Bishop Ullathorne Catholic School
Knowledge Organiser

Year 9
Spring Term
2023-2024

Name
Tutor Group

"If you are not willing to learn, no one can help you.
If you are determined to learn, no one can stop you."

Your Knowledge Organiser and Self Quizzing Book

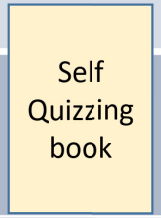
Knowledge Organisers

Knowledge Organisers contain critical, fundamental knowledge that you MUST know in order to be successful in Year 9 and subsequent years.

They will help you recap, revisit and revise what you have learnt in order to move the knowledge within from your short-term memory to your long term memory.

You must keep all of your Knowledge Organisers and Self Quizzing books at home because the fundamental knowledge required in Year 9 will also be required in Year 10 to 11.

Self Quizzing Book



This is the book that you should write in to complete your Knowledge Organiser Home Learning. **You do not need to bring this to school.**

Follow the simple rules on the right about how to use your Knowledge Organiser. You can also watch the video on our Home Learning webpage for more ideas on how to use the Knowledge Organiser.

You will be tested as a starter activity in your lesson on the day that the Home Learning is due. This will be completed in your normal exercise book and you will mark it in class.

The 'Look Cover Write Check' method

Step 1 Check Class Charts for what section your teacher has set you to learn for your Home Learning.

Step 2 Write the title of the section in your Self Quizzing Book .

Step 3 Write out the section that you have been asked to learn.

Step 4 Cover up the section in your Self Quizzing book. Read it, Cover it, Say it in your head, check it…REPEAT until confident.

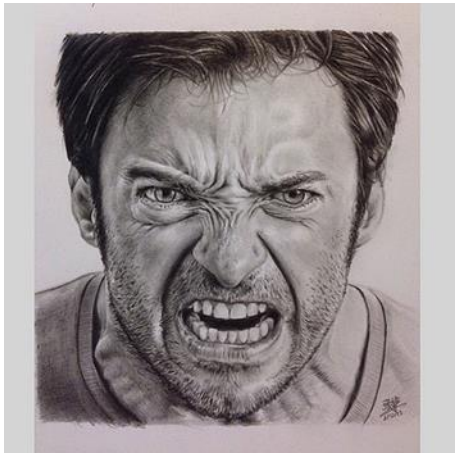
Step 5 Cover up the section and write from memory in your Self Quizzing book.

Step 6 Check your answers and correct where required. Repeat steps 4 to 6 until you are confident.

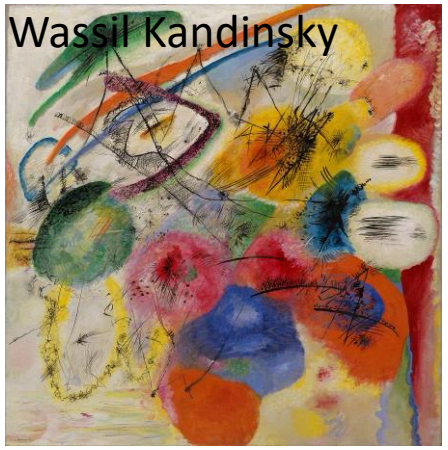
Contents

Knowledge Organiser – Year 9- Skill Grid- Outcome: Produce a grid of different techniques and skills

Watercolour painting	Watercolor or watercolour, also aquarelle, is a painting method in which the paints are made of pigments suspended in a water-based solution. Watercolor refers to both the medium and the resulting artwork.
Oil pastel	An oil pastel is a painting and drawing medium formed into a stick which consists of pigment mixed with a binder mixture of non-drying oil and wax, in contrast to other pastel sticks which are made with a gum or methyl cellulose binder. They can be blended with white spirit.
Scraffito	(Italian: "scratched"), in the visual arts, a technique used in painting, pottery, and glass, which consists of putting down a preliminary surface, covering it with another, and then scratching the superficial layer in such a way that the pattern or shape that emerges is of the lower colour.
Tonal drawing	Tonal drawing is the variation of black to grey that is given to a drawing on paper usually with a pencil. ... So, simply put Tonal drawing is the art of gradual increase or decrease from light to dark from one part of the drawing to another.
Abstract art	is art that does not attempt to represent an accurate depiction of a visual reality but instead use shapes, colours, forms and gestural marks to achieve its effect. Wassily Kandinsky. Cossacks 1910–1. Tate. Strictly speaking, the word abstract means to separate or withdraw something from something else.



PENCIL SHADING – *Draw a close up of a face in pencil*

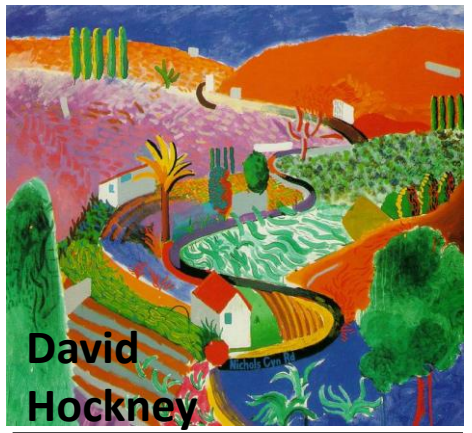


Block painting – *a close up of an abstract painting*

Impasto painting – *use expressive thick paint*

Black fine liner – *work in the style of 'Zentangle'*

Pencil crayon- *copy a close up of a natural forms picture*



Pastel drawing - *choose from oil or soft pastel to draw a landscape/street scene*

Home learning tasks:
Tasks will be set as work develops and may be completing work or researching artists.

Knowledge Organiser – Year 9- observational Drawing- 'Collections'

Observationa	Observational art is to draw or paint a subject as accurately as possible. The subject may be a still life, figure model, portrait or landscape and the image must be created from real life rather than a photograph or the artist's imagination
Hyper realism Art	Hyperrealism is a genre of painting and sculpture resembling a high-resolution photograph. Hyperrealism is considered an advancement of Photorealism by the methods used to create the resulting paintings or sculptures
Continuous line drawing	CONTINUOUS LINE DRAWING. The line in a continuous line drawing is unbroken from the beginning to the end. The drawing implement stays in uninterruped contact with the surface of the paper during the entire length of the drawing.
Composition	Composition is the term given to a complete work of art and, more specifically, to the way in which all its elements work together to produce an overall effect.
Grid drawing	Grid drawing is a technique that will help improve your accuracy without compromising the development of your freehand drawing in the long-term. It basically involves placing a grid over your reference photo and canvas, then using that grid to assist with the placement of your drawing.

Home learning tasks:
1. Observational drawing of a collection of objects (pencil case contents) in pen.
Artists study of chosen artist
Artists copy of chosen artist

Close up,
Section, Scale
Overlap,
Layer
Juxtapose
Observation
Angle
Reflective
Smooth
Texture
Line
Tone
Shade
Scale

a.Sarah Graham- Hyper realism- Graham paints everday objects in a way that it often looks like a photograph

Patrick Caulfield

c. Michael Craig Martin uses precise, bold outlines demarcating flat planes of intensely vibrant colours., he uses composition to explore spatial relationships by juxtaposing and layering colours

c. Colour Contrast-using colour theory to create contrast in your work

d. Using viewfinder to produce a close up of a subject

2

Year 9 Computer Science – Computer Networks

Network Security

Security Type	Meaning
Firewall	Controls which programs on your computer can send and receive data packets.
Antimalware	Scans your computer system and files for malicious software.
Encryption	Scrambles data to make it unreadable.
Decryption	Unscrambles it so that it is readable.

Viruses

Malware combines the words 'malicious' (meaning 'harmful') and 'software'. It is a program designed to cause damage to a computer or a computer network.

Virus

A virus embeds itself within computer software. When the software is run it creates copies of itself using software as a host. A virus is capable of slowing down your digital device, can stop it running or even steal your data.

Spyware

Spyware is a type of program that secretly records what you do on a computer. Spyware can be used to steal personal Information such as capture passwords, email addresses or banking information. They can even control your webcam.

Worms

Worms attack systems connected to the internet. Like a virus, a worm is capable of copying itself, causing similar damage to a virus. However, worms are standalone software and don't require existing software to host them.

Trojan

A Trojan is a harmful piece of software, pretending to be useful. Commonly spread through email attachments, a user is typically tricked into loading it onto their computer. Attacks can vary from deleting files and stealing data to creating access points for hackers

Passwords

A strong password contains a mixture of numbers, letters, symbols and is at least 8 characters in length, for example: **Ce91!*8dj**

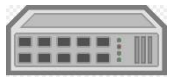
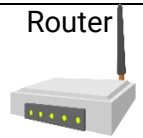
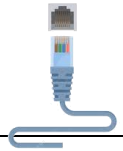
Networks

LAN- Local Area Network - connects devices together over a small geographical location e.g. a building. They connect computers using a combination of Ethernet cables and switches and require a Network Interface Card.

WAN-Wide Area Network - A computer network where devices are connected over a large geographical area (e.g. the internet). They require access to the internet via a router/ modem.

WPAN - Wireless Personal Area Network used to connect devices to your personal computer system without the use of wires. Most commonly uses Bluetooth. E.g. connecting a peripheral device to your laptop, connecting a mobile phone to a car, wireless headphones to your phone etc.

LAN Hardware

Hardware	Meaning
Server 	Stores all user data and information within a network in a central location. This allows users to log into any work station.
Switch 	Using Ethernet cables to connect to both the server and individual workstations. A switch directs information between the server and individual workstations.
Router 	Allows wireless connection of mobile devices to a network if within suitable range. Allows sever devices to be connected at the same time.
Ethernet Cable 	Networking hardware used to connect one network device to another. They can be used to share devices such as printers and scanners among many users

Reference to Robbot Resources

Year 9 Computer Science – Computational Thinking

Data Types

Data Type	Meaning
Integer	whole number e.g. 1,2,3,4
Real	Decimal number e.g. 1.2, 3.7
Character	A single character e.g. %, (, &
String	Ordered sequence of characters
Boolean	Produces a TRUE or FALSE output – AND, OR, NOT

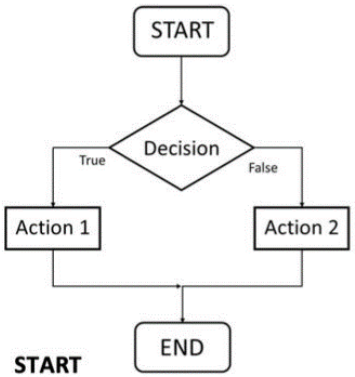
Boolean Operators

Operator	Meaning
>	Greater than
<	Less than
==	Equal to
!=	Not equal to
AND	Both conditions are true
OR	At least one condition is true

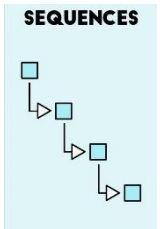
Key Words

Key Word	Meaning
Computational Thinking	The ability to solve problems logically
Variable	A memory location where values are stored – locally or globally
Sequence	A set of instruction or actions in order
Selection	A decision which has one input and two possible answers
Iteration	Repeating actions a number of times (FOR) or until a condition is met (WHILE)
Syntax Errors	Mistakes in the way the code is written
Logic Errors	The logic is correct but the output is wrong
Runtime Errors	When a program is asked to do something it cannot – it crashes
Debugging	Identification and amendment of errors

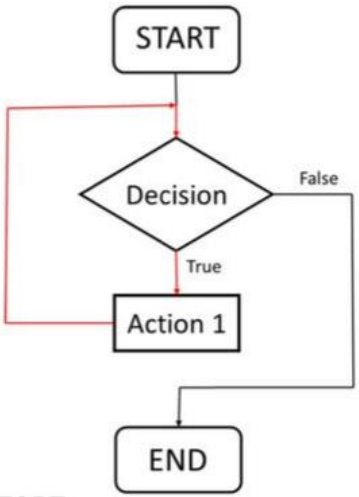
Selection (IF)



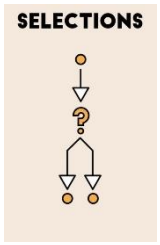

```
START
IF Decision = TRUE
  Go to Action 1
ELSE
  Go to Action 2
END IF
END
```



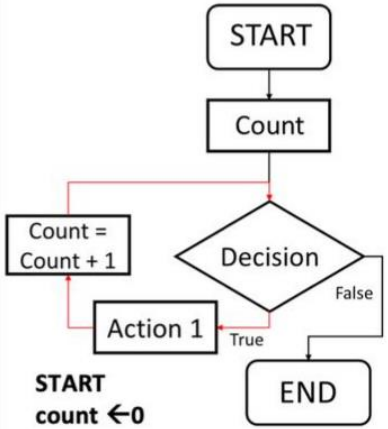
WHILE Loop



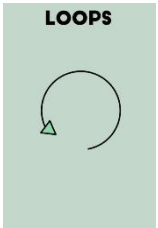

```
START
WHILE Decision = TRUE
  Go to Action 1
END WHILE
END
```



FOR Loop




```
START
count ←0
REPEAT
  Go to Action 1
  count ← count + 1
UNTIL Decision is TRUE
END
```



Computational Thinking

Decomposition	Pattern Recognition	Abstraction	Algorithm Design
Breaking down a problem into smaller, more manageable parts	Looking for similarities within problems	Focus on the important information only, ignoring irrelevant details	The creation of a step by step solution to the problem
			

Mathematical Operators

Addition	Subtraction	Multiplication	Division
+	-	*	/

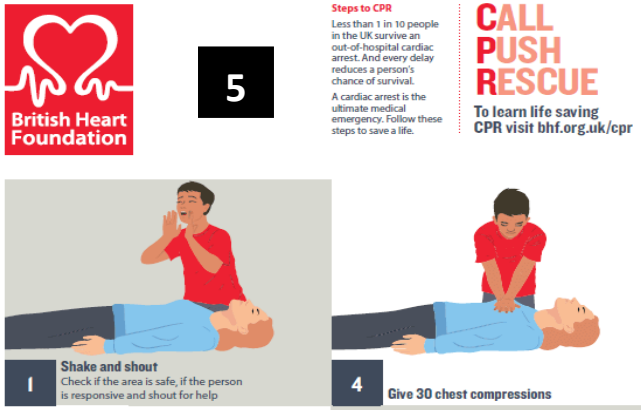
4

Year 8 CPSHE Spring Term 1

Healthy Lifestyles

Lesson overview 1
First aid
Drugs
Alcohol
Gambling

Keywords	**Definitions**
CPR 2	CPR stands for cardiopulmonary resuscitation. It's a life saving medical procedure which is given to someone who is in cardiac arrest. It helps to pump blood around the person's body when their heart can't.
First aid	First aid is the first and immediate assistance given to any person suffering from either a minor or serious illness or injury, with care provided to preserve life, prevent the condition from worsening, or to promote recovery.
Drugs	A drug is a substance that affects the way the body functions. If a drug is classified as 'illegal', this means that it is forbidden by law.
Alcohol	Alcohol is a colourless liquid that is found in drinks such as beer, wine, and whisky.
Gambling	It can be said to cover various forms of entertainment involving gain and loss based upon risk. 'Gaming' is the playing of a game (being a game of chance or a game that combines skill and chance) for a prize.



#kooth
#childline 8

5

Year 8 CPSHE Spring Term 2

Rights of Young People

Lesson overview
Rights of Young People—Legal age in the UK
Rights of Young People—Criminal responsibilities
Rights of Young People— UNICEF

1

Keywords	**Definitions**
Rights	That which is morally correct, just, or honourable.
Legal	Something connected to law or a government's system of rules. An example of legal is the type of action that will be decided by a court.
Criminal	A person who has committed a crime.
UNICEF	UNICEF, also known as the United Nations Children's Fund, is a United Nations agency responsible for providing humanitarian and developmental aid to children worldwide.
CEIAG	CEIAG (Careers Education, Information, Advice and Guidance) is designed to prepare students for life in modern Britain by providing the knowledge, understanding, confidence and skills that they need to make informed choices and plans for their future learning and career.

2

The age of criminal responsibility in England and Wales is 10 years old.

This means that children under 10 cannot be arrested or charged with a crime. There are other punishments that can be given to children under 10 who break the law (they can be given a Local Child Curfew or a Child Safety Order).

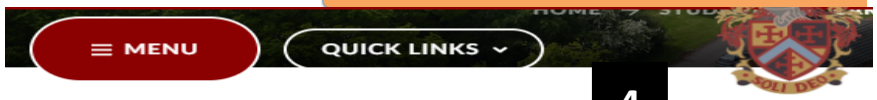
Children between 10 and 17 can be arrested and taken to court if they commit a crime. They are treated differently from adults and are:

- Dealt with by youth courts
- Given different sentences
- Sent to special secure centres for young people, not adult prisons.

3

C E I A G

Careers Education, Information, Advice and Guidance



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CAREERS EDUCATION, INFORMATION, ADVICE AND GUIDANCE (CEIAG)

Careers education and guidance helps students gain the knowledge and skills needed for their future career choices and gives them the information they will need to get there.

What does UNICEF do?

5

- UNICEF provides child protection to children all around the world by enforcing laws that protect children's rights
- Some laws that UNICEF may help to enforce are laws against poor working conditions or laws that help children from being forced to become soldiers
- UNICEF also helps children meet their basic needs and strive to reach their full potential
- UNICEF provides help to children in 156 countries
- UNICEF helps children in developing countries by providing them with health and nutrition, education, child protection, water supply and sanitation

6 **Legal ages in England**

	ENG
Leave school	**16**
Drink alcohol	**18** (16 in bars)
Have consensual sex	**16**
Be charged with a crime	**10**
Vote	**18** (UK elections)
Get married	**16** (with parental consent until 18)
Work	
•Modelling, theatre, etc.	**13**
•Light work	**14**
•Full-time work	**School leaving age**
Bet, gamble and play lotteries	
•Gamble	**18**

6

Year 9 CPSHE Spring Term 1

CEIAG

Lesson overview
CEIAG—Careers session with Mrs Bellingham
CEIAG—My learning journey
CEIAG—Future learning
CEIAG—Skills for life
Personal safety—Safer Internet Week

Keywords	**Definitions**
CEIAG	CEIAG (Careers Education, Information, Advice and Guidance) is designed to prepare students for life in modern Britain by providing the knowledge, understanding, confidence and skills that they need to make informed choices and plans for their future learning and career.
Future	Time which is still to come.
Skills	Train to do a particular task.
Personal Safety	Your personal safety is a general recognition and avoidance of possible harmful situations or persons in your surroundings.

Careers Education, Information, Advice and Guidance

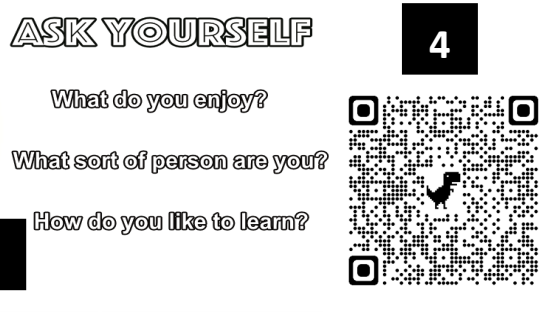
Safer Internet Day 2024 | Tuesday 6 February

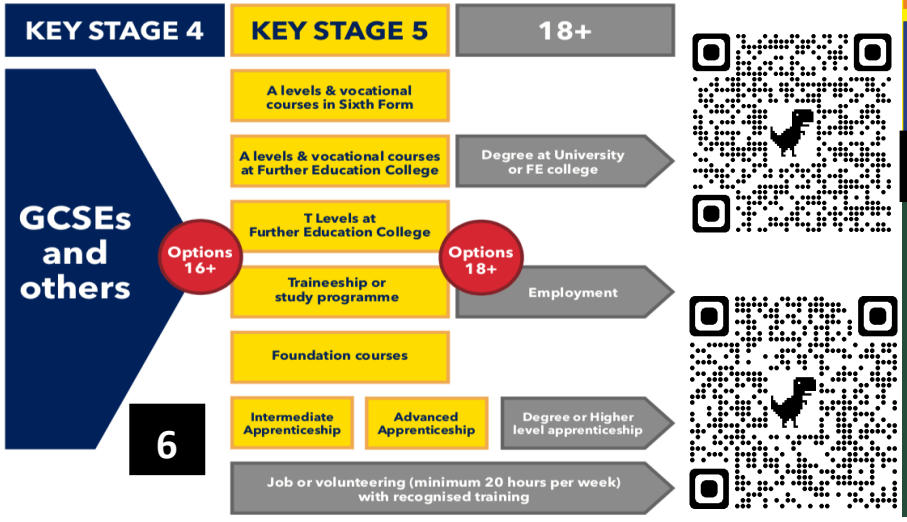
Coordinated by the UK Safer Internet Centre

saferinternetday.org.uk

CAREERS EDUCATION, INFORMATION, ADVICE AND GUIDANCE (CEIAG)

Careers education and guidance helps students gain the knowledge and skills needed for their future career choices and gives them the information they will need to get there.





