosary

#### The Agony of Jesus in the Garden

Jesus prays when confronted with the sins of the world.

#### The Scourging at the Pillar

Jesus is whipped before His execution.

#### Jesus is Crowned with Thorns

Jesus is mocked with a painful crown of thorns.

#### Jesus Carried the Cross

Jesus carries the weight of our sins to His crucifixion.

#### The Crucifixion of our Lord

Jesus Christ dies to save all mankind.

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## 9. What is faith?

### **Glorious Mystery of the Rosary**

#### **The Resurrection of Jesus Christ**

Jesus rises triumphant over death.

#### **The Ascension of Jesus to Heaven**

As Jesus ascends, He gives us a special task.

#### **The Descent of the Holy Ghost**

At Pentecost the Church is born.

#### **The Assumption of Mary into Heaven**

The Virgin Mary is gloriously assumed into heaven.

#### **Mary is Crowned as Queen of Heaven and Earth**

Mary is honoured above all creatures.

### **Luminous Mystery of the Rosary**

#### **The Baptism in the Jordan**

God proclaims Jesus is His Son.

#### **The Wedding at Cana**

Jesus performs a surprising miracle at a wedding.

#### **The Proclamation of the Kingdom**

Jesus calls us to do something important.

#### **The Transfiguration**

Jesus is gloriously transformed.

#### **The Institution of the Eucharist**

Jesus shares His Body and Blood for our salvation.

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## 10. What is faith all about?

### **Catholic Social Teaching**

How Catholics should think about their role in the world

Helps Catholics to make decisions and take action

Guided by the Popes of the past and present

#### **CST Principles**

Dignity of the Human person

Solidarity

Community and Participation

Dignity in work

Peace and reconciliation

Care for creation

Dignity in work

"For, by his Incarnation, he, the son of God, in a certain way united himself with each man"

**Vatican II**

We are all one family in the world...

...through each of us respecting each other's dignity, rights and responsibilities makes the world a better place to live.

**Saint John Paul II**

#### **Key Words**

<b>Dignity</b>	The right of a person to be loved and respected
<b>Encyclical</b>	A letter sent from the Pope to the Catholic church
<b>Magisterium</b>	The teaching authority of the Catholic church

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## 11. What is faith?

### Principles of Catholic Social Teaching

#### Dignity

Catholics believe every human person is made in the image and likeness of God.

Catholics believe all humans are all infinitely loved by God.

God is present in every human person, regardless of religion, culture, nationality, orientation or economic standing.

Every person is **unique** and **beautiful**.

Catholics are called to treat every person and every creature with loving respect.

#### Solidarity

Solidarity arises when humans remember that they should work together.

Catholics believe the Eucharist unites all people.

Catholics know that they should work with others to help those in need, especially the poor.

#### The common good

The common good means that the fruits of the earth belong to everyone.

No one should be excluded from the gifts of creation.

Humankind has always put money at the centre of everything.

Catholics believe emphasis should be put onto the natural world.

Resources are finite, so humans should be careful with their use.

#### Option for the poor

The option for the poor reminds Catholics of God's preferential love for the poorest and most vulnerable people.

God's love is universal; he does not side with oppressors, but loves the humble.

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## 12. What is faith?

### Principles of Catholic Social Teaching

#### Peace

Peace is a cornerstone of Christianity.

Christ, the Prince of Peace, sacrificed himself on the cross.

In 1963, Pope John XXIII published **Pacem in Terris** (Peace on earth).

It was a dangerous time for humanity; with the rise of nuclear weapons and the building of the Berlin Wall.

The Pope's letter urged the world to seek peace.

#### The dignity of work and participation

In 1891, Pope Leo XIII shone a light on the injustice and exploitation of workers by the rich during the Industrial Revolution.

Humans should always come before the pursuit of profit.

Workers have the right to join trade unions, to a just wage, to spend time with their families and to rest.

#### Creation and Environment

The first pages of the Bible teach Christians about how God created the sun and the stars, the water and earth, and every creature.

In 2015, Pope Francis brought together decades of Church teaching in the encyclical, **Laudato Si'**.

Pope Francis invites everyone on the planet to consider how their actions are affecting the earth and the poorest people.

Everything is interconnected, and all of creation praises God.

It is the Christian vocation to care for creation.

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#### 9. Who is in the Bible?

Daniel

Jonah

#### 10. Who is in the Bible?

Women in the Bible

#### 11. Reading The Bible

Stained Glass

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### 1. What is the Bible?

Key Words	
<b>Revelation</b>	To make known something that was previously unknown The way God makes himself known to humans
<b>Inspiration</b>	God guides a person to write or act what is good and true The bible is inspired by God as it gives truth
<b>Literal</b>	The idea that something is exactly as it says The belief that the bible is factually accurate
<b>Liberal</b>	A text has a deeper meaning The belief that the bible is not accurate in what happened The bible is accurate in the messages and truth contained within it
<b>Context</b>	The period a story or event is set within To look at the full setting to help with full understanding The information before and after a text that clarify its meaning
<b>Interpretation</b>	To explain the meaning of something The way in which someone applies their understanding to scripture
<b>Testament</b>	A text written as a source of evidence The bible has two testaments focussing on two different key events
<b>Scripture</b>	The sacred writings of a religion The bible contains Christian scripture

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## 2. What is the Bible?

### What is it?

The source of Christianity's main beliefs  
Writings that were inspired by God  
Written over thousands of years  
Written by several authors  
Passed down by word of mouth  
Written so as not to forget it  
Structure of books agreed by Pope Damasus I

### When was it written

Approximate Dates  
Old Testament – 1445BC – 1BC  
New Testament – 44AD - 96AD

### Books of the Catholic Bible

46 Old Testament books  
27 New Testament books

### Translations

Written in multiple languages, Hebrew, Aramaic, Greek  
Translated into multiple languages  
Each language has a unique way to translate words  
Mistranslations lead to misunderstandings  
The Catholic church accepts 8 English translations

### Categories of Books

Law	Prophets
History	Letters
Poetry	Revelation
Early Church	
Gospel	

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## 3. What is the Bible?

### How to read the Bible

The Bible is split into the Old and New Testaments.  
The Testaments are made up of different books from a variety of authors.  
Testament means covenant. The Old Testament is about the old covenant with Abraham and Moses, the New Testament is about the new covenant with Jesus.  
The books are made up of chapters, like any other book.  
These chapters are numbered from 1 onwards.  
The chapters are then made up of verses, which are numbered.  
To make it easier to find a particular passage in the bible, references can direct a person to the correct place.

### Bible references

The shortest Bible passage is found in the Gospel of John, chapter eleven, and the fifth verse.

References are always written in the same format to help locating text more easily:

### Book Chapter: Verse

So John chapter eleven verse five is written as

### John 11:5

Any passages that include multiple verses looks like the following

### Exodus 20:2-17

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#### 4. What is the Bible?

##### God in the Bible

God is the greatest being that can be thought of.

God's characteristics are **revealed** through the Bible.

**Omnipotent** – God is an all-powerful being who can create an entire universe from nothing.

**Omniscient** – God is all-knowing and knows all possible realities.

**Omnibenevolent** – God is all-loving and gave us a perfect world to live on.

**Transcendent** – God is outside of time and space, which is how God was able to create the universe.

**Personal** – God can be known and experienced as any other person.

**Eternal** – God has always, and will always, exist.

**Immanent** – God is nearby and is with us.

##### Creator

In the beginning God created the heavens and the earth. Now the earth was formless and empty, darkness was over the surface of the deep, and the Spirit of God was hovering over the waters. And God said, "Let there be light," and there was light.

**Genesis 1**

##### Law Giver

For the LORD is our judge; the LORD is our lawgiver; the LORD is our king; he will save us.

**Isaiah 33**

##### The Trinity

"And the Holy Spirit descended upon Him [Jesus] in bodily form like a dove, and a voice came out of heaven, "You are My [the Father's] beloved Son, in You I am well-pleased."

**Luke 3**

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#### 5. What is the Bible?

##### Creation in the Bible

God created the universe with just God's voice.

God gave the command and then it was so.

Creation shows that God is an **omnipotent**, **omniscient** being, who is outside of time and space.

This is what Catholics call **creation ex nihilo** – creation from nothing.

Christians also learn that humans were made at the height of creation.

The world had been declared 'good' and then God created humanity.

Humans are the only beings in God's creation to have been made in God's image.

This is known as **imago dei** – the image of God.

##### Creator

In the beginning God created the heavens and the earth. Now the earth was formless and empty, darkness was over the surface of the deep, and the Spirit of God was hovering over the waters. And God said, "Let there be light," and there was light.

**Genesis 1**

##### The Soul

Then the Lord God formed a man from the dust of the ground and breathed into his nostrils the breath of life, and the man became a living being.

**Genesis 2**

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## 6. What is the Bible?

### Sources of Morality

You shall have no other gods before Me.

You shall make no idols.

You shall not take the name of the Lord your God in vain.

Keep the Sabbath day holy.

Honour your father and your mother.

You shall not murder.

You shall not commit adultery.

You shall not steal.

You shall not bear false witness against your neighbour.

You shall not covet.

Exodus 20

### The Catholic View

These are not random rules

Given as commandments for protection of our soul

Eternal happiness is the reward for following them

“Teacher, which is the greatest commandment in the Law?”

Jesus replied:

“‘Love the Lord your God with all your heart and with all your soul and with all your mind.’

This is the first and greatest commandment.

And the second is like it:

‘Love your neighbour as yourself.’

All the Law and the Prophets hang on these two commandments.”

Matthew 22

### The Catholic View

If you do not want to experience something, do not do it to others

Show love to everyone else and this fulfils the law

Do all things with God at the centre of your thought

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## 7. What is the Bible?

### Covenant in the Bible

A **covenant** is a solemn and binding agreement that can be made between two people.

There are two types of covenant, unconditional and conditional.

An **unconditional covenant** is a promise where there are no obligations that need to be met. This covenant will be kept without one party doing anything at all.

Conditional covenants are promises with certain conditions. The covenant relies on someone doing or keeping their side of the covenant.

God made covenants with his followers in the Bible.

**Noah** was an early example of someone with whom God made a covenant. God promised to never flood the earth again.

God made a covenant with **Abraham**, who is considered the founder of Judaism. Abraham proved his faithfulness to God and God promised him many things in return.

**Moses** also had a covenantal relationship with God, where God asked him to free the Israelites from slavery and to teach them the Ten Commandments. In return, God led them to the Promised Land and looked after the people.

God promises **David** a descendent who will come and extend God's kingdom over all the nations.

**Jesus** is the fulfilment of God's covenant with humanity on earth. He is the New Covenant.

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## 8. What is the Bible?

### People of God in the Bible

'I will dwell in them, and walk in them; and I will be their God, and they shall be my people'

**Ezekiel 37:27**

The People of God are God's chosen people.

In the Bible, we read about the accounts of Adam and Eve, Noah, Abraham, Moses and other important figures in Christian history.

These are the People of God.

### Characteristics of the People of God

The People of God should have certain characteristics in order to live according to God's commands.

People of God should be **loving of God** and of the people around them. They should take seriously the command to love their neighbour.

**Prayer** should form an important part in the life of a Person of God. This means they should communicate with God regularly to develop a relationship with Him.

People of God should **live by the Bible**, following the teachings and commands of God to live a life that is pleasing to Him.

People of God should be **purposeful**. Christians should use the talents God has given them well.

**Hope** plays an important part of life for the People of God. They should keep positive in all circumstances.

**Character** is something that People of God should develop. They should be spiritually renewed even throughout their years.

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## 9. What is the Bible?

### Daniel

Daniel is a prophet who was taken captive by the Babylonians.

He became known for interpreting dreams and became favoured by the king.

Daniel was faithful to the God of Abraham, which was not liked by the King's court officials.

The King passed a law to ban worship to anyone other than the King.

Daniel continued to pray to God.

Daniel was caught and had to be punished.

Daniel was thrown into a lion's den but through the grace of God survived.

Daniel's story teaches Christians to always be faithful to God, no matter what.

God should be put first and Christians should not be persuaded to stray from worshipping God.

### Jonah

God called to Jonah to preach to the people of Nineveh.

Jonah was terrified at the thought of this, as the people of Nineveh were dangerous.

Jonah tried to escape from God by going to Tarshish on a boat.

God sent a storm and once Jonah was identified as the cause of the storm, he was thrown overboard.

Jonah was swallowed by a big fish, where he remained for three days.

Jonah realised that he should obey God and went to Nineveh to preach.

The Ninevites repented and turned to God.

Jonah's account teaches Christians to obey God.

God has a plan for each of us and therefore we should listen to God's call.

Through God, all things are possible, including the impossible.

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## 10. What is the Bible?

### Women in the Bible

#### Hagar

Hagar was the slave of Abraham's wife, Sarah.  
Hagar was given to Abraham to have his child because Sarah could not.  
Sarah became jealous of Hagar and Ishmael and cast her out, so Hagar and her son fled and lived in the desert.  
Hagar's account teaches that God will not abandon anyone in their time of need.

#### Esther

Esther became Queen in the Persian Empire.  
The King's advisor wanted the King to kill all Jews in Persia.  
Queen Esther risked her life to speak to the King on behalf of the Jewish people.  
Esther is an example of courage, selflessness and faith in God.

#### Ruth

Ruth lived with her mother-in-law Naomi at a time when women were looked after by men. They had no support.  
Ruth worked hard to support her and Naomi.  
Boaz noticed her and got the other workers to leave extra food for her.  
Naomi convinces Ruth to speak to Boaz to offer herself as a servant and he be her **family redeemer**.  
Ruth was not an Israelite, but she converted after marrying Boaz.

#### Deborah

Deborah was a female prophet and judge.  
She showed strength and courage in the face of battle.  
Deborah also sought guidance from God when settling arguments as a judge.  
Deborah is bold and makes decisions when needed

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## 11. What is the Bible?

### Stained glass

To tell stories from the Bible  
To inspire congregations to reflect on God  
To inspire the ideas of God into the people  
  
In medieval times. Most of the world was illiterate and could not afford bibles  
  
Stained glass windows was essentially that of a picture book  
  
Churches used stained glass windows as a way to teach those who could not read

Colour of stained glass	Meaning of the stained glass colour
Red	Christ's blood, sacrifice, martyrdom, love, hate
Blue	The sky, heaven, sincerity, creation, hope, holiness (Virgin Mary)
Green	Nature, growth, rebirth, life over death
White	Innocence, purity and chastity, associated with God
Black	Death, regeneration
Yellow	Teachery and betrayal (Judas), but if golden, divinity, power and glory
Violet	Love, truth, passion, suffering
Purple	Suffering and pain, also used to depict royalty or God the Father
Grey	humility and mourning and can also be seen representing the immortality of the spirit.
Brown	Used as a symbol of spiritual death and renunciation of worldly things.
Rainbow	A happy depiction of the union and God's covenant with humanity.

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## Year 8 Religious Studies

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Sacrament of the Sick

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### 1. Sin and Forgiveness

Key Words	Definition
<b>Sin</b>	An action that goes against the will and law of God Breaks the bond between the soul and God
<b>Forgiveness</b>	To pardon someone for their offense To recognise human weakness and imperfection
<b>Origin</b>	The beginning of something The very first occasion of something
<b>Covenant</b>	An agreement between two or more people God made covenants with humans
<b>Teaching</b>	Passing on wisdom and knowledge between generations Principles and rules from an authority such as the Church
<b>Reconcile</b>	To restore a relationship back to its fullest To remove all consequence of previous actions
<b>Sacrament</b>	An outward sign of an inward Grace The way Catholics fully participate in God's love
<b>Atheist</b>	A person who does not believe in any god

#### God is:

**Omnipotent** - All Powerful

No limits to God's power

**Omniscient** - All Knowing

God knows all there is to know

**Omnipresent** - All Present

God is in all places at all times

**Omnibenevolent**- All Loving

God desires absolute good for all

**Eternal**- No beginning or end

God is existence itself,

Everything exists because of God

**Transcendent** – unrestricted

God is not physical

Not contained by laws of space and time

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## 2. Sin and Forgiveness

### Origin of Evil

#### Bible

Some Christians think evil is a result of **Original Sin**  
Original Sin is the sinful nature of all humans  
Original Sin comes from Adam and Eve

#### Bible

Other Christians think Adam and Eve are real  
Adam and Eve bit the fruit that introduced evil  
Evil exists because of what they did

### Types of Evil

#### Moral Evil

God is **omnibenevolent** so made the world **good**  
Suffering exists because of human **freewill** and sin  
Humans can make good or bad choices  
Good choices result in more goodness in the world  
Bad choices result in evil and suffering

#### Natural Evil

Events that cause suffering that **occur naturally** in the world  
Examples are earthquakes, tidal waves, hurricanes.  
Humans have little to no control over this type of evil.

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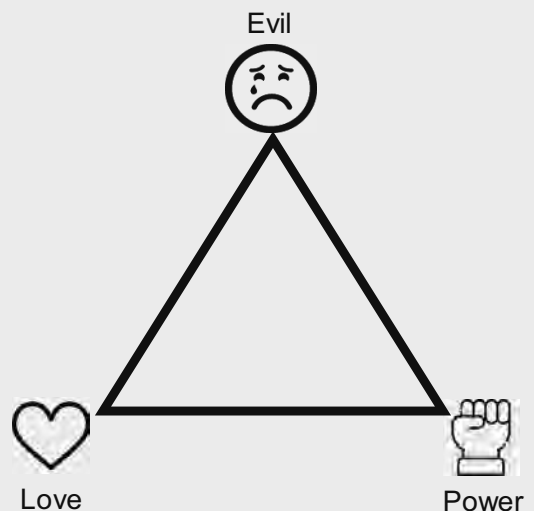
## 3. Sin and Forgiveness

### The Problem of Evil

Evil very certainly exists, as we can see it in the world.  
This causes a problem for people who believe in God, if  
God is omnipotent and omnibenevolent.  
An all-loving God would not want humans to suffer.  
An all-powerful God would be able to stop suffering.  
Moral and natural evil still exist.  
If God is omnipotent, then God cannot be omnibenevolent  
as God doesn't love humanity enough to stop the suffering.  
If God is omnibenevolent, God cannot be omnipotent as  
God wouldn't want humans to suffer but doesn't have the  
ability to stop it.

### Mackie and the Inconsistent Triad

If evil exists, then:  
God does not love humans enough to stop it  
God is not powerful enough to stop it



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## 4. Sin and Forgiveness

### Explanations of evil

#### Saint Augustine

Evil is not a real thing

Evil is what is left when people stop doing good

Evil helps humans to become better people

We can appreciate goodness more when we have experienced evil

#### John Hick

God made Evil to help humans find perfection

Through evil and suffering humans learn compassion

Evil allows humans to learn how to be good and loving

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## 5. Sin and Forgiveness

### Noah

God despairs over a fallen humanity

God removes sinfulness from the world through a flood

God sees just and godliness in Noah and his family

Noah and his family, with the animals are saved through

God's love

God releases Noah to a new life and a fresh start

God provides a rainbow as a sign he will not flood the earth again

### What do we learn from Noah?

God provides a route back to Him from sin

Just people can achieve salvation

God cleanses depth of sin through cleansing water

An early forerunner to the idea of Baptism

### The Ark

The Ark has three sections, mirroring the ancient view of the universe, Heavens, Earth, Underworld (Hell)

The Jewish temple had three sections the same as the Ark as a 'model' of the universe

Each deck of the Ark was the same height as the Jewish Temple

The Temple housed the Ark of the covenant

A Jewish synagogue still has an Ark in it to store the Torah

The Torah teaches people how to live so they might be saved by God

An Ark seeks to preserve human life and restore it to the side of God

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## 6. Sin and Forgiveness

### Job

He is a just, wealthy and good man who loves God  
Satan thinks this is only because life is easy  
Satan was allowed to test Job, but not kill him  
Job loses 10 children, all his animals and servants in one day  
He refuses to curse God but praises him instead  
Satan tests a second time with sores all over his body  
Job's wife encourages him to curse God and die  
Job cursed his wife's attitude and praised God  
Job questions God's plan with his friends  
Job curses the day he was born  
God tells Job off  
Job repents and seeks God's forgiveness  
God gives Job a more abundant life than before.

### What does the account of Job teach?

It teaches about suffering in the world  
Humans cannot give suitable answers to such deep questions

**Suffering and sin** are linked on occasion.

Our decision can lead to our suffering  
Suffering is not always linked to human sin

**Common suffering** affects all people

It is linked to living in a fallen and broken world.  
Illness, death, bad weather, financial suffering are all examples

**Godliness and suffering** are combined

Those who are godly risk persecution for their belief  
Following the teaching of the church is not always accepted

**Suffering builds us** up to be more

Through enduring suffering humans can become better people  
Compassion for others can be increased through suffering  
Eternal life is achieved through the trials of this life.

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## 7. Sin and Forgiveness

### Jesus on Sin and Forgiveness

Jesus teaches that we should live a good and pure life  
We are all sinners but still loved by God  
We should seek forgiveness for our sins  
We should not judge other people's sins as we also sin  
We should forgive all others who hurt us

Our Father, who art in heaven...  
Forgive us our sins  
As we forgive those who sin against us.  
Lead us not into temptation  
But deliver us from Evil

**The Lord's Prayer**  
**Luke 11**

A woman is guilty of adultery  
Jewish Law says to stone her to death.  
She is brought before Jesus to see what to do  
Jesus writes in the sand without speaking.  
Jesus then speaks  
"Let him without Sin cast the first stone."  
He continues writing  
One by one the people leave  
He stands and asks the woman where her accusers are  
She speaks, "They have all gone"  
Jesus tells her "then go also, and sin no more."

**John 8**

## 8. Sin and Forgiveness

### Sacrament of Reconciliation

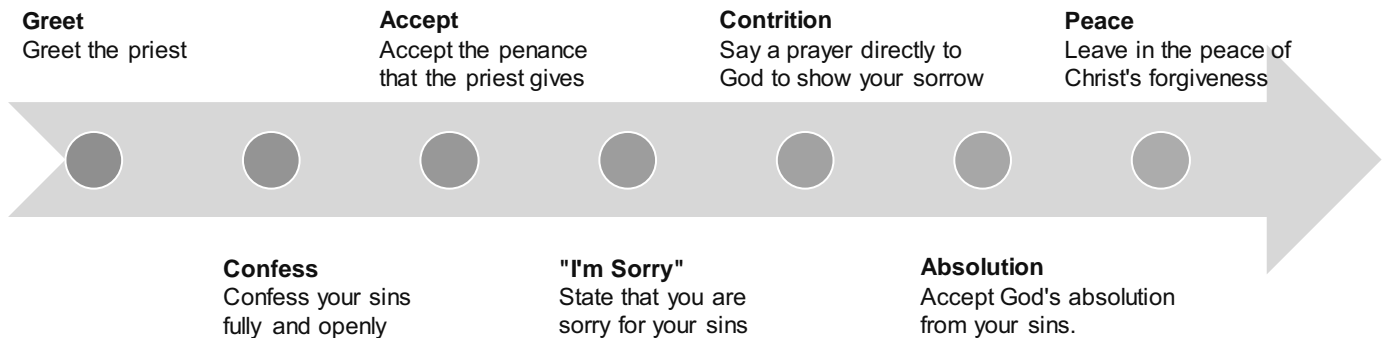
Gives space to examine your **conscience**  
Allows the person to take responsibility for their sins  
Speaking sins allowed takes ownership of actions  
Promotes a desire to change and adapt a way of life  
Penance tests resolve by completing atonement tasks  
Absolution comes from God not the priest

Baptism does snatch us from the power of sin and death and brings us into the new life...

...it does not free us from human weakness and the inclination to sin...

...need a place where we can be reconciled with God again and again.

**YOUCAT 226**



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## 9. Sin and Forgiveness

### Sacrament of the Sick

Prepares a person to cope physically and spiritually with suffering  
Recognises that human life is reliant on God  
Combines forgiveness with strengthening through the Eucharist  
Become spiritually strengthened by recognising weakness and frailty

The anointing of the sick imparts consolation, peace and strength...

Unites the sick person with Christ in his suffering...

...If God decides to call someone home to himself...gives the strength for all the physical and spiritual battles on their final journey...

...always has the effect of forgiving sins.

**YOUCAT 245**

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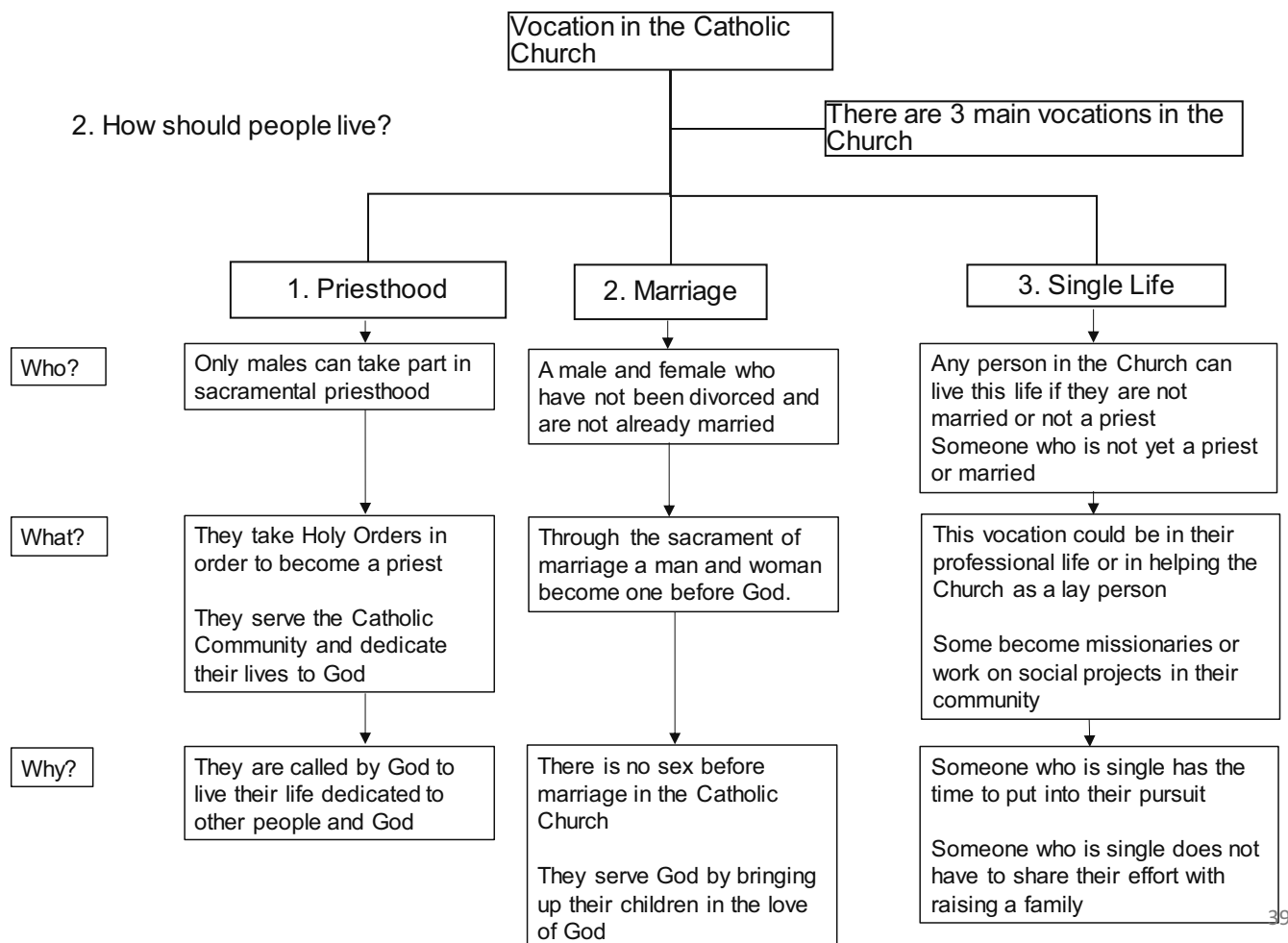
Catechesis

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## 1. How should people live?

Key Words	Definition
<b>Vocation</b>	A divine call to serve the Church or humanity Commitment to a way of life pleasing to God
<b>Confirmation</b>	Affirming oneself the promises made for them at baptism The final sacrament of Initiation
<b>Relationship</b>	An affinity between two people leading to mutual rights and duties A cause of desiring mutual good for another
<b>Mitzvah</b>	Commandment of the Jewish faith Form the basis of Jewish law
<b>Magisterium</b>	The teaching authority of the Catholic Church Sets out the position of the Church on matters of morality and faith
<b>Tradition</b>	A custom that has been present for generation after generation A way of doing things that is accepted as right
<b>Genesis</b>	The first book of the Christian bible and the Jewish Torah Sets the starting point for church teaching on life
<b>Chastity</b>	Living a life in control of sexual desires and reserving them for love Resists the temptations of self-satisfaction from sexual relationships

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### 3. How should people live?

#### Jesus as a priest

In the Old Testament, priests acted as mediators between God and humanity.

Sacrifices were offered by priests and this was part of Jewish law.

The High Priest was the only person able to offer the sacrifice on the Day of Atonement – Yom Kippur.

The sacrifice on Yom Kippur cleansed the Jewish people for an entire year.

For Christians, Jesus fulfilled this role of the High Priest.

Jesus' sacrifice removed sins of the faithful forever.

Jesus knows that the sacrifices offered by the priests were not pleasing to God, even though they were following the law of God.

Jesus' sacrifice was willing and the sacrifice of Jesus makes us all holy through the body of Christ.

Jesus' sacrifice forgives us of our sins.

Jesus is known as the Lamb of God.

Jesus is also known as the **Good Shepherd** and, like a Shepherd who looks after his flock, Jesus is a priest who looks after the faithful.

Jesus has the compassion to sympathise with the weak and pays special attention to them.

#### 4. How should people live?

##### Vocation in the Priesthood

The priesthood is a response to the call of God to serve and love Him and His people in **consecrated life**.

The priest is ordained to “stand in innocence before God’s holy altar, to proclaim the Gospel of His truth, to offer unto Him spiritual gifts and sacrifices, and to renew His people through the laver of regeneration.”

His own life is wholly dedicated to the service of God and God’s people. Priests are held accountable for all those committed to his charge.

Priests must preach the word, live a life consistent with what he teaches, administer the **sacraments**, and be a steward of the mysteries of God and live a life of prayer.

##### A priest's daily life

A diocesan priest most often lives out their vocation through service of a parish community. They do this by:

Celebrating **Mass** and administering other sacraments.

Leading the community in **prayer**.

**Visiting** those in need.

Providing for the **spiritual and temporal needs** of the people.

Priests are often called upon to provide **chaplaincy** services, in schools, universities and prisons.

A priest will be called upon to act with thoughtfulness and patience, and to show wisdom drawn from their experience, study, and prayer.

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#### 5. How should people live?

##### Confirmation

Confirmation is one of three **sacraments of initiation**. Confirmation typically takes place when a child is able to make the decision **to renew their baptismal promises** that were made on their behalf by their parents and godparents.

There is no set age for confirmation, and some Catholics receive the sacrament as an adult.

The confirmation candidate receives **the gifts of the Holy Spirit** through the imposition of hand and anointing with oils by the bishop.

Confirmation is the full outpouring of the **Holy Spirit** as once granted to the apostles on the day of Pentecost.

##### The four parts of confirmation

**Presentation of the candidate** - The individuals awaiting confirmation are summoned.

**Renewal of baptismal vows** - The individuals renew the promises made at their baptism.

**Laying on of hands** - The candidate kneels before the bishop. The Bishop reads the candidate’s chosen confirmation name. A sponsor places their right hand on the shoulder of the candidate and the bishop lays his hands on the candidate’s head. This calls down the power and blessing of God.

**Anointing with chrism** - The bishop then anoints the candidate with chrism (holy oil). The bishop makes a sign of the cross on the candidate’s forehead, saying “**be sealed with the gifts of the Holy Spirit**”.

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## 6. How should people live?

### Bar and Bat Mitzvah

A bar/bat mitzvah is a rite of passage to celebrate a Jewish boy or girl entering adulthood.

Bar means 'Son of' and Bat means 'Daughter of', with 'mitzvah' meaning 'Commandment'.

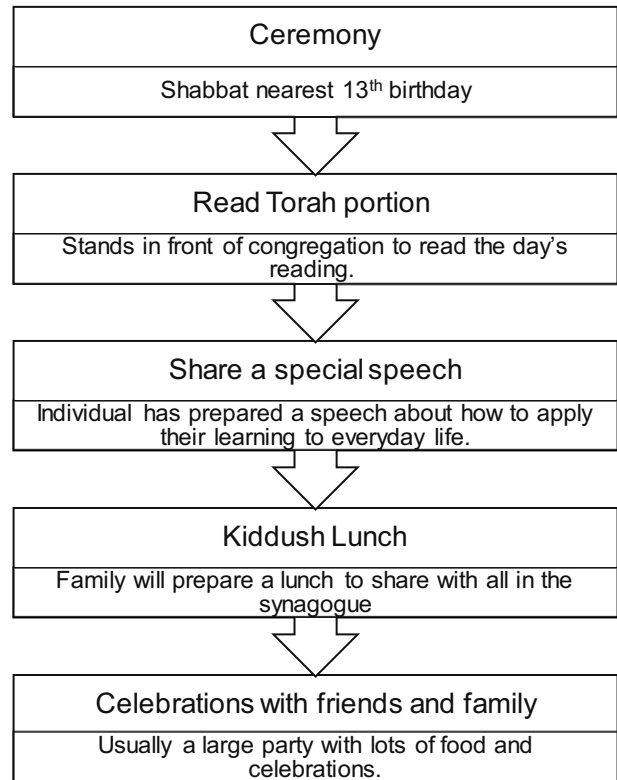
This represents the beginning of their journey to follow Jewish law in the religious community as an adult.

Boys become Bar Mitzvah at 13, whereas girls become Bat Mitzvah aged 12.

The young people have spent many years learning Hebrew and have undertaken preparation classes in readiness to become Jewish adults

Faith and dedication are intended to grow stronger after this milestone.

At this point in their life, boys will begin to wear the tefillin and tallit (prayer shawl) during prayer.



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## 7. How should people live?

### Catechesis

A Catechism is a **summary of religious belief** used to teach about the faith.

Catechism comes from the Greek work 'keto', which means to teach.

Catechesis is religious instruction given in preparation for Christian **baptism** or **confirmation**.

Jesus gave instructions to his followers to **go and continue his mission on earth**.

This ministry of teaching and forming has traditionally been referred to as catechesis.

Catechesis is a life-long process of conversion, formation, education.

Catechesis takes many forms and includes the **initiation of adults, youth and children** as well as the intentional and systematic effort to **enable all to grow in faith and discipleship**.

Then Jesus came to them and said, "All authority in heaven and on earth has been given to me. Therefore go and make disciples of all nations, baptizing them in the name of the Father and of the Son and of the Holy Spirit, and teaching them to obey everything I have commanded you. And surely I am with you always, to the very end of the age."

**The Gospel of Matthew**

Catechesis is nothing other than the process of transmitting the Gospel, as the Christian community has received it, understands it, celebrates it, lives it and communicates it in many ways.

**General Directory for Catechesis**

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## Year 8 Religious Studies

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### 1. Islam

Key Word	Definition
Allah	The Arabic word for God The one true God
Prophet	A person chosen to deliver God's message An example for other humans to follow
Qur'an	Sacred scripture of Islam Revealed to Mohamed over 23 years
Ramadan	Ninth month of the Islamic Calendar Marks the month the Qur'an was first revealed Muslims fast during daylight hours
Mecca	The holiest city in Islam Home of the Kabbah Site of mass pilgrimage
Mosque	The Islamic holy building Centre of Islamic community
Worship	How Muslims connect with God The way Muslims serve God

#### Key Beliefs

Belief in God as the only god (Allah)

Belief in the angels of God

Belief in the Qur'an and the prophets

Belief in the day of judgement and resurrection

God is responsible for everything both good and evil

"There is no God but Allah, and Muhammad is his messenger."

**Muslim profession of faith**

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## 2. Islam

### Worship and Liturgy

#### The Five Pillars

Expected to fulfil five fundamental acts of worship

Basic acts of a believing and practising Muslim

Each Pillar is a gateway to a deeper understanding

Allows a greater understanding of faith

#### Shahadah:

Sincerely reciting the Muslim profession of faith

#### Salat:

Correctly performing ritual prayer five times each day

#### Zakat:

Contributing to charity to benefit the poor and the needy

#### Sawm:

Fasting during the month of Ramadan

#### Haji:

Pilgrimage to Mecca

### Rituals

#### Shahada

Marks a young Muslim's formal entry into Islam

There is no set age for this rite

Commonly celebrated during the teenage years

#### Marriage Ritual

Witnesses observe formal offer and acceptance of marriage

There is no elaborate ceremony

The reception includes music and dancing

#### Funerals and Mourning

Recitation of prayers for the dead at the gravesite

May include a service at the funeral home

Burial of the dead takes place within 24 hours of death

#### Ramadan

Takes place in the ninth month of the Islamic calendar

It is a time of fasting and daily repentance

#### Maulid al-Nabi

Celebrates the birth of Muhammad

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## 3. Islam

### Scripture

The Qur'an is the holy book for Muslims

Revealed to the Prophet Muhammad over 23 years

Revelations are regarded as the sacred word of God

Intent is to correct errors in holy books such as the Bible

Revealed in Arabic so written in Arabic

There are 114 Surahs in the Qur'an,

Surahs are not in the chronological order of their revelation.

*Bismillahirrahmanirraheem,*

'In the name of Allah the most merciful and the most kind'.

**The first sentence of the Surahs**  
**The first thought before all action**

### Worship

Every aspect of a person's life acts as worship in Islam

Intention must be to please God

Action must be consistent with the Quran

Rituals also form the basis of worship

#### Qur'an

The Qur'an is recited during every prayer

#### Prayer

Pray at dawn, noon, mid-afternoon, sunset and night

Enables a physical and mental break from the world

Fridays have a special noon prayer, with a brief sermon

#### Mosques

The house of worship in Islam

Mosque is for prayer and as a community centre

Mosques are very active on Fridays for the noon prayer

#### Charity

Muslims must give 2.5% of their annual savings

Acknowledges that all wealth comes from God

Purifies the soul from material greed.

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## 4. Islam

### Festivals

#### Hajj

A pilgrimage to Mecca

Must be performed by every Muslim once in their life

It symbolises the unity of humankind

Muslims assemble in equality to worship God

Follows the traditions of Abraham.

#### Holy Days

The two Eid festivals mark important holy days

Eid-ul-Fitr is celebrated at the completion of Ramadan

Eid-ul-Fitr means Festival of Breaking the Fast

Eid-al-Adha falls during the days of Hajj

Both begin with a congregational prayer and a sermon

Contain festive meals, gift-giving and socialising.

### Ramadan

A month of fasting

The ninth month of the Islamic lunar calendar,

Muslims refrain from eating, drinking and sexual interaction from dawn to sunset.

Fasting instils self-restraint, provides spiritual cleansing and strengthens one's willpower.

While fasting, Muslims strive to increase charitable acts and control bad habits such as foul language, gossip and anger.

Eid-ul-Fitr  
Festival of Breaking the Fast

Eid-al-Adha  
Festival of the Sacrifice

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## 5. Hinduism

Key Word	Definition
Brahman	Ultimate, unchanging force The source and goal of all existence
Vishnu	Preserver God Protects the universe from destruction
Shiva	Destroyer God Destroys all evil Human form to guide humans
Brahma	Creator God Highest in the triad of great gods
Trimurti	Means 'three forms' Collective name of the three gods
Diwali	Festival of new beginnings Celebrates the victory of good over evil
Karma	The result of a person's actions
Moksha	Final stage of cycle of reincarnation Ultimate oneness with Brahman

### Key Beliefs

Truth is eternal

Brahman is truth and reality

The Vedas are the ultimate authority

Everyone should strive to live a good moral life

Individual souls are immortal

The goal of the Soul is to achieve Moksha

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## 6. Hinduism

### Prayer and Worship

Prayer is central to Hindu life

Popular form is to chant mantras

Yoga and meditation are devotional services

Focussed on personal forms of God

### Scripture

Known as the Vedas

Vedas means 'knowledge and wisdom'

These are unauthored and not of human writing

Vedas are revealed to divinely inspired people

Passed on from teacher to disciple

### Rituals

Hinduism is full of ritual

Benefit personal, world, peace, society and environment

Related to stages of life

Each ritual has deep meaning that may not be obvious

Hindus do not have to follow set rituals, personal choice

On the absolute reality and its planes,  
On that finest spiritual light,  
We meditate, as remover of obstacles  
That it may inspire and enlighten us.

**Gayatri mantra**

Om is the sacred sound  
Universal name of God and surrounds creation



om

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## 7. Hinduism

### Festivals

Celebrations include visiting a temple, eating special foods and exchanging gifts

### Diwali

The festival of lights

Late October or early November

Light represents knowledge

This is the Hindu New Year

### Holi

The festival which marks the coming of spring

It is held in March or April

Processions and people light bonfires

People cover each other with coloured water and powders

### Dussehra

Marks Rama's triumph over the evil Ravana

Held in September

Has dances and plays about events of the god Rama

### Kumbha Mela:

A huge bathing affair

Millions of Hindu pilgrims go to the River Ganges at Allahbad.

Atone for past mistakes

Every twelve years in January or February

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34. Photosynthesis
35. Respiration
36. Maths in science 1
37. Maths in science 2

## 1. Practical Skills Key Terms

Keyword	Definition
Anomalous result	A piece of data that does not fit the pattern i.e. odd result
Bar chart	Used for categorical (discontinuous) data. e.g. eye colour
Categorical data	Has values that are words or discrete numbers.
Continuous data	Has values that can be any number.
Correlation	A relationship between data where one increases or decreases as the other increases.
Experimental error	Variations in measurements due to the scientist, equipment or readings.
Line graph	Used when the data is continuous.
Line of best fit	A straight or curved line drawn to show the pattern of data points
Mean	An average of a set of data, calculated by adding all the values and dividing by the number of values.

Keyword	Definition
Pie chart	Diagram to show the proportions or percentages that make up a whole.
Random error	Error when the same thing is measured but different numbers are taken.
Range	The maximum and minimum values of your data.
Repeatable	When repeat readings, carried out by the same person and using the same method are close together.
Systematic error	Error due to a fault with the equipment or experimental set-up used.

## 2. Hazard Symbols and Equipment

	FLAMMABLE
	OXIDISING
	GAS UNDER PRESSURE
	CORROSIVE
	TOXIC
	MODERATE HAZARD (eg, harmful if inhaled or in contact with skin, causes eye irritation)
	HEALTH HAZARD (eg, sensitisers, carcinogens)
	ENVIRONMENTAL HAZARD

Item	Diagram	Purpose
Beaker		Used for holding solids or liquids.
Conical flask		Used for holding liquids.
Test tube and boiling tube		Test tube – holding liquids and solids. Boiling tube – heating them.
Measuring cylinder		Used to measure volumes of liquids.
Bunsen burner, tripod and gauze		Used to heat up items.

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## 3. Presenting Data

### Variables

Independent variable	The variable being deliberately changed
Dependent variable	The variable which changes as a result of hanging something else (the result)
Control variable	A variable which may affect the dependent variable, so must be kept the same.

### Presenting data in a table

Mass (g)	Extension 1 (mm)	Extension 2 (mm)	Average Extension (mm)
0	0	1	0.5
100	5	6	5.5
200	9	9	9
300	15	15	15
400	20	21	20.5
500	24	25	24.5
600	30	31	30.5

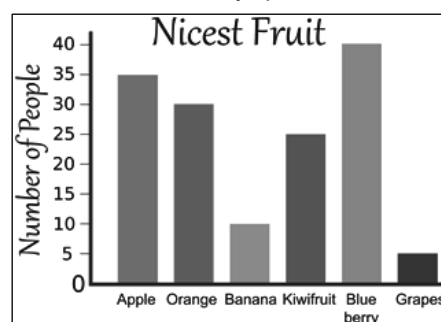
The independent variable is always in column 1.

Units should only be in the column heading.

### Presenting data as a graph

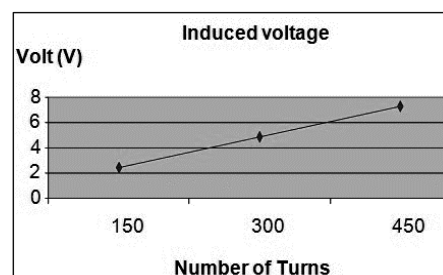
The independent variable is always plotted on the X axis.

The dependent variable is always plotted on the Y axis.



We use **bar graphs/charts** if our experiment has categories

e.g. favourite colour, shoe size, favourite animal.



We use **line graphs/charts** if the data from our experiment could be any value, height, weight etc.

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## 4. Day, Night and Seasons

### Day

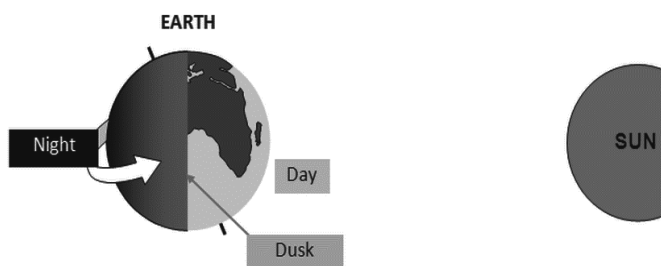
The time taken for the Earth to rotate on its axis.

This takes 24 hours

### Day and Night

The Sun lights up one half of the Earth, and the other half is in shadow.

As the Earth spins, we move from shadow to light and back again.



### Year

The time taken for a planet to orbit the Sun

The Earth orbit takes 365.25 days.

To make things easier, we call 365 days a year, and have a leap year every 4th year to add up the extra four lots of 0.25 years.

### Seasons

The Earth tilts on its axis

**Summer in the UK:** The northern hemisphere is tilted towards the Sun.

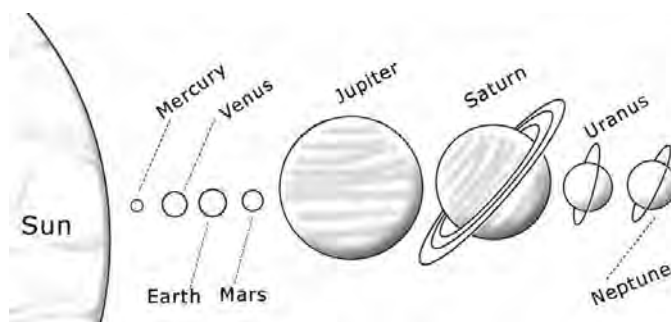
**Winter in the UK:** The northern hemisphere is tilted away from the Sun.

Light takes minutes to reach Earth from the Sun, four years from our nearest star and billions of years from other galaxies.

4

## 5. The Moon and the Universe

Keyword	Definition
Exoplanet	Planet that orbits a star outside our solar system.
Galaxy	Collection of stars held together by gravity. Our galaxy is called the Milky Way.
Light year	The distance light travels in a year (over 9 million, million km).
Orbit	Path taken by a satellite, planet or star moving around a larger body. Earth completes one orbit of the Sun every year.
Stars	Bodies which give out light, and which may have a solar system of planets.

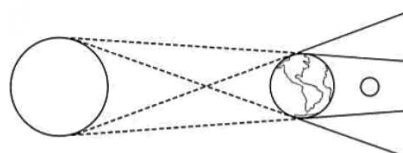


**Solar eclipse:** When the Moon comes directly between the Sun and the Earth. Part of the Earth is in the Moon's shadow.

**Result:** The sky goes dark even though it is day-time.



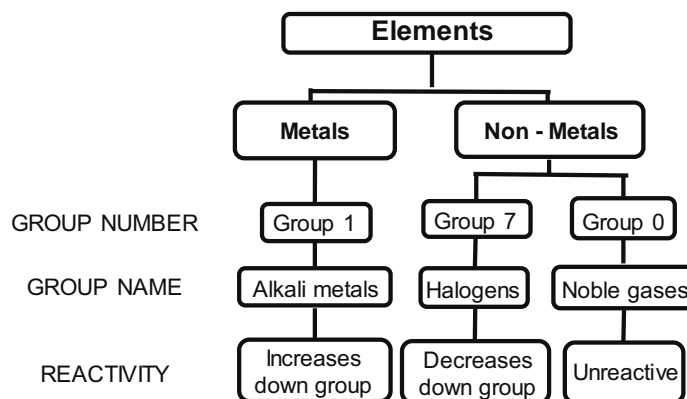
**Lunar eclipse:** when the Earth lies directly between the Sun and the Moon. The Moon lies in the shadow of the Earth.



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## 6. The Periodic Table

Keyword	Definition
Groups	Columns of the periodic table.
Periods	Rows of the periodic table.
Periodic table	Shows all the elements arranged in rows and columns in order of proton number.



### Periodic table

The periodic table is a way of representing chemical elements according to the properties and mass.

As you go down a group and across a period the elements show patterns in physical properties.

Metals are found on the left side of the table. Non-metals are found on the right of the 'staircase'.

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## 7. Elements

Keyword	Definition
Atom	The smallest particle of an element that can exist.
Chemical properties	An example is reactivity. Hard to observe, but you can react elements with other elements and see if a compound forms.
Elements	What all substances are made up of, and which contain only one type of atom.
Physical properties	Examples include colour, boiling point, conducting electricity. Something you can observe which doesn't change the substance itself.

### Symbols

All element symbols start with a capital letter.

If the next letter is lower case, it is still the same element

Ca for calcium

Cu for copper

Co for cobalt

7                      **Top number (Mass number)**

**Li**

3                      **Bottom number (Atomic number)**

**Proton**    = bottom number

**Electron**   = bottom number

**Neutron**   = top number – bottom number

7



## 8. Compounds

Keyword	Definition
Compound	2 or more elements chemically joined together e.g. H <sub>2</sub> O
Mixture	More than one element, atom compound or molecule that is not chemically joined together.
Molecules	More than one element of <u>the same</u> element chemically joined together e.g. H <sub>2</sub>
Polymer	A molecule made of thousands of smaller molecules in a repeating pattern. Plastics are man-made polymers, starch is a natural polymer.

To name simple compounds of metals and non-metals

1. Write down the name of the metal
2. Write down the name of the non-metal, changing the ending of the word to “-ide”.  
magnesium and oxygen becomes **magnesium oxide**.

### Naming complex compounds:

Chemical formula	Name
-SO <sub>4</sub>	Sulfate
-NO <sub>3</sub>	Nitrate
-OH	Hydroxide
-CO <sub>3</sub>	Carbonate

MgSO<sub>4</sub> - magnesium sulfate

NaOH – sodium hydroxide

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## 9. Chemical Formulae

### Meaning of words

Mono means 1

Di means 2

Tri means 3

Carbon dioxide = 1 carbon and 2 oxygen

Carbon monoxide = 1 carbon and 1 oxygen

### Meaning of numbers

A lower-case number next to an element tells you how many atoms of that **element** you have.

CO<sub>2</sub> Carbon dioxide

This compound has 1 carbon atom (the number 1 is not written) and 2 oxygen atoms.

A large number before a compound tells you how many of those **compounds** you have.

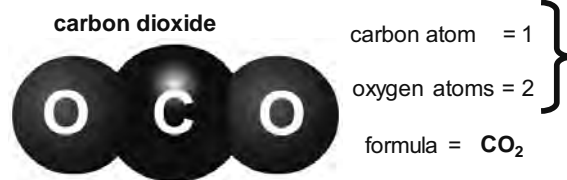
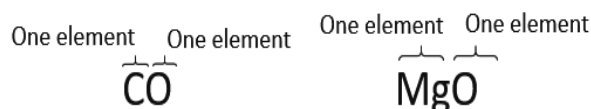
2H<sub>2</sub>O means 2 molecules of water.

### Word equations

Magnesium + Oxygen → Magnesium oxide



Potassium iodide + chlorine → Potassium chloride + Iodine



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## 10. Types of Forces

Keyword	Definition
Compression	Force squashing or pushing together.
Friction	Force opposing motion which is caused by the interaction of surfaces moving over one another. It is called 'drag' if one is a fluid.
Gravitational field strength, $g$	The force from gravity on 1 kg (N/kg).
Newton	Unit for measuring forces (N).
Tension	Force extending or pulling apart.
Upthrust	The upward force that a liquid or gas exerts on a body floating in it.

Contact Forces (objects in contact with another)	Non-contact Forces (objects NOT in contact with another)
Friction	Gravitational force
Air/water resistance 'drag'	Electrostatic force
Upthrust/buoyancy	Magnetic force
Tension/pull	
Compression/push	

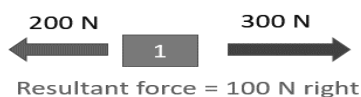
10

## 11. Effects of Forces

### Effects of forces:

On a diagram, force is an arrow. The bigger the arrow drawn the bigger the force. The force is working in the same direction as the arrow is pointing

Forces have a size and direction



<b>Resultant force</b>	The sum of all the forces acting on an object
<b>Resultant force = 0</b>	The object does not move, or stays at the same speed in a straight line
<b>Resultant force ≠ 0</b>	The forces are unbalanced. The object will slow down, speed up or change direction.

### Unbalanced forces

The object:

- Will accelerate or decelerate
- Change in direction/position/physical appearance (compressed or deformed)

### Balanced Forces

The object will:

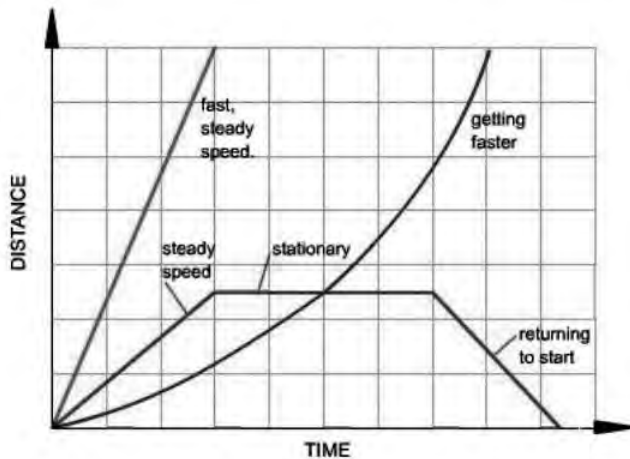
- Be stationary
- Be moving at a constant speed.

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## 12. Speed

Keyword	Definition
Acceleration	The rate of change of speed either increase or decrease.
Average speed	The overall distance travelled divided by overall time for a journey.

### Distance-Time Graphs



### Using the speed equation

$$\text{speed} = \text{distance} \div \text{time}$$

Use the EVERY model for calculations

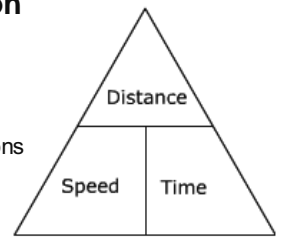
E = equation

V = values

E = enter results

R = result

Y = units



**Example 1:** Calculate the average **speed** of a runner who runs 100 m in 10 s.

E distance  $\div$  time

V d = 100 m and t = 10 s

E 100 m  $\div$  10 s

R 10

Y m/s

**Example 2:** The speed limit on a road is 13.4 m/s. Calculate the **distance** travelled by a car in 2 s at this speed.

E speed  $\times$  time

V speed = 13.4 m/s and t = 2 s

E 13.4 m/s  $\times$  2 s

R 26.8

Y m

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## 13. Mass, Weight and Pressure

Keyword	Definition
Mass	The amount of matter/'stuff' in an object.
Weight	The force of gravity on an object (N).

Mass will not change but weight can change due to gravitational field strengths.

$$\text{weight (N)} = \text{mass (kg)} \times \text{gravitational field strength (N/kg)}$$

Use the EVERY model for calculations

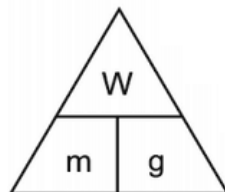
E = equation

V = values

E = enter results

R = result

Y = units



**Example:** Find the weight of a person on Earth if they have a mass of 65 kg (g = 10 N/kg).

E mass  $\times$  gravitational field strength

V m = 65 kg and g = 10 N/kg

E 65 kg  $\times$  10 N/kg

R 10

Y N

Keyword	Definition
Fluid	A substance with no fixed shape, a gas or a liquid.
Pressure	The ratio of force to surface area, in N/ m <sup>2</sup> ,

**Pressure** acts in all directions.

Underwater - As the weight of fluid above you increases, it increases the pressure.

Objects sink or float depending on whether the weight of the object is bigger or smaller than the upthrust.

Air pressure decreases as we go higher into the atmosphere.

$$\text{Pressure (N / m}^2\text{)} = \text{force (N)} \div \text{area (m}^2\text{)}.$$

**Example:** A force of 20 N acts over an area of 4m<sup>2</sup>.

Calculate the pressure

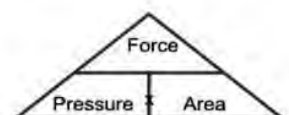
E force  $\div$  area

V F = 20N and A = 4 m<sup>2</sup>

E 20N  $\div$  4 m<sup>2</sup>

R 4

Y N/m<sup>2</sup>



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## 14. Work Done and Moments

When a force causes a body to move, work is being done on the object by the force.

The amount of work done when a force acts on a body depends on two things:

- The size of the force acting on the object
- The distance through which the force causes the body to move in the direction of the force

$$\text{Work done (J)} = \text{Force (N)} \times \text{Distance (m)}$$

Use the EVERY model for calculations

E = equation

V = values

E = enter results

R = result

Y = units



**Example:** A horizontal force of 50 N causes a trolley to move a horizontal distance of 30 m. How much work is done on the trolley by the force?

E force x distance

V  $F = 50\text{N}$  and  $d = 30\text{m}$

E  $50\text{ N} \times 30\text{m}$

R 1500

Y J

**Machines** make work easier by lowering the force needed.

**Lever:** A simple machine which is a rigid bar that moves around a point.

When you apply effort, it works across a called a pivot and applies a greater load somewhere else.

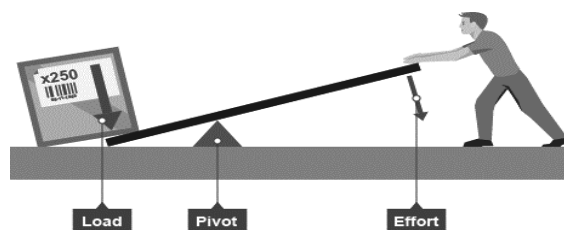
A **moment** is a turning force.

$$\text{Moment (N/m)} = \text{Force (N)} \times \text{Distance (m)}$$

The work done can be reduced by reducing the force applied and/or the distance from the pivot.

The effort is the force you apply.

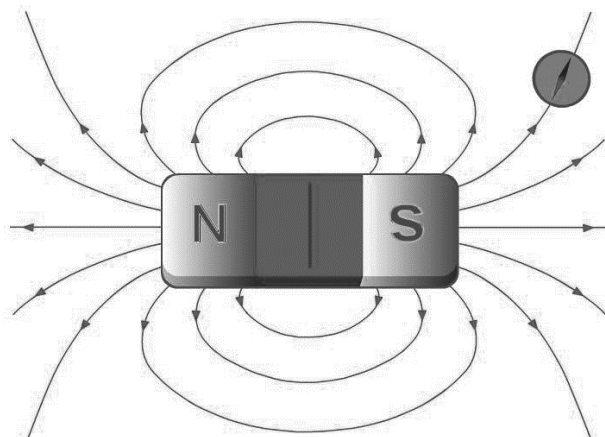
The pivot produces a bigger force to move the load, which requires less effort.



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## 15. Magnetism

Keyword	Definition
Magnetic force	Non-contact force from a magnet on a magnetic material.
Magnetic poles	The ends of a magnetic field, called north-seeking (N) and south-seeking poles (S).
Permanent magnet	An object that is magnetic all of the time



### Magnetism

A permanent magnet is always magnetic.

Two 'like' magnetic poles repel (N with N, and S with S)

Opposite 'unlike' magnetic poles attract (N and S)

Field lines flow from the north-seeking pole to the south-seeking pole.

A compass will point to Earth's magnetic north pole.

**Iron, nickel and cobalt** are magnetic metals. Steel is magnetic because it contains iron.

### Magnetic field lines

Magnetic materials, electromagnets and the Earth create magnetic fields.

We can show these fields using field lines.

The closer the field lines are, the stronger the magnetic force.

The magnetic field is strongest at the poles.

Field lines go from NORTH to SOUTH

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## 16. Electromagnets

### Electromagnets:

When an electrical current passes through a wire it makes a magnetic field.

If you wrap this wire around a magnetic material such as iron, it becomes magnetically induced (only becomes magnetic when it is in a magnetic field).

### Increasing the strength of an electromagnet:

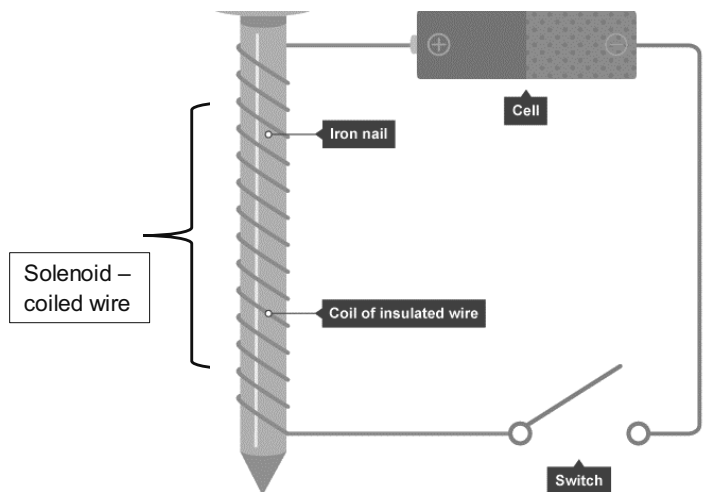
1. Increase the current through the wire.
2. Use an iron core.
3. Use a higher number of coils of wire around the core.

The magnetic field of an electromagnet decreases in strength the further away an object is.

### Difference between magnets and electromagnets

In an electromagnet the magnetic field can be turned on and off, and the strength of the magnet can be changed.

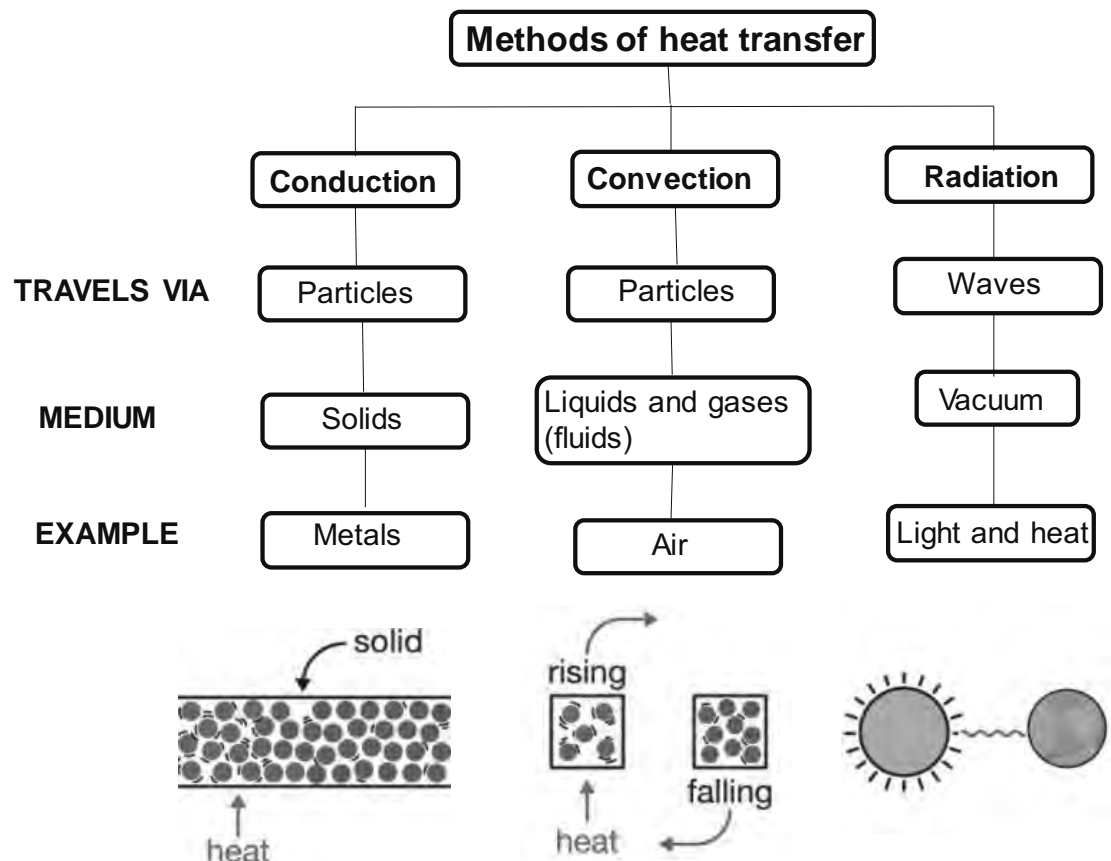
Electromagnets are useful in a variety of circuits such as in an electric bell.



Electromagnet	A non-permanent magnet turned on and off by controlling the current through it.
Solenoid	Wire wound into a tight coil, part of an electromagnet.
Core	Soft iron metal which the solenoid is wrapped around.

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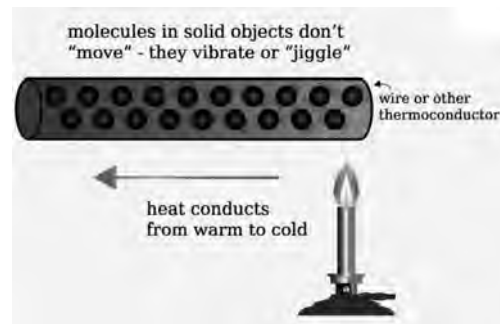
## 17. Methods of Heat Transfer



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## 18. Conduction and Specific Heat Capacity

Keyword	Definition
Conduction	Transfer of thermal energy by the vibration of particles in a solid.
Temperature	A measure of the motion and energy of the particles.
Thermal conductor	Material that allows heat to move quickly through it.
Thermal energy	The amount of energy stored in a substance due to the vibration of its particles
Thermal insulator	Material that only allows heat to travel slowly through it



Happens in **solids** because particles are close together for the heat to transfer between them.

Particles gain internal energy and move more vigorously.

The particles bump into nearby particles and make them vibrate more.

This passes internal energy through the substance from the hot end to the cold end.

### Specific Heat Capacity

The specific heat capacity of a material is the energy required to raise one kilogram (kg) of the material by one degree Celsius (°C).

$$\begin{array}{l} \text{Change in} \\ \text{thermal} \\ \text{energy (J)} \end{array} = \text{mass (kg)} \times \begin{array}{l} \text{specific} \\ \text{heat} \\ \text{capacity} \\ \text{(J/kg°C)} \end{array} \times \begin{array}{l} \text{change} \\ \text{in} \\ \text{temperature} \\ \text{(°C)} \end{array}$$

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## 19. Convection and Radiation

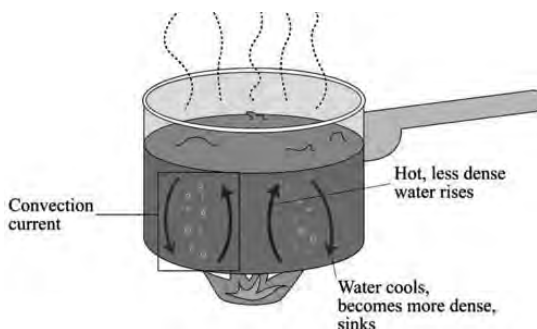
### Convection

Particles with a lot of heat energy in a **liquid or gas** move and take the place of particles with less heat energy.

As areas of particles gain heat energy they move faster, become less dense and rise.

As they cool, they lose heat energy and become more dense, sinking to the bottom.

This process creates a convection current.



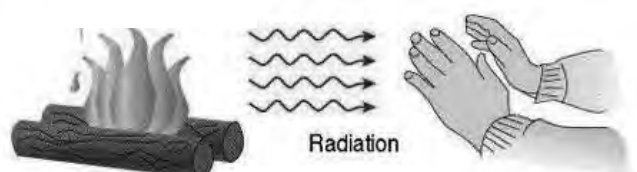
### Infrared radiation

Energy transfer by radiation can occur in a vacuum (where there are no particles).

All objects transfer thermal energy by infrared radiation.

The hotter an object is, the more infrared radiation it gives off.

Radiation is how we feel the heat of the sun.



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## 20. Food Chains and Webs

Keyword	Definition
Consumer	An animal that eat other animals or plants.
Food chain	Part of a food web. Starts with a producer and ends with a predator.
Food web	Shows how food chains are linked together.
Interdependence	All organisms in an ecosystem depend upon each other
Producer	Green plant or algae that makes its own food using sunlight.

Organisms (such as decomposers, consumers and producers) in a food web rely on each other for energy and food (nutrients).

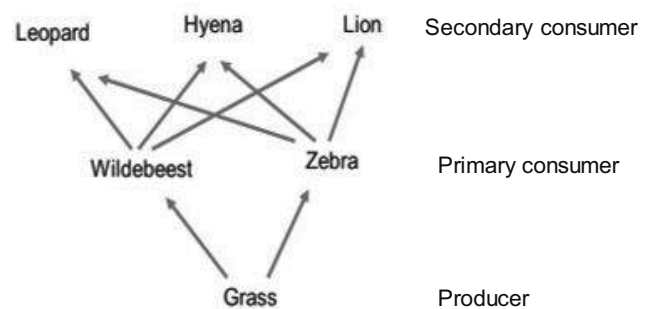
The **arrow** in a food chain shows the direction of energy.

A **food chain** always starts with a producer, a green plant or algae that uses photosynthesis to make sugar. For example:

Grass → Zebra → Lion

A **food web** shows multiple food chains together.

If there is a change in the number of one of plants or animals, there will be a knock-on effect to the others in the food web.



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## 21. Interdependence

Keyword	Definition
Decomposer	Organism that breaks down dead plants and animals so nutrients can be given back to the soil or water.
Ecosystem	The living things in an area and their non-living environment
Pesticide	Substance that is sprayed onto crops to kill organisms that can reduce plant growth such as weeds, insects and fungi e.g. DDT
Population	Group of the same species living in an area.

Bees are an example of a species that are involved in interdependence.

Bees pollinate crops including fruit, vegetables and cereals. Many organisms including humans, rely on these food sources.

**The number of plants or animals in a species is affected by:**

The number of predator animals

The number of prey animals

Diseases

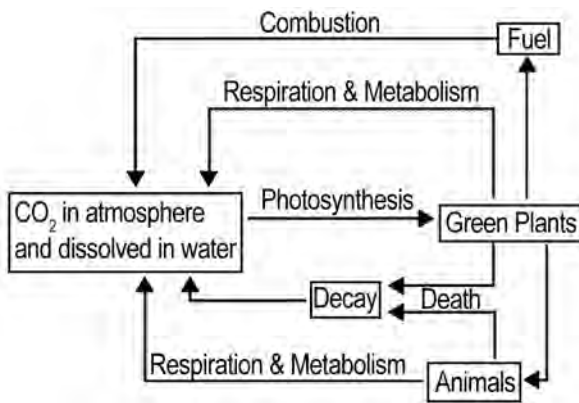
Pollution

Competition between plants and animals for water and food.

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## 22. The Carbon Cycle

The carbon cycle shows how carbon moves through organisms and as carbon dioxide (CO<sub>2</sub>) in the atmosphere.



**Earth's atmosphere:** 78 % nitrogen, 21 % oxygen, <1 % carbon dioxide, plus small amounts of other gases.

**How carbon is recycled:** By photosynthesis (COW GO) and respiration (GO COW).

**Reasons why CO<sub>2</sub> levels have increased:**

Human activities such as burning fossil fuels (FO COW) and deforestation.

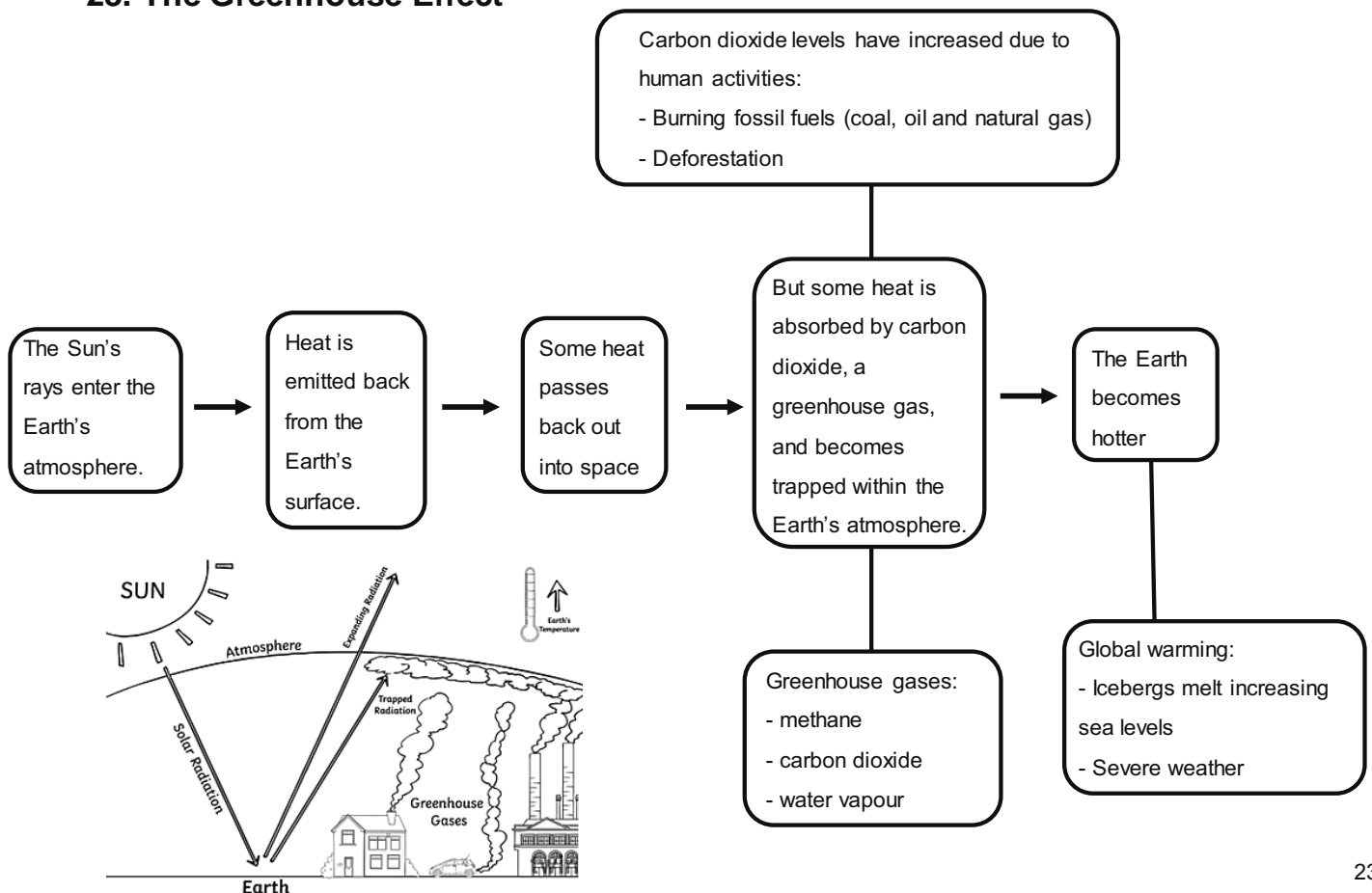
**Greenhouse effect:**

Greenhouse gases are carbon dioxide, methane, water vapour and ozone.

