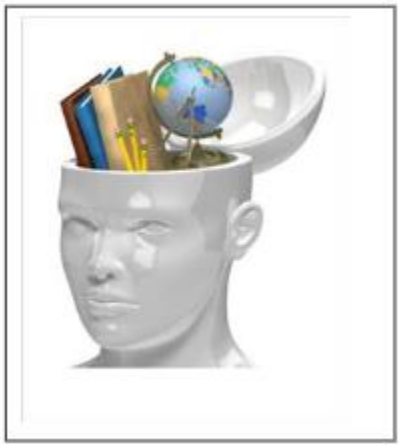
# Year 9
# Knowledge Organiser Summer Term



# Instructions for using your Knowledge Organiser

## Self-testing

You can use your knowledge organisers and exercise book in a number of different ways but you should not just copy from the Knowledge Organiser into your book.

**Below are some possible tasks you could do in your workbooks**

- Ask someone to write questions for you
- Write your own challenging questions and then leave it overnight to answer them the next day
- Create mindmaps
- Create flashcards
- Put the key words into new sentences
- Look, cover, write and check
- Mnemonics
- Draw a comic strip of a timeline
- Use the 'clock' template to divide the information into smaller sections. Then test yourself on different sections
- Give yourself spelling tests
- Definition tests
- Draw diagrams of processes
- Draw images and annotate/label them with extra information
- Do further research on the topic
- Create fact files
- Create flowcharts

# Presentation

You should take pride in how you present your work; each page should be clearly labelled with underlined title and date. There should be an appropriate amount of work.

The Knowledge Organisers are designed to help you learn a wide range of knowledge which in turn will mean you are more prepared for your lessons as well as the new style GCSEs that you will sit in the future.

To get the most out of your Knowledge Organiser, you should be learning sections and then self testing in your workbook.

**Do not just copy into your workbook**

**Always check and correct!**

# Subject: Art Year 9: Portraits

In this project you will learn to use a wide range of art techniques to explore the work of famous Portrait artists. You will experiment with blending and mark-making. You will be expected to research and show a greater sense of independent learning. Students will be expected to produce a self-portrait using one tone.

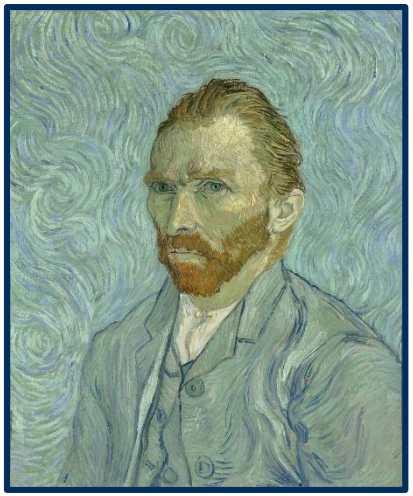
## Key Artists

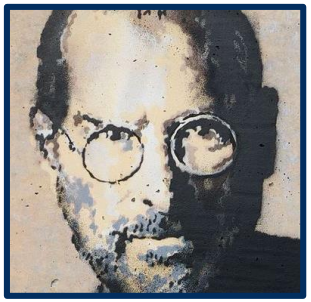
**Vincent Van Gogh**
His use of broad marks makes his style quite unique.

**Andy Warhol**
His use of repetitive (iconic/famous) images.

**Julian Opie**
Known for designing illustrated covers for adverts and CD's.

**Banksy**
Stencil artist, who's spray can art has political response to the world





## Key Words

- ✓ **Formal Elements**
- ✓ **Close-up/zoom-in**
- ✓ **Blending**
- ✓ **Harmonious**
- ✓ **Mood**
- ✓ **Proportion**

## Key Skills & Knowledge

By the end of the project you should have gained the skills and knowledge to be able to do the following:

1. Understand why Portraits are a form of advertising
2. Can demonstrate observational skills in proportion of facial features
3. Successfully use resources to create a range of art works
4. Present your work to a high standard
5. Have written in more than **30 words** on why you have done a piece of work

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# Year 9 Computer Science KO

| Summer Term | |
|---|---|
| Summer 1 | Summer 2 |
| Python fundementals | Programming Project |
| Programming with a textual language. Designing basic programs. Understanding basic Python functions and the difference between a variable and list . Performing casting - converting one data type to another. | Creating a basic computer quiz - simplified version of Music quiz. Analysing and solving a problem using algorithms - flowchart, pseudocode. Testing and evaluating the solution. |
| Formative Assessment | Summative Assessment |
| Turn in designed programs for early feedback. Extended programming projects learnig from groups' input as well as peer assessment. | A summative written assessment (Synoptic) - Exam style question covering programming techniques. |
| A02 - Apply knowledge, understanding and skills | A0 2 - Apply knowledge, understanding and skills<br>A0 3 - Analyse and evaluate |