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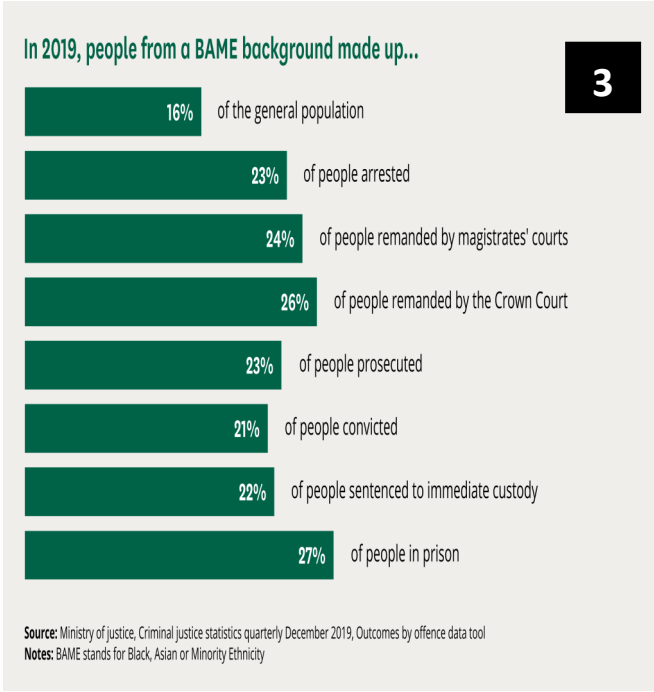
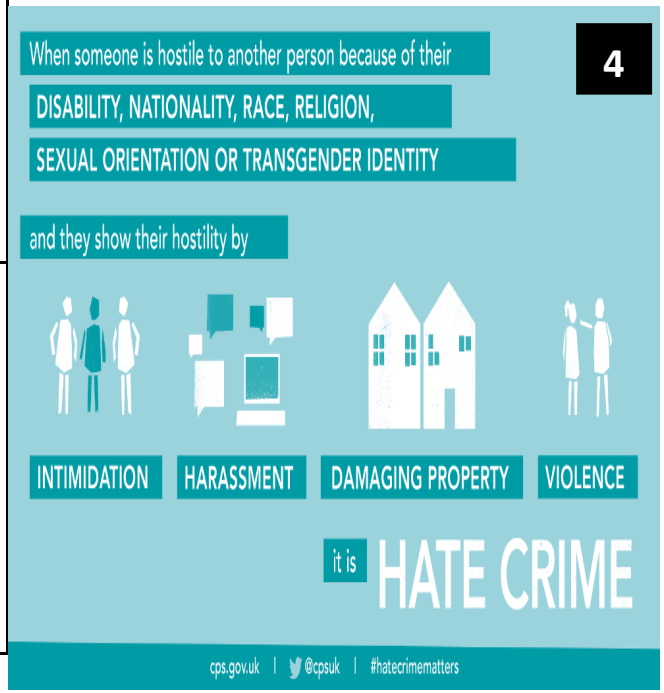
Year 9 CPSHE Spring Term 2

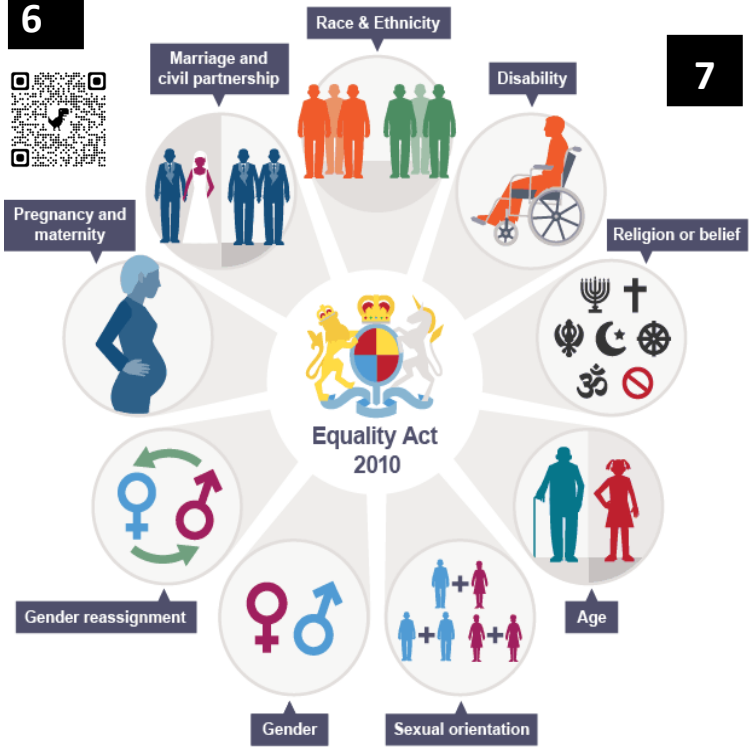
Criminal Justice System

Lesson overview
Punishment and reform
Case studies in crime
Racism and the law

Keywords	**Definitions**
Punishment	A penalty inflicted for an offence
Reform	To cause a person to abandon wrong ways of life or conduct.
Probation	Means you are serving your sentence but you are not in prison. This could include serving a community sentence or if you have been released from prison on licence or on parole.
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 marginalised.







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Year 9 - Art Textiles - Under the microscope

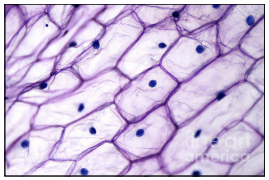
1. Keywords	
Decoration	Features that are added to something in order to make it look more attractive
Style	The style of a piece of work is its design and appearance
Refine	Making small changes to make something better
Couching	A textiles techniques where thread or wool is attached to fabric.
Tyvek	A fabric which can be heat manipulated and warped with heat.
Experimentation	Trying out of a new idea or method in order to see what it is like and what effects it has.
Explore	An idea or suggestion, you think about it or comment on it in detail, in order to assess it carefully.
Pattern	An arrangement of lines or shapes, especially a design in which the same shape is repeated at regular intervals over a surface.
Development	The process or result of making an idea better over time.

2. Assessment Objective 1—Analysing an artists work

Introduce the work of your designer or artist (key facts only), how does their work fit into trends at the time it was produced or current trends? Consider what key features appear regularly in your designers work, why might that be? What colours do they use a lot of? What effect does this give? Explain what you like / dislike about the designs and why that is. What techniques has the designer used? Why? Could different techniques be used to create different effects? How will this designer inspire your work? How does the designer fit into the theme? What techniques will you sample? Why?

3. Assessment Objective 3—Annotation of work

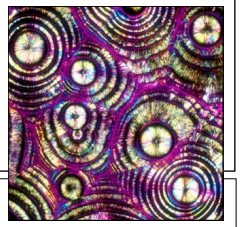
What should you include in your sketchbook. You need to annotate your work through out and be reflective.



What textile techniques have you used in your designs? Why? How does it link to the samples you have done?

Is you design inspired by any of your sources? How? Why?

What materials would you use? Why?



How does this design link to your theme?

What developments would you make to your designs? Why?

4. Assessment Objective 2 and 4—Techniques

The techniques you will focus on this project are:

Embellisher

Felting

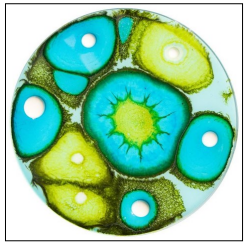
Heat Manipulation

Tyvek

Couching

5. Artist—Klari Reis

An American artist that use fabrics and epoxy resin to create petri dish style art.



6. Artist—Makiko Wakisaka

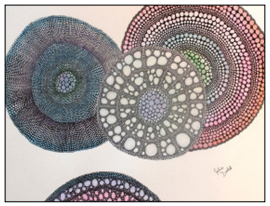
A Japanese soft sculpture artist, which looks at close up of leaf veins and hand machine stitch.

8. Artist—Julie Dodd

A British artist that uses papers to create repetitive patterns and shapes found in nature.

7. Artist— Laura Katherine McMillan

A trained doctor that gave up medicine to pursue a love of textiles. Her work looks at cell structures close up.



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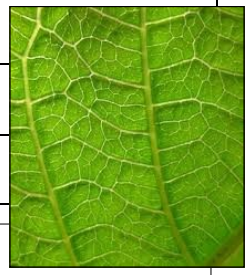
Year 9 - Art Textiles - Natural Forms

1. Keywords	
Aesthetics	The overall look of something, to study its appeal and beauty
Annotation	Notes or explanations added to a piece of work to explain your thinking
Texture	The quality of something that can be decided by touch
Techniques	A practical skill learnt in Art Textiles such as printing, embroidery
Poly printing	A printing techniques where marks are left in Styrofoam and then ink rolled
Natural Form	an objects in nature in its original form. Examples:- Leaves, flowers, pine cones, sea weed, shells, bones, insects, stones, fossils, crystals, feathers,
Image Page	A page covered in images which reflects a theme
Theme	The main focus or subject of the work
Reflective	To think about and analyse your thoughts and ideas



2. Assessment Objective 1—Researching for a project

What you should include in your sketchbook

A Theme Mind Map – Mind map all the things you can think of relating to your topic! Include images if you want to.

Image Page – Collect images linked to your theme into an image page – annotate keywords about the images / theme.

Artist / Designer Analysis – Look at an existing artist or designer and complete an analysis of their work

3. Assessment Objective 3—Annotation of work

What should you include in your sketchbook. You need to annotate your work through out and be reflective.

Describe—What? What is it that you have made?

Explain—How? How did you do it? What techniques did you use? How does it fit the brief?

Reflect—Why? Why did you use those techniques? Why did it work/not work? What might you do differently next time? How will you use this in the future of your pro-

4. Assessment Objective 2 and 4—Techniques

The techniques you will focus on this project are:

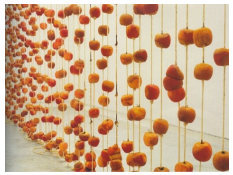
Mono Printing

Poly Printing

Ink work

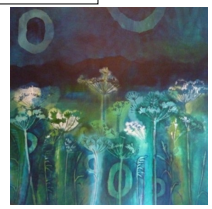
5. Artist—Anya Gallaccio

A British textile artists that creates installation art based on organic and natural matter.



6. Artist—Cas Holmes

A multi media textile artist that works with found materials and stitch



8. Artist—Yellena James

An illustrator that works with under the sea theme and specialises in silk and gutta work

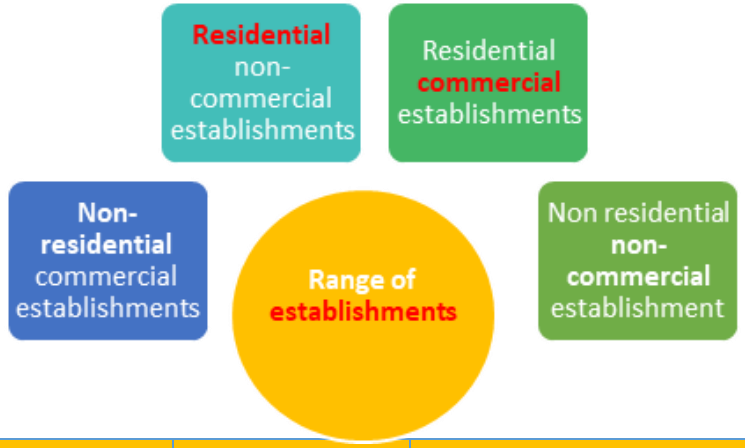
7. Artist—Caroline Dangerfield

A freelance artist that explores landscapes and nature in her local area.

10

Catering - Year 9 Knowledge Organiser

1 Types of Provider



Establishment	Services provided	Examples
Commercial residential	Accommodation, house keeping, food, beverages, conference or training facilities	Hotels, guest houses, campsites, bed and breakfasts, holiday parks, farmhouses.
Commercial non-residential	Food and beverage to eat in or take away, areas to sit eat and drink.	Restaurants, cafes, tea rooms, coffee shops, fast food outlets, pubs and bars, street food and pop up restaurants, mobile vans.
Non-commercial residential	Accommodation, food and beverages	Hospitals, care homes, prisons, armed forces, boarding schools, colleges, universities.
Non-commercial non-residential	Food and beverages	Canteens in offices, day-care centres, schools and nurseries, charity food suppliers e.g. soup kitchen

2 Front of House roles

Reception

Receptionist: meet customers and direct them to the correct person or place; they manage visitor lists and booking systems

Porter/ Concierge; assist hotel guests by making reservations, booking taxis and booking tickets for local attractions and events.

Restaurant and bar

Restaurant manager (Maître d'Hote): The restaurant manager is in overall charge of the restaurant,; they take bookings, relay information to the head chef, complete staff rotas, ensure the smooth running of the restaurant

Head waiter (ess): Second in charge of the restaurant,. Greets and seats customers, relays information to the staff, Deals with complaints and issues referred by the waiting staff.

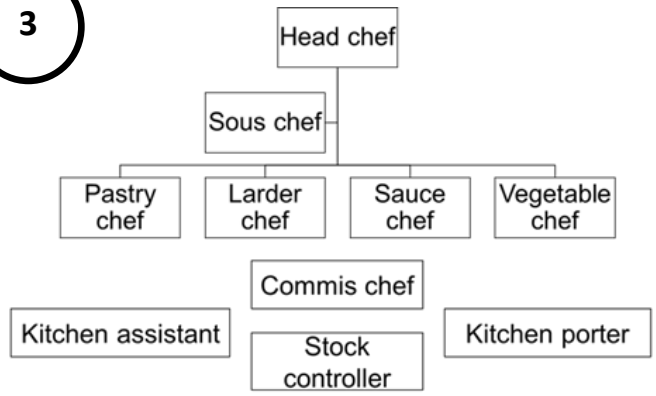
Waiting staff Serve customers, clear and lay tables, check the customers are satisfied with the food and service. May give advice on choices from the menu and special order foods

Wine waiter- Le sommelier: Specialises in all areas of wine and matching food, advises customers on their choices of wine, Wine waiters serve the wine to the customer and can advise customers on their choices as well

Bar staff serve drinks and take food orders , wash up, clear tables, change barrels and fill shelves.

Baristas make and serve hot and cold beverages, in particular different types of coffee such as espresso, cappuccino and latte.

3 The Kitchen brigade- Back of House



Most large establishments could have **chefs de partie** in the following areas:

Sauce chef- Le Saucier

Pastry chef- Le Patissier- baked goods and dessert

Fish chef- Le Poisonnier

Vegetable chef- L'entremetier

Soup chef- Le Potager

Larder chef- Le garde manger- cold starters and salads

The **commis chef** or assistant chef is a chef in training

The **kitchen porter** washes up and may do basic vegetable preparation

The **stock controller** is in charge of all aspects of store keeping and stock control.

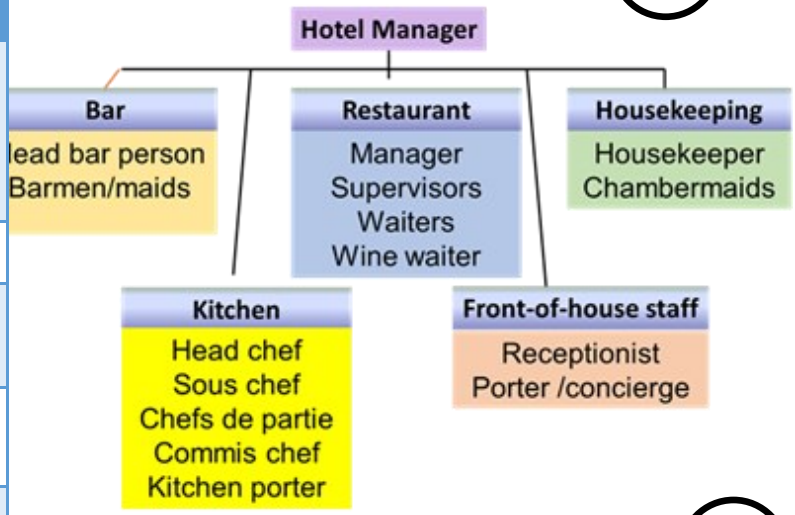
11

Food service	Description
Formal food	Food is usually served to customers by waiting staff. **Plate**—the meal is plated up and bought to the customers table by waiting staff. **Waiting service**—the food is served to the customers at the table by waiting staff. **Gueridon** - the customers food is cooked at the table, usually for dramatic effect.
Street food	Ready-to-eat food or drink sold on the street or in a public place such as a market or festival.
Self-service	Customers help themselves to food, for example, a carvery where the meat is on display and carved by a chef, then the customers help themselves to vegetables and gravy.
Fast food	Food is made to order very quickly and can be taken away from the restaurant or stall to eat. Seats and tables are often provided.
Cafeteria	Small and inexpensive restaurant or coffee bar, serving light meals and refreshments.
Takeaway	Takeaway restaurants take an order and deliver the food to the customers home, customers can also order at the restaurant and take the food away to eat.
Buffet	A selection of dishes is laid out for the customers to help themselves. Different buffet styles include: **Sit-down buffet**—once the customer has chosen their food from the buffet, they can sit down at a table to eat it. **Stand-up or fork buffet**—once the customer has chosen their food, they stand to eat it; this allows guests to circulate and meet other guests. **Finger buffet** - all the food is prepared to be eaten with fingers (without the need for a knife and fork). Foods are normally bite-size and easy to eat.
Automatic vending	Drinks and snacks are stored in a machine with a glass front and items are selected by the customer. They are often coin operated and placed in establishments where it may not always be possible to get access to food.
Transport catering	A variety of food service options are available on train, planes and ships.
Hotel	Provides overnight accommodation and food and drink options. Many hotels offer breakfast, evening meals, bar snacks, lunch and room service.
Bed & Breakfast	Offers overnight accommodation and breakfast. Often these are private family homes where rooms are made available to guests. Breakfast is usually served in a dining room or the owners kitchen.

4

Staff structure in a hotel

6



5

Proposing ideas

You need to be able to match different types of visitors to suitable types of catering and/or accommodation. The different types of visitors include:

- Families with children under 12
- Families with teenage children
- Groups of people, for example a school group
- Old age pensioners (OAP's)
- Overseas visitors
- Single people
- Couples

A range of information must be gathered to be able to make a structured proposal for catering and accommodation for a specific requirement such as: Budget, type of occasion, type of venue, number of people, information about the area.

12

Year 9 SPRING EXAM Product Design Knowledge Organiser

1

Coping Saw		A saw with a very narrow blade stretched across a D-shaped frame, used for cutting curves in wood
Sand-paper		A low grade abrasive material used to smooth woods and plastics
Wet and dry paper		A high grade abrasive material used to achieve a high quality finish
Vice		Used to hold work in place when sawing and filing

How to cut acrylic:

1. with hand tools (above)
2. with CAD/CAM:

Step 1: create the design on **2D Design** computer software

Step 2: put the correct **colour, size and thickness** of acrylic on the laser cutter **bed**

Step 3: **program** the laser cutter for the right **settings** for **speed and power**

Step 4: turn the **extraction** on and **run** the program

The Process of Injection Moulding

2

1 **Granules** (small beads) of polymer are fed into a **hopper**. A **colour pigment** is added at this stage if a specific colour is required.

2 The granules are **fed forwards towards the mould** using an Archimedes **screw**.

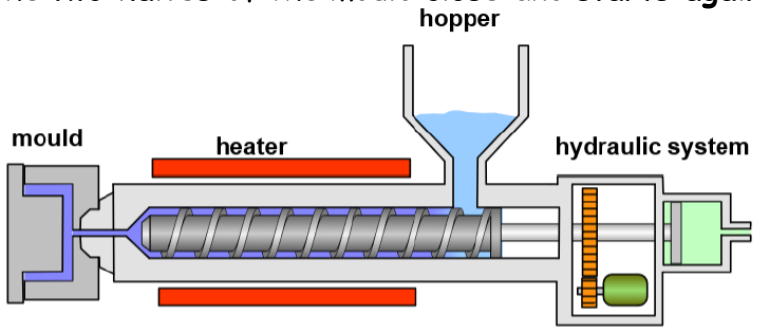
3 The **heat chamber** that surrounds the screw gradually **melts** the polymer as it moves towards the mould.

4 The screw **moves away from the mould** as the volume of molten polymer **builds up next to the mould**.

5 A **hydraulic system** rams the **screw towards the mould**, pushing the molten polymer into the mould.

6 The **polymer cools quickly** in the **mould**. The **two halves** of the mould are **opened**. The **ejector pins push** the formed object from the mould.

7 The **two halves** of the mould **close** and **starts again**.

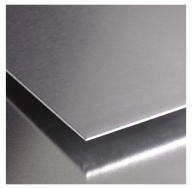


Acrylic is readily available in 3mm and 5mm sheets which means the overall cost is lower. One solid thick piece of 30mm is difficult to source and expensive.

Layering different sheets means you can select colours to achieve different effects.

The adhesive you use to glue acrylic together is Tensol Cement because it is a solvent-based adhesive that melts the surface to fuse them together. It does not need to be mixed first.

3

E.g. cast iron **Ferrous Metals** E.g. stainless steel		Metals which contain iron and will rust and will attract a magnet
E.g. copper **Non-ferrous Metals** E.g. aluminium		Metals which contain DO NOT iron and will NOT rust and will NOT attract a magnet
E.g. ferrous alloy: stainless steel **Alloys** E.g. non-ferrous alloy: brass, bronze		Metals that are a mixture of two or more other metals or elements

Aluminium requires **bauxite ore** to be extracted. Smelting or electrolysis is used to get aluminium from the bauxite.

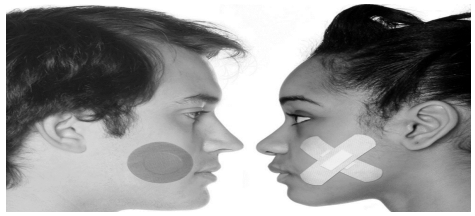
Aluminium is commonly found in China, Australia and USA. The extraction sites create a lot of **noise and pollution** and destroy natural **habitats**.

Smelting and electrolysis need a lot of **electricity**. These factories are usually powered from **non-renewable** sources like coal, oil and gas which we have a limited supply of and generates pollution.

The ore and aluminium are likely to be **transported** between a number of **factories** (e.g. for it to be printed) which will cause more pollution.

13

‘Noughts and Crosses’: Knowledge organiser



Key dramatic terms

Play – a text written for performance on a stage

Act – a division of a **play** made up of several individual **scenes.**

Scene – an individual unit of action in a **play**.

Soliloquy / Aside – a **dramatic technique** in which a character speaks their thoughts to the **audience** without other characters hearing.