Scientists have evidence that global warming caused by human activity is causing changes in the climate.

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## 23. The Greenhouse Effect

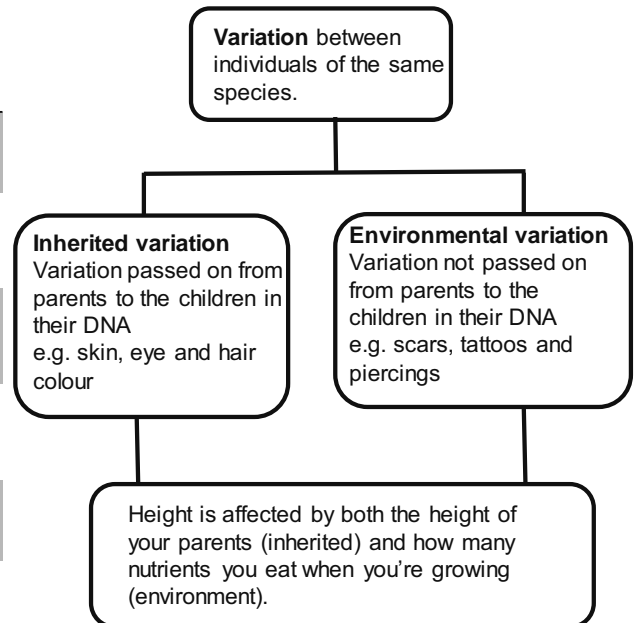


23



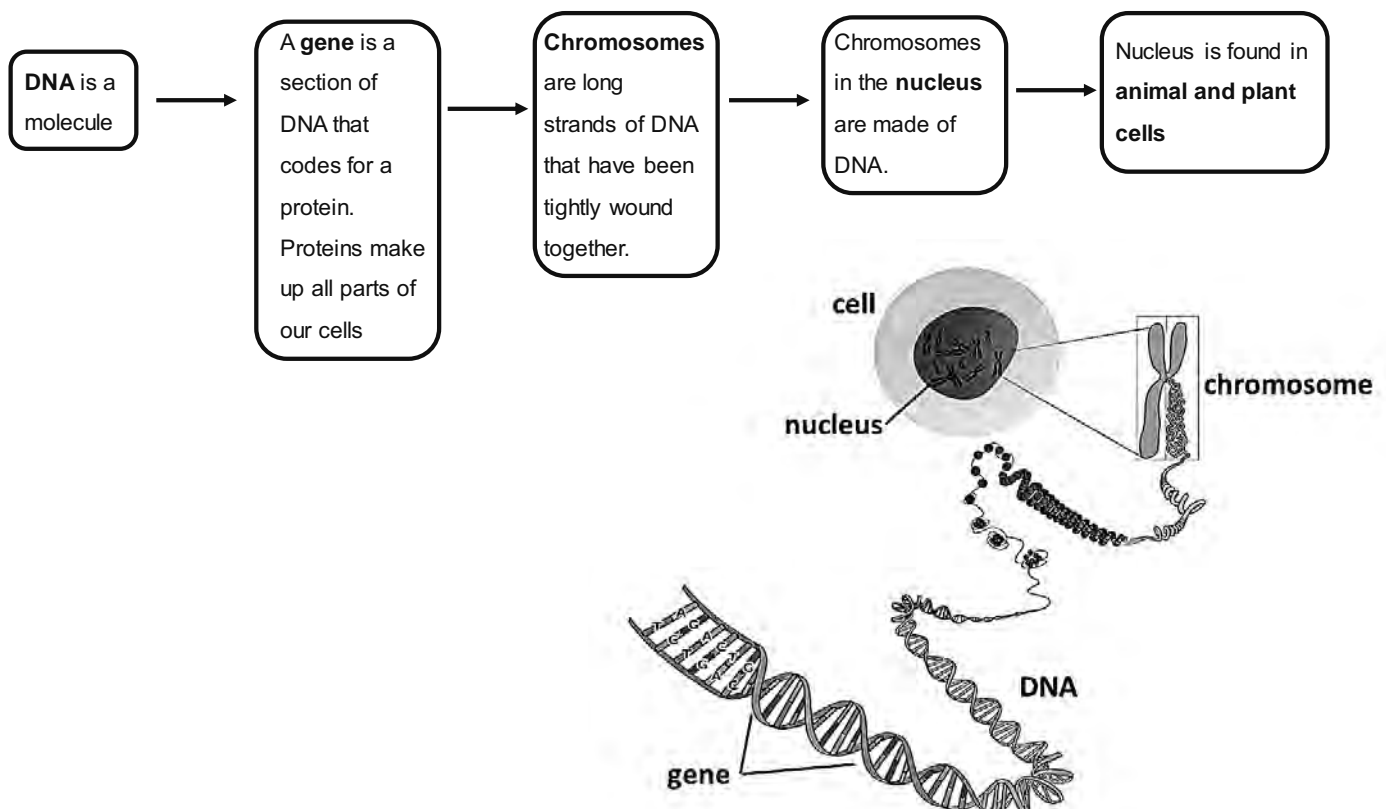
## 24. Variation

Keyword	Definition
Adaptation	The adaptations of organisms allow them to thrive in different habitats, including extreme environments.
Continuous variation	Where differences between living things can have any value (e.g. height, weight).
Discontinuous variation	Where differences between living things are grouped into categories (e.g. eye colour, hair colour).
Endangered	At risk of becoming extinct.
Evolution	How better adapted organisms have an advantage and are more likely to have offspring with this same adaptation.
Extinct	No living members of an organism exist in the wild.
Species	A group of living things that have more in common with each other than with other groups.
Variation	The differences within and between species.



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## 25. DNA



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## 26. Natural Selection and Evolution

**Charles Darwin** stated that it is natural selection that drives the evolution of a species over time.

The key principles of **natural selection**:

1. Mutation causes variation in the population.
2. This variation gives some organisms an advantage (they are fitter).
3. These organisms are more likely to survive and reproduce.
4. The genes are passed onto the next generation.
5. Over many generations, the proportion of the population with that characteristic increases.

Charles Darwin was criticised in the 1800's as he didn't have sufficient evidence for his theory of natural selection. There is now a lot of evidence for natural selection.

### **Fossils are evidence for natural selection.**

Fossils are the remains of organisms from millions of years ago, found in rocks.

We can learn from fossils about how life changed over time.

Fossils show us that extinctions happen.

**Extinctions** may be caused by:

New disease

New predator

Climate change

Habitat loss

Single catastrophic events e.g. an asteroid

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## 27. Energy Stores and Transfers

Keyword	Definition
Chemical energy store	Emptied during chemical reactions when energy is transferred to surroundings e.g. batteries and food
Dissipated	Become spread out wastefully
Elastic potential energy store	Filled when a material is stretched or compressed e.g. springs
Gravitational potential energy store	Filled when an object is lifted up.
Kinetic energy store	Filled when an object speeds up or increases movement.
Magnetic energy store	Filled when repelling poles have been pushed closer together or when attracting poles have been pulled further apart.
Power	How quickly energy is transferred by a device (measured in Watts).
Thermal/internal energy store	Filled when an object is warmed up.

**Energy stores:**

**Mnemonic:** MEN GET KC

Magnetic

Electrostatic

Nuclear

Gravitational potential

Elastic potential

Thermal

Chemical

Kinetic

**Energy transfers from one store to another by:**

Heating

Mechanical transfer (sound)

Electrical current

Waves (radiation/ light)

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## 28. Energy Costs

We pay for the electricity we use in our homes based on the amount of energy transferred.

**cost = power (kW ) x time (hours) x price (per kWh)**

Different appliances in the home transfer different amounts of energy.

Appliances that heat (oven, hairdryer, kettle) transfer lots of energy.

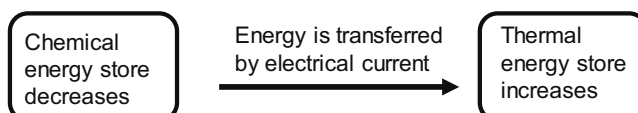
Appliances such as TVs and phones transfer less energy.

$$\text{Energy Efficiency \%} = \frac{\text{Useful energy output}}{\text{Total energy input}} \times 100$$

Food labels list the energy content of food in kilojoules (kJ).

When energy is transferred from one store to another, the total amount of energy stays the same.

Energy stores will increase or decrease but the total amount of energy in the system will not vary.



Some energy is transferred to unwanted or wasted energy (**dissipated**), reducing the amount of useful energy.

Energy is usually dissipated as heat or sound e.g. the waste energy of a light bulb, a TV or a car engine is heat.

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## 29. Energy Resources

Keyword	Definition
Energy resource	Something with stored energy that can be released in a useful way.
Fossil fuels	Non-renewable energy resources formed from the remains of ancient plants or animals. Examples are coal, crude oil and natural gas.
Non-renewable	An energy resource that cannot be replaced and will be used up. Examples are fossil fuels (natural gas, coal, oil) and nuclear power.
Renewable	An energy resource that can be replaced and will not run out. Examples are solar, wind, waves, geothermal and biomass.

### Generating Electricity

Electricity is generated using a variety of different resources.

We separate the resources into renewable and non-renewable.

For both renewable and non-renewable energy resources, the same pathway is taken to generate electricity:

1. A fuel is burned (fossil fuels/nuclear/biofuel)/ OR a turbine is turned (wind power/hydroelectric power)
2. The fuel heats water which creates steam which turns a turbine.
3. The turbine turns a generator to generate electricity.

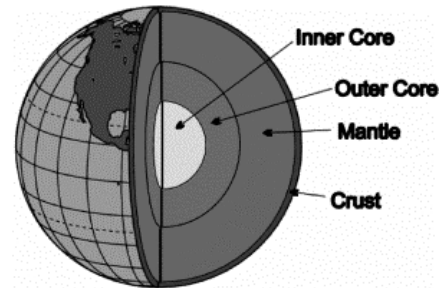
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## 30. Earth Structure and Rocks

Keyword	Definition
Igneous rocks	Formed from cooled magma, with minerals arranged in crystals. Examples include granite, basalt and obsidian.
Metamorphic rocks	Formed from existing rocks exposed to heat and pressure over a long time. Examples include marble, slate and schist.
Minerals	Chemicals that rocks are made from.
Sedimentary rocks	Formed from layers of sediment, which can contain fossils. Examples include limestone, chalk and sandstone
Strata	Layers of sedimentary rock.

The Earth is made up of three different layers:

1. Crust
2. Mantle
3. Core

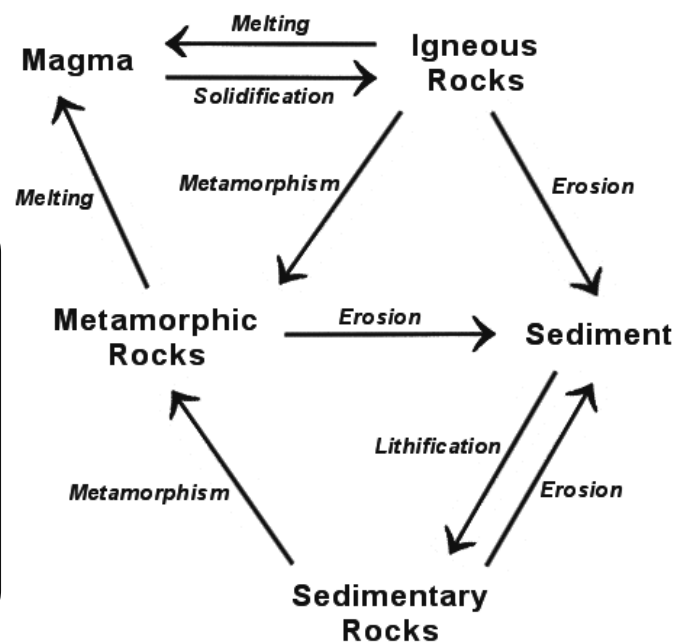
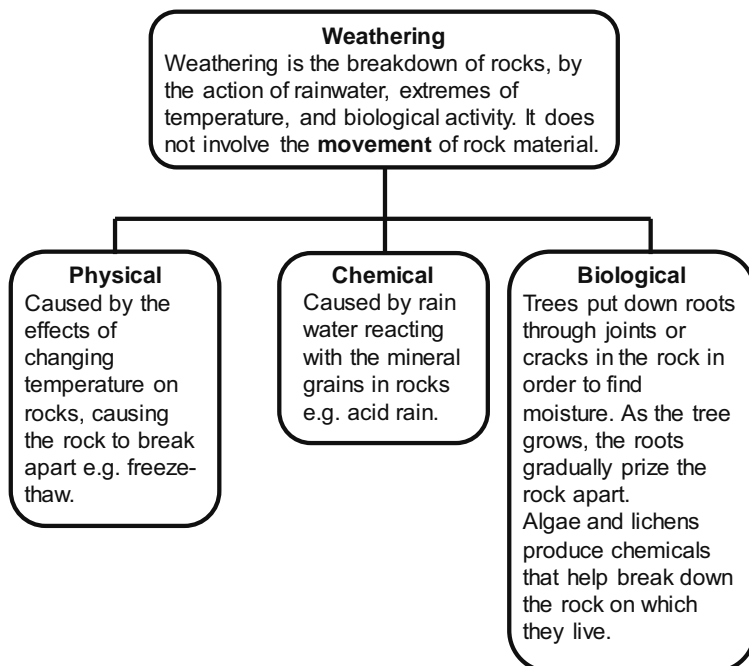


There are three main rock types found on Earth.

- 1: Sedimentary
- 2: Metamorphic
- 3: Igneous.

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## 31. Weathering and the Rock Cycle



**Erosion** is the process by which soil and rock particles are worn away and moved elsewhere by gravity, or by a moving transport agent – wind, water or ice. This involves movement of rock particles

**Transport** refers to the processes by which the sediment is moved along e.g. pebbles rolled along a river-bed or sand grains whipped up by the wind

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## 32. Earth Resources

Keyword	Definition
Electrolysis	Using electricity to split up a compound into its elements.
Extraction	Separation of a metal from a metal compound (metal ore).
Mineral	Naturally occurring metal or metal compound.
Natural resources	Materials from the Earth which act as raw materials for making a lots of different products such as steel or plastics.
Ore	Naturally occurring rock containing large amounts of minerals for extraction.
Recycling	Processing a material so that it can be used again.

Natural resources such as iron, coal, oil and aluminium are found on Earth.

Most metals are found bound with other elements such as oxygen.

These compounds are called **ores** (e.g. bauxite, haematite)

### Using the reactivity series to determine how to extract the metal from its ore

Potassium	}	Extract using electrolysis. Electrolysis requires lots of energy making it expensive to run
Sodium		
Calcium		
Magnesium		
Aluminium		
Carbon	}	Extract using carbon (reduction) by displacement. Carbon is cheap so this is an inexpensive process.
Zinc		
Iron		
Tin		
Lead		
Copper	}	Occurs native in the ground
Silver		
Gold		

**Recycling** lowers the amount of natural resources taken from the Earth.

Plastic items can be reused, recycled or burnt.

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## 33. Photosynthesis and Respiration Keywords

Photosynthesis Keywords	
Keyword	Definition
Chlorophyll	Green pigment in plants and algae which absorbs light energy.
Chloroplast	The site of photosynthesis inside a plant cell.
Fertilisers	Chemicals containing minerals that plants need to build new tissues.
Photosynthesis	A process where plants and algae turn carbon dioxide and water into glucose and release oxygen.
Stomata	Pores (holes) in the bottom of a leaf which open and close to let gases in and out.

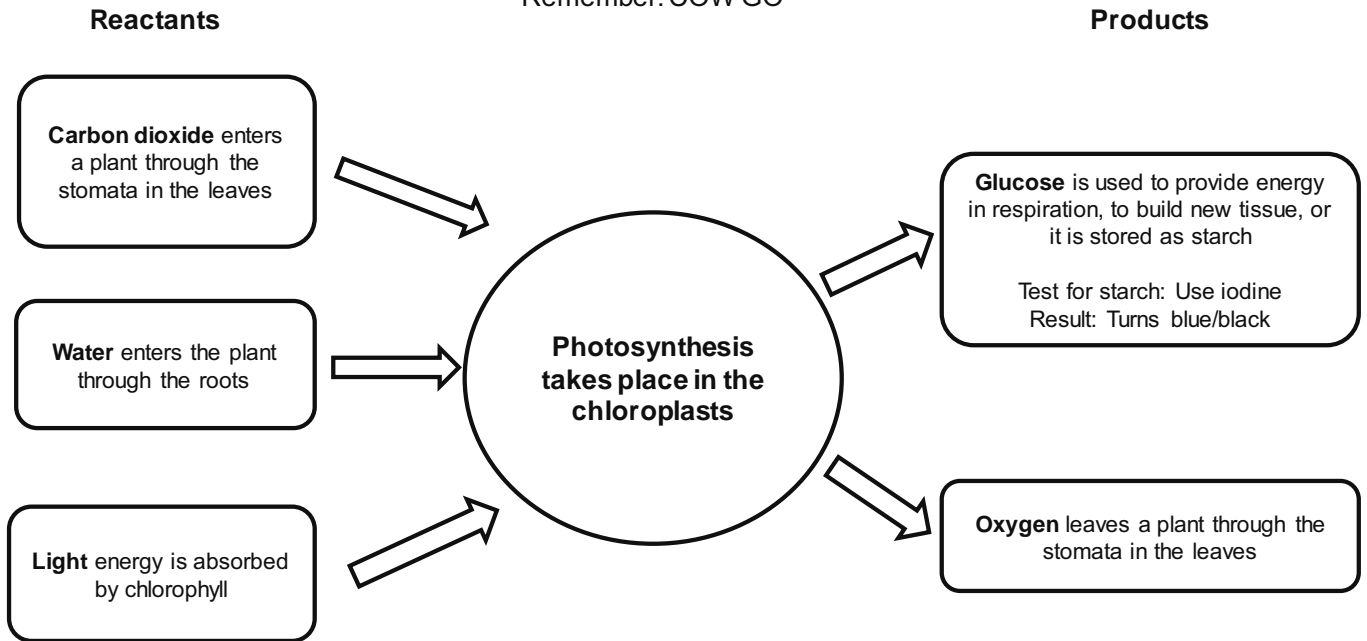
Respiration Keywords	
Keyword	Definition
Aerobic respiration	Breaking down glucose with oxygen to release energy and producing carbon dioxide and water.
Anaerobic respiration (fermentation)	Releasing energy from the breakdown of glucose without oxygen.
Mitochondria	The site of aerobic respiration inside a plant or animal cell.
Respiration	A chemical reaction that takes place in the mitochondria of cells

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## 34. Photosynthesis

**Photosynthesis word equation:** Carbon dioxide + Water → Glucose + Oxygen

Remember: COW GO

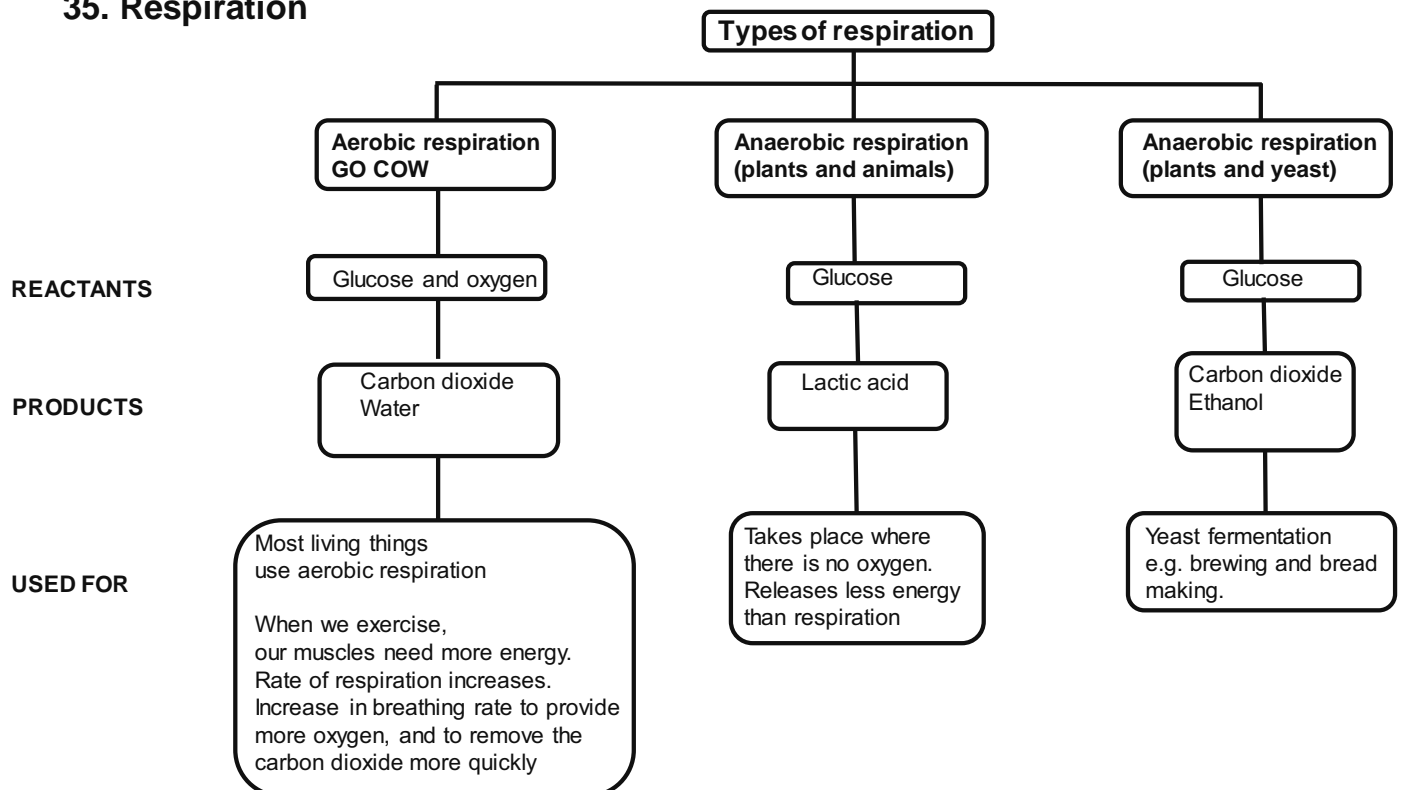


Three factors can limit the rate of photosynthesis:

**light intensity, carbon dioxide concentration and temperature.**

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## 35. Respiration



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## 36. Maths in Science 1

Keyword	Definition
Anomalous result	A number that does not fit the pattern.
Mean	Adding up a list of numbers and dividing by how many numbers are in the list. Exclude any anomalous results.
Median	The middle value when a list of numbers is put in order from smallest to largest.
Mode	The most common value in a list of numbers. If two values are tied then there are two modes. If more than two values are tied then there is no mode.
Range	The maximum and minimum values of a variable.

Person	Heart rate after 10 star jumps (bpm)	Heart rate after running 200 metres (bpm)	Heart rate after 10 squats (bpm)
1	98	104	87
2	102	107	91
3	96	105	94

### Calculating a mean:

Adding up a list of numbers and dividing by how many numbers are in the list.

**Example** from above: Calculate the mean heart rate in bpm for person 1 over the 3 exercises.

$$98 + 104 + 87 = 289.$$

$$289 \div 3 \text{ (as we have 3 results)} = 96.33 \text{ bpm.}$$

Rounded to 96.3 (1d.p.)

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## 37. Maths in Science

### Calculating percentage:

$$(\text{Part} \div \text{whole}) \times 100$$

e.g. Out of 90 insects, 40 of them were ladybirds.

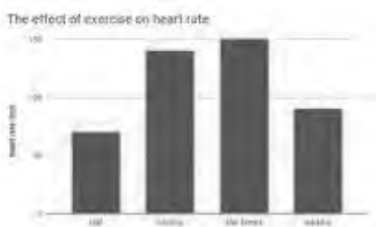
What is the % of ladybirds?

$$(40 \div 90) \times 100 = 44 \%$$

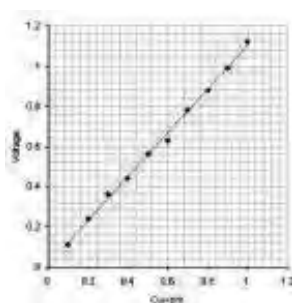
x - axis = left hand column in results table = independent variable

y - axis = right hand column in results table = dependent variable

**Categoric data:** data put into groups e.g. colour of eyes  
Draw a bar chart



**Continuous data:** data that can take any value e.g. current  
Draw a line graph

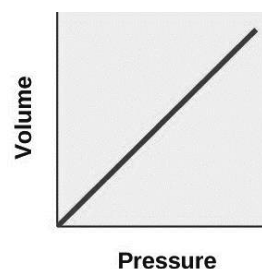


### Linear relationship:

In science we use graphs to show relationships between two factors.

When a graph shows a straight line which goes through the origin (0,0).

We say the two variables are directly proportional.



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1	2											3	4	5	6	7	0
		</															



# YEAR 8 ART & DESIGN KNOWLEDGE ORGANISER

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## FORMAL ELEMENTS



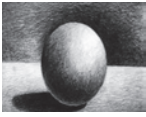
### CONTENTS

Page 3	Tone, Shape & Form
Page 3	Pattern, Line & Texture
Page 4	Colour

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## THE FORMAL ELEMENTS

### TONE



Tone describes the lightness or darkness of a surface.

A gradient is a series of tonal values from light to dark.



Tone can help to provide a form with value to give a sense of volume to a flat surface.

#### ADJECTIVES TO DESCRIBE TONE

Dark	Highlights
Light	Shadows
Mid tone	Shading
Grey	Blending
Blend	Graduated

### SHAPE

**Shape** is an area enclosed by a line. It can be 2-dimensional and can be geometric or organic.



Geometric



Organic

#### ADJECTIVES TO DESCRIBE SHAPE

Circular	Irregular
Square	Stylized
Rectangular	Organic
Triangular	Geometric
Misshaped	Contour

### FORM

**Forms** are 3-dimensional shapes. They occupy space (like sculptures) or give the illusion that they occupy space (drawing).



#### WORDS TO DESCRIBE FORM

Angular	Curvaceous
Twisted	Solid
Bulbous	Malformed
Tapered	Rounded
Contours	Negative space

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## THE FORMAL ELEMENTS

### PATTERN

**Pattern** is a design that is created by repeating a formal element. It can be natural, like the stripes of a zebra, or man made, like a design on fabric. The image repeated is called a **motif**. These can be simple shapes or more complicated arrangements.

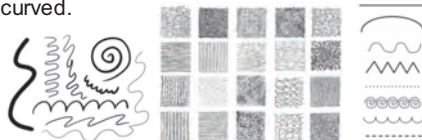


#### ADJECTIVES TO DESCRIBE PATTERN

Regular	Motif
Irregular	Repetition
Symmetrical	Radial
Tessellating	Tiered
Organic	Even

### LINE

**Line** is a mark left by a moving point e.g. a pencil, or paint on a paintbrush. It can take many forms e.g. horizontal, diagonal, or curved.



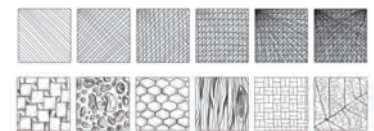
Marks can be repeated and used to create patterns in order to give tone and texture to your drawing.

#### ADJECTIVES TO DESCRIBE LINE

Broken	Graphical	Hesitant
Flowing	Angular	Scribbled
Moving	Geometric	Wavy
Woolly	Confident	Organic
Tight	Faint	Heavy

### TEXTURE

**Texture** is the surface quality of an object. Texture can be real or implied. **Real texture** can be felt e.g. tree bark, whereas **implied texture** creates the look of texture on a flat surface e.g. a drawing or a painting.



#### WORDS TO DESCRIBE TEXTURE

Texture	Impasto	Hatching
Smooth	Fine	Rough
Tactile	Uneven	Shiny
Jagged	Frosted	Soft
Coarse	Silky	Stippled

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THE FORMAL ELEMENTS

COLOUR

To see colour, you have to have light. When light shines on an object some colours bounce off the object and others are absorbed by it. Our eyes only see the colours that are bounced off or reflected.

Primary Colours



All colours can be obtained by mixing primary colours together. Primary colours cannot be created by mixing other colours.

Secondary Colours

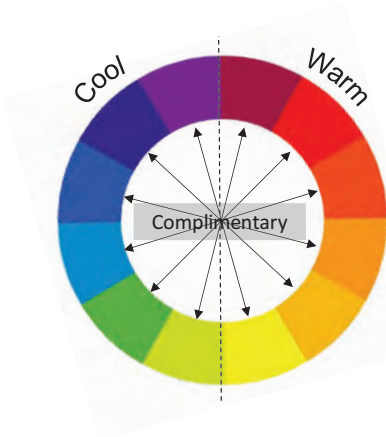


A colour mixed from two primary colours

Tertiary Colours



A colour mixed from a primary colour and a secondary colour



**Harmonious Colours** are 3 colours next to each other on the colour wheel

**Complimentary Colours** are colours opposite each other on the colour wheel

The colour wheel can be split up into **warm** and **cool** colours, and each individual colour has it's own warm and cool variant

ADJECTIVES TO DESCRIBE COLOUR		
Opaque	Luminous	Pale
Translucent	Bright	Pastel
Transparent	Saturated	Soft
Contrasting	Vibrant	Muted
Harmonious	Vivid	Deep
Complementary	Brilliance	Dull
Cool	Harsh	Hue
Warm	Neutral	Tint

# DESIGN PRINCIPLES



## CONTENTS

<b>Page 7</b>	Unity/Variety, Balance & Contrast
<b>Page 8</b>	Scale/Proportion, Repetition & Emphasis

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## THE DESIGN PRINCIPLES

### UNITY & VARIETY

Unity is how well the elements of a design work together. Each element should have a clear visual relationship with each other element to help communicate a clear, concise message.



Unity = Same colour  
Variety = Different sizes

Unity = Same size  
Variety = Different colours

### BALANCE

Balance can be symmetrical (with items of equal weight on either side of the centre line) or asymmetrical (with items of different weights laid out in relation to a line that may or may not be centred)



Balance = Symmetrical

Balance = Asymmetrical

### CONTRAST

Contrast is the difference between various elements within a design, that makes them stand out from each other.



Contrast in shape

Contrast in colour

Contrast in scale

Contrast in layout



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## THE DESIGN PRINCIPLES

### SCALE/PROPORTION

Proportion is the size of the elements in relation to one another. Larger elements tend to be seen as more important while smaller ones are seen as less so.



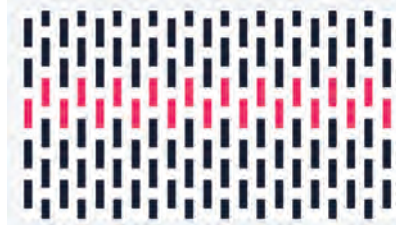
Size

Ratio

Divisions

### REPETITION

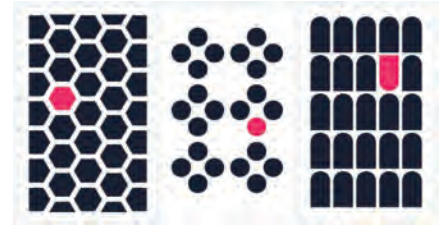
Repetition reinforces an idea or perception. It can be achieved by repeating the same colours, shapes, images, objects, mark making techniques, and so forth.



Repetition changes perspective

### EMPHASIS

Emphasis causes a certain part of a design to stand out compared to other elements. Conversely, it can also be used to minimise how much an element stands out.



Creating a focal point



# WRITING ABOUT ART



## CONTENTS

Page 10	Writing About Art - Knowledge
Page 11	Writing About Art - Understanding
Page 12	Writing About Art – Beyond & Bigger Picture
Page 13	Writing About Art – Sentence Starters
Page 14	Writing About Art - Vocabulary

## ART & DESIGN – WRITING ABOUT ART – KNOWLEDGE

### KNOWLEDGE

- What is the artist's name?
- Where/when were they born? (this is important to put the work in context)
- What do you know about the artist's background? (Life events/education/career)
- When was the work created?
- What is their style of work?
- What does the artwork show?
- Is the artwork part of a series?
- Is there a theme? What is the theme about? (this could be researched or your own opinion)



### EXAMPLE

Dutch Impressionist painter, Vincent Van Gogh was born on March 30th, 1893, in Zundert, a predominantly Catholic province of North Brabant in the Netherlands. Van Gogh created about 2,100 artworks, most of which date from the last two years of his life. They include landscapes, stillifes, portraits and self-portraits, and are characterised by bold colours and dramatic, impulsive and expressive brushwork that contributed to the foundations of modern art. He was not commercially successful, and his suicide at 37 came after years of mental illness, depression and poverty.

The painting 'Starry Night' is one of the most recognized pieces of art in the world. Vincent van Gogh painted Starry Night in 1889 during his stay at the asylum of Saint-Paul-de-Mausole near Saint-Rémy-de-Provence. When in a state of depression Van Gogh incorporated darker colours and Starry Night is a wonderful example of this. Blue dominates the painting, blending hills into the sky. The small village lays at the base in the painting in browns, greys, and blues. Even though each building is clearly outlined in black, the yellow and white of the stars and the moon stand out against the sky, drawing the eyes to the sky.



## ART & DESIGN – WRITING ABOUT ART – UNDERSTANDING

### UNDERSTANDING

What is the main focus/where is your eye drawn to?

What formal elements have they used and how? Line, Colour, Shape, Form, Texture, Pattern, Tone...

How would you describe the composition?

If they have used people in their artwork, can you read any body or facial language?

How has the artist achieved the meaning, concept or message in the image?

What techniques has the artist used to create the meaning/concept or message?

What are your opinions of the work and why?

How does the piece of work make you feel?



### EXAMPLE

The stars in the sky are the big attention grabber of the painting; the brightness of them, the swirling brushstrokes and the contrast between them and the blue-sky help make them stand out. It could be that Van Gogh simply wanted to breathe in the higher power into his art, as he grew up in a religious household, they could also represent hope. The village is painted with dark colours, but the brightly lit windows create a sense of comfort. The village is peaceful in comparison to the dramatic night sky and the silence of the night can almost be felt in Starry Night. Vincent Van Gogh's unique, thick brush strokes are very much obvious and it's possible that his severe attacks further dramatized his brush work, this technique that adds even more depth as well as a rich texture to this work of art. The steeple dominates the village and symbolizes unity in the town. In terms of composition, the church steeple gives an impression of size and isolation. You cannot ignore the huge, curvy cypress tree positioned to the left in the foreground of the painting, cypress trees are typically associated with mourning. Personally, I believe that Van Gogh was showing that even with a dark night such as this it is still possible to see light in the windows of the houses. Furthermore, with shining stars filling the sky, there is always light to guide you. This is one of my favourite paintings by Van Gogh, I find the blues calming and the sky transfixes me.

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## ART & DESIGN – WRITING ABOUT ART – BEYOND & THE BIG QUESTION

### BEYOND

What viewpoint has the artist used?

Are there any back stories as to how the work was made?

Does the artwork have depth or is it shallow?

What materials do you think they have used?

Can you think of any other materials they could have used?

What skills will you develop looking at this artist?

Could you approach the work using different techniques?

How could you experiment with the artist's ideas further?

### THE BIG QUESTION

How will you be influenced by this artist's work when planning your own artwork?



### EXAMPLE

Van Gogh painted 'The Starry Night' during his stay at the Saint-Paul-de-Mausole asylum near Saint-Rémy-de-Provence in France, several months after suffering a breakdown. This painting is based on the view from his window; it appears that his room could have been high up or that the asylum was on a hill. Van Gogh was not allowed to paint in his room, so he created sketches of the view and used these alongside his memory. There is a great deal of depth to this painting; Van Gogh has achieved this by including the foreground, middle ground and the background. There is also depth and texture within the paint that Van Gogh has used, to achieve this he loaded his brush with oil paints to build up a thick, impasto texture. This impasto texture is a key feature in many of van Gogh's works. By creating work in response to Van Gogh I will develop my understanding of mark making, and colour, I will also develop my painting and drawing skills, and I think it will also provide me with the opportunity to be more expressive within my work. When planning my own work I will consider exaggerating certain elements like colour and perspective, if I paint light within my work I could use a strong colour contrast, like yellow and orange against blue. I could also use directional brushwork to create a sense of movement and turbulence in my painting and finally, I will consider repeating similar techniques and processes within my work, so that I can achieve a strong style.

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## ART & DESIGN – WRITING ABOUT ART – SENTENCE STARTERS

### KNOWLEDGE

The artist... was born in...  
 Their parents were...  
 They studied at...  
 Events that may have influenced...  
 They are/were influenced by...  
 The painting is called...  
 It was completed in the year...  
 The work portrays...  
 This style of... is called...  
 Looking at this piece of work...  
 This painting is/isn't part of a series called...  
 When first looking at the painting I thought...  
 In the painting I can see the following: ...  
 The subject of the painting is...  
 To me the artwork looks like...

### UNDERSTANDING

My eye is initially drawn to..... Because...  
 In the piece the artist has created a... texture... by...  
 The colours used can be described as...  
 I can see the following shapes and forms...  
 There is limited use of... this suggests...  
 The artist uses space to create a feeling of...  
 The composition of the image suggests...  
 The composition style conveys...  
 The objects/people/scene looks... because the artist has...  
 The artist's use of... suggests...  
 I think he/she has done this to convey...  
 In my opinion...  
 It is in my view that...  
 This piece of artwork makes me feel...

### BEYOND

I think the artist worked from... because...  
 The artist prepared for this work by...  
 I think the artist is trying to communicate...  
 There are/aren't any clear messages...  
 The reason I think this is because...  
 They have used...  
 It appears that...  
 They may have also used...  
 If they had used... It might have...  
 I could potentially use...  
 By looking at... I will develop my skills in...  
 It could also influence...  
 When creating my own work I will...

### BIGGER PICTURE

This piece of art will influence how I...  
 Moving forward I think I will...  
 As a result of studying... I will...  
 This piece of art has made me consider...

These sentence starters can be used to help you form your artist research and analysis. You might not always be able to find the answer to all of the questions through research, some of the questions require your thoughts and opinions. Always write in full sentences and evidence your thoughts and opinions.

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## ART & DESIGN – VOCABULARY

### WORDS TO DESCRIBE ART

Realistic	Unrealistic
Abstract	Colourful
Abstraction	Linear
Expressive	Rounded
Impressionistic	Motion
Surreal	Messy
Still life	Organised
Portraiture	Geometric
Figurative	Structured
Non-Western	Fluid
Sculpture	Neat
Textile	Loud
Batik	Accurate
Appliqué	Disorganised
Glass	Graphic
Painting	Traditional
Mixed media	Modern
Ceramics	Contemporary

### COMPOSITION

Balanced  
 Unbalanced  
 Skewed  
 Perspective  
 Plane  
 Proportion  
 Symmetry  
 Space  
 Scale  
 Foreground  
 Middle ground  
 Background  
 Decorative  
 Eye-line  
 Focus  
 Blurred  
 Form  
 Birds eye view

### DRAWING

Line  
 Tone  
 Shading  
 Contour  
 Two-Dimensional  
 Three-Dimensional  
 Observational  
 Composition  
 Proportion  
 Perspective  
 Scale  
 Accuracy  
 Realistic  
 Outline  
 Mark-making  
 Sketch  
 Composition  
 Tracing  
 Impression

### PAINTING

Wash  
 Watercolour  
 Acrylic  
 Oil  
 Brush strokes  
 Impasto  
 Drybrush

### PRINTING

Monoprint  
 Etching  
 Intaglio  
 Lithograph  
 Woodcut  
 Block Printing  
 Lino Print  
 Linocut  
 Relief Print  
 Ink  
 Brayer

### LIGHT

Natural  
 Artificial  
 Dark  
 Bright  
 Shadow  
 Low light  
 Dim

### FEELING

Atmospheric  
 Expressive  
 Humorous  
 Disturbing  
 Refreshing  
 Nostalgic  
 Emotive  
 Depressing  
 Delicate  
 Sinister  
 Joyous

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# BIRDS



## CONTENTS

**Page 16** Topic Overview

**Page 17** Keywords

**Page 18** Mark Hearld

**Page 19** Abby Diamond

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## YEAR 8 - BIRDS

### BRIEF OVERVIEW OF TOPIC

In this project you will explore the theme birds.

You will begin by learning observational drawing techniques using pencil coloured pencil and pen.

You will focus on developing skills in representing texture, tone and mark making.

You will also develop skills using paint, mark making, collage, paper manipulation and sculpture.

You will explore and analyse the work of a range of artists who use birds as inspiration for their artwork, and then you will compose and create your own response showing an influence of their styles and techniques.

We will explore birds that are endangered and at risk of being endangered, and we will explore how we can support our bird population.

### ARTISTS WHO EXPLORE THE THEME BIRDS



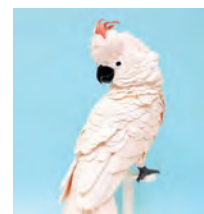
Mark  
Hearld



Abby  
Diamond



Lonac



Diana  
Beltrán  
Herrera

### PLACES TO VISIT

Derby Cathedral  
Darley Park  
Elvaston Castle Country  
Park  
Kedleston Park  
Carsington Water

Ogston Reservoir  
Staunton Harold  
Reservoir  
Attenborough Nature  
Reserve  
Cromford Canal  
Chatsworth Park

### WEBSITES TO VISIT

[www.rspb.org.uk](http://www.rspb.org.uk)  
[www.allaboutbirds.org](http://www.allaboutbirds.org)  
[www.nationalgeographic.com](http://www.nationalgeographic.com)  
[www.countryfile.com](http://www.countryfile.com)  
[www.bbwt.org.uk](http://www.bbwt.org.uk)  
[www.birdspot.co.uk](http://www.birdspot.co.uk)

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## YEAR 8 - BIRDS

KEYWORDS	DEFINITIONS
<b>Bird</b>	A bird is a warm blooded, egg-laying, vertebrate animal, that is distinguished by the possession of feathers, wings, a beak, and typically by being able to fly.
<b>Flight</b>	The action or process of flying or moving through the air.
<b>Wings</b>	A modified forelimb that bears large feathers and is used for flying.
<b>Beak</b>	The beak is the part of a bird which it uses for eating, preening, moving objects around, killing prey, looking for food, courtship and feeding it's young.
<b>Bill</b>	Another word to describe the beak.
<b>Feather</b>	All birds grow feather which help them to fly or swim. They also protect their skin, help to attract mates, act as insulation and camouflage. The central part of the feather is called a shaft.

KEYWORDS	DEFINITIONS
<b>Contour Feathers</b>	These feathers cover the wings, body, and tail. They streamline a bird to help give it a smooth, sleek shape.
<b>Down Feathers</b>	These feathers are fluffy feathers which are close to the body, underneath the contour feathers. They help insulate a bird and keep it warm.
<b>Flight Feathers</b>	These feathers are special contour feathers on the wings, shaped to fan the air, creating lift to help a bird get off the ground, move about in the air, and land safely.
<b>Ornithology</b>	The study of birds. People who study birds are called ornithologists
<b>Talon</b>	A talon is a claw on a bird, especially a bird of prey
<b>Wingspan</b>	The wingspan of a bird is the distance from the wingtip to the other wingtip.

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## YEAR 8 – BIRDS – MARK HEARLD

### MARK HEARLD

Mark Hearld was born in York in 1974. He studied Illustration at Glasgow School of Art from 1994-97 and went on to the Royal College of Art to study for an MA in Natural History Illustration.

Mark Hearld has a fascination with animals and plants, and they lie at the heart of Mark's work. Hen runs, pigeon lofts and foxes appear within his work often.

Mark Hearld works across a number of mediums, producing limited edition lithographic and linocut prints, unique paintings, collages and hand-painted ceramics.

Mark Hearld's main inspiration is Picasso, but he is also greatly admires the work of Bawden, Ravilious and Piper from the 1930's - and the Neo-Romantic artist/illustrators of the 40's and 50's, Keith Vaughn and Craxton.

Mark has completed commissions for Faber & Faber and Tate Museums. A children's book illustrated by a series of Mark's unique collages was published by Walker Books in 2012.

In Autumn 2012 Merrell Books published "Mark Hearld's Work Book" - the first book devoted to Mark's work.



### KEYWORDS

Flora & Fauna  
Nature  
Mark-Making  
Mixed Media  
Illustration

Collage  
Linocut  
Lithograph  
Painting  
Ceramics  
Layered

Depth  
Colourful  
Vibrant  
Expressive  
Tactile  
Distinctive

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YEAR 8 – BIRDS – ABBY DIAMOND

ABBY DIAMOND

Abby Diamond is a freelance illustrator from Pennsylvania, America. She graduated in 2012 with a BFA in Studio Art.

Abby Diamond gets inspired mostly by birds, insects and nature, she creates beautiful colourful illustrations of a wide variety of different species.

Abby Diamond uses watercolour, ink and marker pen to create her illustrations. Her technique involves using watercolour and ink which she then allows to dry before soaking the paper with a sponge and finishing with marker pens and fountain pens.

Abby Diamond achieves a layered look within her pieces where she uses watercolour painting and ink drawing. She has a beautifully fluid motion and great sense of movement in her illustrations. Abby Diamond uses watercolour paint almost as if she is letting it do what it wants, such as the splatters, faded areas, how the colours blend together, and the way she lets the colour bleed outside of the lines, all these elements make her work look effortless.

Abby Diamond creates artwork and visual materials for a wide range of industries including, children's art, editorial illustration, clothing design, and the music industry, advertising agencies, magazines, musicians, and a variety of publishers.



KEYWORDS

Effortless

Movement

Motion

Mark-Making

Paint

Illustration

Watercolour

Ink

Drawing

Drips

Splats

Layered

Line

Energetic

Organic

Expressive

Distinctive

# OUR LANDSCAPE



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## YEAR 8 – OUR LANDSCAPE

### BRIEF OVERVIEW OF TOPIC

In this project you will begin by exploring the local areas around Derby. We will look at the vast differences between our rural, urban and suburban landscapes.

You will research and create a mind map, before beginning to study images of local landmarks and the hidden spaces we sometimes overlook. We will explore our own landscape and how varied it is, we will look at how we can celebrate or expose areas that we inhabit.

You will work in a range of media to present your own response which reflects how you view our city of Derby and also learn how artists have represented their own locations.

You will learn a variety of perspective drawing techniques, as well as printing techniques such as mono printing and relief printing. You will also explore various painting materials and techniques.

### ARTISTS WHO RESPOND TO THEIR LOCATION



George Shaw



Ben Holland



Narbi Price



Rowan Leckie

### PLACES TO VISIT

Derby Cathedral  
Kedleston Hall  
Pickford House  
Guildhall Market  
The Silk Mill  
The Arboretum

The Quad  
Derby Museum and Art Gallery  
Derby Arena and Velodrome  
Pride Park Football Stadium

### WEBSITES TO VISIT

<https://www.lovederby.com>  
<https://www.derbymuseums.org>  
<https://www.inderby.org.uk>  
<https://www.derbylive.co.uk>  
<http://www.derbycathedral.org>  
<https://www.visitderby.co.uk>

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## YEAR 8 – OUR LANDSCAPE

KEYWORDS	DEFINITIONS
<b>City</b>	In the UK, a city is a place which has been granted city status by the monarch. There are 66 cities in the UK
<b>Town</b>	Town comes from an Old English word that referred to a walled or fenced place, such as a farm, village, or courtyard. Our modern word refers to populated areas with fixed boundaries and a local government..
<b>Suburb</b>	The suburbs are an area where people live, which is away from the centre of a town or city
<b>Village</b>	A village is a small settlement usually found in a rural setting.
<b>Site Specific</b>	A work of art designed specifically for a particular location and that has an interrelationship with the location.
<b>Landmark</b>	A landmark includes anything that is easily recognizable, such as a monument, building, or other structure.

KEYWORDS	DEFINITIONS
<b>Green Belt</b>	An area of open land around a city, on which building is restricted.
<b>Manmade</b>	Made or caused by human beings as opposed to occurring or being made naturally.
<b>Natural</b>	Existing in or derived from nature; not made or caused by humankind.
<b>Commercial</b>	Concerned with or engaged in work for profit.
<b>Residential</b>	Designed for people to live in.
<b>Structures</b>	The arrangement of and relations between the parts or elements of something complex.
<b>Architecture</b>	The art or practice of designing and constructing buildings.
<b>Viewpoint</b>	A position or perspective from which something is seen.
<b>Perspective</b>	Perspective in art, is the representation of three dimensional objects or spaces.

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## YEAR 8 – OUR LANDSCAPE – BEN HOLLAND

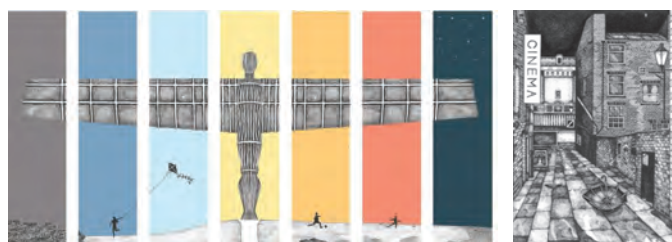
### BEN HOLLAND

Ben Holland is an artist and illustrator based in Heaton in Newcastle Upon Tyne. His drawings reflect his view of Newcastle and the North East. Beyond the great landmarks, they are the places he lives his everyday life. In 2010 he developed his pen and ink style by drawing pubs and cinemas, barber shops and newsagents. To Ben, these places signify Newcastle more than the city's major landmarks. He likes to think of these places being alive with hope, possibility, romance and, in the most atmospheric spots – a certain edginess – something he increasingly hopes to capture within his work.

Ben Holland takes photographs of the pubs from various angles rather than sitting outside them to draw them, as each drawing takes around 20 to 25 hours to complete. He photographs the venues in both day and night before he starts so he can understand the detail in the daylight and where shadows fall or lights shine at night. From that he can draw something that is a mixture of the two giving a unique spin on the building.

Ben Holland exhibits a lot of his work throughout Newcastle Upon Tyne, mainly in the venues that he has drawn.

He has previously been nominated as a finalist for The Biscuit Factory's UK Young Artist of the Year Award and he sells his artwork on the internet, at the Baltic shop and also from his stall on the Quayside Market every Sunday.



### KEYWORDS

Landmarks	Illustration	Depth
Monochrome	Colour Blocks	Line
Drawing	Everyday Life	Tone
Ink	Atmospheric	Nostalgic
Paint	Pen	Perspective
	Detail	Shadows

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YEAR 8 – OUR LANDSCAPE - GEORGE SHAW

GEORGE SHAW

**George Shaw** is a contemporary British artist known for his realistic depictions of banal spaces in the English suburbs. Born in 1966 in the Tile Hill suburb of Coventry, United Kingdom, Shaw received his formal training at Sheffield Polytechnic and London's Royal College of Art. Notably, the artist was nominated for the Turner prize in 2011. He currently lives and works in Ilfracombe, United Kingdom.

George Shaw came to prominence with his paintings of the estate where he grew up in the 1970s. He attracted attention for his use of Humbrol enamel, normally used for painting Airfix models. Painting on hard surfaces, such as MDF and plywood, his paintings possessed a distinctly sheeny, reflective, almost lacquered-looking finish.

In the artist's paintings, the presence of graffiti, litter, and architecture, creates an eerie sense of someone else being there. Occasionally, the lights will be on in an upstairs room, but that is as much of a human presence as these paintings ever register. The light is often uniformly dull and subdued, almost sourly so, edging off to evening. There is frequent evidence of the aftermath of rain – the wet sheen on flag stones, making them look uneven, drab, a clichéd reminder of a culture blighted by chill and damp.

Today, Shaw's works are held in the collections of the Royal College of Art in London, the University of Warwick, and the British Council Collection in London.



KEYWORDS

Isolation  
Eeriness  
Banal  
Humanity  
Enamel

Absence  
Subdued  
Dull  
Nostalgia  
Pathos  
Realistic

Dilapidated  
Nondescript  
Neighbourhood  
Troubled  
Haunting  
Curious

# ART HISTORY



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## ART HISTORY – WESTERN ART TIMELINE

**Ancient Art**  
15,000 BC



**Baroque**  
1600-1730



**Post-Impressionism**  
1886-1905



**Cubism**  
1907-1914



**Surrealism**  
1924-1939



**Renaissance**  
1300-1600



**Impressionism**  
1860-1890



**Expressionism**  
1905-1930



**Dadaism**  
1916-1920



**Pop Art**  
1954-1970

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## ART HISTORY - CUBISM

Cubism was a revolutionary new approach to representing reality invented in around 1907–08 by artists Pablo Picasso and Georges Braque. They brought different views of subjects (usually objects or figures) together in the same picture, resulting in paintings that appear fragmented and abstracted

### FAMOUS CUBIST ARTISTS



Pablo Picasso  
Weeping Woman  
1937



Georges Braque  
Mandora  
1909-10



Juan Gris  
The Guitar  
1918



Jean Metzinger  
Man with a Pipe  
1913



Diego Rivera  
Martín Luis Guzmán  
1915



Fernand Léger  
Still Life with a Beer Mug  
1921-2

### CUBISM IN DETAIL

Cubism was one of the most influential styles of the twentieth century. It is generally agreed to have begun around 1907 with Picasso's celebrated painting *Demoiselles D'Avignon* which included elements of cubist style. The name 'cubism' seems to have derived from a comment made by the critic Louis Vauxcelles who, on seeing some of Georges Braque's paintings exhibited in Paris in 1908, described them as reducing everything to 'geometric outlines, to cubes'.

Cubism opened up almost infinite new possibilities for the treatment of visual reality in art and was the starting point for many later abstract styles including constructivism and neo-plasticism.

By breaking objects and figures down into distinct areas – or planes – the artists aimed to show different viewpoints at the same time and within the same space and so suggest their three-dimensional form. In doing so they also emphasized the two-dimensional flatness of the canvas instead of creating the illusion of depth. This marked a revolutionary break with the European tradition of creating the illusion of real space from a fixed viewpoint using devices such as linear perspective, which had dominated representation from the Renaissance onwards.

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## ART HISTORY - CUBISM

### WHAT INSPIRED THE CUBIST STYLE?

Cubism was partly influenced by the late work of artist Paul Cézanne in which he can be seen to be painting things from slightly different points of view. Pablo Picasso was also inspired by African tribal masks which are highly stylised, or non-naturalistic, but nevertheless present a vivid human image. 'A head', said Picasso, 'is a matter of eyes, nose, mouth, which can be distributed in any way you like'.

### TYPES OF CUBISM: ANALYTICAL VS. SYNTHETIC

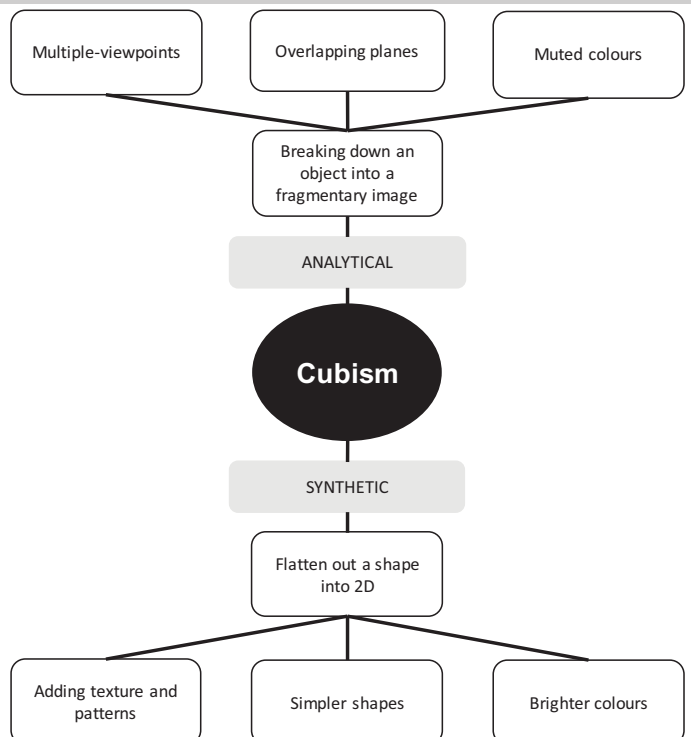
Cubism can be seen to have developed in two distinct phases: the initial and more austere analytical cubism, and a later phase of cubism known as synthetic cubism.

**Analytical Cubism** ran from 1908–12.

**Synthetic Cubism** is the later phase of cubism, generally considered to date from about 1912 to 1914.

Synthetic Cubist works also often include collaged real elements such as newspapers.

The inclusion of real objects directly in art was the start of one of the most important ideas in modern art.



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## ART HISTORY – CUBISM

KEYWORDS	DEFINITIONS
<b>Abstracted</b>	When an object, figure or landscape is stylized, distorted or exaggerated using colours and textures to communicate a feeling, rather than produce a replica.
<b>Fragmented</b>	Broken or separated into distinct parts
<b>Geometric</b>	Shapes that are mathematical shapes. They are perfect and regular. They are characterised by straight lines, angles and points. An exception to this would be a perfect circle as it has no straight lines or points. Other geometric shapes are squares, rectangles, triangles, parallelograms, hexagons etc.
<b>Planes</b>	A surface that is a flat surface, and any distinct flat surface within a painting or sculpture
<b>Three-dimensional</b>	Having or appearing to have length, breadth, and depth.
<b>Two-dimensional</b>	Having or appearing to have length and breadth but no depth

KEYWORDS	DEFINITIONS
<b>Illusion</b>	A deceptive appearance or impression.
<b>Viewpoint</b>	A position or perspective from which something is seen.
<b>Depth</b>	The apparent distance from front to back or near to far in an artwork.
<b>Analytical Cubism</b>	The earlier phase of cubism characterised by its more severe appearance and its interweaving of planes and lines in muted tones of blacks, greys and ochres.
<b>Synthetic Cubism</b>	The later phase of cubism and characterised by simpler shapes and brighter colours. Synthetic cubist works also often include collaged real elements such as newspapers.
<b>Perspective</b>	Perspective in art, is the representation of three-dimensional objects or spaces.
<b>Elements</b>	An essential or characteristic part of a piece of artwork.

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## ART HISTORY – CUBISM – PABLO PICASSO

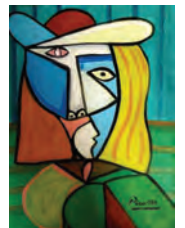
### PABLO PICASSO (25 October 1881 – 8 April 1973)

Spanish artist, Pablo Picasso was born in Malaga in 1881. He is one of the most influential artists of the 20th century. His ingenious use of form, colour, and perspective profoundly impacted later generations of painters. Picasso's talent was cultivated early on by his father the painter Jose Ruiz Blasco. Picasso went on to attend the Royal Academy of San Fernando in Madrid and lived for a time in Barcelona before settling in Paris in 1904.

Constantly in search of pictorial solutions and in dialogue with his friend Georges Braque, Picasso melded forms he saw in African sculpture with the multiple perspectives he picked up from Paul Cézanne, to produce Cubism. Not limited to painting, the artist also expressed himself through collage, sculpture, and ceramics.

Having been deeply affected by the ongoing Spanish Civil War, Picasso created what is arguably his most overtly political work *Guernica* (1937), a mural-sized painting depicting carnage with jagged shapes and contrasting grayscale.

The artist was prolific up until his death on April 8, 1973, in Mougins, France. Today, his works are held in the collections of The MOMA in New York, the Tate in London, the Hermitage Museum in St. Petersburg, as well as institutions devoted solely to his life work.



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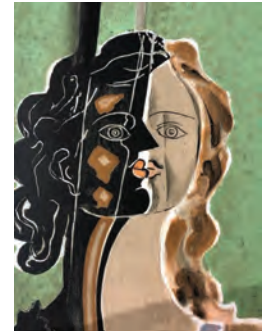
## ART HISTORY – CUBISM – GEORGES BRAQUE

### GEORGES BRAQUE (23 May 1882 – 31 August 1963)

Parisian painter, Georges Braque was born in 1882. He was most well known for being the founder of Cubism alongside famous artist Pablo Picasso. He also did work which touched on Impressionism, fauvism, and even focused on collage styles of work, which brought together a series of imaginative pieces, bold colours, and distinct shapes and styles to his work.

During the wartime period, the work he put together would change in order to represent the sombre, dark period the world was going through. In between wartime, he would also change the style and themes, to represent lighter times, and happier things which were taking place around him. Although he did change his style, tone, colour use, and design features, he never strayed too far away from Cubism. From 1909 up to 1914, he spent a majority of his career working with Picasso. This was when the two men focused on developing a new style of art. The two developed new themes, bold lines, and a series of darker colour schemes, and created the Cubism style. Georges Braque also incorporated collages, and the use of the entire canvas, to convey pieces that were created.

In his personal life, Georges Braque failed to ever take on larger scale projects; this was namely due to his poor health, which would not allow him to work on major pieces, or spend too much time focused on any individual piece.



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## ART HISTORY – CUBISM – JUAN GRIS

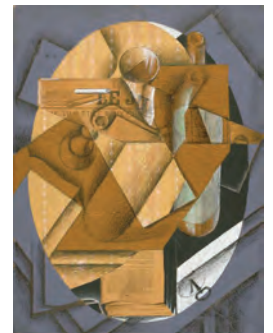
### JUAN GRIS (23 March 1887 - 11 May 1927)

Spanish painter, Juan Gris was born in Madrid. Gris studied mechanical drawing at the Escuela de Artes y Manufacturas in Madrid from 1902 to 1904, during which time he contributed drawings to local periodicals. From 1904 to 1905 he studied painting with the academic artist José María Carbonero.

In 1906 he moved to Paris and became friends with Henri Matisse, Georges Braque, Fernand Léger. In Paris, Gris followed the lead of another friend and fellow countryman, Pablo Picasso. By 1912 Gris had developed a personal Cubist style. At first Gris painted in the analytic style of Cubism, but after 1913 he began his conversion to synthetic Cubism, of which he became a steadfast interpreter, with extensive use of papier collé. Unlike Picasso and Braque, whose Cubist works were monochromatic, Gris painted with bright harmonious colours in daring, novel combinations in the manner of his friend Matisse.

Gris was frequently ill with bouts of uremia and cardiac problems. He died of kidney failure in Boulogne-sur-Seine (Paris) in the spring of 1927 at the age of forty, leaving a wife, Josette, and a son, Georges.

The top auction price for a Gris work is £34.8 million, achieved for his 1915 painting *Nature morte à la nappe à carreaux* (Still Life with Checked Tablecloth).



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## ART HISTORY – DADAISM

Dada was an art movement formed during the First World War in Zurich in negative reaction to the horrors and folly of the war. The art, poetry and performance produced by dada artists is often satirical and nonsensical in nature

### FAMOUS DADAIST ARTISTS



Marcel Duchamp  
Fountain  
1917



Hannah Hoch  
Da-Dandy  
1919



Max Ernst  
Sacred Conversation  
1921



Hugo Ball  
Cabaret Voltaire  
1916



Francis Picabia  
Tableau Rastadada  
1920



Raoul Hausmann  
Dada Siegt  
1920

### DADAISM IN DETAIL

Dada artists felt the war called into question every aspect of a society capable of starting and then prolonging it – including its art. Their aim was to destroy traditional values in art and to create a new art to replace the old. As the artist Hans Arp later wrote:

*'Revolted by the butchery of the 1914 World War, we in Zurich devoted ourselves to the arts. While the guns rumbled in the distance, we sang, painted, made collages and wrote poems with all our might.'*

In addition to being anti-war, dada was also anti-bourgeois and had political affinities with the radical left.

The founder of dada was a writer, Hugo Ball. In 1916 he started a satirical night-club in Zurich, the Cabaret Voltaire, and a magazine which, wrote Ball, **'Will bear the name "Dada". Dada, Dada, Dada, Dada.'** This was the first of many Dada publications. Dada became an international movement and eventually formed the basis of surrealism in Paris after the war.

Leading artists associated with it include **Jean Arp, Marcel Duchamp, Francis Picabia, Max Ernst, Hannah Hoch, Man Ray, Raoul Hausmann and Kurt Schwitters**. Duchamp's questioning of the fundamentals of Western art had a profound subsequent influence.

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## ART HISTORY – DADAISM

### WHAT INSPIRED THE DADAIST STYLE?

Dadaism was a movement with political overtones – a reaction to the senseless slaughter in the trenches of WWI. It essentially declared war against war, countering the absurdity of the establishment's descent into chaos with its own kind of nonsense.

### TYPES OF DADAISM

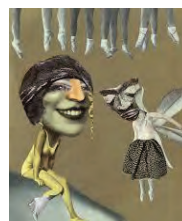
The Dadaists and the Dada movement did not shy away from experimenting with new media. Jean Arp, for example, explored the art of collage and the potential for randomness in its creation. Man Ray also toyed with the arts of photography and airbrushing as practices that distanced the hand of the artist and thus incorporated collaboration with a chance. Beyond these artistic media, the Dadaists also probed the literary and performance arts. Hugo Ball, for instance, the man who penned the unifying manifesto of Dadaism in 1916, investigated the liberation of the written word. Freeing text from the conventional constraints of a published page, Ball played with the power of nonsensical syllables presented as a new form of poetry. These Dadaist poems were often transformed into performances, allowing this network of artists to move easily between media.



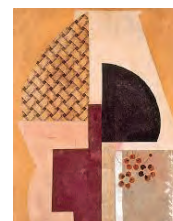
A still from a piece of **Performance Art** at the Cabaret Voltaire in Zurich



Dada **Photography** explored by Man Ray



**Photomontage**



**Collage**



A piece of dada **Poetry** by Hugo Ball



**Ready Mades**

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## ART HISTORY – DADAISM

KEYWORDS	DEFINITIONS
<b>Satirical</b>	When irony, sarcasm, humour or exaggeration is used to criticize or discredit something.
<b>Nonsensical</b>	Having no meaning or making no sense.
<b>Bourgeois</b>	Belonging to or characteristic of the middle class, typically with reference to its perceived materialistic values or conventional attitudes.
<b>Anti-Bourgeois</b>	is opposed to anyone or anything considered bourgeois.
<b>Collage</b>	Collage describes both the technique and the resulting work of art in which pieces of paper, photographs, fabric and other ephemera are arranged and stuck down onto a supporting surface
<b>Performance Art</b>	Artworks that are created through actions performed by the artist or other participants, which may be live or recorded, spontaneous or scripted
<b>Photomontage</b>	A photomontage is a collage constructed from photographs

KEYWORDS	DEFINITIONS
<b>Aesthetic</b>	An aesthetic object or a work of art is one that shows great beauty.
<b>Unconscious</b>	An unconscious thought or feeling is one that you do not know you have
<b>Political</b>	Relating to the government of a country
<b>Anti-Art</b>	Anti-art is a term used to describe art that challenges the existing accepted definitions of art
<b>Readymade</b>	A found object, items or products that are not normally considered materials from which art is made, therefore they are 'readymade'
<b>Narrative</b>	A visual narrative is art that tells a story.
<b>Frottage</b>	The technique or process of taking a rubbing from an uneven surface to form the basis of a work of art.

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## ART HISTORY – DADAISM – HANNAH HOCH

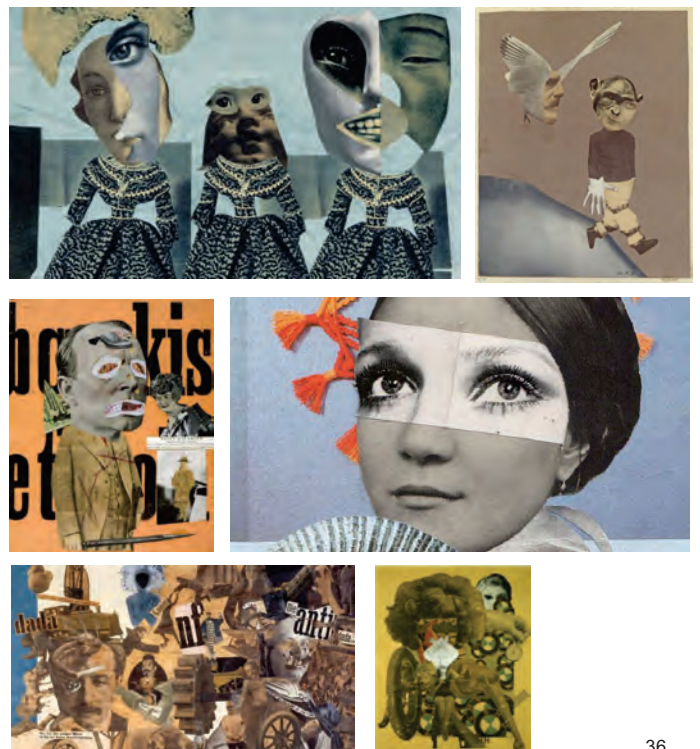
### HANNAH HOCH (23 March 1887 - 11 May 1927)

German Dada artist Hannah Hoch born in Gotha, Germany in 1887, is known for her political photomontages made from newspaper clippings and found objects. Her work often engaged with the early 20th-century ideal of the "New Woman"—one who challenged the traditional domestic role of females.

The artist is most commonly associated with her photomontage 'Cut with the Kitchen Knife through a Beer-Belly of the Weimar Republic' (1919-1920) (bottom left), which critiqued the male-dominated political apparatus, a system the artist believed resulted in the failure of the Weimar Republic and the increasing militarization in post-World War I Germany.

Hoch studied at the Berlin's College of Arts and Crafts, training that was not available to many European women at the time. In 1915, Höch formed a romantic relationship with artist Raoul Hausman, who introduced her to Dadaism. In 1926, she split from Hausman and moved to the Netherlands, where she worked alongside several influential artists including Piet Mondrian and Kurt Schwitters. Later in her career, the artist lived in Berlin and was forced to stop showing her work in public after her art was deemed degenerate by the Nazi regime.

Höch died on May 31, 1978 in Berlin, Germany. Her work is currently held in the collections of the MOMA in New York, and the Berlinische Galerie.



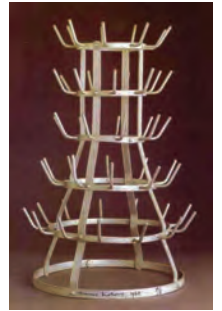
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## ART HISTORY – DADAISM – MARCEL DUCAMP

### MARCEL DUCAMP (28 July 1887 – 2 October 1968)

French artist Marcel Duchamp was born in Blainville, Normandy. He was the son of a notary and the younger brother of the painter Jacques Villon and the Cubist sculptor Raymond Duchamp-Villon. He studied at the Académie Julian in 1904-5. His early figure paintings were influenced by Matisse and Fauvism, but in 1911 he created a personal brand of Cubism combining earthy colours, mechanical and visceral forms, and a depiction of movement which owes as much to Futurism as to Cubism. His *Nude Descending a Staircase, No.2*, 1912, created a sensation at the 1913 New York Armory Show. Duchamp did very little painting after 1912, creating the first of his 'ready-mades' in 1913. These were ordinary objects of everyday use, sometimes slightly altered, and designated works of art by the artist. His earliest ready-mades included *Bicycle Wheel* (1913), a wheel mounted on a wooden stool, and a snow shovel entitled *In Advance of the Broken Arm* (1915). One of his best-known pieces is a urinal, titled *Fountain* and signed 'R. Mutt', which he submitted to an exhibition of the Society of Independent Artists in New York in 1917. In the ensuing controversy, the concept of the readymade became associated with an assault on the conventional understanding of the nature and status of art. Duchamp also used ready-mades as parts of a private symbolic language. Duchamp spoke of how using prefabricated objects freed him from the 'trap' of developing a particular style or taste. His friendship with Man Ray led to their publication of *New York Dada* in 1921. In the last twenty years of his life, he worked in secret on a three-dimensional realisation of 'The Bride Stripped Bare by her Bachelors'.



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## ART HISTORY – DADAISM – RAOUL HAUSMANN

### RAOUL HAUSMANN (12 July 1886 - 1 February 1971)

Austrian artist Raul Hausmann was born on July 12, 1886 in Vienna, Austria, he was exposed to art at a young age by his father who was a painter. He and his family moved to Berlin in 1900, where 8 years later he entered into the studio of Arthur Lewin-Funcke. In 1917, having mostly produced works in the aesthetic idiom of German Expressionism, he met Richard Huelsenbeck, who introduced him to the tenets of Dada. In the years that followed, Hausmann wrote several essays and exhibited works alongside his lover Hannah Höch as well as George Grosz and John Heartfield. During the Nazi regimes rise to power, Hausman and his new wife, fled to Ibiza, Spain.

Raoul Hausmann was known for his inventive collages, photographs, and photomontages. Hausmann's works as well as his writings, contributed a great deal to the discourse of the Berlin Dada group during the 1920s. "What is important is that our optical awareness rids itself of classical notions of beauty and opens itself more and more to the beauty of the instant," he once wrote. After World War II, he dedicated much of the rest of his career to publishing writings about Dadaism. Hausmann died on February 1, 1971 in Limoges, France.

Today, the artist's works are held in the collections of The Museum of Modern Art in New York, the National Gallery of Art in Washington, D.C., and the Tate Gallery in London, among others.



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# Year 8 Computer Science Knowledge Organiser

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## Online Safety

1. **Don't** give out your personal details
2. If you share a picture remember it can easily be changed
3. Remember people **lie** online
4. **Don't** meet up with strangers without an adult you trust
5. **Always** report problems

### Netiquette rules:

- When posting on sites don't be abusive (you can disagree with someone without name calling!)
- Remember that posts are public
- Stay on topic when posting in forums
- Do not post copyrighted material
- When sending emails always include a subject and suitable message

# Online Safety

Childline Number: 0800 1111

[www.nspcc.org.uk/keeping-children-safe/online-safety/](http://www.nspcc.org.uk/keeping-children-safe/online-safety/)

[saferinternet.org.uk/](http://saferinternet.org.uk/)

[www.getsafeonline.org/](http://www.getsafeonline.org/)

## Media – Vector Graphics

### Inkscape General Setup

**How to...** Create a new .svg file

#### Steps

1. Run Inkscape (vector graphic editing program).

2. Save a new .svg file.

#### Instructions

Use the menus: **File** > **Save**



Select a suitable folder to place your file in.


Enter a suitable file name for your new .svg file.

Make sure you set the type to 'Inkscape SVG (\*.svg)'.

To finish, click the **Save** button.




## How to... Zoom in and out

Steps	Instructions
<p>1. <b>Zoom</b> in and out on the canvas.</p> <p>Zooming in and out is something that you will need to do very often when working with vector graphics.</p>	<p>Use the <b>Zoom tool</b>:</p>  <p>Click on the <b>Zoom</b> tool then click on the canvas to zoom in. Click on the <b>Zoom</b> tool then hold the Shift key and right click on the canvas to zoom out.</p>

## Activity 1 – Create shapes

### How to... Create a rectangle/square

Steps	Instructions
<p>1. <b>Drag</b> a rectangle/square shape onto the canvas.</p> 	<p>Select the rectangle/square tool from the tool bar on the left side of the screen (the square icon).</p> <p>Click and hold the left mouse button on the canvas.</p> <p>Drag the mouse to draw a rectangle/square to the required size.</p> <p>Release the left mouse button to finish drawing your rectangle/square.</p>

## How to... Create an ellipse

### Steps

1. **Drag** an ellipse shape onto the canvas.



### Instructions

Select the ellipse tool from the tool bar on the left side of the screen (the circle/ellipse icon).

Click and hold the left mouse button on the canvas.

Drag the mouse to draw an ellipse to the required size.

Release the left mouse button to finish drawing your ellipse.

## How to... Create a polygon

### Steps

1. **Drag** a polygon shape onto the canvas.



### Instructions

Select the star/polygon tool from the toolbar on the left side of the screen (the star/polygon icon).

Select the polygon icon at the top of the screen. The shape-specific attributes for polygons will appear.

Click and hold the left mouse button on the canvas.

Drag the mouse to draw a polygon to the required size.