# Python & Programming:

| Python -> English | |
|---|---|
| `print('hello!')` | Prints a value on screen (in this case, hello!) |
| `input('')` | Inputs a value into the computer. |
| `x=input('')` | Inputs a value and stores it into the variable x. |
| `x=int(input(''))` | Inputs a value into x, whilst also making it into an integer. |
| `print(str(x))` | Prints the variable x, but converts it into a string first. |
| `if name == "Fred":` | Decides whether the variable 'name' ha a value which is equal to 'Fred'. |
| `else:` | The other option if the conditions for an if statement are not met (eg. name = 'Bob' when it should be Fred) |
| `elif name == "Tim"` | elif (short for else if) is for when the first if condition is not met, but you want to specify another option. |
| `#` | # is used to make comments in code – any line which starts with a # will be ignored when the program runs. |

| Comparative Operators | |
|---|---|
| `==` | Equal to |
| `!=` | Not equal to |
| `>` | Greater than |
| `<` | Less than |
| `>=` | Greater than or equal to |
| `<=` | Less than or equal to |

| Key vocabulary | |
|---|---|
| **Python** | A high level programming language. |
| **Programming** | The process of writing computer programs. |
| **Code** | The instructions that a program uses. |
| **Sequence** | Parts of the code that run in order and the pathway of the program reads and runs very line in order. |
| **Selection** | Selects a pathways through the code based on whether a condition is true |
| **Iteration** | Code is repeated (looped), either ***while*** something is true or ***for*** a number of times |
| **Algorithm** | A set of rules/instructions to be followed by a computer system |
| **Variable** | A value that will change whilst the program is executed. (eg. temperature, speed) |
| **Comparative Operator** | When comparing data, an operator is used to solve the equality such as <>, != or == |
| **Syntax** | The punctuation/way that code has to be written so that the computer can understand it. Each programming language has its own syntax. |
| **Data Type** | This indicates how the data will be stored. The most common data types are integer, string, and float/real. |
| **String** | A collection of letters, numbers or characters. (eg, Hello, WR10 1XA) |
| **Integer** | A whole number. (eg. 1, 189) |
| **Float/Real** | A decimal number, not a whole number. (eg. 3.14, -26.9) |
| **Boolean** | 1 of 2 values. (eg. True, False, Yes, No) |

# Year 9 Melodrama & Soap Opera

| Key Terminology | Definition |
|---|---|
| Proxemics | Use of stage space and how it is used to convey emotion and interact with the audience. |
| Stage Directions | *Italic* writing on a script that tells the actor how to act or explains the setting. |
| Connotations | The meaning behind what something could represent. For example, the connotations of the colour red are love, fear or danger. |
| Still Image | Being frozen during a performance to highlight a key moment. |
| Thought Tracking | When a character states a thought or emotion out loud for only the audience to hear. |
| Movement | The physical way in which you perform to convey emotion and tell a story. |

## Elements of a Soap Opera:

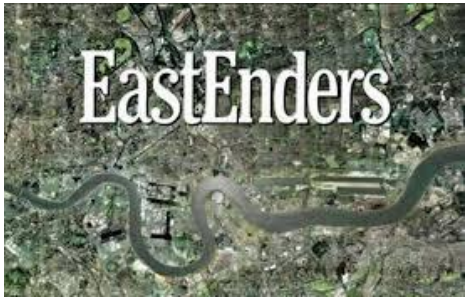
- Each soap opera episode contains multiple storylines and many scenes.
- A soap opera actor uses exaggeration in their performance skills to create a character.
- Soap opera storylines are believable and empathetic.
- Each episode ends with a cliff hanger to encourage the viewers to watch the next episode.

**Genre:**

- Tragedy
- Romance
- Comedy
- Melodrama

**Cliff hanger:**

A suspenseful moment that makes the audience want to know what happens next.