Stage directions - instruction written in the script of a **play** that gives direction to the actors or information about the action or scenery.

Audience – the people who watch a **play** at the theatre or see it performed on television or at a cinema.

Important unit vocabulary

Segregation – setting people apart
Oppression – cruel or unjust treatment
Prejudice – unreasonable opinion (also **bigotry**)
Discrimination – unjust treatment of difference
Inequality – difference in how you’re treated
Injustice – unfair treatment
Intolerance – unwillingness to accept something
Manipulation – making you behave a certain way
Dystopia – a broken world full of suffering
Slavery – making you work in unjust conditions
Terrorism – unlawful use of violence and intimidation
Politics – activities linked to government
Liberation – setting people free
Freedom – the right to act, speak, think as you choose
Isolation – being separated from others
Identity – who you are and what you believe
Radicalisation – being made to adopt extreme views

The play’s structure

The play of ‘Noughts and Crosses’ is adapted from a novel of the same name by Malorie Blackman, which alternates the narrator between Sephy and Callum.

In the play, Act 1 mainly focuses on Callum’s ‘world’ and Act 2 switches to Sephy’s ‘world’.

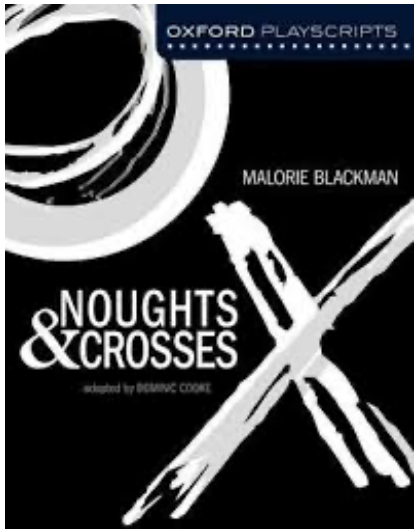
Key Themes: Racism Discrimination Friendship Love War Prejudice

Context

The story of ‘Noughts and Crosses’ was written in a time where white people had control over black people. In the play’s scenario, as in the original novel, black people (Crosses) have control over white people (Noughts).

Other books in ‘Noughts and Crosses’ series

‘Knife Edge’, ‘Checkmate’, ‘Double Cross’, ‘Crossfire’, ‘Endgame’



Characters:

The Noughts

Callum McGregor - in love with Sephy

Jude McGregor - Callum’s brother

Lynette McGregor - Callum’s sister

Ryan McGregor - Callum’s father

Meggie McGregor - Callum’s mother

Characters:

The Crosses

Sephy Hadley - in love with Callum

Kamal Hadley - Sephy’s father

Jasmine Hadley - Sephy’s mother

Minerva Hadley - Sephy’s sister

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Year 9 DRAMA
Writing Skills

How to write about playing your character and the choices you have made in the devising process. Use this structure and remember to link to semiotics, technical semiotics and dramatic conventions/ techniques.

Description	I am going to lower the **pitch** of my **voice**, **(Voice)** frown **(Facial expression)** and walk slowly and deliberately **(Physicality)** over to the **character** Margaret.
Example	I will do this in the **scene** where I am threatening her, in particular when she says she is leaving me.
Justification / Explanation	I am using it here to **emphasise** the intimidating aspects of this **character**. The **exaggerated facial expression** such as staring at her will show that the character is dangerous and frightening. Hopefully this will make the **audience** suspect me as the murderer.
Analysis	I found through **peer/audience feedback** that lowering the **pitch** of my **voice** didn't work as it actually made the character seem quite funny and made the audience giggle.
Evaluation	This wasn't appropriate for our **audience** as I should be making them feel unsettled, not making them laugh.
Solution	If I was to do this again I would use my own **vocal pitch** but I would add in lots of **pauses** to **create tension**. Hopefully this would **create suspense** for the **audience** and create a '**red herring**' as it will make them think that I am the murderer when I am not. This will fit in much better with the **genre of**

15

Year 9- Love and Relationship Poetry.

1 Poem Summary

When We Two Parted- Lord Byron
At the time Byron claimed the poem was written in 1808. However, Byron's later letters shows that he lied in order to protect the name and reputation of the poem's subject, Lady Frances Wedderburn Webster. Lady Frances was a famous member of the aristocracy, who had an affair with Byron, The poem reveals Byron's emotions about breaking up with Lady Frances and his feelings of seeing her with another man.

Love's Philosophy- Percy Bysshe Shelley
Written from the perspective of a narrator desperate to be in a relationship with the woman he is interested in. The speaker attempts to explain his 'philosophy' behind love, or to try to rationalize his irrational feelings of love for the person he is speaking to. He attempts to use harmony and connections in nature as way of rationalizing his love for the woman he addresses the poem to.

Porphyria's Lover- Robert Browning
During the Victorian period women and men were expected to be very formal and reserved. If people went against these social conventions then they were frowned up and socially outcast. The poem is told from the perspective of a mentally disturbed mind and the narrator has an obsession with Porphyria's hair. It is implied in the poem that the female character is perhaps socially superior to the speaker or that her family disapproves of their relationship.

Sonnet 29- 'I think of thee!' Elizabeth Barrett Browning
n 'Sonnet 29', Elizabeth Barrett Browning speaks to her husband Robert Browning about how she thinks of him, but that in reality he is probably not like that. She thinks about him when he is away from her, but she is worried that her thoughts do not match the reality of what he is really like.

Neutral Tones- Thomas Hardy
The speaker reflects on the final moments of a dying relationship as a couple seem on the brink of splitting up and leaving each other. The weather is bleak and the colours associated with it are dull and washed out, reflecting the difficulties of the relationship the couple find themselves in.

2

Letters from Yorkshire- Maura Dooley
Based on her real-life friendship with a friend from Yorkshire. Dooley previously lived in Yorkshire before moving to London. People who live in London have very different lives to people who live in Yorkshire. London is a vast city, whereas much of Yorkshire is isolated countryside. For the narrator, country life is romantic and inviting.

The Farmer's Bride- Charlotte Mew Heavily influenced by her own life events, Mew was from a middle class family, but her father's inability to manage the family finances meant she lived most of her early life in poverty. Two of her siblings were committed to insane asylums after suffering from mental illnesses. Mew and her sister Anne were terrified of passing on 'insanity' to their children, and so made a pact never to marry and have children. The Farmer's Bride tells the story of a farmer who married a young woman but she is scared of him

Walking Away- Cecil Day- Lewis
The narrator talks about watching his son's first football match eighteen years ago. Despite his immense sadness at having to 'let go' of his son and his child, the father knows he must do so in order to allow his son to become independent and grow up to be an independent person.

Eden Rock- Charles Causley
A man sees his parents, still young, on a bank on the other side of a river. They beckon to him to come to them. The narrator imagining a time before he was alive. The use of pronoun 'it' in the last line allows for this experience to be interpreted in multiple ways

Follower- Seamus Heaney
In this poem the narrator's father is a farmer who is ploughing his fields. The narrator describes himself as a boy, following his father around. As they both grow older, they swap roles. The boy becomes a man and is 'followed' around by his now elderly father.

3

Mother, Any Distance- Simon Armitage any of Simon Armitage's poems see him take on the voices of characters or 'personas'. In this case, a man is contemplating leaving home and thinking of the new freedom he will enjoy, but he tells his mum he still needs her and she will help to keep him grounded.

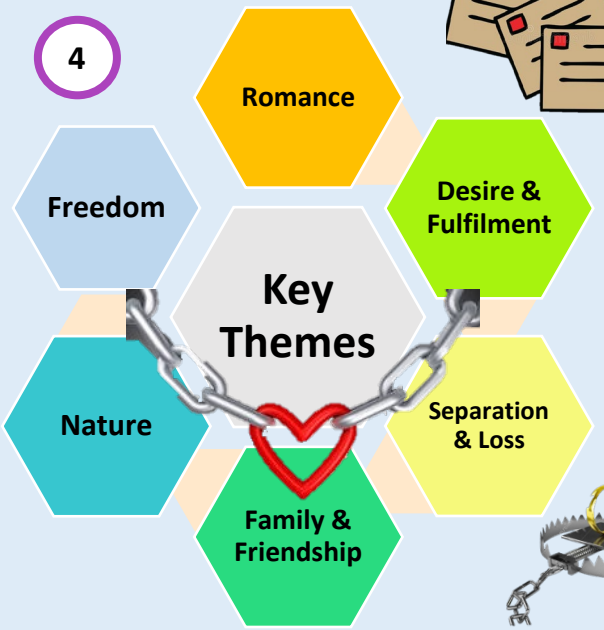
Before You Were Mine – Carol Ann Duffy 'Before You Were Mine' is a poem about motherhood and identity. The narrator seems to be looking a photo of her mum and her friends before she was born. The narrator imagines what her mum was like before she was born. How do you think she feels about her mum? How do you think the mum might feel?

Winter Swans- Owen Sheers
A couple walk around a lake on a cold and miserable winter's day. As they walk, distant with each other, they see two swans on the water and admire their unity and harmony. The symbol of the swans brings the couple back together as they think on their own relationship.

Singh Song!- Daljit Nagra This poem looks at the stereotypes surrounding British Asians and makes fun of them. Daljit Nagra is himself the son of immigrants. The writer uses a combination of accent and dialect within the poem. In the poem The first few stanzas show a man abandoning his responsibilities as a shopkeeper to spend intimate time with his partner.

Climbing My Grandfather- Andrew Waterhouse
The narrator uses an extended metaphor of a climber and a mountain to describe his grandfather. It could be interpreted in two different ways: It could be that the narrator remembers or tries to remember climbing up onto his grandfather when he was a little child. However, it could be that the narrator is using the metaphor of climbing to explain his relationship with his grandfather as an adult.

4



16

Year 9- Love and Relationship Poetry.

5 The Purpose and Function of Pathetic Fallacy

What is pathetic Fallacy?

Pathetic fallacy occurs when a writer attributes human emotions to things that are not human, such as objects, weather, or animals. It is often used to make the environment reflect the inner experience of a narrator or other characters. For example, if a writer mourning the death of a loved one writes that "the flowers on the grave drooped in sadness," this would be an example of pathetic fallacy, since the flowers do not, in fact, feel sad. Any time a writer describes a wave as "angry," the sun as "smiling," or birdsong as "mournful," it is an example of pathetic fallacy, since emotions are being attributed to things that do not actually have them (or at least not in the way humans do). Although the example of a sun "smiling down" on someone technically does not refer explicitly to an emotion (e.g., happiness) it is fair to count it as an example of pathetic fallacy because the action being described so clearly suggests a specific emotion. The word "pathetic," in this context, does not mean "bad" or "lame." It comes from the Latin *pathos*, meaning "feeling." The word "fallacy" comes from the Latin *fallax*, meaning "deceitful" or "false." When they are put together, these words suggest that assigning human feelings to nonhuman things is a falsehood. However, that does not mean that pathetic fallacy is always a mistake; it is often used on purpose in order to evoke a certain emotional atmosphere. Pathetic fallacy is a specific type of personification, or the attribution of human qualities to non-human things.

Reasons why Writers use pathetic Fallacy:

- Set the mood of a scene.
- Imbue the environment with a certain emotional quality.
- Craft a vivid and compelling setting.
- Convey the emotional state of a characters and/or narrator, because the way that character or narrator describes the world in fact reveals the state of their own mind.
- Make inanimate objects or nonhuman forms of life seem more familiar and relatable.

6

Where can we see symbolism in the Love and Relationships poetry?

Pathetic Fallacy in Robert Browning's "Porphyria's Lover"
In the poem "Porphyria's Lover," the speaker describes the wind as sullen, and destroying trees out of spite.

The sullen wind was soon awake,
It tore the elm-tops down for spite,
and did its worst to vex the lake

The wind, of course, may be powerful and destructive, but it is not purposefully causing damage. Instead, the speaker's description of the wind reveals the speaker's state of mind.

7 Approaching Unseen Poetry

TITLE, OPENING AND CLOSING LINES

- What ideas/themes are suggested by the title?
- Mind map possible things a poem with this title could be about. Skim read the poem and see if any are plausible.
- Check the opening and closing lines- Are they linked or connected in any way?

SHAPE

- Look at the shape of the poem on the page. Does it have a recognisable form: sonnet, ballad, narrative?
- Does it have stanza? Are the regular or irregular?
- Are the lines of equal length/ syllables or do they vary?

VOICE

- Who seems to be speaking the poem? The poet of a character?
- What type and tone of voice do you imagine?
- Which parts of the poem are most powerful when you red it aloud?
- Do you notice any alliteration/assonance or other sounds as you read it aloud?

VOCABULARY & IMAGERY

- Are there any words or phrases that stand out? Do they have one or several meanings?
- Are any words/ phrases repeated? If so, why?
- Are similes and metaphors used? If so, what 2 things are compared and why?

PERSONAL RESPONSE

- Read the poem thoroughly and decide what you think the poet was trying to do.
- Is there a message?
- Is there an emotional response to an event or situation? Doe the emotion shift and change throughout?
- Could the poem be interpreted in different ways?
- What do you feel as a reader?

17

Year 9- *'Othello'* by William Shakespeare

Plot Overview

1

Iago is angry that Othello, the general of the army, has promoted Cassio to be his lieutenant instead of Iago.

Othello has secretly married Desdemona, the daughter of a senator in Venice.

Iago tells Desdemona's father about the secret marriage to cause trouble for Othello.

Desdemona's father makes a formal complaint about Othello's behaviour to the Duke of Venice. His complaint is ignored, and the Duke sends Othello to Cyprus to continue fighting in a war.

Othello goes to Cyprus and takes his new wife Desdemona with him, together with Iago and Michael Cassio.

2

Characters

Othello:
- Respected
- Impulsive
- Victimised
- Suspicious

Desdemona:
- Submissive
- Kind
- Naïve
- Innocent

Iago:
- Manipulative
- Disloyal
- Resourceful
- Duplicitous

Emilia:
- Loyal
- Outspoken
- Independent
- Down-trodden

3

Historical Context

In Elizabethan England, the term "Moor" could be used to refer to a wide range of non-European people, including black Africans, North Africans, Arabs, and even Indians. References to Othello's origins throughout the play are frequent: Iago calls Othello a 'Barbary horse'; Barbary was an area in Africa between Egypt and the Atlantic Ocean. Roderigo, however, calls him 'thicklips', suggesting that he may come from further south on the African continent. Brabantio calls him 'sooty'; Othello, along with numerous other characters, refers to himself as 'black'. Shakespeare's reference to Othello as a 'Moor' is almost certainly an indication that Othello's ethnicity is of African descent.
In England during Shakespeare's time, views regarding 'Moors' were slightly more complex because of strong anti-Catholic sentiment in England and English fears of invasion by the Spanish. In fact, England maintained independent trade relationships with "Moorish" Northern Africa, despite Spanish and Portuguese protest. The English slave trade also brought black slaves to Europe, from mid-sixteenth century onward.

Iago encourages Cassio to get drunk whilst on duty. Cassio ends up in a drunken fight and is demoted from his position as lieutenant.

Iago begins to plant seeds of suspicion in Othello's mind about his wife's relationship with Michael Cassio. Iago gets hold of a handkerchief belonging to Desdemona and hides it in Cassio's room pretending it is proof of Desdemona's unfaithfulness.

Desdemona pleads with Othello to give Cassio his job back. She does this innocently, but Othello takes this as proof of her feelings for Cassio.

4

Useful 'translations' from Shakespearean to modern English:

Thee and thou = *you*
Thy = *your*
('thee', 'thou' and 'thy' were more informal versions of '*you*' in Shakespearean times. Characters are more likely to use '*you*' and '*your*' when they are being respectful or polite, e.g. when speaking to someone with a higher status than them.)
art = are
chide = tell off/ scold/ rebuke/ reprove
cuckold = (mocking/insulting) a man with an unfaithful wife
false = treacherous, traitorous, perfidious
forsooth = =in truth, certainly, truly, indeed
hath = *has*
humour = *mood / temperament*
morn = *morning / dawn*
o'er = *over*
oft = *often*
prate = *talk / chat*
prithee = Please, may I ask
thy = *your*
'twixt = *between*
vex'd = angry
wench = *girl*
whence = why

5

KEY QUOTES EXPLAINED

'I'll [...] make the Moor thank me, love me, and reward me For making him egregiously an ass.' Iago is left alone and delivers soliloquy revealing his evil scheme. He has announced that winning Desdemona for himself would be the best possible form of revenge against Othello, but that he will settle for driving Othello mad with jealousy by tricking him into thinking Desdemona has been unfaithful. Iago finishes his speech with the alarming boast that he will make Othello **'thank me, love me, and reward me'** for making a fool out of him, again using the racist imagery and says he will turn Othello into an ass (donkey). This passage is a reminder of Iago's scheming nature—he wants to destroy Othello not only for the pleasure of vengeance, but also for the "reward" of advancing his own career. It also reveals the truly stubborn, heartless extent of his desire for revenge. It is not enough for Iago to ruin Othello; he wants Othello to "thank" and "love" him for it too.

Iago continues to manipulate Othello to the point where Othello punishes his new wife for her supposed lies and unfaithfulness.

Iago's wife, Emilia, tells Othello that Iago has lied. Othello realises his tragic mistake as Iago is arrested.

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Year 9- *'Othello'* by William Shakespeare

6 The Purpose and Function of Allusion

What is an allusion?

In literature, an allusion is an unexplained reference to someone or something outside of the text. Writers commonly allude to other literary works, famous individuals, historical events, or philosophical ideas, and they do so in order to layer associations and meanings from these sources onto their own work. Allusions can be direct or indirect, meaning that they might explicitly state the name of the thing they're referring to, or they might hint at it in other, subtler ways.

Reasons why writers use allusion:

- To efficiently convey big ideas or refer to stories that would take too long to explain.
- To deepen and enrich the meaning of a text by adding a layer that may not be obvious to all readers.
- To invite readers to reflect on the similarities between their own lives and the lives of authors or characters being alluded to.

Where can we see allusion in *'Othello'*?

He hath not yet made wanton the night with her, and / she is sport for Jove."
In the allusion to Jove in *Othello*, Iago is using deceitful tactics to play with Cassio's mind by attempting to attract him to Desdemona. He claims that Desdemona is "sport for Jove," signifying that Desdemona is a woman fine enough to belong to the King of Gods. Since the King of the Gods is likely to have a woman of high class and beauty, the allusion to Jove is ideal. In addition Jove had many different wives and famously cheated on Hera, suggesting Othello might be the same.

8 Shakespeare alludes to the following mythological characters in Othello.

In Roman mythology, Jove is the king of the gods as well as the god of sky and thunder. Jove is also commonly known as Jupiter was the chief deity of Roman state religion throughout the Republican/ Imperial eras, until the Empire came under Christian rule. He is the Greek equivalent of Zeus, who wielded bolts of thunder.

In Greek mythology, the Hydra is poisonous serpent-like water beast that possessed up to nine heads. Additionally, for each head cut off, it grew two more, and it had extremely infectious poisonous breath and blood; the stench from its breath was enough to kill man or beast. Hercules found the Hydra and killed it. Heracles cut off the heads one by one from the Hydra and Iolaus held a torch over the open wounds to stop them from growing, until just one head was left. Hercules used a golden sword from Athena to destroy the last head with a mighty blow.

The term Janus describes someone who is duplicitous. Shakespeare's mythological allusion to Janus is, ironically, a quote by Iago. Even more surprisingly, when he uses it he is not telling a lie; he simply swears no by Janus when Othello asks him if Brabantio is approaching. Nevertheless, Janus, as a two faced god, is very appropriate and fitting for Iago's own role during the play. Iago himself is many faced with all of his feigned behaviours. His duplicity is further demonstrated when Othello steps away and Iago shows his other face of Janus and begins his malicious scheming again, yet switches back his original "face" when Othello returns.

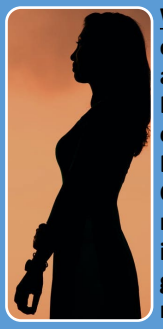
7 Themes

PREJUDICE: Othello shows the impact of racial prejudice. In nearly every case, the prejudiced characters use terms that describe Othello as an animal or beast. In other words, they use racist language to try to define Othello

not only as an outsider to white Venetian society, but as being less human and therefore less deserving of respect. Othello himself seems to have internalized this prejudice. On a number of occasions he describes himself in similarly unflattering racial terms. And when he believes that he has lost his honour and manhood through Desdemona's supposed unfaithfulness, he quickly becomes the kind of un-rational animal or monster that the white Venetians accuse him of being:

Jealousy:

Iago refers to jealousy as the "green-eyed monster." As this metaphor suggests, jealousy is closely associated with the theme of appearance and reality. For instance, at one point Othello demands that Iago provide "ocular proof" of Desdemona's infidelity—he demands to see reality. But Iago instead provides the circumstantial evidence of the handkerchief, which Othello, consumed by his jealousy, accepts as a substitute for "ocular proof." Othello's jealousy impedes his ability to distinguish between reality and appearance.



Women and marriage: Two contrasting images of womanhood dominate Othello: the virtuous and loyal woman, or Madonna, embodied by Desdemona; and the strong and opinionated, embodied, to a certain extent by Emilia. Desdemona often describes her devotion to Othello in front of other people, she plays the role of the virtuous wife. Emilia is far less idealistic about marriage and the world in general than Desdemona is, she is loyal to her mistress.