Release the left mouse button to finish drawing your polygon.

## How to... Alter the height and width of a shape

### Steps

1. **Select** the shape you wish to alter.



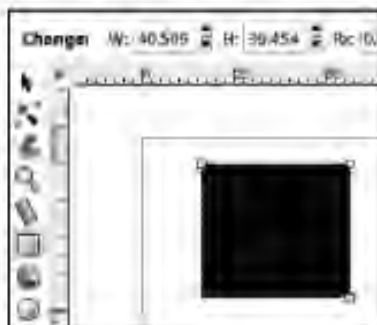
### Instructions

Select the selection tool from the tool bar on the left side of the screen (the black arrow icon).

Click on the shape to select it.

Black double-ended arrows will appear around the selected shape.

2. **Alter** the height and width of a rectangle/square.



There are two ways to alter the height and width of a rectangle/square.

#### Method 1:

Click and drag the nodes in the top left or bottom right corner of the selected rectangle/square.

#### Method 2:

To alter the height and width more accurately, change the **W**: (width) dimension and the **H**: (height) dimension at the top of the screen by using the up and down arrows or entering the required height and width.

## How to... Add rounded corners to rectangle/square

### Steps

### Instructions

1. **Select** the rectangle/square you wish to alter.

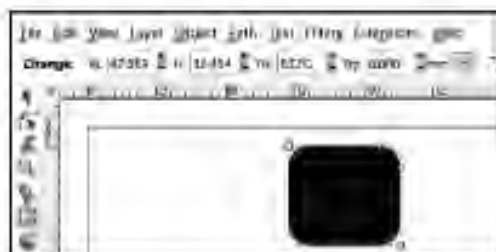


Select the selection tool from the tool bar on the left side of the screen (the black arrow icon).

Click on the required rectangle/square to select it.

Black double-ended arrows will appear around the selected rectangle/square.

2. **Add** rounded corners to your rectangle/square.



Click and drag the vertical and horizontal radius nodes in the top right corner of the selected rectangle/square.

## Activity 2 – Change fill and outline

### How to... Alter the fill of a shape

#### Steps

#### Instructions

1. **Select** the shape you wish to alter.

Select the selection tool from the tool bar on the left side of the screen (the black arrow icon).

Click on the required shape to select it.

Black double-ended arrows will appear around the selected rectangle/square.



2. **Select** the required fill colour.

Click on the fill tab from the fill and stroke window on the right side of the screen.

Choose a paint type by clicking on one of the options shown as squares. Options include: No paint, Flat colour, Linear gradient, Radial gradient, Pattern, Unset paint. Use flat colour for now.

Below the text that reads 'flat colour', select the wheel option.

Select a colour from the outer wheel.

Select the required tone from the centre triangle.



#### Tip:

You can also choose a fill colour for a selected shape using the bar at the bottom of the page.



## How to... Alter the stroke of a shape

### Steps

1. **Select** the shape you wish to alter.



### Instructions

Select the selection tool from the tool bar on the left side of the screen (the black arrow icon).

Click on the required shape to select it.

Black double-ended arrows will appear around the selected rectangle/square.

2. **Select** the required stroke colour.



Click on the stroke paint tab from the fill and stroke window on the right side of the screen.

Choose a paint type by clicking on one of the options shown as squares. Options include: No paint, Flat colour, Linear gradient, Radial gradient, Pattern, Unset paint. Use flat colour for now.

Below the text that reads 'flat colour', select the wheel option.

Select a colour from the outer wheel.

Select the required tone from the centre triangle.

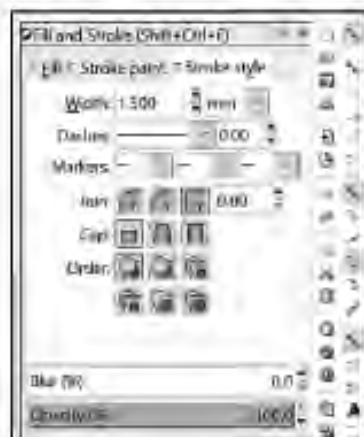
#### Tip:

You can also choose a stroke colour for a selected shape using the bar at the bottom of the page, once a paint type has been selected.



3. **Select** the required stroke style.

Click on the stroke style tab from the fill and stroke window on the right side of the screen.



Change the width to the required size.

Select a suitable dash pattern.

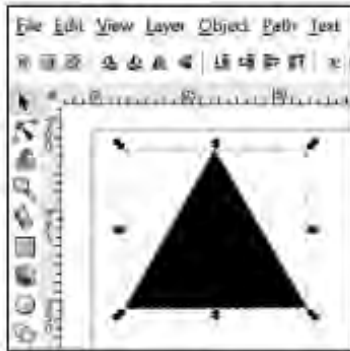
## Activity 3 – Rotate and reposition

### How to... Rotate a shape

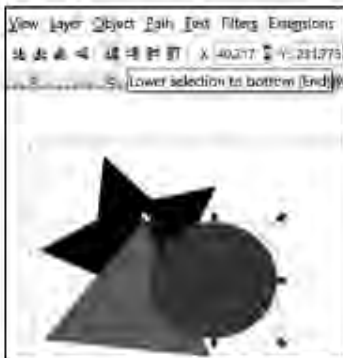
Steps	Instructions
1. <b>Select</b> the shape you wish to rotate.	
2. <b>Rotate</b> the selected shape.	Click <b>twice on a shape</b> and the double arrows around the shape will change direction to point around the edge of the shape. Click on any one of the double arrows and drag to rotate the shape in any direction.



## How to... Move a shape

Steps	Instructions
1. <b>Select</b> the shape you wish to move.	
1. <b>Move</b> the selected shape.	Click and drag the shape to a different position on the page.
	

## How to... Alter the z-order of a shape

Steps	Instructions
1. <b>Select</b> the shape you wish to change the z-order for	
2. <b>Change</b> the z-order of the selected shape	<p>Click on the <b>Lower selection to bottom</b> button at the top of the screen to send the selected shape to the back/behind the other shapes on the canvas.</p> <p>Click on the <b>Lower selection one step</b> button to send the selected shape one step back/behind the previously created shape on the canvas.</p> <p>Click on the <b>Raise selection to top</b> button to send the selected shape to the front/in front of the other shapes on the canvas.</p> <p>Click on the <b>Raise selection one step</b> button to send the selected shape one step forward/in front of the shape created directly afterwards on the canvas.</p>
	

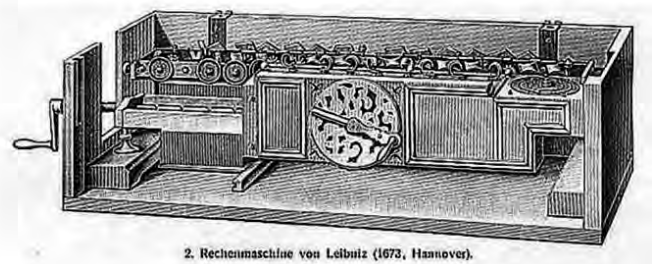
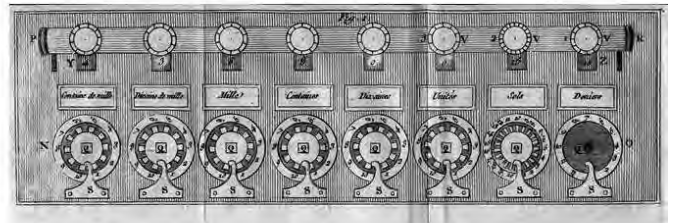


# Layers of Computing Systems

## The Pascaline and the stepped reckoner

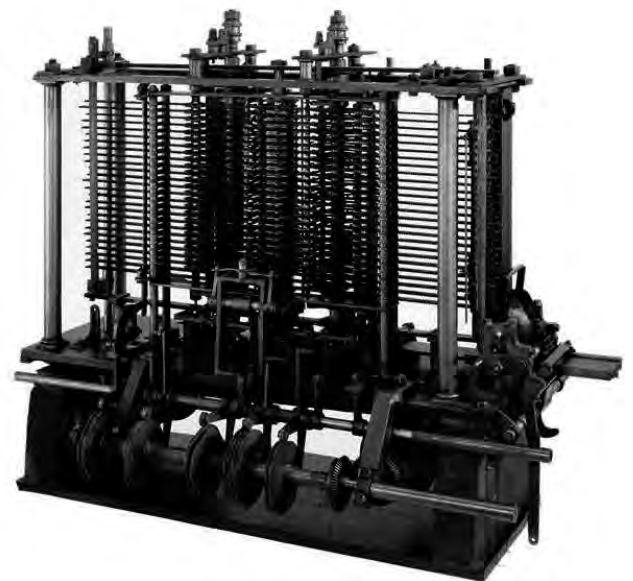
Pascal (1642) and Leibniz (1672) designed calculating machines.

Leibniz's machine was the first to add, subtract, multiply, and divide.



## Babbage's Analytical Engine

Babbage (1837) conceived of a programmable machine that would perform calculations, as specified by **instructions** on punched cards.



# Automate the process

## Calculating machines

“

Purpose-built: designed to automate a specific process

The data and operations to be performed are either specified manually by the user, or hardwired into the machine.

## Modern computers

Receive **input**, **process** it, produce **output**

General-purpose: designed to automate any process, as specified by a **program**

The data and instructions to be performed can be stored in **memory**.

## What makes a computer different...

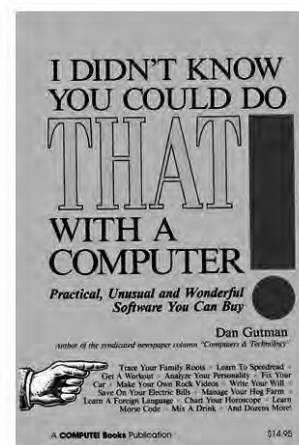
...than an appliance such as a dishwasher?

The computer is the only appliance that can do more than one thing. Toasters toast. Refrigerators cool. Lamps illuminate.

One appliance, one task.

But the computer can do hundreds of tasks. **The computer doesn't have a specific, well-designed purpose.**

”



*I didn't know you could do that with a computer!* – Dan Gutman (1986)

The purpose of a general-purpose computer is to **execute programs** that operate on data.

Through each program, the computer transforms itself into a machine that performs a specific task.

This is essentially how Alan Turing described it.



## Your software

You use programs for every task that you perform on your computer.

The word **software** simply means **programs**.



The word **computer** applies to all kinds of general-purpose computing devices.

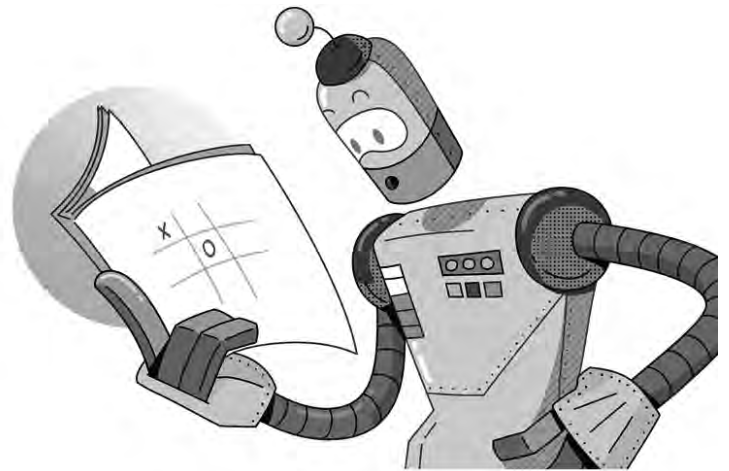


The **physical components** of a computing system are called **hardware**.



Hardware is any component of a computing system that you can touch.

The **programs** of a computing system are called **software**.



	Desktop	Laptop	Phone	Raspberry Pi 4	micro:bit	Rover
Processor	✓	✓	✓	✓	✓	✓
Memory	✓	✓	✓	✓	✓	✓
Storage	✓	✓	✓	✓	✓	✓
Communication	✓	✓	✓	✓	✓	✓
Graphics processor	✓	✓	✓	✓		
Input and output		✓	✓		✓	✓
Connections	✓	✓	✓	✓	✓	
Weight		✓	✓	✓	✓	

The **storage** (secondary memory) is the set of components that **stores** programs and data.

Storage is **persistent**: it retains its contents when the power is off.

Storage technology evolves over time.  
The concept of storage is a constant.

**Question** Name a few common storage devices.



Hard disk  
(HDD)



Solid-state  
drive (SSD)



SD card



USB stick

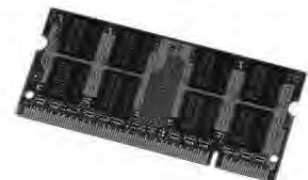


Optical disc

The main **memory** is the component that **stores** the programs and data **currently in use**.

Memory is **volatile**: its contents are lost when the power is off.

**Terminology:** The main memory is commonly referred to as **RAM** (random-access memory).



This is what the main memory looks like in desktops and laptops.

Sometimes, memory is integrated with other components, rather than being a separate component.

The **processor** is the component that **executes** program instructions.

An instruction may:

- Perform arithmetic or logic operations on data
- Perform input/output of data
- Control program flow

**Terminology:** The processor is commonly referred to as the **CPU** (central processing unit).



This is what the processor looks like in desktops and laptops.

Sometimes, the processor is integrated with other components, rather than being a separate component.

Computing systems exchange information and form networks using **communication** components.

**Programs** and **data** are transferred between computing systems, when required.

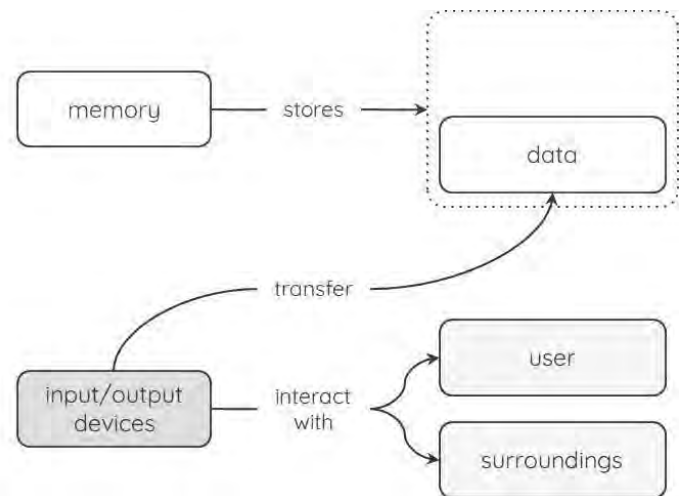
This allows:

- Input to be obtained remotely
- Data to be stored on remote systems
- Programs to be executed remotely

Computing systems interact with the user and their surroundings through devices for **input** and **output**.

Input: data **received** by a system

Output: data **transmitted** from a system



## Input Devices



Keyboard



Mouse



Camera



Microphone

Sensors



Screen



Speakers



Printer



Projector



LEDs



Motors

## Boolean logic

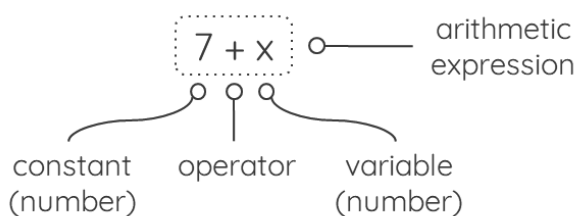
In 1854, George Boole published *The Laws of Thought*.

The book didn't really capture how we think.

It was an effort to represent **logic** and **reasoning** as **mathematical operations**.

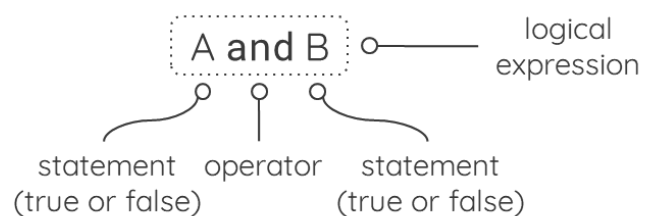


**Arithmetic operations**, such as addition, operate on numbers.



The result, the value of an arithmetic expression, is also a number.

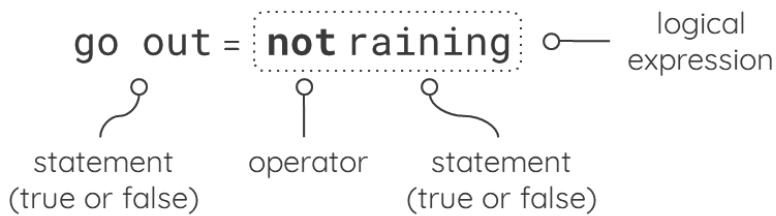
**Logical operations** operate on statements that are **true** or **false**.



The result, the value of a logical expression, is either true or false.



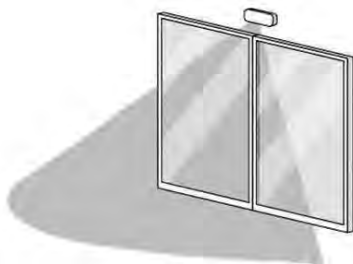
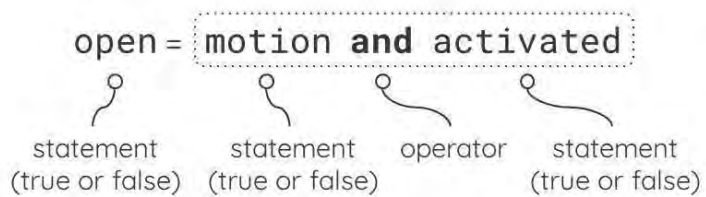
## Boolean logic - Examples



go out	
raining	not raining
true	false

The statement **not A** is true when A is false and vice versa.

## Boolean logic - Examples



open		
motion	activated	motion and activated
true	false	false
true	true	true

The statement **A and B** is true when both A and B are true.

## Logic gates and logic circuits

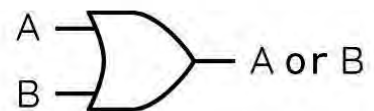
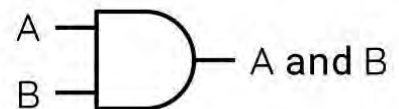
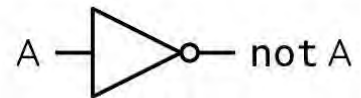
Logical expressions — **logic circuits** can be represented using diagrams



Logical operations — **logic gates** can be represented using symbols



We use this **abstract** representation because we are not interested in the details of the circuit.



## Scratch Programming

Scratch 3 Component	What it means
<b>Sprite</b>	The character within your program that is being controlled by commands.
<b>Script</b>	Each script is a group of commands. Each sprite can execute one or more scripts.
<b>Costume</b>	Each sprite can have many costumes. These are found in the purple Looks commands and control the appearance of the sprite.
<b>Stage</b>	Includes backgrounds for the Scratch project and scripts but no motion commands as the stage cannot move.
<b>Clone</b>	A copy of a sprite. Each sprite can spawn many clones.

Terminology	What it means
<b>Iteration</b>	A command that repeats or loops For example: <b>Repeat 10</b> , <b>Repeat until</b> , <b>Forever</b>
<b>Selection</b>	<b>IF ELSE</b> command that selects which programming path to follow
<b>Condition</b>	A condition is either true or false, for example touching colour red. In Scratch these commands have a long hexagon shape – either green or light blue
<b>Broadcasts</b>	A broadcast is a message that is sent by one sprite to other sprites. Upon receiving a broadcast a script can begin execution.
<b>Variable</b>	A value stored by the program that can <b>change</b> . For example, <b>Set Score to 0</b>

## HTML Programming

HTML Start & End Tags	What it means
<b>&lt;HTML&gt;</b> <b>&lt;/HTML&gt;</b>	The start and end tags for the HTML webpage.
<b>&lt;Head&gt;</b> <b>&lt;/Head&gt;</b>	The Head section of the webpage. Style rules can be put in here.
<b>&lt;Body&gt;</b> <b>&lt;/Body&gt;</b>	The Body section of the webpage. All the content of the webpage such as the text, images and hyperlinks is put in here.

HTML Start & End Tags	What it means
<b>&lt;p&gt;</b> <b>&lt;/p&gt;</b>	Paragraph <b>&lt;p&gt;This is all about ....&lt;/p&gt;</b>
<b>&lt;h1&gt;</b> <b>&lt;/h1&gt;</b>	Heading 1. <b>&lt;h1&gt;My Webpage&lt;/h1&gt;</b>
<b>&lt;img&gt;</b>	Image tag. (There is no end tag). The source of the image is included in the tag. Eg. <b>&lt;img src="images/My Picture.png"&gt;</b>
<b>&lt;a&gt;</b> <b>&lt;/a&gt;</b>	Anchor start and end tags. These are used for hyperlinks. Eg. <b>&lt;a href="Second Page.html"&gt;Page 2&lt;/a&gt;</b>

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## Computer Hardware

Computer Hardware – the **physical** components that make up the inside of the computer so it can work effectively

Hardware name	Description
<b>CPU</b> Central Processing Unit	The CPU is like the <b>brain</b> of the computer. It does all the 'thinking' or processing.
<b>RAM</b> Random Access Memory	This type of memory is <b>volatile</b> which means always changing. It is like <b>short-term memory</b> . It is wiped when the power is off.
<b>Motherboard</b>	This is like the <b>skeleton</b> of the computer because everything else plugs into it.
<b>Graphics Card</b>	This is like a <b>personal assistant</b> to the CPU. It handles all the graphics processing leaving the CPU to process everything else.

Hardware name	Description
<b>HDD</b> Hard Disc Drive	This is <b>non-volatile</b> storage and is like <b>long-term memory</b> . HDDs have a large <b>capacity</b> and can store large amounts of programs, files and data.
<b>SSD</b> Solid State Drive	This is <b>non-volatile</b> storage that is FAST and ROBUST. They are more expensive for their capacity than HDDs. They are also like <b>long-term memory</b> .
<b>DVD Drive</b> Digital Versatile Disc Drive	DVD, Blu-ray and CD Drives are <b>optical</b> storage which means they use a laser to store and read the data.
<b>PSU</b> Power Supply Unit	The PSU is like the <b>heart</b> of the PC. It provides the power needed for each component to run effectively.

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## Computer Hardware Topic

Computer Hardware – can be measured in terms of speed and capacity – often preceded by an indication of size using a letter

Measurement	Speed
<b>Speed</b>	The time taken to complete something, measured in Hertz (Hz) e.g. KHz
<b>Capacity</b>	The storage capability of the system, measure in Bytes (B) e.g. 16 GB

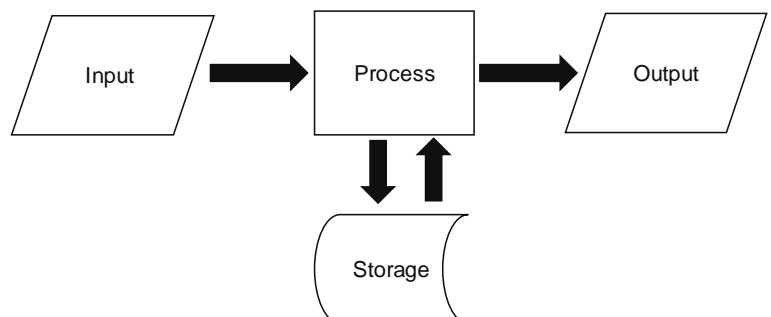
Size	Description
<b>bit (b)</b>	0 or 1. The smallest unit on a computer.
<b>Byte (B)</b>	8 bits
<b>KiloByte (KB)</b>	1 Thousand Bytes
<b>MegaByte (MB)</b>	1 Million Bytes
<b>GigaByte (GB)</b>	1 Billion Bytes
<b>TeraByte (TB)</b>	1 Trillion Bytes

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## Computer Hardware Topic

Computer Hardware– the devices that connect to the computer to enable it to be used

Type of device	Description
Input Devices	Allow data to be entered into a computer
Processing Devices	Processes data within a computer
Output Devices	Allow information to be retrieved and interpreted
Storage Devices	Can be both internal and external Allows files to be retrieved



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## Computer Hardware Topic

### Common Types of Input Devices

Device	Description
Keyboard	Allows characters to be entered using keys
Mouse	A hand-held device that detects motion which in turn moves a pointer which is displayed on a monitor
Microphone	Allows for audio input
Touchscreen	Allows data and information to be input via a screen using touch

### Common Types of Output Devices

Device	Description
Monitor	Allows data and information to be displayed on a screen
Speakers	Allows audio to be heard
Touchscreen	Allows data and information to be displayed on a screen
Printer	Allows files to be printed out to become a physical document



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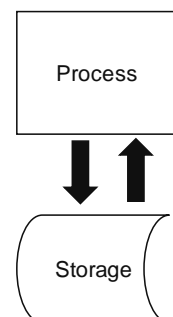
## Computer Hardware Topic

### Common Types of Processing Devices

Device	Description
CPU (Central Processing Unit)	Where the main processing takes place within the computer.
GPU (Graphical Processing Unit)	A processor designed to speed up the rendering of images
Network Card	A device that connects a computer to a network
Sound Card	Provides input and output of audio signals to and from a computer

### Common Types of Storage Devices

Device	Description
USB Flash Drive	A small external drive that can be plugged in to a USB port
CD	A circular disc that can hold data stored as notches and read by a laser from an optical drive
DVD	A circular disc that can hold data stored as notches and read by a laser from an optical drive, larger storage capacity than a CD
HDD	Uses magnetic storage to hold data



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## Computer Hardware and Software Topic

As part of this topic you will present your work using presentation **software**.

Below is a reminder of what to think about when creating a presentation.

What to consider	How to do it	Why it is important	What to consider	How to do it	Why it is important
<b>A simple colour scheme</b>	Use a dark background with light writing or a light background with dark writing.	It will make the text easier to read.	<b>Relevant, high quality images</b>	Ensure any images used are not blurry and are relevant to the text on the slide.	If the images are not relevant or poor quality it makes the presentation look unprofessional
<b>Limit bullet points and text</b>	5 bullet points of one sentence each is usually enough.	Too much information on one slide can become distracting and may not be read.	<b>Ensure the text is in your own words</b>	After reading the information, see if you can reword the key explanations.	There are copyright issues to consider and it also shows that you have used only the key information.
<b>Limit animations and transitions</b>	Choose one type of animation and one type of transition and apply them only where needed.	If there are too many used or they are not consistent, it can look unprofessional and become distracting			

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## Computer Hardware and Software Topic

As part of this topic you will be using the Internet to research about **Computer Hardware and Software**.

Below are two reminders of what you could do when entering search criteria online for better results.

What to consider	How to do it	Example
<b>Use specific terms</b>	Instead of entering a whole sentence as a search term, select the keywords from the sentence	Instead of searching for: 'How is an Ethernet cable used in a computer?' you could just search using 'Ethernet Cable Uses'
<b>Use quotations for exact phrases</b>	If you know the exact wording then use speech marks " " to restrict the search to just those terms	If you wanted to know 'how a firewall protects a computer from unauthorised access' is you could search using the phrase "firewall preventing unauthorised access"

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# Python Programming

An **algorithm** is a set of **precise** instructions, expressed in some sort of **language** (e.g. textual, visual).

**Understanding** the language is necessary in order to **execute** the instructions.

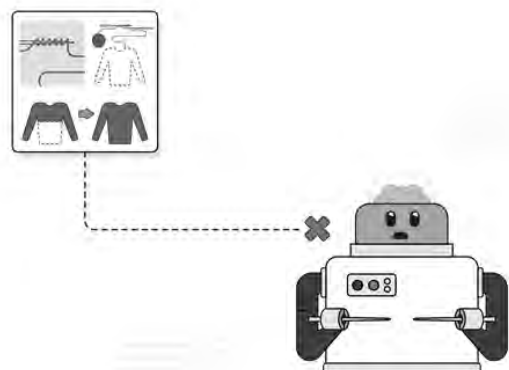
Executing these instructions is meant to solve a **problem**.



## Programs

A **program** is a set of precise instructions, expressed in a **programming language**.

**Translating** the programming language is necessary for a machine to be able to **execute** the instructions.

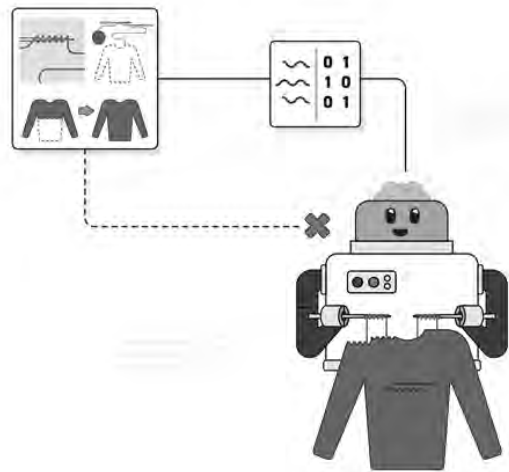


## Python programs

To execute a Python program, you need a **Python interpreter**.

This is a program that translates and executes your Python program.

The Python interpreter doesn't necessarily run on your computer.



## Syntax

All programming languages have rules for **syntax**, i.e. how statements can be assembled.

Programs written in a programming language must follow its syntax.

Programs with **syntax errors** cannot be translated and executed.

All languages have rules for **syntax**, i.e. how sentences can be assembled.

Speech or text in a language must follow its syntax.

Humans can infer meaning even in cases when syntax rules are violated.

For example, “tonight see you”, instead of “see you tonight”, will probably be understood.



## Syntax



All programming languages have rules for **syntax**, i.e. how statements can be assembled.

Programs written in a programming language must follow its syntax.

Programs with **syntax errors** cannot be translated and executed.



In Scratch, syntax errors are not possible: rules are enforced by the blocks and the way they fit together.

You can still make **logical errors**! That's when your program doesn't work the way it should.

## Syntax



All programming languages have rules for **syntax**, i.e. how statements can be assembled.

Programs written in a programming language must follow its syntax.

Programs with **syntax errors** cannot be translated and executed.

```
if remaining < 10:
    print("We are getting
    there")
else:
    print("Still some way to
    go")
```

In Python, you can (**and you will**) make syntax errors. You will need to follow the syntax rules.

Syntax errors can be frustrating when you start learning a text-based programming language.

## Syntax

**SyntaxError:** invalid syntax

**SyntaxError:** Missing parentheses in call to 'print'.

**SyntaxError:** EOL while scanning string literal

Don't be overwhelmed by these errors. They are here to discourage the faint-hearted. **You** can fix them!

## Your first steps in Python: commentary

```
user = "Claude"
print("Hello", user)

lucky = 13
print("My lucky number is",
lucky)
```

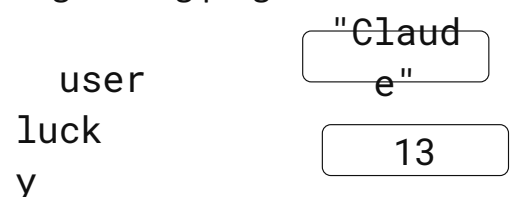
`user` is a variable.

It is assigned a **string** value.

`lucky` is another variable.

It is assigned an **integer** value.

It is useful to **sketch** variables and their corresponding values, as they change during program execution.



## Your first steps in Python: commentary

```
print("What's your name?")
user = input()
print("Hello", user)
```



You will need the `input` function: when your program must receive keyboard input from the user.

When `input` is invoked, the program pauses, waiting for keyboard input. The text typed by the user is **assigned** to the `user` variable.

We can refer to the value of `user` in the program without knowing what it will be.

## Assignments

```
days = 365
print(days, "days in a year")
```



Assignments are **not** equations.

This assignment does **not** mean that the `days` variable always equals 365.

Assignments are **instructions** to be executed.

This is an instruction to assign the value 365 to the `days` variable.

A subsequent assignment can assign a **new** value to the `days` variable, **replacing** the previous value.

## Assignments with expressions

```
days = 7 * 31 + 4 * 30 + 28
print(days, "days in a year")
```



You can use **expressions** in assignments.

This is an instruction to **evaluate** the expression on the right

and then assign the value to the `days` variable on the left.

**Tip:** Read assignments from right to left.

A subsequent assignment can assign a **new** value to the `days` variable, **replacing** the previous value.

## Arithmetic operators (in Python)

You can use these operators to form arithmetic expressions.

+	addition
-	difference
*	multiplication
/	division
//	integer division
%	remainder of integer
division	
**	exponentiation

### Examples

<code>a + 1</code>	a plus 1
<code>b - c</code>	b minus c
<code>3 * d</code>	3 times d
<code>9 / 4</code>	9 divided by 4 (value: 2.25)
<code>15 // 2</code>	quotient of 15÷2 (value: 7)
<code>15 % 2</code>	remainder of 15÷2 (value: 1)
<code>2 ** 8</code>	2 to the power of 8 (value: 256)

## Referring to variables

```
days = 7 * 31 + 4 * 30 + 28
quad = 4 * days + 1
print(quad, "days in four
years")
```

An expression can **refer** to the values of variables.

To evaluate this expression, the days variable must have been assigned a value.

During program execution, a variable must have been assigned a value before that value is referred to.

## The machine

executes the code

```
days = 7 * 31 + 4 * 30 + 28
quad = 4 * days + 1
print(quad, "days in four
years")
```

### Current instruction

Evaluate the expression and assign the value to days.

② Calculate the days in a year.

### State

days 365

### Output

## The machine

executes the code

```
days = 7 * 31 + 4 * 30 + 28
quad = 4 * days + 1
print(quad, "days in four
years")
```

### Current instruction

Evaluate the expression and assign the value to quad.

① Calculate the days in four years.

### State

days	365
quad	1461

### Output

## The machine

executes the code

```
days = 365
quad = 4 * days + 1
print(quad, "days in four
years")
```

### Current instruction

Display the value of quad and the literal "days in four

years".  
① Display the result.

### State

days	365
quad	1461

### Output

1461 days in four years

# Year 8 Dance & Drama Knowledge Organiser

## Drama

Page 2 & 3 – The origins of Greek and Elizabethan theatre: 'Horrible Histories'

Page 4 - Devising Drama exploring social media

Page 5 – Devising Drama Superheroes

## Dance

Page 6 & 7 - Dance Skills

Page 8 - Unit 1: West Side Story

Page 9 to 11- Unit 2: Hairspray

Page 12 to 13 - Unit 3: Bollywood

1

## Year 8 Drama – Unit 1: The origins of Greek and Elizabethan Theatre: 'Horrible Histories'

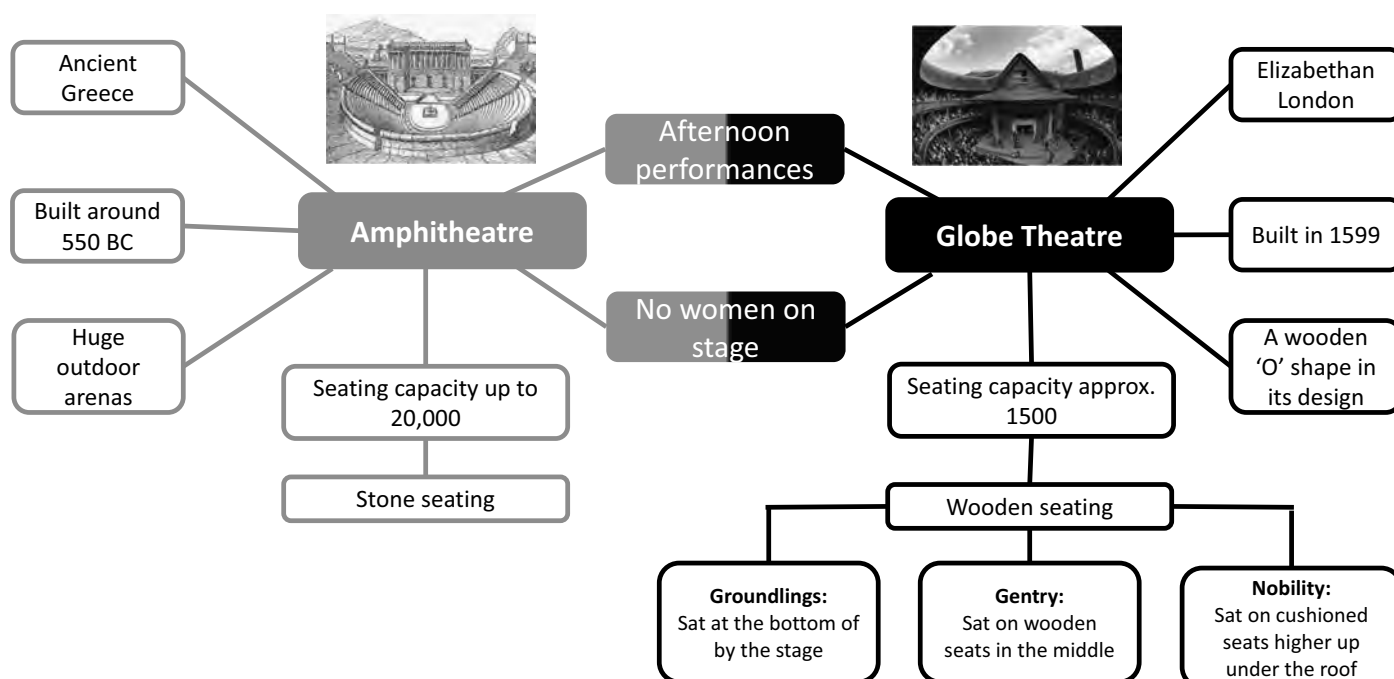
Keywords for the unit	
<b>Amphitheatre</b>	A type of traditional Greek theatre which is open air and has a performance space in the centre and seating around the side 'in the round'.
<b>Chorus</b>	A group or ensemble of male actors who contribute to the story by narrating action and voicing opinions on main characters.
<b>Mask</b>	A large mask worn over the face in all Greek Drama to help identify each character
<b>Comedy</b>	A genre of theatre, usually humorous and/or topical which usually ends with a wedding.
<b>Tragedy</b>	A genre of theatre dealing with human emotions and crises which follows the downfall of the central character and always ends with at least one death.
<b>Parody</b>	A type of comedy in which a serious issue is presented in a funny way, often using modern references (Horrible Histories).
<b>The Globe</b>	A theatre built in London associated with William Shakespeare. Built in 1599 by Shakespeare's company 'The Lord Chamberlains men'.
<b>Groundling</b>	A person who visited the theatre in the early 17 century that stood in the bottom level because they were too poor to pay to sit on the three levels of the theatre.
<b>Gentry</b>	Middle class people who would pay to sit in the gallery of the theatre. They would often have a cushion to sit on.

Keywords	VOICE
<b>Tone</b>	The emotion in your voice
<b>Pitch</b>	How high/low your voice is
<b>Pace</b>	How fast/ slow your voice is
<b>Pause</b>	When you stop moving/ speaking
<b>Volume</b>	How loud/ quiet your voice is
<b>Projection</b>	When you speak clearly and can be heard by an audience

Keywords	MOVEMENT
<b>Gestures</b>	How you move any part of your body to show a mood, feeling or idea
<b>Facial expressions</b>	Using your face to show emotions, mood, feelings and responses
<b>Eye contact</b>	When you establish eye contact with another actor or the audience
<b>Posture</b>	How you hold your body/your stance

2

## Year 8 Drama – Unit 1: The origins of Greek and Elizabethan Theatre: ‘Horrible Histories’



3

## Year 8 Drama – Unit 2 : Devising Drama Exploring Social Media

### Keywords for the unit

<b>Ensemble</b>	Where all the actors have equal amounts of time onstage and all work together to create a piece that feels like a 'group' piece.
<b>Verbatim Theatre</b>	A form of documentary style theatre, where plays are created based on real people's experiences, words and interviews.
<b>Social Message</b>	A moral idea or consequence that makes an audience think about a specific message in society.
<b>Choral Speaking</b>	When a group of performers all say the same thing at the same time, usually directly out to the audience.
<b>Monologue</b>	A speech in a play in which one character speaks directly to the audience, often revealing true feelings and secret thoughts.
<b>Empathy</b>	The ability to emotionally understand what other people feel, see things from their point of view, and imagine yourself in their place. Essentially, it is putting yourself in someone else's position and feeling what they must be feeling.

Keywords	VOICE
<b>Tone</b>	The emotion in your voice
<b>Pitch</b>	How high/low your voice is
<b>Pace</b>	How fast/ slow your voice is
<b>Pause</b>	When you stop moving/ speaking
<b>Volume</b>	How loud/ quiet your voice is
<b>Projection</b>	When you speak clearly and can be heard by an audience

Keywords	MOVEMENT
<b>Gestures</b>	How you move any part of your body to show a mood, feeling or idea
<b>Facial expressions</b>	Using your face to show emotions, mood, feelings and responses
<b>Eye contact</b>	When you establish eye contact with another actor or the audience
<b>Posture</b>	How you hold your body/your stance

4



**Year 8 Drama – Unit 3 : Superheroes**  
using Drama conventions

Keywords for the unit	
<b>Protagonist</b>	The central character in a story to whom the plot happens.
<b>Antagonist</b>	A character or group of characters who oppose the protagonist and whose aim is to block the protagonist from getting what they want, often using unfair or evil tactics.
<b>Flashback</b>	An interjected scene that takes the story back in time. They are often used to fill in a backstory or retell a key event.
<b>Monologue</b>	When a character speaks/ shares their thoughts and feelings with the audience. Other characters onstage cannot hear what they say.
<b>Voice over</b>	A piece of narration that the audience hears. Can help to set the scene or explain who a character is or the passing of time.
<b>Split focus</b>	When two scenes are happening onstage at the same time .
<b>Cross Cutting</b>	A staging technique to show two or more scenes happening simultaneously.

Keywords	VOICE
<b>Tone</b>	The emotion in your voice
<b>Pitch</b>	How high/low your voice is
<b>Pace</b>	How fast/ slow your voice is
<b>Pause</b>	When you stop moving/ speaking
<b>Volume</b>	How loud/ quiet your voice is
<b>Projection</b>	When you speak clearly and can be heard by an audience

Keywords	MOVEMENT
<b>Gestures</b>	How you move any part of your body to show a mood, feeling or idea
<b>Facial expressions</b>	Using your face to show emotions, mood, feelings and responses
<b>Eye contact</b>	When you establish eye contact with another actor or the audience
<b>Posture</b>	How you hold your body/your stance

5

**Year 8 Dance– Dance Skills**

**Constructive Feedback**

**Positivity**

State something that you enjoyed.

**Improvement**

Identify something that needs making better.

**Target**

State specifically what can be done to make the work better.



**Physical Skills-**

Required to perform physical activity.



**Technical Skills-**

Required to perform a dance movement.

Keywords	
<b>Accuracy</b>	A being correct and precise.
<b>Timing</b>	The use of counts when moving to sound or music.
<b>Dynamics</b>	How a movement is performed.

Keywords	
<b>Strength</b>	The power exerted by a muscle.
<b>Stamina</b>	Being able to maintain physical energy for a period of time.
<b>Posture</b>	The way the body is held.
<b>Balance</b>	A steady or held position through even distribution of weight.
<b>Coordination</b>	Efficient combination of body parts.
<b>Extension</b>	Lengthening a muscle or limb.
<b>Flexibility</b>	The range of movement at a joint.

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## Year 8 Dance – Dance Skills

### Expressive Skills-

Required to connect with an audience.



Key Words	
<b>Focus</b>	The use of eyes to enhance performance.
<b>Facial Expression</b>	The use of face to communicate mood, theme and atmosphere.
<b>Projection</b>	The energy a dancer uses to connect with an audience.

## Choreography Skills-

Required to create a dance.



Key Words	
<b>Unison</b>	2 or more dancers performing movement at exactly the same time
<b>Canon</b>	When the same movements overlap in time
<b>Formation</b>	Shapes or patterns created in space by dancers
<b>Pathway</b>	Designs traced on the floor or in the air
<b>Level</b>	Distance from the ground – low, medium or high
<b>Direction</b>	The way a movement faces
<b>Solo</b>	One performer
<b>Duet</b>	Two Performers
<b>Trio</b>	Three Performers
<b>Group</b>	Three or more Performers.
<b>Still Image</b>	A held position or image.
<b>Climax</b>	The most significant moment of a dance.

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## Year 8 Dance – Unit 1: West Side Story

### Key Information-

West Side Story is a musical film created in 1961.

Jazz and Modern style of dance choreographed by Jerome Robbins.

Themes: Gang Rivalry, Love, Racial Prejudice, Loyalty, Immigration.

Known as a modern version of Romeo & Juliet.

2 Gangs: The Jets- American & The Sharks- Puerto Rican. Both gangs are wanting to rule the streets and have their own territory of New York.

### Dance Style-

Energetic	Choreographed fight scenes
Strong, fast and sharp dynamics	Acrobatic
Extension of the arms and legs	Elevated jumps and hops
Use of various levels	

Keywords	
<b>Contact Work</b>	Contact work is using resistance, weight, counterbalance and support to create movements with at least two or more dancers.
<b>Still Image</b>	A held position for short amount of time.
<b>Dynamics</b>	How a movement is performed.
<b>Elevation</b>	A movement which leaves the ground and is performed in the air.
<b>Relationships</b>	The number of dancers in a performance and how they interact within the choreography.
<b>Canon</b>	Performing a movement at different times, after another dancer has previously performed it. For example, like a Mexican wave.
<b>Unison</b>	Performing the same movement at exactly the same time as other dancers.

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## Year 8 Dance – Unit 2: Hairspray

### Key Information-

Hairspray is a film and a musical.

Set in the 1960's in America.

Key Themes: Segregation, Racial Inequality, Individuality, Body Image, Stereotypes.

Dance Style: 1960's, Jazz, Energetic, Lively.

### The Story of Hairspray-

Tracy Turnblad is the main character who has a passion for dance and performing.

There is a TV show called the Corny Collins Show which is racially segregated.

Tracy auditions for the Corny Collins show but is rejected due to her size and appearance.

Tracy is eventually noticed at a live performance and is allowed to join the show.

The show is racially segregated and Tracy campaigns for equality, along with the Black community.

The show eventually becomes integrated after lots of campaigning.

Keywords	
<b>Segregation</b>	The action or state of setting someone or something apart from others.
<b>Stereotype</b>	A widely held, but fixed idea or perception, of a particular type of person or thing.
<b>Equality</b>	The state of being equal, especially in status, rights, or opportunities.
<b>Inequality</b>	Unequal opportunities and rewards for different social positions or statuses within a group or society.
<b>Racism</b>	Prejudice, discrimination, or antagonism by an individual, community, or institution against a person or people based on their membership of a particular racial or ethnic group.
<b>Integrated</b>	Separate groups of people or things being brought together equally.
<b>Body Image</b>	Body image is a perception of the physical body and the thoughts and feelings towards the body, positive, negative or both.
<b>Individuality</b>	The quality or character of a particular person or thing that distinguishes them from others of the same kind.
<b>Social Issue</b>	A social issue is a problem that influences and affects many citizens within a society.

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## Year 8 Dance – Unit 2: Hairspray

### 1960's Dance Movements-

#### The Twist-

Bending the knees and twisting the ankles and knees from side to side in different directions.

#### The Mashed Potato

Using the hands to create fists and tapping them on top of each other in front of the body.

#### The Madison

Crossing footwork action. Stepping in front with one leg and flicking the other behind.

#### The Hully Gully-

Shimmy action using the shoulders and lifting them up and down.

#### The Hitchhike

Opening the right arm outwards with the elbow bent and returning it back vertical in front of the body to meet the other arm in front.

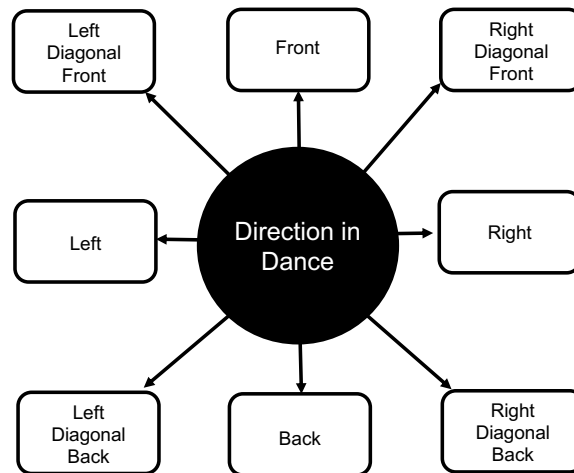
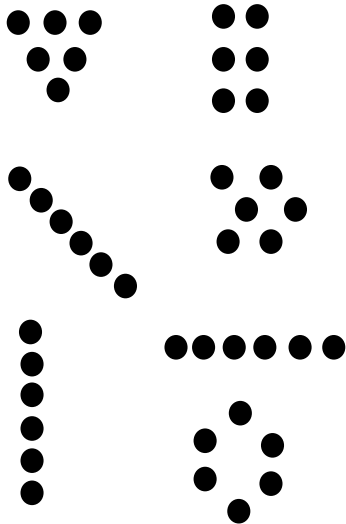
### Choreography Keywords

<b>Formation</b>	Where you stand within a choreography or performance. Various shapes can be used.
<b>Levels</b>	The level a movement is performed on, such as low, middle and high.
<b>Pathway</b>	The path a movement or sequence of movements use.
<b>Direction</b>	The way you face within a performance or choreography.
<b>Relationships</b>	The number of dancers in a performance and how they interact within the choreography.
<b>Canon</b>	Performing a movement at different times, after another dancer has previously performed it. For example, like a Mexican wave.
<b>Unison</b>	Performing the same movement at exactly the same time as other dancers.
<b>Repetition</b>	Doing it over again.

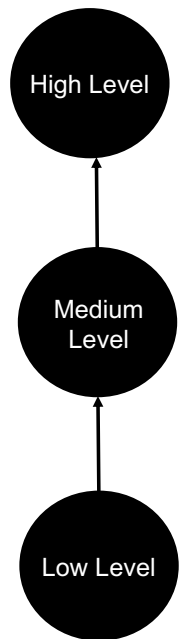
10

## Year 8 Dance – Unit 2: Hairspray

### Types of Formation in Dance-



### Levels in Dance-



11

## Year 8 Dance – Unit 3: Bollywood

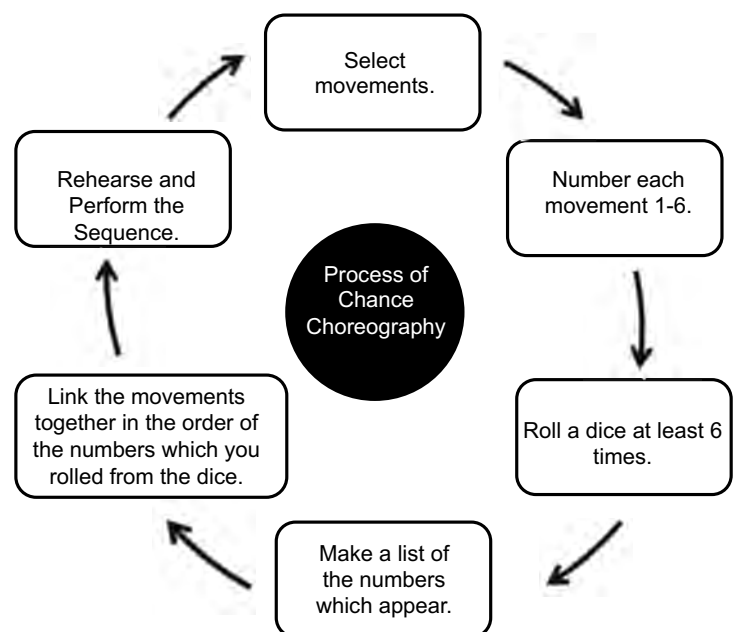
### Merce Cunningham

American Contemporary Dancer and Choreographer.

Created Chance Dance and Choreography.

Cunningham would use 'chance' to create a performance. His dancers would know individual movements but never know the order of the movements until the night of the performance, where he would use chance to put the movements in an order, for example by rolling a dice.

Keywords	
<b>Chance</b>	A method of creating choreography created by Merce Cunningham.
<b>Choreography</b>	
<b>Transition</b>	A fluent movement link between movements or section of movements.
<b>Half Count</b>	Half a count, often referred to as 'and'. For example, 1 'and' 2.
<b>Fusion of Styles</b>	A combination of dance styles which merge and mix together to form another dance style.



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## Year 8 Dance – Unit 3: Bollywood

### Bollywood Dance-

Bollywood Dance is the name given to the dance-form used in Indian films.

Bollywood Dance style is a fusion of various dance styles. It includes Bharatanatyam, Kathak, Bhangra, Jazz, Hip-hop, Arabic and Western dance.

Classical Indian dance incorporates the two basic elements of dance and expression.

It evolved in the late 1950-60's after it started to appear in numerous Bollywood films.

Bollywood is a film industry in India which create and develop Indian films. When dance occurred in these films it was given the name 'Bollywood Dance'.

### Bollywood Dance Movements-

#### Lightbulb

Fingers are stretched as if they are holding something, the wrists twist to either side, in line with the head. The knees bend at the same time.

#### Rainbow

Middle finger goes to thumb, the hands meet in the centre of the chest, travel up the body above the head and open outwards.

#### Twist

Feet together with knees bent, the heels and knees twist opposite ways to create a twisting motion.

#### Squash Bug

Stepping from one foot to the other, pressing one foot into the ground and transferring the weight from one foot to the other. This creates a bouncing motion.

#### Chicken Head

Moving the chin in isolation from side to side. The middle finger goes to the thumb with the backs of the hands meeting together and placed above the head. Elbows facing outwards.

#### Cross Run

One-foot crosses in front of the other whilst jumping, the feet then open outwards whilst jumping with the weight leaning towards one side.



# Year 8 Technology Knowledge Organiser

## Keyring project

- 2. Casting Project 1
- 3. Casting Project 2
- 4. Casting Project 3
- 5. Casting Project 4
- 6. Casting Project 5
- 7. Casting Project 6

## Picture Frame project

- 8. Manufacturing: Joints
- 9. Manufacturing: Key words
- 10. Manufacturing: Tools and finishes
- 11. Manufacturing: Process diagram
- 12. Manufacturing: Preparation for finish

## Food and Nutrition

- 13 -15. Food related causes of ill health
- 16-17. 4Cs for Food Safety
- 18. Storing Food Safely
- 19-20. Nutrition – macro and micro nutrients
- 21-22. Healthy balanced diet
- 23. Carbohydrates
- 24. Protein
- 25. Fat
- 26. Fat Soluble vitamins
- 27. Water Soluble vitamins
- 28. Minerals
- 29. Dietary Fibre
- 30. Water
- 31-32. Factors affecting food choice
- 33. Food manufacturing
- 34. Seasonal produce
- 35. Fairtrade
- 36-36. Knife skills
- 38. Evaluating food products

## Year 8 Technology –Casting Project (1)

Keywords	
Aesthetics	How a product looks
Cost	How much does the product cost to buy or make?
Consumer	The group of people that the product is aimed at
Environment	a) The place where the product will be used and/ or b) The effect that the product will have on the planet
Safety	Are there any risks that using the product poses to the user?
Size	The size should be suitable for the intended consumer
Function	The job that the product is supposed to be doing
Material	What is the product made from and why?

### Product Analysis

To examine an existing product in detail with the aim of finding out what it's strengths and weaknesses are so that you can use the information for the development of a new product.

### Specification/ Design Criteria

A list of particular criteria that the product must satisfy

## Year 8 Technology –Casting Project (2)

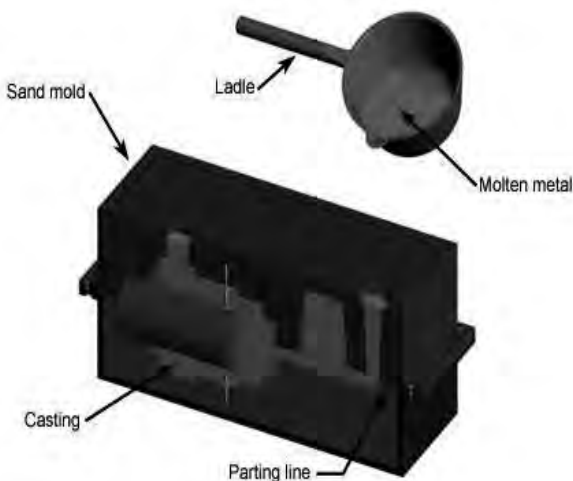
Keywords	
Casting	To heat up metal (in our project pewter) and pour it into a mould to make specific shapes
Pewter	Shiny silver coloured jewellery, commonly used in jewellery making
Ventilation	Clean air supply
Abrasive	To wear a surface away
Mould	A hollow contained used to make a particular shaped part
Melting Point	The point at which a material turns to liquid

Keywords	
Adhesive (Tensol Cement)	A substance that allows other objects to be stuck together permanently
Computer Aided Design (CAD)	When design work is completed using a computer
Computer Aided Manufacture (CAM)	When a product/ part is made using machinery controlled by a computer
Extrusion	Process used to create objects of a fixed cross-sectional profile
Rotate	To turn something through 360 degrees

3

## Year 8 Technology –Casting Project (3)

Casting - an object made by pouring molten metal or other material into a mould



### Advantages:

Casting has following advantages over other manufacturing process.

- It can create any complex structure economically.
- The size of object doesn't matter for casting.
- The casting objects have high compressive strength.
- All structure made by casting has wide range of properties.
- This can create an accurate object.
- All material can be cast.
- It is cheapest among all manufacturing processes.
- Composite components can be easily made by casting

### Disadvantages:

Along with these advantages, casting has following disadvantages.

- It gives poor surface finish and mostly requires surface finish operation.
- It gives low fatigue strength.
- It is not economical for mass production

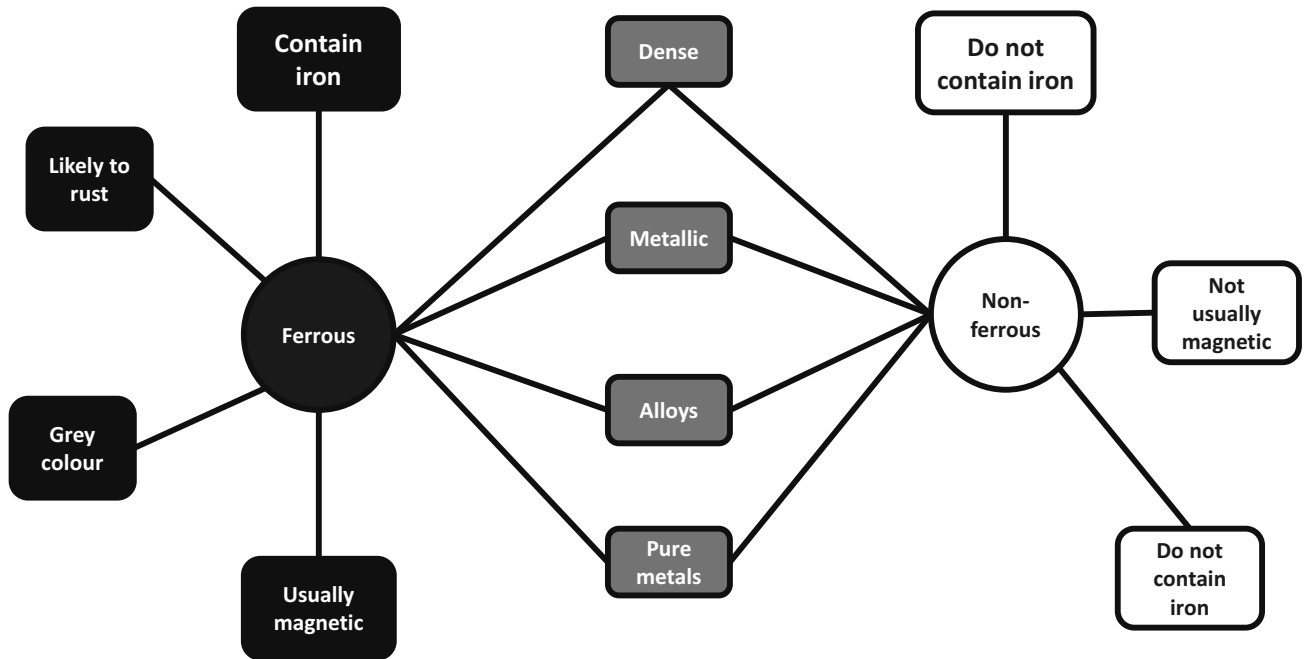
4



## Year 8 Technology –Casting Project (4)

### Ferrous and Non-Ferrous metals

We can categorise metals as ferrous and non-ferrous. Ferrous metals are ones that contain iron. Although iron is only one element, it is part of lots of metals.

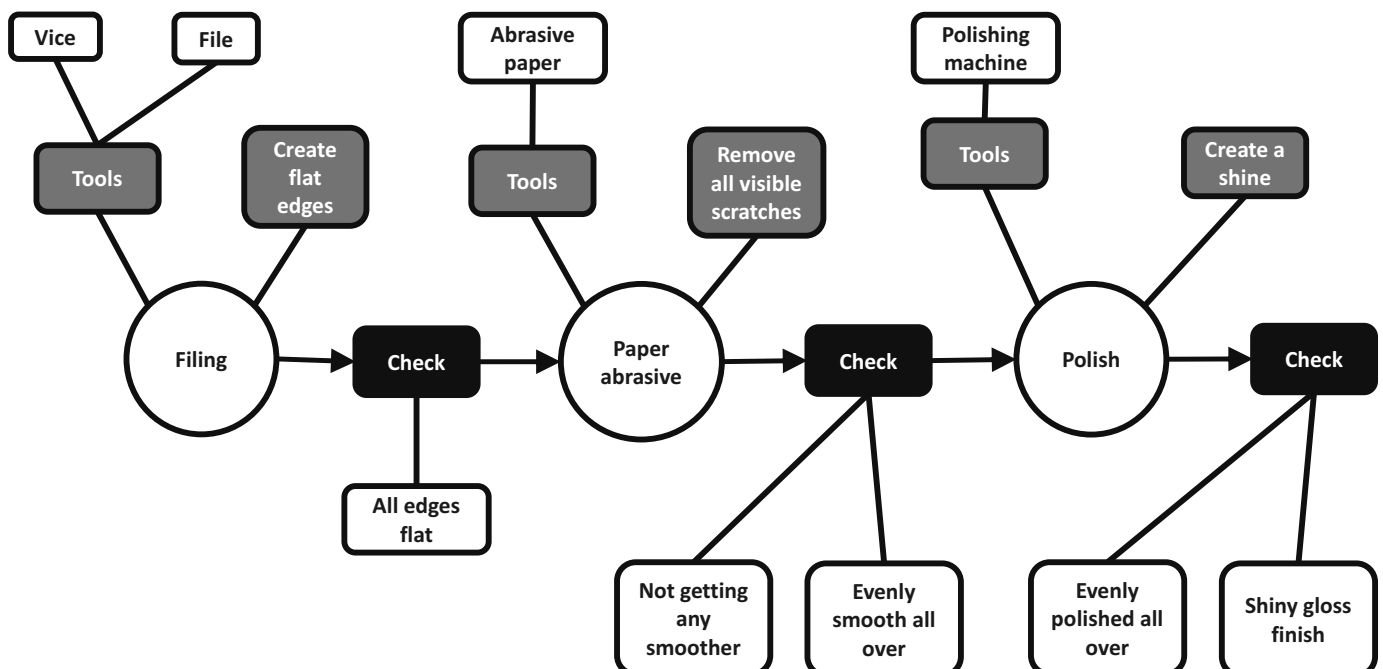


5

## Year 8 Technology –Casting Project (5)

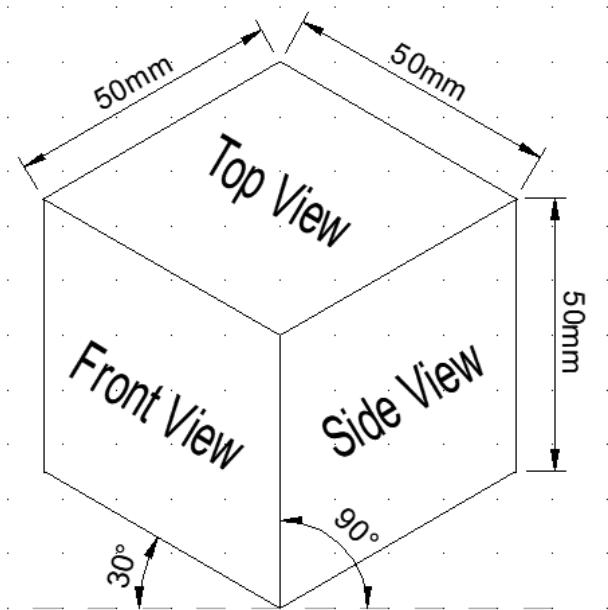
### Steps in creating a polished finish

Polishing is achieved by progressively removing scratches starting with the deepest scratches until none remain and the work shines with a glossy finish.



6

## Year 8 Technology –Casting Project (6)



### Isometric Projection

3D drawing technique that allows you to draw an object, showing the height, width and depth.

Isometric projection is a good way of showing measurements and how components fit together.

There are three main rules to isometric drawing:

- horizontal edges are drawn at 30 degrees
- vertical edges are drawn as vertical lines
- parallel edges appear as parallel lines

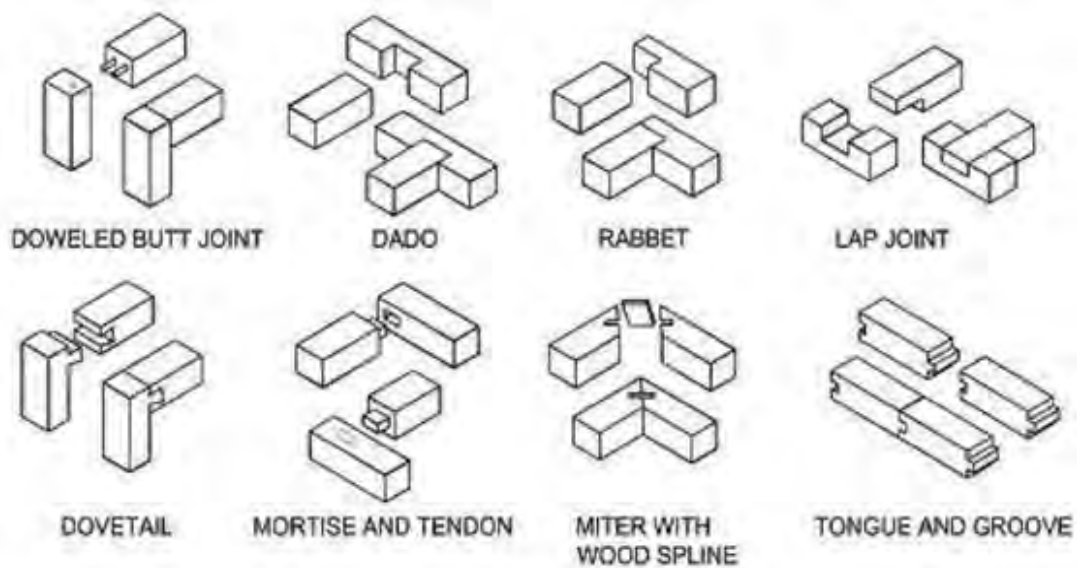
Isometric drawings are used to show a graphical representation of a 3D object.

They are used by architects and engineers to communicate their ideas to the client and manufacturer, showing the product or design to scale.

7

## Year 8 Technology – Manufacturing Project 1

### Types of wood joint



## Year 8 Technology – Manufacturing Project (2)

Keywords	
Consistency	To produce parts that are exactly the same every time they are made
Production	To use tools and machines to make products or parts
Quality control inspection	To check each stage of the production to find if there are any defects
Assembling	To put all the parts of a product together to the product is complete
Fabrication	The process of manufacturing or inventing something
Assurance	To feel confident that the final product will work properly because the manufacturing process has been adequately quality control checked throughout.

Keywords	
Manufacturing aid/ jigs	Items that enable a manufacturing process to be carried out quickly and to be the same each time.
Standards	A particular level of quality that is aimed for in the product.
Efficiency	To make parts and product without wasting time or material
Sustainable	To be able to be maintained at a certain rate

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## Year 8 Technology – Manufacturing Project (3)



### Bench Hook

Used to hold wood whilst it is cut with a hand saw



### Glass Paper

Used to abrade wood until smooth



### Try square

Used to draw lines at 90 degrees on wood



### Wood Stain

Wood stain allows you to change the colour of the wooden object



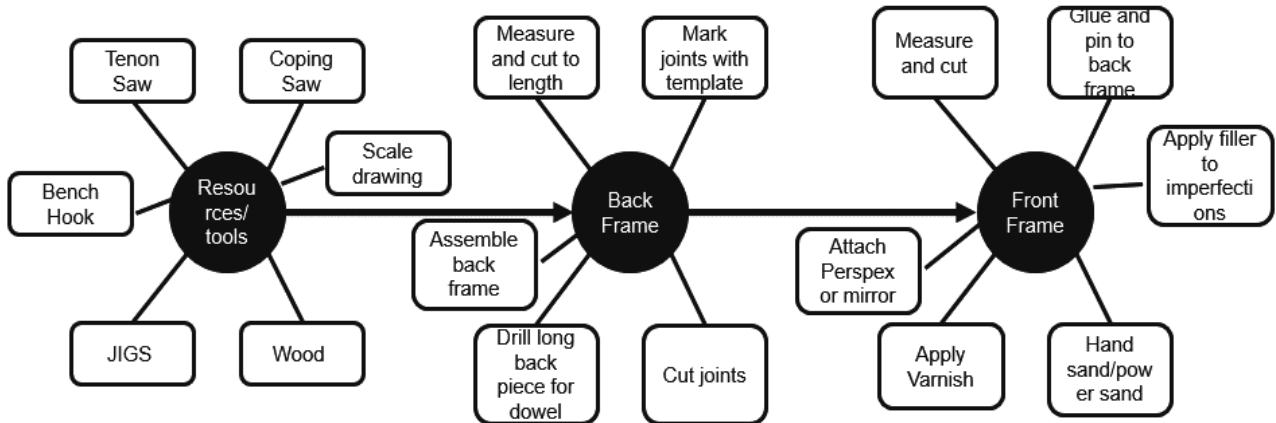
### Tenon saw

Used to cut straight lines in wood

## Year 8 Technology – Manufacturing Project (4)

### Picture Frame Project

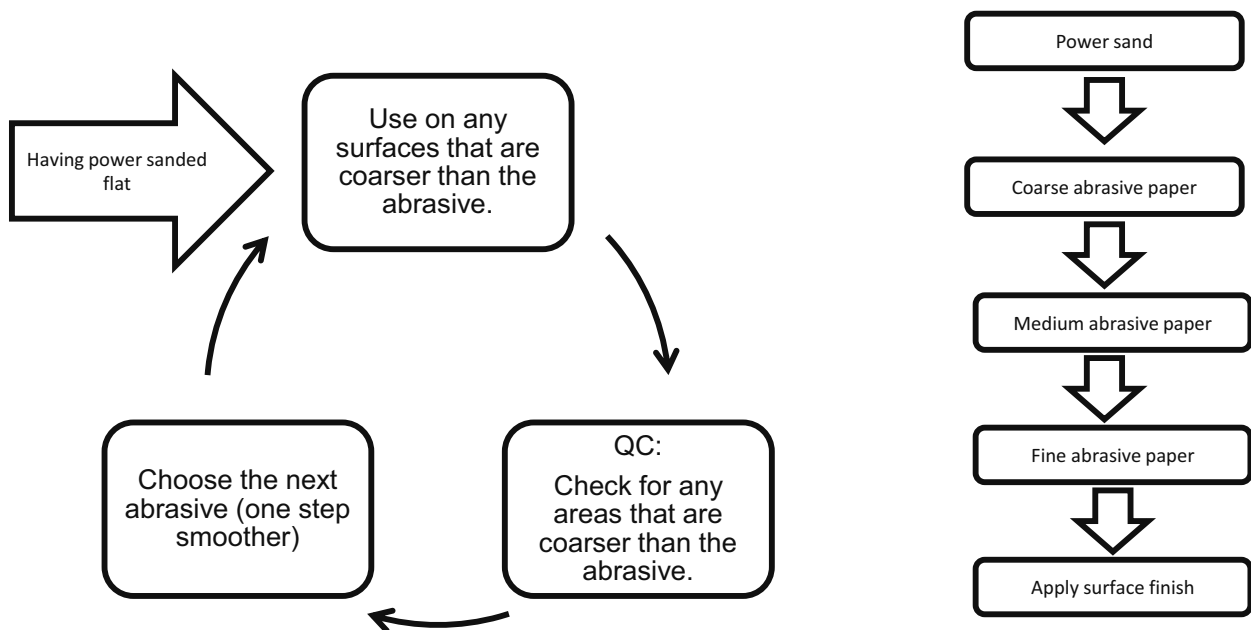
A diagram to explain how to make the picture frame.



11

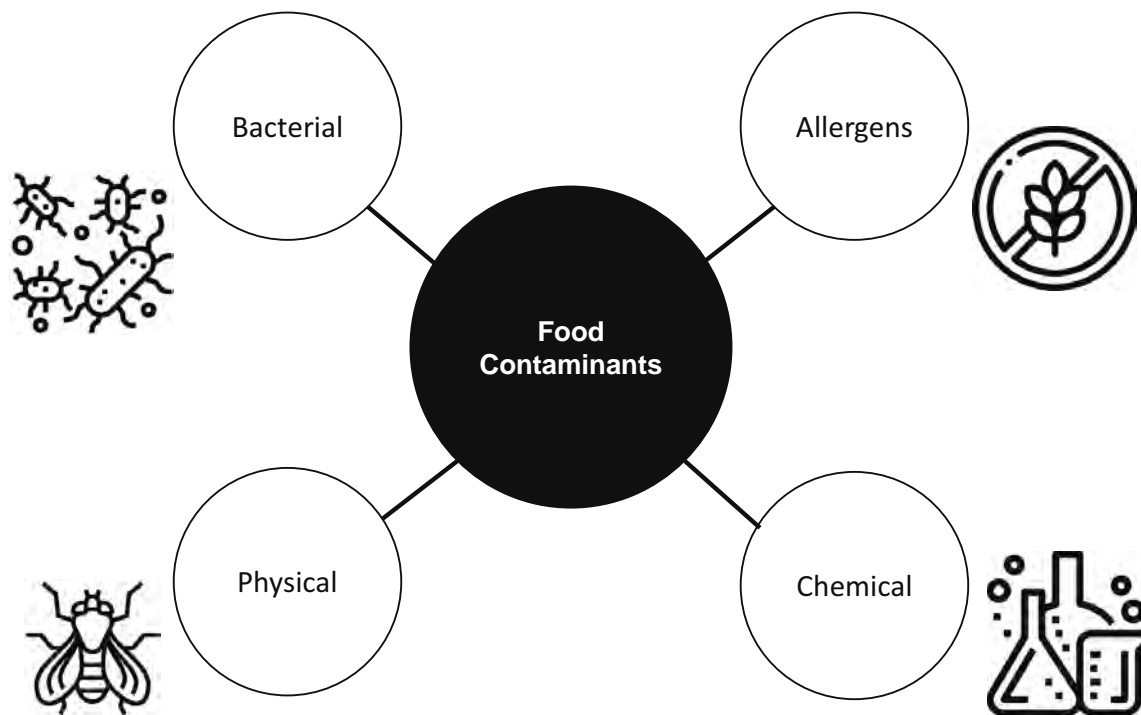
## Year 8 Technology – Manufacture

Preparing for a quality finish e.g. varnish.