# Year 9 Summer Term 1 English Knowledge Organiser

## SUBJECT: The Harlem

| The Harlem Renaissance began around 1914 | The Great Migration and the Great War |
|---|---|
| **African Americans of all social classes joined together in Harlem, which became the focal point of a growing interest in African American culture: jazz, blues, dance, theatre, art, fiction, and poetry.** | When the U.S. entered World War I in 1917, jobs previously held by white workers suddenly became available, and industrial expansion in the North provided opportunities for African Americans to seek a new lifestyle. |
| **Black-owned businesses, from newspapers, publishing houses, and music companies to nightclubs, cabarets, and theatres, helped fuel the neighbourhood's thriving scene** | Hundreds of thousands of black people migrated from the South into dense Northern urban areas that offered relatively more economic opportunities and cultural capital. |
| Some of the era's most important literary and artistic figures migrated to or passed through Harlem, helping to define a period in which African American artists reclaimed their identity and pride in defiance of widespread prejudice, racism and discrimination. | They settled in various northern cities during this Great Migration, though New York City was the most popular, particularly the district of Harlem. |
| Harlem drew nearly 175,000 African Americans and became a destination for African Americans of all backgrounds | in the words of editor, journalist, and critic Alain Locke, "a spiritual coming of age" for African American artists and thinkers, who seized upon their "first chances for group expression and self-determination". |
| From unskilled labourers to an educated middle-class, they shared common experiences of slavery, emancipation, and racial oppression, as well as a determination to forge a new identity as free people. | With the end of the Civil War in 1865, hundreds of thousands of African Americans newly freed from the yoke of slavery in the South began to dream of fuller participation in American society, including political empowerment, equal economic opportunity, and economic and cultural self-determination. |
| Poetry from the Harlem Renaissance reflected a diversity of forms and subjects. | Unfortunately, by the late 1870s, that dream was largely dead, as white supremacy was quickly restored to the Reconstruction South. |
| Some poets, such as Claude McKay, used culturally European forms—the sonnet was one—melded with a radical message of resistance | The oppressive poverty and racism in the South was a big motivator for the Great Migration. Wages for black workers were between seventy-five cents on farms to $1.75 in southern cities. |
| Others, including James Weldon Johnson and Langston Hughes, brought specifically black cultural creations into their work, infusing their poems with the rhythms of ragtime, jazz, and blues. | Living conditions for black people in the south were terrible; sharecroppers were housed often in the cabins left standing from the time of slavery. |
| The considerable population shift resulted in a Black Pride movement with leaders like W. E. B. Du Bois working to ensure that black Americans got the credit they deserved for cultural areas of life. | Most Southern rural communities had no secondary schools for black children and at primary schools they were taught how to plant and harvest crops rather than an academic curriculum. |
| **Renewed firsts for African Americans in publishingLangston Hughes** published his first poem, "The Negro Speaks of Rivers," in the June 1921 | **Renewed firsts for African Americans in publishing:** Jean Toomer's *Cane* was the first book of fiction (by an African American writer to appear from a New York publisher since Charles Chestnutt's *The Colonel's Dream* (Doubleday, Page, 1905 |

# Year 9 Summer Term 1 English Knowledge Organiser

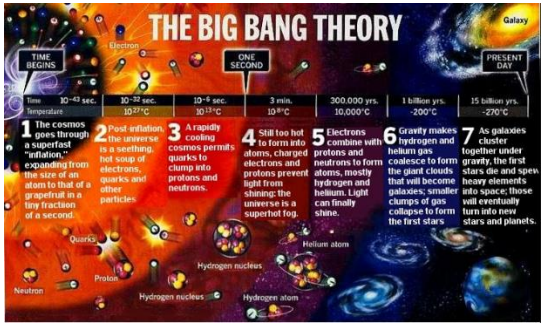
## SUBJECT: The Harlem

| Key Words | |
|---|---|
| **Prejudiced (adjective)** | A person who is **prejudiced** against someone has an unreasonable dislike of them. |
| **Egalitarian (adjective)** | If you are **egalitarian** you are supporting or following the idea that all people are equal and should have the same rights and opportunities |
| **Autonomy (noun)** | If a person or group has **autonomy**, they have the power to control what they do. |
| **Multitude (noun)** | A **multitude** of things or people is a very large number of them. |
| **Critique (verb)** | A **critique** is a written judgment of a situation or of a person's work or ideas. |