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YEAR 9 GEOGRAPHY - TECTONICS

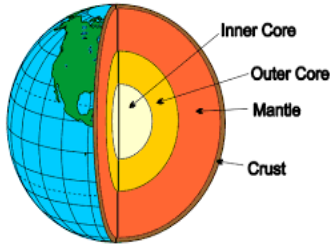
1.KEY VOCABULARY

Destructive plate margin	Tectonic plate margin where two plates are converging and oceanic plate is subducted – there could be violent earthquakes and explosive volcanoes
Conservative plate margin	Two plates sliding alongside each other, in the same or different directions
Constructive (transform) plate margin	Tectonic plate margin where rising magma adds new material to plates that are diverging or moving apart
Continental crust	The low density, thick outer layer of Earth which forms our continents
Oceanic crust	The dense, thin outer layer of Earth that lies underneath the ocean
Plate margin	The border between two tectonic plates
Tectonic plate	Section of the Earth's crust about 100km thick
Composite volcanoes	Steep-sided volcanoes found at constructive plate margins
Shield volcano	broad, flat volcano with non-violent eruptions formed at constructive margins and at 'hot spots'

2. STRUCTURE OF THE EARTH

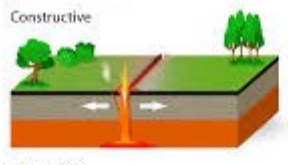
1.Outer core – made of liquid nickel and iron
2. Inner core – solid centre of the earth that reach 6000℃
3. Mantle – contains magma that moves in currents
4. Crust – think layer of solid rock

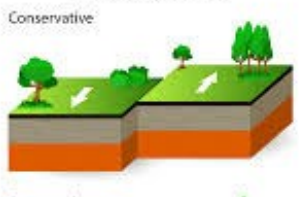
Magma is molten rock which Is called Lava once is has reached the surface of land.



3. PLATE TECTONICS

- Convergent plate boundary – where two plate collide, and fold mountains are formed
- Constructive plate boundary – when two plates separate, and volcanic islands are formed. An example is the Hawaiian islands.
- Conservative plate boundary – where two plates slip past each other and earthquakes occur. An example is San Andreas fault line.
- Destructive—Where an oceanic and continental crust collide and form a subduction zone leading to volcanoes being formed.





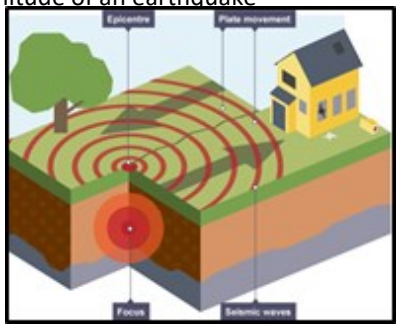
4. IMPACTS OF PLATE TEC-

Volcanic Eruptions— These can be created when plate collide and separate

•Lava comes up the vent and out of the crater

•A shield volcano is much flatter and less explosive whereas Shield volcanoes have much steeper sides and thicker (more viscous) lava.

Earthquakes— Occurs when two plate slip past each other. Tremors radiate from the point of impact . The strength of them are measured using the **Richter scale**— a scientific scale from 1-10 used to measure the magnitude of an earthquake



Tsunamis— A tsunami is caused by an underwater earthquake. •The focus is underwater and causes huge waves to come ashore. Waves can travel at up to 500 miles per hour. •Tsunami can be predicted when the sea retracts (pulls back)

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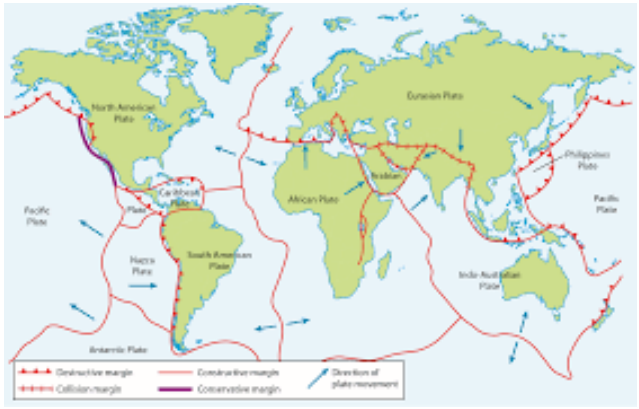
YEAR 9 GEOGRAPHY - TECTONICS

5.KEY VOCABULARY

Prediction	Using historical evidence and monitoring, scientists can make predictions about when and where a hazard may happen
Monitoring	Recording physical changes, i.e. detecting heat and shape changes of volcanoes using remote sensing, to help forecast when and where a natural hazard might strike
Protection	Actions taken before a hazard strikes to reduce its impact, such as educating people or improving building design
Primary effects	Initial impact of a natural event on people and property, caused directly by it, i.e. the buildings collapsing following an earthquake
Secondary effects	After-effects that occur as indirect impacts of a natural event, sometimes on a longer timescale, i.e. fires due to ruptured gas mains, resulting from the ground shaking
Management strategies	Techniques of controlling, responding to, or dealing with an event

6. GLOBAL DISTRIBUTION OF TECTONIC ACTIVITY

Most tectonic activity is along plate margins and on the edge of continents. Some volcanoes form over hot spots in the mantle eg. Hawaii.



7. MANAGEMENT OF TECTONIC HAZARDS

- Scientist can monitor tectonic activity, e.g seismometers can monitor Earth's movements and equipment can measure escaping gas.
- Volcanic activity can be predicted and people can evacuate. Predicting volcanoes is less precise as they measure things such as **ground deformation** (changes in the shape of volcanoes which is closely monitored to predict eruptions).
- Buildings and infrastructure (transport links, connecitivy links, buildings) can be designed and reinforced by using things such as strenghthened concrete and foundations. Gas and electricity supplies can have automatic shut-offs to prevent fires and explosions.
- Areas at risk can plan and educate people to reduce the risk of tectonic hazards.

8. PRIMARY AND SECONDARY EFFECTS OF VOLCANIC ACTIVITY

Primary Effects (Immediate Impacts)		Secondary Effects (Happen Afterwards)	
Primary Effects of Volcanoes	**Primary Effects of Earthquakes**	**Secondary Effects of Volcanoes**	**Secondary Effects of Earthquakes**
• People and animals injured/killed • Buildings and farm land destroyed • Water supplies contaminated • Volcanic ash prevents air travel	• Buildings collapse. • Roads, railways, bridges etc destroyed • Water/gas pipes and electricity cables are damaged • People are injured/killed	• People are left homeless • Damaged transport routes prevent aid reaching the area • Melting ice can cause flooding • The negative effects to businesses can cause unemployment/ poverty • Volcanic ash creates fertile farm land • Tourism can increase • Crops can be damaged • Ash contaminates water supplies	• People are left homeless • Damaged transport routes prevent aid reaching the area. • Tsunamis and landslides (lahars) can be triggered • Broken gas pipes cause fire • The negative effects to businesses can cause unemployment/ poverty • Lack of clean water/ medical care can cause disease and death

9. WHY DO PEOPLE LIVE NEAR TECTONIC HAZARDS?

- Minerals in volcanic ash produce fertile soil. Crops will grow well.
- Jobs, e.g. Los Angeles is in an area at risk of earthquakes.
- People are confident that the government will help.
- Families have always lived in the area.
- Volcanoes attract tourists. There will be lots of jobs in the tourism industry.
- Some volcanoes can lay dormant for thousands of years so people may think an eruption is unlikely so take the risk of living in a hazardous activity.

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YEAR 9 GEOGRAPHY – COASTS

1 KEY VOCABULARY

Coastal zone	The coastal zone is the place where the land meets the sea.
Erosion	Waves can erode the coastline in a similar way to the water in rivers. This usually occurs when the sea takes lots of energy from the power of destructive waves.
Transportation	The movement of eroded material up and down, and along the coast.
Deposition	When the sea loses energy, it drops the sand, rock particles and pebbles that it has been carrying, depositing them
Hydraulic action	Air may become trapped in joints and cracks on a cliff face. When a wave breaks, the trapped air is compressed which weakens the cliff and causes erosion.
Abrasion	Bits of rock and sand in waves grind down cliff surfaces like sandpaper.
Attrition	Waves smash rocks and pebbles on the shore into each other, and they break and become smoother.
Solution	Acids contained in sea water will dissolve some types of rock such as chalk or limestone.

2 TYPE OF WEATHERING

BIOLOGICAL—When plants wear away rocks because the roots get into the cracks. Or animals burrow into the cracks.	CHEMICAL—Carbon dioxide from the air dissolves into the rainwater making it acidic. Limestone and chalk are easily eroded.	PHYSICAL—Freeze thaw weathering is when water gets into a crack and freezes. As it freezes it expands and breaks the rock apart.

3 LONGSHORE DRIFT

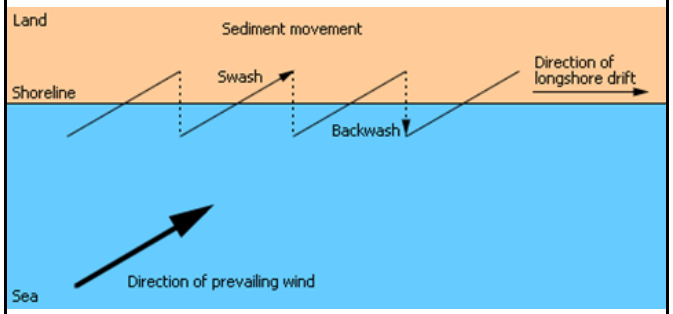
A process of transportation, longshore drift is where sediment moves along a beach,

Waves approach the coast at an angle.

Swash carries sediment up the beach at an angle.

Backwash carries sediment down the beach with gravity – at right angles to the beach.

This creates a zig-zag movement of sediment along the beach.



4 FACTORS THAT INFLUENCE RATES OF EROSION

Rock Type	chalks and limestone can form **steep cliffs**, whereas clays and softer rock form large **bays**.
Rock Structure	a discordant coastline, where rocks are at an angle to the edge of the coastline, will erode at different rates.
Shape of the coastline	headlands of a coastline are exposed to the full force of destructive waves. Bays are more sheltered from the wave energy because of **wave refraction**, so erosion is slower.
Type of wave	The amount of energy a wave has helps determine the rate of erosion.

5 WAVE TYPES

There are two types of waves

constructive : low energy waves that often deposit sediment

Destructive : high energy waves that often erode sediment

Wave energy is created by the wind. The length of time it blows, how strong it is and the distance it blows across which is called the fetch

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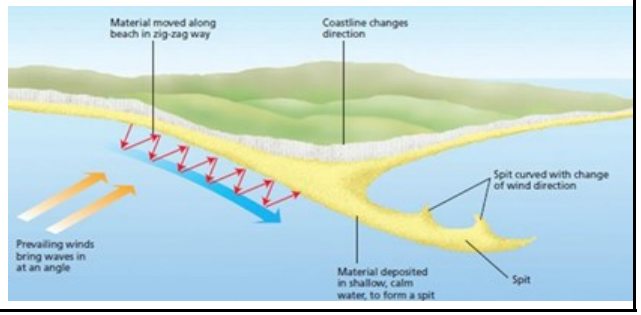
YEAR 9 GEOGRAPHY – COASTS

5 FORMATION OF A SPIT EXPLAINED

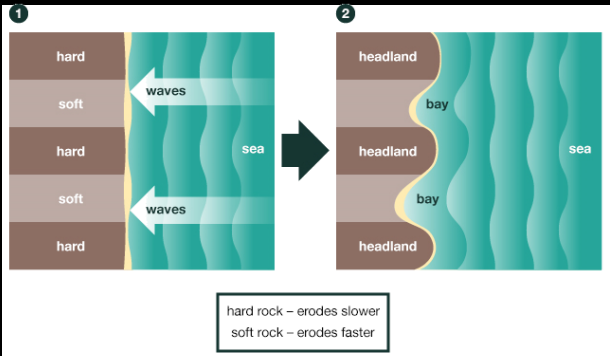
1. Longshore drift moves material along the coastline.
2. A spit forms when the material is deposited.
3. Over time, the spit grows and develops a hook if wind direction changes further out.
4. Waves cannot get past a spit, which creates a sheltered area where silt is deposited and mud flats or salt marshes form.

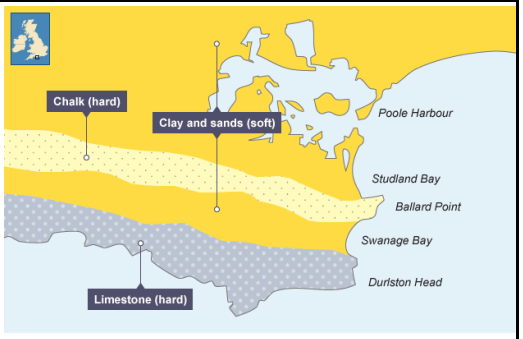


7 KEY VOCABULARY

long-shore drift	The movement of material along a coastline due to the angled approach of waves.
spit	A stretch of beach at one end of a coastline caused by waves depositing material.
Salt marsh	an area of coastal grassland that is regularly flooded by seawater, often found behind coastal spits.
Geology	Type of rock e.g. chalk, limestone, granite

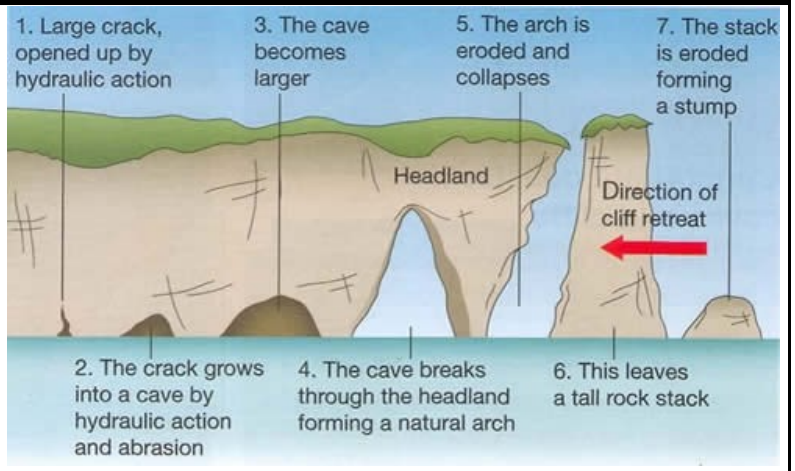
6 BAYS AND HEADLANDS





Headlands are formed when the sea attacks a section of coast with alternating geology, bands of hard and soft rock.
The bands of soft rock, e.g. sand and clay, erode more quickly than those of more resistant rock, e.g. chalk and limestone.
This leaves a section of land jutting out into the sea called a headland. The areas where the soft rock has eroded away, next to the headland, are called bays.

8 EROSION OF A HEADLAND



- Headlands are usually made of more resistant rocks that have weaknesses like cracks.
- Waves crash into the headlands due to wave refraction and enlarge the cracks mainly by hydraulic action and abrasion.
- Repeated erosion and enlargement of the cracks causes a cave to form.
- Continued erosion deepens the cave until it breaks through the headland forming an arch.
- Erosion continues to wear away the base of the arch and weathering weakens the roof.
- The arch eventually collapses to form a stack – an isolated rock that separate from the headland

9 OTHER DEPOSITIONAL FEATURES

Beaches - formed by constructive waves. Sand beaches are flat and wide, shingle are steep and narrow.

Sand dunes—sand is moved by longshore drift, obstacles cause wind speed to drop so sand is deposited. Plants and grass grow (colonise). The embryo dune becomes a mature dune over time.

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HARD AND SOFT ENGINEERING STRATEGIES TO MANAGE THE COASTLINE

Strategy/ HARD OR SOFT	Description	Advantages	Disadvantages
Beach nourishment SOFT	Material dredged from the sea bed is used to build up the beach. Sand is pumped into the existing beach to make it more firm against the waves.	The new sand blends with the previous land and looks natural. It improves the aesthetic beauty of the place and attracts more tourism.	The sand needs to be constantly replaced with new and better grain of sand. The sand has to be transported from one place to another
Managed retreat SOFT	It allows the exposure of land near to coastal area to flooding so that the waves pressure is distributed and it does not erode a specific area.	This is the cheapest option as compared to other coastal protection strategies. The formation of salt marshes allows wildlife to make this place their habitat and also work as natural defence against floods and erosion.	A large area is covered by the sea which can't be used for any other purpose. The owners of the land need to be compensated for the cost of land occupied for flooding.
Sea Walls HARD	Curved concrete walls built at the back of the beach send the wave energy back to the sea. These made of concrete at the base of the cliff to prevent erosion	Effectively protect the foot of the cliff. Promenade can be made on these so that public can walk along the seafront.	These are very expensive. Powerful waves can still break them and erode them away, so continuous maintenance are required.
Rock Armour HARD	Large boulders are placed at the base of cliffs. Wave energy is absorbed that helps in reduction of erosion and preventing cliff collapse.	These are also used for fishing. It is a cheaper option than a sea wall and maintenance is also easy.	Transportation of big rocks is difficult and expensive. Rocks which do not belong to local geological structure looks a bit odd as it does not match the structures in the surrounding area.
Gabions HARD	Boulders and rubbles are wired together into large blocks to stop them from moving. The blocks absorb the wave energy.	These are cheap and absorb wave energy effectively.	These are relatively less sturdy than other options. These also look odd as the mesh structures give an unnatural look to the surroundings.
Groynes HARD	These are wooden fences that prevent longshore drift. Sands and pebbles collect between these fences and build a beach	Increase in tourism due to development of beach. Longshore drift cannot take away the sand and pebbles available on the beach.	These do not give an aesthetic look to the beach. They do not allow the sediments to spread further on the beach leading to erosion on a different place

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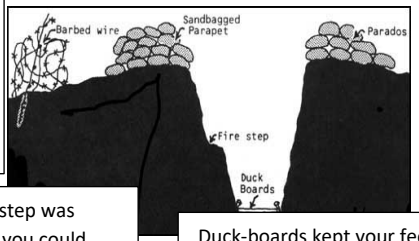
Year 9 Knowledge Organiser - Life During The First World War.

1. Keywords

Keyword	Definition
Recruitment	Getting people to join something. The government realised that the British Army wasn't large enough and it needed to 'recruit' more men as soldiers
Propaganda	Using the media to persuade people. The government employed artists to create posters that persuaded men to 'join up' and become soldiers.
Censorship	To 'block out' information. The government censored any information that made the war seem bad or a failure. They wanted 'morale' to be kept up.
Morale	Feeling positive about something.
Patriotism	Feeling proud of your country.
Conscientious objector	Someone who refused to become a soldier –as they believed war was wrong. These people were often criticised by others and the government made them contribute to the war by being stretcher bearers.
Western Front	The line of trenches that ran along Western Europe from Belgium to France. Most British soldiers served here.
Eastern Front	The line of trenches East of Germany where the Russians fought against Germans and Austrians. A number of Britain's EMPIRE troops fought here also.

2. A Trench – how did they look?

Barbed wire was meant to stop enemy soldiers getting to the trench.



The fire-step was there so you could 'step up' and fire your rifle at any enemies coming towards you

Duck-boards kept your feet out of the water that gathered at the bottom of the trench. Wet feet could lead to trench-foot disease

3. How did trenches work in battle?

- Trenches ran for miles, often in wiggly lines.

- The primary purpose was to give cover and protection from gunfire.

- They were dug quickly and reinforced when possible.

- There were different types – reserve trenches were further 'behind the lines' (fighting) and were a place for soldiers to take a break from fighting, supply trenches held weapons and food, front-line trenches were the most dangerous and were right next to the fighting.

- The space between the trenches was called 'no-man's land' – because no man owned it.

4. Weapons

Artillery were huge guns that shot bombs or shells.

The Lee Enfield Rifle and Bayonet (blade)

Machine Gun

Gas

Tanks

5. Conditions in the Trenches

- Rats as big as cats fed off the dead bodies of men.

- Shell-shock often caused men to have complete nervous breakdowns.

- It was difficult to stay clean as washing facilities were very limited – lice and diseases like dysentery and TB became common.

- Soldiers spent about a week in a front-line trench before being moved further away from the lines to have a break.

- Men weren't fighting all of the time – most of the fighting happened in the early hours of the morning. During the day men tried to sleep, they wrote letters and poems, they played cards and smoked. They even told jokes to keep morale up!

- British soldiers were generally well-fed – for some poorer soldiers it was better food than they would

6. Key Battles

Name	Where	When	What
Verdun	North-East France	Feb-Dec 1916	The Germans attacked this forted city. Both sides tried to wear the other down in a 'war of attrition'.
The Somme	Northern France	July-November 1916	Largest battle of the war. British forces were led by Haig. He is often criticised for continuing to send men 'over the top'.
Passchendaele	Belgium	July – November 1917	British and French attempt to break through German lines. Known for the mud caused by heavy bombing.
Gallipoli	Turkey	February 1915	British, Empire and French troops fought the Turkish. They tried to take control of a strait of water so they could get supplies to Russia.

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Year 9 History – Hitler's rise to power

SECTION 1 – Key words

Weimar Republic	Democratic government set up after the abdication of the Kaiser, led by F. Ebert
Reichstag	The German Parliament
Chancellor	Like a Prime minister appointed by the President
Communism	People do not own land, factories, or machinery. Instead, the government or the whole community owns these things. Everyone is supposed to share the wealth that they create.
Fascism	Fascism is a right-wing form of government in which most of the country's power is held by one ruler
Constitution	Rules for how Germany was to be governed as a democracy

Section 3 – The Munich Putsch 1923

WHO? The Nazi party led by Hitler and General Ludendorff (a popular WW1 hero). There were 55,000 Nazi members and their own private army the SA.

WHY? Hitler and the Nazis hated democracy. They planned to take over Germany by force.

WHAT? The Nazis planned to take over the government and set General Ludendorff as leader of Germany. They started in Munich. Hitler and 600 of his SA burst into a meeting where the leader of Bavaria Von Kahr was speaking. They forced Kahr to support their plan.

SUCCESS? The Putsch was badly planned - Kahr left the meeting and informed the government. The Nazis were met by armed police and soldiers- 14 Nazis were killed. Hitler was arrested- the Putsch had failed. Hitler was put on trial but he impressed the judges by his speech which gave Hitler lots of publicity and led to a reduced prison sentence of 5 years and then cut to 9 months. Hitler had learned a very important lesson – taking control by force wouldn't work- he would have to take control through the democratic process.