12

## Food related causes of ill health



13

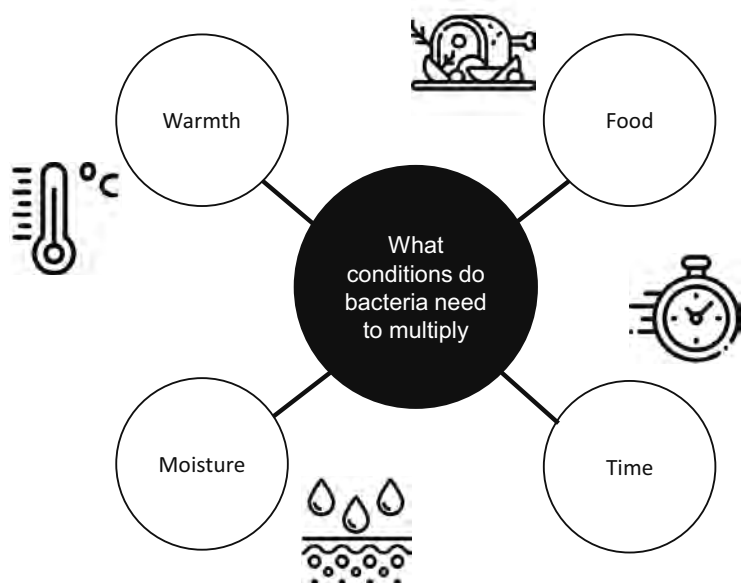
## Food related causes of ill health

### Bacteria

Some bacteria have to be **INSIDE** your body to make you ill. These are consumed in the food.

Once inside you, the bacteria attack your body causing illness, some such as Salmonella cling to the gut wall preventing absorption of water and nutrients- this type take hours even days to colonise the gut so symptoms may not show for a few days.

Some produce a **TOXIN** (poison) on the food which makes you ill when you eat it. Toxins act on the body rapidly so this type make you ill within minutes to hours of eating them.

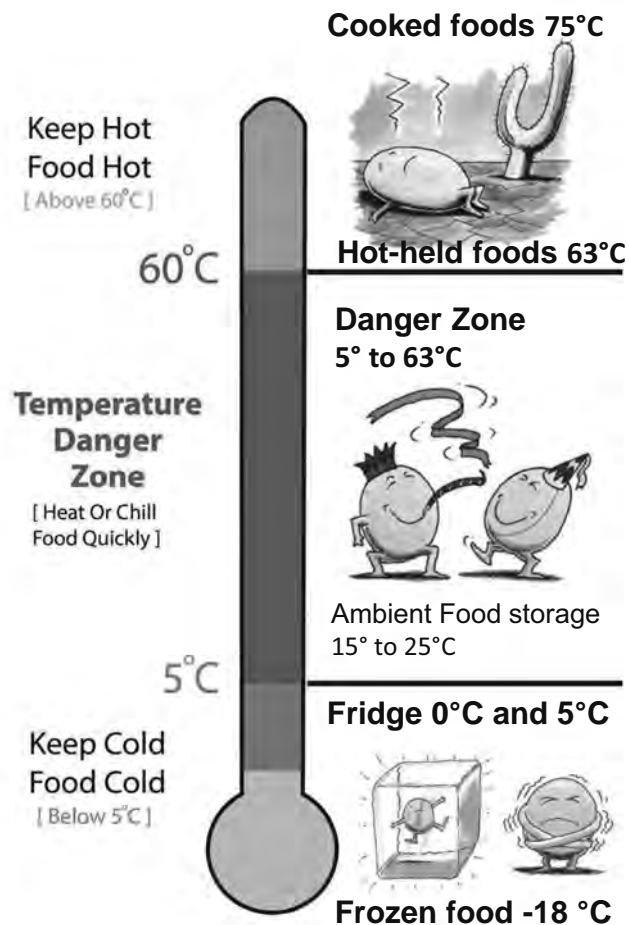


### Sources of food poisoning bacteria

- People/sewage
- Raw food
- Insects
- Rodents
- Soil/dust
- Refuse/waste
- Animals/birds
- Contaminated packaging

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## Pathogenic Bacteria



## Food poisoning symptoms

### Visible:

Diarrhoea  
pale in colour  
vomiting  
signs of dehydration  
confusion  
chills/shivering  
bloating/swelling  
Sweating  
fatigue

### Non-visible:

stomach pains  
muscle contractions  
headaches  
feeling sick/nausea  
flu like symptoms  
(dizziness/light-headed)  
loss of appetite  
fatigue  
joint/muscle pains  
Chills  
weakness



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## The 4C's for Food Safety



### CLEAN

#### Personal Hygiene

Wash hands  
Cover cuts with a blue plaster  
Nails clean and short  
Tie hair back  
No jewellery  
Wear a clean apron  
Do not handle food if you have an upset stomach  
Do not cough or sneeze near food

#### Kitchen Hygiene

Clean and sanitise surfaces  
Equipment must be cleaned thoroughly  
Cupboards, fridges and freezers must be cleaned regularly  
Always use a clean spoon each time you taste food  
Lids on  
Ensure pest infestations are dealt with immediately



### CROSS CONTAMINATION

#### Equipment used on

raw foods **MUST** be cleaned thoroughly before being used on other food.

**Clean and sanitise** surface between uses.

**Wash** fruit and vegetables to remove dirt or soil.

**Wash** hands after touching raw meat and fish.

#### Use colour coded chopping boards:

Green - Salad and veg  
Red - Raw Meat  
Yellow - Cooked Meat  
Blue - Fish  
White - Dairy and bakery

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## The 4C's for Food Safety



### CHILL

**Temperature of the fridge** should be between **below 5 °C**.

Never put hot food in the fridge, as it will raise the temperature of the fridge.

Do not overload the fridge, air needs to circulate

Throw away food that is past its use by date.

Always store **raw** meat and fish on the **bottom** shelf

**Cooked** meat should be on the **top** shelf.

Keep food covered or wrapped to prevent cross- contamination.

Temperature of a freezer should be **-18 °C**.



### COOK

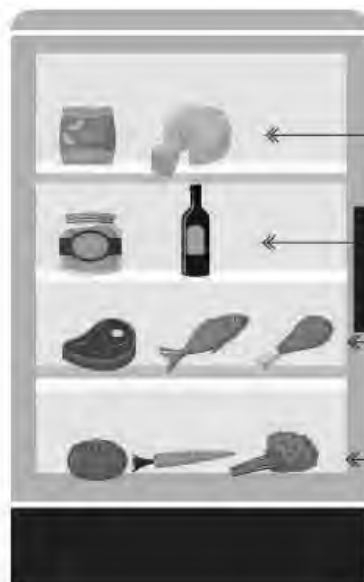
Use a temperature probe to ensure food is cooked.

To kill bacteria food must reach at least 75°C.

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## Storing Food Safely

- It is important to store food properly.
- Food should be wrapped, covered or kept in a suitable clean container.
- The refrigerator should be cleaned regularly.
- Dry and canned foods, e.g. dried pasta, tinned tomatoes, herbs and spices should be stored in cupboards that are clean and dry.
- Frozen food still could have bacteria present but they are dormant.  
Enzymes that cause food spoilage are slowed but not stopped.



**READY TO EAT FOOD**  
Such as dairy products, yoghurt & cream

**READY TO EAT FOOD**  
Such as cream cakes, butter, cooked meats, leftovers & other packaged food.

**RAW MEAT, POULTRY & FISH**  
Always cover & keep in sealed containers.

**SALAD, FRUIT & VEGETABLES**  
Keep ready to eat fruit and vegetables in sealed bags or containers, always wash before use.

## Dates on packaging

### Best-before Dates

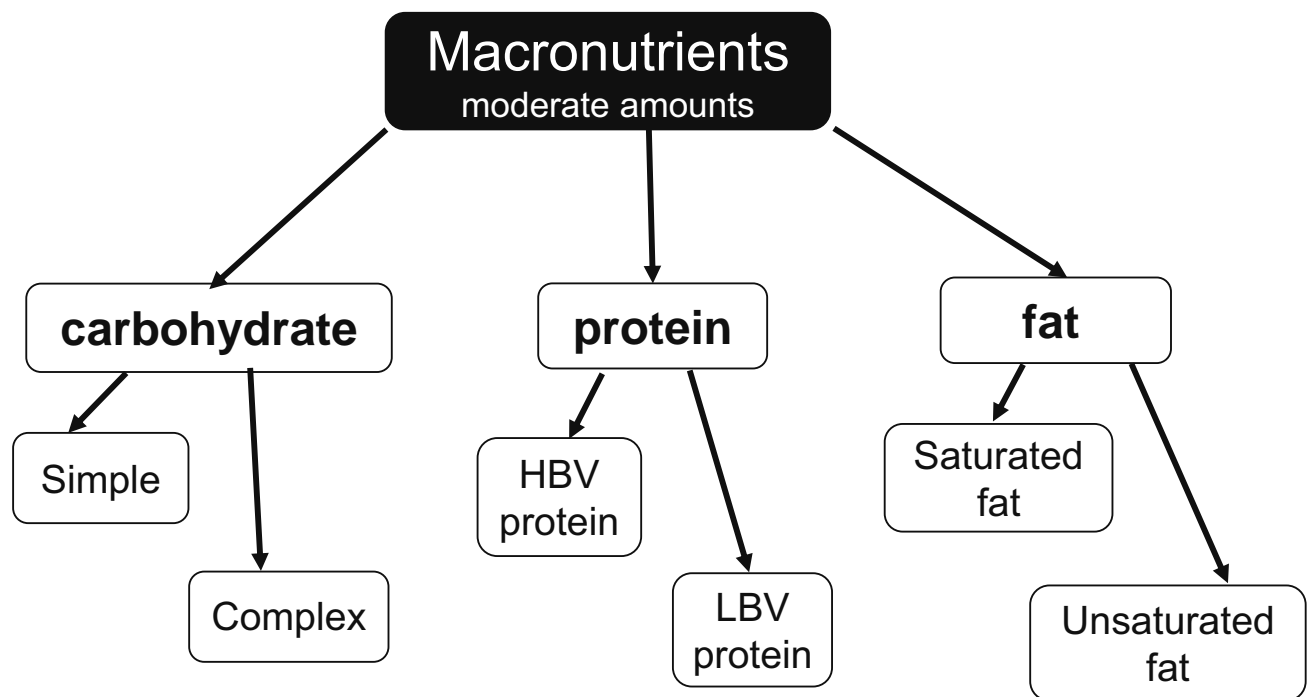
- Best-before dates usually appear on less perishable foods that have a long shelf life, such as canned, dried and frozen food products.

### Use-by Dates

- A use-by date is a safety date found on foods and their packaging.
- Use-by dates are found on highly perishable, packaged food such as meat, fish and dairy products that require chilling and have a short shelf life.
- It is an offence for businesses to sell or use food that has passed its use-by date.

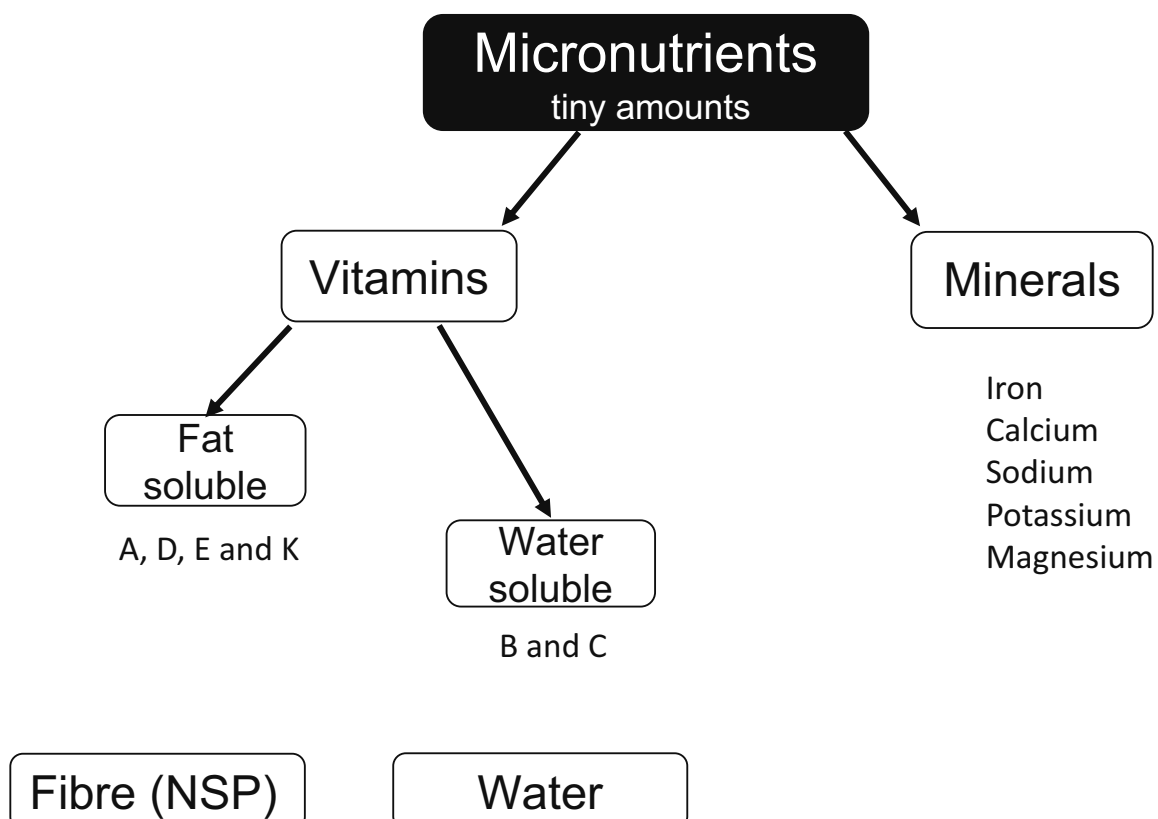
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## Understanding the importance of nutrition



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## Understanding the importance of nutrition



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# A Healthy Balanced Diet

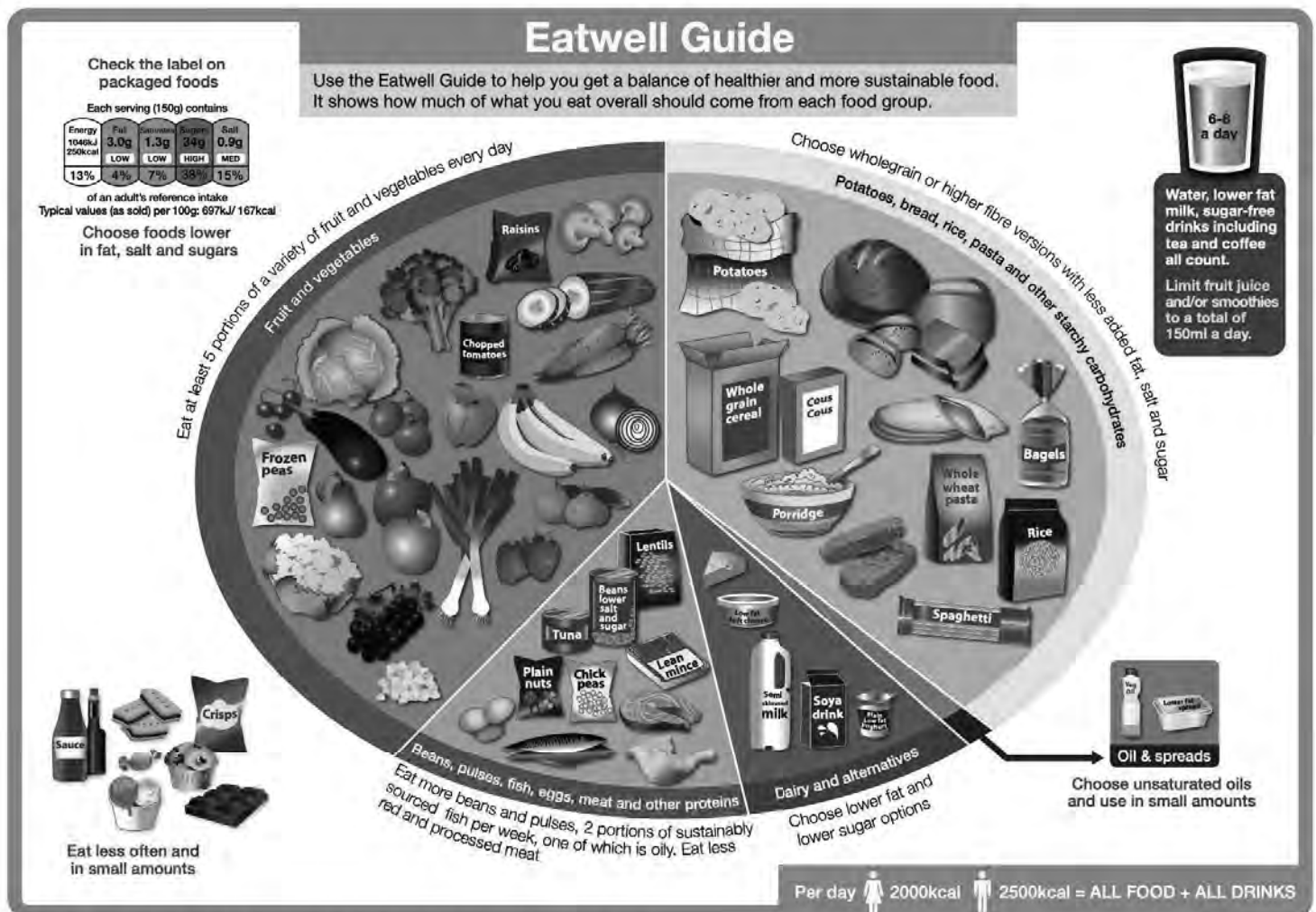
A healthy balance diet provides all the nutrients needed for healthy body functions and normal physical activity.

To help achieve a balanced diet the Government have put together some dietary guidelines. The Eatwell Guide and 8 Tips for Healthy Eating.

## 8 Tips for Healthy Eating

1. Base meals on starchy foods
2. Eat 5 portions of fruit & vegetables a day
3. Eat 2 portions of fish a week
4. Small amounts of saturated fat and sugar
5. Eat less salt
6. Drink plenty of water
7. Do not skip breakfast
8. Get active

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## Carbohydrates

Carbohydrate provides an important source of **energy** for the body.

Carbohydrate provide energy to move and be active as well as energy for body processes such as breathing, heart beating.

Vitamin B (thiamine and riboflavin) is needed to help release the energy to the body.

All carbohydrates are converted to **glucose** when digested and this is converted to energy.

If the energy is not used up then it is stored as body fat.

Simple Carbohydrates (sugars)		Complex Carbohydrates (starch)
Sugar gives a fast release of energy that means your blood sugar levels go up.		Starchy foods provide a slow release of energy and help our blood sugar levels stay the same so we don't feel tired.
Some foods contain natural sugars such as milk, fruit & honey.		
<b>glucose</b> – Fruit, vegetables, honey, sugar beet/cane, corn	<b>sucrose</b> – Sugar beet/cane	<b>starch</b> – Potatoes, wheat, oats, pulses, corn, rice, pasta, bread, cous cous, cereals, beans, lentils, kidney beans, porridge, muesli, non-starchy vegetables
<b>galactose</b> – found in the milk of mammals	<b>maltose</b> – Soya beans, barley, wheat	
<b>fructose</b> – found in fruit Fruit, vegetables	<b>lactose</b> – Milk and milk products	<b>Dietary Fibre (NSP)</b> – found in wholegrain cereals, Fruit, vegetables, seeds and nuts

### Excess carbohydrates :

Obesity, Tooth decay, Type 2 diabetes

### Carbohydrates deficiency:

Lack of energy, weight loss, severe weakness

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## Protein

Protein is a macronutrient formed from chains of amino acids which are the building blocks of protein. There are 20 amino acids that come from animals and plants.

### What is protein needed for?

**Growth** of skin, hair, cells, organs, bones and connective tissue. Growth especially in children and pregnancy.

**Repair** body tissues after illness, injury or surgery.

A **secondary source of energy** for the body.

**Maintaining the body** (bones and muscles)

Higher biological value (HBV) protein	Lower biological value (LBV) protein
Contain <b>all</b> essential amino acids	Contain <b>some</b> essential amino acids
From animal sources	From plant sources
Meat, fish, eggs, milk, cheese <i>Exception – soya beans</i>	Cereals, nuts, beans, seeds

**Excess protein** in the diet is used as energy. If it is not required for energy then it will be stored as fat.

**Protein deficiencies** are rare but in developing countries but can lead to stunted growth in children.

### Some groups of people have a higher need for protein:

- babies and children – for growth;
- adolescents – for growth spurts;
- pregnant women – for the growing baby;
- People healing from surgery
- An athlete for growth and repair of muscle and tissue

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# Fat

Our bodies need fats for many essential functions, however in the modern world many people consume over the recommended daily amounts of fat which can cause problems with obesity, heart disease and stroke.

## What is fat needed for?

Protect vital organs

Stores fat-soluble vitamins (A, D, E and K)

To maintain body temperate

Ensure a healthy immune system

Maintain healthy skin and hair

Provide energy (fat is very high in energy)

Fat is a source of fatty acids, these are essential mechanisms for cell membranes in the nervous system and the brain

Saturated fat	Unsaturated fat
Solid at room temperature	Liquid at room temperature
More harmful to health, as they raise LDL cholesterol	Considered to be the 'healthier' fats. They can help maintain healthy HDL cholesterol levels
Mainly from animal sources	From plant sources and fish
Butter, lard, ghee Coconut and palm oil Fatty and processed meats, sausages, bacon and cured meats Full fat milk and dairy products (cream, ice cream, cheese) Chocolate	Vegetable oils and olive oil Nuts, flax seeds and sesame seeds Avocados and olives Fatty fish (salmon, sardines, mackerel)

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## Fat-soluble Vitamins

Vitamin	Function	Sources
<b>Vitamin A</b>	Helps with vision in dim light Helps the body grow and develop Strengthens the immune system Skin health	Animal sources (retinol) - liver, milk, oily fish (retinol) Plant sources (beta carotene) - green leafy vegetables, carrots and orange and red coloured fruits (carotenoids) Added to margarine
<b>Vitamin D</b>	Absorption and use of calcium and phosphorus Maintenance and strength of bones and teeth Important in brain function Supports immune and nervous system Supports lung function	Oily fish, eggs and dairy products Fortified breakfast cereals and margarines (vitamin D added by law) Sunlight on the skin
<b>Vitamin E</b>	Healthy skin and eyes Boosts immune system Helps clots from forming in the arteries	Sunflower seeds Almonds, peanuts Avocados, butternut squash, asparagus, pumpkin, mango, dark green vegetables Vegetable oils Oily fish
<b>Vitamin K</b>	Blood clotting and help healing wounds Keeps bones healthy	Leafy green vegetables, kale, spinach, broccoli, asparagus Cheese Liver, bacon

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## Water-soluble Vitamins

Vitamin	Function	Sources
<b>Vitamin B</b>	Release of energy from food Healthy nervous system Normal growth of children	Wholegrain products, wheat, rice Meat, fish, milk and dairy Marmite Seeds, nuts, beans and lentils. Peas Fresh fruit – bananas and oranges
<b>Vitamin C</b>	Helps absorb iron from foods Helps the immune system fight and prevent infection Production of collagen that binds connective tissue Antioxidant – protects from pollutants in the environment Helps heal wounds Helps skin health	Citrus fruits, lemon, oranges, limes kiwi, blackcurrants, strawberries, papaya, pineapple, mango Potatoes Salad and green vegetables, e.g. broccoli, kale, spinach Peppers, chillies, cauliflower

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## Minerals

Vitamin	Function	Sources
<b>Calcium</b>	Strengthens bones and teeth Bones are able to reach peak bone mass – maximum strength Growth of children Promotes nerves and muscles to work properly Vitamin D is needed to help absorb calcium	Dairy foods, milk, cheese, cream, yogurt Green vegetables, kale, spinach, cabbage White bread – calcium is added by law, Soya products, tofu Nuts and seeds
<b>Iron</b>	Supports the production of haemoglobin in red blood cells; this transports oxygen around the body Low iron levels cause anaemia Vitamin C is required to absorb iron	Red meats – liver and kidney Lentils, dried apricots, cocoa, chocolate, Curry spices, Green leafy vegetables, e.g. spinach, Breakfast cereals fortified with iron
<b>Sodium</b>	Regulate the amount of water in the body To assist the body in the use of energy To help control muscles and nerves Too much salt/sodium can increase blood pressure and heart disease	Processed foods – for flavour and as a preservative, Salt added to food in cooking process for flavour, Smoked meats Bacon

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## Dietary Fibre (NSP)

**Insoluble fibre** is not easily broken down by the digestive system. It passes through the body unchanged, keeping the bowels healthy and preventing digestive problems such as constipation and haemorrhoids.

**Sources:** Oats barley rye most beans and peas fruit root vegetables

**Soluble fibre** is broken down by bacteria in the bowel to be digested. It can help reduce cholesterol in the blood and guard against coronary heart disease.

**Sources:** wholegrain cereals, wholemeal bread Bran, nuts, corn, oats, fruit, vegetables (especially the skin)

### Functions

- Helps prevent constipation.
- Helps prevent type 2 diabetes.
- Helps reduce the risk of colon cancer.
- Lowers the risk of coronary heart disease.
- Reduces the temptation to snack between meals.
- Helps support a healthy weight.
- Slows down absorption of carbohydrates in the blood to help keep blood sugar levels constant.

### Deficiency

A deficiency is often caused by eating too many refined foods, e.g. white bread instead of whole meal, or white rice instead of brown rice. It may also be caused by a general lack of fruit and vegetables in the diet. A deficiency can lead to constipation, haemorrhoids, colon cancer and/or diverticulitis.

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## Water in the diet

Water is the major component of body fluid and has many functions in the body:

- it acts as a lubricant for joints and eyes;
- it is the main component of saliva;
- it helps get rid of waste;
- it helps regulate body temperature.

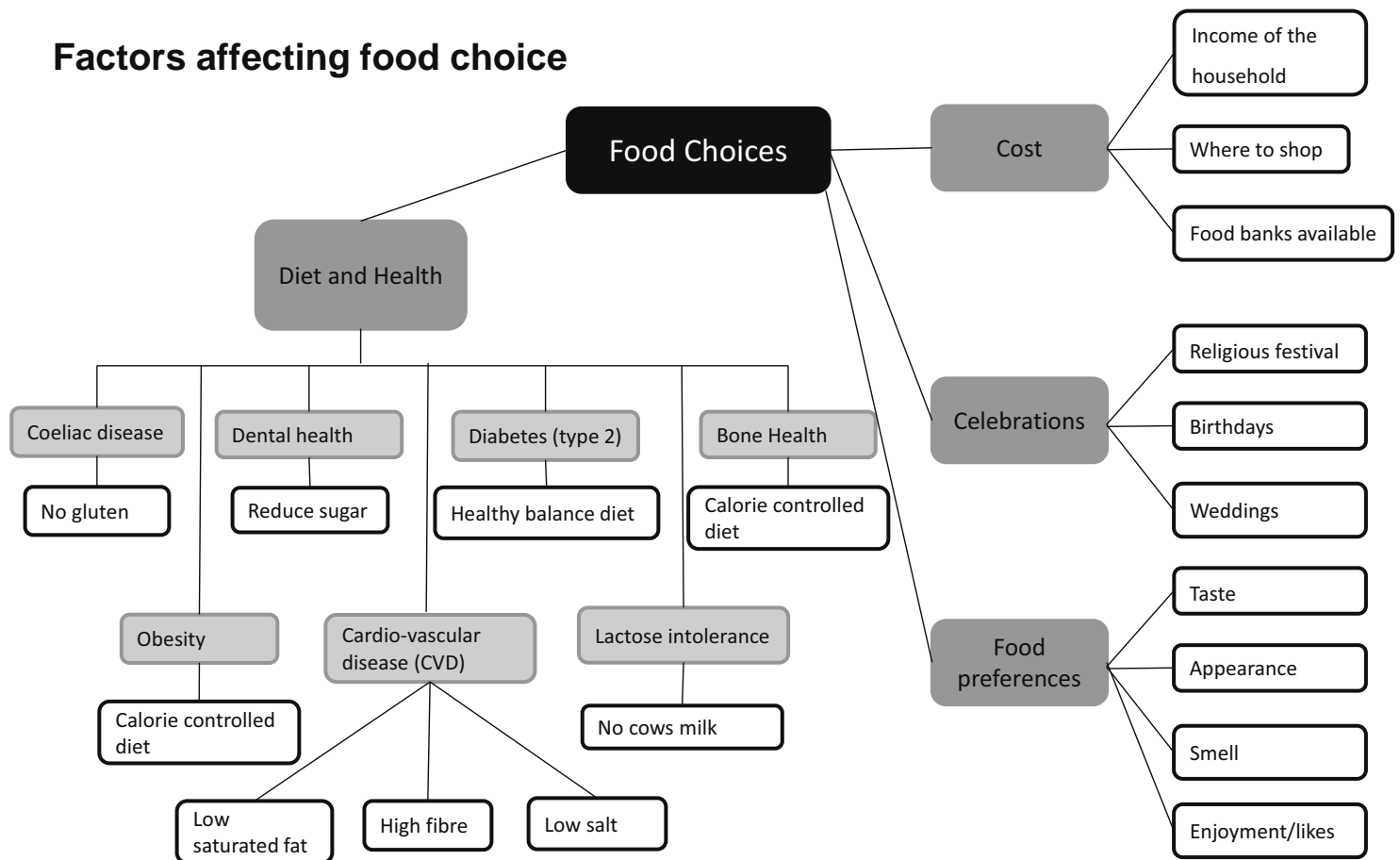
The body loses water all the time, when we go to the toilet, from sweat and also evaporation from skin. If we do not consume enough water, we become dehydrated.

- Water is provided by food and drinks.
- 20% of water consumed is from food.
- 80% is from drinks.
- Some fluids are less beneficial, coffee and tea can increase water loss, sweetened drinks contain a lot of sugar and fizzy drinks are acidic on the teeth.



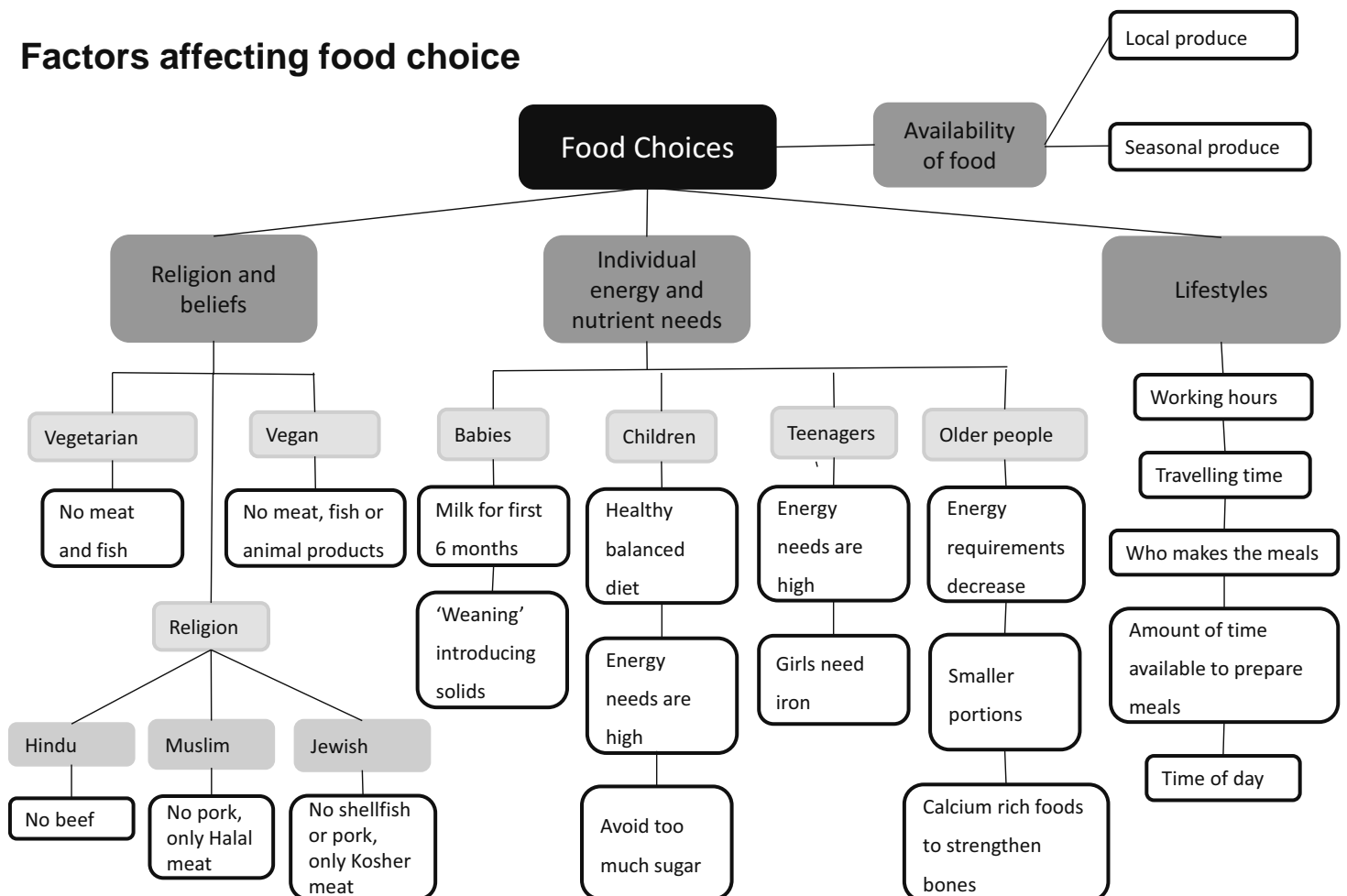
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## Factors affecting food choice



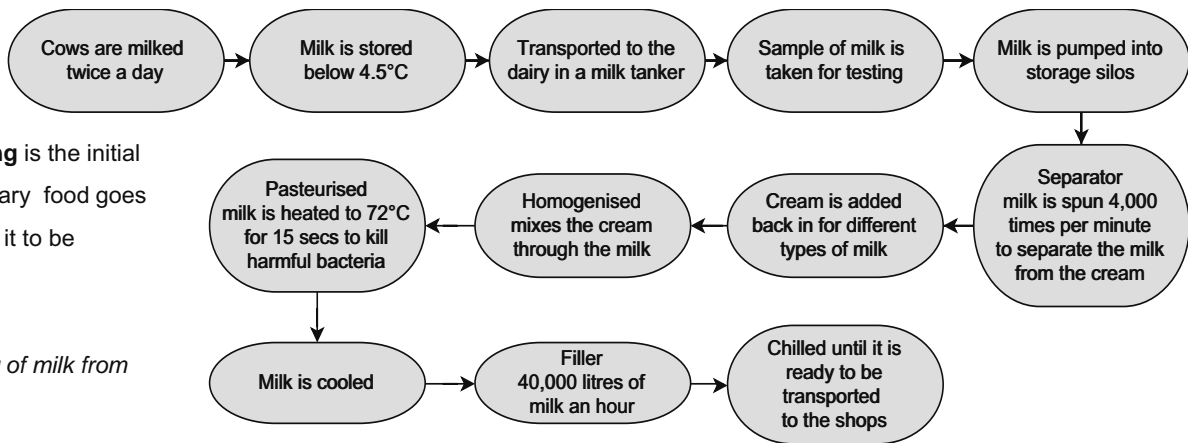
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## Factors affecting food choice



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# Food Manufacturing



**Secondary processing** is a further process that can take place using the primary processed product to make a new food product.

**An example of secondary processing** would be the processing of milk into other dairy products, for example:

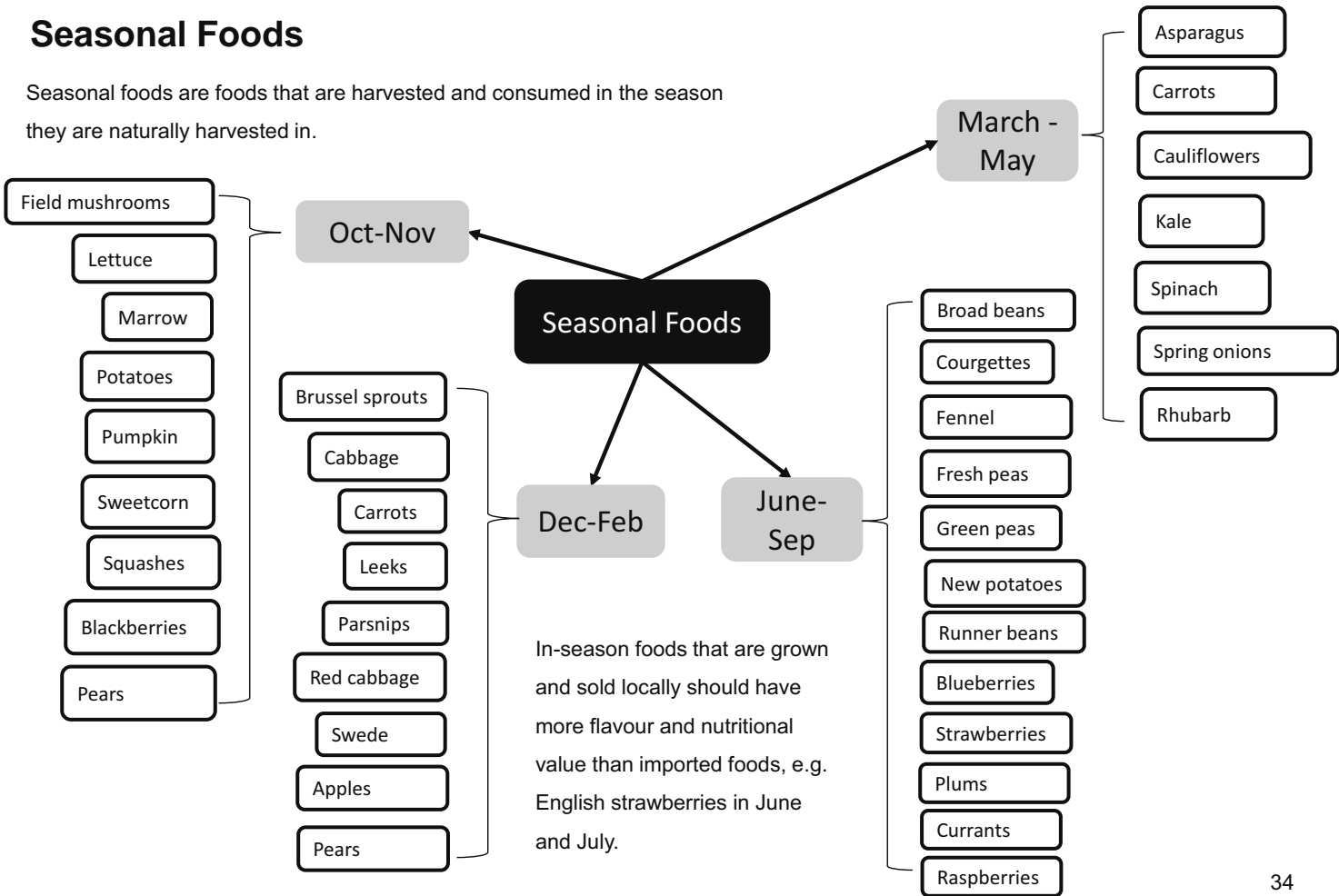
**Cream** – the fat removed from milk is used. Types of cream are single, whipping, double and extra thick. Cream can be further processed to make soured cream, clotted cream and crème fraîche.

**Butter** – cream is churned to make butter. It can then be salted and made into regional varieties, e.g. ghee, continental.

**Cheese** – this is milk in its solid form. It can be processed into many different types, e.g. hard pressed cheese such as cheddar, soft cheese such as goat’s cheese and blue veined such as stilton.

# Seasonal Foods

Seasonal foods are foods that are harvested and consumed in the season they are naturally harvested in.



## 10 FACTS ABOUT FAIRTRADE CHOCOLATE

1. In 1994, Green & Black's Maya Gold chocolate bar became the first Fairtrade-certified product in the UK.
2. Most cocoa farmers have never tasted chocolate, but farmers from a Fairtrade-certified cooperative in Ghana own 44% of the Divine chocolate company. Launched in 1998, it went down in history as the first farmer-owned confectionery brand in the UK.
3. Cocoa is produced in tropical. The ideal climate for growing cocoa is hot, rainy, and tropical, with lush vegetation to provide shade for the cocoa trees. Ghana and Côte d'Ivoire are the top selling countries.
4. Cocoa farmers gain very little from a very profitable global cocoa trade.
5. Most cocoa farmers in Ghana and Côte d'Ivoire live on less than a \$1 a day. Poverty, and its many related issues, such as child labour, is the key challenge faced by cocoa growing communities. With Fairtrade sales, farmer cooperatives receive the Fairtrade Premium which they spend on improving quality and productivity of their farms, to increase incomes.



6. The average age of a cocoa farmer is now over 50 because the younger generation cannot be attracted to the profession as the benefits are so poor.
7. There are lots of different types of chocolate products bearing the FAIRTRADE Mark in the UK, including premium, conventional, organic, gluten free and vegan.
8. Fairtrade chocolate accounts for 12% of total sales in the UK – and the trend for Fairtrade-certified cocoa treats is growing.
9. 25% of all Fairtrade cocoa growers are women.
10. Education is key to the future of cocoa communities. Fairtrade Africa currently trains cocoa farmers in financial management, governance, good agricultural practices, gender and child labour.

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## Knife Skills

### Knife Safety Rules

The correct knife should be used for the appropriate job.






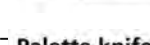

Knives must be kept sharp and clean; a blunt knife is more likely to cause a cut because more pressure needs to be applied to use it to cut.

Knife handles must be grease-free. The point must always be downwards when carrying a knife.

Knives should not be put in the washing-up bowl.

A knife must not be left on the edge of a table or chopping board.

### Types of Knives

Knife	Description	Uses
<b>Cook's knife</b> 	Comes in different sizes. Strong, ridged blade is suitable for a range of tasks.	Dicing, chopping and trimming vegetables, meat, poultry and fresh herbs.
<b>Paring knife</b> 	A small knife with a thin and slightly flexible blade.	Fruit and vegetable preparation.
<b>Boning knife</b> 	A very strong blade that will bend or break easily. May have a straight or curve blade.	Removing bones from meat joints and poultry.
<b>Filleting knife</b> 	Thin-bladed, flexible, very sharp knife.	Filleting fish.
<b>Carving knife</b> 	Long blade with a serrated or plain edge. Can be rounded or pointed.	Carving meat joints or cooked hams.
<b>Bread knife</b> 	Long serrated edge.	Slicing loaves and other bread products.
<b>Palette knife</b> 	Flexible blade, which is rounded at the top.	Icing cakes; turning food during cooking; moulding and smoothing food.

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# Knife Skills

## Hold



### Bridge Hold

To use the bridge hold, first place the flat surface of the item on a chopping board. Now form a bridge with the thumb and index finger of one hand and hold the item on the chopping board.



### Claw Grip

Shape your hand into a claw shape, tucking the thumb inside the fingers - the knuckle to fingertips part of the hand acts as a barrier against the knife blade when being held in the claw grip shape.

## Vegetable Cuts

	<b>Jardinière</b> Baton-shaped lengths		<b>Julienne</b> Matchstick-sized strips
	<b>Macédoine</b> Medium-sized dice		<b>Batonnet</b> Square-shaped lengths
	<b>Chiffonade</b> Fine shreds of leafy green vegetables		<b>Turning</b> Barrel-shaped vegetables

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## How to evaluate a food product

**What** have you made?

**What** skills/techniques have you used?

**What** went well?

**How** did you decorate/garnish it?

**What** did you like/dislike about it?

**How** could you improve?

**What** sensory words would you use to describe it?  
(appearance, taste, texture, smell)

Is there anything you would change?  
**Why?**

**How** would you improve your product if you were to make it again?

## Sensory Words

### Appearance (Looks)

Appetising	Dry	Hot
Attractive	Fattening	Moist
Clear	Firm	Runny
Cold	Fresh	Smooth
Colour	Greasy	Soft
Colourful	Hard	Tasty
Crumbly	Healthy	Tough

### Taste (Flavour)

Acid	Herby	Stale
Bitter	Meaty	Sweet
Bland	Old	Tangy
Burnt	Salty	Tasteless
Cheesy	Sharp	Tasty
Creamy	Sickly	Undercooked
Dry	Sour	Watery
Fruity	Spicy	

### Smell (Aroma)

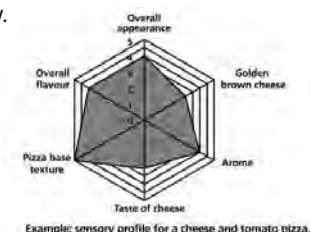
Burnt	Yeasty	Garlicky
Fragrant	Sickly	Spicy
Fruity	Spicy	Stale

### Texture (Mouthfeel)

Airy	Firm	Mushy
Brittle	Fizzy	Powdery
Chewy	Flaky	Slimy
Creamy	Foamy	Smooth
Crisp	Goey	Soggy
Crumbly	Greasy	Sticky
Crunchy	Gritty	Stringy
Dry	Hard	Tender
Fatty	Lumpy	Watery

## Sensory Profiles

The results of sensory tests are often displayed visually using charts and sensory profiles, such as the star profile/radar diagram below.



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**Year 8**

**French**

**Knowledge organiser  
2023-2024**



[7.1] Helping at home - present + opinions

Qu'est-ce que (What is it that)	tu fais (you do)	pour aider à la maison? (to help around the house?)		
J'aide mes parents (I help my parents)	de temps en temps, (from time to time,) deux fois par semaine, (twice a week,) tous les jours, (every day,) tous les matins, (every morning,) tous les soirs, (every evening,) une fois par semaine, (once a week,) une fois par mois, (once a month,)	et (and)	j'adore ça (I love it) j'aime ça (I like it) ça ne me dérange pas (I don't mind it) je fais ça (I do it) je n'aime pas ça (I don't like it) je déteste ça (I hate it)	c'est amusant (it's fun) c'est facile (it's easy) j'aime aider (I like to help out) c'est facile (it's easy) c'est nécessaire (it's necessary) c'est utile (it's useful) j'aime aider (I like to help out) c'est nécessaire (it's necessary) j'aime aider (I like to help out) je n'ai pas le choix (I don't have a choice) c'est ennuyeux (it's boring) c'est fatigant (it's tiring) c'est difficile (it's difficult) c'est une perte de temps (it's a waste of time)
J'arrose les plantes (I water the plants)				
Je débarrasse la table (I clear the table)				
Je fais les courses (I do the shopping)				
Je fais la cuisine (I do the cooking)	et (and)	car (as) parce que (because) puisque (since)		
Je fais les tâches ménagères (I do the housework)				
Je fais la vaisselle (I do the dishes)				
Je mets la table (I lay the table)				
Je m'occupe de mon frère (I look after my brother)	mais (but)			
Je m'occupe de ma sœur (I look after my sister)				
Je passe l'aspirateur (I vacuum)				
Je passe la serpillère (I mop the floor)				
Je promène le chien (I walk the dog)				
Je range ma chambre (I tidy my room)				
Je sors la poubelle (I put the bin out)				
Je tonds la pelouse (I mow the lawn)				

## [15.2] Weather and free time [IMPERFECT]

Quand le ciel était dégagé (When the sky was clear)	je jouais (I would play)	elle jouait (she would play)	vous jouiez (you all would play)	au basket (basketball)	aux cartes (cards)
Quand il y avait des nuages (When it was cloudy)	tu jouais (you would play)	on jouait (one would play)	ils jouaient (they (m) would play)	au foot (football)	aux échecs (chess)
Quand il faisait beau (When it was good weather)	il jouait (he would play)	nous jouions (we would play)	elles jouaient (they (f) would play)	au tennis (tennis)	avec des amis (with friends)
Quand il faisait chaud (When it was hot)	je faisais (I would do)	elle faisait (she would do)	vous faisiez (you all would do)	du footing (jogging)	de l'escalade (climbing)
Quand il faisait froid (When it was cold)	tu faisais (you would do)	on faisait (one would do)	ils faisaient (they (m) would do)	du ski (skiing)	de la musculation (weight training)
Quand il faisait mauvais (When it was bad weather)	il faisait (he would do)	nous faisions (we would do)	elles faisaient (they (f) would do)	du sport (sport)	de la natation (swimming)
Quand il y avait du soleil (When it was sunny)	j'allais (I would go)	elle allait (she would go)	vous alliez (you all would go)	du vélo (cycling)	de la randonnée (hiking)
Quand il y avait du vent (When it was windy)	tu allais (you would go)	on allait (one would go)	ils allaient (they (m) would go)	de l'équitation (horse riding)	les devoirs (homework)
Quand il y avait du brouillard (When it was foggy)	il allait (he would go)	nous allions (we would go)	elles allaient (they (f) would go)	au centre commercial (to the shopping centre)	à la pêche (fishing)
Quand il y avait de l'orage (When it was stormy)	je restais (I would stay)	mon ami restait (my friend (m) would stay)	vous alliez (you all would go)	au centre sportif (to the sports centre)	à la plage (to the beach)
Quand il pleuvait (When it rained)	tu restais (you would stay)	mon amie restait (my friend (f) would stay)	elles allaient (they (f) would go)	au parc (to the park)	chez des amis (to friends' houses)
Quand il neigeait (When it snowed)				à la maison (at home)	dans ta chambre (in your room)
				dans ma chambre (in my room)	dans sa chambre (in his/her room)

[13] Talking about clothes [FUTURE]

Dans l'avenir, (In the future.) L'année prochaine, (Next year.)	il fera beau, (it is [will make] good weather,) il fera chaud, (it is [will make] hot.) il y aura du soleil, (it is [there will be] sunny,)	quand (when)	je porterai (I will wear)	un chapeau (a hat)	un pantalon (a pair of trousers)
			tu porteras (you will wear)	un costume (a suit)	un pull (a jumper)
			il portera (he will wear)	un haut (a top)	un short (a pair of shorts)
			elle portera (she will wear)	un jean (a pair of jeans)	un survêtement (a tracksuit)
			on portera (one will wear)	un maillot de bain (a swimsuit)	un tee-shirt (a T-shirt)
			nous porterons (we will wear)	un manteau (a coat)	un uniforme (a uniform)
			vous porterez (you all will wear)	une casquette (a cap)	une jupe (a skirt)
			ils porteront (they (m) will wear)	une chemise (a shirt)	une montre (a watch)
			elles porteront (they (f) will wear)	une cravate (a tie)	une robe (a dress)
				une écharpe (a scarf)	une veste (a jacket)
				des gants (gloves)	
				des baskets (trainers)	des tongs (flip flops)
				des bottes (boots)	des pantoufles (slippers)
				des chaussettes (socks)	des sandales (sandals)
				des chaussures (shoes)	

[12] Drink, eat, have [FUTURE]

Qu'est-ce que (What is it that)	je boirai. (I will drink.)	elle boira. (she will drink.)	vous boirez. (you all will drink.)	au petit déjeuner? (at breakfast?)	au déjeuner? (at lunch?)	au dîner? (at dinner?)
Au petit déjeuner (At breakfast)	tu boiras. (you will drink.)	on boira. (one will drink.)	ils boiront. (they (m) will drink.)	du café (coffee)	du lait (milk)	
	il boira. (he will drink.)	nous boirons. (we will drink.)	elles boiront. (they (f) will drink.)	du chocolat chaud (hot chocolate)	du thé (tea)	
				du coca (coke)	de l'eau (water)	
				du jus de fruits (fruit juice)	de la limonade (lemonade)	
Au déjeuner (At lunch)	je mangerai. (I will eat.)	elle mangera. (she will eat.)	vous mangerez. (you all will eat.)	du chocolat (chocolate)	de la viande (meat)	
	tu mangeras. (you will eat.)	on mangera. (one will eat.)	ils mangeront. (they (m) will eat.)	du fromage (cheese)	des céréales (cereal)	
	il mangera. (he will eat.)	nous mangerons. (we will eat.)	elles mangeront. (they (f) will eat.)	du miel (honey)	des chocolats (chocolates)	
				du pain (bread)	des frites (fries)	
Tous les jours (Every day)	je prendrai. (I will have.)	elle prendra. (she will have.)	vous prendrez. (you all will have.)	du pain grillé (toast)	des fruits (fruit)	
	tu prendras. (you will have.)	on prendra. (one will have.)	ils prendront. (they (m) will have.)	du poisson (fish)	des légumes (vegetables)	
	il prendra. (he will have.)	nous prendrons. (we will have.)	elles prendront. (they (f) will have.)	du poulet rôti (roast chicken)	des oeufs (eggs)	
				du riz (rice)	des pâtes (pasta)	
				du saumon (salmon)	des sandwiches (sandwiches)	
				de la pizza (pizza)	des saucisses (sausages)	
				de la salade verte (green salad)	des spaghettiis (spaghetti)	

[1] Saying where I live

Près de chez moi (Near my house)  Dans le centre (In the centre)  Dans mon quartier (In my neighbourhood)  Dans ma ville (In my city)	il y a (there is/are)  nous avons (we have)	beaucoup de (many) plein de (loads of) des / de (some (de before adj))  beaucoup de (many) de (any)		commerces (businesses)  installations sportives (sports facilities)  jolies rues (beautiful streets)	magasins (shops)  restaurants (restaurants)  vieux bâtiments (old buildings)	
	il n'y a pas (there isn't/aren't)  nous n'avons pas (we don't have)	un / une (a (m/f))  de (a*)	aquarium (aquarium)  centre commercial (shopping mall)	centre sportif (sports centre)  cinéma (cinema)	club de jeunes (youth club)  grand parc (big park)  jardin botanique (botanical garden)  rue piétonne (pedestrian street)	
		beaucoup de choses à faire (many things to do) beaucoup de choses à voir (many things to see)		beaucoup de jeunes (many young people) beaucoup à faire pour les jeunes (a lot to do for young people)		
	J'aime mon quartier (I like my neighbourhood)  Je n'aime pas mon quartier (I don't like my neighbourhood)  J'aime là où j'habite (I like where I live)  Je n'aime pas là où j'habite (I don't like where I live)	car (as)  parce que (because)  puisque (since)	c'est (it is)  il y a (there is) il n'y a pas (there isn't)  on peut (one can) on ne peut pas (one can't)	bien tenu (well kept) dangereux (dangerous)  beaucoup de (a lot of) trop de (too much)	mal tenu (badly kept) propre (clean)  bruit (noise) circulation (traffic)	sale (dirty) sûr (safe)  pollution (pollution)  bien manger (eat well) faire du sport (do sport)  se promener (go for a walk)



[2.2] What I did in my neighbourhood (perfect)

Avant-hier (The day before yesterday) Hier (Yesterday) Il y a trois jours (Three days ago) Le week-end dernier (Last weekend) Vendredi dernier (Last Friday)	j'ai fait (I did)	du sport (sport) de l'équitation (horseriding) du footing (jogging)	de la natation (swimming) de la randonnée (hiking) du tourisme (sightseeing)	dans les bois (in the woods) dans le centre-ville (in the city centre) au parc (at the park)
	j'ai joué (I played)	au foot (football) au golf (golf)	au rugby (rugby) au tennis (tennis)	au centre sportif (at the sports centre) au parc (at the park)
	je suis allé (I went (m)) je suis allée (I went (f))	en boîte (clubbing) à un café (to a cafe)	me promener (for a walk (I)) se promener (for a walk (one))	au centre commercial (at the shopping mall) dans les rues piétonnes (in the pedestrian streets) dans la vieille ville (in the old town)
	j'ai vu (I saw)	un concert au théâtre (a concert at the theatre) un spectacle de danse (a dance show)	un match de foot au stade (a football match at the stadium) un film au cinéma (a film at the cinema)	dans le centre-ville (in the city centre) dans le quartier touristique (in the tourist district) commercial (in the commercial district)
j'ai visité (I visited)	le château (the castle) la galerie d'art (the art gallery) le musée (the museum)	le palais historique (the historic palace) les ruines romaines (the Roman ruins)		sur la place principale (in the town square) dans le quartier historique (in the historic district) dans la vieille ville (in the old town)



**SentenceBuilders**  
Powered by  **THE LANGUAGE GYM**

[3] Describing my street

Dans ma rue (On my street)	il y a (there is)	un (a)	centre commercial (·shopping mall)	magasin de sport (·sports shop)	petit parc (·small park)	supermarché (·supermarket)						
		une (a)										
Près de chez moi (Near my house)	il n'y a pas de (there isn't a)		centre sportif (·sports centre)	magasin de vêtements (·clothes shop)	restaurant chinois (·Chinese restaurant)	terrain de foot (·football pitch)						
Près de là où j'habite (Near where I live)		aucun (any (m))										
		aucune (any (f))										
Mon appartement (My flat)	à droite (to the right)	à gauche (to the left)	à dix minutes (10 minutes away)	à côté (next to)	bibliothèque (·library)	librairie (·bookshop)						
							est (is)	piscine municipale (·local swimming pool)	synagogue (·synagogue)			
	Ma maison (My house)											
	entre (between)	la boucherie (the butcher's)	l'église (the church)	le centre sportif (the sports centre)	le supermarché (the supermarket)	le restaurant (the restaurant)						
							et (and)	la piscine (the swimming pool)	le restaurant (the restaurant)			



[9] Making after-school plans

Qu'est-ce que (What is it that)	tu voudrais (you would like)	tu veux (you want)	vous voulez (you all want)	faire (to do)	ce matin? (this morning?) cet après-midi? (this afternoon?) ce soir (this evening?)	ce week-end? (this weekend?) aujourd'hui? (today?) demain? (tomorrow)
Aujourd'hui (Today) Ce week-end (This weekend)	j'ai envie de (I feel like)	je voudrais (I would like)	je veux (I want)	aller chez Pierre (to go to Pierre's house) aller au cinéma (to go to the cinema) aller au parc (to go to the park) aller à la piscine (to go to the swimming pool)	faire les magasins (to go shopping) faire un tour à vélo (to go for a bike ride) faire un tour en centre-ville (to go for a walk in the centre) jouer au basket (to play basketball)	
Ça te dit de (Do you fancy) Tu voudrais (Would you like) Tu veux (Do you want)				Je préférerais (I'd rather)		avec moi? (with me?) avec nous? (with us?)
Désolé, (Sorry, (m)) Désolée, (Sorry, (f))	ça ne me dit rien. (I don't fancy it.) je ne veux pas. (I don't want to.)			je dois (I have to) je ne peux pas, car (I can't, as)	aider ma mère (help my mum) étudier (study) faire mes devoirs (do my homework)	faire les tâches ménagères (do the housework) rester chez moi (stay at home) travailler (work)
Oui, ça me dit bien, mais (Yes, I fancy it, but) Oui, je veux bien, mais (Yes, I want to, but)	Oui, ça me dit bien. (Yes, I fancy it.)	Oui, d'accord. (Yes, OK.)			Allons-y! (Let's go!)	On y va? (Shall we go?)
On se retrouve (We meet)	à quelle heure? (at what time?) où? (where?)	On se retrouve (Let's meet)		devant (in front of) en face de (opposite)	le cinéma (the cinema) la piscine (the swimming pool)	à cinq heures (at 5) à sept heures (at 7)

Normalement je vais (Normally I go)		au centre commercial (to the shopping centre) aux magasins (to the shops) aux magasins de marques (to designer shops) aux magasins de mode (to fashion shops) aux magasins d'occasion (to second hand shops)	avec mes amis (with my frinds) avec mon meilleur ami (with my best friend) avec ma mère (with my mum)	et c'est toujours amusant. (and it's always fun.) mais ça peut-être ennuyeux. (but it can be boring.)
D'habitude je vais (Usually I go)				
Chaque semaine nous allons (Every week we go)				
De temps en temps, on va (From time to time, we go)				
La semaine dernière (Last week)	je suis allé(e) (I went) Nous sommes allé(e)s (we went)			et je me suis amusé(e). (and I had a good time.) et c'était génial. (and it was great.) et j'ai vraiment aimé. (and I liked it a lot.)
Avant-hier (The day before yesterday)				
Hier (Yesterday)				
Samedi dernier (Last Saturday)				
Le weekend dernier (Last weekend)				
J'ai pris le bus (I took the bus)	et aux magasins (and at the shops)	j'ai acheté (I bought) nous avons acheté (we bought) j'ai dépensé mon argent sur (I spent my money on) nous avons dépensé notre argent sur (we spent our money on)	des vêtements. (clothes.) des chaussures. (shoes.) de la technologie. (technology.) des jeux vidéos. (videogames.) des magazines. (magazines.) des cadeaux. (presents.) de la nourriture. (food.) des boissons. (drinks.) des bonbons. (sweets.)	Je pense que c'était très cher. (I thought it was very expensive.) Je crois que c'était une affaire! (I think it was a bargain!)
Nous avons pris un taxi (We took a taxi)				
J'y suis allé(e) en voiture (I went by car)				
Nous y sommes allé(e)s à pied (We went on foot)				
Je suis sorti(e) avec ma copine (I went out with my friend (f))	et ça m'a coûté vingt livres. (and it cost me £20.) et j'ai payé cinquante euros. (and I paid 50 euros.)	j'ai essayé plein de vêtements (I tried lots of clothes) nous avons essayé des vêtements (we tried clothes) j'ai essayé des chaussures (I tied shoes) j'ai essayé des baskets (I tried trainers)		Je l'ai trouvé assez bon marché! (I found it quite cheap!)
Nous sommes sorti(e)s en groupe (We went out as a group)				



[10] Mobile technology (present)

À l'heure actuelle, <i>(At the current time.)</i>		De nos jours, <i>(Nowadays.)</i>		est <i>(is)</i>  est de plus en plus <i>(is more and more)</i>	attrayante <i>(attractive)</i>  indispensable <i>(indispensable)</i>  vitale <i>(vital)</i>	du fait de sa versatilité <i>(due to its versatility)</i>  dans le monde du travail <i>(in the world of work)</i>  pour nos tâches quotidiennes <i>(for our daily tasks)</i>
Dans notre société moderne, <i>(In our modern society,)</i>		Dorénavant, <i>(From now on,)</i>				
Un des <i>(One of the)</i>	avantages <i>(advantages)</i>	de <i>(of)</i>				
	bienfaits <i>(benefits)</i>					
	inconvenients <i>(disadvantages)</i>					
problèmes <i>(problems)</i>				c'est <i>(it is)</i>	la capacité de payer à distance <i>(the ability to pay remotely)</i> que c'est une source de divertissement <i>(that it's a source of entertainment)</i> la possibilité de chercher sur Google <i>(the possibility to Google things)</i>	
				ce sont <i>(they are)</i>	son impact sur l'environnement <i>(its impact on the environment)</i>  les coûts environnementaux <i>(the environmental costs)</i> les distractions qu'elles génèrent <i>(the distractions they generate)</i>	
J'aime me servir de <i>(I like to make use of)</i>	mon enceinte portable <i>(my portable speaker)</i>	mon téléphone portable <i>(my mobile phone)</i>		car <i>(as)</i>	c'est efficace et compact <i>(it's efficient and compact)</i> c'est léger à transporter <i>(it's light to transport)</i> c'est pratique <i>(it's practical)</i> c'est rapide et divertissant <i>(it's fast and entertaining)</i>	
Je me sers souvent de <i>(I often make use of)</i>	mon ordinateur portable <i>(my laptop)</i>	ma montre connectée <i>(my smartwatch)</i>				
J'aime utiliser <i>(I like to use)</i>	ma tablette <i>(my tablet)</i>					
J'utilise souvent <i>(I often use)</i>						

[19.1] My holiday plans

Cet été (This summer)	je vais aller (I'm going to go)	en vacances (on holiday)	en Allemagne (to Germany)	en avion (by plane)
En juin (In June)	nous allons aller (we're going to go)		en Belgique (to Belgium)	en bateau (by boat)
En juillet (In July)			en Espagne (to Spain)	en car (by coach)
			en France (to France)	en voiture (by car)
			au Portugal (to Portugal)	
Au mois de juillet (In the month of July)		dans la maison de ma famille (in my family's house)	dans le nord (in the north)	du pays (of the country)
Au mois d'août (In the month of August)	je vais rester (I'm going to stay)	dans un camping (on a campsite)	dans le sud (in the south)	de l'Espagne (of Spain)
Le mois prochain (Next month)	nous allons rester (we're going to stay)	dans un hôtel bon marché (in a cheap hotel)	dans la capitale (in the capital)	de la France (of France)
L'année prochaine (Next year)		dans un hôtel de luxe (in a luxury hotel)	sur la côte (on the coast)	
			à la montagne (in the mountains)	
Je vais passer (I'm going to spend)	une semaine (a week)	là-bas (there)	et ce sera (and it will be)	amusant (fun)
Nous allons passer (We're going to spend)	deux semaines (2 weeks)	avec ma famille (with my family)	et je pense que ce sera (and I think it will be)	cool (cool)
	un mois (a month)	avec mes cousins (with my cousins)		ennuyeux (boring)
	quinze jours (fifteen days)	avec mes amis (with my friends)		génial (great)

# Year 8 Geography

## Knowledge Organiser

### Contents Page

Topic	Pages
GEOGRAPHY OVERVIEW	Pages 3 – 9
ASIA	Pages 10 - 27
MIDDLE EAST	Pages 28 - 49
AFRICA	Pages 50 - 69
CLIMATE CHANGE	Pages 70 - 76

## Key Terminology

### **SEEP**

**Social** = Issues to do with peoples lives

**Economic** = Jobs, business and money

**Environmental** = The Environment

**Political** = Countries and Governments

**Stakeholder** = Somebody who has an interest in an issue

**Timescale** = Are you talking short term ( days and weeks ) Or long term ( months and years ) ?

**Spatial** = What scale are you looking at ? Is it *local* scale, *regional* scale , *national* scale or *global* scale ?

### **Sustainability**

*"Meeting the needs of the present without compromising the ability of future generations to meet their own needs"*

*Enough , For all, Forever*

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## Geography Connectives

**At the end of every sentence ask yourself – ‘So ?’ , ‘And ?’ and ‘Why ?’**

This means that ...  
As a result of this ...  
This leads to ...  
The result of this ...  
This results in ...  
In the future this may lead to ...  
As a consequence of this ...  
This occurs because ...  
The reasons for this is ...  
This causes ...  
An example of this is ...  
The reason for this is ...

... leading to ...  
... meaning that ...  
The impact of this is ...  
This produces ...  
This may bring about ...  
...and because of this ...  
This is due to ...  
This suggests that ...  
...and this means that ...  
One reasons for this is

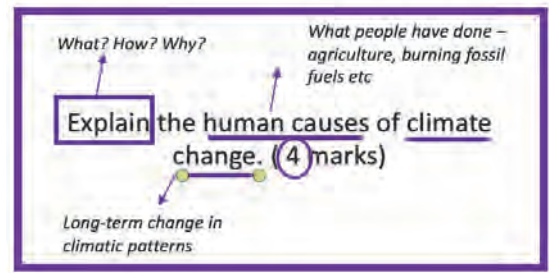
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## BUG the exam question

Before you answer any question remember to **BUG** the question

- B** – box the command work
- U** – Underline any other key words
- G** – glance at the mark



## Developing your points using the PEEL structure

### Point

What is the point you are making ?

### Evidence

Which examples / facts / data link to your point ?

### Explain

Develop your point using connectives such as 'This means that' or 'therefore' or 'this shows that'

### Link

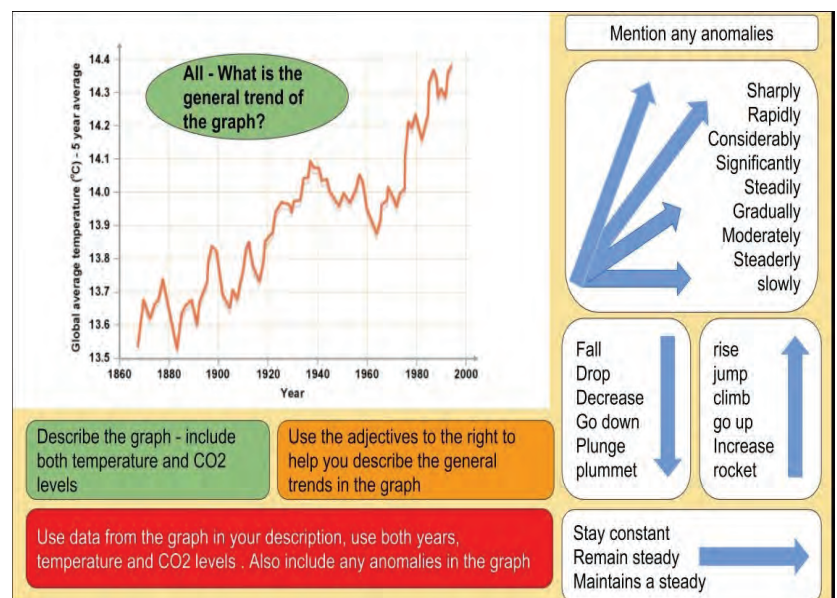
How does your point link back to the question ?

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## Reading a graph in Geography

### PEA

<b>P</b>	<b>Pattern</b>	E.g. "Its increasing"
<b>E</b>	<b>Evidence</b>	E.g. "Between 1990 and 2005 it increased ..."
<b>A</b>	<b>Anomalies</b>	Is there anything different ?  A sudden drop ? Point it out.



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## Reading maps in Geography – ‘CLOCK’

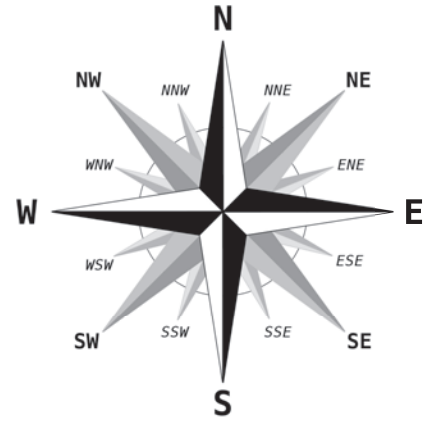
**C** = Country

**L** = Latitude / longitude

**O** = Oceans and Seas

**C** = Compass points

**K** = Kilometres ( distance and scale

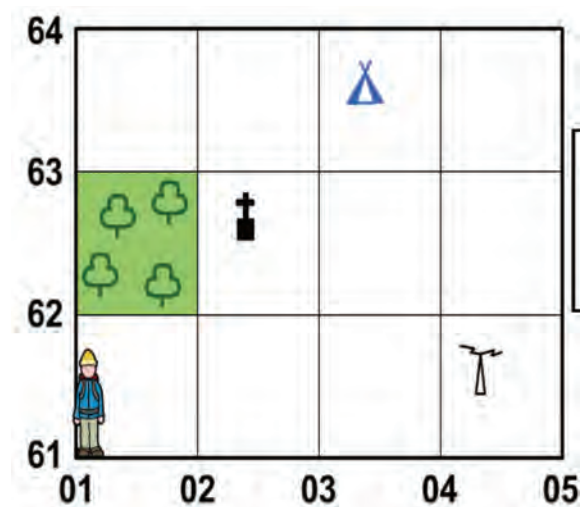


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## Using OS maps in geography

### **Follow the 3 Grid reference rules**

1. Always go across the landing and then up the stairs .
2. If you are ‘in’ a square, then go down and left.
3. If you are given a grid reference and need to find it ,go up and right.



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# **Decision making exercises checklist.**

## **Did you ...**

1. Plan your answer ?
2. Rank your option choices ?
3. Develop your points using TAT ?
4. Link to SEE ? ( *Social , Economic, Environmental* )
5. Mention stakeholders ?
6. Use the resource booklet ?
7. Link to scale – *local, regional and national* ?
8. Link to time – *short term vs long term* ?
9. Think about the bigger picture – national or global issues ?

# Asia

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## Year 8 Geography Asia

### How is Asia being transformed?

Asia means 'East'

It is the world's largest continent in both area and population.

It is made up of 49 countries.

The population of Asia is to over 4.3 billion.

More than half of the population of Asia are found in China and India.



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## Year 8 Geography Asia Physical features in Asia

The Himalayas are found in Asia.

Mount Everest, the highest mountain in the world, is found here.

It is over 8848 m above sea level.

The Gobi desert is found in Asia.

The Pacific Ocean is found to the east of mainland Asia.

The Indian Ocean is found to the south of mainland Asia.



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## Year 8 Geography Asia

### How does India rely on the monsoon climate?

India relies on the monsoon climate for its economic development.

The Monsoon months are June to September.

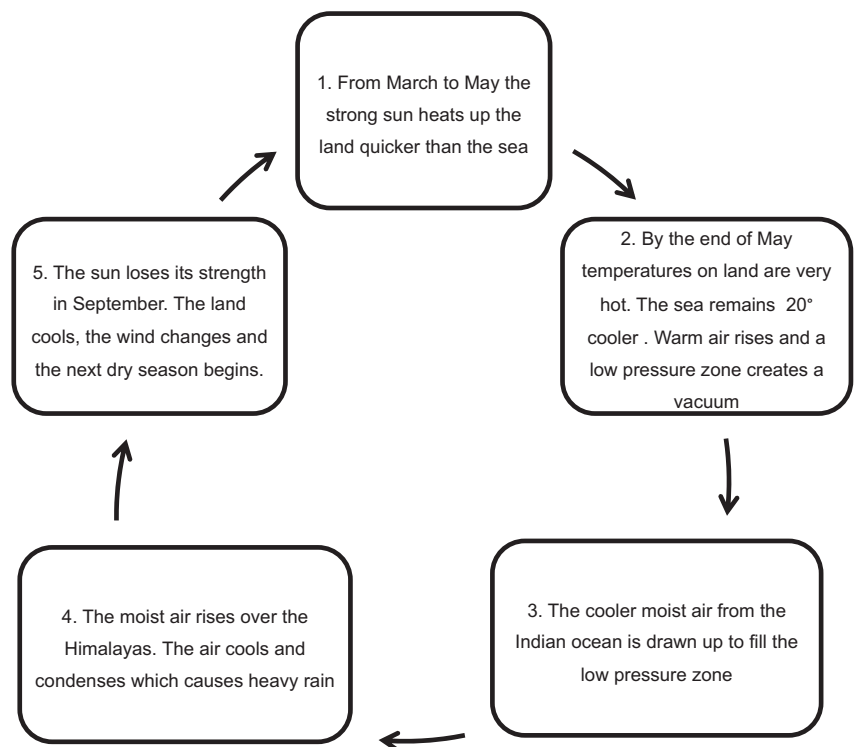
The Monsoon season brings 3/4 of India's yearly rain.

Over 50% of people are employed in agriculture (farming) in India.

1.4 billion people rely directly on agriculture.

India grows over 100 million tons of rice and grain each year.

Agriculture produces 15% of India's \$1.83 trillion GDP.



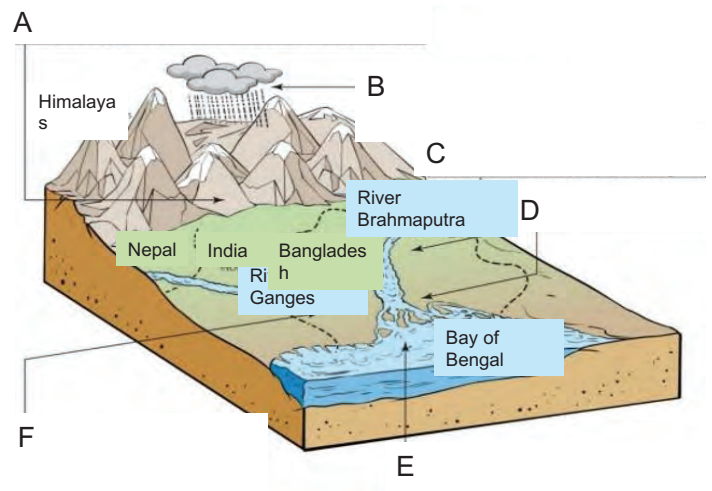
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## Year 8 Geography Asia

### Causes of the 2017 Bangladesh floods in South Asia

Description of cause	
A	Trees were chopped down at the bottom of the Himalayas in Nepal.
B	Monsoon climate creates heavy rain.
C	Rivers split due to soil erosion in the Himalayas.
D	The water level rises due to soil and materials being washed into the river.
E	Cyclones (violent storms) frequently move up the Bay of Bengal.
F	80% of Bangladesh lies on a huge flood plain which is 1m above sea level.