| Oppression | Great Harlem Renaissance poets |
|---|---|
| Mob violence against black people continued to rise and between 1885 and 1918 there were almost 3,000 lynchings | W.E.B. Du Bois was an American sociologist, historian, author, editor, and activist who was the most important black protest leader in the United States during the first half of the 20th century. |
| Hate groups like the Ku Klux Klan (KKK) perpetrated lynchings and conducted campaigns of terror and intimidation to keep African Americans from voting or exercising other fundamental rights. | **W. E. B. Du Bois (1868 – 1963)**<br>Du Bois' prose poem "Credo" was written before the Harlem Renaissance and proclaimed his philosophy of racial equality and remains one of his most famous and most influential works. |
| After the Supreme Court agreed that black and white people could be "separate but equal", white lawmakers on state and local levels passed strict racial segregation laws known as "Jim Crow laws" that made African Americans second-class citizens | **Claude McKay (1889 – 1948)** Festus Claudius "Claude" McKay was a Jamaican writer and poet, and was a central figure in the Harlem Renaissance. His 1922 poetry collection, *Harlem Shadows*, was among the first books published during the Harlem Renaissance. |
| While a small number of African Americans were able to become landowners, most were exploited as sharecroppers, a system designed to keep them poor and powerless. | **Jean Toomer (1894 – 1967)** A poet, playwright, and novelist, Toomer's most famous work, *Cane*, was published in 1923 and was hailed by critics for its literary experimentation and portrayal of African-American characters and culture. |
| "Jim Crow laws" made African Americans second-class citizens, leading to segregation where the facilities for black people were never equal to those reserved for white people.<br><br>The lack of economic opportunities, and, more importantly, the prevalence of prejudice, lynching, and segregation in public spaces all contributed to the intolerable conditions of African Americans. | **Countee Cullen (1903 – 1946)** When Countee Cullen's (pronounced count-ay) paternal grandmother and guardian died in 1918, the 15-year-old was taken into the home of the Reverend Frederick A. Cullen, the pastor of Salem Methodist Episcopal Church, Harlem's largest congregation. There the young Countee entered the centre of black politics and culture in the United States and acquired both the name and awareness of the influential clergyman who was later elected president of the Harlem chapter of the NAACP. |

Christians believe that God created the Earth and all living things on Earth. Many Christians believe that although it may not be scientifically accurate, this account contains religious truth, explaining that the process of creation was God's choice and that God designed and caused it to happen.

Genesis 1- The Creation Story
Day 1- Light and dark
Day 2- Separates the sky and the sky
Day 3- Separates the sea and the land
Day 4- Creates the sun, moon and stars
Day 5- Creates air and water animals
Day 6- Land animals and humans
Day 7- He rested




Genesis 1 &2 says that God created the world in 6 days, and on the 7th He rested. Some Christians take this **LITERALLY** and read this story as **fact (fundamentalist).** Others see the Genesis story as a **symbolic** story **(Liberal)**

Key terms: PLANET EARTH
**Universe-** all of time and space and its contents including planets and matter and energy.
**Wonder-** marvelling at the complexity and beauty of the universe.
**Awe-** feeling of devout respect, mixed with fear or wonder.
**Responsibility-** a duty to care for, or having control over something or someone.
**Stewardship-** the idea that believer have a duty to look after the environment on behalf of God.
**Dominion-** to rule over and have power over something.

**Key terms- Animals and Humans**
**Vegetarian-**a person who does not eat meat or fish
**Vegan-** a person who does not eat animals or food produced by animals (such as eggs); a vegan does not use any products that have caused harm to animals such as (fur and leather).
**Pescetarian-** a person who only eats fish and no meat in their diet.
**Evolution-** The process by which living organism are thought to have developed and diversified from earlier forms of life during the history of the Earth.
**Adaptation-** a process of change where an organism or species becomes better suited to its environment.

How are animals used?
- Experiments
- Sport
- Entertainment
- Transport
- Food
- Pets

*STEWARDSHIP*
*"The LORD God took the man and put him in the Garden of Eden to work it and take care of it."*
Genesis 2:15

DOMINION
***"Rule over the fish in the sea and the birds in the sky and over every living creature that moves on the ground." Genesis 1:28***

| Haram | Halal |
|---|---|
| Pigs | Fish |
| Reptiles | Chicken |
| Rodents | Correctly slaughtered meat (under Islamic Law) |
| Animal blood | Milk |
| Alcohol | |

Christians believe that animals were created by God for humans to use and care for. Many believe God values animals but that **humans are more important** because they were created in the **image of God, and have souls.** The story of Noah and the flood shows this. God commanded Noah to take animals in to the ark so they would be safe.