Section 2 - Adolf Hitler – Profile

Early life

1889- Born in Austria. Unhappy at school. He is moody, shy and lonely. Poor at most subjects (except gym and ar

1903 –Father dies - Leaves school without any qualifications

1907- Mother dies. Goes to Vienna. Fails to gain a place at Academy of Fine Arts. Struggles to make any money and lives rough

1914- Joins the Germany army. Fights in WW1 as a messenger and wins the Iron Cross for bravery

1918- Angry to hear of Germany's surrender- feels betrayed by the government

Political Life

1919- Sent to spy on the German Workers' Party. Agrees with their idea**s**

1920 – Helps to rewrite their political programme. Party is renamed the National Socialist German Workers 'party (Nazi Party)

1921- Becomes leader and sets up the SA, the Nazi Party's private army. Support for the Nazi party grows. By 1922, 20,000 members

1923- Munich Putsch – Nazis try to overthrow the government by force but fail in the short term (**see section 3)**

1924 – In prison Hitler writes Mein Kampf (My Struggle). This outlines his main ideas about how Germany should be ruled. He is released from prison early and starts to rebuild the Nazi party improving the way it is organised and changing its tactics. His aim now is to use democratic means rather than force, to get into power

1928 - General Election. Nazis got under 3% of the overall votes in the election. Although membership of the Nazi Party has almost doubled between 1923-1928, the vast majority of Germans do not appear to be attracted to the Nazi Party. The reasons for this were that most of the working classes voted for the Social Democratic Party or if not the Communist Party , the Chancellor Stresemann had solved the economic problems Germany had faced in 1923 ,and people felt better off. Also many people were put off by Hitler's extreme ideas. They were put off by the anti semetic ideas and the talk of invading other countries.

1929. The Wall Street crash changed things all of this. When the US stock market crashed it led to many problems in the Us. People lost confidence to invest, which meant businesses lost money and many people were unemployed. USA asked for the money back they had loaned Germany during 1923. This impacted badly on Germany and by 1933 6 million people were unemployed. This economic crisis gave Hitler the opportunity he was looking for to gain more votes by promising the German people he would end the crisis.

1933 – People started voting for the Nazis making the biggest party in the Reichstag, leaving the President no option but to make Hitler **Chancellor.**

1934- President Hindenburg died, and Hitler combined the position of Chancellor and President to become Fuhrer of Germany

Year 9 History – Hitler's rise to power

Section 4 - Hitler's rise to power can be explained through

a) the Nazis and their own actions and b) the events that they had no control over

Nazi Propaganda (main reason why support grew). Organised by Josef Goebbels Nazis used the latest technology to spread their message. This included loud speakers and rallies gave the impression of discipline and order. They used powerful propaganda posters with simple slogans to spread their key ideas

Organisation- Nazis were well organised, which impressed voters. Money for their election campaigns came from rich businessmen and ordinary members. Nazi members worked hard in their locality to spread the message through leaflets and public meetings

Hitler's leadership skills played a crucial role in the Nazis rise to power. His speeches gave the Nazis a great deal of support. He came across as a strong leader who could solve Germany's problems

Nazi Promises- they said what people wanted to hear, to solve Germany's economic problems, provide strong leadership, ignore the Treaty of Versailles, build up the army and make Germany a great country again. They promised something for everyone.

The Wall Street Crash led to a terrible crisis in Germany and explains why many people started voting for Hitler. Many businesses went bankrupt and by 1932, 6 million people were unemployed. It made the government look weak. They couldn't decide what to do and when they did they actually cut back on the money they spent to help the poor. The Depression made people very angry. They blame the political parties governing the country and the democratic way the Weimar Republic was being governed. People started to support more extremist parties like the Nazis and the Communists

Weak Opposition. Nazis were lucky because their opponents were so weak. The Communists and the Social Democratic party were bitter enemies and not prepared to work together to stop the Nazis. They gave the impression of a weak government that couldn't solve the economic problems

Fear of Communism. Many people particularly farmers and business owners voted for the Nazis because they were scared that the German Communist party the largest outside of the USSR would take over the country. They voted for the Nazis to stop them

A Political Deal. The Nazis were the biggest party but didn't have a majority. Hitler did a deal with Papen the leader of the Catholic Centre party. Hitler would be Chancellor and Papan, Vice Chancellor. This was supported by Hindenburg and business owners -they thought Papen not Hitler would control the government

Section 5 – Further research

Bitesize-
https://www.bbc.co.uk/bitesize/search?q=hitlers+rise+to+power

PLUS
https://www.mrallsophistory.com/revision/the-rise-of-hitler-

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Maths, Y9 - Formulae

1. Making and using word formulae

Mr Jones is organising an orienteering trip for his group of 6 students.

He uses these rules to work out what he needs.

He lets **p** stand for the **number of people**.

The number of maps needed is 3 more than the number of people.

m = p + 3

For 6 students p = 6

m = 6 + 3

m = 9

Mr Jones needs 9 maps

For every 2 people we need 1 compass.

c = p ÷ 2

For 6 students p = 6

c = 6 ÷ 2

c = 3

Mr Jones needs 3 compasses

We need 3 fewer bags than the number of people.

b = p - 4

For 6 students p = 6

b = 6 - 4

b = 2

Mr Jones needs 2 bags

Buy 2 snacks per person plus 5 extra.

s = 2p + 5

For 6 students p = 6

s = 2 x 6 + 5

s = 12 + 5

s = 17

Mr Jones needs 17 snacks

2. Substituting into formulae

Consider the formula

v = u + at

This formula can be used to calculate **v**.

Find v when u = 10, a = 2, t = 5.

v = 10 + 2 x 5

= 10 + 10

= **20**

Find v when u = 5, a = -4, t = 0.5.

v = 5 + (-4) x 0.5

= 5 + - 2

= **3**

When substituting make sure you remember to apply BIDMAS

$v = \frac{1}{3}\pi r^2 h$

This formula is used to calculate the **volume of a cone**.

Find v when r = 3 and h = 8.

$v = \frac{1}{3} \times \pi \times 3^2 \times 8$

$= \frac{1}{3} \times \pi \times 9 \times 8$

$= \frac{1}{3} \times 72 \times \pi$

$= 24\pi$

$= 75.40\ cm^3$ (2 d.p.)

$s = 2\pi rh + 2\pi r^2$

This is the formula for the **surface area of a cylinder**.

Find s when r = 1.5 and h = 6

$s = 2 \times \pi \times 1.5 \times 6 + 2 \times \pi \times 1.5^2$

$= 18\pi + 2 \times \pi \times 2.25$

$= 18\pi + 4.5\pi$

$= 22.5\pi$

$= 70.69\ cm^2$ (2 d.p.)

3. Rearranging formulae

A. one step

$$a = bh$$

a is the **subject** of the formula.

Make **b** the subject of the formula.

In this formula **b** is multiplied by **h**.

To make **b** the subject we need to undo this process

Divide by h: $\frac{a}{h} = \frac{bh}{h}$

$$b = \frac{a}{h}$$

B. two step

$$v = u + at$$

Make **a** the subject of this formula.

This formula takes a variable **a**, multiplies it by **t**, then adds **u**.

Reverse this one step at a time

Subtract u: $v - u = at$

Divide by t: $\frac{v-u}{t} = a$

$$a = \frac{v-u}{t}$$

C. formulae containing brackets

$$x = p(y + q)$$

Make **y** the subject of this formula.

We have started with **y**, added **q**, then multiplied the result by **p**.

To make **y** the subject we need to:

Divide by p: $\frac{x}{p} = y + q$

Subtract q: $\frac{x}{p} - q = y$

$$y = \frac{x}{p} - q$$

D. formulae containing fractions

$$\frac{a+5}{x} = 3b$$

Make **x** the subject of this formula.

It would be easier to rearrange if there were no fractions, so we should undo the fractions first.

Multiply by x: $a + 5 = 3bx$

x has been multiplied by 3b

Divide by 3b: $\frac{a+5}{3b} = x$

$$x = \frac{a+5}{3b}$$

E. rearranging quadratic formulae

$$\frac{ax^2 + f}{e} = b$$

Make **x** the subject of this formula.

In words, we start with **x**, square it, multiply by **a** then add **f** and finally divide everything by **e**.

To make **x** the subject, undo the process.

Multiply by e: $ax^2 + f = be$

Subtract f: $ax^2 = be - f$

Divide by a: $x^2 = \frac{be-f}{a}$

Square root both sides:

$$x = \sqrt{\frac{be-f}{a}}$$

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Maths Y9 - Graphs

1. Plotting straight line graphs using a table

Draw the graph of the line $y = 2x + 1$

To get the y coordinate given the x:

x → **X 2** → **+ 1** → y

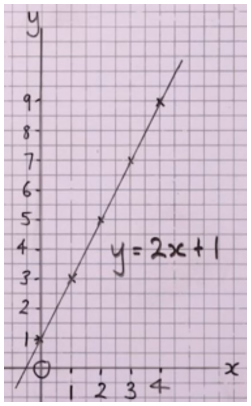
X	0	1	2	3	4
y	1	3	5	7	9

Plot the coordinates from the table

(0, 1) (1, 3) (2, 5) (3, 7) (4, 9)

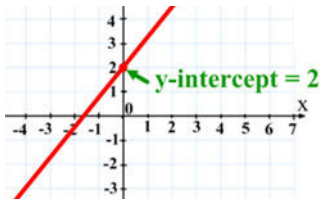
Your points should form a straight line.

Join the points with a ruler.



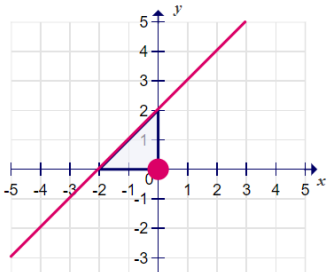
2. Intercept

Where the line crosses the y axis. It can be written as a coordinate (0, 2)



3. Gradient

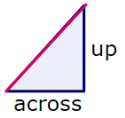
How steep the line is, the steeper the line the bigger the gradient.



If the line goes up from left to right it has a **positive** gradient.

If the line goes down from left to right it has a **negative** gradient.

We draw a triangle under the line, and calculate the value of:

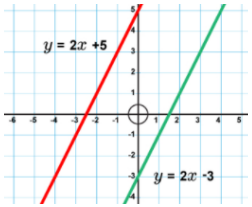


$$\frac{\text{up}}{\text{across}} = \frac{2}{2} = 1$$

5. Parallel lines

Parallel lines are like train tracks they stay the same distance apart and never meet.

Parallel lines have the same gradient



4. The equation of a straight line

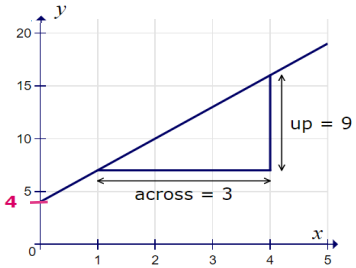
y = mx + c

m = gradient of the line

c = y intercept

(where the line crosses the y axis)

Find the equation of this line



This line intercepts the y axis at 4.

$c = 4$

$y = mx + 4$

The gradient is:

$$\frac{\text{up}}{\text{across}} = \frac{9}{3} = 3$$

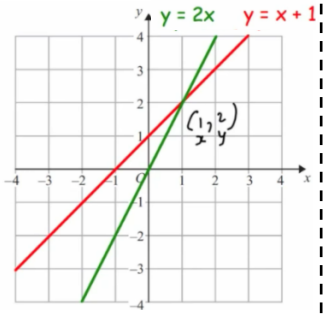
$m = 3$

The equation of this line is: **$y = 3x + 4$**

6. Solving simultaneous equations graphically

Solve these simultaneous equations by drawing their graphs.

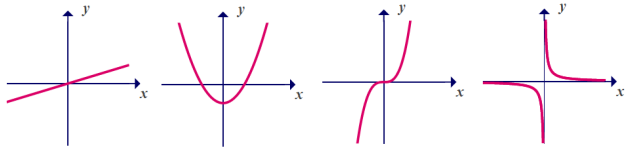
y = 2x and y = x + 1



The point of intersection is (1,2). x = 1 and y = 2

The coordinates of the **point of intersection** are the solution of the simultaneous equations.

7. Recognising graphs



linear **quadratic** **cubic** **reciprocal**

8. Plotting quadratic graphs

Draw the graph of $y = 2x^2 + 5x - 4$ for $-3 \le x \le 3$?

x	-3	-2	-1	0	1	2	3
$2x^2$	18	8	2	0	2	8	18
$5x$	-15	-10	-5	0	5	10	15
-4	-4	-4	-4	-4	-4	-4	-4
y	-1	-6	-7	-4	3	14	29

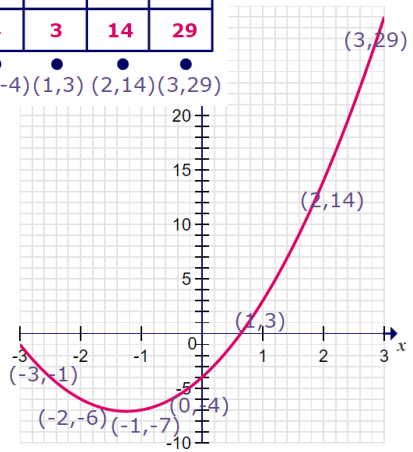
(-3,-1) (-2,-6) (-1,-7) (0,-4) (1,3) (2,14) (3,29)

To work out $2x^2$, first square x, then multiply by 2.

$(-3)^2 = 9$

2 x 9 = 18

Calculate each term separately and then add your answers for each row of the table together to find the y coordinate.



9. Plotting cubic graphs

Draw the graph of $y = x^3 - 5x^2 + x + 2$ for $-1 \le x \le 5$.

x	-1	0	1	2	3	4	5
x^3	-1	0	1	8	27	64	125
$-5x^2$	-5	0	-5	-20	-45	-80	-125
x	-1	0	1	2	3	4	5
2	2	2	2	2	2	2	2
y	-5	2	-1	-8	-13	-10	7

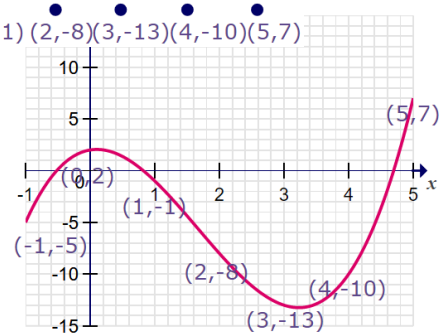
(-1,-5) (0,2) (1,-1) (2,-8) (3,-13) (4,-10) (5,7)

Remember, to work out $-5x^2$, first square x, then multiply by -5.

$(-1)^2 = 1$

-5 x 1 = -5

Calculate each term separately and then add your answers for each row of the table together to find the y coordinate.



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Maths Y9 - Compound Units & Standard Form

1. Compound units

A. Speed, distance, time

Speed is the **distance** travelled per unit of **time**

A cyclist travels 400 kilometres in 8 hours.

What is his average speed?

$$\text{speed} = \frac{\text{distance}}{\text{time}} = \frac{400\text{ km}}{8\text{ h}}$$

$= 400/8$ km/h

$= \mathbf{50}$ **km/h**

$\text{speed} = \frac{\text{distance}}{\text{time}}$

$\text{distance} = \text{speed} \times \text{time}$

$\text{time} = \frac{\text{distance}}{\text{speed}}$

} Rearrange to get the others

B. Density, mass, volume

Density is the amount of **mass** per unit of **volume**

A bath sponge is roughly a cuboid, 10cm by 8cm by 3cm Its mass is 180grams.

What is its density?

Its volume is $10 \times 8 \times 3 =$ **240 cm³**.

$$\text{Its density} = \frac{\text{mass}}{\text{volume}} = \frac{180\text{ g}}{240\text{ cm}^3}$$

$= 180/240$ g/cm³

$=$ **0.75 g/cm³**

$\text{density} = \frac{\text{mass}}{\text{volume}}$

$\text{mass} = \text{density} \times \text{volume}$

$\text{volume} = \frac{\text{mass}}{\text{density}}$

} Rearrange to get the others

C. Pressure, force, area

Pressure is the amount of **force** per unit of **surface area**

A man weighs 800 newtons and his footprints cover an area of 0.05m^2

How much pressure does he put on the floor?

$$\text{pressure} = \frac{\text{force}}{\text{surface area}} = \frac{800\text{ N}}{0.05\text{ m}^2}$$

$= 800/0.05$ N/m²

$=$ **16000 N/m²**

$\text{pressure} = \frac{\text{force}}{\text{surface area}}$

$\text{force} = \text{pressure} \times \text{surface area}$

$\text{surface area} = \frac{\text{force}}{\text{pressure}}$

} Rearrange to get the others

2. Standard form

A. Large numbers

Standard form is another way of writing very large numbers

The first number must always be greater than or equal to 1 and less than 10.

For large number the power will be positive.

$1{,}360{,}000 = 1.36 \times 1{,}000{,}000$

we know that: $1{,}000{,}000 = 10^6$

therefore: $1{,}360{,}000 = 1.36 \times 10^6$

$1{,}360{,}000$ is the **ordinary number**

1.36×10^6 is the **standard form**

B. Small numbers

Standard form is also a way of writing very small numbers

The first number still must be greater than or equal to 1 and less than 10.

For small numbers the power will be negative.

$0.00535 = 5.35 \times 0.001$

we know that: $0.001 = 10^{-3}$

therefore: $0.00535 = 5.35 \times 10^{-3}$

Hint: Count how many places left the digits move so that the decimal point sits just after the first non-zero figure.

3. Calculating with standard form (non-calculator)

A. Multiplying and dividing

Calculate $7.5 \times 10^3 \times 3 \times 10^3$

Give your answer in standard form.

rewrite with the coefficients at the start: $= 7.5 \times 3 \times 10^3 \times 10^3$

multiply the coefficients: $= 22.5 \times 10^3 \times 10^3$

add the indices to multiply the powers of 10: $= 22.5 \times 10^6$

rewrite in standard form: $= 2.25 \times 10^7$

Calculate $\frac{2.5 \times 10^2}{5 \times 10^6}$

Give your answer in standard form.

split the division, to divide the coefficients and powers separately: $= \frac{2.5}{5} \times \frac{10^2}{10^6}$

divide the coefficients: $= 0.5 \times \frac{10^2}{10^6}$

subtract the indices to divide the powers of 10: $= 0.5 \times 10^{-4}$

rewrite in standard form: $= 5 \times 10^{-5}$

B. Adding and subtracting

Calculate $7.5 \times 10^3 + 5.25 \times 10^5$

Give your answer in standard form.

rewrite the with the same power of 10: $= 7.5 \times 10^3 + 525 \times 10^3$

add the coefficients: $= (7.5 + 525) \times 10^3$

rewrite in standard form: $= 532.5 \times 10^3$

$= 5.325 \times 10^5$

Calculate $1.25 \times 10^5 - 8.2 \times 10^4$

Give your answer in standard form.

rewrite with the same power of 10: $= 1.25 \times 10^5 - 0.82 \times 10^5$

subtract the coefficients: $= (1.25 - 0.82) \times 10^5$

rewrite in standard form: $= 0.43 \times 10^5$

$= 4.3 \times 10^4$

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Year 9 French Spring Half Term 3 Ma ville et l'environnement

J'habite dans une grande ville *(I live in a big town)*
ville *(in a town)*
village *(in a village)*

industrielle *(industrial)*
commerciale *(commercial)*
historique *(historic)*
moderne *(modern)*

qui est *(which is)*

au bord de la mer *(at the seaside)*
à la montagne *(in the mountains)*
à la campagne *(in the countryside)*
au bord de la mer *(at the seaside)*
en banlieue *(in the outskirts)*

J'habite à Coventry depuis 5 ans. *(I have been living in Coventry for 5 years)*
J'y habite depuis 5 ans. *(I have been living there for 5 years)*

quel rêve ! *(What a dream!)*
quel désastre ! *(What a disaster !)*
quel cauchemar ! (*What a nightmare!)*

Dans ma ville , il y a
(In my town there is)

une gare	*a station*
un château	*a castle*
un musée	*a museum*
un cinéma	*a cinema*
un zoo	*a zoo*
un café	*a café*
un port	*a harbour*
un gymnase	*a gymnasium*
un magasin	*a shop*
le centre ville	*a city-centre*
une piscine	*a swimming pool*
une plage	*a beach*
une bibliothèque	*a library*
une église	*a church*
une boîte	*a nightclub*

malheureusement *(unfortunately)*
par contre/ en revanche/néanmoins *(however)*

il n'y a pas de
there isn't

plage *(a beach)*
patinoire *(an ice rink)*

La bibilothèque est
(the library is)
Le parc est
(the park is)

petite *(small)*
intéressante *(interesting)*
barbante *(boring)*
plein de divertissement
(full of entertainment)
sale *(dirty)*
démodée *(old-fashioned)*
propre *(clean)*
bruyante*(noisy)*
polluée *(polluted)*
bien-tenue *(well-kept)*
moche/laide *(ugly)*
bondée *(overcrowded)*

The present tense

verb type	infinitive	present
regular **-er**	collect**er**	je collect**e**
regular **-ir**	fin**ir**	je fin**is**
regular **-re**	vend**re**	je vend**s**
key irregulars	aller	je **vais**
	avoir	j'**ai**
	être	je **suis**
	faire	je **fais**

Quand il fait du soleil, *(when it is sunny)*
Quand il pleut, *(when it rains)*
Quand il neige, *(when it snows)*
Quand il fait beau, *(when the weather is nice)*
Quand il fait mauvais, *(when the weather is bad)*
Quand il y a du vent, *(when it is windy)*
Quand il y a du brouillard, *(when it is foggy)*
Quand il y a de l'orage *(when it is stormy)*
Quamd il fait chaud *(when it is hot)*
Quand il fait froid *(when it is cold)*

on peut *(you can)*
on ne peut pas *(you can't)*

jouer à l'ordinateur *(play at the computer)*
faire de la natation *(go swimming)*
aller au cinéma *(go to the cinema)*
faire du lèche-vitrine *(go window-shopping)*
jouer au hockey *(play hockey)*

https://quizlet.com/6596607/lenvironnement-et-ma-ville-flash-cards/

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Year 9 French Spring Term 3 Ma ville et l'environnement

Tu préfères la ville ou la campagne?