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## Year 8 Geography Asia

### Impact of the 2017 floods in South Asia

#### Countries affected:

**India:** 31 million people lost their homes, jobs, cattle or property.

**Bangladesh:** more than 8 million were affected, 3 million were children.

**Nepal:** 1.7 million people were affected.

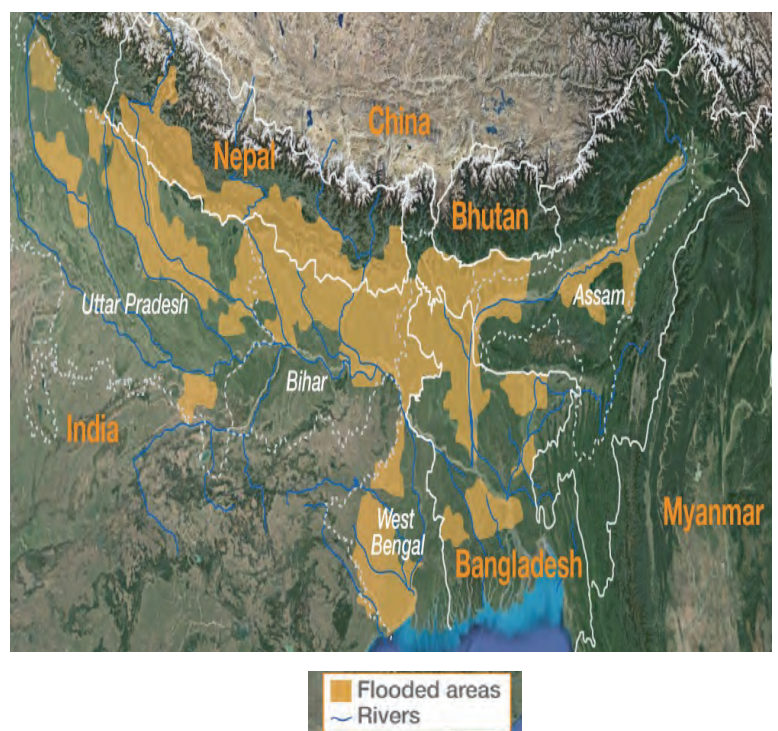
#### Social impact:

1.5 million homes were destroyed.

Thousands of schools, hospitals, roads and bridges were damaged.

1,300 people were killed.

30-40% of people killed were children.



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## Year 8 Geography Asia

### Population distribution and growth

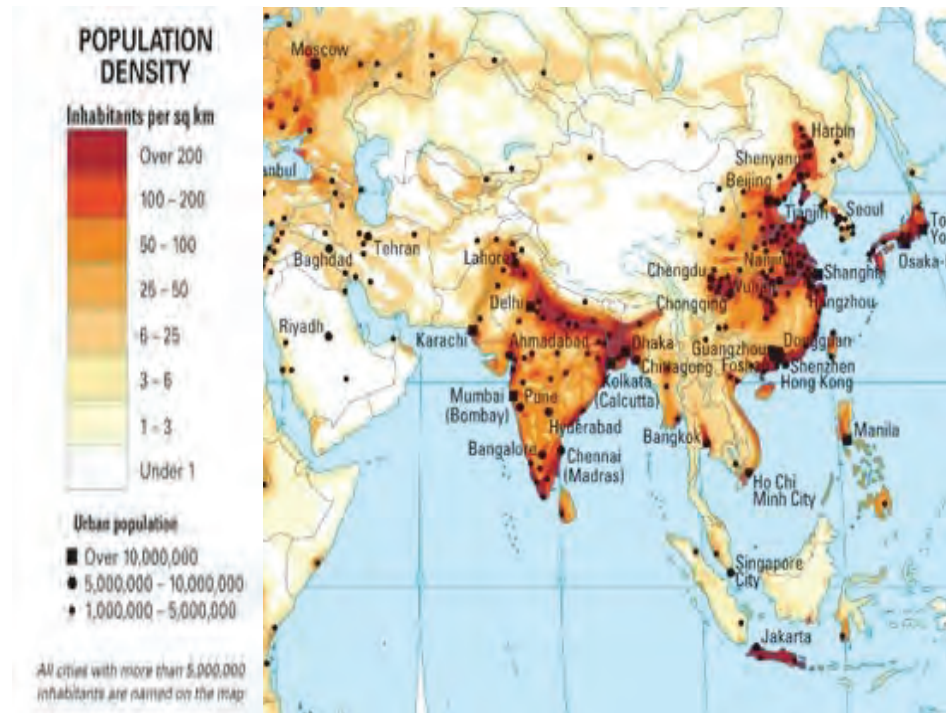
66% of the world's population lives in Asia.

4.4. billion people live in Asia.

China: 1.4 billion

India: 1.3 billion

Population distribution is unevenly spread



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## Year 8 Geography Asia

### Population of Japan

Population: 127 million

Average life expectancy: 85 years

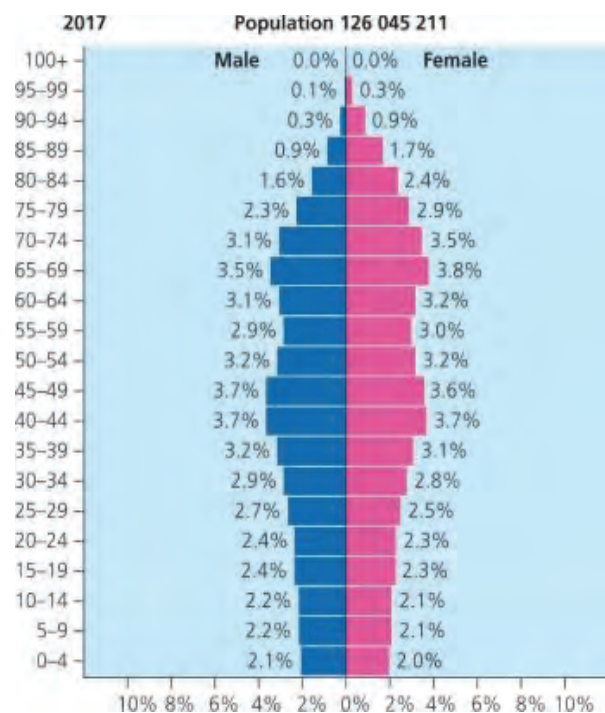
Birth rate: 7.4 births per 1000 people

#### Future predictions:

The population will shrink by 1/3 in the next 50 years.

Over 64-year olds (currently 25% of the population)

will increase to 38%.



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## Year 8 Geography Asia

### Solving Japan's aging population issue

#### Issues:

Japan has an aging and shrinking population.

There is a shortage of workers.

In Tokyo there are twice as many job vacancies as applicants.

#### Solutions:

The Prime Minister is supporting a 'robot revolution'

Increased use of robots and automated machines will reduce the need for workers.

The government has increased the number of overseas workers to over a million, double that in 2008.

An internship programme launched attracted cheap labour from Asia to farms and factories.

Foreigners are now able to buy homes in Japan.

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## Year 8 Geography Asia

### Population of Afghanistan

Population: 30 million

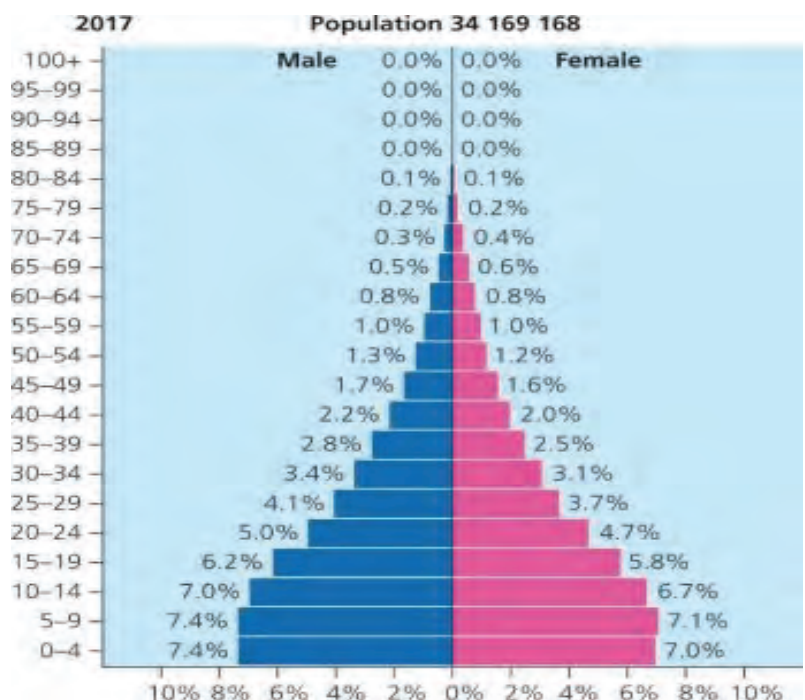
Average life expectancy: 65 years

Birth rate: 32.2 births per 1000 people

#### Future predictions:

The population will double.

The increase in population will cause the economic development of Afghanistan to suffer.



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## Year 8 Geography Asia

### Solving Afghanistan's overpopulation issue

#### Issues:

The population is set to double in the coming years.

The United Nations have calculated that Afghan women have 6.3 children, on average, over their lifetime.

Women have a significantly lower literacy rate compared to men.

#### Solutions:

The Afghan government is encouraging more people to use contraception.

Educating people about the use of contraception.

Afghanistan has a conservative Muslim society who may oppose the use of contraception due to religious beliefs.

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## Year 8 Geography Asia

### Urbanisation of Karnataka, India

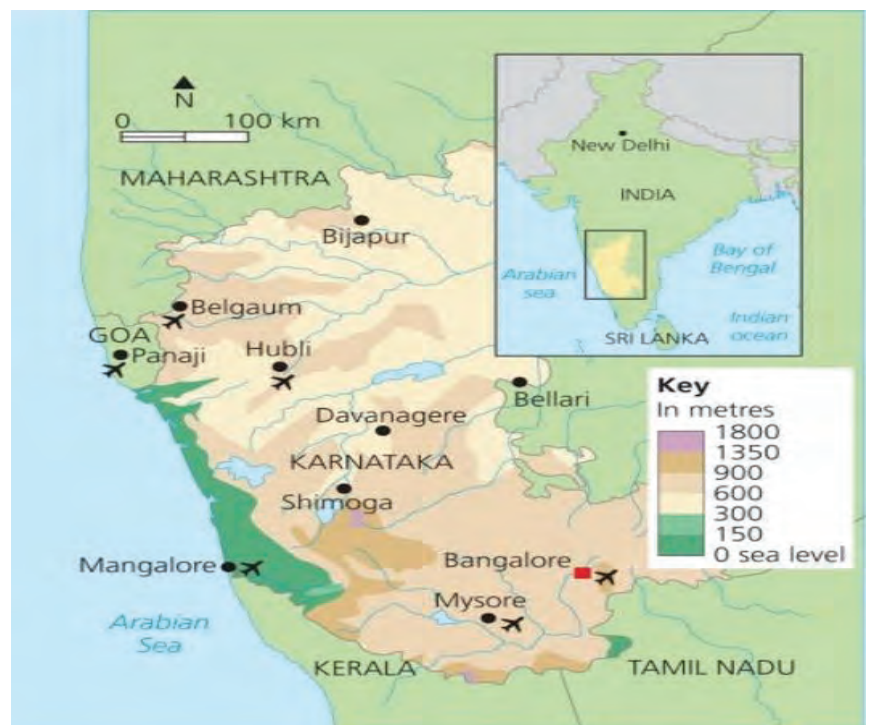
Population of Karnataka: 61.1 million

Number of people below the poverty line: 23.6%

Infant mortality rate: 35 infant deaths per thousand

Percentage of under 3-year-old children: 40%

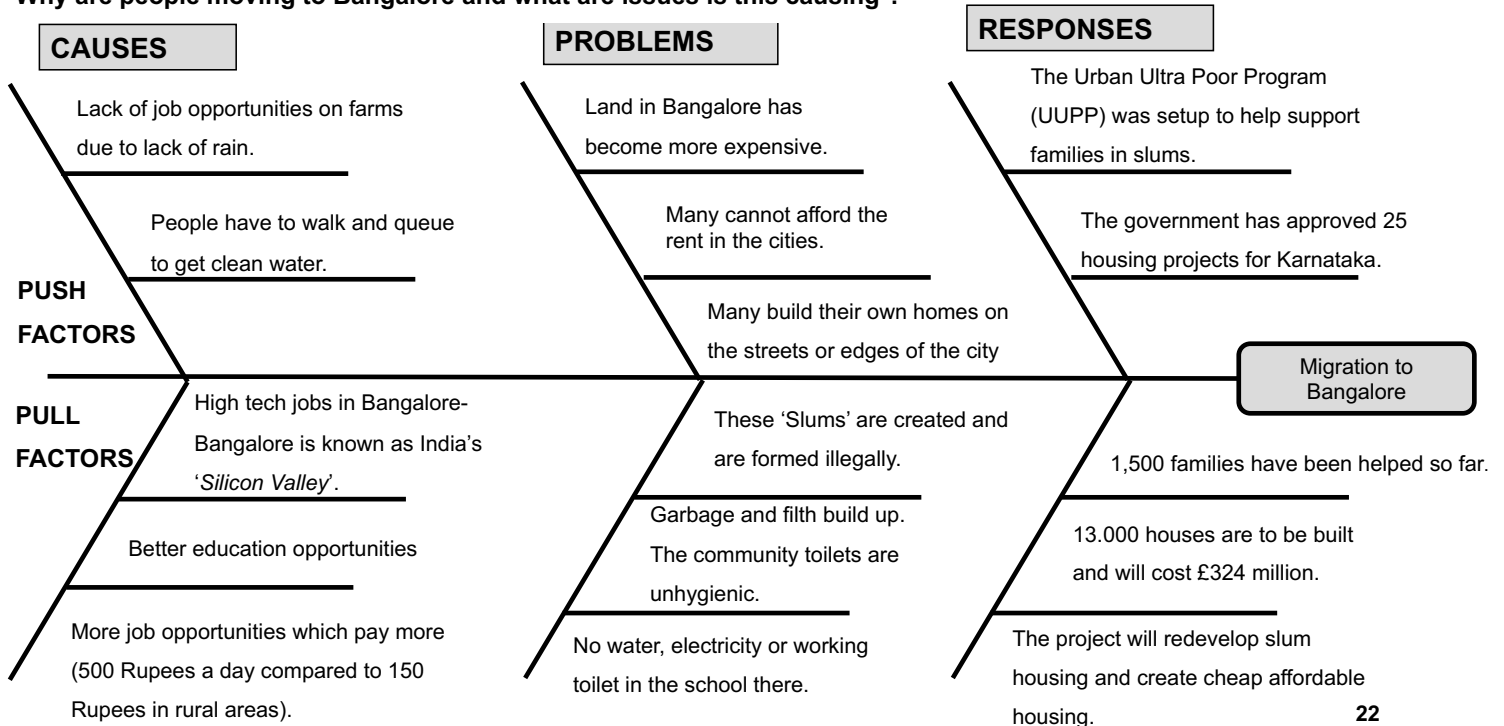
Cities with a population of over 1 million: Bangalore



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## Year 8 Geography Asia

### Why are people moving to Bangalore and what are issues is this causing ?



## Year 8 Geography Asia

### Reasons behind China's economic growth

Reason	Details
<b>Labour Supply</b>	China has the biggest population in the world.
<b>Large percentage of female workers</b>	Due to the one-child policy, women take less time off for maternity leave compared to other countries.
<b>Low wages</b>	Low wages increase the amount of profit companies can make.
<b>Natural resources</b>	12% of the world's mineral resources.
<b>Location</b>	Close to India, South Korea Japan, Russia and the Middle East to make trade links with.

Reason	Details
<b>Poverty reduction</b>	Since 1990, 439 million people have been lifted out of poverty.
<b>Investment in infrastructure</b>	The government has built many new roads, rail systems and made rivers navigable.
<b>Energy supply</b>	China is the largest producer and consumer of coal in the world.
<b>Political system and strong leadership</b>	The government controls the economy rather than private businesses and can plan for the long-term.

## Year 8 Geography Asia

### China's Belt and Road Initiative

#### Key facts:

Created by the Chinese government in 2013.

The aim is to create more trade links between China and other countries in Asia, Europe and Africa.

By 2017 over 100 countries and international organisations have supported the initiative.

Railways, roads, ports are being built to allow China to create new trading routes with countries.



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## Year 8 Geography Asia

### World trade

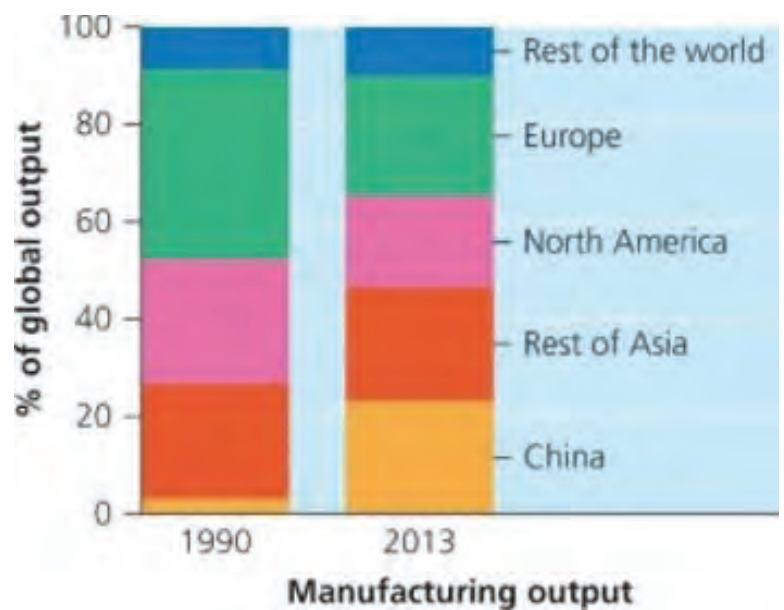
China and India now rank in the top ten countries for global wealth.

This economic growth has been called the '*Asian Miracle*'.

It is estimated that China's economy growth will overtake America's by the late 2020s.

By 2050 China's economy will be 50% bigger than America's.

Wages for factory workers average at \$27.50 per day compared to factory workers in Vietnam who average at \$6.70 per day.



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## Year 8 Geography Asia

### China's One-Child policy

#### Why was the policy introduced?

In 1970 China's population was over 800 million and it was growing too quickly causing overpopulation.

The population was holding China's economic development plans back.

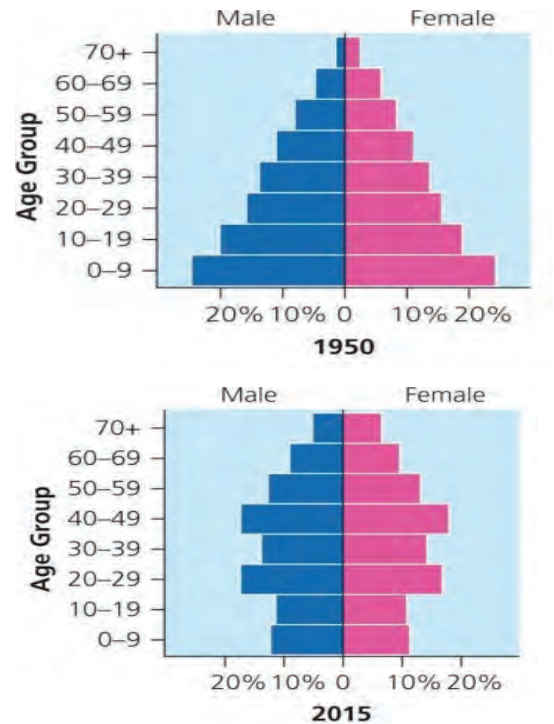
The population growth rate would have meant by 2020 the population would have doubled.

#### The policy:

In 1979 the One-Child Policy was introduced by the Chinese government.

Married couples who only had 1 child would get free education, better pensions, free childcare and benefits for their child.

If couples had more than 1 child they lost all these benefits.



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## Year 8 Geography Asia

### China's One-Child policy

#### Problems of the policy:

In 2012, there were 6.7 million forced abortions and more than 10 million a year previously.

There were millions of forced sterilisations.

Many mothers had abortions if they found out they were having a girl.

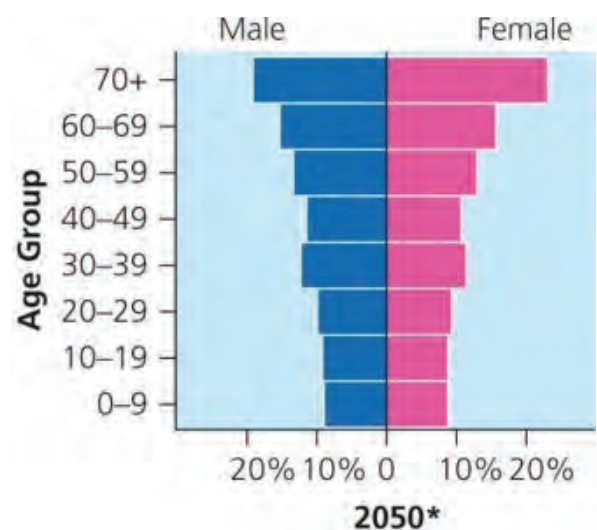
Women wanted their 'One Child' to be a boy.

The policy led to the population decreasing by 400 million.

There are now over 30 million more marriage-aged young men than women in China.

China now suffers from a rapidly ageing population.

The One-Child Policy was ended by the government in 2016.



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# The Middle East

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Year 8 Geography Middle East. Why is the Middle East an important world region?

Countries/States	Capitals
Turkey	Ankara
Syria	Damascus
Iraq	Baghdad
Iran	Tehran
Jordan	Amman
Cyprus	Nicosia
Lebanon	Beirut
Israel	Jerusalem
Egypt	Cairo
Oman	Muscat
Yemen	Sana'a
Saudi Arabia	Riyadh
UAE	Abu Dhabi
Bahrain	Manama
Kuwait	Kuwait City



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## Year 8 Geography Middle East

### Why is the Middle East an important world region?

#### Why is it important?

It is where the continents of Asia, Europe & Africa meet.

It can also be called Southwest Asia

Traders used this area to split India and the Far East

The term 'Middle East' describes neither geography nor culture.

It is important because it has oil

It has suffered from huge conflict

Key Term	Definition
<b>Crude oil</b>	Naturally occurring and unrefined petroleum that can be refined into petrol, diesel, gasoline, kerosene and other petrochemicals
<b>Diversifying</b>	The creation of a much wider variety of new business opportunities and jobs in a region
<b>Forced migration</b>	Movement of people away from their homes due to political conflict, natural disaster or environmental hazard.
<b>Mediterranean climate</b>	Region that experiences mild winters and warm summers
<b>Region</b>	An area within a country

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## Year 8 Geography Middle East

### The Physical Geography of the Middle East

#### Main physical zones

There are two zones

#### In the north it is mountainous:

Pontic & Taurus Mountains in Turkey

Zargros & Elburz Mountains in Iran

#### In the south it is desert:

Arabian Desert

Rub' Al Khali or Empty Quarter

#### River basins:

Nile

Euphrates

Tigris



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## Year 8 Geography Middle East

### How does plate movement affect the Middle East?

#### Tectonic Plate History:

The Arabian Plate was part of the African Plate about 500 million years ago.

They have been spreading apart since then

#### This spread has created:

Red Sea

The Gulf of Aden

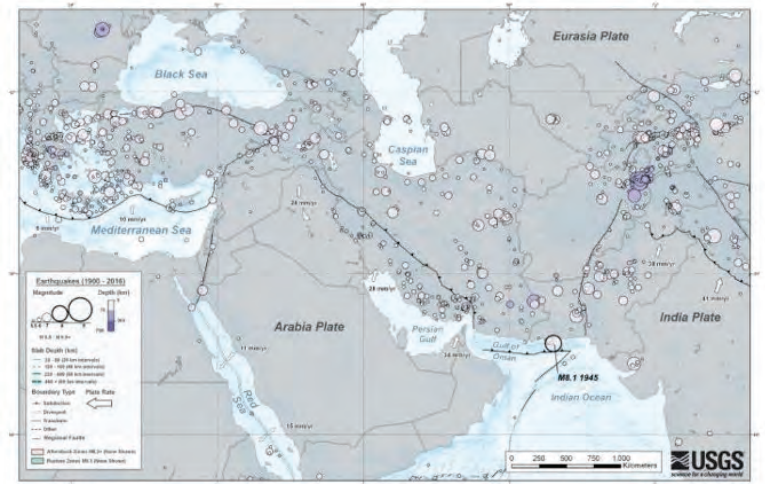
The Persian Gulf

#### Tectonic Plate Movement:

The Red Sea is lined with volcanoes

The Arabian Plate is moving northward by 3cm each year

It collides with the Eurasian Plate to make the mountains in the north (Pontic/Taurus/Zargroz/Elburz)



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## Year 8 Geography Middle East

### The climate of the Middle East

#### Climatic Zones

There are 2 zones: Desert & Mediterranean

#### The South

The Arabian Peninsula is mainly desert

Rain is light, only between May-Sept and sometimes not at all

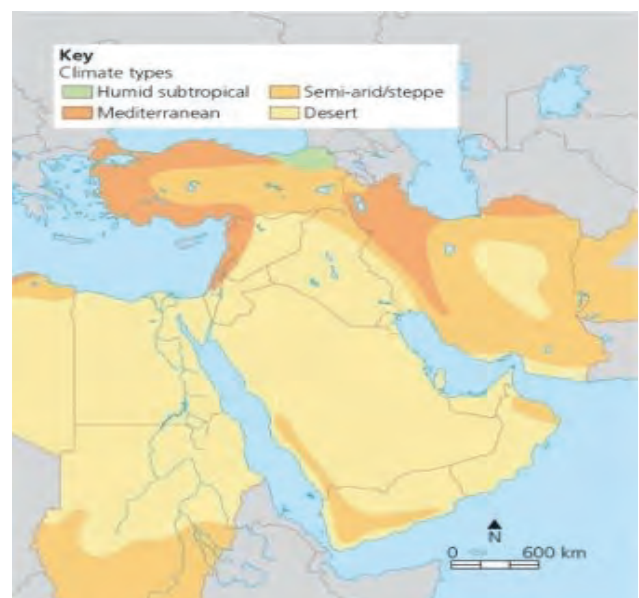
Daytime temperature in the desert can reach 52°C

At night the deserts can be cool or even cold

#### The North

The Mediterranean climate has 2 seasons – a hot summer and warm, wet winters

It is mainly arid (dry) causes water scarcity



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## Year 8 Geography Middle East

### The population of the Middle East

#### Population Density:

410 million people

Distribution is uneven and linked to the physical geography

Vast deserts are sparsely populated

The north and coasts are more densely populated

Egypt contains the most densely populated areas.

#### Why is it so diverse?

It is at a meeting point of trade routes for over 5,000 years

It connects Asia, Africa & Europe

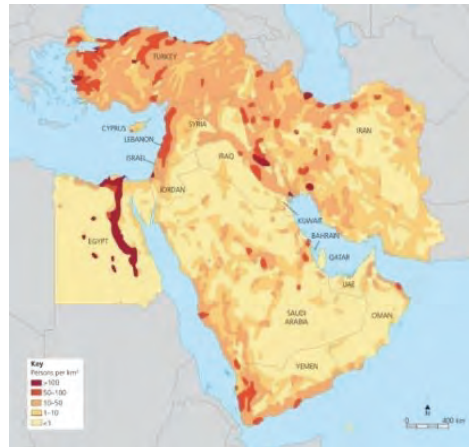
This results in a complicated mix of languages, customs & cultures

Most people speak Arabic, apart from in Turkey, Iran & Israel

The region is the birthplace for 3 main religions: Christianity, Judaism & Islam

Most people are Islamic

There are many ethnic groups, mostly Arab (apart from in Israel & Turkey)



Country	Population (millions in 2017)
Bahrain	1.5
Egypt	93.4
Iran	79.1
Iraq	39.2
Israel	8.3
Jordan	9.7
Kuwait	4.1
Lebanon	6.2
Oman	4.7
Qatar	2.7
Saudi Arabia	32.6
Syria	18.3
Turkey	80.9
UAE	9.4
Yemen	28.3

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## Year 8 Geography Middle East

### The economy of the Middle East

#### Crude Oil reserves in the region

It is the largest source of crude oil

The Arabian Plate holds 48% of the world's oil reserve % 43% of natural gas

Oil was discovered in 1908 in Persia (now Iran)

These discoveries were made just when the car was being invented & oil was the fuel

The rich countries (UK & USA) became very interested in the region

Oil has brought great wealth to the region

#### The importance of Oil

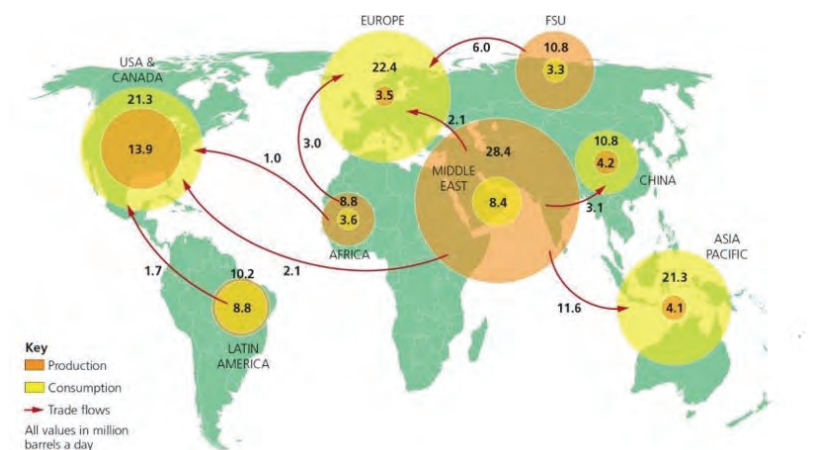
The discovery of oil has revolutionised the economy

The world is dependent on the Middle East for its oil

China imports 60% of its Crude oil to sustain its economic growth – 50% of this is from the Middle East

Their economy is dependent on one produce – Oil

They lack the range found in other economies like the UK & USA



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## Year 8 Geography Middle East

### The development of the UAE

#### How has the UAE developed?

Formed in 1971

Made of 7 emirates

Abu Dhabi is the largest emirate, covering 85% of the country

Dubai is the most populated, 35% of population

Oil reserves are 7<sup>th</sup> largest in the world

Gas reserves are 17<sup>th</sup> largest in the world

Second largest economy in the Middle East

Since 1971, the economy has grown 231 times.

In 2011 it was ranked 30<sup>th</sup> on the Human Development Index of 187 countries

#### Diversification

It has a strong government

It has reduced the dependence on oil by diversifying

Dubai has become a world communication hub & tourist destination

Dubai is the 5<sup>th</sup> largest tourist destination in the world.

#### How is the population changing?

The country had one of the largest migrant male workforce in the world

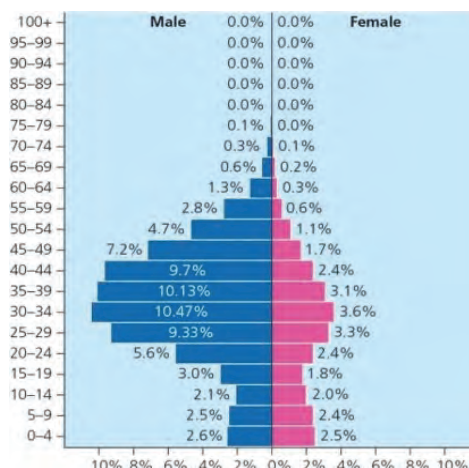
Only 1.4 million people are actually from the UAE

The distorts the population structure of the country

Immigrants make up 90% of the workforce

Most come from Bangladesh, Pakistan & the Philippines

In 2012, 240,000 migrants were from Britain.



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## Year 8 Geography Middle East

### The development of Yemen – Part 1

#### How has Yemen developed?

It is the poorest country in the Middle East

It is a country of great beauty & heritage

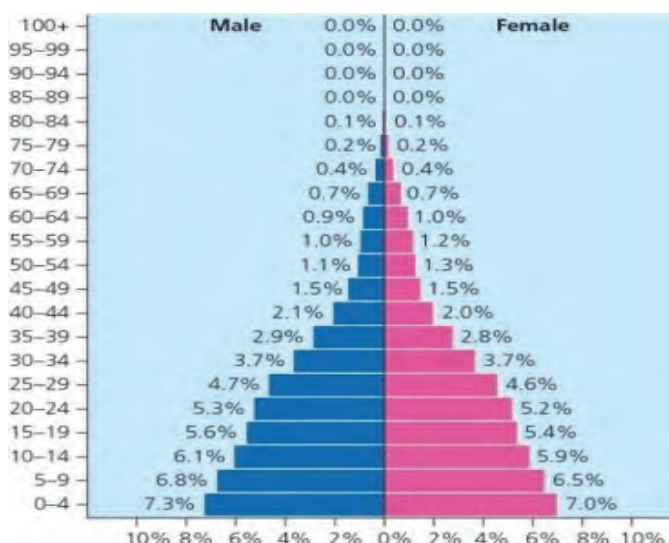
It has 4 UNESCO World Heritage Sites

It's population is 25.4 million

54% of people live in poverty, living on less than \$2 a day

45% of the population is malnourished

There was a Civil War in 2017: this created a humanitarian crisis



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## Year 8 Geography Middle East

### The development of Yemen - Part 2

Yemen economic report	
<b>Conflict</b>	Until 1990 it was 2 countries: north & south Civil War has drained its oil reserves Wealth has been used on military spending
<b>Imports/exports</b>	No products are exported Most food is imported Economy is reliant on oil exports & foreign aid Every family had at least one member working in Saudi Arabia, but when Yemen declared itself neutral during the Gulf War led to them being expelled and losing income
<b>Governments</b>	Corruption has mispent the nations wealth Oil pipelines have been destroyed by enemies of Yemen's former president.
<b>Wealth from Oil</b>	In 2005, oil accounted for 65% of wealth & 86% of exports Oil is running out and gas has been found, but not developed due to war

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## Year 8 Geography Middle East

### The development of Yemen - Part 2

Yemen economic report	
<b>Infrastructure</b>	There are no railways. People cannot access basic services
<b>Population</b>	Due to double in next 20 years to 40 million It should reach 60 million in 30 years 2/3 of people are under 24 – 60% of these are unemployed
<b>Gender Equality</b>	Worst country in the world Girls taken out of school to marry or care for family 49% of women are illiterate
<b>Water</b>	7 <sup>th</sup> water stressed country in the world Due to mismanagement of supplies Water in the capital Sana'a is only available once every 4 days
<b>Tourism</b>	It has potential – it is beautiful It cannot be visited until it sorts its security crisis & wars

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## Year 8 Geography Middle East

### Conflict in the Middle East

#### Why is there ongoing conflict in the Middle East?

**Borders** Regional borders, set by Britain & France when they colonised the region has led to many displaced people  
The Kurds have no state of their own – they are in 5 different states  
Israel was made in 1948 as a Jewish homeland  
This led to the division of Palestine and conflict between Jews and Muslims

**The Arab Spring** In 2011 protesters rebelled in Tunisia & Egypt  
Unemployment, corruption & rising prices were common  
This led to change in governments in both countries  
More protests started in Yemen, Bahrain, Libya & Syria – but these met with violence and failed  
The ongoing wars in Yemen & Syria are results.

#### Why is there ongoing conflict in the Middle East?

**Oil** Foreign nations (USA) interfere in local politics because they are concerned about oil supply  
This has contributed to terrorist atrocities around the world

**Religion** Shia Muslims and Sunni Muslims fight  
Shia Muslims control Iran & Sunni control Saudi Arabia  
Muslims on both sides look to these countries for religious & political support  
Since the Iraq War in 2003 tension has become worse

**The Iraq War** The balance of power shifted in 2003 with the defeat of Saddam Hussein in Iraq  
Shia Muslims took over Iraq  
This has created two large Shiite States (Iran & Iraq)  
This has increased tension with the Sunni Saudi Arabia

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## Year 8 Geography Middle East

### Conflict in Syria – Causes & events

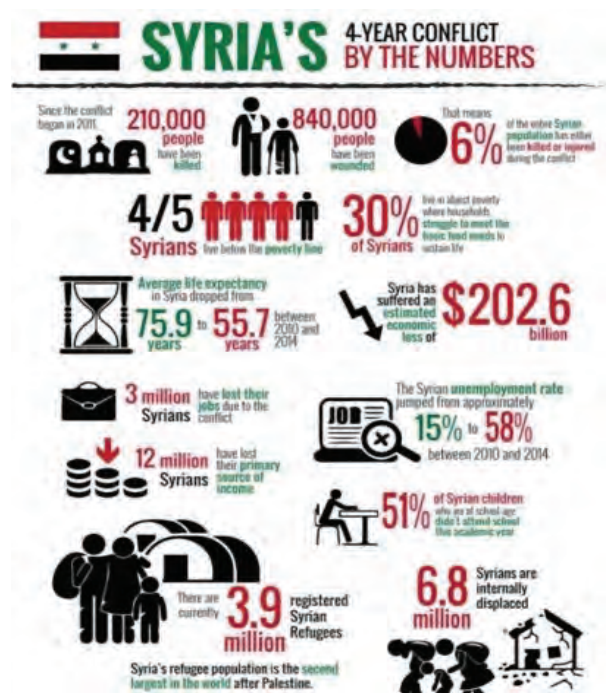
#### How did the conflict in Syria start?

**Background** Syria borders Turkey, Iraq, Jordan, Israel & Lebanon  
It has 23 million people  
Until 2011 it was strong and stable  
People complaint about lack of freedom & corruption  
The al-Assad family have held power since 1971

**Conflict** Inspired by the Arab Spring, demonstrations began in March 2011  
This unrest was met with force by the government  
Protesters armed themselves  
The country has been in civil war ever since

**International Involvement** Other countries have made the situation worse  
Iran, Russia, Saudi Arabia & USA have all provided military, financial and political support

**Religion** The governments Shia minority is fighting the Sunni majority  
Each side is backed by Iran (Shia) and Saudi Arabia (Sunni)



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## Year 8 Geography Middle East

### Conflict in Syria - Impact

#### Why did people start to leave Syria?

People left in mass numbers

This is forced migration

11.5% of population have been killed or injured in the war

Children have experience relentless violence & brutality

People initially fled to Turkey, Jordan & Lebanon

There are now 5 million Syrian refugees

Host countries must find shelter, food, work & serviced = expensive

It is very difficult to adapt to a new culture, language & way of life

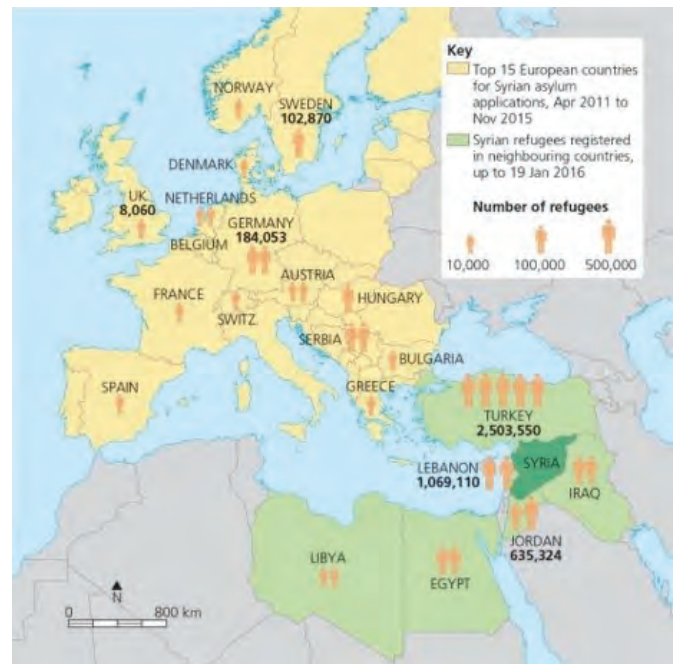
Many refugees thought their life in refugee camps would be short

term

Many Syrians have given up on the idea of going home

Many make difficult & dangerous journeys into Europe to have a

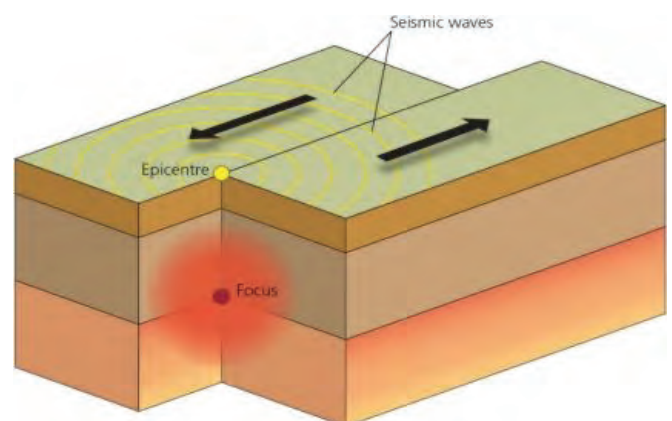
better life



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## Year 8 Geography Middle East. How does an earthquake occur?

Keyword	Definition
<b>Focus</b>	The location under the Earth's surface where the earthquake starts.
<b>Epicentre</b>	The area on the surface directly above the focus.
<b>Tectonic plates</b>	Pieces of Earth's crust and uppermost mantle
<b>Fault line</b>	A break in the earth's surface where two tectonic plates move.
<b>Seismic waves</b>	Waves of energy caused by the sudden movement of the plates.
<b>Conservative plate boundary</b>	Where two tectonic plates move past each other slowly and get stuck which builds up pressure.
<b>GNI per capita</b>	Gross National Income per person, a measure of a country's wealth



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## What caused the Haiti Earthquake?

Key Terminology	
Richter Scale	a measure of the energy released in an earthquake

Haiti lies on a conservative boundary.

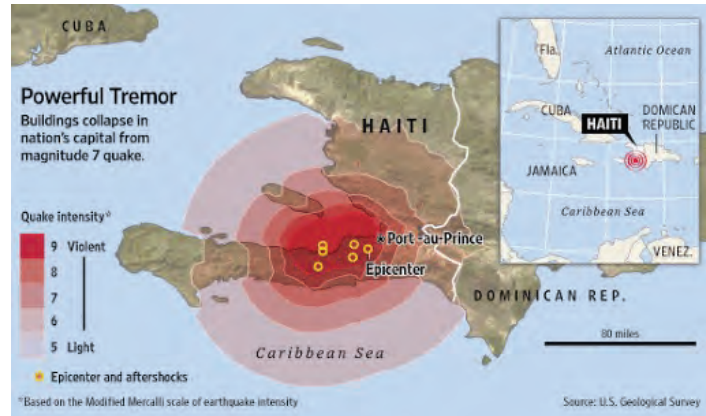
The epicentre was close to the capital Port Au Prince

The earthquake was a 7 on the Richter scale

Haiti is an LIC

Buildings are poorly constructed

There is little technology to predict an earthquake



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## What were the effects of the Haiti earthquake?



### Social Effects

- 3 million people affected.
- Over 220,000 deaths.
- 300,000 injured.
- 1.3 million made homeless.
- Several hospitals collapsed.



### Economic Effects

- 30,000 commercial buildings collapsed.
- Businesses destroyed.
- Damage to the main clothing industry.
- Airport and port damaged.



### Environmental Effects

- Haiti was unable to dispose of the bodies and this led to the spread of disease.
- Building, dust and debris remained for months after.

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## What were the responses of the Haiti earthquake?

### Short Term Responses

Dominican Republic provided **emergency water** and **medical supplies** as well as heavy machinery to help with search and rescue.

Most people were left to dig through the rubble by hand.

Emergency **rescue teams** arrived from a number of countries.

Medical teams began treating the injured - **temporary field hospitals** were set up by organisations like the Red Cross.

People from around the world **pledged money** over their mobile phones.

United Nations troops and police were sent to help distribute **aid** and keep order.

Key Terminology	
<b>Short term responses</b>	reactions immediately after the earthquake. Usually concerning survival.
<b>Long term responses</b>	reaction in the months following the earthquake. Usually concerning repair and rebuilding.

### Long Term Responses

Money was pledged by organisations and governments to assist in rebuilding, but only slow progress had been made after one year.

After one year, there were still 1,300 camps.

'Cash for work' programs are paying Haitians to clear rubble.

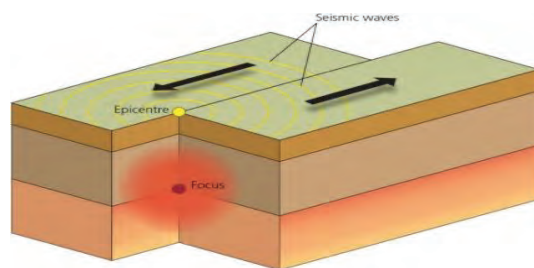
Small farmers are being supported - so crops can be grown.

Schools are being rebuilt.

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## Year 8 Geography Middle East : What were the causes of the Turkey / Syria Earthquake 2023

- The North and East Anatolian faults are a conservative boundary where two plates move sideways past each other.
- Friction prevents this, so pressure builds up until the plates move suddenly, releasing energy and causing earthquakes. These are often shallow, which makes them dangerous.
- Syria is on the Arabian Plate, moving north at 15mm per year towards the huge Eurasian Plate.
- This squeezes the small Anatolian Plate westwards at about 20mm per year. Here most of Turkey sits.
- The North and East Anatolian faults mark the boundaries between these plates and the location of many earthquakes.
- The African plate, moving north-east at about 20mm per year.



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## Year 8 Geography Middle East : What were the effects and responses to the Turkey / Syria Earthquake 2023

### Effects

On Monday 6 February at 4.17 a.m. local time, a 7.8 magnitude earthquake struck southern Türkiye (Turkey) and Syria. Later that day, two further large earthquakes (6.5 and 7.5) and a series of aftershocks hit the region.

Then two weeks later, a 6.4 magnitude earthquake struck near Antakya in Türkiye – an area already severely affected by the first earthquakes.

More than 51,000 people have died in these disasters, with thousands more injured. Around 26 million people are currently in need of our help.

Close to 26 million people in Turkey and Syria have been impacted by the disaster, with over 55,000 dead and nearly 130,000 injured. Millions have been displaced from their homes, with over 10 million in need of urgent aid.

### Responses

Immediately after the earthquake local people began to search for survivors in the rubble

250,000 volunteers from the rest of Turkey headed there.

After a day or two international rescue teams began to arrive.

Aid (such as shelter and food) began to arrive from Turkey and overseas. It was more difficult for rescue and aid to reach victims in Syria

Nine days later the last survivors were being pulled out

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## Year 8 Geography Middle East : Why was the earthquake so deadly ?

World-wide 500,000 earthquakes occur a year, 10–15 are over magnitude 7.0. Some cause more damage than others, it depends on:

**Type of earthquake:** its strength, depth, aftershocks

**Location:** population density (e.g. low in rural and high in urban areas)

**Timing:** earthquakes that occur at night often kill more people

**Communications:** how easily relief can reach the earthquake zone

**Construction:** how well buildings can withstand earthquakes

**Preparation:** emergency planning and education.

Turkey is a middle income country (with mostly good infrastructure

In 2011, Syria was a middle income country, since then civil war has shattered its people, economy and infrastructure. By 2021, it was a low income country and less able to respond to the earthquake.

Millions of war refugees live in both countries.

2021	Turkey	Syria
GNI per capita	US\$9900	US\$760
Human Development Index	0.838	0.577
Population	85 million	21 million

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# Africa

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## Year 8 Geography Africa

### Key Terms

Key Term	Definition
<b>Aid</b>	Help given to a country in the form of money, supplies, services or technology. Can be short-term emergency aid or long-term development aid
<b>Biome</b>	An ecosystem that covers a really large area
<b>Climate</b>	The average weather conditions over a long period of time (30 years)
<b>Climate Change</b>	A change in global or regional climate patterns
<b>Colonisation</b>	The action of settling among and establishing control over the indigenous people of an area
<b>Desertification</b>	The process of fertile land becoming a desert.
<b>Development</b>	The process of a place developing through improved social, environmental, economic and political factors
<b>Drought</b>	A prolonged period of no rainfall.

Key Term	Definition
<b>Ethnic Group</b>	A community made up of people who share a common cultural background or descent
<b>Exploitation</b>	The action of treating a person or a place unfairly in order to benefit from it
<b>Human Development Index (HDI)</b>	A compound development indicator that includes: GDP, literacy rate and life expectancy
<b>Imperialism</b>	An ideology of extending a country's rule over another, often through military force or by gaining political or economic control of that place
<b>Infrastructure</b>	The systems, services and facilities serving a given place (e.g. buildings, transport links, power supply)
<b>Migrate</b>	The movement of people from one place to another
<b>Resource</b>	A supply of 'goods' that can be used by a person, city or entire country
<b>Slum</b>	Informal housing that is illegal and poorly built
<b>Urbanisation</b>	The process of making an area more urban (e.g. a town or a city)

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## Year 8 Geography Africa

### The Climate and Biomes

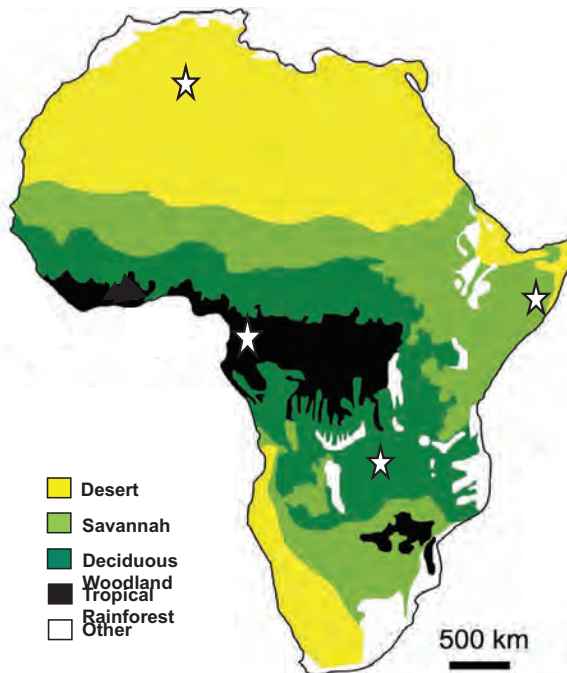
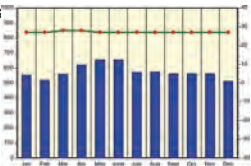
#### Algeria (Desert):

Very hot daytime temperatures (30° - 45°)  
 Very cold night time temperatures (0° or less)  
 Very little/no rainfall  
 Plants and animals adapted to survive in extreme heat and dry conditions



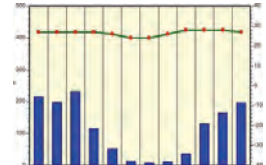
#### Cameroon (Tropical Rainforest):

High levels of rainfall (over 1000cm per year)  
 Hot temperature (26° all year round)  
 Very high biodiversity of plants, animals and insects  
 Large amount of trees = removes CO2 from air and releases oxygen



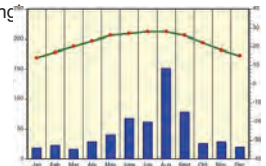
#### Somalia (Savannah):

2 distinct seasons – very wet and very dry season  
 Mostly made up of grass but there are some trees (acacia trees)  
 More than 50% of Africa is considered savannah  
 High biodiversity of animals



#### Zambia (Deciduous Woodland):

Has all 4 seasons (summer, autumn, winter, spring)  
 Trees in this biome lose leaves in the autumn/winter  
 Temperatures here are not extreme  
 Plants and animals have adapted to cope with the ever changing climate



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## Year 8 Geography Africa

### The Physical Landscape

Feature	Description
<b>A. Atlas Mountains</b>	Extend for 1550 miles across North-Western Africa Home to the Berber people (original inhabitants) There are 4 distinct regions of this mountain range Anti-Atlas region is thought to have formed due to the collision of the African and North American Plate millions of years ago
<b>B. Sahara Desert</b>	The world largest hot desert (covers 3.3 millions square miles) Makes up 25% of the continent The desert consists of sand/gravel plains, sand dunes, elevated rocky plateaus and oases
<b>C. River Nile</b>	World's longest river = 4132 miles Lake Victoria (2 <sup>nd</sup> largest freshwater lake in the world) is the Nile's chief source North flowing river, mouth of river meets Mediterranean Sea

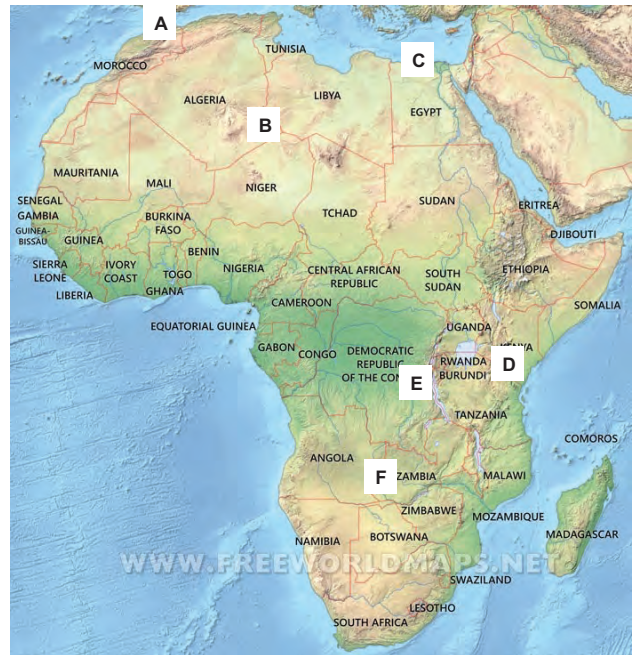


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## Year 8 Geography Africa

### The Physical Landscape

Feature	Description
<b>D. Mt Kilimanjaro</b>	Highest mountain in Africa = 5895m Located in Mt Kilimanjaro National Park, Tanzania Kilimanjaro is a dormant volcano (last erupted 360,00 years ago)
<b>E. Great Rift Valley</b>	Formed at a constructive plate boundary (plates moving apart) Length approx. 4000 miles and average width of 35 miles Surrounded by The Great Lakes (some of the worlds largest and deepest lakes)
<b>F. Victoria Falls</b>	Located along the Zambezi River Natural border between Zambia and Zimbabwe 1700m wide and 108m in height World Heritage Site since 1989



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## Year 8 Geography Africa

### Erosion Key Terms

#### Hydraulic action

Air becomes trapped in cracks in the rocks. This trapped air is compressed and breaks the rocks apart causing erosion.



#### Abrasion

Rock and sand grind along the river bed, wearing away at the rocks surface like sandpaper.



#### Weathering

The breaking down of rocks at Earth's surface

#### Erosion

The wearing away of rocks and their transportation elsewhere

#### Attrition

Rocks and pebbles suspended in the river crash into each other, and they break down, becoming smaller and smoother.



#### Solution

Acids contained in river water will dissolve some types of rock such as chalk or limestone.

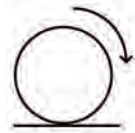


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**Year 8 Geography Africa**  
**Transportation Key Terms**

**Traction**

Large pebbles and boulders are rolled along the riverbed.



**Saltation**

Beach material is bounced along the riverbed



**Transportation**

The movement of material/ sediment in the river channel.

**Deposition**

The dropping of a rivers loads due to it losing velocity (speed)

**Suspension**

River material is suspended and carried by the flowing water

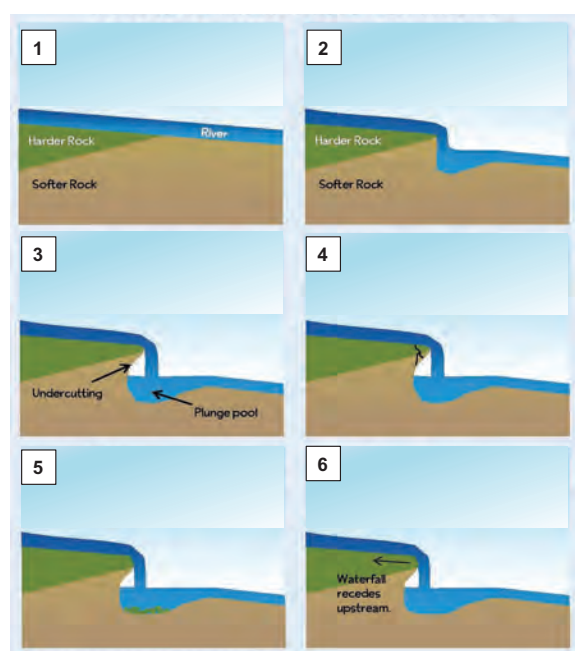
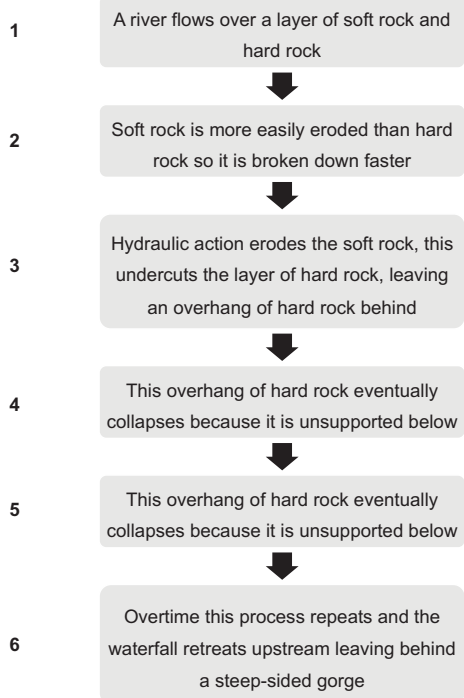


**Solution**

Material is dissolved and carried by the flowing river water



**Year 8 Geography Africa**  
**Hydrology: Waterfall & Steep-sided Gorge Formation:**



## Year 8 Geography Africa

### Hydrology: Interlocking Spurs

In the upper course there is more **vertical erosion**. The river cuts down into the valley



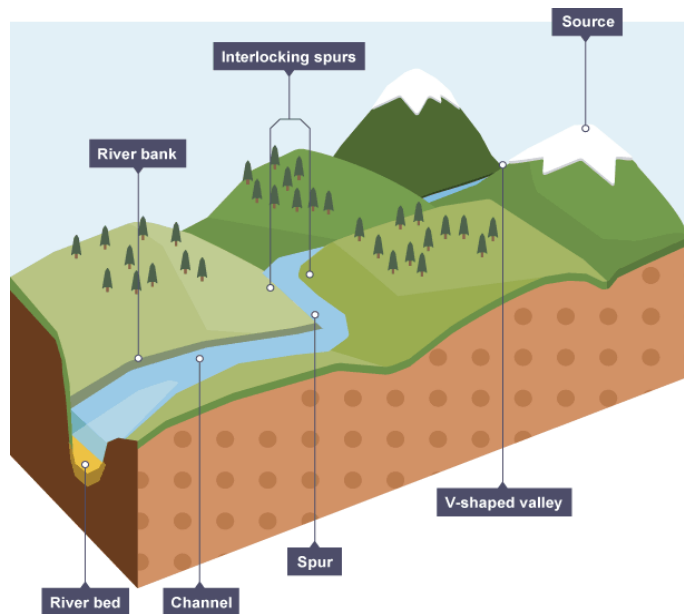
If there are areas of hard rock which are more difficult to erode, the river will bend around it



These outcrops of hard rock are called **spurs**



**Interlocking spurs** of land link together like the teeth of a zip and are formed by the river bending round multiple spurs



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## Year 8 Geography Africa

### Natural Resources

30% of all of the world's minerals are found in Africa, making it the richest continent in the world, in terms of its natural resources.

However, the natural resources are not evenly distributed across the continent; and the continent has been massively exploited for its natural and mineral resources.

It exports **16%** of the world's **uranium** (used to produce nuclear energy)

Africa produces **55%** of the world's **diamonds** (led by Congo and Botswana)

Produces **75%** of the world's **platinum** (precious metal)

It exports **58%** of the world's **cobalt** (found in every mobile phone)

Has **10%** of the world's **oil and gas** reserves (Nigeria and Libya are two of the world's leading oil producing countries)

**22%** of the world's total production of **gold** (483 tons)

Africa is rich in rainforests, a source of valuable **hardwoods**



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## Year 8 Geography Africa

### Desertification in the Sahel (1)

**Location:** The Sahel, Southern border of the Sahara Desert

**Distance:** 3670 miles, from Senegal (West) to Eritrea (East)

**The Problem:** The Sahel is vulnerable to drought which has lead to frequent famine and the death of millions of inhabitants. Prolonged drought and strain on the land are causing the Sahara Desert to spread southwards, a process known as desertification.

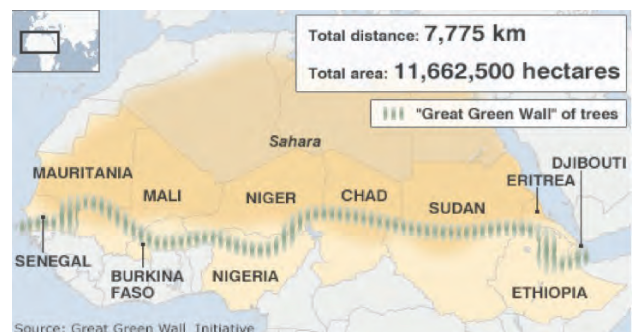
Key Term	Definition
<b>Drought</b>	A prolonged period of no rainfall.
<b>Desertification</b>	The process of fertile land becoming a desert.
<b>Famine</b>	Extreme shortage of food leading to widespread starvation
<b>Irrigate</b>	To supply water to land or crops to help growth.
<b>Soil Erosion</b>	The removal of the upper layer of soil, resulting in loss of soil nutrients.
<b>Vegetation</b>	A collective of plants found in a given area.

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## Year 8 Geography Africa

### Desertification in the Sahel (2)

<b>Causes of Desertification</b>	Overgrazing AND over-farming Deforestation Climate change (erratic rainfall and drought) Population growth (more pressure to grow more crops)
<b>Effects of Desertification</b>	Soil becomes less usable (nutrients lost) Vegetation damaged or lost (soil erosion occurs) Food loss leading to famine Fewer plant and animal species
<b>Responses to Desertification</b>	Afforestation (Great Green Wall from Senegal to Djibouti) Terracing // use 'Magic Stones' Irrigation (water the land AND drip irrigation) Responsible farming (drought resistant crops)



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## Year 8 Geography Africa

### Consequences of the Past

The history of European exploitation of Africa still influences the geography of the continent today.

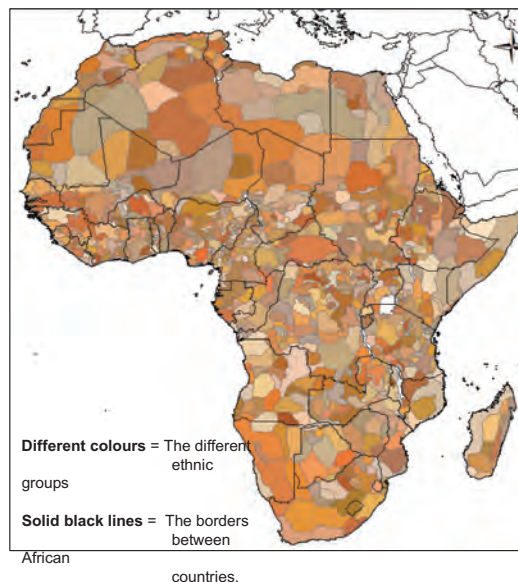
Before 1860, Africa had a rich history and culture. It was divided into thousands of small areas/kingdoms, based on different ethnic groups, language and culture (see map).

#### The Slave Trade:

Between 1600's and 1800's approx. **15 million** Africans were sold into slavery  
West Africans were bought in exchange for goods

#### The Legacy of Colonialism:

African countries began gaining **independence** in the **1960's**  
The borders created during the Berlin Conference frequently lead to **war** and ethnic **conflict**  
African countries remain locked into **old colonial trade**; selling **natural resources** to the world market



#### The Scramble for Africa:

During European Industrial Revolution nations wanted to exploit Africa's natural resources  
To prevent war between European countries, the **1884 Berlin Conference** divided Africa amongst **14** European countries

#### The Belgian Congo:

**King Leopold II of Belgium** controlled a region of rainforest in the Congo Basin  
He cruelly forced locals to collect **rubber** from rubber trees  
Approx. **10 million** Congolese people died due to the abuse

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## Year 8 Geography Africa

### Development (1)

Indicator	Description	Social, Environmental & Economic
<b>Birth Rate</b>	Total number of births per 1000 of the population	<b>Social</b>
<b>Death Rate</b>	Total number of deaths per 1000 of the population	<b>Social</b>
<b>Life Expectancy</b>	The total number of years a person is expected to live	<b>Social</b>
<b>Infant Mortality</b>	The total number of infants dying before reaching one year old, per 1000 live births	<b>Social</b>
<b>Maternal Mortality</b>	The total number of women dying during pregnancy or child birth, per 100,000 of the population	<b>Social</b>
<b>Access to safe drinking water</b>	The percentage of the total population who have a source of safe water within 1km of their dwelling	<b>Environmental</b>
<b>Gross National Income (GNI)</b>	The total amount of money earned by a nation's people and businesses	<b>Economic</b>
<b>Gross Domestic Product (GDP)</b>	The amount of money a country makes from its products per year	<b>Economic</b>
<b>Purchasing Power Parity (PPP)</b>	Compares different countries currencies through contrasting a specific product/good	<b>Economic</b>
<b>Literacy Rate</b>	The percentage of the total population who can read and write	<b>Social</b>

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## Year 8 Geography Africa

### Development (2)

**Location-** For landlocked countries without a coast, trade can be more difficult

**Climate-** Extreme climates can make growing crops difficult, which makes food supplies unreliable

**Natural Disasters-** Frequent natural disasters means a country spends more time rebuilding than developing

**Education-** A lack of education results in a shortage of people being able to carry out high paying skilled jobs

**Equality-** When women have fewer rights than men; a country is not fully utilising its entire workforce

**War-** War-torn countries services are continually disrupted, buildings and infrastructure is damaged and people are killed

**Politics-** Unstable or corrupt governments make poor political decisions that keep countries in poverty

### Human Development Index (HDI)

A compound development indicator that considers: GDP, life expectancy and literacy rate

By having three indicators in one, the method becomes more reliable at accurately measuring development

HDI could be improved by including an environmental indicator

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## Year 8 Geography Africa

### Population Change (1)

Key Term	Definition
<b>Population</b>	All the inhabitants of a particular place
<b>Population Density</b>	The number of people living in one kilometre square
<b>Population Distribution</b>	Is the spread and pattern of people in a given area
<b>Sparsely Populated</b>	Few people living in a given area
<b>Densely Populated</b>	A large number of people living in a given area
<b>Young Dependent</b>	Individuals under the age of 16 years
<b>Old Dependent</b>	Individuals over the age of 65 years

Africa's population is approx. 1.3 billion people

Africa's population is equivalent to 16.7% of the world's total population

The population in Africa is not equally distributed

Africa's population is increasing and is expected to reach 2.4 billion people by the year 2050

Africa has the youngest population in the world, with 60% of the population below 25 years old

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## Year 8 Geography Africa

### Population Change (2)



#### Opportunities of Population Change: ✓

Improvements in public health have decreased infant and child mortality rates

Overall life expectancy has risen, though there are variations between different countries (average African life expectancy now = 62 years)

Young population means a large workforce

African workforce will be cheap so Multi-National Companies looking for cheap labour will move their factories to Africa

**Africa:**  
Population  
Change

#### Challenges of Population Change: ✗

33 of the UN's list of least developed countries are in Africa

Increased population growth will make it harder for governments to reduce extreme poverty and hunger

Increased population growth will make it harder for governments to improve health and education systems

African birth rate remains high (4.7 children per woman)

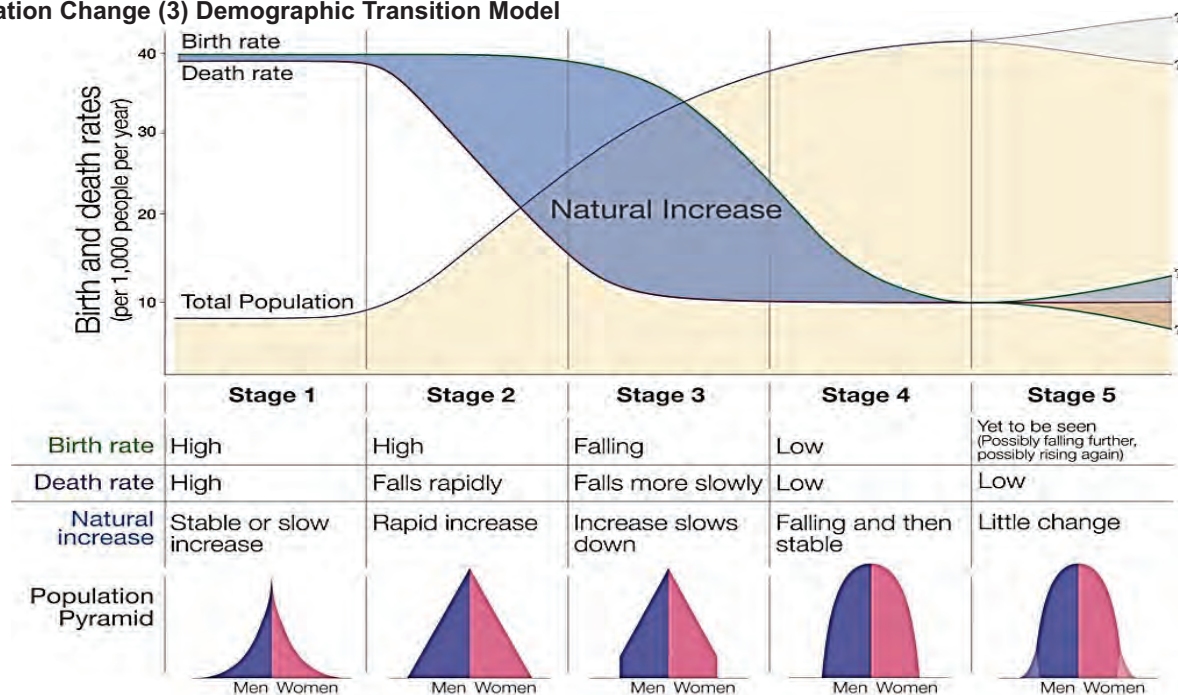
Young population is frustrated by: lack of jobs and corrupt governments

This frustration leads to young people migrating or seeking answers from extremist/ terrorist groups

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## Year 8 Geography Africa

### Population Change (3) Demographic Transition Model



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## Year 8 Geography Africa

### Urbanisation

Africa has the highest rate of urbanisation in the world

There are 48 African cities with over 1 million inhabitants living there

The growth of cities can lead to economic growth, transformation and poverty reduction

However, growth of cities can also lead to increased inequality, urban poverty and an increase in slum living

#### Urbanisation in Ethiopia:

Ethiopia has the 2<sup>nd</sup> largest population in Africa (over 100 million)

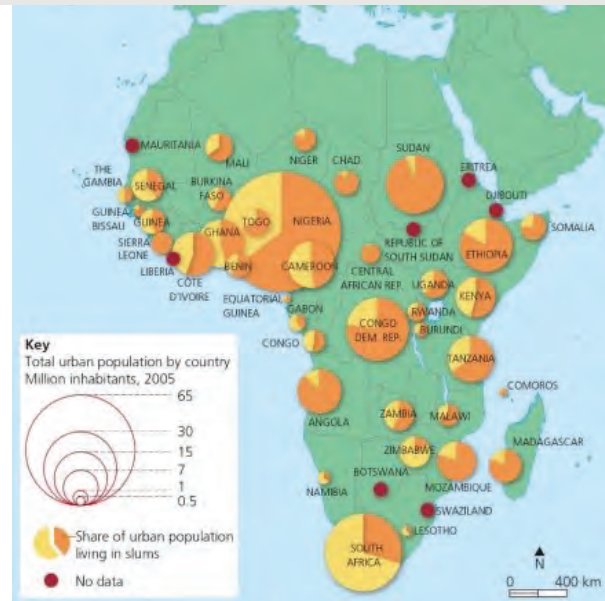
80% of Ethiopia's population is still rural (countryside) but urbanisation is accelerating fast

Of the urban population, 83% of people live in slum housing

Slum housing is informal housing that is often built poorly and illegally

Life in slums is tough: **poor sanitation** and **healthcare**, **limited** access to clean **water**, **rubbish piles up** as there is no organised refuse collection and often there are high levels of **violence and crime**

**Urbanisation** – The process of making an area more urban (built up e.g. a city)



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## Year 8 Geography Africa

### Improving Development

**Giving Aid-** Aid is the giving of goods, services and/or money from one country to another.

It can be short-term emergency aid or long-term development aid.

**Improving Trade Links-** It allows for easier and cheaper trade between different countries. There will be lower tariffs placed on goods from certain countries.

**Multi-National Companies-** Large international companies (e.g. Nike and Coca-Cola) will manufacture goods in developing countries and sell their products in developed countries.

**Promoting Education-** Placing a high value on education and making school attendance compulsory for all children. Encouraging more people to attend university

**Improving Political Stability-** Ensure that law and order are maintained. Introduce a government without corruption and ensure that democracy is achieved.

**Promoting Equal Rights-** Improve the social standing of women, those with a disability and others from minority groups.

#### China: Helping Africa to Develop

Financial support from China has helped the economy of African countries like Ethiopia develop quickly

African leaders view the growing relationship between their nations and China as an engine for economic growth

China funded a new 460 mile long railway line between landlocked Ethiopia and Djibouti on the East coast of Africa

China is spending billions of dollars a year funding the building of infrastructure and transport links in Africa

#### Trade between China and Africa

In 2009, China became Africa's largest trade partner

15% of Africa's exports (mainly natural resources) go to China

China provides 21% of Africa's imports, including: machinery, transportation, communication equipment and manufactured goods

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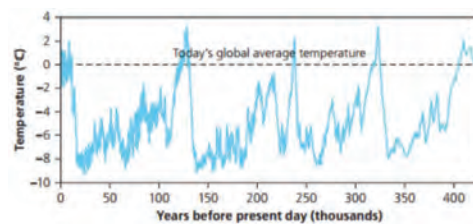
# Climate Change

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## Climate Change and Global Warming

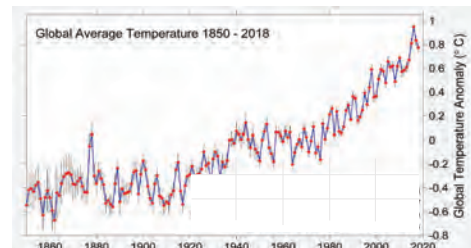
Key Term	Definition
<b>Climate</b>	The average weather conditions over a long period of time
<b>Climate Change</b>	A change in global or regional climate patterns
<b>Atmosphere</b>	The layer of gases that surrounds the earth
<b>Global Warming</b>	The gradual increase in the overall temperature of the earth's atmosphere
<b>Fossil Fuels</b>	A natural fuel such as coal or gas formed from the remains of organisms that lived long ago
<b>Greenhouse Gases</b>	Gases in the air that trap energy from the sun e.g. carbon dioxide, methane and nitrous oxide
<b>Greenhouse Effect</b>	Warming of the earth caused by the trapping of the sun's energy by greenhouse gases
<b>Quaternary Period</b>	The period of geological time from about 2.6 million years ago to the present day

## Long Term Climate Change



- Temperatures have fluctuated (gone up and down) during this time.
- It shows glacial periods (lows) and inter-glacial periods (peaks).

## Recent Global Warming



- Since 1860 the global temperature has increased rapidly
- The 20 warmest years on record have all come since 1995

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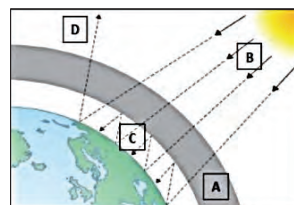
## GCSE: Causes of Climate Change

### Natural Causes of Climate Change

<b>Solar Output</b>	<ul style="list-style-type: none"> <li>Sunspots are dark patches that appear on the surface of the sun</li> <li>The more sunspots the greater the sun's energy (warmer)</li> <li>The number of sunspots increase and decrease over a 11 year period</li> </ul>
<b>Orbital Change</b>	<ul style="list-style-type: none"> <li>This is how the earth moves round the sun.</li> <li>It affects how close the earth is to the sun and therefore how much energy we get from the sun.</li> <li>When the earth is very close to the sun, it is warmer.</li> <li>When the earth is further away from the sun, it is cooler.</li> </ul>
<b>Volcanic Activity</b>	<ul style="list-style-type: none"> <li>The ash and sulphur dioxide gas produced in large eruptions spreads around the world creating a blanket of ash</li> <li>This blanket of ash and gas will stop solar energy (sunlight) reaching the Earth</li> <li>Sunlight bounces off the sulphur and gas and is reflected back into space, cooling the planet and lowering the temperature</li> </ul>

### Human Causes of Climate Change

- The greenhouse effect is a naturally occurring process
- However, human activity is causing more greenhouse gases to be produced
- This increase in greenhouse gases has caused a rapid increase in global temperature



- A. Humans produce greenhouse gases (CO<sub>2</sub>, methane, nitrous oxide) which create a blanket around the earth
- B. Sunlight travels to earth as shortwave radiation
- C. Sunlight is reflected off the Earth's surface as long-wave radiation. Some of this reflected sunlight is trapped in the Earth's atmosphere by the greenhouse gases = **Earth heats up**
- D. Some heat does manage to escape

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## GCSE: Effects of Climate Change

### Social, Environmental and Economic Impacts of Climate Change

Social Effects	Environmental Effects	Economic Effects
<ul style="list-style-type: none"> <li>Diseases such as malaria would spread (mosquitos prefer hot climate)</li> <li>People who lose their homes to floods would be forced to migrate elsewhere</li> <li>Droughts would increase, causing severe water and food shortages</li> <li>Thousands of people would be left without clean water, causing diseases such as cholera</li> <li>A lack of clean water may lead to war or conflicts</li> <li>Deaths due to extremes in temperature</li> </ul>	<ul style="list-style-type: none"> <li>Sea level rise due to melting ice sheets = flooding in low lying countries such as the Maldives</li> <li>Extreme weather (drought) causes land to dry and crops to die</li> <li>Prolonged drought will lead to desertification</li> <li>Extreme weather (tropical storms) become more frequent as ocean temperatures increase</li> <li>Habitats lost due to extreme weather = decrease in biodiversity</li> </ul>	<ul style="list-style-type: none"> <li>Governments will be forced to purchase and maintain flood defences on coasts and in coastal cities</li> <li>Failing crop yields due to climate and extreme weather will damage the economy</li> <li>Alpine ski resorts may close down due to lack of snow and ice</li> <li>Due to melting ice and sea level rise- ocean passages may become open for commercial shipping use</li> </ul>

### Key Terms:

#### Drought

A long period without rainfall

#### Desertification

The process where fertile land becomes desert

#### Migration

The movement of people or animals from one area to another

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## GCSE: The Responses to Climate Change

### Managing Climate Change: Mitigation and Adaptation Key Terms

Key Term	Definition
Mitigation	The action of reducing the severity/seriousness of something
Adaptation	The process of change/ adjustment to climate change and its effects.
Local	Actions that can be taken within our homes and communities
National	Actions which are taken across an entire country, usually by a government
International	Actions which are taken by more than one country working together (global)

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## GCSE: The Responses to Climate Change

### Managing Climate Change: Mitigation and Adaptation

#### Mitigation:



##### **Renewable Energy Sources**

- Energy sources that can quickly replenish themselves and can be used again and again
- 7 key types of renewable energy: solar, wind, tidal, thermal, hydroelectric power, biomass and nuclear.



##### **Carbon Capture**

- Scientists are developing ways to capture CO2 from factories and safely store it underground so it can't go into the atmosphere.



##### **Afforestation**

- Deforestation contributes to global warming through the release of CO2
- Planting trees mitigates effects by removing CO2 from the atmosphere
- Carbon is stored within trees until being returned back to the atmosphere through the natural process



##### **International Agreements**

- **COP26** was the most recent climate meeting held in Glasgow, Scotland 2021
- COP26 is a **legally binding** international treaty, so pledges must be followed and carried out. COP26 agreed to
- 1. **Reduce the usage of fossil fuels and invest in renewable energy sources**
- 2. **Prevent global temperatures from warming by more than 1.5°C**
- 3. **Help low-income countries become more environmentally friendly, by supporting them financially.**
- 4. **Halt deforestation by 2030**
- However, many countries have **failed** to stick to past pledges, and there has been **no punishments** for this

#### Adaptation:



##### **Change in Agriculture**

- Plant new crop types suitable to the new climate of an area (e.g. growing grapes in southern England)
- Technology can be used to create new crops that are more resistant to extreme weather
- Plant shade trees to protect seedlings and soil from strong sunlight



##### **Coping with Rising Sea Levels**

- Prepare for flooding by building flood defences (e.g. the Thames Barrier)
- For LIC's that cannot afford defences, people can build their homes on top of embankments or build raised flood shelters



##### **Managing Water Supply**

- Unreliable rainfall and periods of water shortage mean people need to use water resources more efficiently.
- Water meters can be installed in people's homes to discourage them from using lots of water
- Rainwater can be collected and waste water can be recycled to make more water available.

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## **GCSE: Climate Change in the UK (Case-Study)**

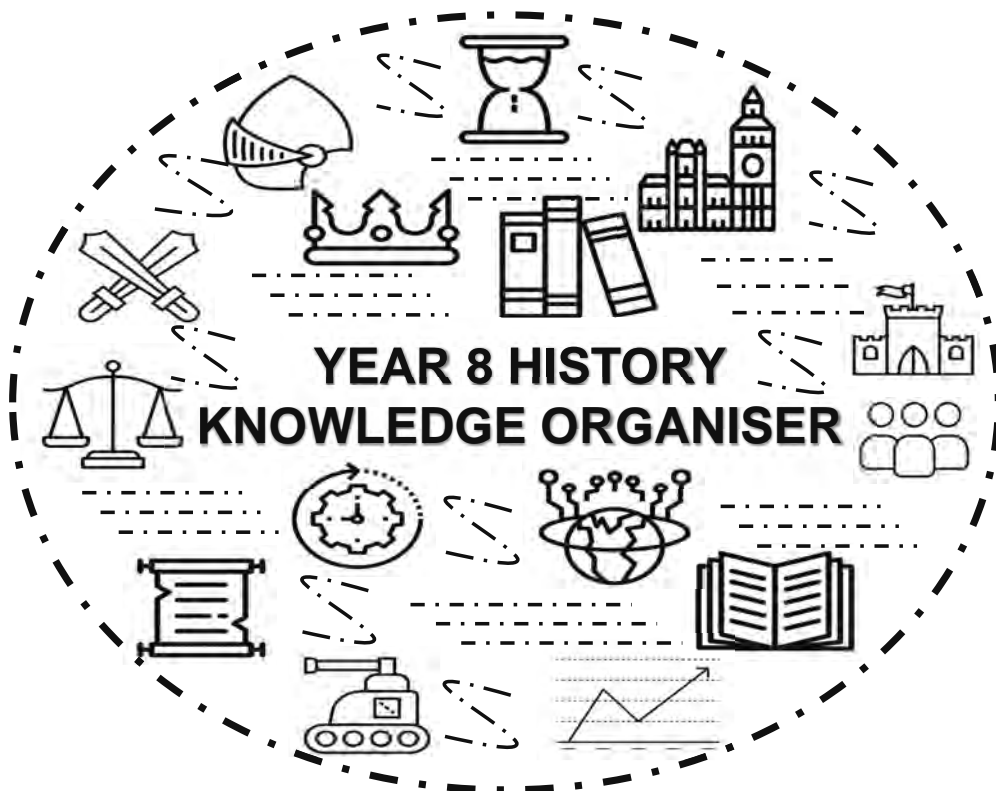
### **Why should the UK care about climate change?**

- Sea levels around the UK coasts are rising by approx. 3mm per year  
Coastal areas are at increased significant risk of flooding
- Emerging evidence of changing rainfall patterns  
Drier summers leading to drought  
Wetter winters leading to more frequent and severe flooding
- In 2003, the UK and Europe experienced one of the most significant heat waves in recorded history (Kent, UK recorded a record temperature of 38.5°C)  
Over 2000+ people died in the UK alone
- Increase risk of vector-borne diseases  
Warmer temperatures will attract insects out of their native habitats and with them they will bring diseases such as: malaria, yellow fever and zika virus etc...
- In 2017, 37 out of 43 zones in the UK were considered to have illegal levels of air pollution (nitrogen dioxide), according to the European Commission
- London air pollution causes at least 4300 early deaths each year
- There are economic costs that the government will have to pay due to climate change. For example, building sea walls to prevent coastal flooding or paying our insurance claims.

### **What is the UK doing to combat climate change?**

- UK legislation: 2008 Climate Change Act commits government to cut national greenhouse gas emissions by at least 80% by 2050
- WWF UK campaigned to ensure that the UK government committed to end the use of coal in the UK by 2025 (the government have committed to this goal)
- The UK government has set a target of ending the sale of petrol and diesel cars by 2040
- Over one third of the UK's total energy now comes from renewable sources
- There are plans to make London the world's first ultra-low emission zone
- Promoting at home methods such as: turning off electrical appliances when not in use, recycling, insulating homes, not wasting water, using public transport, cycling or walking





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Time Periods and Factors

Time Period	Details
1170 -1500	Medieval
1500 – 1750	Renaissance
1750 –1900	Industrial
1900 +	Modern

Factor	
War and violence	
Religion	
Chance	
Government	
Communication	
Economic	
The role of the individual in encouraging or inhibiting change.	
New Ideas (about equality & representation)	



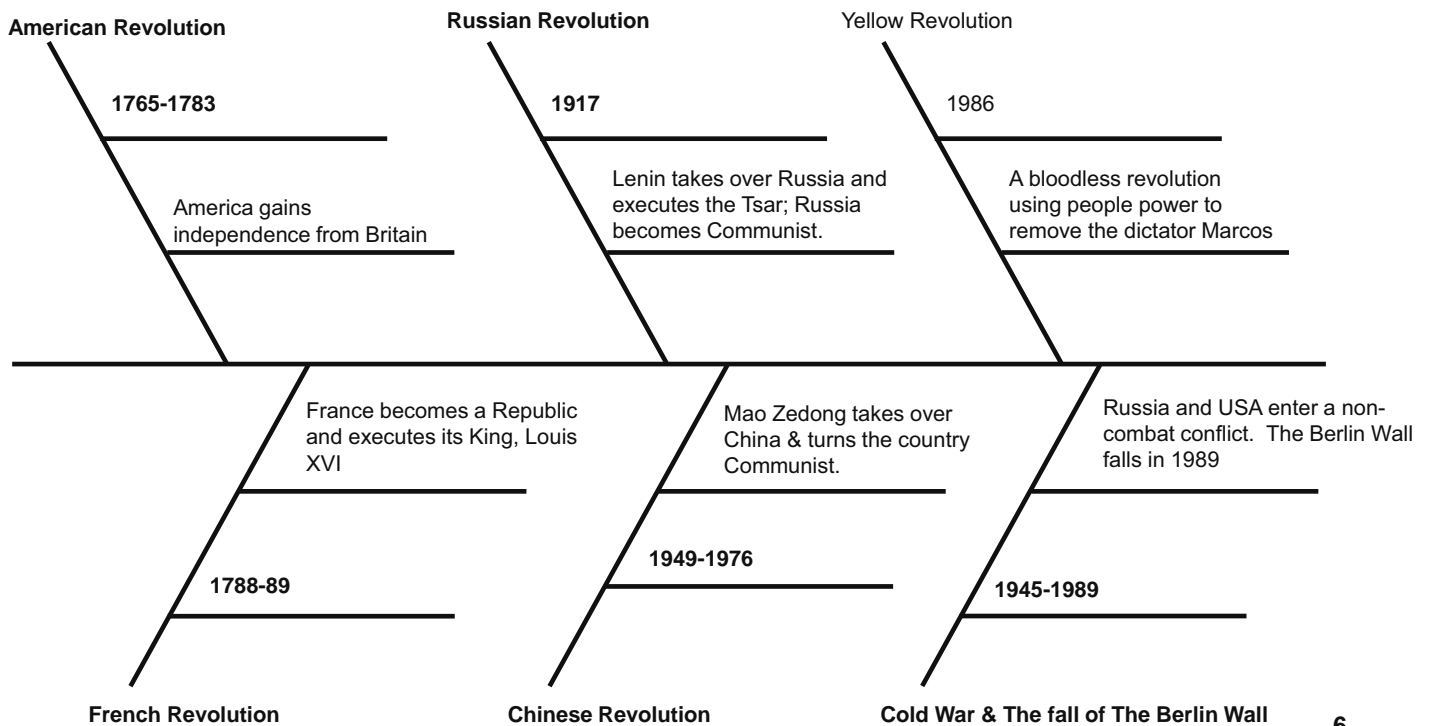
# Year 8 History

## Revolutions

A forcible overthrow of a government or social order,  
in favour of a new system.

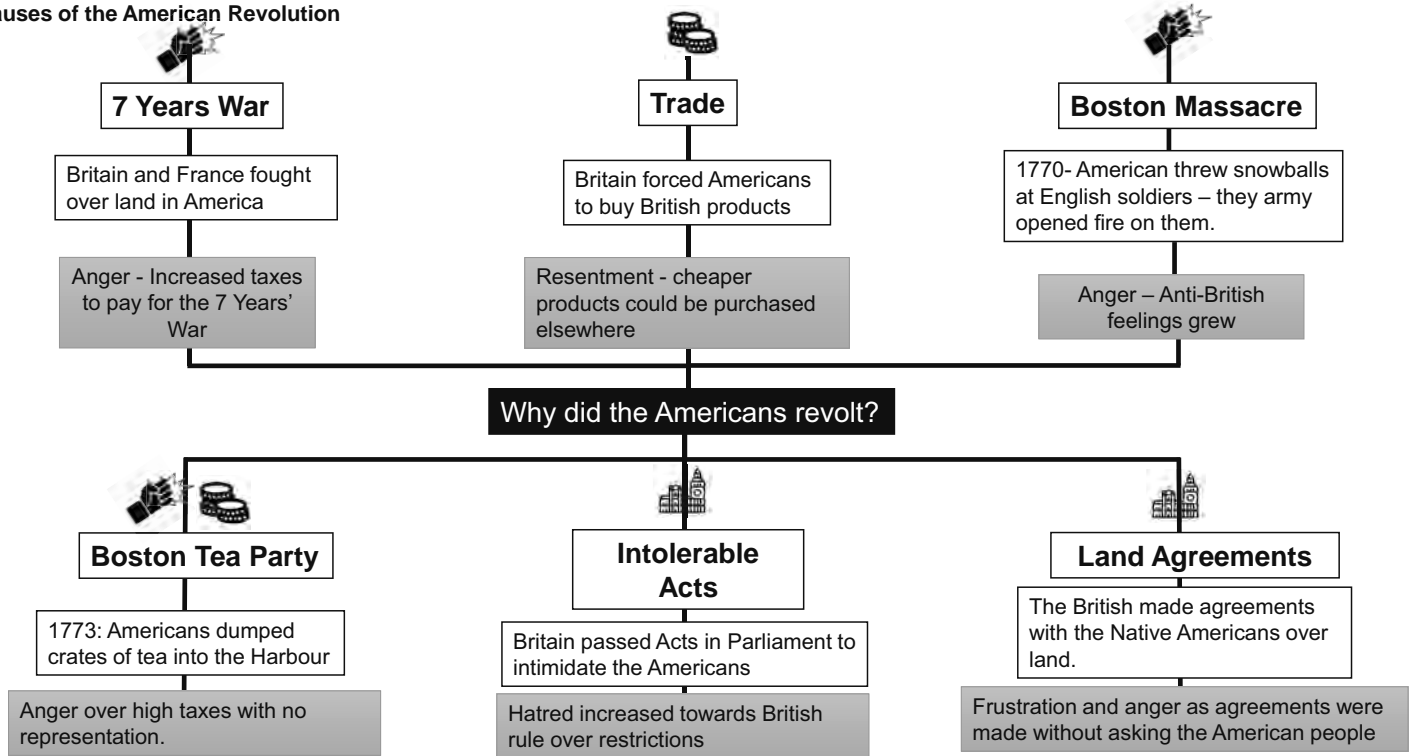
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### 1. Year 8 History: Revolutions Unit Overview



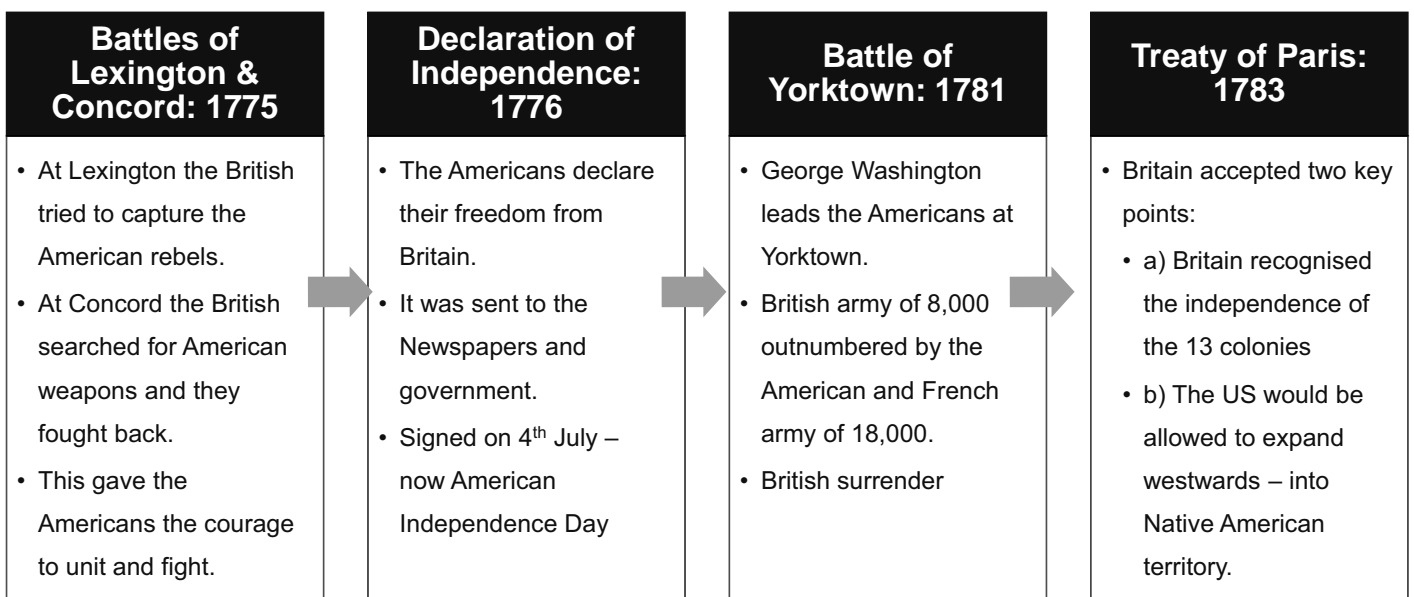
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2. Year 8 History: Revolutions  
Causes of the American Revolution

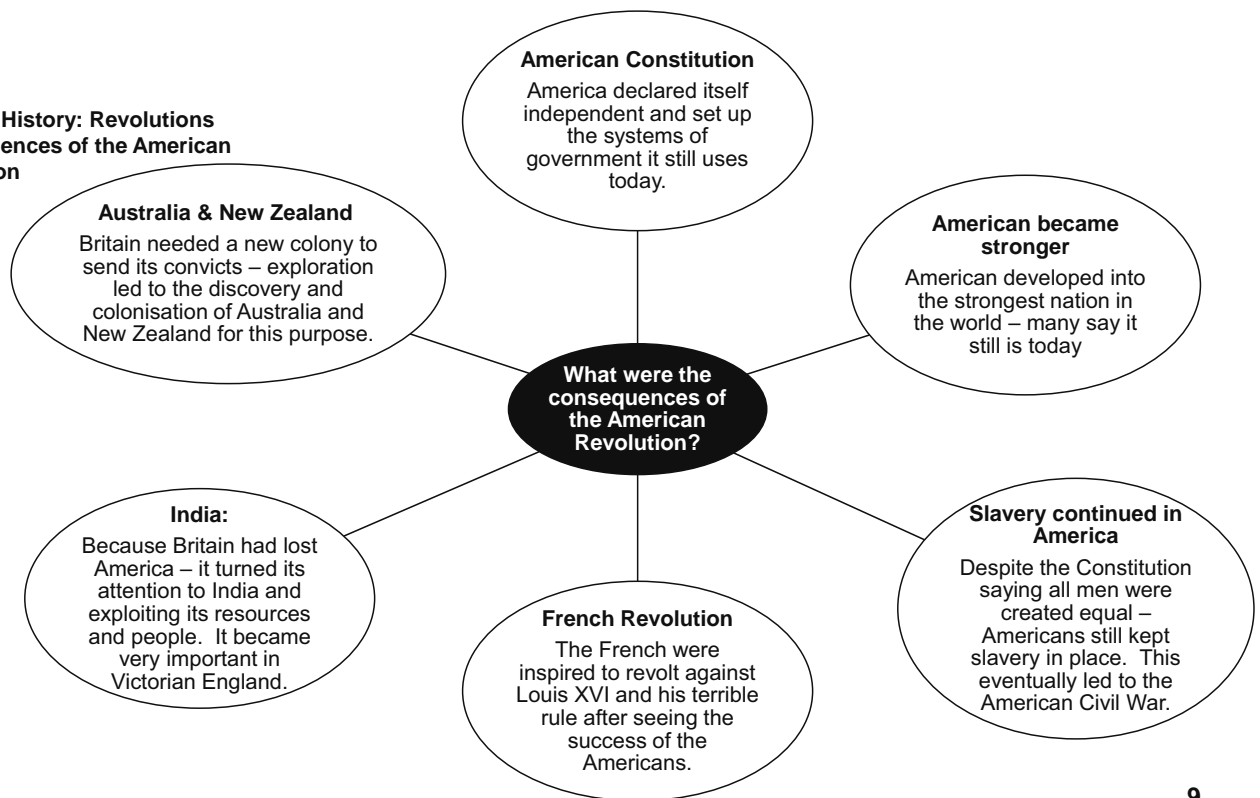


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3. Year 8 History: Revolutions  
Events of the American Revolution



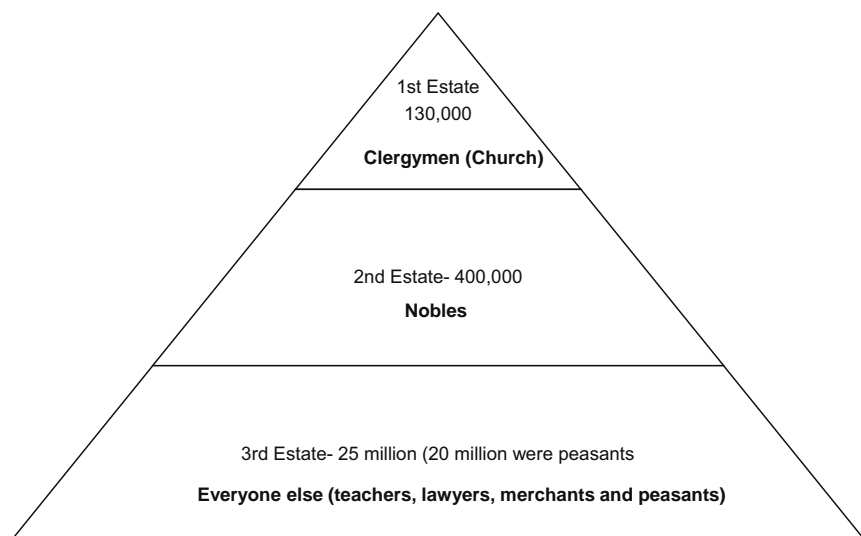
**4. Year 8 History: Revolutions**  
**Consequences of the American Revolution**



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**5. Year 8 History: Revolutions**

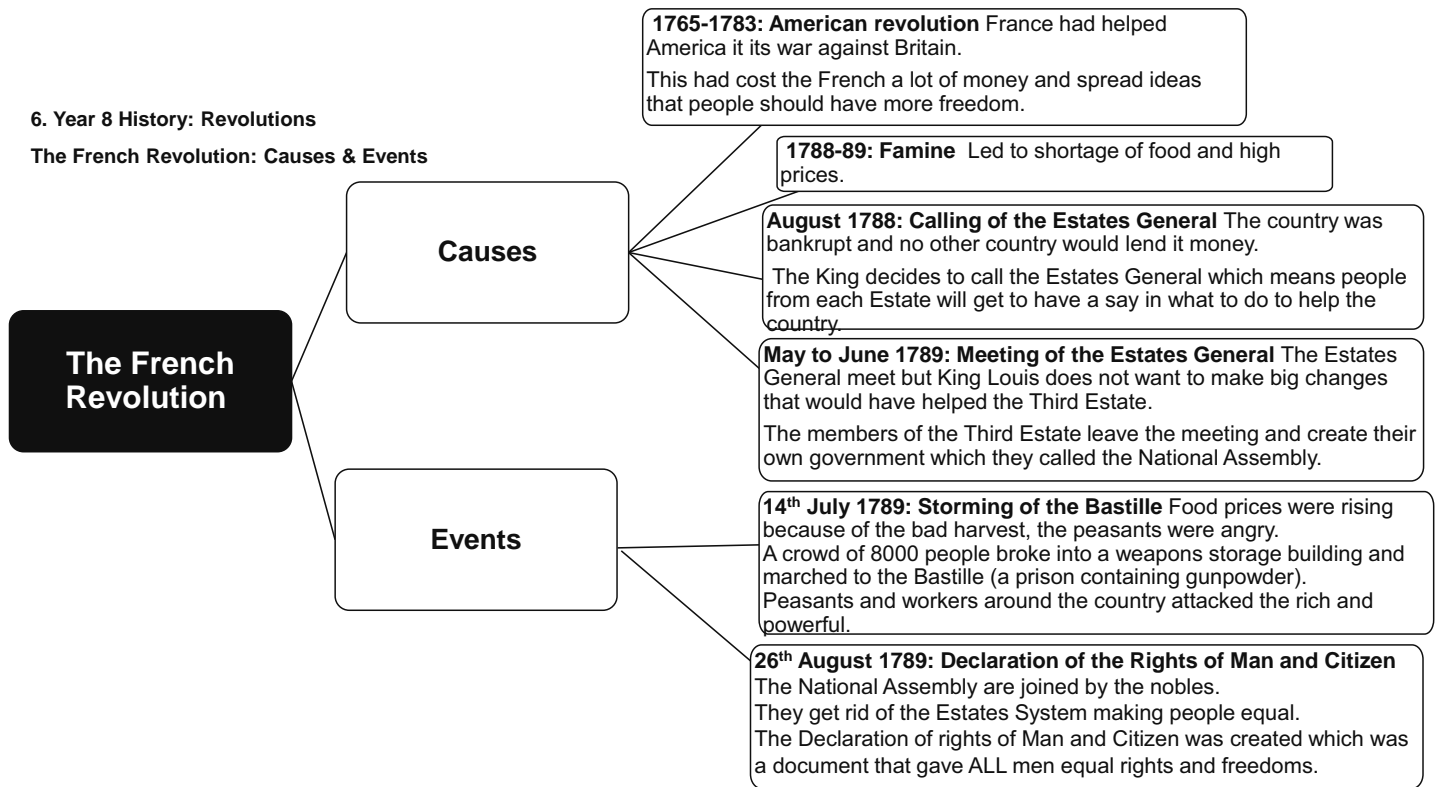
**The Estates System- How French society was structured**



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## 6. Year 8 History: Revolutions

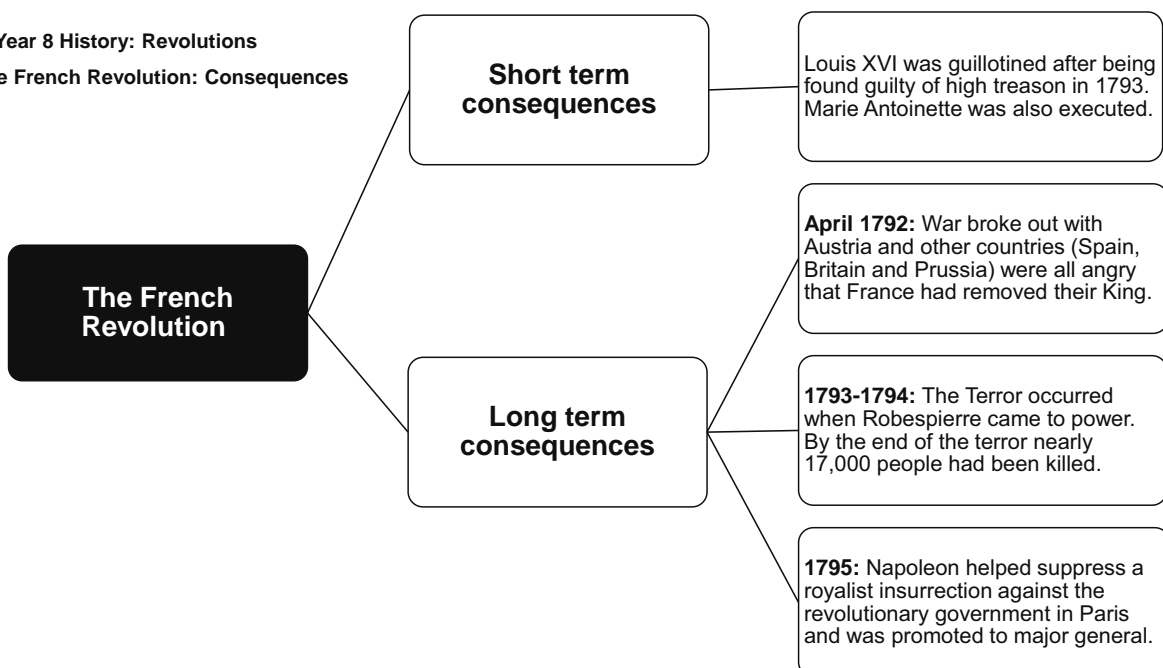
### The French Revolution: Causes & Events



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## 7. Year 8 History: Revolutions

### The French Revolution: Consequences



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## 8. Year 8 History: Revolutions

### The French Revolution: keywords and key individuals

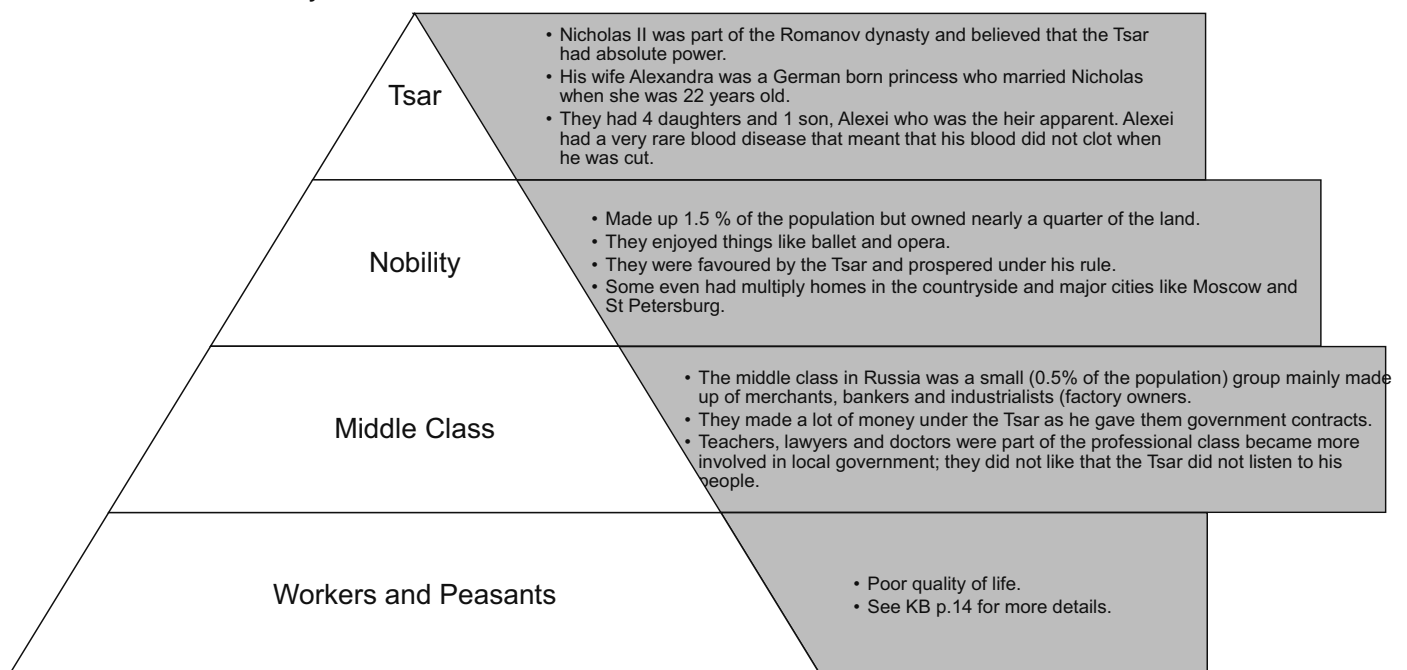
Keyword	Definition
<b>Absolute monarch</b>	A ruler who believes they have all the power
<b>Third Estate</b>	Group in society who had no power but had to pay three taxes (Gabelle, Taille and Tithe)
<b>Estates General</b>	Representatives from each Estate attend a meeting to discuss problems in the country.
<b>National Assembly</b>	New government setup by the Third Estate.

Key Individuals	Details
<b>Louis XVI</b>	King of France from 1774-93.  He was an absolute monarch and was criticised for his decisions as a ruler.
<b>Marie Antoinette</b>	Married to Louis XVI, she was an Austrian Princess who spent too much on gambling and building her palace, Petit Trianon. Famous for telling the people of France to 'let them eat cake' when there was no bread to eat.
<b>Robespierre</b>	Encouraged the execution, mostly by guillotine, of more than 17,000 enemies of the Revolution

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## 9. Year 8 History: Revolutions

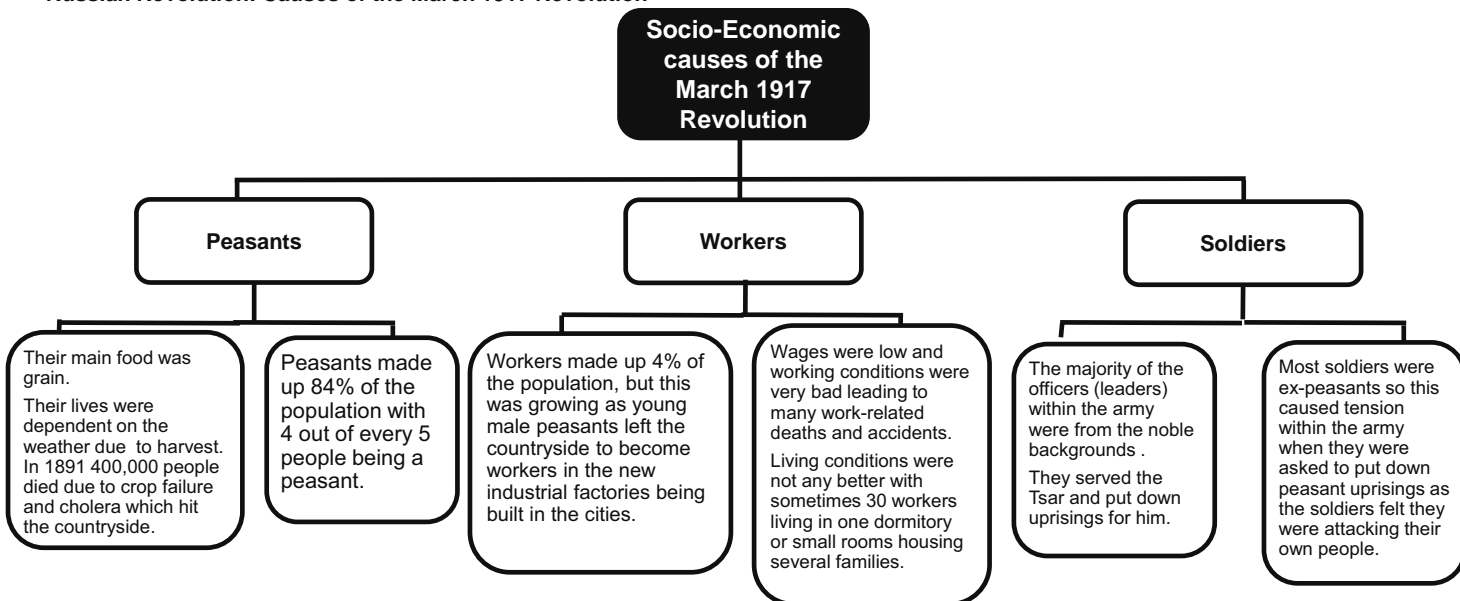
### Russian Revolution: Society in Russia



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## 10. Year 8 History: Revolutions

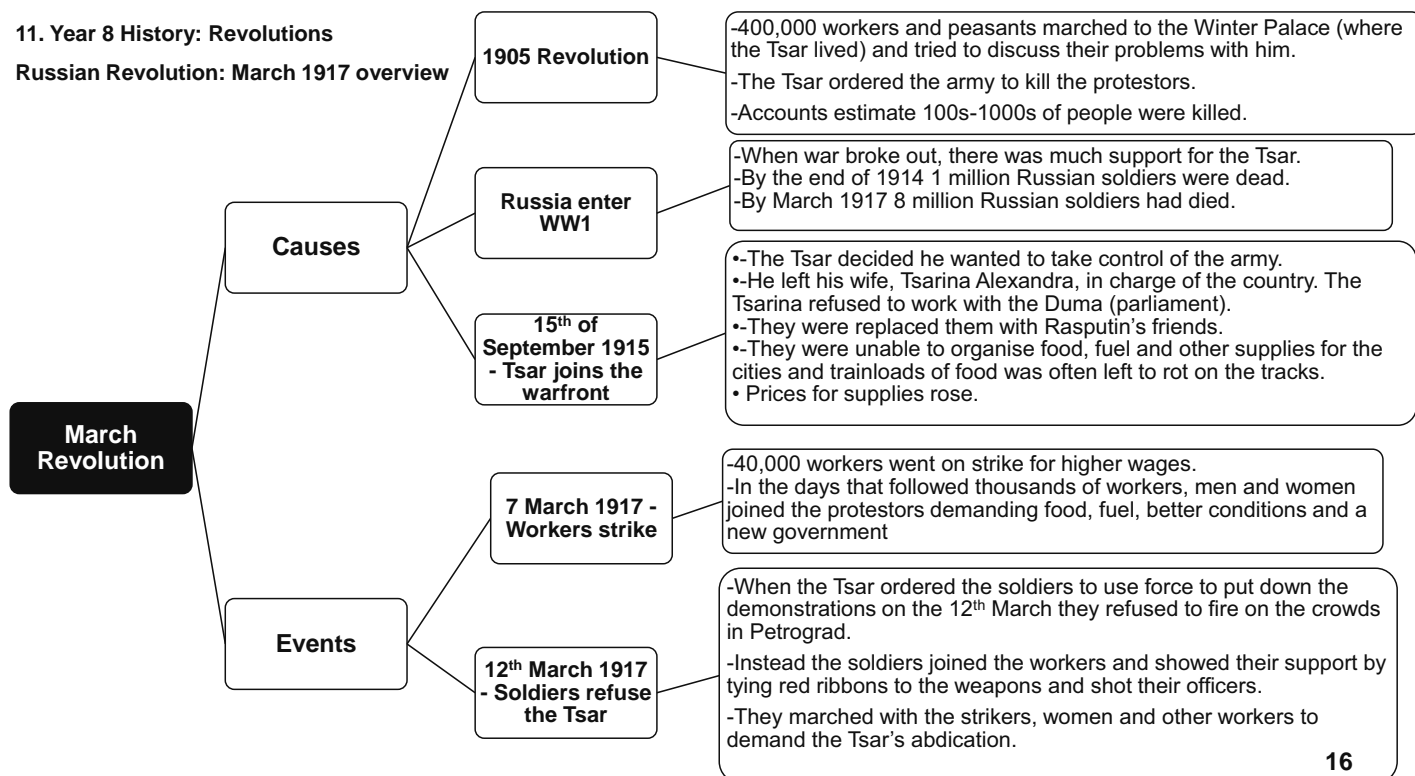
### Russian Revolution: Causes of the March 1917 Revolution



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## 11. Year 8 History: Revolutions

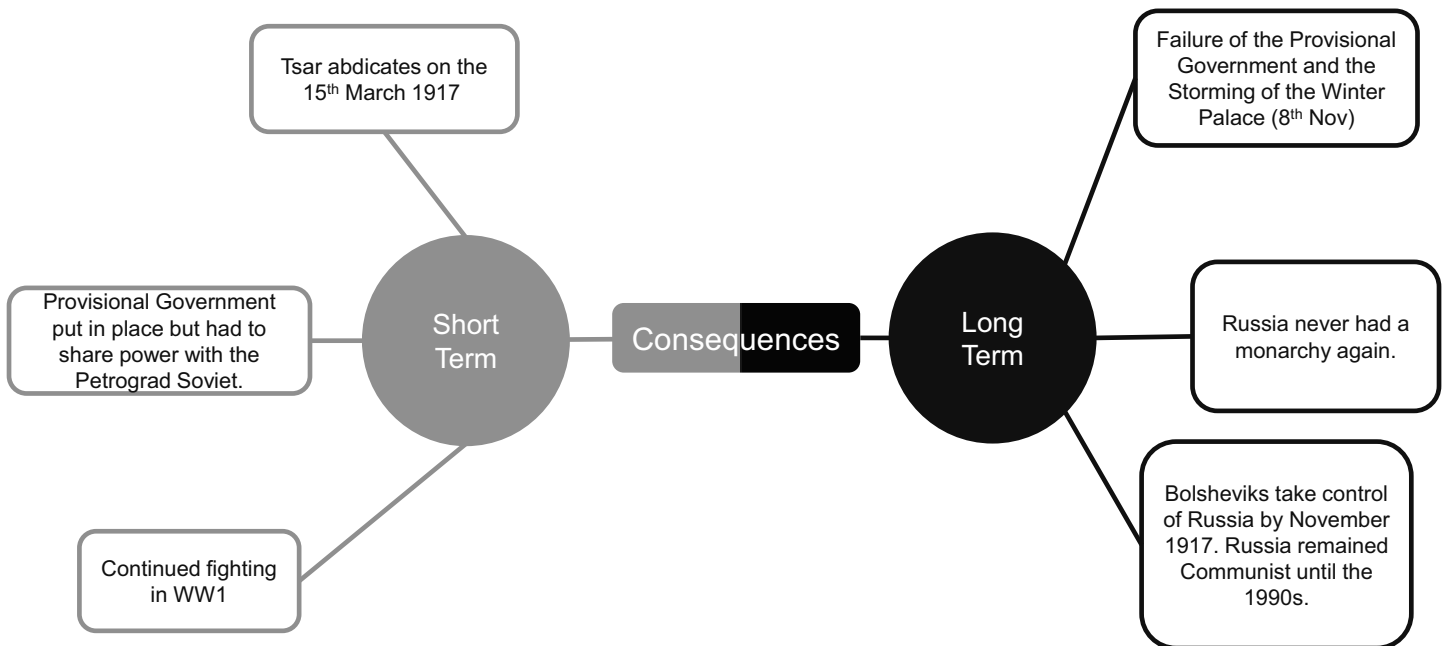
### Russian Revolution: March 1917 overview



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## 12. Year 8 History: Revolutions

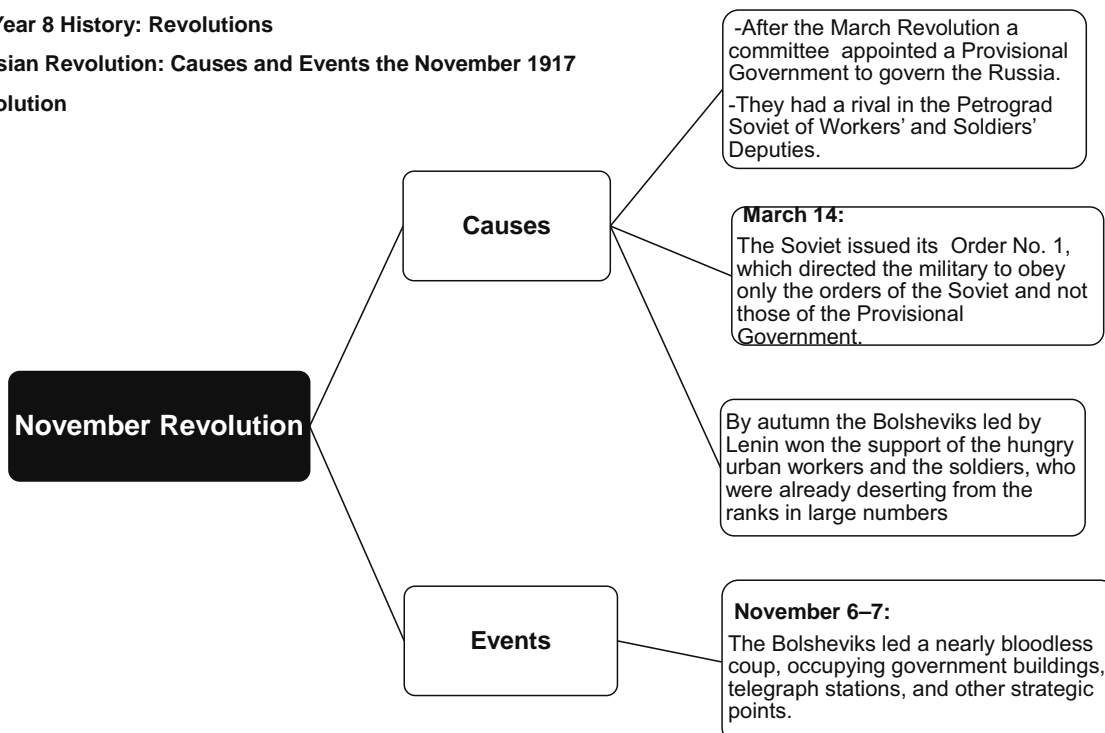
### Russian Revolution: Consequences of the March 1917 Revolution



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## 13. Year 8 History: Revolutions

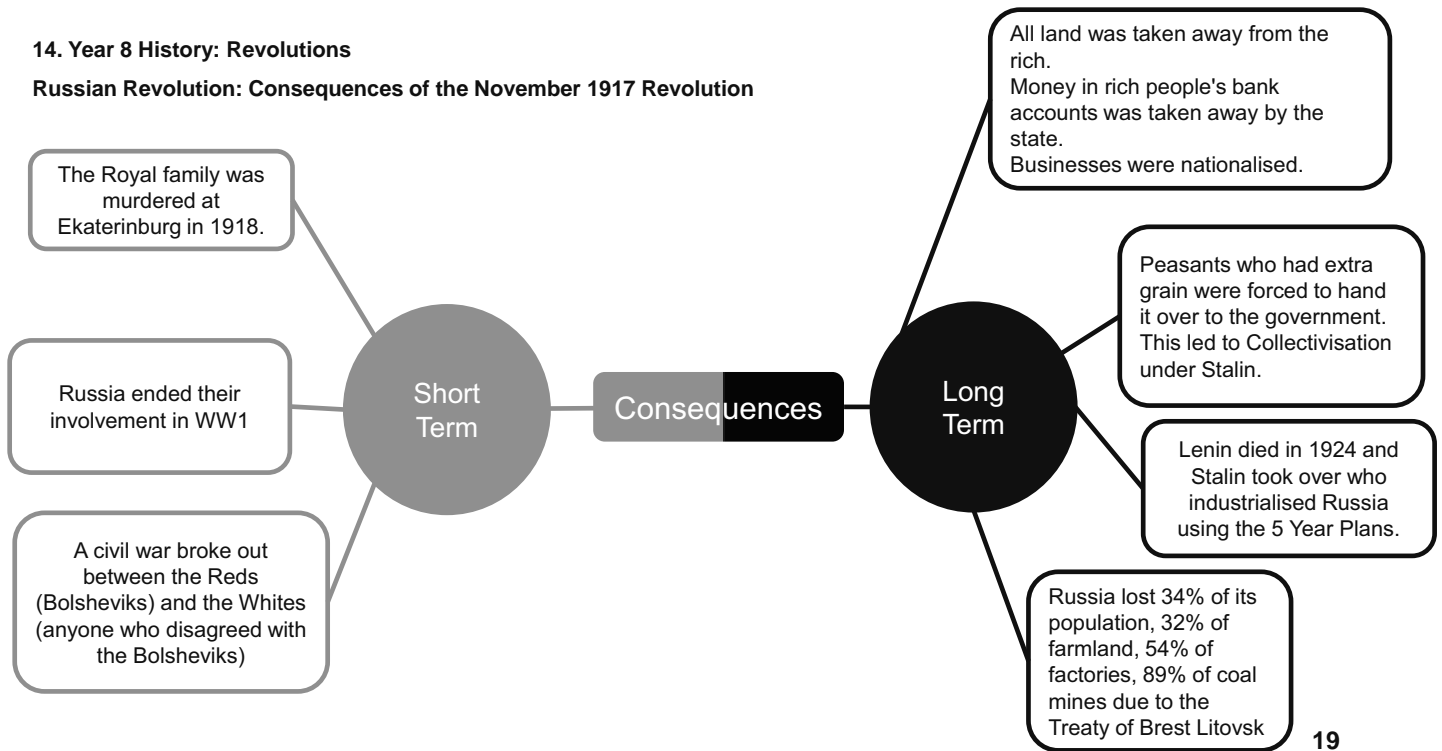
### Russian Revolution: Causes and Events the November 1917 Revolution



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#### 14. Year 8 History: Revolutions

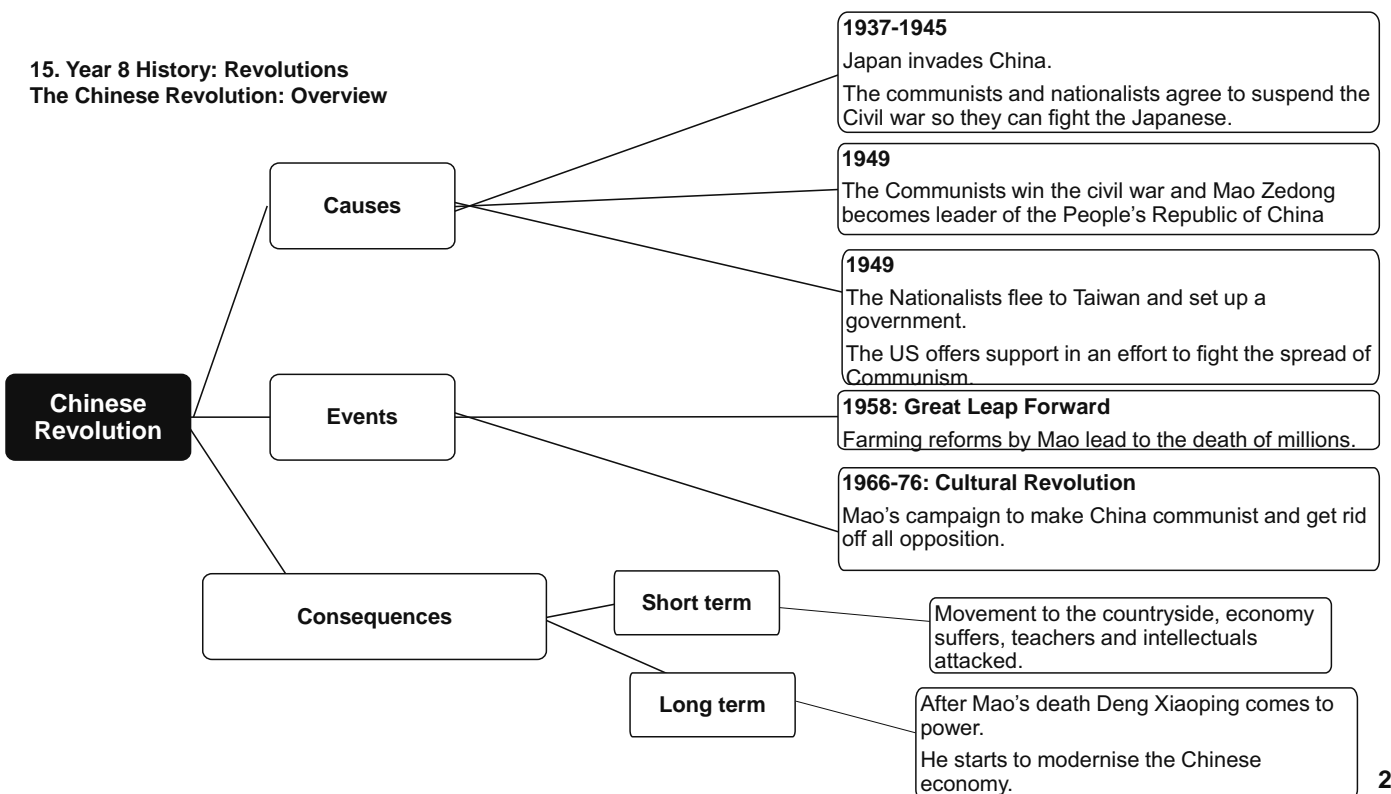
##### Russian Revolution: Consequences of the November 1917 Revolution



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#### 15. Year 8 History: Revolutions

##### The Chinese Revolution: Overview



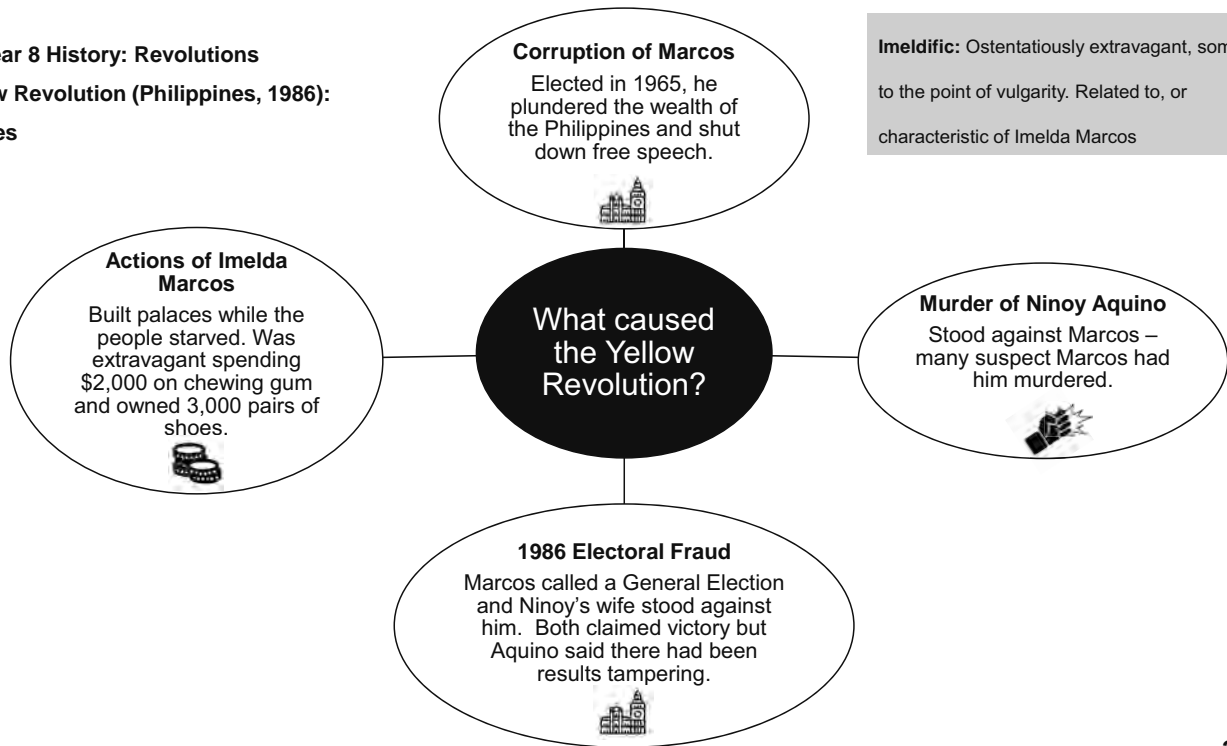
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## 16. Year 8 History: Revolutions

### Yellow Revolution (Philippines, 1986):

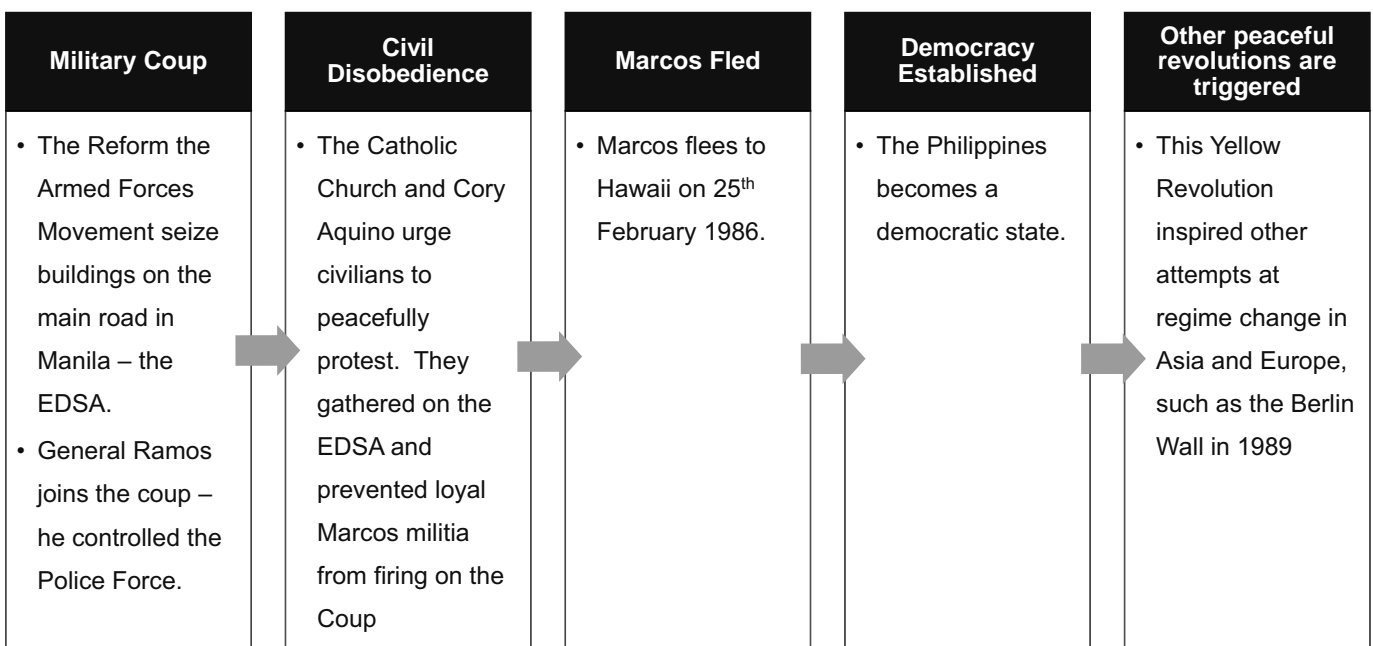
#### Causes



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## 17. Year 8 History: Revolutions

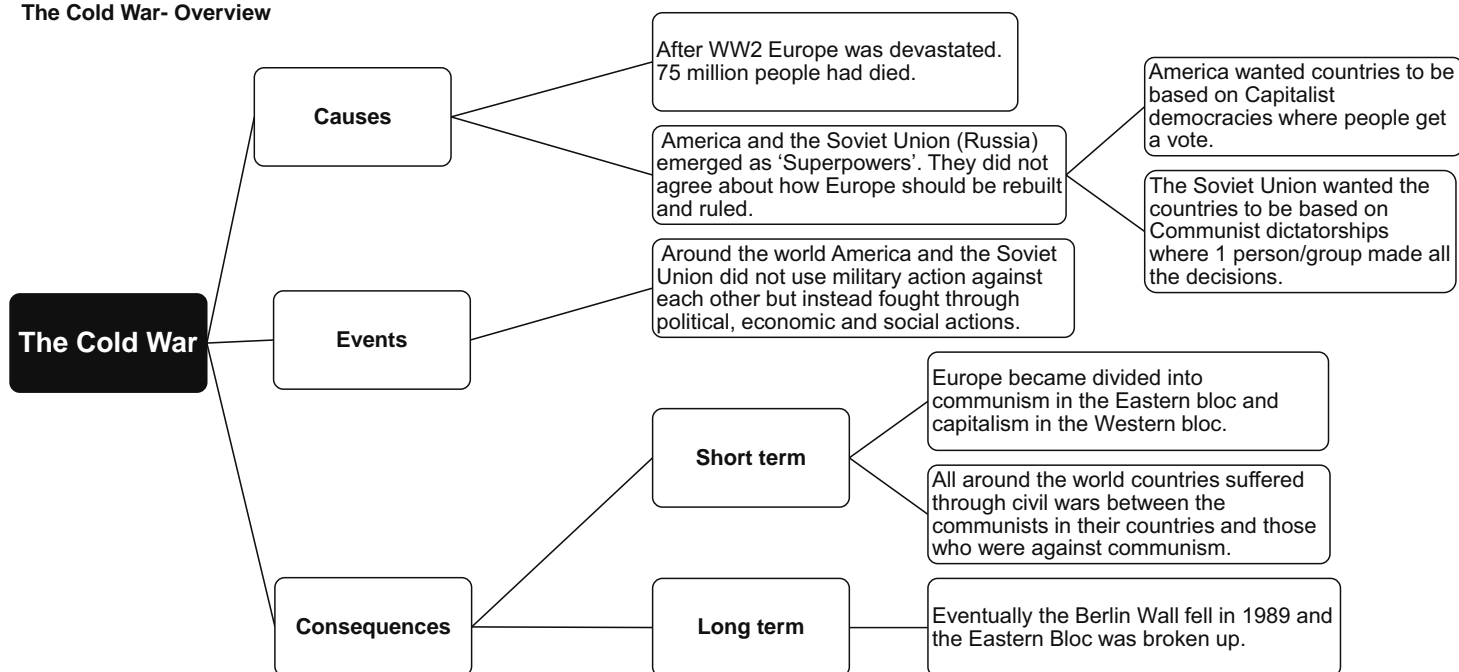
### Yellow Revolution (Philippines, 1986): Events and consequences



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## 18. Year 8 History: Revolutions

### The Cold War- Overview



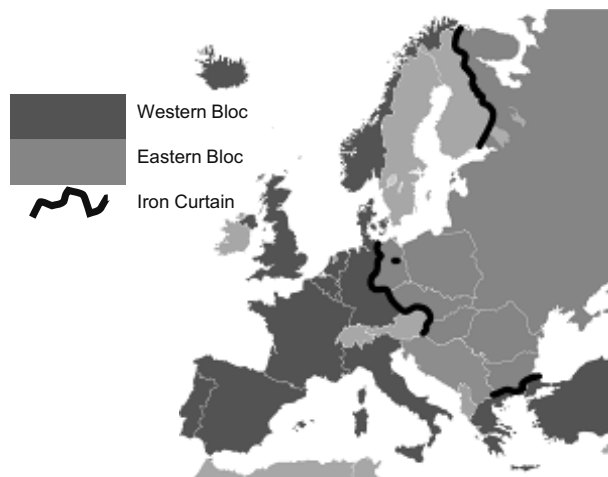
23

## 19. Year 8 History: Revolutions

### The Cold War: Capitalism vs Communism

**Cold War (1945-1991):** Around the world America and the Soviet Union did not use military action against each other but instead fought through political, economic and social actions.

	Capitalism	Communism
<b>Countries</b>	United States	Soviet Union (USSR)
<b>Property/business</b>	Privately owned- profit	Owned and controlled by the state
<b>System of government</b>	Democracy- votes	Dictatorship- one party state
<b>Freedom</b>	Being free more important than being equal	Equality was more important than having freedom
<b>Religion</b>	Complete freedom of religion- mixing pot of culture	Religion banned



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## 20. The Cold War Events: 1946-1950

### The Iron Curtain- March 1946

The Soviet Union took control of several Eastern European countries and split Germany into East and West Germany after the Second World War.

Winston Churchill made a speech describing the divide in Europe as an 'Iron Curtain'.

### People's Republic of China- October 1949

The Chinese Civil War between the Communists and Chinese government continued after Japan's defeat in WW2.

Russia gave the Communists in China the weapons seized from Japan. America gave the Chinese government 50,000 soldiers and weapons.

Berlin was in East Germany however, it was split into East Berlin (supported by the Soviet Union) and West Berlin (supported by USA, GB and France).

The Soviet Union blocked food and supplies going into West Berlin, so America, Britain and France dropped supplies using planes.

### Berlin Blockade- June 1948

North Korea supported by the Soviet Union invaded South Korea. South Korea was supported by America. 5 million people died.

In 1953 the Americans organised an agreement with North Korea to prevent an all-out war with the USSR.

### Korean War- June 1950

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## 21. The Cold War Events: 1961-1979

### Berlin Wall- August 1961

20% of East Germany's population (skilled workers & professionals) fled to West Berlin so the USSR built the Berlin Wall between East and West Berlin.

The USSR reinforced the wall with dogs, land mines and watch towers. 5,000 people still managed to escape in 28 yrs.

### Vietnam War- July 1965

North Vietnam was supported by the Soviet Union and South Vietnam was supported by America. 3 million people were killed.

In 1975 Communist forces took control of South Vietnam and united the country under a Communist leader.

America discovered that the USSR were storing missiles in Cuba (90 miles from the America). Neither side were willing to compromise for 13 days.

Eventually the USSR agreed to remove the missiles from Cuba as long as America did not invade Cuba.

### The Cuban Missile Crisis- October 1962

The Soviet Union sent in troops to help the Communists in Afghanistan fight non-Communist groups angering America.

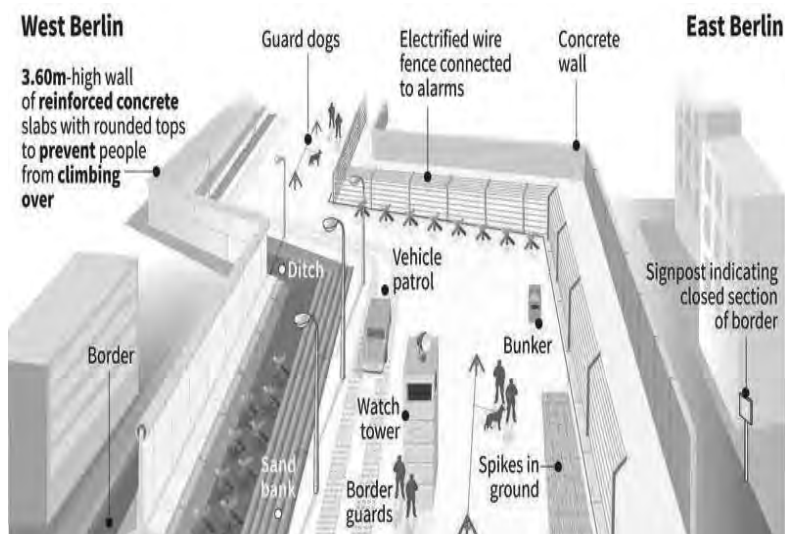
America stopped trading grain with Russia, boycotted the 1980 Moscow Olympics and sold weapons to non-Communist groups in Afghanistan (including the Taliban).

### USSR invades Afghanistan- December 1979

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## 22. Year 8 History: Revolutions

### The Cold War: Berlin



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## 23. Year 8 History: Revolutions

### Causes of the Fall of the Berlin Wall 1989

Cause	Details
<b>Social</b>	The events of the People's Revolution in the Philippines inspired the people of East Berlin to protest against Soviet control.
	In cities all over East Germany protests and demonstrations broke out calling for greater freedoms.
<b>Economic</b>	By supporting various Communist groups around the world USSR was running out of money and could not afford to put down uprisings.
	In East Berlin, the economy was suffering due to the number of educated professionals and skilled workers who had fled to the West before the wall was built.

Cause	Details
<b>Political</b>	In 1985, Gorbachev became the leader of the Soviet Union.
	He was seen as a moderate (not extreme) and allowed countries in Eastern Europe more freedoms.
	President Ronald Reagan saw that Gorbachev wanted to make changes to the way the Soviet Union controlled East Germany, so Reagan worked to improve relations with Gorbachev.
	In August 1989, Hungary (a country in Eastern Europe) turned off its electric fence border with Austria.
	Thousands of people from the East travelled to Hungary and crossed the border into Austria and the West.

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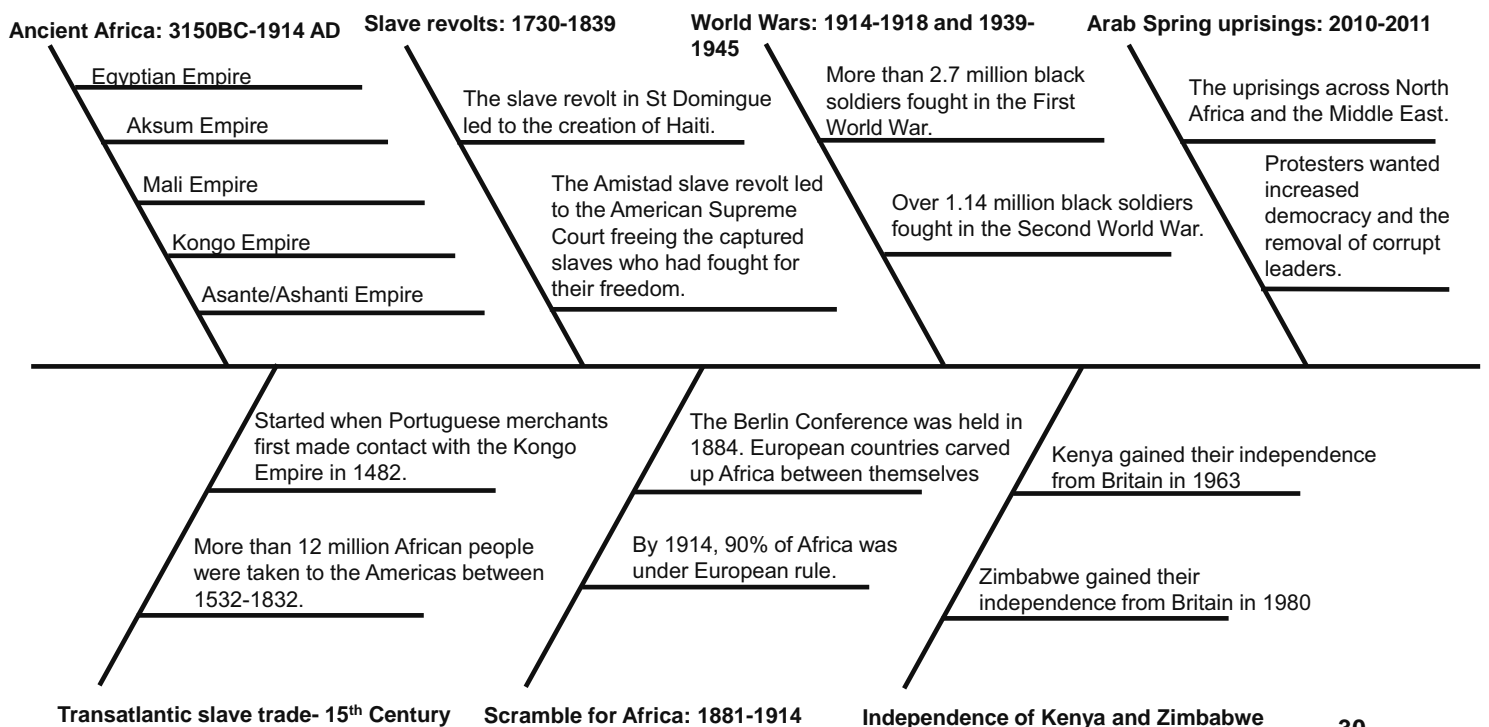
# Year 8 History

## Africa

The world's second- largest and second most populous continent south of Europe and between the Atlantic and Indian oceans.