1. Il y a beaucoup de distractions
2. C'est plus calme
3. C'est très animé
4. C'est extrêmement ennuyeux
5. Il y a trop de pollution
6. C'est moins pollué
7. C'est trop bruyant
8. On peut sortir
9. Tout le monde est pressé
10. On peut se détendre

there are a lot of entertainment
it is calmer
it is very lively
it is extremely boring
there is too much pollution
it is less polluted
it is too noisy
you can go out
everyone is busy
you can relax

il y a beaucoup de *there are a lot of*
il y a de nombreux *there are a lot of*
il n'y a pas assez de *there is not enough*
il y a peu de *there is a little of*

https://quizlet.com/177160987/ville-ou-campagne-flash-cards/

les gaz d' échappement *(exhaust fumes)*
le centre de recyclage *(recycling centre)*
le bruit/ bruyant *(noise/noisy)*
le verre *(glass)*
les bouteilles *(bottles)*
le papier *(paper)*
une douche *(a shower)*
un bain *(a bath)*
un robinet *(a tap)*
une poubelle *(a bin)*
par terre *(on the floor)*
une piste cyclable *(a cycling lane)*
les transports en commun *(public transport)*

Quels sont les problèmes de l'environnement ?

la circulation *(traffic)*
les embouteillages/ les bouchons *(traffic jams)*
la pollution des rivières *(river pollution)*
les déchets/ les ordures *(litter)*
la pollution de l'air *(air pollution)*
la fumée des usines *(factory smoke)*
la deforestation *(deforestation)*
le réchauffement climatique de la terre *(global warming)*
le trou dans la couche d'ozone *(the gap in the ozone layer)*
la sécheresse *(draught)*
les inondations *(flood)*
les incendies *(fires)*

Qu'est-ce qu'on peut faire pour sauver l'environnement ?

Il faut...
On doit...

you have to

recycler le papier.
protéger les animaux.
trier les déchets.
réduire la pollution.
prendre le bus
baisser le chauffage.
fermer le robinet .
prendre une douche .
mettre les ordures dans la poubelle .

recycle paper
protect animals
sort out of the litter
reduce pollution
take the bus
turn down the heating
close the tap
take a shower
put the litter in the bin

1. Je ferme le robinet
2. J' éteins la lumière
3. Je jette les emballages.
4. Je trie les déchets
5. Je prends le bus .
6. je vais au centre de recyclage.
7. J'achète des produits bios
8. Je prends une douche au lieu d'un bain

I close the tap
I switch off the light
I throw the packaging
I sort out the litter
I take the bus
I go to the recycling centre
I buy organic products
I take a shower not a bath

Qu'est-ce que tu fais pour sauver l'environnement ?

Tu préfères la ville ou la campagne?

- Je préfère…, /car …
- À mon avis /… / je trouve que…
- Je suis pour / contre la vie …
- L'avantage de vivre… c'est que…
- L'inconvénient de vivre… c'est que
- Si on habite …on peut

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Year 9 French Spring Half Term 4

J'habite (I live) **Tu habites** (You live) **Il/Elle habite** (He/she lives) **On habite** (we live) **Nous habitons** (we live) **Vous habitez** (You guys live) **Ils/elles habitent** (they live)	**dans une** (in a)	**assez** (quite) **très** (very) **vraiment** (really)	**nouvelle** (new) **vieille** (old) **belle** (beautiful) **grande** (big)	**petite** (small) **jolie** (pretty) **immense** (huge)	**maison mitoyenne** (terraced house) **maison jumelée** (semi-detached house) **maison individuelle** (detached house) **caravane** (caravan) **cabane** (shack) **péniche** (house boat) **yourte** (yurt) **hutte en terre** (earth hut)	**à deux** étages (with two storeys) **à la campagne** (in the countryside) **au bord de la mer** (by the sea) **dans une ville** (in a town) **dans une grande ville** (in a city) **dans un village** (in a village) **dans un cité** (on an estate) **dans la banlieue de…** (in the suburb of…) **sur la rivière** (on the river) **dans un bidonville** (in a shanty town)
	dans un (in a)		**nouvel** (new) **vieil** (old) **bel** (beautiful)	**petit** (small) **joli** (pretty) **immense** (huge) **grand** (big)	**appartement** (flat) **immeuble** (block of flats) **igloo** (igloo)	
J'y habite (I have lived there) **On y habite** (We have lived there)	**depuis** (for) **depuis** (since)		**cinq ans** (five years) **dix ans** (ten years) **l'âge de trois ans** (the age of three) **toujours** (always)			https://quizlet.com/gb/520171393/allez-2-unit-81-un-toit-a-moi-flash-cards/

33

Year 9 French Spring Half Term 4 Chez moi !

J'ai une chambre à moi (I have a bedroom of my own)	**Je partage ma chambre** (I share my bedroom) **Je dois partager une chambre** (I have to share a bedroom) **Je partageais ma chambre** (I used to share my room)	**avec** (with)	**ma sœur** (my sister) **mon frère** (my brother) **mes sœurs** (my sisters) **mes frères** (my brothers)

Je l'aime car (I like it because)	**c'est très grand** (it's very big) **c'est assez grand** (it's quite big) **c'est douillet** (it's cosy) **on apprend à partager** (you learn to share) **on a un espace privé** (you have a private space) **on s'entend bien** (we get on well)	**j'ai besoin de mon propre espace** (I need my own space) **c'est toujours bien rangé** (it's always tidy) **j'ai toutes mes affaires** (I have all my things) **on n'est jamais seul** (you are never alone) **on rigole** (we have a laugh) **on se respecte** (we respect each other)

Bedroom

https://quizlet.com/663582076/allez-2-unit-83-ne-pas-deranger-flash-cards/

Je ne l'aime pas car (I don't like it because)	**c'est trop petit** (it's too small) **c'est toujours en désordre** (it's always messy) **il y a des vêtements partout** (there are clothes everywhere) **il n'y a pas assez d'espace** (there isn't enough space) **on se dispute** (we argue) **ce n'est pas pratique pour recevoir des amis** (it's not practical when friends come over)	**et** (and)	**ma sœur** (my sister) **mon frère** (my brother)	**m'énerve** (gets on my nerves) **parle trop** (talks too much) **prend mes affaires** (takes my things) **ronfle** (snores) **porte mes vêtements** (wears my clothes)

34

Year 9 KO HT3 5.1 Lo que hago por las mañanas pp. 96-97 & 5.2 Lo que hago por las tardes y por las noches pp.98-99
Claro2 on www.kerboodle.com

la rutina	*routine*
desayunar	*to have breakfast*
despertar(se)	*to wake up*
duchar(se)	*to have a shower*
ir al instituto	*to go to school*
lavar(se) los dientes	*to brush your teeth*
levantar(se)	*to get up*
peinar(se)	*to brush/comb your hair*
vestir(se)	*to get dressed*
a menudo	*often*
a veces	*sometimes*
antes	*first, before*
después	*after, afterwards*
durar	*to last*
inmediatamente	*immediately*
luego	*then, later*
mientras	*while*
nunca	*never*
raras veces	*rarely*
siempre	*always*
deprisa	*fast, quickly*
tener prisa	*to be in a hurry*

1

acostar(se)	*to go to bed*
cambiar(se) de ropa	*o get changed*
cenar	*to have dinner*
hacer los deberes	*to do homework*
merendar	*to have a snack (afternoon)*
pasear al perro	*to walk the dog*
relajar(se)	*to relax*
volver a casa	*to return home*
cuando llego a casa	*when I arrive home*
cuando me apetece	*when I feel like it*
si mis padres me dejan	*if my parents let me*
si tengo tiempo	*if I have time*
siempre que puedo	*he never I can*
al final del día	*at the end of the day*
aproximadamente	*approximately*
el proyecto	*project*
temprano	*early*
(no) tener tiempo	*to (not) have time*

2

1

2

https://quizlet.com/gb/646817509/claro-2-unit-5-lo-que-hago-por-las-mananas-flash-cards/

https://quizlet.com/gb/430029439/claro-2-lo-que-hago-por-las-tardes-y-por-las-noches-flash-cards/

35

las tareas domésticas	*household tasks/chores*
los trabajos	*jobs*
corto el césped	*I mow the lawn*
hago la colada	*I do the washing*
lavo/friego los platos	*I wash the dishes*
ordeno mi dormitorio	*I tidy my room*
paso la aspiradora	*I do the hoovering*
pongo la mesa	*I lay the table*
quito el polvo	*I dust*
quito la mesa	*I clear the table*
plancho la ropa	*I iron*
una vez	*once*
dos veces	*twice*
al día	*per day*
a la semana	*per week*
al mes	*per month*
todos los días	*every day*
fregar	*to wash*
hacer	*to do*
limpiar	*to clean*
planchar	*to iron*
repartir	*to share*
fácil	*easy*
horrible	*horrible*
perezoso/a	*lazy*
relajante	*relaxing*

1

los pasatiempos	*hobbies*
bailar salsa	*to dance salsa*
chatear en el móvil	*to chat on the phone*
descansar en casa	*to relax at home*
escuchar música	*to listen to music*
jugar a la videocon-sola	*to play on the games console*
leer libros	*to read books*
navegar por Internet	*to surf the Internet*
practicar deportes	*to do/play sports*
salir con mis amigos	*to go out with friends*
ver la tele	*to watch TV*
la discoteca	*nightclub*
estupendo/a	*wonderful*
favorito/a	*favourite*
interesante	*interesting*
el programa	*programme*
el tipo	*type*

2

1

2

https://quizlet.com/gb/494213823/claro-46-ayudo-en-casa-flash-cards/

https://quizlet.com/gb/472235565/claro-1-mi-tiempo-libre-flash-cards/

36

Year 9 KO HT4 3.2 ¿Qué ponen en la tele? pp.54-55 & 3.5 ¿En el cine o en la casa? pp.56-57 Claro2 on www.kerboodle.com

una película…	a film
cómica	comedy
de aventuras	adventure
de ciencia ficción	science fiction
de dibujos animados	animated
de miedo	horror
de misterio	mystery
del oeste	western
musical	musical
romántica	romantic
Me hacen reír las películas de…	(Genre) films make me laugh
Me dan miedo las películas de…	(Genre) films make me scared
Me hacen pensar las películas de…	(Genre) films make me think

1

A la carta	on demand
el canal	channel
el capítulo	episode/chapter
el dispositivo	device
la experiencia	experience
hacer un maratón de	to binge-watch
la programación	tv guide
la variedad	variety

3

En la tele hay…	On tv there is
un concurso	a quiz show
un dibujo animado	a cartoon
un documental	a documentary
una película	a film
un programa de deportes	a sports programme
un programa de humor	a comedy programme
un programa musical	a music programme
una serie	a series
un telediario	a news bulletin
una telenovela	a soap opera

2

porque son…	because they are…
cautivadoras	captivating
complejas	complex
decepcionantes	disappointing
entretenidas	entertaining
espeluznantes	terrifying
impactantes	striking
mejores	better/best
memorables	memorable
nuevas	new
peores	worse/worst
predecibles	predictable
profundas	deep
sangrientas	bloody
tristes	sad

4

https://quizlet.com/gb/499851642/claro-32-flash-cards/

https://quizlet.com/gb/439720450/claro-2-33-flash-cards/

37

Rock ‘n’ Roll of the 1950’s and 1960’s – Knowledge Organiser – Year 9 Music	Rock ‘n’ Roll combines elements of Rhythm and Blues and Country and Western Music and emerged in the mid-1950’s. Rock ‘n’ Roll helped establish the typical pop music instrumental combination of Lead and Rhythm Guitars, Bass Guitar and Drum Kit. Repetition is an important feature of Rock ‘n’ Roll meaning untrained composers and performers could quickly and easily learn music and then improvise over the basic structure.			
Lyrics	**Tempo & Metre**	**Harmony & Tonality**	**Melody**	**Dynamics**
Simple, repetitive and easily memorable – teenage concerns: love, relationships, cars, school life and holidays.	Fast (*Allegro*) – ideal for dancing. 165-185 bpm. 4/4 Time Signature.	Major tonality using mainly simple and repetitive Primary Chords – I, IV & V with slow Harmonic Rhythm often in the 12-Bar Blues Structure. Close harmonies used in the vocals.	Often uses ‘blue notes’ (flattened 3rd, 5th and 7th against a major chord). “Catchy” Melodies have a narrow vocal range. Vocal and guitar melodies use repeated phrases, riffs and hooks.	Consistent loud volume – *Forte (f)* often louder in the choruses – *Fortissimo (ff)* achieved through amplification.
Rhythm	**Texture**	**Articulation**	**Accompaniment**	**Form & Structure**
Backbeat (accenting 2nd and 4th beats of the bar on the snare drum). Often features a Walking Bass Line. Syncopation, Swung Rhythms and Boogie-Woogie rhythms also used.	Homophonic (Melody & Accompaniment) Texture – a solo singer accompanied by instruments. Some textural variety within songs e.g. instruments ‘dropping out’.	Harsh, brash and raw sound possessing energy and drive. Accents on the 2nd and 4th beats of the bar provide the backbeat.	Sometimes Call and Response between solo voice and accompaniment (band or backing singers). Lead singers and/or instrumental solos backed by band.	Verse-Chorus Form with a short Introduction (often instrumental but sometimes vocal), solo verses, chorus, instrumental section (improvised solos or shuwaddy section featuring Scat singing) ending with a Coda/Outro.

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Vocal Performance & Technique	Technology	Venue	Artists, Bands & Performers
Mainly male lead singers using high-pitch vocals and Falsetto giving an untrained or shouty tone/timbre with screeches, jeers and cheers. Portamentos and Scat Singing often used.	Amplifiers for Electric Guitars used for the first time. Basic effects such as Reverb and Echo. Clean guitar sounds (not overdriven). Double-track lead and backing vocals for richer sounds. "Raw" sound of recordings.	Dance Halls, Clubs (live), Concert Halls, Juke Boxes, Coffee Bars, Radio and to buy on Record/Vinyl.	Little Richard, Elvis Presley, The Beatles, Bill Haley & The Comets, The Beach Boys, Johnny Cash, Chuck Berry, Buddy Holly, Chubby Checker, The Doors.

Instrumentation – Typical Instruments, Timbres and Sonorities

Early Rock 'n' Roll – lead vocalist accompanied by a small group of acoustic instruments – piano, drum kit, saxophone, trumpet, harmonica, trombone and double bass. The Electric Guitar soon became an essential part of Rock 'n' Roll and Backing Singers/Vocalists were frequently used in Rock 'n' Roll songs.

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SOUNDTRACKS

Exploring Film Music

Knowledge Organiser – Year 9 – Term 2

A. The Purpose of Music in Film

Film Music is a type of **DESCRIPTIVE MUSIC** that represents a **MOOD, STORY, SCENE** or **CHARACTER** through music, it is designed to **SUPPORT THE ACTION AND EMOTIONS OF THE FILM ON SCREEN**. Film Music can be used to:

- Create or enhance a mood (though the **ELEMENTS OF MUSIC**) ->
- Function as a **LEITMOTIF** (see D)
- To emphasise a gesture (**MICKEY-MOUSING –** when the music fits precisely with a specific part of the action in a film e.g. cartoons)
- Provide unexpected juxtaposition/irony (using music the listener wouldn't expect to hear giving a sense of uneasiness or humour!)
- Link one scene to another providing continuity
- Influence the pacing of a scene making it appear faster/slower
- Give added commercial impetus (released as a **SOUNDTRACK**) – sometimes a song, usually a pop song is used as a **THEME SONG** for a film.
- Illustrate the geographic location (using instruments associated with a particular country) or historical period (using music 'of the time').

D. Leitmotifs

LEITMOTIF – A frequently recurring short melodic or harmonic idea which is associated with a character, event, concept, idea, object or situation which can be used directly or indirectly to remind us of one not actually present on screen. Leitmotifs can be changed through **SEQUENCING, REPETITION** or **MODULATION** giving a hint as to what may happen later in the film or may be heard in the background giving a "subtle hint" to the listener *e.g. the "Jaws" Leitmotif*

B. How the Elements of Music are used in Film Music

PITCH AND MELODY – **RISING MELODIES** are often used for increasing tension, **FALLING MELODIES** for defeat. Westerns often feature a **BIG THEME**. **Q&A PHRASES** can represent good versus evil. The **INTERVAL OF A FIFTH** is often used to represent outer space with its sparse sound.
DYNAMICS – **FORTE (LOUD)** dynamics to represent power; **PIANO (SOFT)** dynamics to represent weakness/calm/resolve. **CRESCENDOS** used for increasing threat, triumph or proximity and **DECRESCENDOS** or **DIMINUENDOS** used for things going away into the distance. Horro Film soundtracks often use **EXTREME DYNAMICS** or **SUDDEN DYNAMIC CHANGES** to 'shock the listener'.
HARMONY – **MAJOR** – happy; **MINOR** – sad. **CONSONANT HARMONY OR CHORDS** for "good" and **DISSONANT HARMONY OR CHARDS** for "evil". **SEVENTH CHORDS** often used in Westerns soundtracks.
DURATION – **LONG** notes often used in Westerns to describe vast open spaces and in Sci-Fi soundtracks to depict outer space; **SHORT** notes often used to depict busy, chaotic or hectic scenes. **PEDAL NOTES** – long held notes in the **BASS LINE** used to create tension and suspense.
TEXTURE – **THIN/SPARE** textures used for bleak or lonely scenes; **THICK/FULL** textures used for active scenes or battles.
ARTICULATION – **LEGATO** for flowing or happy scenes, **STACCATO** for 'frozen' or 'icy' wintery scenes. **ACCENTS (>)** for violence or shock.
RHYTHM & METRE – 2/4 or 4/4 for Marches (battles), 3/4 for Waltzes, 4/4 for "Big Themes" in Westerns. **IRREGULAR TIME SIGNATURES** used for tension. **OSTINATO** rhythms for repeated sounds *e.g. horses.*

C. Film Music Key Words

SOUNDTRACK – The music and sound recorded on a motion-picture film. The word can also mean a commercial recording of a collection of music and songs from a film sold individually as a CD or collection for digital download.
MUSIC SPOTTING – A meeting/session where the composer meets with the director and decides when and where music and sound effects are to feature in the finished film.
STORYBOARD – A graphic organiser in the form of illustrations and images displayed in sequence to help the composer plan their soundtrack.
CUESHEET – A detailed listing of **MUSICAL CUES** matching the visual action of a film so that composers can time their music accurately.
CLICK TRACKS – An electronic **METRONOME** which helps film composers accurately time their music to on-screen action through a series of 'clicks' (often heard through headphones) – used extensively in cartoons and animated films.
DIEGETIC FILM MUSIC – Music within the film for both the characters and audience to hear *e.g. a car radio, a band in a nightclub or sound effects.*
NON-DIEGETIC FILM MUSIC – Music which is put "over the top" of the action of a film for the audience's benefit and which the characters within a film can't hear – also known as **UNDERSCORE** or **INCIDENTAL MUSIC**.

E. History of Film Music

Early films had no soundtrack **("SILENT CINEMA")** and music was provided live, usually **IMPROVISED** by a pianist or organist. The first **SOUNDTRACKS** appeared in the 1920's and used existing music **(BORROWED MUSIC –** music composed for other (non-film) purposes) from composers such as Wagner and Verdi's operas and ballets. In the 1930's and 1940's Hollywood hired composers to write huge Romantic-style soundtracks. **JAZZ** and **EXPERIEMENTAL MUSIC** was sometimes used in the 1960's and 1970's. Today, film music often blends **POPULAR, ELECTRONIC** and **CLASSICAL** music together in a flexible way that suits the needs of a particular film.

F. Film Music Composers and their Soundtracks

Jerry Goldsmith
Planet of the Apes
Star Trek: The Motion Picture
The Omen
Alien

John Williams
Star Wars
Jaws
Harry Potter
Indiana Jones
Superman, E.T.

James Horner
Titanic
Apollo 13
Braveheart
Star Trek II
Aliens

Ennio Morricone
The Good, The Bad and The Ugly
For a Few Dollars More
The Mission

Danny Elfman
Mission Impossible
Batman Returns
Men in Black
Spider Man

Hans Zimmer
The Lion King
Gladiator
Dunkirk
Blade Runner 2049
No Time to Die

Bernard Hermann
Psycho
Vertigo
Taxi Driver

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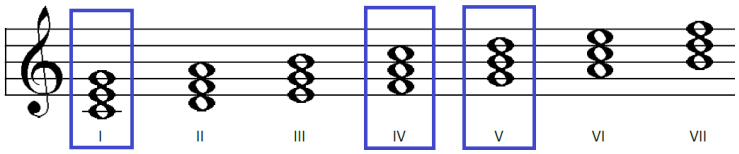
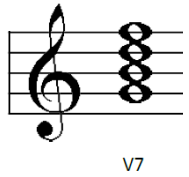
Dance Music Knowledge Organiser – Year 9

The **RHYTHMS** of dance music always match the **STEPS** of the dance: the two are inter-related. Dance music is based on **CHORD PATTERNS**: mainly **PRIMARY CHORDS** (I, IV & V(7)) and has a clear **MELODY** with an **ACCOMPANIMENT** (**HOMOPHONIC TEXTURE**). Different dances and their music use different **METRES/TIME SIGNATURES**.