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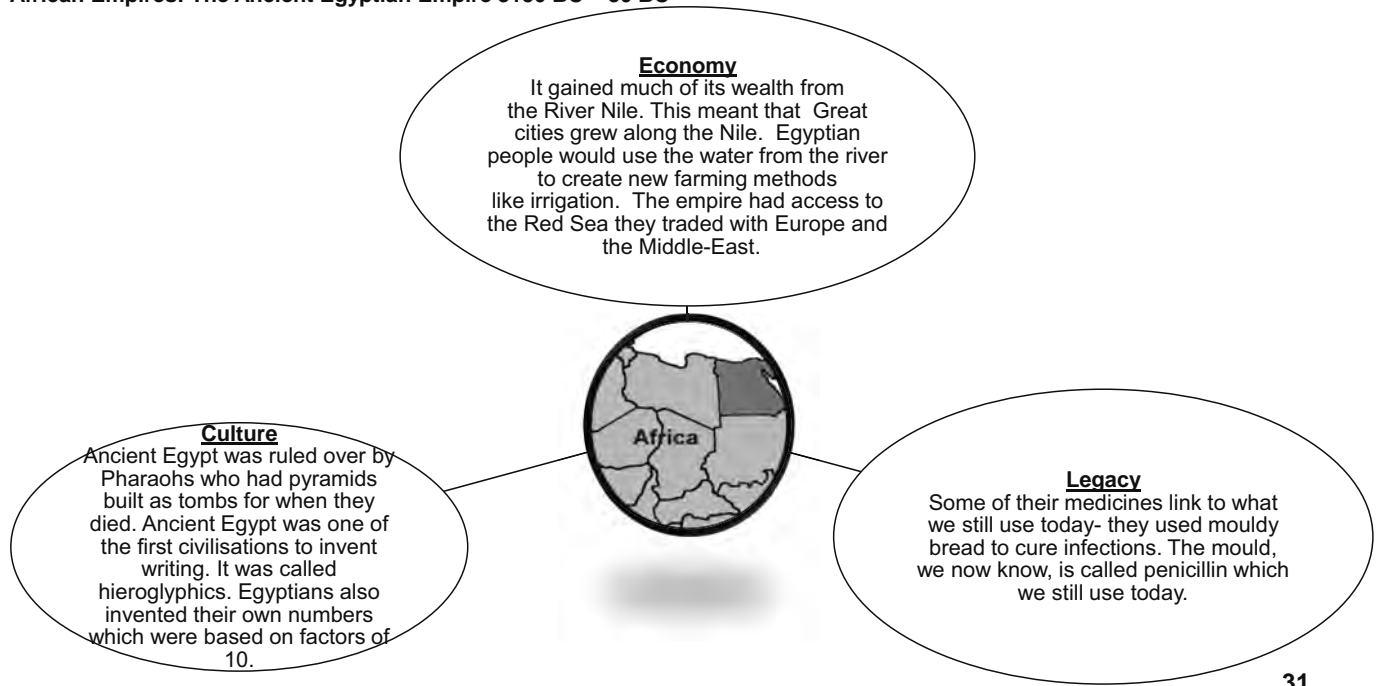
### 1. Year 8 History: Africa Unit Overview



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## 2. Year 8 History: Africa

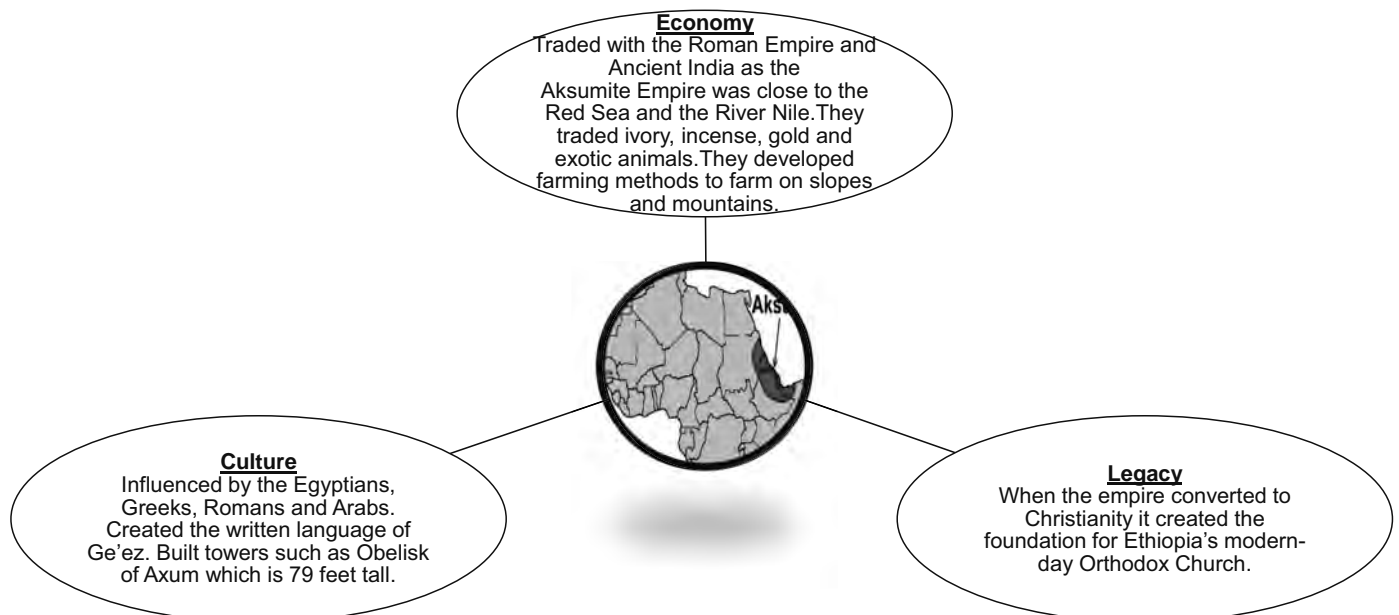
### African Empires: The Ancient Egyptian Empire 3150 BC – 30 BC



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## 3. Year 8 History: Africa

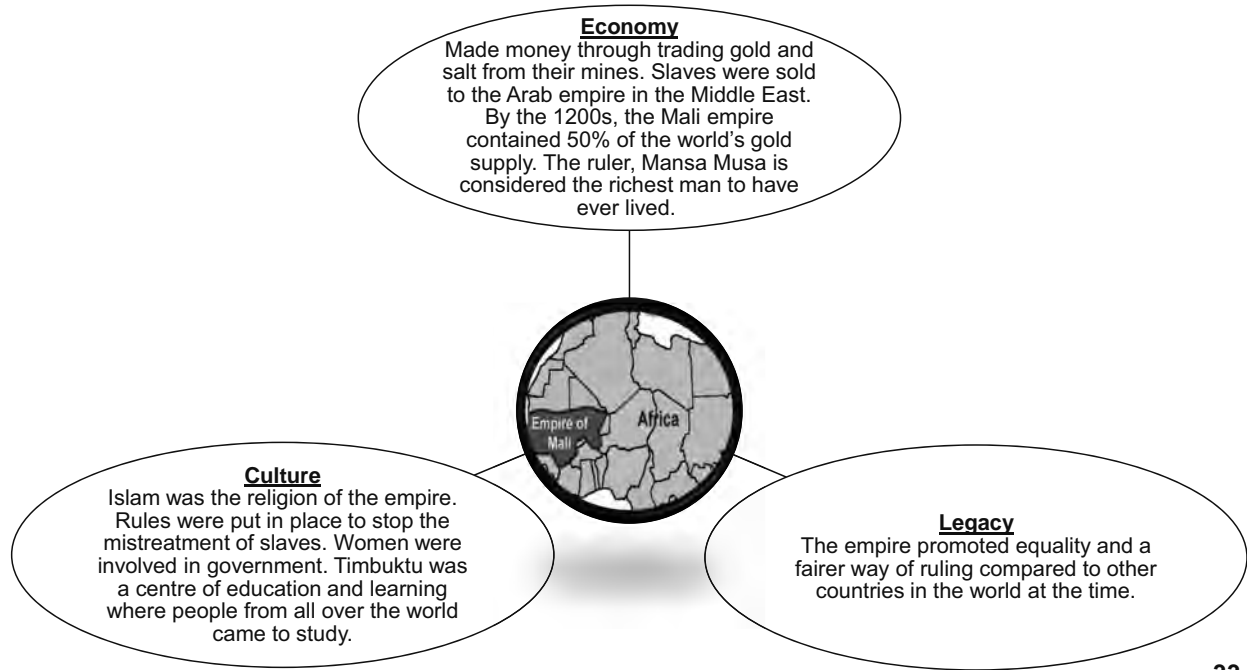
### African Empires: The Aksum Empire 100 AD – 960 AD



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#### 4. Year 8 History: Africa

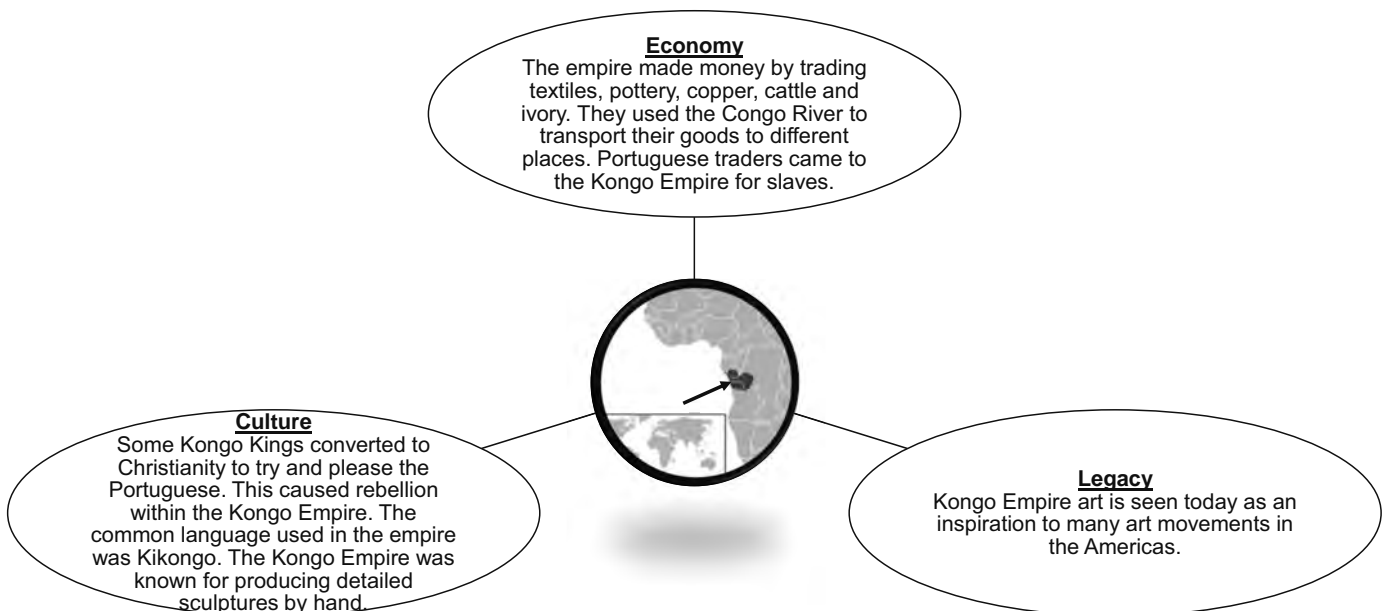
##### African Empires: The Mali Empire 1234 AD – 1600 AD



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#### 5. Year 8 History: Africa

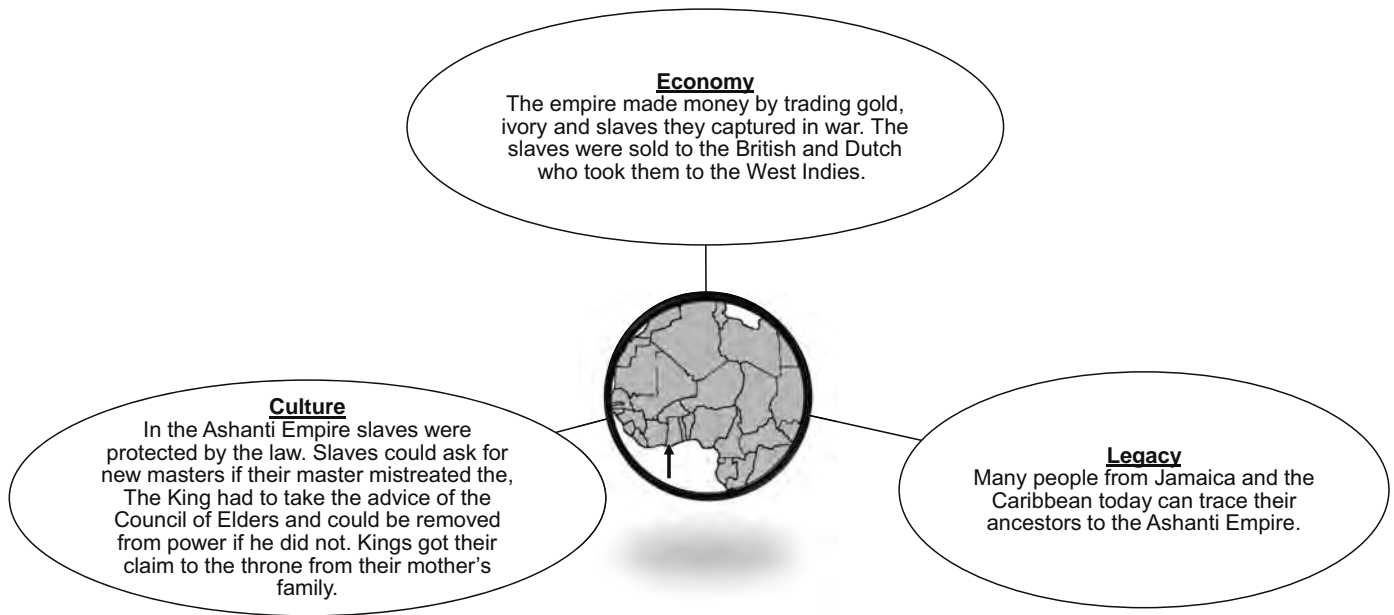
##### African Empires: The Kongo Empire 1390 AD – 1914 AD



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## 6. Year 8 History: Africa

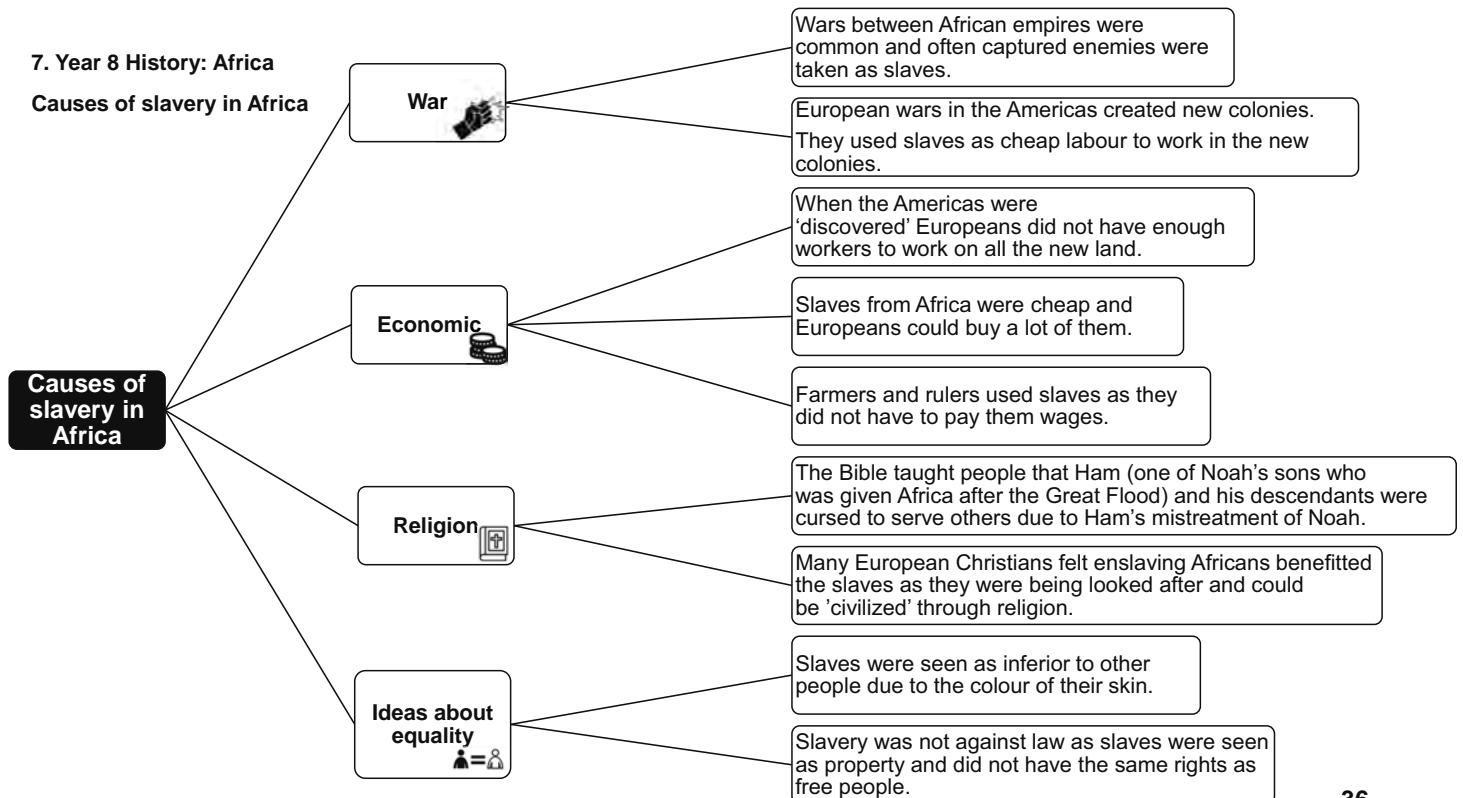
### African Empires: The Ashanti/Asante Empire 1670 AD – 1896 AD



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## 7. Year 8 History: Africa

### Causes of slavery in Africa

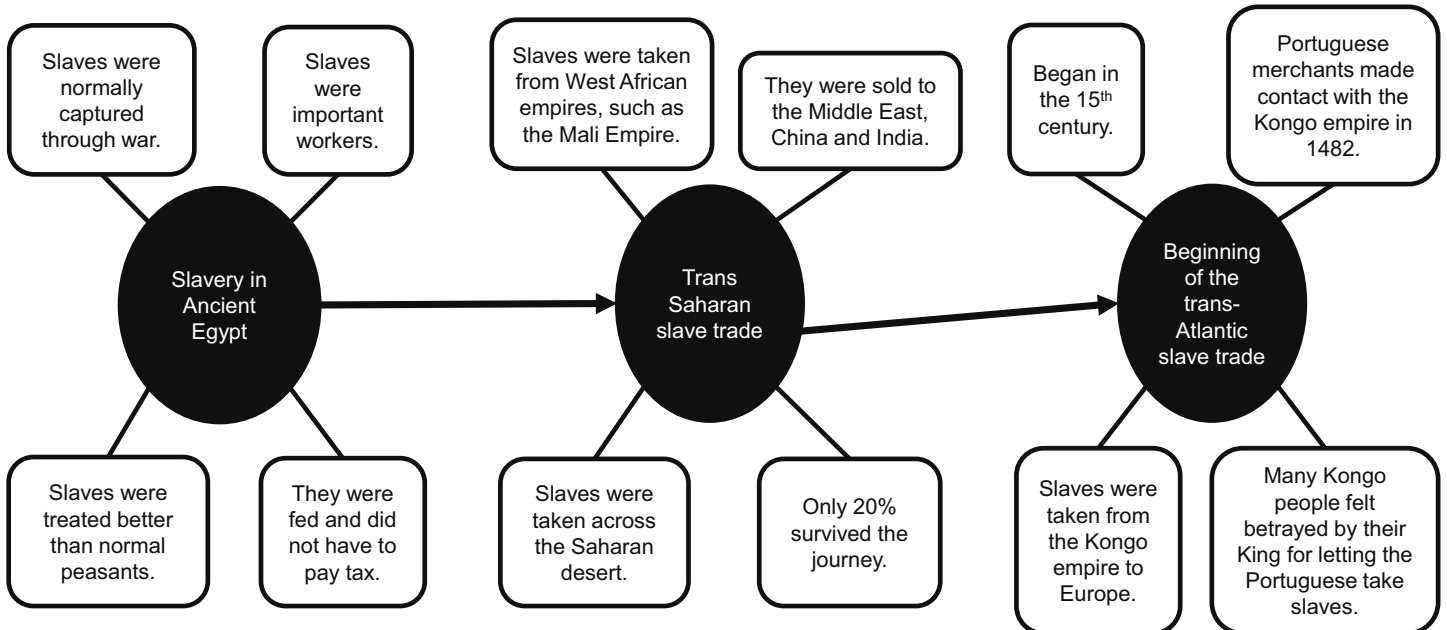


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## 8. Year 8 History: Africa

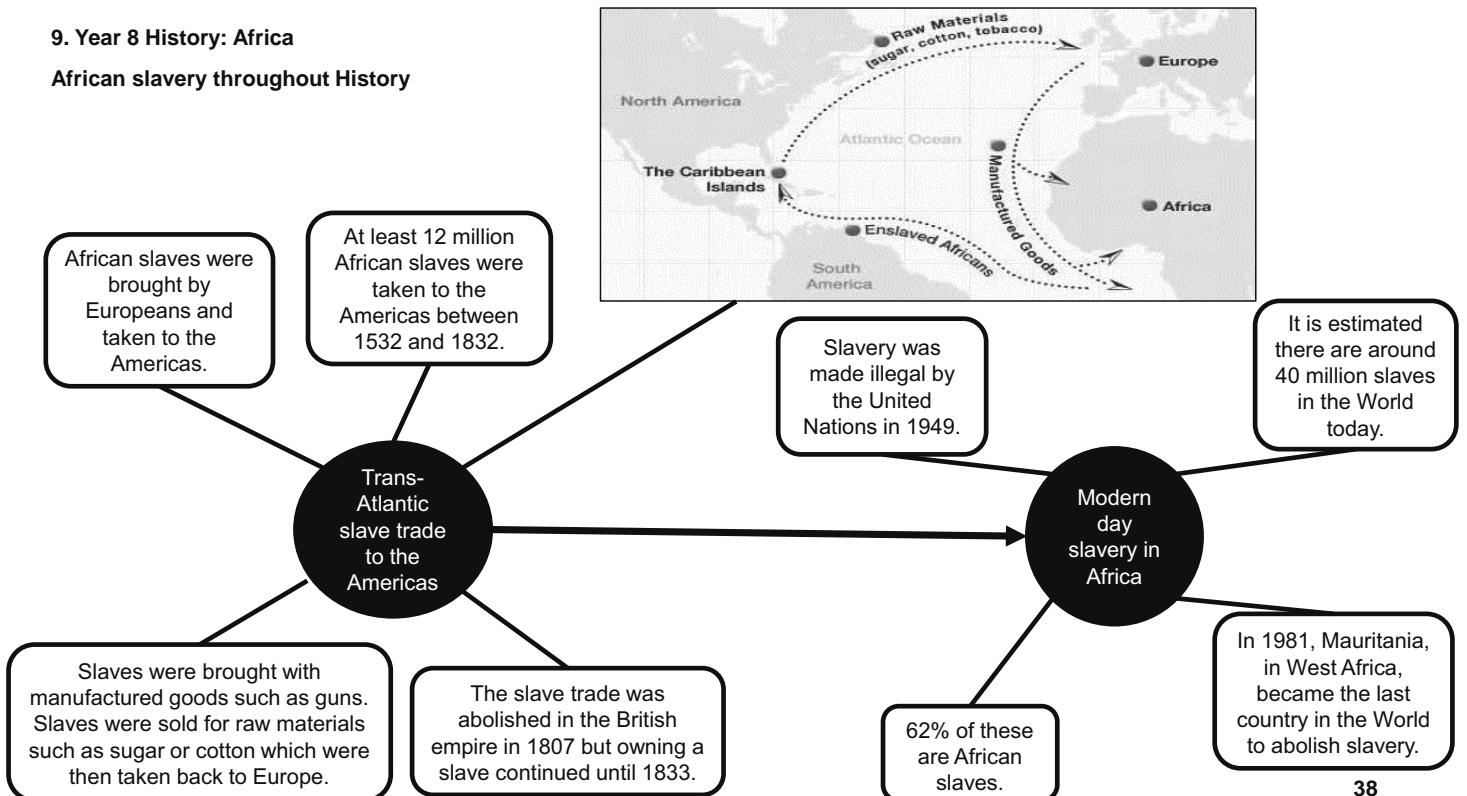
### African slavery throughout History



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## 9. Year 8 History: Africa

### African slavery throughout History



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## 10. Year 8 History: Africa

### The Transatlantic Slave Trade: The Middle Passage

Stage of slavery	Details
<b>Middle Passage</b>	<p>Journey between West Africa and the Americas.</p> <p>It is estimated 20 million Africans were taken across the Atlantic Ocean and sold as slaves.</p> <p>Slave ships could carry from 250-600 slaves with 1.5m space between slave decks.</p> <p>They had little food/water and no medicine</p> <p>20% died during the journey.</p> <p>The journey took around 8 weeks.</p>

Stage of slavery	Details
<b>Auction</b>	<p>Buyers bid for slaves and sold to the highest bidder.</p> <p>Unhealthy and unsold slaves were left to die without food or water.</p> <p>The buyers would all rush at once to get the 'best slaves'.</p> <p>Families would be split up, never to see each other again.</p>

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## 11. Year 8 History: Africa

### Treatment of African slaves in Africa

Aspects of life	Details
<b>Treatment by masters</b>	<p>Most slaves in Africa were only temporary slaves and were only slaves due to owing a debt (money) or being punished for a crime.</p> <p>Chattel slaves (slaves who were sold and seen as property) were people taken as prisoners during wars with other empires.</p> <p>Normally, children of slaves were considered free.</p> <p>Many former slaves wrote about how they were well fed and treated well by their masters.</p> <p>African slaves were not free, they had to ask permission to leave their master's lands.</p> <p>They were punished or killed if they did not follow the rules.</p>

Aspects of life	Details
<b>Forms of resistance and escape</b>	<p>Most slave resistance in Africa was caused by African people rebelling against being sold to other countries or being taken to the Americas.</p>
<b>Legacy and impact</b>	<p>It is estimated that there are around 40 million slaves in the world today with 62% being African slaves.</p> <p>The last country to officially abolish slavery was Mauritania, an African country in North-west Africa, in 1981.</p>

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## 12. Year 8 History: Africa

### Treatment of African slaves in Brazil

Aspects of life	Details
<b>Treatment by masters</b>	<p>4.9 million African slaves were taken to Brazil.</p> <p>40% of all African slaves taken to the Americas were taken to Brazil.</p> <p>30% of Brazil's population was made up of African slaves.</p> <p>African slaves worked on the sugar cane fields.</p> <p>From 1690, African slaves mined gold and diamonds</p> <p>Male slaves were forced to work long hours without breaks in the fields or mines.</p> <p>Slaves would be harshly punished (whipped, beaten, even killed) if they did not work fast enough.</p> <p>Female slaves were often raped by their masters and brought forth a new generation of Brazilians.</p>

Aspects of life	Details
<b>Forms of resistance and escape</b>	<p>Runaway slaves in Brazil created new settlements called quilombos (free communities).</p> <p>Quilombos were located in the Serra da Barriga- a mountainous area in Brazil.</p> <p>The Palmares was a quilombos which was the home of 10,000-30,000 escaped slaves.</p>
<b>Legacy and impact</b>	<p>Slavery in Brazil was abolished in 1888, but slaves were not given any money or land when they became free.</p> <p>Today, millions of Afro-Brazilians live in poverty in favelas.</p> <p>Young Afro-Brazilians make up 2/3 of Brazil's 60,000 victims of violent crime each year.</p> <p>2/3 of the country's prison population are Afro-Brazilian.</p>

## 13. Year 8 History: Africa

### Treatment of African slaves in the Southern states of America

Aspects of life	Details
<b>Treatment by masters</b>	<p>African slaves taken to the United States were chattel slaves.</p> <p>African slaves worked on cotton plantations (farms) in the Southern states.</p> <p>They would work up to 16 hours a day without breaks, food or water and would be whipped if they did not 'work hard enough'.</p> <p>Pregnant women were expected to work and strap the baby to them when it was born.</p> <p>Children as young as 6 worked in the fields.</p> <p>The slaves lived in wooden shacks on the plantations.</p> <p>There was no privacy and 12 or more slaves living in them.</p>

Aspects of life	Details
<b>Forms of resistance and escape</b>	<p>Slaves passively resisted by breaking tools, faking illness and stealing food.</p> <p>Slaves would escape and go to the Northern states or Native communities- some even got to Canada.</p> <p>Escaped slaves would use the Underground Railroad to escape.</p> <p>By 1850 over 100,000 slaves had escaped via the 'Railroad'.</p>
<b>Legacy and impact</b>	<p>Slavery was abolished in 1865.</p> <p>Southern states introduced Jim Crow laws to keep African Americans separate from white Americans.</p> <p>These laws were not removed until 1964.</p> <p>Some African-Americans today live in ghettos and struggle due to lack of a good education and opportunities.</p>

## 14. Year 8 History: Africa

### Treatment of African slaves in England

Aspects of life	Details
<b>Treatment by masters</b>	<p>A very small number of African slaves were brought back to England.</p> <p>African slaves were sold in London, Liverpool and Bristol.</p> <p>African slaves were sold to government officials, military leaders and planters (rich farmers).</p> <p>Slavery in England was legal until 1722.</p> <p>African slaves were made to work as butlers and maids.</p> <p>They were made to look exotic and used to show off the wealth of their owners.</p> <p>African slaves in England had no freedom and were treated like objects.</p>

Aspects of life	Details
<b>Forms of resistance and escape</b>	<p>African slaves who escaped lived in poverty on the streets.</p> <p>Masters would put up lost-and-found adverts.</p> <p>In London, escaped slaves would flee to the East End.</p> <p>They would become pickpockets, beggars and work on ships.</p> <p>The poor white community living on the streets often helped to hide escaped African slaves.</p>
<b>Legacy and impact</b>	<p>Britain abolished slavery in their empire in 1833.</p> <p>Britain paid the slave owners the equivalent of £20 billion.</p> <p>The loans used to pay the owners were not paid back until 2015.</p> <p>Newly freed slaves were given no money or support but had to work for their old owners every week until 1838.</p>

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## 15. Slave Revolts: 1730-1811

### 1730- First Maroon War (Jamaica)

The Maroon were escaped slaves in Jamaica who lived in the hills and forests. They would help rescue slaves and use violence against British slave owners in Jamaica.

In 1739 the Maroon people signed an agreement with the British. The agreement gave the Maroon more freedom and rights.

The Maroon promised to return escaped slaves after the agreement was signed.

### 1791-1804- Haitian Revolution (St Domingue/Haiti)

Saint Domingue was a French colony, rich in sugar and located in the Caribbean. A slave army led by Toussaint L'Ouverture burned the plantations and defeated the French soldiers.

The ex-slaves took control of the island and renamed it Haiti. Haiti became a beacon of hope to other slaves in the Caribbean and escaped slaves even tried to travel there.

In 1793 the British fought against the ex-slave army in Haiti but they were defeated.

96 African slaves were being taken from Guinea to Rhode Island (USA). Some of the African male slaves slipped out of their shackles and overpowered the crew.

3 members of the crew were killed, the rest were taken prisoner. The African slaves sailed back to the Sierra Leone river and abandoned the ship and crew.

### 1730- Little George Ship Revolt (Slave ship)

Biggest slave revolt in US history. 200-500 slaves took part in the revolt. Slaves from sugar plantations marched 20 miles over 2 days.

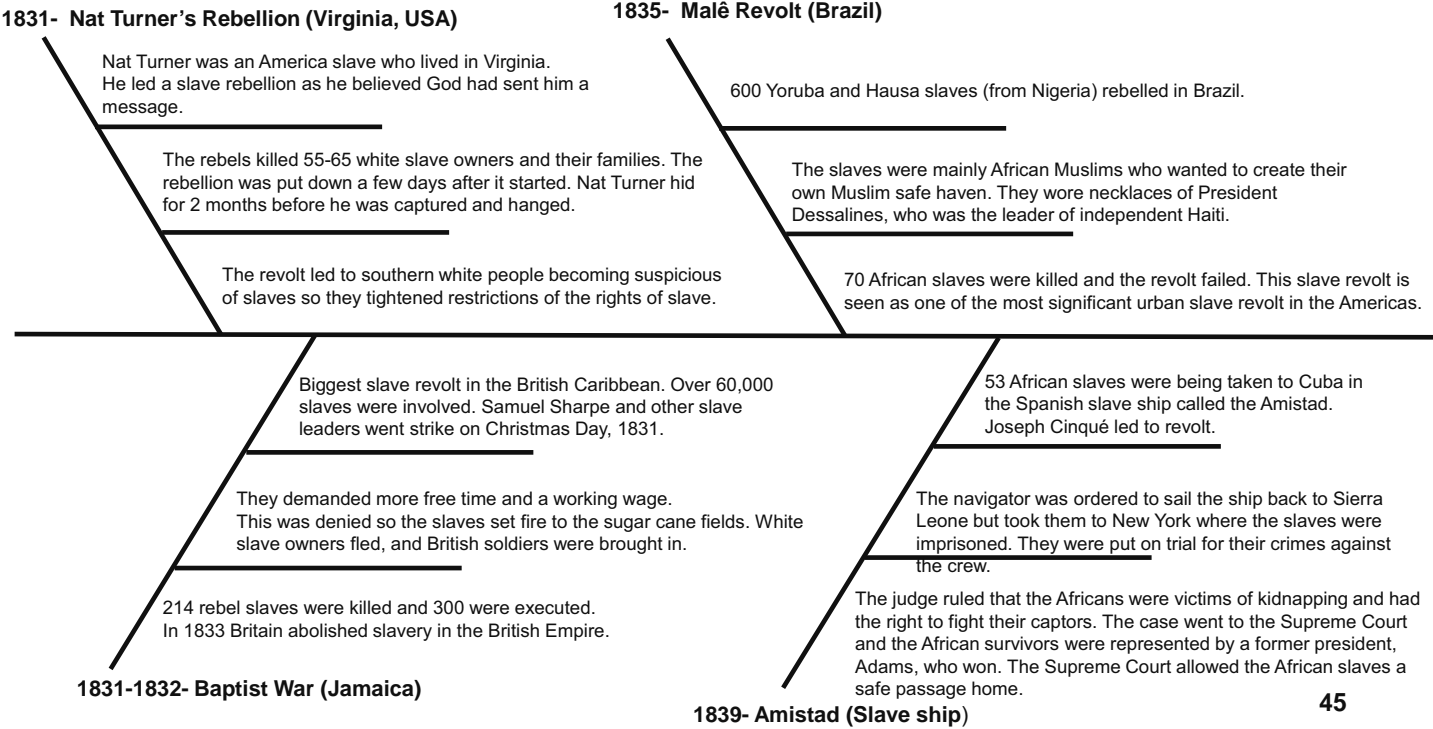
During the march they burned 5 plantation houses, several sugarhouses and crops. They were armed with hand tools and killed 2 white men.

Soldiers were used to put down the revolt. 95 slaves were killed and executed.

### 1811- German Coast Uprising (New Orleans, USA)

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16. Slave Revolts: 1831-1839



17. Year 8 History: Africa

The Scramble for Africa

Key questions	Details
Who	Britain, France, Germany, Portugal, Belgium, Italy and Spain.
What	By 1914, 90% of Africa was under European rule.
When	Between 1881-1914.
Where	The beginning of the Scramble for Africa was at the Berlin Conference in 1884.  European countries decided which areas of Africa would be controlled by who.

Factor	Why?	Details
	Economic	Britain, France and Germany were competing for global trade.  Explorers located lots of raw materials in Africa.  Cecil Rhodes, a British coloniser, made a fortune from the diamond and gold mines in South Africa.  The Industrial Revolution in Britain increased the need for Palm Oil to lubricate machines.
	Political	The leader of Germany, Bismarck, wanted to expand their empire.
	Religious	Dr Livingstone, a Scottish missionary, wanted to make sure slavery was not continuing in Africa after it was abolished by Britain in 1833.  Christian missionaries felt it was their duty to 'civilise' the Africans

## 18. Year 8 History: Africa

### Impact of the Scramble for Africa

#### Impact for Europe

European countries took the best land.

European countries used Africans as cheap workers.

Raw materials were taken from Africa to European to manufacture in their factories then sold all around the world.

During the First and Second World Wars European countries used soldiers from their African colonies to fight for them.

#### Impact for Africa

Many Africans lost their land and had to work for poor wages on European owned land which had been stolen.

Due to the way Africa had been divided conflict grew within countries where different ethnic groups were forced to live.

Example- Rwandan Genocide 1994.

European medicine was introduced in Africa.

Africa's population grew from 120 million in 1900 to over 1 billion today.

Land was used to grow cash crops such as: coffee, cocoa, tea and cotton so there was little land left to grow food crops.

This led to famine and starvation.

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## 19. Year 8 History: Africa

### Experiences of African and black soldiers in the First World War

Soldiers	First World War
African	2.35 million
Caribbean/West Indies	20,500
African American	350,000

Soldiers	Experiences in the First World War
African	Many were used as carriers. Due to the way borders had been drawn in the Berlin Conference, African soldiers found themselves fighting friends/family. The French used African soldiers to shock the Germans and to spare French soldiers from being killed.

Soldiers	Experiences in the First World War
Caribbean/ West Indies	At first, the British did not want black soldiers fighting white Europeans. By 1915, King George allowed volunteers from the Caribbean to join the British forces. They were paid less than the white soldiers and had to do jobs such as: carrying equipment, digging trenches, building roads and railways. Caribbean soldiers had to put out fires in burning, sometimes, exploding areas.

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## 20. Year 8 History: Africa

### Experiences of African and black soldiers in the First World War

Soldiers	Experiences in the First World War
<b>African American</b>	The Harlem Hellfighters were a group of 3,000 African American soldiers who fought for America against the Central Powers.  They were the most decorated black soldiers in the First World War.  Henry Johnson, known as “Black Death”, was the first American of any ethnicity to be given the French Croix de Guerre.

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## 21. Year 8 History: Africa

### Experiences of African and black soldiers in the Second World War

Soldiers	Second World War
<b>African</b>	Over 1 million
<b>Caribbean/West Indies</b>	16,000
<b>African American</b>	125,000

Soldiers	Experiences in the First World War
<b>African</b>	The King's African Rifles were soldiers from Britain's African colonies who fought in the Second World War.  They were very important in fighting and defeating the Italians in Abyssinia (modern day Ethiopia).

Soldiers	Experiences in the Second World War
<b>Caribbean/ West Indies</b>	Many Caribbean soldiers who had fought for Britain in the Second World War migrated to Britain to help rebuild the 'mother country'.
<b>African American</b>	They were kept separate from white soldiers.  African American nurses were the only nurses allowed to help African American soldiers.  After the sacrifices and bravery of African American units such as: the Tuskegee Airmen and 761st Tank Battalion, President Truman desegregated all military units in 1948.

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## 22. Year 8 History: Africa

### Impact of African and black soldiers fighting in the war: Positives

#### Positives

After the Second World War the British government created the British Nationality Act which allowed members of the Commonwealth to live in Britain.

After the Second World War, many African countries started to demand their independence.

Britain and other European countries, who had colonies in Africa, could not continue to rule over countries who had given soldiers to help fight for freedom against the Nazis when they had no freedom themselves.

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#### Positives

In 2017 the African and Caribbean War Memorial was unveiled in Windrush Square in Brixton, South London. It was dedicated to the 70,000 men and women from the Caribbean and Africa who died for Britain in the war.

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## 23. Year 8 History: Africa

### Impact of African and black soldiers fighting in the war: Negatives

#### Negatives

After the First World War the German colony of Cameroon was split between Britain and France.

In 1960 the 2 parts were given independence and reunited.

There was violence between the 2 parts.

The German colony of Namibia was put under the protection of the League of Nations after the First World War.

The South African government invaded and took control of Namibia enforcing its Apartheid rules which discriminated against black people.

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#### Negatives

African American soldiers returning to Southern states after both wars had to follow the Jim Crow laws.

These laws kept African American and white Americans separate.

The Jim Crow laws were not abolished until 1964 under the Civil Rights Act.

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## 24. Year 8 History: Africa

### Causes of independence In Africa

Factor	Causes of independence in Africa	
	<b>War and violence</b>	During the Second World War over 1.4 million African soldiers fought in the war.
	<b>War and violence</b>	After the war ended in 1945 many colonies demanded their independence by rebelling against colonial rule.
	<b>Economic</b>	Countries like Britain and France did not have the strength and money to hold on to their colonies.
	<b>Ideas about equality and freedom</b>	Many African soldiers who had fought against Nazi Germany felt they had been fighting to defend freedom but did not have their own.
	<b>Government</b>	<p>Britain's government were too weak to keep control over countries who fought against them.</p> <p>India had been given its independence in 1947 which set an example for other colonies to follow.</p>

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## 25. Year 8 History: Africa

### Independence of Kenya

Key questions	Actions by Kenyans
<b>When</b>	12 <sup>th</sup> December 1963
<b>Who</b>	<p>In the 1940s the Kenya African Union (KAU) was setup.</p> <p>Jomo Kenyatta was the leader.</p> <p>They demanded independence and access to white-owned land.</p>
<b>What</b>	<p>In the 1950s Kenyans protested and rebelled against British rule.</p> <p>The Mau Mau rebellion lasted 8 years.</p> <p>The Mau Mau used violence against British settlements.</p> <p>10,000 members of the Mau Mau were killed and even more were imprisoned and tortured by the British.</p>
<b>Impact</b>	<p>Britain could not afford to fight against the Kenyan people who wanted independence.</p> <p>Jomo Kenyatta was elected Kenya's first black Prime Minister in 1964.</p>



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## 26. Year 8 History: Africa

### Impact of the independence of Kenya

Positives after independence	Negatives after independence
Kenya joined the Organisation of African Unity to trade with other independent African countries.	Kenyatta's 'Africanisation' policy led to the majority of Asian Kenyan's fleeing discrimination.
Foreign investment in Kenya doubled.	Kenyatta made Kenya a one-party- state meaning his party was the only one people could vote for.
The number of Secondary schools in Kenya increased by 80%	Kenyatta used violence against any other political groups who were against him.
The life expectancy in Kenya increased by 10 years.	Kenyatta used his power to give land to powerful people in government.

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## 27. Year 8 History: Africa

### Independence of Zimbabwe

Key questions	Actions by Zimbabweans
<b>When</b>	18 <sup>th</sup> April 1980
<b>Who</b>	The main groups who fought for independence from the majority white government were the Zimbabwe African People's Union (ZAPU) and the Zimbabwe African National Union (ZANU).
<b>What</b>	The Bush War or Zimbabwe War of Independence lasted 15 years. Black members of society fought against the white government who had declared Zimbabwe independent without Britain's permission.
<b>Impact</b>	<p>After much fighting an agreement was reached.</p> <p>Elections were held in February 1980.</p> <p>Robert Mugabe (leader of ZANU) was elected the first Prime Minister of Zimbabwe.</p>



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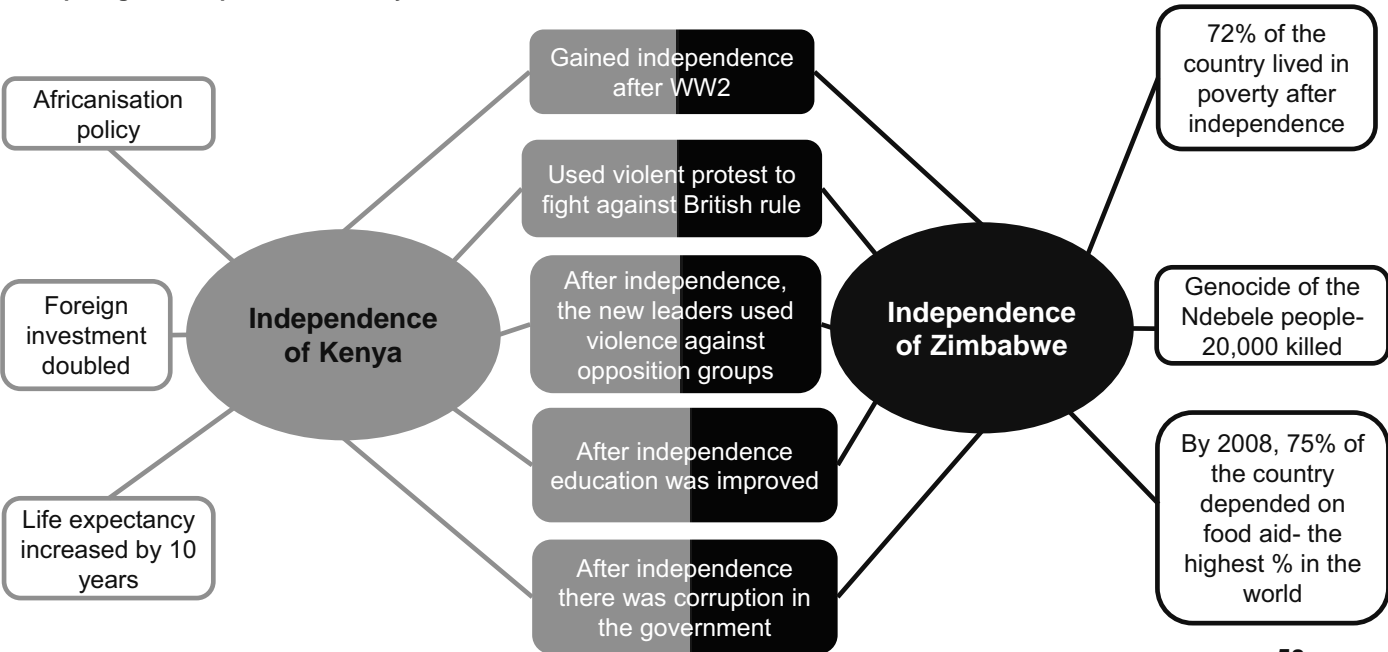
28. Year 8 History: Africa

Impact of the independence of Zimbabwe

Positives after independence	Negatives after independence
The literacy rate (number of people who can read and write) in 2015 was 90% of the population.	Mugabe used violence to remove opposition such as the Ndebele people.
The number of secondary schools increased from 177 to 1,548.	More than 20,000 Ndebele people were killed- seen as a genocide.
	Mugabe and his government stole money from Zimbabwe's diamond and mining industries.
	72% of the country lived in poverty and Zimbabwe lost \$1 million a year due to government corruption.

29. Year 8 History: Africa

Comparing the independence of Kenya and Zimbabwe



### 30. Year 8 History: Africa

#### Arab Spring

Key questions	Arab Spring
<b>When</b>	The movement started in Dec 2010 and lasted until late 2011
<b>Where</b>	The uprisings were in largely Muslim countries such as: Tunisia, Morocco, Syria, Libya, Egypt and Bahrain.
<b>What</b>	The protests were based mainly on wanting leader and government changes. Protesters wanted increased democracy and cultural freedom
<b>How</b>	The movement was helped due to the use of social media platforms such as Facebook and Twitter. These social media platforms helped to spread messages and organise protests.

#### What happened after the Arab Spring?



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### 31. Year 8 History: Africa

#### Arab Spring in Tunisia

Key questions	The Jasmine Revolution
<b>Causes</b>	Mohammed Bouazizi set himself on fire outside a government office building to protest against government corruption. Bouazizi was a fruit seller who was fed up with local officials demanding bribes. Anger over Bouazizi's situation inspired other Tunisians who were suffering due to unemployment, poverty and political inequality.

Key questions	The Jasmine Revolution
<b>Actions of the people</b>	Street demonstrations, rallies and strikes broke out across the country. Protesters used social media, such as Facebook and Twitter, to organise the protests.
<b>Government response</b>	Ben Ali (the President of Tunisia) made promises to make social, political and economic changes. His promises did not stop the protests which had swept across the country. Ben Ali and his family fled the country. Tunisians called for his arrest as he had stolen billions of dollars from Tunisia through corruption.

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### 32. Year 8 History: Africa

#### Arab Spring in Libya

Key questions	The Libyan Civil War
<b>Causes</b>	<p>Inspired by events in Tunisia.</p> <p>Colonel Muammar Gaddafi, the head of the government, was seen as very corrupt.</p> <p>He had control over Libya's oil which made up 90% of the country's wealth.</p> <p>Gaddafi was seen as a dictator who violated human rights and supported global terrorist groups.</p> <p>In 2009 and 2011 Libya was voted the most censored country in the Middle East and North Africa.</p>

Key questions	The Libyan Civil War
<b>Actions of the people</b>	<p>There were street demonstrations and protests all over Libya.</p> <p>Violence was used such as: petrol bombs, throwing rocks and setting fire to police and security buildings.</p> <p>A website was set up which aimed to replace the government.</p>
<b>Government response</b>	<p>Gaddafi ordered the army to use violence against protesters.</p> <p>Gaddafi imprisoned tens of thousands of protesters.</p> <p>Countries across the world (including the UK) used the air force and navy to support the protesters.</p> <p>Gaddafi was killed by the new National Transitional Council (new government) on the 20th October 2011.</p>

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### 33. Year 8 History: Africa

#### Arab Spring in Egypt

Key questions	The Egyptian Revolution
<b>Causes</b>	<p>Inspired by events in Tunisia, and Libya.</p> <p>Protesters in Egypt demanded the President, Hosni Mubarak be overthrown.</p> <p>Many protesters were against increasing police brutality (violence) during the years of Mubarak's rule.</p> <p>People were angry about the lack of political freedom, freedom of speech, government corruption, unemployment, high price of foods and low wages.</p>

Key questions	The Egyptian Revolution
<b>Actions of the people</b>	<p>Methods used by the protesters included: demonstrations, marches, occupying certain areas (refusing to move), violence and strikes (this was mainly workers and trade unions).</p>
<b>Government response</b>	<p>Many protesters were attacked by military police.</p> <p>Over 846 people were killed and over 6,000 injured.</p> <p>On the 11th February 2011 President Mubarak stepped down.</p> <p>He was arrested and interrogated in May 2011 for his actions as president.</p>

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### 34. Year 8 History: Africa

#### Arab Spring in Syria

Key questions Syrian Civil War	
Causes	Inspired by events in Tunisia, Libya and Egypt.
	Bashar Al-Assad (Syrian President) created a new constitution (set of rules) in 1973 which did not require the president of Syria to be a Muslim; which angered the Muslim Brotherhood.
	There was a drought (very little/no rain) which lasted from 2006-2011 which led to many dying of famine (starvation).
	People in Syria did not have freedom of speech and public gatherings of more than 5 people could lead to imprisonment.

Key questions Syrian Civil War	
Actions of the people	Protesters protested in the streets and burned down important government buildings.
	A Civil War broke out in Syria- it is still going on today.
	America and Turkey support the protesters with weapons, soldiers and airstrikes.
Government response	The army used tanks, guns and other weapons against the protesters -1,000 civilian had died by May 2011.
	Russia and Iran both support Assad and provide weapons, air strikes, training and intelligence sharing (giving them information).
	More than 400,000 people have been killed in Syria so far.

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### 35. Year 8 History: Africa

#### Impact of the Arab Spring

Positives
The Arab Spring movement inspired other movements such as the Occupy movement and the Spanish Indignados Movement .
The protests across the Arab world showed that the actions of ordinary people could lead to the removal of leaders who were corrupt.
Many of the demands of the Egyptian protesters have been met such as: rise in the minimum wage, ending curfew and the arrest of Mubarak.

Negatives
In Syria, due to the Civil War, the terrorist group (Islamic State/IS) has increased in power.
In August 2013 hundreds were killed by a chemical weapon fired over homes in Damascus in Syria.
The overthrow of leaders in Egypt, Tunisia and Libya has created conflict between groups in the countries about how the new government should function.
Economic problems (unemployment and poor wages) which had caused the protests have not improved for many ordinary people.
The UN has warned that the rising violence in Libya could cause a full-scale civil war.

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# Year 8 History

## Asia

The world's largest and most populous continent which borders Europe to the west, with the Indian Ocean to the south and Pacific Ocean to the east of it.

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### 1. Year 8 History: Asia Unit Overview

#### Mugal Empire

1526 - 1857

An Islamic Empire in control of much of northern and central India. The East India Company grew in power after 1757

#### World War 2 in Asia

1940 to 1945

In 1941 Japan attacked Pearl Harbor bringing the USA into World War 2. In 1945 the USA used the Atomic bomb to bring the war to an end.

#### Korea today

1953 to Present

The two Korean states are still officially at war. A demilitarised zone separates them. The South is much richer than the North.

After the rebellion of 1857 The British Army took control of India. By 1947 India and Pakistan were independent.

1857 to 1947

Britain in India

A war for control of the whole of Korea between North and South Korea. China and the UN also fought. The war was a stalemate.

1950 - 1953

The Korean War

A struggle for control of Vietnam after World War 2. Communist North Vietnam won, forcing the USA out of Vietnam and unifying the nation.

1945 to 1975

The Vietnam War

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## 2. Year 8 History: Asia

### The Mughal Empire

#### The Mughal Empire

**When** 1526 - 1857

#### Economy



By 1600 it had the largest Economy in the world, richer than all of Europe and also China.

It had one currency, the Rupee, and a well organised tax system.

The economy was based on agriculture but industry was developing.

The Mughals built a road system to help trade develop.

#### Growth of the Mughal Empire, 1526–1707



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## 3. Year 8 History: Asia

### The Mughal Empire

#### The Mughal Empire

#### Society

The Mughal Empire had many large urban cities with populations over 500,000.

The Empire had a feudal system with the Emperor at the top, then Chieftains called Zamindars next.

The Emperors were Muslim but usually treated Hindus as equals.

The Empire was divided into regions called Subah.

#### The Mughal Empire

#### Legacy

The Mughals brought Persian influence to India.

They developed arts in particular architecture creating buildings such as the Taj Mahal.

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#### 4. Year 8 History: Asia

##### The East India Company

Key question	Details
When	1600 - 1858 AD
Origins	The Company was set up in 1600 and granted a charter by Queen Elizabeth I. It was set up to organise trade with the East Indies, Asia. The East India company got permission of the Mughal Emperors to set up trading stations called Factories in the Mughal Empire.

Key question	Details
Growth	Set up its own army in India and employed local soldiers called Sepoys. Fought against other European traders and local rulers. 1757 Battle of Plassey gave it control over Bengal, although the Mughal Emperors were officially in charge. It's power over India grew until 1857.

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#### 5. Year 8 History: Asia

##### The Indian Rebellion

Key question	Details
When	1857 - 1858 AD
Origins	Many Indian soldiers did not like fighting other Indians. The Company did not respect Indian traditions and religions. People objected to the Company's high taxes. There had been famines in India

Key question	Details
Result	The Rebellion was brutally put down with public execution of many rebels. The last Mughal Emperor was deposed in 1857. The British called the Rebellion a Mutiny. The British Government took control of India and the East India Company was wound up. In 1876 Queen Victoria was crowned Empress of India.

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## 6. Year 8 History: Asia

### The British Raj

Key question	Details
<b>When</b>	1858 AD – 1947 AD
<b>Origins</b>	<p>The Indian National Congress was set up in 1885. By the early 20<sup>th</sup> Century it was campaigning for Independence.</p> <p>Indian people were fed up with high taxes, famine and being treated unfairly by the British.</p>

Key question	Details
<b>Growth</b>	<p>The British sometimes dealt with protest very harshly, including in 1919 a massacre of peaceful protesters.</p> <p>From 1921 Congress was led by Mahatma Gandhi. He organised a very successful, non-violent campaign.</p> <p>Gandhi organised events like the Salt March that attracted the attention of the World's media.</p>

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## 7. Year 8 History: Asia

### Indian Independence

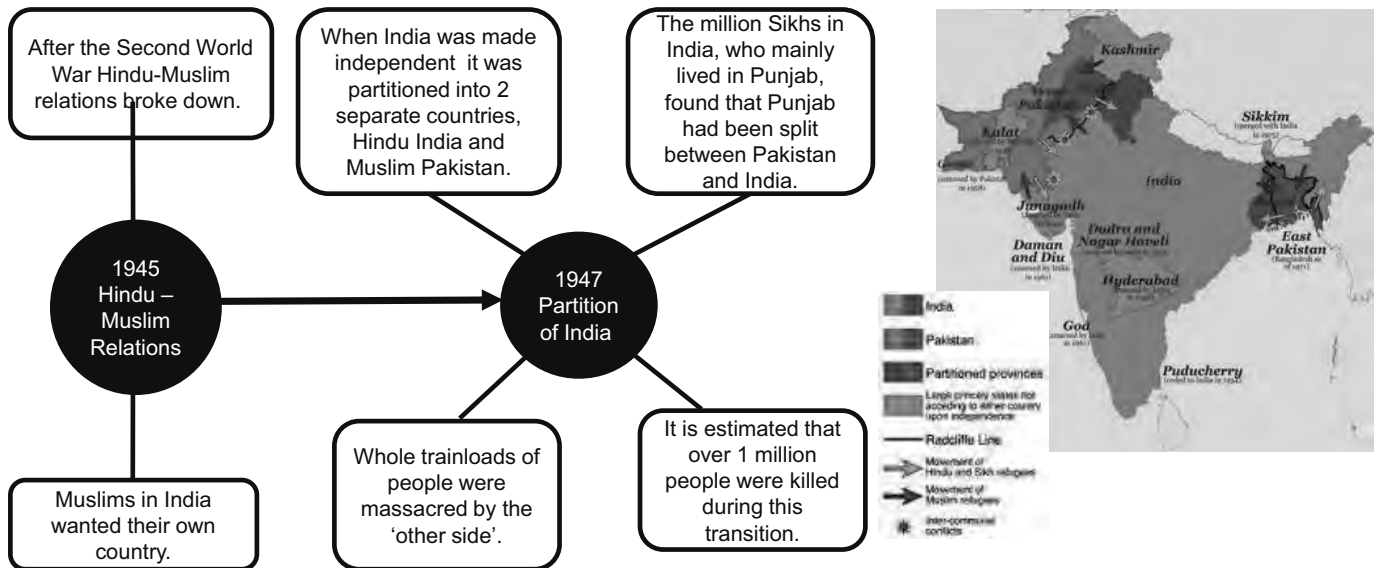
Towards Independence	
<b>Talks</b>	The British Government invited Gandhi and other Indian leaders to the Round Table Conferences in London. The talks failed.
<b>Split</b>	Indian Muslims increasingly called for a separate state for areas where the majority were Muslim. The state was to be called Pakistan. The Muslim League was led by Muhammad Ali Jinnah.

Towards Independence	
<b>War</b>	<p>Gandhi stated that Britain could not claim to fight for freedom while refusing to give India freedom.</p> <p>The war bankrupted Britain. They could not afford to control India anymore.</p>
<b>1947</b>	In August 1947 British rule of India ended. The States of India and Pakistan were set up.

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## 8. Year 8 History: Asia

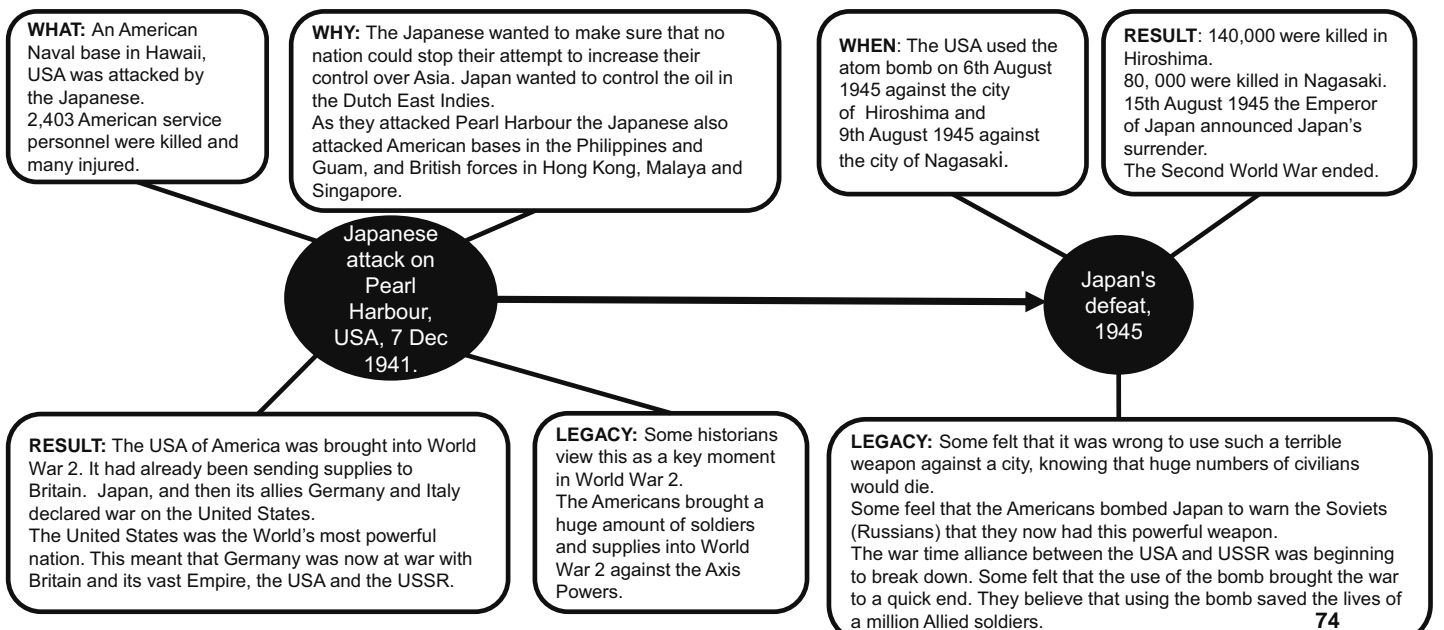
### Partition of India



73

## 9. Year 8 History: Asia

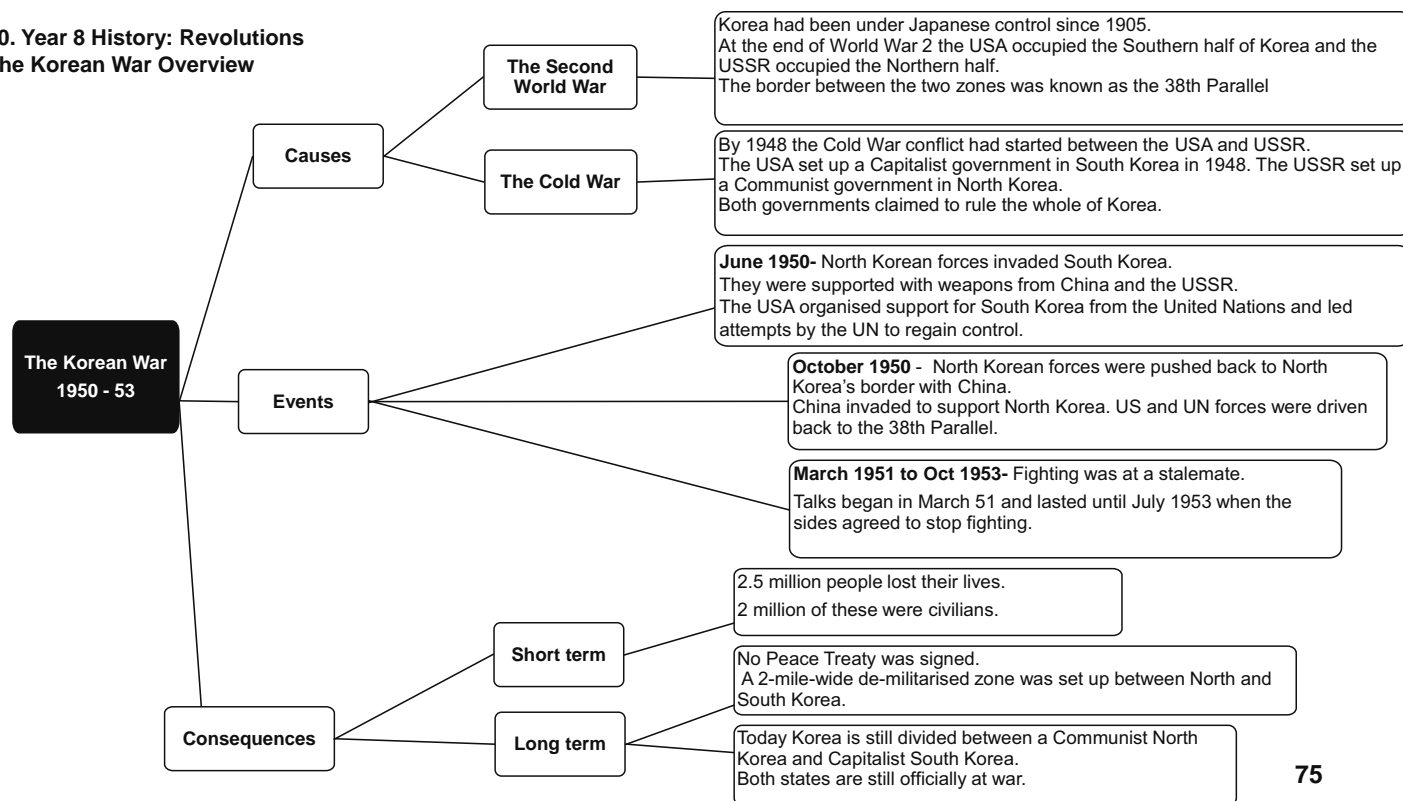
### Conflict between the USA and Japan in World War 2



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## 10. Year 8 History: Revolutions

### The Korean War Overview



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## 11. Year 8 History: Asia

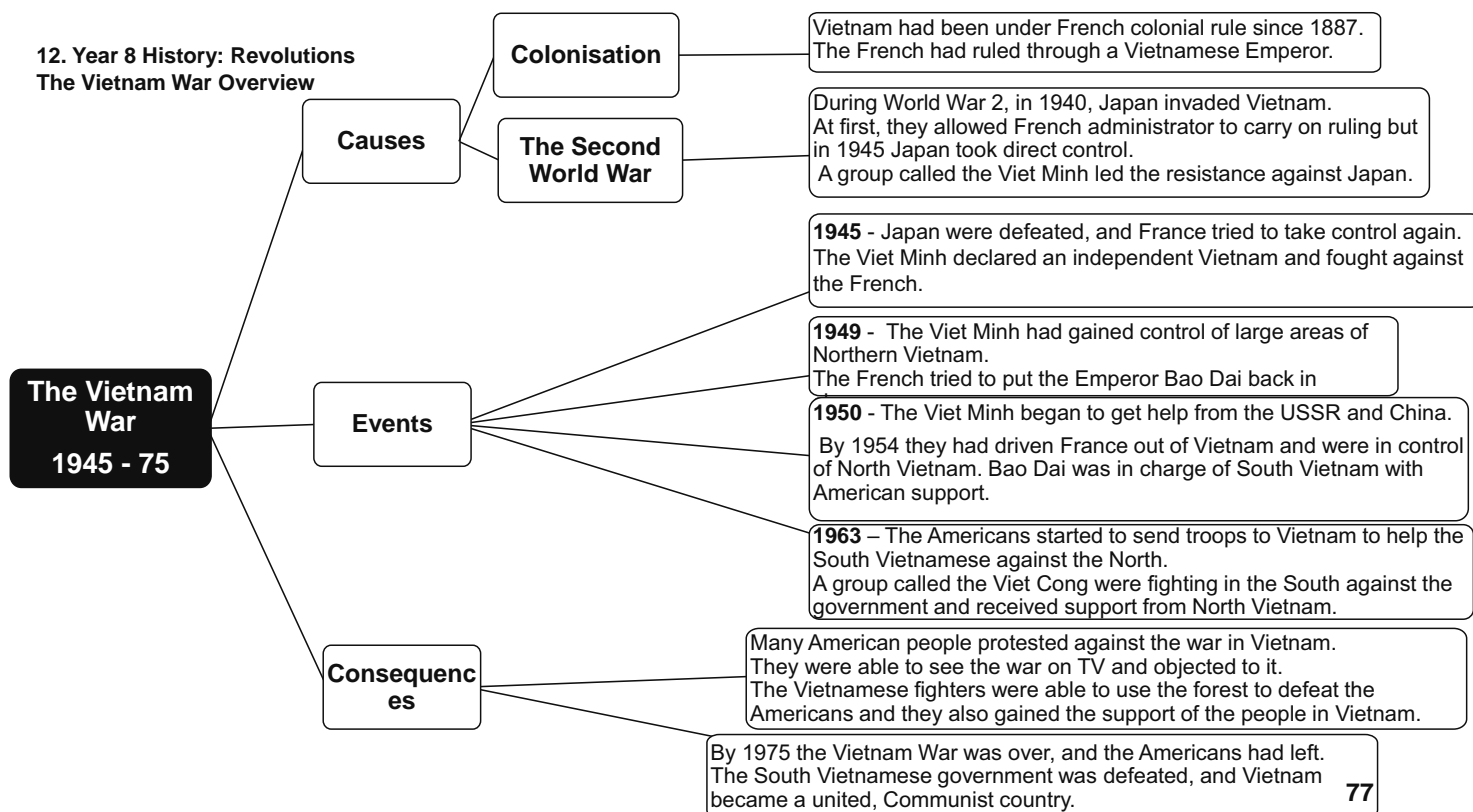
### Korea today

Part of Korea	Details
<b>North Korea</b>	<p>Still a Communist state ruled by Kim Jong-un. His father and grandfather ran North Korea before him.</p> <p>North Korea spends a large amount of its income on its military.</p> <p>It has developed missiles and has the Atomic bomb.</p> <p>It is a very poor, under-developed country.</p> <p>It has a very poor Human Rights record.</p> <p>China (also Communist) is now its only real ally but is often embarrassed by North Korea's behaviour.</p>

Part of Korea	Details
<b>South Korea</b>	<p>Still a Capitalist country. Now a democracy with a good recent Human Rights record.</p> <p>It is one of the World's most Economically developed nations.</p> <p>It has a strong military. It is allied to the USA and American troops are still based in South Korea.</p>
<b>Problem today</b>	<p>North Korea keeps testing and developing its missiles despite international condemnation, including from China.</p> <p>It tests the weapons by firing them over Japan and across the Pacific Ocean towards the USA.</p>

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## 12. Year 8 History: Revolutions The Vietnam War Overview



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## 13 Year 8 History: Asia

### The Origins of the Vietnam War

Dates	Key Events
1887	Vietnam was under French control as a part of French Indo-China. France ruled through the local Emperor.
Sept 1940	Japan invaded Vietnam but kept the French administration in charge. Japan was allied to Germany in World War 2
March 1945	Japan took control of Vietnam. A Vietnamese group, the Viet Minh, fought against Japan with American support.
September 1945	Japan was defeated in World War 2. The leader of the Viet Minh declared the existence of the Democratic Republic of Vietnam. However British and French troops restored French control. The Viet Minh fought back from the hilly areas.

Dates	Key Events
1949	The French tried to put the Emperor Bao Dai back in charge of Vietnam as an alternative to the Viet Minh who were gaining power over North Vietnam.
1950	China and the USSR recognised the Viet Minh as the Government of North Vietnam and provided them with weapons. Fighting continued until 1954.
1954	The French were forced out of Vietnam after the Battle of Dien Bien Phu. Vietnam became independent but the Viet Minh were in charge in the North. Bao Dai was in charge of the South with American support.

#### 14. Year 8 History: Asia

##### The Vietnam War 1955 – 1975.

###### Vietnam War 1955 - 1975

The Vietnam War was fought between North Vietnam and South Vietnam for control of the whole nation.

The USA supported South Vietnam and from 1963 were sending troops to support the South Vietnamese.

China and the USSR supported North Vietnam and their allies in South Vietnam, a group of fighters called the Viet Cong.

By 1975 the Americans and South Vietnamese had lost. Vietnam was united under the North Vietnamese government.

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#### 15. Year 8 History: Asia

##### The Vietnam War: Why did the Americans lose?

###### Reasons for American defeat.

**Losing Hearts and Minds** The poor treatment of South Vietnamese villagers turned them against their government. They began to support and join the Viet Cong.

**Landscape** The Viet Cong and North Vietnamese knew and used the landscape well. They used the dense forest well and were able to launch surprise attacks on the Americans.

**Lack of Will** By 1973 American politicians had given up.

###### Reasons for American defeat.

**Lack of Support at home** There were many protests in the USA against American involvement in the War. Some Americans refused to serve e.g. Muhammad Ali, the boxer.

**Media coverage** American news broadcasters were not censored. Americans were turned against the war by the coverage, particularly footage of the behaviour of the South Vietnamese army.

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# Year 8 History

## Persecution

Hostility and ill-treatment, especially because of race or political or religious beliefs.

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### 1. Year 8 History: Persecution Unit Overview

#### Jews

1<sup>st</sup> Century CE

Jews were massacred by the Romans in Jerusalem after their unsuccessful revolt.

#### Crusades in the Holy Land

1096-1291

Christians and Muslims fought over the Holy Land for 200 years.

When the Christians re-took Jerusalem, they murdered the Muslims and Jews in the city.

#### Mongolians and Genghis Khan

1206-1405

The Mongols conquered land in Asia and Europe.

It is estimated between 20-57 million people were killed.

Christians throughout the Roman Empire were persecuted and killed

64-313 CE

#### Romans and Christians

1290 Edward I expelled all Jews from England.

1189 & 1190 there were massacres of Jews in London and York.

1070-1290

#### Jews in England

By 1900 the Native population has decreased by 80%.

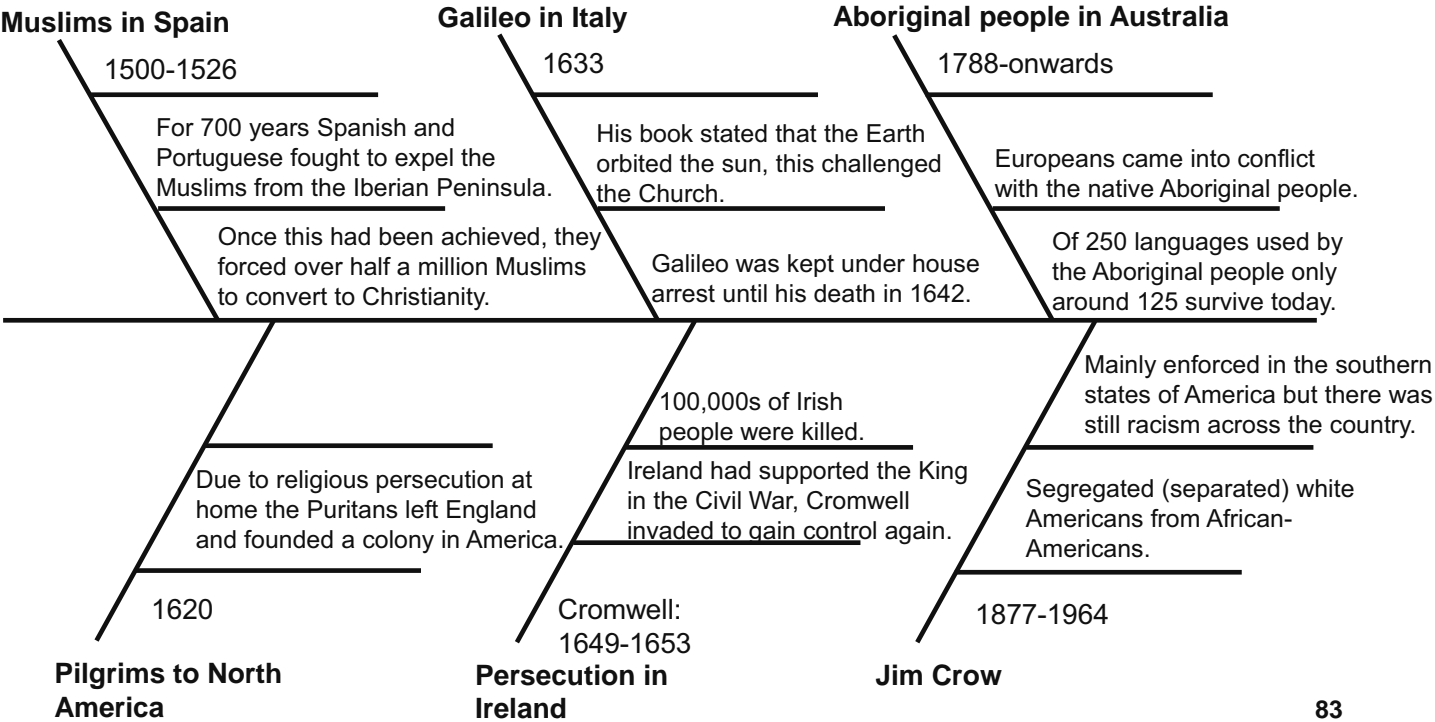
Europeans began to colonise America. They brought new diseases to and fought with the Native Americans.

1491-1900

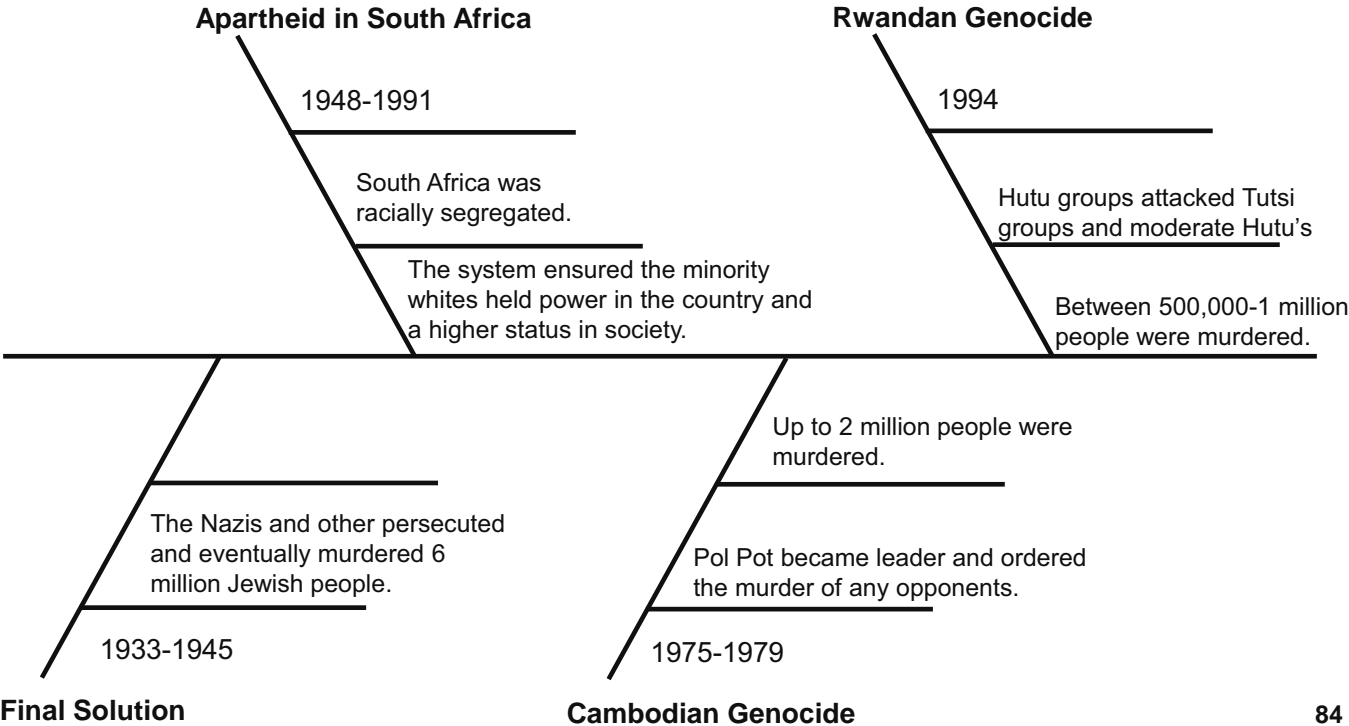
#### Native people of America

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2. Year 8 History: Persecution  
Unit Overview



3. Year 8 History: Persecution  
Unit Overview





#### 4. Year 8 History: Persecution

##### Crusades

Crusade/Event	Date	Description
Council of Clermont	1095	Pope Urban II asked Christians to go to Holy Land and take Jerusalem.
First Crusade	1096-1099	The most successful crusade captured much of the Holy Land.
Taking of Jerusalem	1099	After Jerusalem was taken thousands of Jews and Muslims were murdered.
Third Crusade	1189-1192	Richard the Lionheart set out to take back Jerusalem from the Muslim forces who had re-captured it in 1187.  He failed but did agree with the Muslims that Christians could go to Jerusalem.