A. Chords in Dance Music

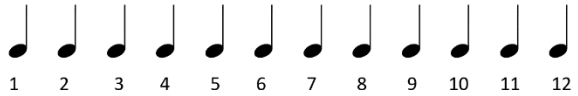


Dance music is based on **CHORD PATTERNS**. **PRIMARY CHORDS**: **CHORD I**, **CHORD IV** and **CHORD V** are most commonly used in dance music with **SEVENTH CHORDS** featuring in popular dance music such as **DISCO** and **CLUB DANCE** (adding a note seven notes above the root of a chord, such as and **DOMINANT SEVENTH CHORD**). All seventh chords have 4 notes. Chords are often performed in different ways as an **ACCOMPANIMENT** in dance music.



B. Pulse, Time and Metre in Dance music

The **BEAT** or **PULSE** of dance music is always **REGULAR**. Here is a regular crotchet pulse of 12 beats:



A single **BEAT** is a basic unit of musical time. In dance music, beats are grouped together to make a repeating pattern – normally made up of either twos, threes or fours.

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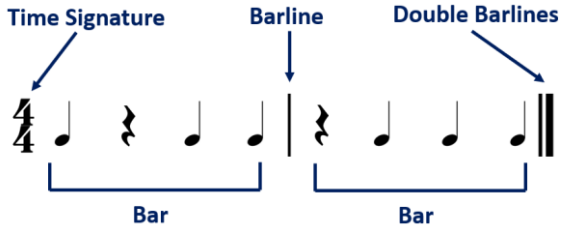
The repeating pattern of beats gives us the **METRE** or the **TIME** of the music, shown by the **TIME SIGNATURE** at the start of a piece of music. Each repetition of the beat-pattern is called a **BAR** and bars are separated by vertical lines called **BARLINES**. A **DOUBLE BARLINE** always comes at the end of a piece of music or section of music.



The top number of a time signature tells you how many beats there are in each bar. The bottom number tells you what types or note values these beats are:
4 = Crotchet
8 = Quaver
16 = Semiquaver

C. <u>Club Dance</u>

Influenced by **MUSIC TECHNOLOGY:** samplers, synthesisers, sequencers and drum machines.
Various genres: House, Techno, Drum and Bass, Garage, Trance, Ambient.
- Dancing in individual and **IMPROVISED** on one spot.

- **SIMPLE QUADRUPLE METRE** (4/4).
- Use of **ELECTRONIC SOUNDS.** A **STRONG BEAT** emphasised by the **DRUM** and **STRONG BASS LINES**.
- **SHORT PHRASES** and **REPETITIVE SECTIONS**.
- **FAST TEMPO** (Ambient is slower/chilled)
- Complex, layered drum patterns. Inclusion of **SAMPLES**.

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Component 3a: Judaism Beliefs Knowledge Organiser

Denominations of Judaism		
1	Reform	More liberal Jews who reinterpret tradition for modern society
2	Orthodox	More conservative Jews who follow tradition more strictly
3	Other	Hassidic/ Secular/ Messianic/ Ashkenazi/ Sephardic

Nature of God		
4	One	Shown in the Shema, God cannot be separated or divided
5	Creator	Everything owes its existence to God, shown in Genesis
6	Lawgiver	God gives direction on how to live and stay close to him, shown in the Mitzvot
7	Judge	God is merciful and fair in his judgements, which decide the afterlife
8	Shekinah	The manifested glory of God, His dwelling place on earth

Messiah		
9	Reform	The Messianic Age will be brought about by collective action, it is not a person, there is no mention in the Torah
10	Orthodox	The Messiah will be a leader, ever generation has the potential for the Messiah to be born, will judge Jews
11	Maimonides	The belief in the Messiah is one of the 13 Principles of Judaism
12	Prophecy	Descendent of David, rebuild the Temple, Teach the Torah, bring Jews back to Israel, Messianic Age of universal peace
13	Isaiah	"the wolf will live with the lamb"
14	Micah	"nation shall not take up sword against nation"

Covenant		
15	Abraham- Land	Abraham was called out of his homeland to the land of Canaan
16	Abraham - descendants	Abraham was promised descendants through his son Isaac, and that they would be a great nation
17	Abraham - blessing	God promises to bless Abraham and the families on Earth through him. Circumcision of boys is a sign of the covenant
18	Moses- Calling	Moses is called by God through the burning shrub and given the covenant to lead the Israelites from Egypt to the Promised Land
19	Moses- Plagues	In the 10th Plague the Israelites are saved from the Angel of Death and allowed to return to the Promised Land
20	Commandments	Moses is given the 10 Commandments on Mount Sinai
21	Moses- Desert	Moses and the Israelites travel through the desert as a Jewish society for 40 years, after God does not let them into Canaan for their disobedience.

Mitzvot		
22	613	Number of Commands/ instructions in the Torah
23	Modern Use	Some Jews choose which to follow according to their relevance, others such as the Temple worship do not apply
24	Mitzvah Day	Established in 2008 to celebrate the mitzvoth
25	Healing the world	Tikkum olam. The world is made perfect, as God intended through the mitzot.
26	Love of neighbour	Gemilut hasadim. Without expecting anything in return, Jews are expected to look after each other, especially the vulnerable
27	Justice	Tzedakah. Social justice and promoting fairness and equality
28	Free will	God judges on our actions, which we have the ability to decide

Importance of Life		
29	Sanctity of Life	God gives life, as shown in Genesis, and therefore it is sacred and needs protecting, as only God can take life.
30	Pikuach Nefesh	The principle that any of the Mitzvot can be broken in order to save a life
31	Examples	Kosher Law can be ignored to save the starving, the Sabbath Law can be broken to drive to the hospital
32	Exceptions	Idolatry, adultery and incest cannot be broken to save a life

Ten Commandments		
33	Importance	They can be kept by every Jew to show love towards neighbour and towards God, and they give the basis of all Jewish beliefs and practices

Afterlife		
34	Significance	Not as important as living a good life
35	Olam Ha Ba	The term for "the world to come"
36	Interpretations	Some Jews think the afterlife is spiritual, others that it is a physical place
37	Talmud	States we should prepare for the afterlife in this life
38	Resurrection	Interpretations differ on a spiritual or physical afterlife, as well as Reform who do not accept it at all
39	Nahmanides	The afterlife comes after the resurrection
40	Maimonides	The resurrected will die a second time, then go to the afterlife
41	Messiah	The resurrection may be during or after the Messianic Age.

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Component 3b: Judaism Practices Knowledge Organiser

Prayer		
1	Amidah	'HaTefillah' (the prayer)18 Blessings reflecting the types of prayer
2	Shema	'listen' One of the most important Jewish prayers of Gods nature
3	Modeh Ani	'I offer thanks' Often the first prayer of the day
4	Mezuzah	Case containing scroll of Shema, placed on right of door
5	Siddur	Book of prayers for Shabbat and other festivals. Considered as holy

Shabbat		
6	Shabbat	Holy day of rest, worship in home and synagogue. One of the Miztvot.
7	Meal	Includes braided loaves (challah) and Kiddush prayer over glass of wine
8	Synagogue	The family go to the synagogue on Saturday. The father goes on Friday evening before the family meal at the home
9	Havdalah	The candle lit to mark the end of Shabbath, with wine and sweet spice.

Items of Worship		
10	Kippah	Skull cap; a sign of respect to God, usually worn through prayer and study
11	Tallit	Garment that covers the shoulders, with 613 fringes (tzizit)
12	Tefillin	Two small leather boxes worn on head and arm, contain the Shema

Synagogue		
13	Purpose	Beit tefilah (house of study) Beit midrash (house of prayer)
14	Yom Tovim	Arranging food, cards etc for festival celebration, especially for the lonely
15	Chevra Kadisha	The burial Society, prepares the ceremony and the body for burial
16	Aron Hakodesh	The Ark, that holds the Torah Scrolls
17	Ner Tamid	The eternal lamp, symbolises the Menorah and God's presence
18	Torah Scrolls	Sacred scripture, hand written on animal skin, read from the Bimah

Brit Milah		
19	Torah reading	Naming ceremonies for boys and girls occur at the next Torah reading at the synagogue
20	Abrahamic link	Circumcision is a sign of the relationship with God, the third covenant
21	Elijah	The boy is placed on a cushion on an empty chair, known as Elijah's chair as his presence visits every Brit Milah
22	Identity	The Jewish name is given, and the boy has entered a covenant with God

Authority		
23	Torah	The first 5 books of scripture, the story of Creation, Abraham, Moses
24	Tenakh	The Torah, plus Neviim (prophets) and Ketuvim (Psalms)
25	Talmud	Mishnah (oral Torah and Halakah) and Gemara (commentary on Mishnah)

Bar/Bat Mitzvah		
26	Responsibility	Deeper relationship with God, duty to follow Mitzvot. Age 12/ 13
27	Torah knowledge	Both boys and girls have to learn Hebrew to read a Torah blessing
28	Bat Chayil	A special ceremony in Orthodox Judaism for the girls' Bat Mitzvah

Marriage		
29	Kiddushin	To be holy or sanctified- the union between the couple is God given
30	Ketubah	Legal document where the groom promises to support his wife
31	Chuppah	The canopy that represents the home, blessings are said for commitment
32	Glass	The breaking of the glass to show the fragility of marriage
33	Nisuin	7 blessings that finalise the marriage and praise God

Mourning		
34	Burial	Rather than cremated. Simple burial with Kiddush said at graveside
35	Shiva	7 days of mourning after burial, no mirrors, social events etc.
36	Tombstone	Stones as a sign of respect to remember Abraham's burial of Sarah
37	Yahrzeit	Ceremony on the anniversary of death, candles are burned for 24 hours

Kosher		
38	Kosher	Part of Mitzvot. Shochet slaughters animals in specific way.
39	Treifah	Forbidden food or objects, such as shellfish, fish without scales
40	Reform	The relevance and availability of Kosher means some Jews don't follow it

Rosh Hashanah		
41	Day of Judgement	Jews reflect on their actions, perform Tashlikh (casting) of sins
42	Shofar	Sounded in the morning to symbolise souls reuniting with God
43	Symbolic Food	The Challah is circular, with apple dipped in honey.

Yom Kippur		
44	Atonement	The 10 "Days of Returning" and repentance, with fasting on Yom Kippur
45	Actions	Charity, spiritual cleansing in mikveh, confession, Yizkor (memorial service

Sukkot		
46	Mosaic link	One of Mitzvot, remembering the journey through the desert
47	Lulav and Etrog	The palm and citrus, representing knowledge of Torah and Mitzvah
48	shelter	Sign of unity, where families eat or sleep in it

Pesach		
49	Exodus	Celebrates the Passover (10th Plague) and freedom from slavery
50	Ceder Meal	Ritual meal of symbolic food of slavery and freedom (lamb/ egg etc

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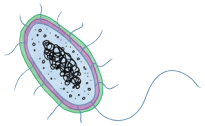
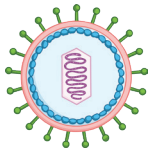
Infection and Response Knowledge Organiser – Foundation and Higher

Communicable Disease

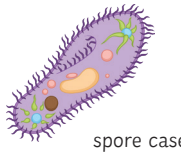
Pathogens are **microorganisms** that enter the body and cause communicable disease (infectious). Plants and animals can be infected by them.



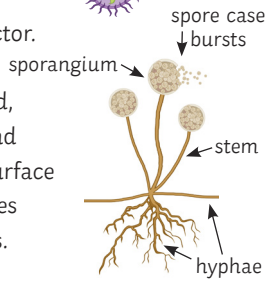
Bacteria are small cells that can reproduce very quickly in the body. They produce **toxins** that make you feel ill, damaging your cells and tissues.



Viruses are much smaller than bacteria; they can also reproduce quickly in the body. Viruses live inside your cells where they replicate. They then burst out of the cell, releasing new viruses.



Protists are eukaryotes (multicellular). Some are parasites which live on or inside other organisms, often carried by a vector.



Fungi are sometimes single celled, others have hyphae that grow and penetrate human skin and the surface of plants. They can produce spores which can spread to other plants.

How Pathogens Are Spread

Pathogens can be spread in many ways, for example:

Water – by drinking dirty water, e.g. cholera.

Air – carried by air and breathed in, e.g. influenza.

Direct contact – touching contaminated surfaces including the skin, e.g. athlete's foot.

Viral Diseases

Measles is spread by droplets of liquid from sneezes and coughs etc. Symptoms include a red rash on the skin and a fever. Measles can be serious or even fatal and it can lead to pneumonia. Most people are vaccinated against measles when they are very young.

HIV is spread by sexual contact or exchanging body fluids. HIV can be controlled be antiviral drugs; this stops the viruses replicating. The virus attacks the cells in the immune system. If the immune system is badly damaged, the body cannot cope with other infections. This is the late stage and is called Aids.

Tobacco mosaic virus affects plants. Parts of the leaves become discoloured. This means plants cannot carry out photosynthesis; this will affect the plants growth.

Fungal and Protist Diseases

Fungal

Rose black spot shows as black spots on the leaves of the plant. This means less photosynthesis occurs. As a result, the plant does not grow as well. It is spread by the wind or the water. They can be treated by using fungicides and taking the leaves off the infected plant.

Protists

Malaria is caused by a protist; mosquitoes are the vectors. They become infected when they feed on an infected animal. The protist is inserted into the blood vessel. Malaria can cause fever and it can also be fatal.

Bacterial Diseases

Salmonella bacteria causes food poisoning. Symptoms include fever, stomach cramps, vomiting and diarrhoea. The symptoms are caused by the toxins produced by the bacteria. Food contaminated with salmonella can give you food poisoning. Most poultry in the UK will have had a vaccination against salmonella.

Gonorrhoea is a sexually transmitted bacterial disease, passed on by sexual contact. Symptoms include pain when urinating and thick yellow/green discharge from the vagina or penis. To prevent the spread, people should be treated with antibiotics and use a condom.

How to prevent the spread:

Being hygienic –

washing hands thoroughly.

Destroying vectors –

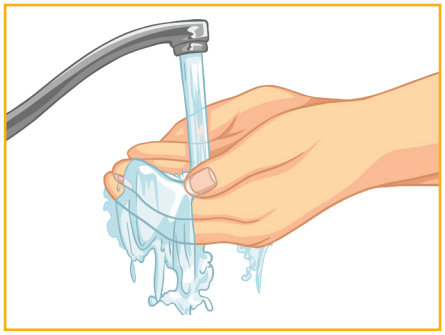
killing vectors by using insecticides or destroying their habitat.

Isolation –

isolating an infected person will prevent the spread.

Vaccination –

people cannot develop the infection and then pass it on.



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Infection and Response Knowledge Organiser – Foundation and Higher

Plant Diseases and Defences

Plants need ions from the soil. If there isn't enough, then the plants suffer deficiency symptoms.

Ion	Symptoms
nitrates	stunted growth
magnesium	yellow leaves

Plant Diseases – common signs include stunted growth, spots on the leaves, patches of decay, abnormal growth, malformed stems or leaves and discolouration.

Plants have physical, chemical and mechanical defences to stop pathogens.

Physical – waxy cuticle, cell walls, layer of dead cells.

Mechanical – thorns, hairs, leaves that droop or curl and some plants can mimic other organisms.

Fighting Diseases

Defence System

1. The skin acts as a barrier to pathogens.
2. Hairs and mucus in your nose trap particles.
3. The trachea and bronchi secrete mucus to trap pathogens. They also have cilia which move backwards and forwards to transport the mucus towards the throat. This traps any pathogens and the mucus is usually swallowed.
4. The stomach contains hydrochloric acid to kill any pathogens that enter the body via the mouth.

The Immune System

This kills any pathogens that enter the body.

White blood cells:

- **Phagocytosis** is when white blood cells engulf pathogens and then digest them.
- They produce **antitoxins** to neutralise the **toxins**.
- They also produce **antibodies**. Pathogens have **antigens** on their surface. Antibodies produced by the white blood cells lock on to the antigen on the outside of the pathogen. White blood cells can then destroy the pathogens.
  Antibodies are specific to one antigen and will only work on that pathogen.

Vaccinations

Vaccinations have been developed to protect us from future infections. A vaccination involves an injection of a **dead** or **weakened** version of the pathogen. They carry antigens which cause your body to produce antibodies which will attack the pathogen. If you are infected again, the white blood cells can produce antibodies quickly.

Pros	Cons
Helps to control communicable diseases that used to be very common.	They don't always work.
Epidemics can be prevented.	Some people can have a bad reaction to a vaccine – however, that is very rare.

Fighting Disease – Drugs

Painkillers relive the pain and symptoms, but do not tackle the cause.

Antibiotics kill the bacteria causing the problem, but do not work on viruses. Viruses are very difficult to kill because they live inside the body cells.

Developing Drugs

There are three main stages in drug testing:

Pre-clinical testing:

1. Drugs are tested on human cells and tissues.
2. Testing carried out on living animals.

Clinical testing:

3. Tested on healthy human volunteers in clinical trials. Starts with a very low dose, then tested on people with the illness to find the optimum dose.

Placebo is a substance that is like the drug but does not do anything.

Placebo effect is when the patient thinks the treatment will work even though their treatment isn't doing anything.

Blind trial is when the patient does not know whether they are getting the drug or the placebo.

Double-blind trial is when both the doctor and the patient do not know whether they are getting the drug.

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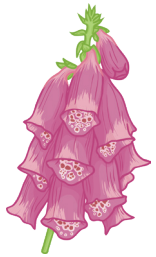
Infection and Response Knowledge Organiser – Foundation and Higher

Drugs from Plants

Chemicals produced by plants to defend themselves can be used to treat human diseases or help with symptoms.

Drug	Plant/Microorganism
aspirin	willow
digitalis	foxglove
penicillin	mould - penicillium

New drugs are now made by chemists, who work for the pharmaceutical industry, in laboratories.



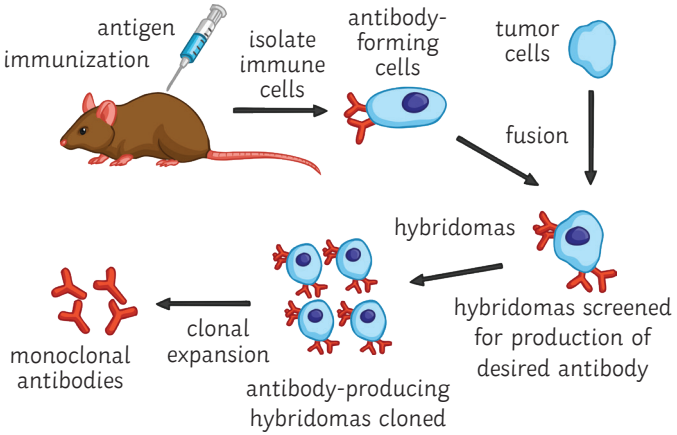
Key Vocabulary

antibodies
antigens
antitoxins
bacteria
blind trial
double-blind
fungus
microorganism
phagocytosis
placebo
protist
toxins
vaccination
vector
virus

Monoclonal Antibodies

Monoclonal antibodies are identical antibodies. Antibodies are produced by B lymphocytes.

It is possible to fuse a B lymphocyte from a mouse with a tumour cell to create a cell called a hybridoma - these can be cloned. They will all produce the same antibodies; the antibodies can be collected and purified.



There are many uses of monoclonal antibodies. For example:

Pregnancy testing: HCG hormone is found in the urine of women when pregnant. Pregnancy testing sticks detect this hormone. The HGC binds to the antibodies on the stick and changes the colour if you are pregnant. If the woman is not pregnant, there is no HCG. This means there is nothing to stick to the blue beads on the test strip, so it does not go blue.

Treating diseases: anti-cancer drugs can be attached to monoclonal antibodies. They can target specific cells (cancer cells) by binding to the cancer marker. This kills the cancer cells, but not the normal body cells.

Research to find specific substances: used to bind to hormones and chemicals in the blood to measure levels. Also used in blood tests for pathogens and locating molecules on a cell or in tissue.

Problems: they have more side-effects than originally thought. For example: fever, vomiting, low blood pressure. They are not used by doctors as much as was first thought.

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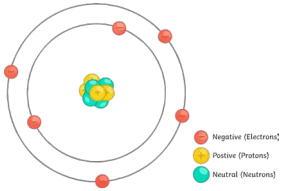
Atomic Structure and the Periodic Table – Foundation and Higher (Separate)

Atoms

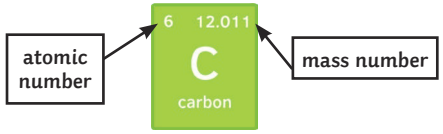
Contained in the nucleus are the **protons** and **neutrons**. Moving around the nucleus are the **electron** shells. They are negatively charged.

Particle	Relative Mass	Charge
proton	1	+1
neutron	1	0
electron	Very small	-1



Overall, atoms have no charge; they have the same number of protons as electrons. An ion is a charged particle - it does not have an equal number of protons to electrons.

Atomic Number and Mass Number



Elements

Elements are made of atoms with the same atomic number. Atoms can be represented as symbols.

N = nitrogen **F** = fluorine **Zn** = zinc **Ca** = calcium

Isotopes – an isotope is an element with the **same number of protons** but a **different number of neutrons**. They have the same atomic number, but different mass number.

Isotope	Protons	Electrons	Neutrons
$^{1}_{1}H$	1	1	1 - 1 = 0
$^{2}_{1}H$	1	1	2 - 1 = 1
$^{3}_{1}H$	1	1	3 - 1 = 2

Compounds – a compound is when two or more elements are chemically joined. Examples of compounds are carbon dioxide and magnesium oxide. Some examples of formulas are CO_2, NaCl, HCl, H_2O, Na_2SO_4. They are held together by chemical bonds and are difficult to separate.

Equations and Maths

To calculate the relative atomic mass, use the following equation:

relative atomic mass (A_r) =

$$\frac{\text{sum of (isotope abundance} \times \text{isotope mass number)}}{\text{sum of abundances of all isotopes}}$$

Balancing Symbol Equations

There must be the same number of atoms on both sides of the equation:

$CH_4 + 2O_2 \rightarrow 2H_2O + CO_2$

C = 1

O = 4

H = 4

Chemical Equations

A chemical reaction can be shown by using a **word equation.**

e.g. magnesium + oxygen → magnesium oxide

On the left-hand side are the reactants, and the right-hand side are the products.

They can also be shown by a **symbol equation.**

e.g. $2Mg + O_2 \rightarrow 2MgO$

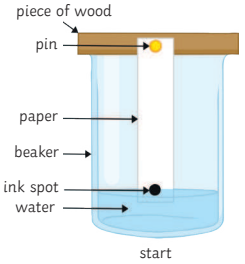
Equations need to be **balanced,** so the same number of atoms are on each side. To do this, numbers are put in front of the compounds.

$CH_4 + \mathbf{2}O_2 \rightarrow \mathbf{2}H_2O + CO_2$

Mixtures, Chromatography and Separation

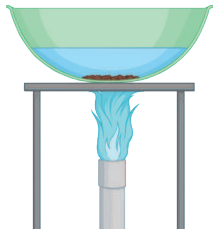
Mixtures – in a mixture there are no chemical bonds, so the elements are easy to separate. Examples of mixtures are air and salt water.

Chromatography – to separate out mixtures.

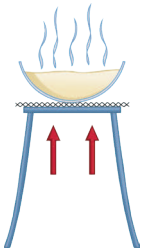


Filtration – to separate solids from liquids.

Evaporation – to separate a soluble salt from a solution; a quick way of separating out the salt.



Crystallisation - to separate a soluble salt from a solution; a slower method of separating out salt.



Separating out salt from rock salt:

1. Grind the mixture of rock salt.
2. Add water and stir.
3. Filter the mixture, leaving the sand in the filter paper
4. Evaporate the water from the salt, leaving the crystals.

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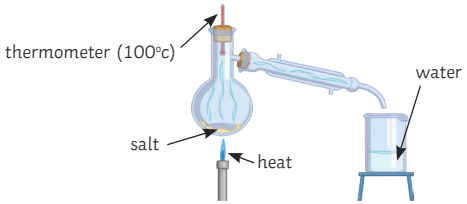
Atomic Structure and the Periodic Table – Foundation and Higher (Separate)

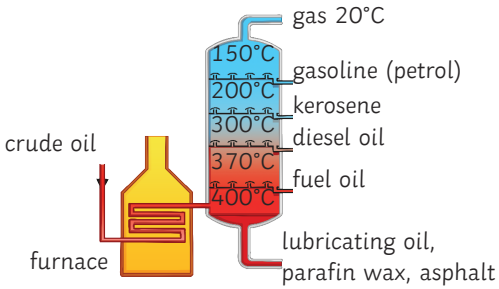
Distillation

To separate out mixtures of liquids.

1. **Simple distillation** – separating a liquid from a solution.



2. **Fractional distillation** – separating out a mixture of liquids. Fractional distillation can be used to separate out crude oil into fractions.



Metals and Non-metals

They are found at the **left** part of the periodic table. Non-metals are at the **right** of the table.

Metals

Are strong, malleable, good conductors of electricity and heat. They bond metallically.

Non-Metals

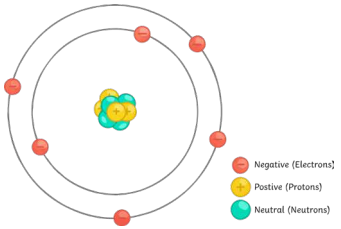
Are dull, brittle, and not always solids at room temperature.

History of the Atom

Scientist	Time	Discovery
John Dalton	start of 19th century	Atoms were first described as solid spheres.
JJ Thomson	1897	Plum pudding model – the atom is a ball of charge with electrons scattered.
Ernest Rutherford	1909	Alpha scattering experiment – mass concentrated at the centre; the nucleus is charged. Most of the mass is in the nucleus. Most atoms are empty space.
Niels Bohr	around 1911	Electrons are in shells orbiting the nucleus.
James Chadwick	around 1940	Discovered that there are neutrons in the nucleus.

Electronic Structure

Electrons are found in shells. A maximum of two in the most inner shell, then eight in the 2nd and 3rd shell. The inner shell is filled first, then the 2nd then the 3rd shell.



Group 7 Elements and Noble Gases

Halogens

The halogens are **non-metals**: fluorine, chlorine, bromine, iodine. As you go down the group they become less reactive. It is harder to gain an extra electron because its outer shell is further away from the nucleus. The melting and boiling points also become higher.

Noble Gases

The **noble gases** (**group 0** elements) include: **helium**, **neon** and **argon**. They are un-reactive as they have full outer shells, which makes them very stable. They are all colourless gases at room temperature.

The boiling points all increase as they go down the group – they have greater intermolecular forces because of the increase in the number of electrons.

Development of the Periodic Table

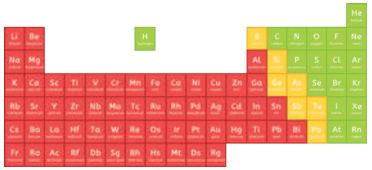
In the early 1800s, elements were arranged by atomic mass. The periodic table was not complete because some of the elements had not been found. Some elements were put in the wrong group.

Dimitri Mendeleev (1869) left gaps in the periodic table. He put them in order of **atomic mass**. The gaps show that he believed there was some undiscovered elements. He was right! Once found, they fitted in the pattern.

The Modern Periodic Table

Elements are in order of **atomic mass/proton number**. It shows where the metals and non-metals are. **Metals** are on the **left** and **non-metals** on the **right**. The **columns** show the **groups**. The **group number** shows the number of **electrons** in the **outer shell**. The rows are **periods** – each period shows another full shell of electrons.

The periodic table can be used to predict the reactivity of elements.



Alkali Metals

The alkali metals (**group 1 elements**) are soft, very reactive metals. They all have **one electron** in their **outer shell**, making them **very reactive**. They are **low density**. As you go down the group, they become more reactive. They get bigger and it is easier to lose an electron that is further away from the nucleus.

They form ionic compounds with non-metals.

They react with water and produce hydrogen.

E.g.

lithium + water → lithium hydroxide + hydrogen

$2Li + 2H_2O \rightarrow 2LiOH + H_2$

They react with chlorine and produce a metal salt.

E.g.

lithium + chlorine → lithium chloride

$2Li + Cl_2 \rightarrow 2LiCl$

They react with oxygen to form metal oxides.

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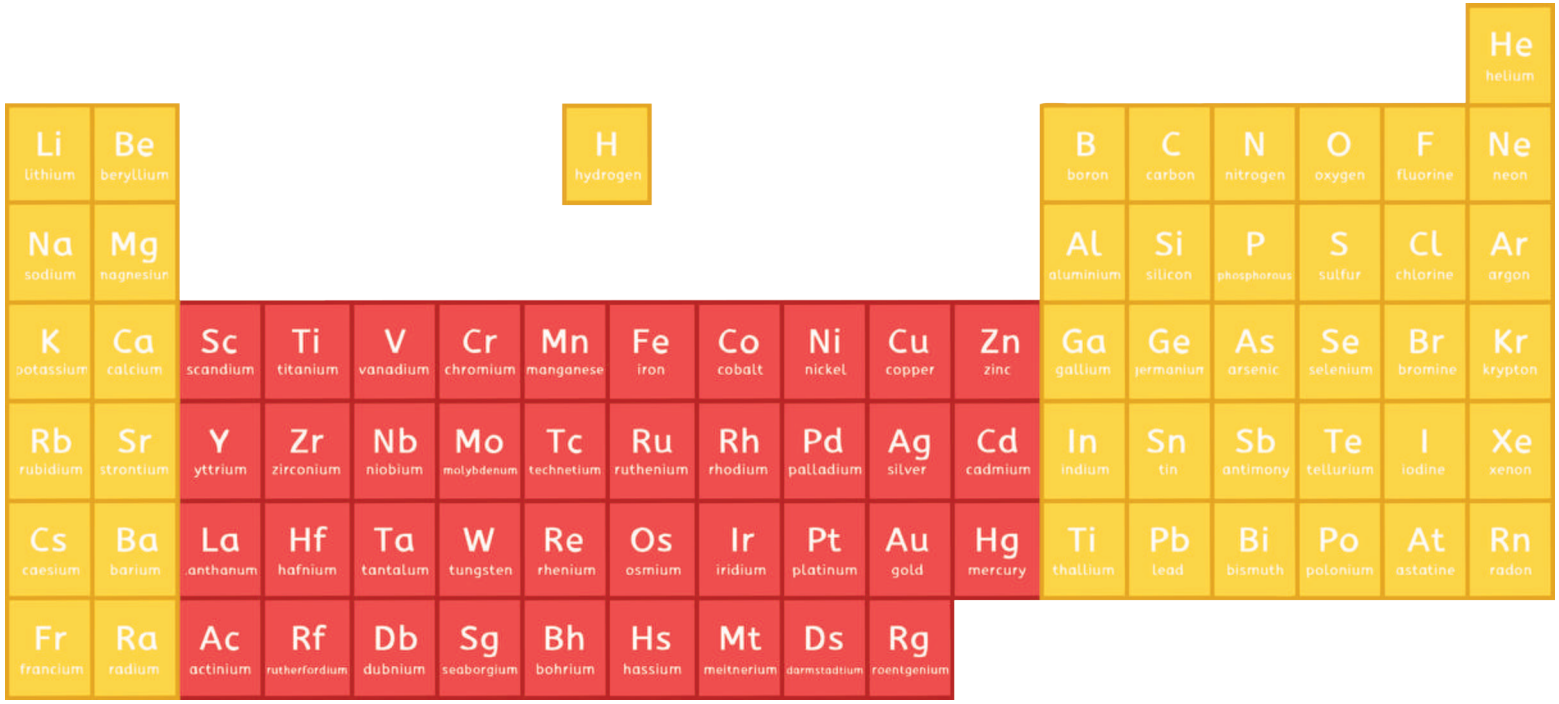
The Transition Metals

The transition metals are a block of elements found between groups 2 and 3 in the middle of the periodic table. Examples of transition metals include copper, nickel and iron with many more included. They have all the properties you would expect metals to have, such as being strong, shiny and conductors of electricity and heat. Transition metals make very good catalysts; this means they speed up a reaction without being used up themselves. Iron is used as a catalyst during the Haber process when making ammonia.

Transition metals can form more than one ion. For example, copper can take the form of Cu^{+}, Cu^{2+} and iron can be Fe^{2+} and Fe^{3+}. The ions are often coloured and the compounds they are found in are also coloured.



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AQA Physics (Combined Science) Unit 6.1: Energy

Required Practical

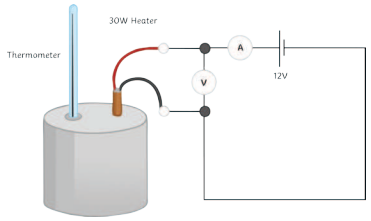
Investigating Specific Heat Capacity

independent variable – material

dependent variable – specific heat capacity

control variables – insulating layer, initial temperature, time taken

$\Delta E = m \times c \times \Delta\Theta$



Method:

1. Using the balance, measure and record the mass of the copper block in kg.
2. Wrap the insulation around the block.
3. Put the heater into the large hole in the block and the block onto the heatproof mat.
4. Connect the power pack and ammeter in series and the voltmeter across the power pack.
5. Using the pipette, put a drop of water into the small hole.
6. Put the thermometer into the small hole and measure the temperature.
7. Switch the power pack to 12V and turn it on.
8. Read and record the voltmeter and ammeter readings – during the experiment, they shouldn't change.
9. Turn on the stop clock and record the temperature every minute for 10 minutes.
10. Record the results in the table.
11. Calculate work done and plot a line graph of work done against temperature.

Equations

$E = \frac{1}{2}mv^2$

$E_p = mgh$

$E_e = \frac{1}{2}ke^2$

$\Delta E = m \times c \times \Delta\Theta$

$P = \frac{E}{t}$

$P = \frac{W}{t}$

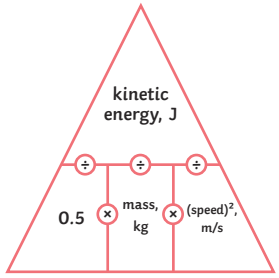
Kinetic and Potential Energy Stores

Movement Energy

kinetic energy = $\frac{1}{2}$ x mass x speed^2

$$E_k = \frac{1}{2}mv^2$$

(J) (kg)(m/s)

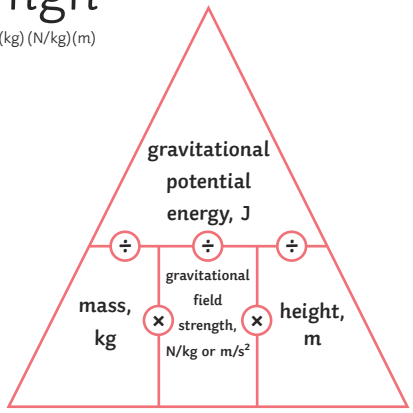


When something is off the ground, it has gravitational potential energy

gravitational potential energy = mass x gravitational field strength x height

$$E_p = mgh$$

(J) (kg) (N/kg)(m)



When an object falls, it loses gravitational potential energy and gains kinetic energy.

Stretching an object will give it elastic potential energy.

elastic potential energy = $\frac{1}{2}$ × spring constant × extension^2

$$E_e = \frac{1}{2}ke^2$$

(J) (N)(m)

Transferring Energy by Heating

Heating a material transfers the energy to its thermal energy store - the temperature increases.

E.g. a kettle: energy is transferred to the thermal energy store of the kettle. Energy is then transferred by heating to the waters thermal energy store. The temperature of the water will then increase.

Some materials need more energy to increase their temperature than others.

change in thermal energy = mass × specific heat capacity × temperature change

$$\Delta E = m \times c \times \Delta\Theta$$

(J) (kg) (J/kg°C) (°C)

Specific heat capacity is the amount of energy needed to raise the temperature of 1kg of a material by 1°C.

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Energy Stores and Systems

Energy Stores	
kinetic	Moving objects have kinetic energy.
thermal	All objects have thermal energy.
chemical	Anything that can release energy during a chemical reaction.
elastic potential	Things that are stretched.
gravitational potential	Anything that is raised.
electrostatic	Charges that attract or repel.
magnetic	Magnets that attract or repel.
nuclear	The nucleus of an atom releases energy.

Energy can be transferred in the following ways:

mechanically – when work is done;

electrically – when moving charge does work;

heating – when energy is transferred from a hotter object to a colder object.

Conservation of Energy

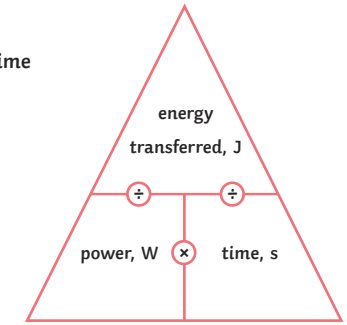
Energy can never be created or destroyed, just transferred from one form to another. Some energy is transferred usefully and some energy gets transferred into the environment. This is mostly wasted energy.

Power

Power is the rate of transfer of energy – the amount of work done in a given time.

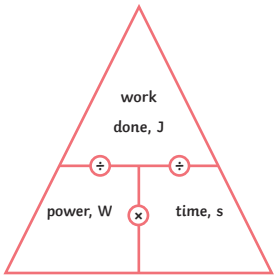
power = energy transferred ÷ time

P (W) = E (J) ÷ t (s)



power = work done ÷ time

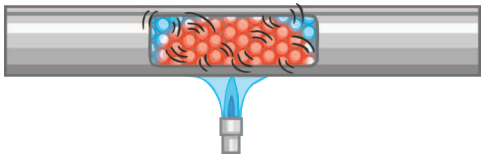
P (W) = W (J) ÷ t (s)



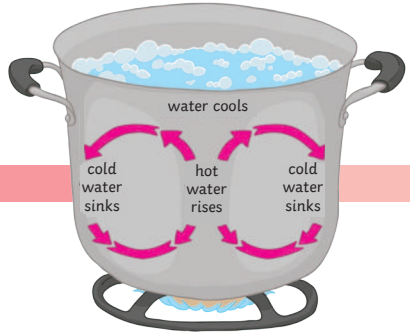
Energy Transfer

Lubrication reduces the amount of friction. When an object moves, there are frictional forces acting. Some energy is lost into the environment. Lubricants, such as oil, can be used to reduce the friction between the surfaces.

Conduction – when a solid is heated, the particles vibrate and collide more, and the energy is transferred.

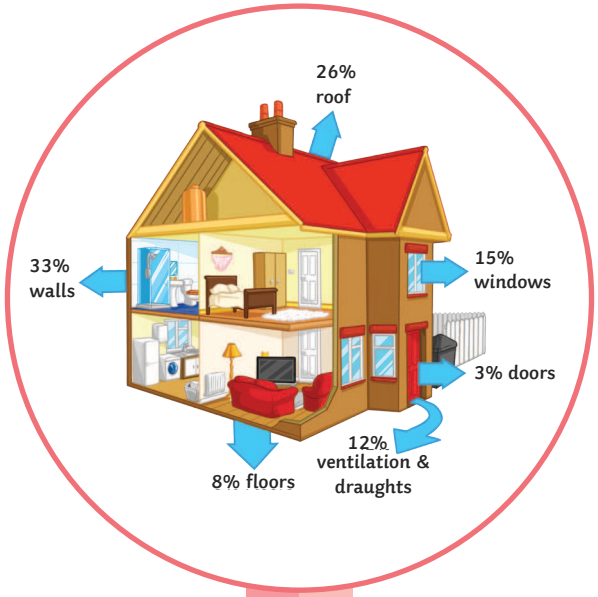


Convection – when a liquid or a gas is heated, the particles move faster. This means the liquid or gas becomes less dense. The denser region will rise above the cooler region. This is a convection current.



Insulation – reduces the amount of heat lost. In your home, you can prevent heat loss in a number of ways:

- thick walls;
- thermal insulation, such as:
- loft insulation (reducing convection);
- cavity walls (reduces conduction and convection);
- double glazing (reduces conduction).



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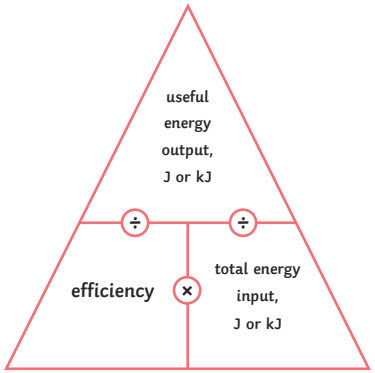
Efficiency

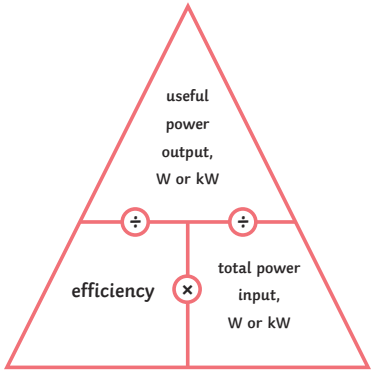
When energy is transferred, some energy is wasted. The less energy that is wasted during the transfer, the more efficient the transfer.

There are two equations to calculate efficiency:

$$\text{efficiency} = \frac{\text{useful output energy transfer}}{\text{total input energy transfer}}$$



$$\text{efficiency} = \frac{\text{useful power output}}{\text{total power input}}$$



Some energy is always wasted. Nothing is 100% efficient.

Efficiency

Non-renewable – coal, oil, gas - they will all run out, they damage the environment, but provide most of the energy.

Renewable – they will never run out, can be unreliable and do not provide as much energy.

Energy Resource	Advantages	Disadvantages
solar – using sunlight	Renewable, no pollution, in sunny countries it is very reliable.	Lots of energy needed to build, only works during the day, cannot increase power if needed.
geothermal – using the energy of hot rocks	Renewable and reliable as the rocks are always hot. Power stations have a small impact on environment.	May release some greenhouse gases and only found in specific places.
wind – using turbines	Renewable, no pollution, no lasting damage to the environment, minimal running cost.	Not as reliable, do not work when there is no wind, cannot increase supply if needed.
hydroelectric – uses a dam	Renewable, no pollution, can increase supply if needed.	A big impact on the environment. Animals and plants may lose their habitats.
wave power – wave powered turbines	Renewable, no pollution.	Disturbs the seabed and habitats of animals. Unreliable.
tidal barrages – big dams across rivers	Renewable, very reliable, no pollution.	Changes the habitats of wildlife, fish can be killed in the turbines.
biofuels	Renewable, reliable, carbon neutral.	High costs, growing biofuels may cause a problem with regards to space, clearance of natural forests.
non-renewable – fossil fuels	Reliable, enough to meet current demand, can produce more energy when there is more demand.	Running out, release CO_2, leading to global warming, and also release SO_2 which causes acid rain.

Trends in energy resources – most of our electricity is generated by burning fossil fuels and nuclear. The UK is trying to increase the amount of renewable energy resources. The governments are aware that non-renewable energy resources are running out; targets of renewable resources have been set. Electric and hybrid cars are also now on the market.

However, changing the fuels we use and building renewable power plants cost money. Many people are against the building of the plants near them and do not want to pay the extra in their energy bills. Hybrid and electric cars are also quite expensive.

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