Crusade/Event	Date	Description
Fourth, fifth, sixth and seventh crusade	1202-1250	All failed to re-take Jerusalem.
Fall of Acre	1291	This was the Christian last city in the Holy Land.  It was captured by the Muslims in 1291.

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#### 5. Year 8 History: Persecution

##### Ireland

Date	Event
400AD-432AD	Conversion of Irish paganism to Christianity.
Norman Conquest	Henry II's invasion and raids of Ireland led to both 'England' and Ireland being ruled by the same king for the first time.
Tudors	Henry VIII declares himself King of Ireland.  English Protestant were encouraged to move to Catholic Ireland.
1640	25,000 English and Scots encouraged to go and live in Ireland.  Aim was to 'civilise' the Irish people by making their culture more English.

Date	Event
1649	After the English Revolution Cromwell led an army of 12,000 to 'deal' with the Irish people
September 1649	Siege of Drogheda  When Cromwell's forces took Drogheda lots of Irish soldiers and civilians were murdered.
1653	Under Cromwell the people of Ireland were persecuted: <ul style="list-style-type: none"><li>• He took land from the Irish Catholics and gave it to English Protestants.</li><li>• Irish Catholics were not allowed to serve in Parliament or marry Protestants.</li><li>• His reign saw 40-60% of the Irish population die of famine, torture or they were killed by the English army.</li></ul>

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## 6. Year 8 History: Persecution

### Ireland continued

Date	Event
1798	British government massacred those involved in a rebellion in Ireland.  The leaders were burnt alive or hung for treason.
18 <sup>th</sup> -19 <sup>th</sup> century	The Irish language was banned from society and education.
Victorian	Ireland suffered due to a disease which affected potato crops.  This was known as the Great Potato Famine.  Many died or migrated to other places, like America.

Date	Event
Home Rule	England blocked Ireland's wish to govern themselves for many years. Parliament refused to pass the Irish Home Rule Bill three times.
Troubles	Bloody Sunday.  British Army broke the Rules of Engagement when they open fired and killed people without due reason.

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## 7. Year 8 History: Persecution

### Natives in America

Date	Event
1600-1700s	European settlers in the East had begun to force Native Americans to move towards the East.
1828	Andrew Jackson became US President and promised to deal with the 'Indian problem'.
1830	Gold was discovered in Georgia.  White settlers were encouraged to move to areas where the Cherokee lived.
1830	Removal Act- Law intended to move Native Americans west of the Mississippi river.  The Supreme Court said the law was illegal, the President ignored them.

Date	Event
May 1838	7000 troops arrived to forcibly remove the Cherokee.  This was the beginning of the Trail of Tears.
March 1839	The Cherokee arrive in their new home in Oklahoma.  Nearly 4000 had died on the journey, 20% of the whole Cherokee nation.
1845	John O'Sullivan wrote that it was the Manifest Destiny of white Americans to spread over all of America.  From this point on more and more Native Americans were forced from their homelands onto reservations.

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## 8. Year 8 History: Persecution

### Jim Crow

Jim Crow Laws	
What?	<p>Southern states passed 'Jim Crow' laws to reduce the rights and freedom of the newly freed African American people.</p> <p>These new laws segregated (kept separate) African Americans and white Americans.</p> <p>The laws began from 1877 and were not officially abolished until the Civil Rights Act in 1964.</p>

Jim Crow Laws	
What?	<p>African Americas were to have separate facilities to white Americans, such as: seats on the bus, public toilets, public water fountains, schools, libraries, churches, seats/entrances to the theatre, places refused to serve African Americans and many others.</p> <p>African Americans were not treated equally in the south.</p> <p>Many moved north and to the west to escape these restrictive laws.</p>

## 9. Year 8 History: Persecution

### Holocaust: before the Second World War

Date	Event	Detail
1924	Mein Kampf	Hitler wrote Mein Kampf (my struggle) in which he set out his views about the Jews and what should happen to them.
1933	Hitler comes to power in Germany	Immediately he begins to introduce anti-Semitic laws and propaganda into Germany.
1935	Nuremburg Laws	<p>The Nazis passed the laws which stated:</p> <ul style="list-style-type: none"> <li>-Jews were no longer citizens of Germany (this meant they lost many rights)</li> <li>-Jews could no longer marry other Germans</li> </ul>
1936	Laws against Jews	Jews must hand in all bikes and radios that they own.

Date	Event	Detail
1938	Kristallnacht	<p>Goebbels blamed the Jews for the death of a German diplomat in Paris.</p> <p>This unleashed a wave of violence.</p> <p>Synagogues, businesses and home were all destroyed and 26,000 Jews were arrested and sent to concentration camps.</p>
1939	Start of World War Two	<p>This meant many more Jews were living within the German Empire. A new solution was needed to deal with them.</p>

## 10. Year 8 History: Persecution

### Holocaust: During the Second World War

Date	Event	Detail
1939	Ghettoes	The Nazis began to round up the Jews in certain areas and force them to live in walled off areas of cities (ghettos) in appalling condition (little food and medicine).  One such example of this was the Warsaw ghetto in Poland
1939-41	Einsatzgruppen	SS killing squads followed behind the army rounding up the Jews and transporting them to mass graves where they would be shot and buried.

Date	Event	Detail
1942	Final Solution	The Nazi leaders decided that the killing squads were not quick enough and the men started to complain that the mass shootings were affecting them psychologically.  Leading Nazis met at Wannsee to decide the Final Solution.  A series of death camps were to be set up where Jews would be killed in the gas chambers and then burnt in incinerators.
1945	End of World War Two	6 million Jews have been murdered during the Holocaust.

## 11. Year 8 History: Persecution

### Holocaust: Key terms

Key terms	Definition
Holocaust	Persecution and murder of European Jews during 1933-1945
Einsatzgruppen	Killing squads sent to massacre Jews
Ghetto	Walled off area of a city where Jews were forced to live in horrendous conditions.
Concentration Camp	Camp where people were forced to work long hours with little food and rest. This led to some inmates dying from the conditions in the camp.

Key terms	Definition
Sonderkommando	Work units of Jews that were forced to empty the gas chambers and dispose of the bodies.
Death Camp	Camp where Nazi enemies would be murdered in gas chambers on arrival.
Auschwitz	Death camp in Poland.
Propaganda	Biased information to give only one side.  Nazis used this to portray the Jews negatively.

## 12. Year 8 History: Persecution

### Apartheid

Date	Event
1910	The Union of South Africa was formed.
1948	The National Party won the election and brought in white rule (Apartheid) in South Africa.
1952	Nelson Mandela led a campaign of defiance against Apartheid. People refused to follow the segregation laws and many were arrested.
1953	64 Rands was spent on white pupils but just 9 Rands on black pupils.
1959 & 1960	Further demonstrations were held. On one march the police opened fire and 69 people were killed.

Date	Event
1962	Mandela was arrested and sentenced to 27 years in prison.
1976	Soweto uprising by students. Police fire and kill two protestors however students continue to protest into the 1980s.
1989	F.W. de Klerk becomes President and begins to introduce a series of reforms that will eventually lead to the end of Apartheid.
1990	Mandela was released from jail.
1994	South Africa holds its first nationwide ballot. Mandela is elected as President of South Africa, bringing the era of Apartheid to an end.

## 13. Year 8 History: Persecution

### Apartheid

#### Key rules during Apartheid

Marriages between whites and blacks was not allowed.

The police had the power to arrest without evidence.

Black pupils were not expected to continue in school beyond primary level.

Public spaces were segregated, for example; cinemas, beaches, buses and toilets.

#### 14. Year 8 History: Persecution

##### Cambodian Genocide: Events

Date	Event
1953	Cambodia becomes independent from France.
1969-	Vietnam War bombing
1970	US bombs Cambodia as part of the war. This bombing helps the Khmer Rouge in the civil war.
1975	Pol Pot and the Khmer Rouge come to power in Cambodia

**Genocide:** The deliberate killing of a large group of people, especially those of a particular nation or ethnic group.

Date	Event
January	Education was banned.
1977	All children eight years and older were sent to re-education camps.
1975-	Genocide in Cambodia
1979	20% of the population is murdered.
1979	Vietnam invades and Pol Pot's rule ends, as does the genocide.

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#### 15. Year 8 History: Persecution

##### Cambodian Genocide: Pol Pot

###### Key rules under Pol Pot

'Year Zero' the country was meant to start all over again.

Cities were cleared. People were sent to the countryside to work on farms.

Religion was banned.

Money was banned.

Children were taken from parents and re-educated.

Middle class, teachers, lawyers, doctors and people who spoke a foreign language were all treated as threats and sent to the Killing Fields.

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## 16. Year 8 History: Persecution

### Rwandan Genocide: Events

Date	Event
1894	Germany colonises Rwanda. They favour the Tutsi minority.
1916	Belgium gain Rwanda after WW1. They also gives the Tutsi more power even though they account for around 10% of the population.
1962	Rwanda gains independence from Belgium. The Belgium's leave the Hutu's in charge. Violence breaks out between the different religions.

Date	Event
1990-1994	The Rwandan Patriotic Front (Tutsi) invade Rwanda to try and regain power from the Hutus. A civil war begins, anti-Tutsi propaganda is spread.
6th April 1994	Rwanda's President plane is shot down, the Tutsi are blamed. Hutu militias use this as an excuse to start a Genocide.
April- July 1994	Hutu militias kill 800,000 Tutsi and some Hutus. The killings are carried out by hand using machete and clubs.

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## 17. Year 8 History: Persecution

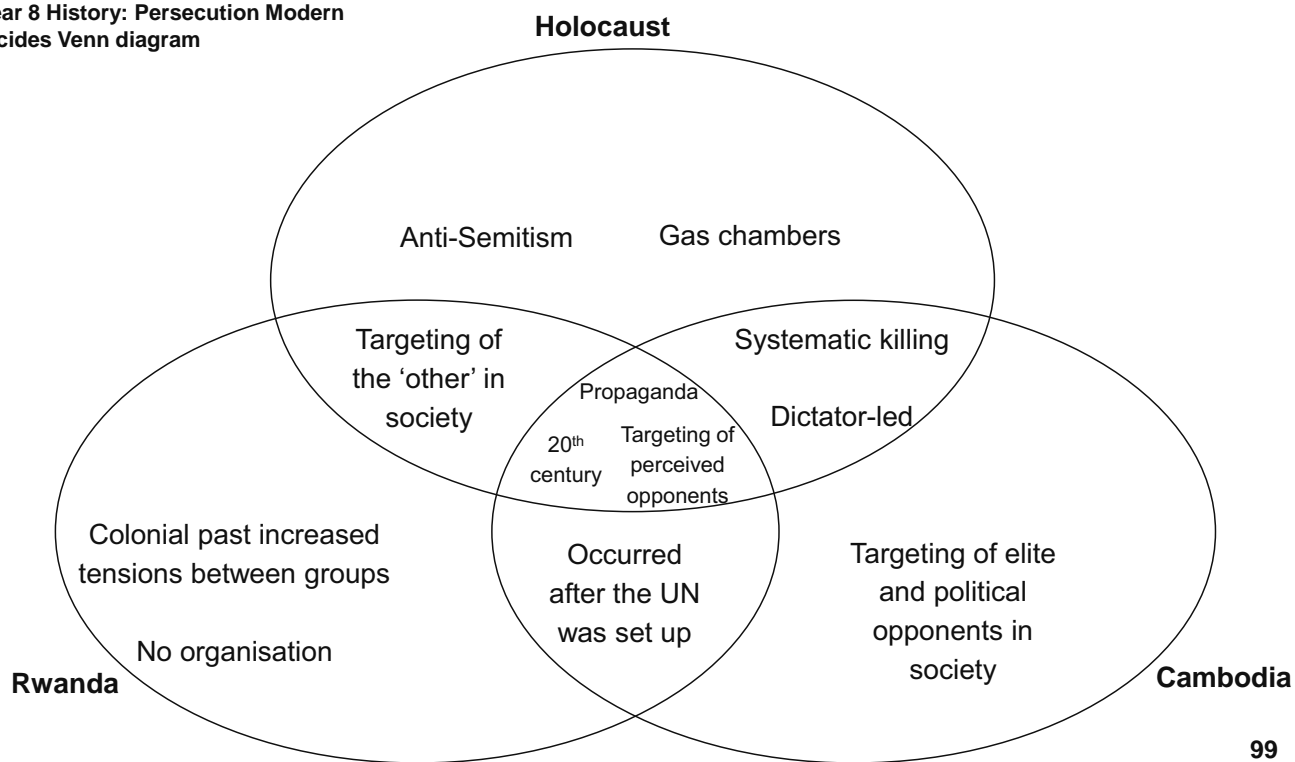
### Rwandan Genocide: Events and key terms

Date	Event
July 1994	Ten United Nations peacekeepers were killed trying to stop the violence. International governments and the UN failed to stop the killings and did not send any more troops.
July 1994	The Rwandan Patriotic Front continued its advance, gaining control of the country and stopping the genocide.

Key terms	Definition
Hutu	Origins are unclear but it has been used to describe people forming the majority population in Rwanda.
Tutsi	Origins are unclear but it has been used to describe people forming a minority of the population of Rwanda. The main victims of the 1994 Rwandan Genocide.
Genocide	The deliberate killing of a large group of people, especially those of a particular ethnic group or nation.

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18. Year 8 History: Persecution Modern  
Genocides Venn diagram





## Year 8 History

### Issues in the Modern World

100

#### 1. Year 8 History: Issues in the Modern World

##### Why is there conflict in the Middle East?

Date	Event	Description
1948	May: UN partition plan and start of 1 <sup>st</sup> Arab-Israeli war	The new state of Israel was created from around 55% of previously Palestinian lands. Neighbouring countries immediately attacked, provoking a war which Israel won.
1956	The Sinai-Suez War	Israel attacked Egypt, supported by Britain and France. Israel won the war. The UN forced them to give back land gained, but UN forces stayed to police the borders, and provide security.

Date	Event	Description
1967	Six Day War	Israel won a quick victory against the combined Arab armies of Egypt, Jordan and Syria. Israel tripled in size as a result, gaining full control of Jerusalem.
1964-80s	PLO terrorist activities	Some Palestinians turned to terrorism because they thought they could not win a war.

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## 2. Year 8 History: Issues in the Modern World

### Why is there conflict in the Middle East?

Date	Event	Description
From 1947	Palestinian refugees	There are believed to be around four million Palestinian refugees living in neighbouring Arab countries and elsewhere, as a result of wars and Israeli occupation.

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## 3. Year 8 History: Issues in the Modern World

### Why is there conflict in the Middle East?

Date	Event	Description
From 1967	Israelis built settlements in Gaza and the West Bank	The land used for settlements now makes up about 40% of the West Bank. The settlements in Gaza were demolished by the Israeli government in 2005, as part of the peace agreements.
1987	First Intifada	Angry, young Palestinians began to throw stones at Israeli settlers and troops. Israel responded by use of force.

Date	Event	Description
1993-95	Oslo Accords	These were peace agreements that created the Palestinian National Authority. Palestinians had finally got back land, but not a state. Some were still angry, and joined Hamas, which continued terrorist activities.

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#### 4. Year 8 History: Issues in the Modern World

##### Why is there conflict in the Middle East?

Date	Event	Description
2003	Israel began a barrier wall around the settlements to protect their security	The UN has ruled that this wall is illegal because it prevents Palestinians from travelling freely in their lands. Discussions are ongoing.
2011	Palestinians asked the UN for recognition as a state. President Obama said there must be peace talks first.	The USA is threatening to cut off aid to the Palestinian Authority if its leaders continue to make demands.

Date	Event	Description
2017	President Trump recognises Jerusalem as the capital of Israel.	Israel and Palestine both had claims on Jerusalem and most countries used Tel Aviv as Israel's capital.

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#### 5. Year 8 History: Issues in the Modern World

##### Is the UN pointless?

Institution	Function
General Assembly	All members have a vote. Passes the budget. Can discuss issues and try to create solutions.
Security Council	15 member, 5 permanent (UK, USA, Russia, China & France). Vote on peace keeping missions and use of force by UN members. 5 permanent members have a veto over all decisions.

Institution	Function
International Court of Justice	To provide legal advice to members. To settle any disputes between members legally.

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## 6. Year 8 History: Issues in the Modern World

### Is the UN pointless?

Key studies of peace keeping missions	Cote d'Ivoire
Why the UN went?	In 2004 the country was in civil war.
What they did?	6000 peacekeepers were deployed in 2004. 70,000 combatants were disarmed. Peaceful presidential elections could go ahead.
Results	Ivorian armed forces have been trained and strengthened. Now one of the fastest growing economies in Africa at 9%

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## 7. Year 8 History: Issues in the Modern World

### Is the UN pointless?

Key studies of peace keeping missions	Liberia
Why the UN went?	Liberia had two civil wars in 1989 and 2003. Half of the population was displaced.
What they did?	Between 2003-2018 over 126,000 peacekeepers were deployed. Disarmed over 100,000 combatants. Ensured that displaced people could return home.
Results	A new Liberia was set up, police and courts were reformed. Liberia's borders became safe and stable.

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## 8. Year 8 History: Issues in the Modern World

### Is the UN pointless?

Successes
The UN has helped more than 34 million refugees, most recently in Syria and Yemen.
Since 1948 the UN has led 71 peace keeping missions to help end conflicts and provide security in countries such as El Salvador, Namibia and Tajikistan.
The UN has encouraged countries to give up nuclear weapons and has been successful in the cases of South Africa and Kazakhstan.
Providing vaccination for 58% of children in the World and helping 30 million pregnant women a year.

Successes
The UN has provided food for 90 million people in over 75 countries.
UNICEF is dedicated to helping children in the World. UNICEF has helped provide nearly 2 billion people with water; immunised 40% of the world's children, helping to save 3 million lives a year ; and has helped reduce the number of deaths of children under five by 50% since 1990.

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## 9. Year 8 History: Issues in the Modern World

### Is the UN pointless?

Failures
Peace keeping in Somalia failed and the country remains a failed state to the present day.
The UN peace keeping force in Rwanda failed to prevent the genocide in 1994. The UN also did nothing to stop the Cambodian genocide.
In Srebrenica in 1995 UN peacekeepers did nothing as 8000 Muslim men and boys were murdered by Bosnian-Serbian forces during the civil war.
The UN has failed to reach a settlement in the dispute between Israel and Palestine.

Failures
After the 2010 earthquake UN aid workers were blamed for spreading cholera which killed more than 10,000 people.
The UN has failed to act to end the war in Yemen largely as the USA is Saudi Arabia's ally and vetoes any proposals put forward.

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## 10. Year 8 History: Issues in the Modern World

Who is/has been the most dangerous leader in the world today?

Key question	Details
<b>Name and title</b>	President Donald Trump (since 2017 until 2021)
<b>Country</b>	United States of America
<b>Army</b>	1.3 million soldiers.
<b>Weapons</b>	USA is the only country to have used nuclear weapons on another country (Japan in WW2). The USA has 3 types of weapons of mass destruction: nuclear, chemical and biological

Key question	Details
<b>Actions</b>	Trump's 'Muslim ban' which was in effect from January 2017 to March 2017 stopped the migration of people from majority Muslim countries like Syria and Iran. During the COVID-19 outbreak in 2020, Trump suggested people should inject themselves with disinfectant to kill the disease.
<b>Beliefs</b>	Publicly supported the use of torture on suspected terrorists in America. Trump's Tweets show he thinks climate change is a myth and created by and for the Chinese.

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## 11. Year 8 History: Issues in the Modern World

Who is/has been the most dangerous leader in the world today?

Key question	Details
<b>Name and title</b>	Supreme Leader of North Korea Kim Jong-un (since 2011)
<b>Country</b>	North Korea
<b>Army</b>	950,000 soldiers.
<b>Weapons</b>	20-30 nuclear weapons but has the equipment/ materials to make 20-60 more nuclear weapons. Also has chemical and biological weapons. In 2015, Kim Jong-un suggested North Korea could launch a hydrogen bomb.

Key question	Details
<b>Actions</b>	Kim Jong-un rules North Korea as a dictator- elections are not fair. People who speak against the government are sent to labour camps where millions have died. If someone is found guilty of a crime not only are they punished but also their family members- this is part of the law. Kim Jong-un has ordered the execution of his own government ministers and the assassination of his half-brother. All communication and media is censored by the state.

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## 12. Year 8 History: Issues in the Modern World

Who is/has been the most dangerous leader in the world today?

Key question	Details
<b>Name and title</b>	President Vladimir Putin (1999 to 2008 and then again in 2012-present)
<b>Country</b>	Russia
<b>Army</b>	900,000 active and 2 million reserves.
<b>Weapons</b>	Estimated that Russia has 6,500 nuclear weapons and 39,967 tons of chemical weapons.  It is believed that Putin sold materials to North Korea so they could make their own nuclear weapons.

Key question	Details
<b>Actions</b>	People who oppose Putin are imprisoned.  Russia is not a member of NATO and Putin has actively worked to discourage countries near Russia from joining NATO.  Many believe Putin instructed 2 Russian soldiers to poison ex-Russian spy, Sergei Skripal, and his daughter in Salisbury, England in 2018.
<b>Beliefs</b>	In 2013 a law known as the 'anti-gay law' was approved which banned all homosexual content in the media.  The law sparked an increase in violence against people in the LGBTQ+ community in Russia.

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## 13. Year 8 History: Issues in the Modern World

Who is/has been the most dangerous leader in the world today?

Key question	Details
<b>Name and title</b>	Xi Jinping President of the People's Republic of China (since 2013)
<b>Country</b>	China
<b>Army</b>	2 million active soldiers and 500,000 reserves.
<b>Weapons</b>	Estimated that China has 260 nuclear weapons.  China's nuclear weapons are developing, by the mid-2020s their missiles could threaten the USA.  Chinese technology might be being used to spy on people all around the world.

Key question	Details
<b>Actions</b>	Xi Jinping's 'Belt and Road' policy has been criticised for trying to control countries around the world rather than help them.  China is very heavily censored- in 2017 Winnie the Pooh was blocked on Chinese social media after Xi Jinping was compared to Winnie the Pooh in a popular meme.  Xi Jinping ended the 2-term presidency limit in 2018 which means he can serve as president for as long as he is 'voted' in.  Xi Jinping's 're-education camps' have been said to be like concentration camps for Muslims where they are beaten, raped and under surveillance.

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## 14. Year 8 Issues in the Modern World

Who is/has been the most dangerous leader in the world today?


Key question	Details
Name and title	President Jair Bolsonaro (since 2019)
Country	Brazil
Army	334,500 soldiers and 1 million reserves
Weapons	Brazil has said they do not have any nuclear weapons, but they do they do have the equipment to create nuclear weapons. Plans for nuclear weapons have been found in Brazil but the government deny they have any.


Key question	Details
Actions	Supported Trump's actions of the assassination of Iranian General, Qasem Soleimani, in 2020.
Beliefs	Known as 'Brazil's Trump' in newspapers and the media. He wants to return Brazil to a dictatorship. Supports the cutting down of the rainforest to make room for farms- deforestation increased by 88% in his first month as president. Bolsonaro believes women should not get paid the same as men in the same job because they go on maternity leave. He has made homophobic comments against the LGBTQ+ community.

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## 15. Year 8 History: Issues in the Modern World

Causes of 9/11 Terror Attacks

Cause	Details
War and violence	The American government supported Israel in the conflict with Palestine (which is a mainly Muslim country).  Al-Qaeda was based in Afghanistan which was a struggling state due to violence between Russian invaders and rebel forces (the Taliban). Since the Gulf War in 1991, there have been American soldiers stationed in Saudi Arabia


Cause	Details
Religion	Bin Laden, the leader of Al-Qaeda, felt that American culture was a threat to the teachings of Islam.  Leaders within Al-Qaeda twisted the message of passages from the Quran to suggest that their jihad (holy war) against Western countries was what Allah wanted. Mecca and Medina (2 very important religious areas for Muslims) are in Saudi Arabia. Having American troops in this holy place led to Bin Laden feeling it was against the Islamic religion.

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## 16. Year 8 History: Issues in the Modern World

### Causes of 9/11 Terror Attacks

Cause	Details
<b>Economic</b> 	After Iraq invaded Kuwait (another country) the United Nations stopped all trading with Iraq as a punishment.

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## 17. Year 8 History: Issues in the Modern World

### Events of 9/11 Terror Attacks

Event	Details
<b>Flight 11</b>	Crashed into the north tower of the World Trade Centre killing many people instantly.
<b>Flight 175</b>	Crashed into the south tower of the World Trade Centre 17 minutes after Flight 11.
<b>Collapse</b>	The fires caused by the crashes melted the floors of the towers creating pressure to build and the floors to collapse.  Dust clouds coated New York City.

Event	Details
<b>Rescue</b>	More than 5,000 people were declared missing.  5 survivors were found in 24 hours after the collapse.  412 emergency workers (police, firefighters, ambulance staff) were killed after the building collapsed whilst they were evacuating the building.

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## 18. Year 8 History: Issues in the Modern World

### Events of 9/11 Terror Attacks


Event	Details
<b>Flight 77</b>	Crashed into the west side of the Pentagon.  The Pentagon is the headquarters building of the United States Department of Defense.
<b>Flight 93</b>	Hijacked and headed towards Washington DC with the White House or Capitol Building as the target.  Passengers heard through their mobile phones about the other plane hijackings.  Passengers fought the hijackers and the plane crashed in a field killing those on board.


Event	Details
<b>Death toll</b>	2,977 people died during the 9/11 attacks.  This was the biggest terrorist attack on American soil.  People called it the second Pearl Harbour.

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## 19. Year 8 History: Issues in the Modern World

### Impact of 9/11 Terror Attacks


Impact	Details
<b>Economic</b> 	143,000 people lost their jobs in New York in 1 month.  \$2.8 billion worth of wages were lost in the first 3 months.  Damage done to the World Trade Centre was \$60 billion.  Cleaning up the destruction in New York City cost \$750 million.  From 2001-2009 America spent \$778 billion on their war in Afghanistan.

Event	Details
<b>Political</b> 	President George W. Bush declared a War on Terror and less than a month after 9/11, U.S. troops invaded Afghanistan in an attempt to destroy Al-Qaeda, the group responsible for the attacks.  Countries, including America and the UK, formed the Northern Alliance and sent troops to Afghanistan and took control of the capital- Kabul.  Immigration laws became stricter which made it more difficult to move to other countries.

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## 20. Year 8 History: Issues in the Modern World

### Impact of 9/11 Terror Attacks

Impact	Details
<b>Social</b>	Globally there has been an increase in Islamophobia and racism against Muslims.
	In 2016 the number of assaults against Muslims in America had increase by 50%.
	75% of Muslims in America say they suffer from significant discrimination on a daily basis.
	Further attacks in Bali, Morocco, Spain and London on 7/7 made people more aware of 'suspicious' behaviour or objects (unattended bags) in public.

Impact	Details
<b>Social</b>	Airports around the world have increased their passenger security: full body scans, pat-downs and restrictions on the amount of liquids per passenger have been introduced.
	Around the world Muslim migrants found getting a job and good housing difficult especially in America and Europe.
	Many studies show that the wages (income) of Muslims in America have decreased since 9/11.

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## 22. Year 8 History: Issues in the Modern World

### Did the end of slavery make all people equal in America?

Date	Event	Details
1865	<b>Abolition of slavery</b>	President Abraham Lincoln abolishes slavery, through the 13 <sup>th</sup> Amendment, after his victory in the American Civil War.
1870s	<b>Jim Crow laws</b>	A series of laws were introduced in southern states, they legalised discrimination against black people.
1915	<b>The Ku Klux Klan</b>	A second wave of the Ku Klux Klan was formed; this was a group of extremists who opposed African Americans and many religious groups.

Date	Event	Details
1954	<b>De-segregation of schools</b>	The NAACP (National Association for the Advancement of Coloured People) successfully campaigned for segregated schools to be banned, claiming that it was harmful to black students and unconstitutional. The Supreme Court agreed, and schools were integrated.

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### 23. Year 8 History: Issues in the Modern World

Did the end of slavery make all people equal in America?

Date	Event	Details
1955	<b>Rosa Parks</b>	Rosa Parks was arrested for refusing to give up her seat for a white person. To support her, many white and African Americans boycotted buses in Montgomery, Alabama. The bus company lost 80% of its profits and was forced to de-segregate its buses.

Date	Event	Details
1957	<b>The Little Rock Nine</b>	After segregation of schools had been abolished, a group of nine black students started at Little Rock High school. But they were faced with angry protesters and federal troops (army) had to escort them into the racially segregated school.

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### 24. Year 8 History: Issues in the Modern World

Did the end of slavery make all people equal in America?

Date	Event	Details
1963	<b>Martin Luther King Jr's 'I have a dream' speech'</b>	Over 200,000 people came to hear Martin Luther King make his speech – now recognised as one of the most famous speeches in history – and they took part in a peaceful march for Civil Rights in Washington DC.

Date	Event	Details
1964	<b>Civil Rights Act</b>	This law recognised that black Americans lived in poorer housing, had lower paid jobs and less access to healthcare and education. The Act tried to bring equality by making the segregation of public places illegal. Many southern states opposed this law, and many felt it didn't do enough

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## 25. Year 8 History: Issues in the Modern World

Did the end of slavery make all people equal in America?

Date	Event	Details
1965	<b>The Voting Rights Act</b>	African Americans had been prevented from voting in many southern states through intimidation and 'literacy tests'. This law made these tests illegal and as a result there was a huge increase in African Americans registering to vote.

Date	Event	Details
1992	<b>LA Riots</b>	Riots broke out in Los Angeles after 4 police officers had been found not guilty for using excessive force when arresting Rodney King a black man.  Many were enraged as there had been video footage of the police officers beating an unarmed Rodney King which had been broadcast on the news.

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## 26. Year 8 History: Issues in the Modern World

Did the end of slavery make all people equal in America?

Date	Event	Details
2012	<b>Trayvon Martin shooting</b>	17-year-old Trayvon Martin, an African-American unarmed teenager, was shot by George Zimmerman on the way back from buying sweets from the local shop.  His behaviour was seen as 'suspicious' by Zimmerman.  Zimmerman was questioned for 5 hours but released by claiming self-defence- he was found not guilty during the trial.

Date	Event	Details
2020	<b>Ahmaud Arbery's shooting</b>	Ahmaud Arbery, a 25-year-old African American man, was shot twice by a shotgun whilst he was out jogging.  Gregory McMichael and his son Travis thought Arbery was a burglar.  Arbery was killed in February but the McMichaels were only arrested in May.

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## 27. Year 8 History: Issues in the Modern World

Did the end of slavery make all people equal in America?

Key Individual	Details
<b>Rosa Parks</b>	Refused to give up her seat on a segregated bus and was arrested.  This sparked a statewide boycott of the buses which led to them being de-segregated.
<b>Martin Luther King Jr</b>	Fought for the Civil Rights of African Americans using peaceful methods.  Made the famous 'I have a Dream' speech in front of 200,000 people.
<b>Malcolm X</b>	Encouraged African Americans to fight for their Civil Rights using more militant actions.

Keywords	Meaning
<b>De-segregate</b>	African Americans no longer had to have different/separate facilities than white people.
<b>Boycott</b>	To stop using a certain service as an act of protest.
<b>Sit-ins</b>	A form of protest in which demonstrators occupy a place, refusing to leave until their demands are met.
<b>Supreme Court</b>	The highest legal court in America.
<b>Unconstitutional</b>	When the actions of a government is against the rights of its people.

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## 28. Year 8 History: Issues in the Modern World

Why is China so powerful?

Key Statistics	
<b>Population</b>	1.3 billion (largest in the World)
<b>Army</b>	2.3 million
<b>Economy</b>	2nd in the World (US is 1st)
<b>GDP</b>	7.298 trillion dollars
<b>Growth rate</b>	9%

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## Year 8 History

### Assessment question structures

4 marks = 5 minutes = 1 paragraph

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#### 1. Year 8 History: Assessment questions structures

### PEEL- How to explain

<b>Point</b> What is your opinion?	<b>Evidence</b> Which examples link to your opinion?	<b>Explain</b> What does your evidence show?	<b>Link</b> How does your opinion link or compare to others?
<ul style="list-style-type: none"><li>• I think...</li><li>• One way...</li><li>• A consequence was...</li><li>• The importance of...</li><li>• The main cause was...</li></ul>	<ul style="list-style-type: none"><li>• For example...</li><li>• This can be seen through</li><li>• This is demonstrated by....</li><li>• A prime example of this is...</li><li>• We can see evidence of this when we look at the...</li><li>• This is reflected in...</li><li>• This links to the fact...</li></ul>	<ul style="list-style-type: none"><li>• This shows us that...</li><li>• This demonstrates how...</li><li>• From this we can assume that...</li><li>• This is significant because...</li><li>• This embodies/ epitomises/reflects the importance of...</li><li>• As a result of this...</li><li>• If this did not happen then...</li><li>• Therefore, this shows...</li><li>• This suggests...</li></ul>	<ul style="list-style-type: none"><li>• In contrast...</li><li>• Although this was important, it was less important than... because...</li><li>• However...</li><li>• Alternatively...</li><li>• Even though...</li><li>• This links to...</li></ul>

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# Source Analysis

How to analyse a source	Sentence starters
1. What can you see?/What does it say? <ul style="list-style-type: none"> <li>Describe what you can see if it is an image based source.</li> <li>Pick out words/phrases from the source which help you work out what it says</li> </ul>	In the source I can see...  In the source it says...
2. What does it mean? <ul style="list-style-type: none"> <li>Explain the main message/meaning of the source.</li> <li>If it is an image based source, explain what the imagery in the source means/symbolises.</li> </ul>	This means...  Therefore, this suggests...
3. What do I know? <ul style="list-style-type: none"> <li>Explain how the message/meaning of the source links to your own knowledge.</li> </ul>	This links to the fact...  I know this to be true because...

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# Interpretation Analysis

How to analyse an interpretation	Sentence starters
1. Summarise the interpretation into 1 sentence of your own words.	The interpretation says...
2. Link back to your own knowledge	This links to the fact...  I know this to be true because...

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# Year 8 Music Knowledge Organiser

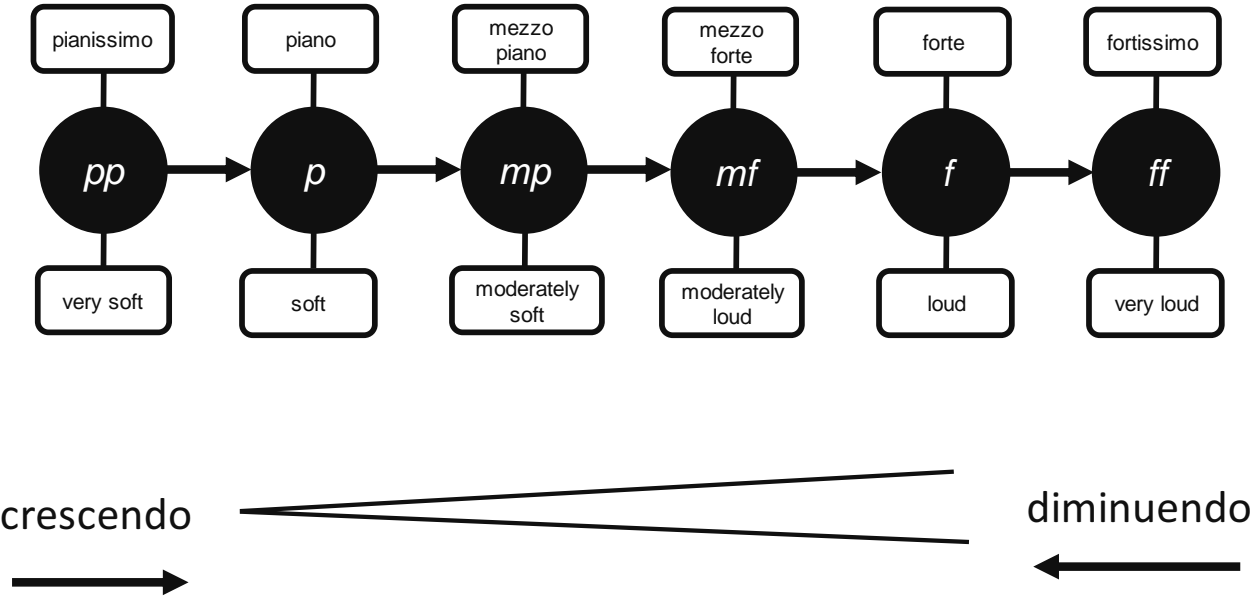
Page 2 – Musical Elements
Page 3 – Dynamics
Page 4 – Tempo
Page 5 – Rhythm
Page 7 – Notation
Page 8 – Pitch
Page 9 – Musical Structure
Page 10- Instruments of the orchestra
Page 12- Blues
Page 14 – Classical Music
Page 16 – Indian Classical Music
Page 17 – Romantic Era – programme music
Page 18 - Popular Song
Page 19 – Computer game music
Page 21 – Composing

1

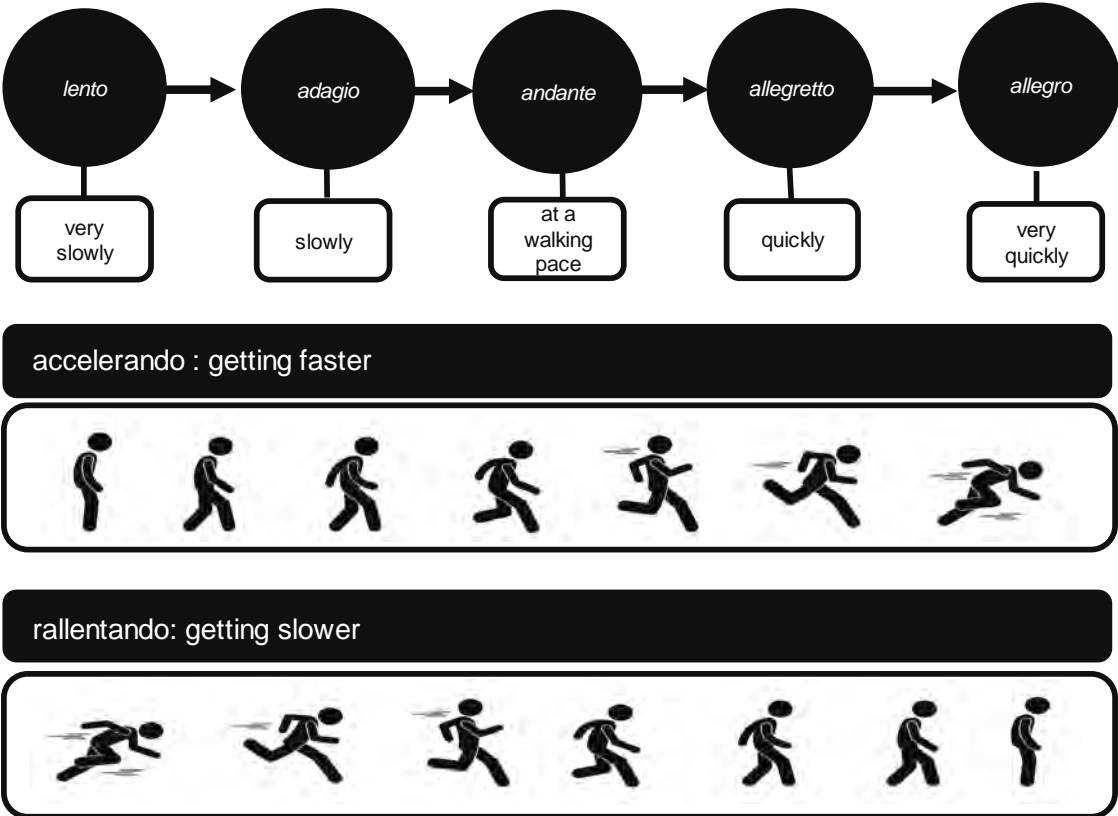
## Musical Elements

Keyword	Definition	Example
Pulse	The beat of the music. Every piece of music has a heartbeat. It doesn't need to be played by drums - you can 'feel' the beat.	"the pulse of the music is steady"
Tempo	The speed of the music. Music can change tempo within a piece. We often describe it using Italian words	"the tempo is fast"
Pitch	How high or how low a sound is.	"the music is high"
Dynamics	The Volume of the Music. Music can change dynamics within a piece. We often describe it using Italian words	"the music is quiet and then gets louder"
Structure	Music is divided into sections. The order of these sections create structure. For example verse and chorus/ Binary/Ternary	"the music starts with an 'A' section"
Texture	How the different musical layers combine. A single melody creates a thin sound. Adding more parts/layers creates a thicker sound.	"there are lots of instruments playing lots of different melodies"
Timbre	Each instrument has a unique sound – this individual sound is its timbre. When describing sound first try to describe the instrument and then how it is played	" the flute has a warm timbre when played low down"
Rhythm	Each note can have a long or short duration. Putting different notes together creates a rhythm	"there are lots of crotchet rhythms in this piece"
Melody	The 'tune' of the music – the part we sing along to	" the melody of this song is made up of lots of repeated sections"

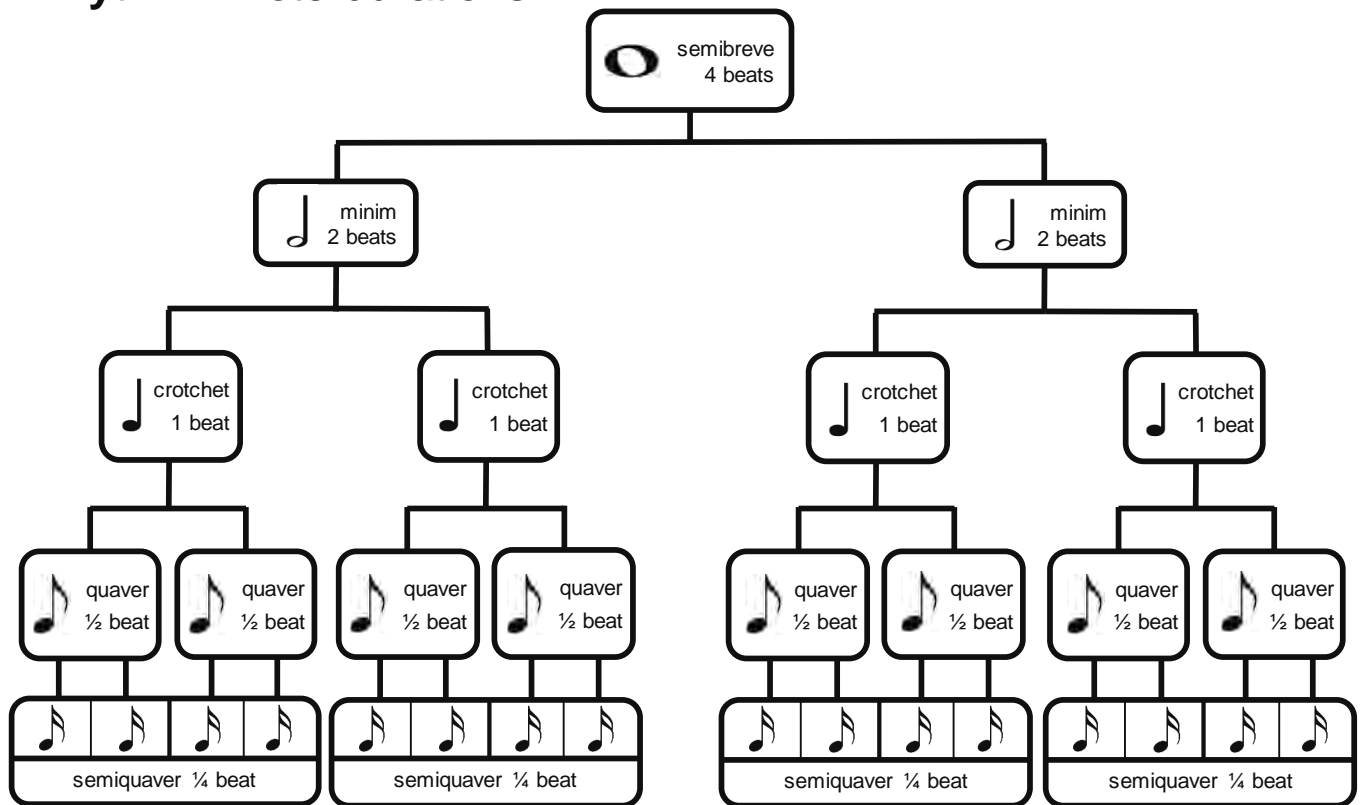
# Dynamics - volume



# Tempo - speed



# Rhythm - note durations



## Rhythm



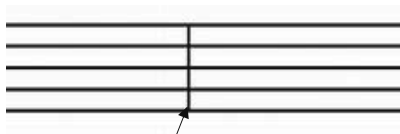
Dotted Minim: 3 Beats

**4/4**

4 Beats in a bar

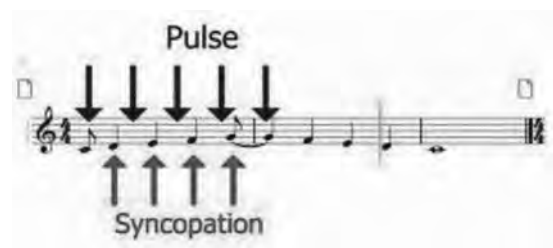
**3/4**

3 Beats in a bar

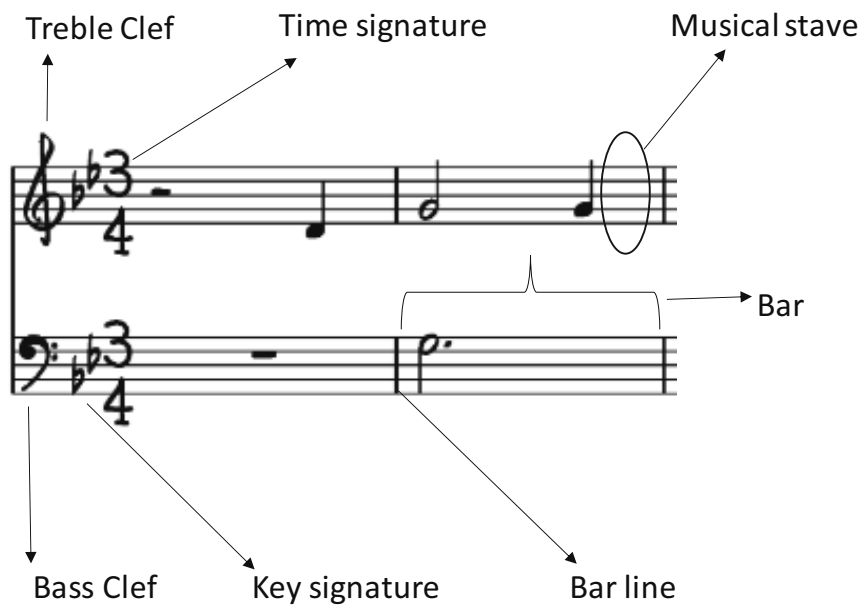


Bar line – this divides up the music: You are allowed so many beats in each bar.

Syncopated Rhythm: playing on the weak beats of the bar (like the offbeat)



# Musical Notation



## Pitch – how high or low a note is

### Treble Clef Notes



**Notes on the line:** Every Green Bus Drives Fast

**Notes in the space:** FACE

### Bass Clef Notes



**Notes on the line:** Good Burritos Don't Fall Apart

**Notes in the space:** All Cows Eat Grass



**Sharp** A sharp makes the note higher



**Flat** A flat makes the note lower



**Natural** A natural cancels out any sharps or flats

**Chromatic**

Notes that are sharp and flat – but they were not in the key signature – they just appear in the music



## Musical Structures

Keyword	Definition
Structure	The way different sections of music are put together
Binary	Two contrasting sections of music which are not repeated later on in the piece:
Ternary	Two contrasting sections of music, where the first section is repeated later on:
Conjunct	A melody that moves up and down in step
Disjunct	A melody that moves up and down by large jumps/leaps
Modulate	To change key in a piece
Chord	More than one note played at the same time: play a note, miss a note, play a note, miss a note, play a note on the keyboard
Major	A 'happy' sounding key
Minor	A 'sad' sounding key

Chord example



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## Instruments of the Orchestra

Keyword	Definition
Instrument	An object that makes a musical sound
String Family	Violin, Viola, Cello, Double Bass, Harp
Woodwind Family	Flute, Clarinet, Oboe, Saxophone, Bassoon
Percussion Family	Anything you hit or shake: Drum, Glockenspiel, Triangle, Tambourine
Brass Family	Trumpet, Trombone, French Horn, Tuba
Conductor	The person in charge of the Orchestra – leading them from the front
Orchestra	A group of musicians playing together – containing woodwind, strings, brass and percussion

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## String Family



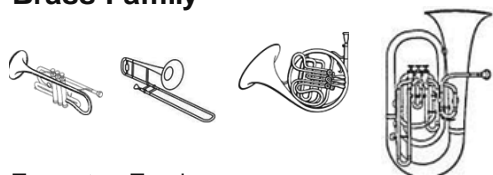
Violin Viola Cello Double Bass

## Woodwind Family



Flute Clarinet Oboe Bassoon Saxophone

## Brass Family



Trumpet Trombone French Horn Tuba

## Keyboards



Piano



Keyboard



Harpsichord

## Percussion Family



Timpani



Glockenspiel (metal)  
Xylophone (wooden)



Triangle



Snare Drum



Bass Drum



Tambourine

# Blues 1: Keywords

Keyword	Definition
<b>Scat</b>	Using your voice as an instrument in order to sing without lyrics
<b>Syncopation</b>	Off-beat rhythm
<b>Improvisation</b>	Making music up on the spot
<b>Blues Scale</b>	A particular scale (pattern) of notes used in Blues music
<b>Blue Note</b>	A flattened note on the 3 <sup>rd</sup> or 7 <sup>th</sup> of the scale
<b>12 Bar Blues</b>	The chord structure used in Blues music
<b>Chord</b>	Two or more notes played at the same time in one part
<b>Walking Bass</b>	A Bassline that moves at a moderate pace usually stepwise up or down the scale
<b>Call and Response</b>	A song style in which the leader sings a call and the rest of the group responds

Keyword	Definition
<b>Work Song</b>	A song that was sung by slaves in order to promote faster work
<b>Spirituals</b>	Songs sung by slaves with themes of yearning for freedom, to be lifted out of suffering and the belief that a higher power will help a person persevere in tough times.
<b>Ostinato</b>	A repeated pattern – usually a rhythm or bassline
<b>Slave</b>	Someone 'owned' by someone else: often forced to work against their will for little/no money
<b>Swing Rhythm</b>	The first bit of the beat is longer as it steals time from the second bit to give the music a swinging feel.

## Blues 2

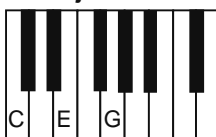
### 12 Bar Blues Chord Sequence in C

C	C	C	C
F	F	C	C
G	F	C	C

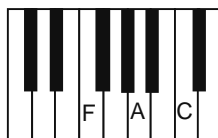
I	I	I	I
IV	IV	I	I
V	IV	I	I

I Chord 1  
IV Chord 4  
V Chord 5

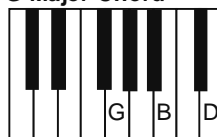
**C Major Chord**



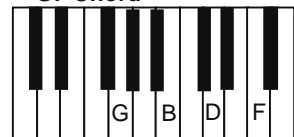
**F Major Chord**



**G Major Chord**



**G7 Chord**



### Instruments in the Blues

Violin



Piano



Trumpet



Double Bass



Saxophone



Banjo



Electric Guitar



Acoustic Guitar



Harmonica



Bass Guitar



# The Classical Era: 1750-1810

Keyword	Definition
<b>Concerto</b>	Solo instrument plus an orchestra
<b>Symphony</b>	Played by a full orchestra
<b>Sonata</b>	Piece for solo instrument (either solo piano or solo instrument with piano accompaniment)
<b>Cadence</b>	Mark the end of a phrase
<b>Perfect Cadence</b>	The music sounds 'finished': Chord V – Chord I
<b>Imperfect Cadence</b>	The music doesn't sound quite 'finished': The phrase ends on chord V
<b>Interrupted Cadence</b>	The music sounds definitely not finished – like its been stopped midway – Ends on chord VI
<b>Diatonic Harmony</b>	Harmony ( chords) that belong to the key
<b>Chromatic Notes</b>	Notes that do not belong to the Key

Keyword	Definition
<b>Major</b>	A more 'happy' sounding key
<b>Minor</b>	A more 'sad' sounding key
<b>Phrase</b>	Short section of music where the melody seems naturally to fall. Sometimes this is 4 bars, but shorter and longer phrases occur. Sometimes a phrase may be contained within one breath
<b>Homophonic Texture</b>	A type of texture: Where all the parts move in block chords
<b>Homophonic Texture: Melody plus accompaniment</b>	A type of texture: Where there is one melody with a simple accompaniment
<b>Polyphonic Texture</b>	A type of texture where there are lots of interweaving melodies

# The Classical Era: 1750-1810

Family	Instruments
<b>String Family</b>	Violin, Viola, Cello, Double Bass, Harp
<b>Woodwind Family</b>	Flute, Oboe, Bassoon,
<b>Percussion Family</b>	Timpani, Triangle, Bass Drum, Snare Drum
<b>Brass Family</b>	Trumpet, Trombone, French Horn, Tuba
<b>Conductor</b>	The person in charge of the Orchestra – leading them from the front

Facts
Important Composers: <b>Beethoven, Mozart, Haydn</b>
Classical melodies have a <b>clear and simple structure</b> – often with <b>balanced phrases</b>
Balanced Phrases are where the music sounds like there is a question and then an answer
Classical <b>texture is often homophonic</b> – melody plus accompaniment
Tempo in classical music will rarely change – <b>one speed throughout</b>
Harmony in classical music is normally diatonic (this means there are not too many surprising notes and chords)



# Classical Music from North India

## Facts

Music is based on ragas (special types of scales)

A piece of Indian Classical Music is also called a Raga

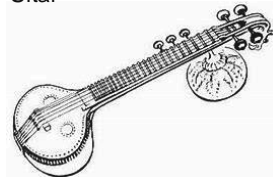
Indian Ragas are often improvised

A raga has 4 sections: The Alap, The Jhor, The Jhala, The Gat or Bandish

## Keyword Definition

<b>Raga</b>	A set of notes (between 5 and 8) – like a scale
<b>Sitar</b>	Stringed instrument – often plays the melody
<b>Tabla</b>	The rhythm is played on the tabla
<b>Tala</b>	The rhythm of the raga – a set pattern of beats
<b>Tambura</b>	An instrument that plays the accompaniment – sounds a bit like a drone
<b>Drone</b>	A long, held on sound
<b>Alap</b>	Opening section of music where the sitar player improvises freely with no pulse. The Tambura plays a drone

Sitar



Tabla



Tambura



# Programme Music: From the Romantic era 1810 - 1900

Keyword	Definition
<b>Programme Music</b>	Music that that is intended to evoke images or convey the impression of events
<b>Motif</b>	A recurring theme or idea
<b>Pedal Note</b>	A note that is held down or repeated over and over again
<b>Cluster Chord</b>	Several notes played together as a chord deliberately designed to make a “clashing” dissonant sound
<b>Ascending Melody</b>	Notes get higher in pitch
<b>Descending Melody</b>	Notes get lower in pitch
<b>Conjunct Melody</b>	Melody moves in step
<b>Disjunct Melody</b>	Melody jumps around – does not move in step
<b>Major Tonality</b>	The music sounds ‘happy’

Keyword	Definition
<b>Minor Tonality</b>	The Music sounds ‘sad’
<b>Chromatic</b>	Notes that are sharpened or flattened and do not belong to the key- often used for expressive purposes
<b>Thick Texture</b>	The music sounds ‘big’ and ‘busy’ – lots of instruments playing different things
<b>Thin Texture</b>	There is only one thing happening in the music - even if there are lots of instruments playing
<b>Important Composers</b>	Chopin, Saens Sans, Rachmaninov, Tchaikovsky

New instruments were added in this era

Glockenspiel (metal) Xylophone (wooden)



Clarinet



Piccolo



## Popular Song

Keyword	Definition
<b>Verse</b>	A part of the song that tells the story and has different words but the same melody each time it is heard
<b>Chorus</b>	A part of the song that is repeated with the same words and melody each time it is heard
<b>Middle 8</b>	A section in the middle of the song that is usually 8 or 16 bars long and introduces a different melody. It can also be instrumental.
<b>Introduction</b>	A short section of music which opens the song and sets the tone and speed which are to follow
<b>Outro</b>	The section of the song that allows it to fade or end in style
<b>Pre-Chorus/Bridge</b>	A short section which connects the verse and the chorus
<b>Hook</b>	A short riff or passage near the beginning of the song designed to capture the ear of the listener

Keyword	Definition
<b>Lyricist</b>	The person responsible for writing the lyrics (words) to the song
<b>Chord Sequence</b>	The repeated chords that you find in a song – lots of songs use the same 4 chords over and over again
<b>Loops</b>	A pre recorded sample that can be repeated over and over again
<b>Sample</b>	A piece of pre-recorded sound used in a song
<b>Cover</b>	Taking an existing song and making it your own – doing it your way
<b>Acapella</b>	Singing with no accompaniment

## Computer Game Music

Keyword	Definition
<b>Sound Effect</b>	An artificially created or enhanced sound used to emphasize certain actions within computer and video games often performed on certain CUES.
<b>Ground Theme</b>	A name given to the music often heard over a computer or video game's "main menu" – the theme by which a computer or video game is often most well known from and may continue throughout the entire gameplay often as 'background music'.
<b>Character Theme/Motif</b>	Describes the music which is associated with a particular character within a computer or video game and may be manipulated, varied and adapted depending different situations, atmospheres and scenarios that the character finds themselves in within a computer or video game. .
<b>Decision Motif</b>	A name given to a point within a computer or video game when the player has to make a decision – often accompanied by a short piece of memorable music or series of sound effects.

# Computer Game Music

Keyword	Definition
Jumping Bass Line	Bass lines often move by leap (DISJUNCT MOVEMENT) in much music from computer and video games, leaving 'gaps' between the notes.
Staccato	An ARTICULATION marking where notes are performed sharply and detached from each other to create a 'spiky' feel – common in much computer and video game music and shown by the musical symbol of a dot. CHROMATIC
Syncopation	Accenting the weaker beats of the bar to give an "offbeat" or 'jumpy' feel to the music.
Soundtrack	Computer or video game music scores. Also, the name given to an album of music taken from a computer or video game sold commercially or performed on radio stations or in live concerts.
Cues	A point within a computer or video game knowing when a significant event is about to occur – often accompanied by music or a sound effect.
Loops	A pre recorded sample that can be repeated over and over again
Sample	A piece of pre-recorded sound used in a song

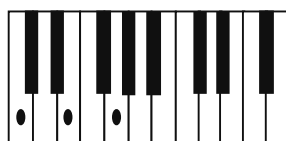
## Composing

Try to choose chords from the same key: Below are chords in C major and A minor

Chords in A Major	Chords in Aminor
C: CEG	Am: ACE
Dm: DFA	Bm: BDF
F: FAC	Dm: DFA
G: GBD	Em: EGB or E: EG#B
Am: ACE	F: FAC

Whatever notes you use in the chord then try to use these for the melody

E.g. C Chord uses C, E, G – so when creating a melody make C, E or G your most important notes



Include Passing Notes to make it more interesting (these are notes that do not belong to the chord but that help you pass from one to the next e.g. C D E F G)



## Physical Education

### Year 8

#### Contents

1. 5 stages of a warm up and benefits
2. Stages of warm up with examples
3. Components of fitness
4. Aerobic and anaerobic respiration
5. Muscles
6. Netball
7. Basketball
8. Gymnastics
9. Hockey
10. Football
11. Gaelic football
12. Fitness
13. Badminton
14. Volleyball
15. Rugby League
16. Athletics
17. Rounders

### Year 7

#### Warm up – 5 Stages

1. Pulse Raiser	Raising the heart rate through running, jogging or swimming
2. Mobility	Moving your joint through a full range of movement (circling arms)
3. Dynamic stretching	Stretching whilst moving e.g. lunges, open the gate or close gate at hip joint
4. Skill Rehearsal	Practise a skill to be used in the activity e.g. passing a ball

#### Benefits of a warm up

**Warm up muscles** – makes them ready for exercise

**Increase body temperature** – helps with oxygen transfer

**Increase heart rate** – increases blood flow to deliver oxygen

**Increase flexibility of muscles and joints** – increases range of movement

**Increase pliability of ligaments and tendons** – increases movement

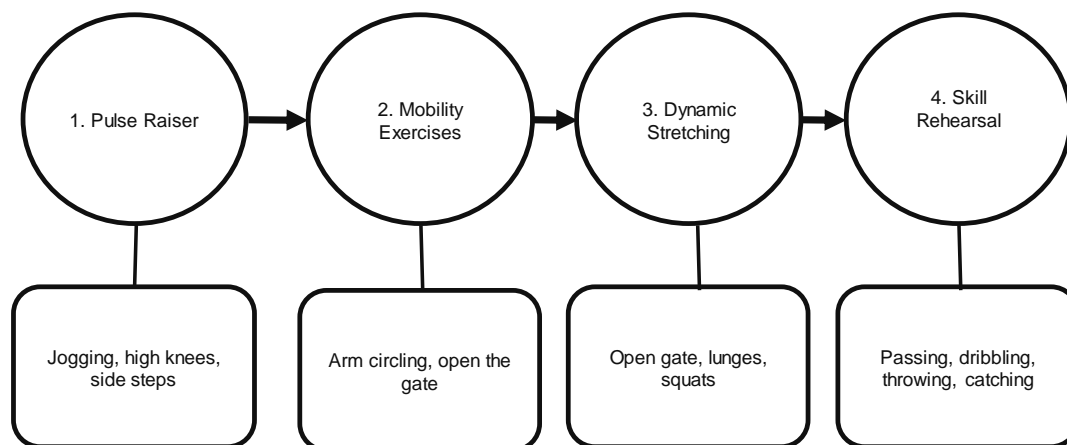
**Increase blood flow and oxygen** – to help supply working muscles with oxygen

**Increase muscle speed contractions** – help to improve performance

## Year 7

### Stages of the warm up with examples

The 4 stages of the warm up showing examples of what you might do at each stage.



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## Year 8

### Components of fitness

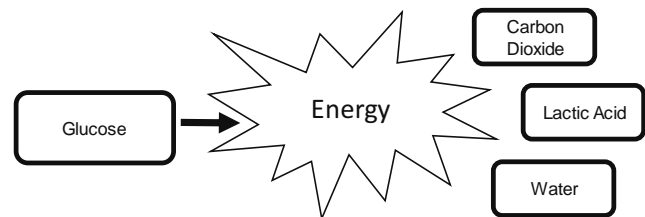
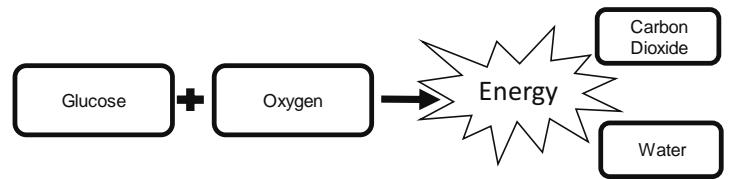
Components of fitness	Definition/Explanation	Sporting examples
1. Strength	Muscles working against a resistance	A Rugby player holding position in a scrum, pushing back against the resistance.
2. Power	Performing any skill which requires strength at speed Speed x strength	A Sprinter exploding out of the blocks with speed and strength to get the best possible start to the race.
3. Agility	Ability to move and change direction quickly under control	The Rugby player changing direction by side stepping to avoid being tackled.
4. Balance	Ability to maintain an upright or stable position	The Gymnast holding the handstand in a stable position on the beam.
5. Flexibility	Ability to move joints through a range of movement	The Goalkeeper diving to stretch and save the ball in the corner of the goal.
6. Muscular Endurance	Ability to keep the muscles working repeatedly	The long distance runner who can keep their muscles working at a high intensity at the end of a race.
7. Cardiovascular Endurance	Ability of the heart, lungs and the blood vessels to get oxygen to the muscles	The Cyclist who can supply the oxygen needed to work at a high intensity for a long period of time.

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## Year 8

### Aerobic and Anaerobic respiration

Aerobic	Using oxygen to perform exercise at a low steady rate  For example working at low intensity jogging, cycling, swimming, rowing
Anaerobic	Performing physical activity without oxygen at a high intensity and usually for less than 60 seconds  For example sprinting, lifting heavy weights

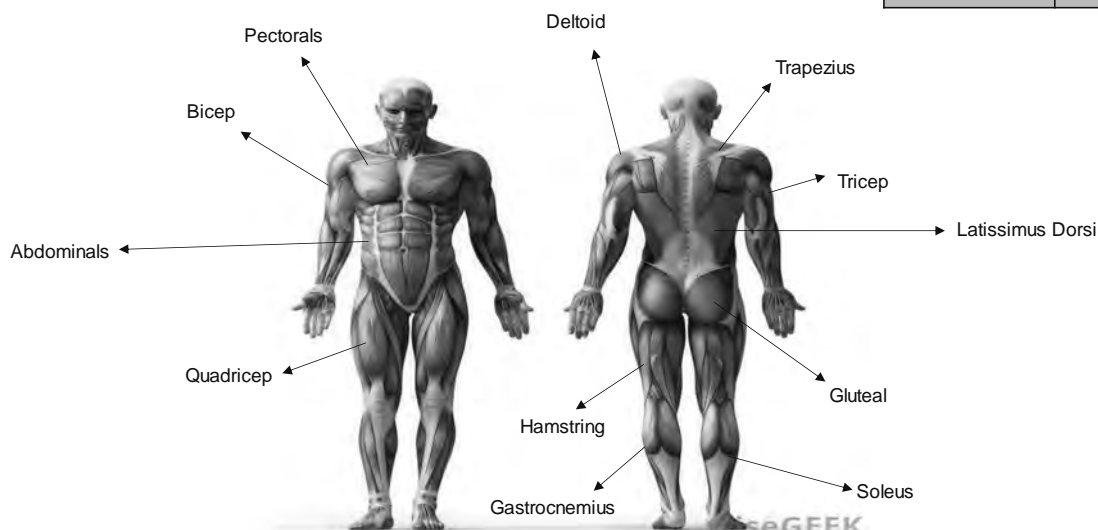


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## Year 8

### Muscles location

Tendons	Tendons – Attach muscle to bones to allow movement
Ligaments	Ligaments – Attach bone to bone to stabilise joints



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## Year 8

### Netball

#### Rules

1. The centre pass must be caught in the centre third
2. You can only hold the ball for 3 seconds
3. You must be a metre away from the player when defending the ball
4. No part of your foot should be on or over the line when taking back line and side-line passes



#### Key terms

Free pass	A pass given when the rules have been broken from where the offence occurred
Penalty pass	A pass given when the rules have been broken from where the offence occurred but the person committing the foul must stand by the side of the person taking the free pass
Feint dodge	Changing your body position quickly to make your marker think you are going one way but then you go another way to receive the ball

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## Year 8

### Basketball

#### Rules

1. Once the ball has gone over the half-way line it can not be returned by the attacking team
2. You cannot dribble the ball pick it up and then dribble the ball again or bounce the ball with two hands (double dribble)
3. You can be as close as you like when you are marking and you can knock the ball out of your opponents' hand.
4. You cannot move with the ball unless you are dribbling (travel)
5. Cannot stand in the key for more 3 seconds



#### Key Terms

Key	The area in front of the basket that you can only be in at any one time for 3 seconds
Lay up	A shooting technique you use on a fast break dribbling to the basket and using the backboard to score a 2-point shot
Set Shot	Taking a shot from a two footed stance
Travel	Taking more than two steps with the ball

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## Year 8

### Gymnastics



#### Key Terms

Extension	Making sure any part of your body is fully stretched out
Tension	Making sure that your position is held using your muscle so that they are tense
Control	Moving your body and knowing exactly what each part of your body is doing
Through Vault	Hands on a vault and legs go through your hands in a pike position

Flight	When you have left the floor or apparatus and you are in the air with no support e.g. a jump
Vault	A wooden box that is used to perform flight movements
Handspring	Rotation your body 360° by placing your hands on the vault and landing on your feet going over the top of the vault in a handstand

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## Year 8

### Hockey

#### Rules

1. You cannot use the back of your stick (the rounded part)
2. You cannot touch the ball with your feet
3. A free pass can be taken to yourself or passed
4. You must back away 5 yards from the ball when a free pass is taken
5. A short corner is awarded for a foul inside the D

#### Key Terms



Jab Tackle	Tackling using one hand with your feet one in front of the other
Indian Dribble	A dribbling technique moving the ball from left to right continuously
Block tackle	Tackling with your stick flat on the ground
Reverse Stick	Stopping or hitting the ball on your left side through turning the stick
Short corner	A penalty awarded when a foul is committed in the D by the defending team

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## Year 8

### Football

#### Rules

1. When throwing the ball in you must throw the ball with two hands from behind your head and both feet on the floor
2. If the ball hits the referee and goes to the opposition team, a drop ball will take place.
3. You must take the ball and not any part of the body when tackling
4. If you accidentally handball the ball and score, the goal will not count.
5. At a goal kick the ball is in play when it is kicked, the defenders can control the ball in the penalty area.

#### Key Terms



Outside foot pass	Using the outside of your foot to make a pass
Drag back turn	Pulling the ball back and turning with the ball to lose your defender
Dribbling	Moving with the ball under control
Foul	When the rules are broken and the other team gain possession
Indirect freekick	You cannot shoot at goal, the ball must be touched by another player before it enters the goal

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## Year 8

### Gaelic Football

#### Rules

1. When the ball is in your hands you cannot throw the ball, you can only hand pass.
2. You can only take 4 steps with the ball in your hands before either passing it, soloing it, bouncing it or shooting with it.
3. You cannot hold onto or push someone when you are tackling them.
4. When doing a near hand tackle you must have an open palm and must only make contact with the ball.
5. You cannot throw the ball up with your hands and then catch it again before it touches the ground, another player or the goal posts

#### Key Terms



Hand pass	The action of passing the ball using an open palm or closed fist and hitting the ball off your hand, similar to an underarm volleyball serve
Bounce	Bouncing the ball after taking 4 steps with the ball in your hands
Soloing	The action of dropping the ball to your foot and kicking it back to yourself
Punt kick	The action of passing the ball low with your foot, similar to a grubber kick in rugby, but without the ball touching the floor.

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## Year 8







### Fitness

#### Key Terms

Calories	A unit that measure energy and is usually included on food labels (kcal)
Buring Calories	Every time you exercise in any form you burn calories.
HITT Training	High intensity interval training – you work 100% for short period of time and then a recovery period
Circuit training	Exercising at different stations for a specific period of time with rest in-between



#### Exercises and targeting muscle groups

Bicep / Triceps	Biceps Curl		
	Triceps dips		
Abdominals (core muscles)	Sit ups		
	Plank hold		
Hamstring and quadriceps	Squats		
	Lunges		

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## Year 8

### Badminton

#### Rules

1. When serving you must serve diagonally across the court into the serving box
2. A serve must be hit under arm and below the server's waist
3. If a player touches the net with their racquet or any part of the body, it is called a fault
4. The shuttlecock can only be hit once on your side of the net
5. There are no second serves



#### Key Terms

Smash	Hitting the shuttlecock in a downward motion aiming for the floor, it is hit fast and hard
Overhead Clear	The shuttlecock is played over the head and hit to the back of the court
High Serve	A serve that is high over the net and to the back of the court
Low Serve	A serve that is close to the net played low and just lands inside the service box line

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## Year 8

### Volleyball



#### Rules

1. Maximum of 3 hits per side
2. You cannot hit it twice in a row
3. You can only score points on your serve
4. Balls may be played off the net , but not on the serve
5. Serve must be played from behind the line

#### Key Terms

Volley / Set	A shot played above the head using two hands
Dig	A shot played underarm to give the ball height
Serve	A shot played to start the game either underarm or overarm
Smash / spike	A shot played after a set to put the ball hard and fast over the net in a downwards motion

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## Year 8

### Rugby League



#### Rules

1. Pass the ball backwards or flat
2. If your in front of the ball you are off side
3. Can't tackle above shoulder height
4. When scoring a try you must apply downward pressure to the ball. Releasing the ball in any way will mean no try is scored.
5. You can not lift your opponent into the air and drop them to the floor.

#### Key Terms

<b>Double movement</b>	When scoring a try and the ball carrying arm has hit the floor only momentum can be used to place the ball down, you cannot have a secondary movement.
Offload	is when a player holding the ball is tackled, but passes the ball to a team mate before the tackle is completed.
Penalty	When a player commits a deliberate infringement of the rules
Free Kick	When a player commits a technical offence for example time wasting.

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## Year 8

### Athletics

#### Key Terms

Sprint Start	You start sprint events e.g. 100m , 200m, 400m, and 4x100m relay in a crouched position
Foul Jump	When your foot is over the line when you take off in long jump, so the jump is not measured
Foul throw in Javelin	If any part of your body touches or goes over the line when you are throwing  If the javelin does not land tip first  The throw is not measured



Long Jump	Jumping as far as you can from a line into a pit of sand
High Jump	Jumping as high as you can over a bar onto a soft mat
Personal Best	Your best possible time, height or distance in an athletic or sporting event
Relay 4x100m	4 participants run 100m and pass a baton around a 400m track.

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## Year 8

### Rounders

#### Rules

- 1.The ball must be bowled above the knee and below the head and must not be wide or at the body
- 2.½ a rounder is scored if you hit the ball and make it to the second post
- 3.1 rounder is scored if you hit the ball and make it around all bases ensuring you touch fourth post as you pass it
- 4.If you hit the ball behind the batting line you have to wait at first post until the ball travels back over the line



#### Key Terms

Bowling	Ball is bowled to batter underarm
Batting	The act of hitting the ball in the box
No ball	When a ball is bowled that is too low (below knee), too high (above head), too wide or at the body
Obstruction	When a fielder gets in the way of the batter running around the post and posts

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