Muslims believe that God **made all living creatures** and they all worship him in their own way. Each animals is **valuable to God,** has rights and should be treated with **kindness and compassion.**

Key quotes- Christianity

***"The righteous care for the needs of their animals" Proverbs 12:10***

***"Everything that lives and moves about will be food for you". Genesis 9:3***

Key quotes- Islam

***"The seven heavens and earth, and everyone in them, glorify Him. There is not a single thing that does not celebrate His praise." Qur'an 17:44***

***"Whoever kills a sparrow or anything bigger than that without a just cause, God will hold him accountable on the day of Judgement." Hadith***

Key terms:
Abortion/Euthanasia/Death
**Sanctity of life-** all life is holy and it is created and loved by God. Christians believe human life should not be misused or abused.
**Quality of life-** the general well being of a person , in relation to their health and happiness; also the theory that the value of life depends on how satisfying or good it is.
**Euthanasia:** the painless killing of a patient suffering from an incurable and painful disease or an irreversible coma.
**Eternity:** a state that comes after death and never ends.

Abortion and the Law:

Abortion is legal in the UK up to the 24th week of pregnancy if continuing with the pregnancy would be result in:

1. A risk of the physical or mental health of the women
2. Harm the health of her existing children.

However, there is no time limit if:

1. There is a substantial risk to the women's life
2. There are foetal abnormalities.

Two doctors must give their consent. No doctor has to carry out an abortion.

Father has no legal rights.


*Halal* = Arabic for acceptable (to eat).

*Haram* = Arabic for not acceptable /forbidden (to eat).

# Food Technology KO Year 9

In this project you will learn to use **The practical activities which involve food preparation and cooking will give student an insight into the role of different types of chefs. For example, within the kitchen brigade, they are the executive head chef, sous chef, chefs de partie, commis chef , butcher, vegetable chef, fry chef, cold food and pantry chef, grill chef, pastry chef, fish chef, roast chef and sauté chef. Some of the job roles (e.g. executive chef and sous chef) are suited for the higher attainers in the subject and these student will be given leadership responsibilities. These skills required by chefs will be developed by students following recipes to make dishes using a variety of commodities. These activities will be supported by teacher demonstrations and video clips.**

## Key Vocabulary

| Equipment | Food Safety |
|---|---|
| Knife | Use by date |
| Table spoon | Best before date |
| Butter Knife | Frozen Food |
| Measuring Jug | Chilled Food |
| Chopping Board | High risk foods |
| Saucepan | Low risk foods |
| Mixing Bowl | Salmonella |
| Wooden Spoon | E Coli |
| Frying pan/Wok | Vitamins & Minerals |
| Food Mixer | Carbohydrates |
| Baking tray | Gluten in |
| Rolling Pin | Gluten |

**Weighing and measuring are skills needed by food scientist and chefs and are practised during the mise en place stage of cooking. This is facilitated by teacher demonstrations and students following recipes. The investigative work done on the impact of cooking methods on nutritional value also links to the job role of a food scientists.**

**By studying about nutrients and healthy eating using the Eat well guide as a framework, students are to the role of a dietitian and a nutritionists. These lessons will be delivered through home learning, group work activities, power points presentations and a visiting speaker.**

**Researching where our food comes from give students the opportunity to hone the skills of a food writer, culinary librarian and food journalist. This piece of work will be done through classwork (market place activity and home learning.**

**Food presentation skills are encouraged by adding a finishing technique to dishes made. This is within the remit of a food stylist, food photographer, food artist as well as a molecular gastronomist.**

**Students practise being a health and safety officer when conducting risk assessment of the food room before their practical tasks. Through role play, students will study the role of an Environmental Health Officer. Linked to these two careers, is the unit of work on health and safety and bacteria and food poisoning .**

**Conducting sensory analysis gives students insights into the job of a food taster and a quality assurer. This activity is conducted after practical activities in class as well as at home.**

**Careers in the hospitality industry include managers, administrators, front house staff as well as back house staff. These careers are studied at KS4 through power point presentations, trips, role plays, independent work and home learning activities.**

## Key Skills & Knowledge

By the end of the project you should have gained the skills and knowledge to be able to do the following:

**Nutritional needs of different groups of people including Special diets**
**Nutritional analysis**
**British and international cuisine**
**Practical activities – making food dishes**
**Food presentation techniques**

## Influential Chefs

**Gordon Ramsey, Jamie Oliver**

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# PAPER 1: PHYSICAL GEOGRAPHY

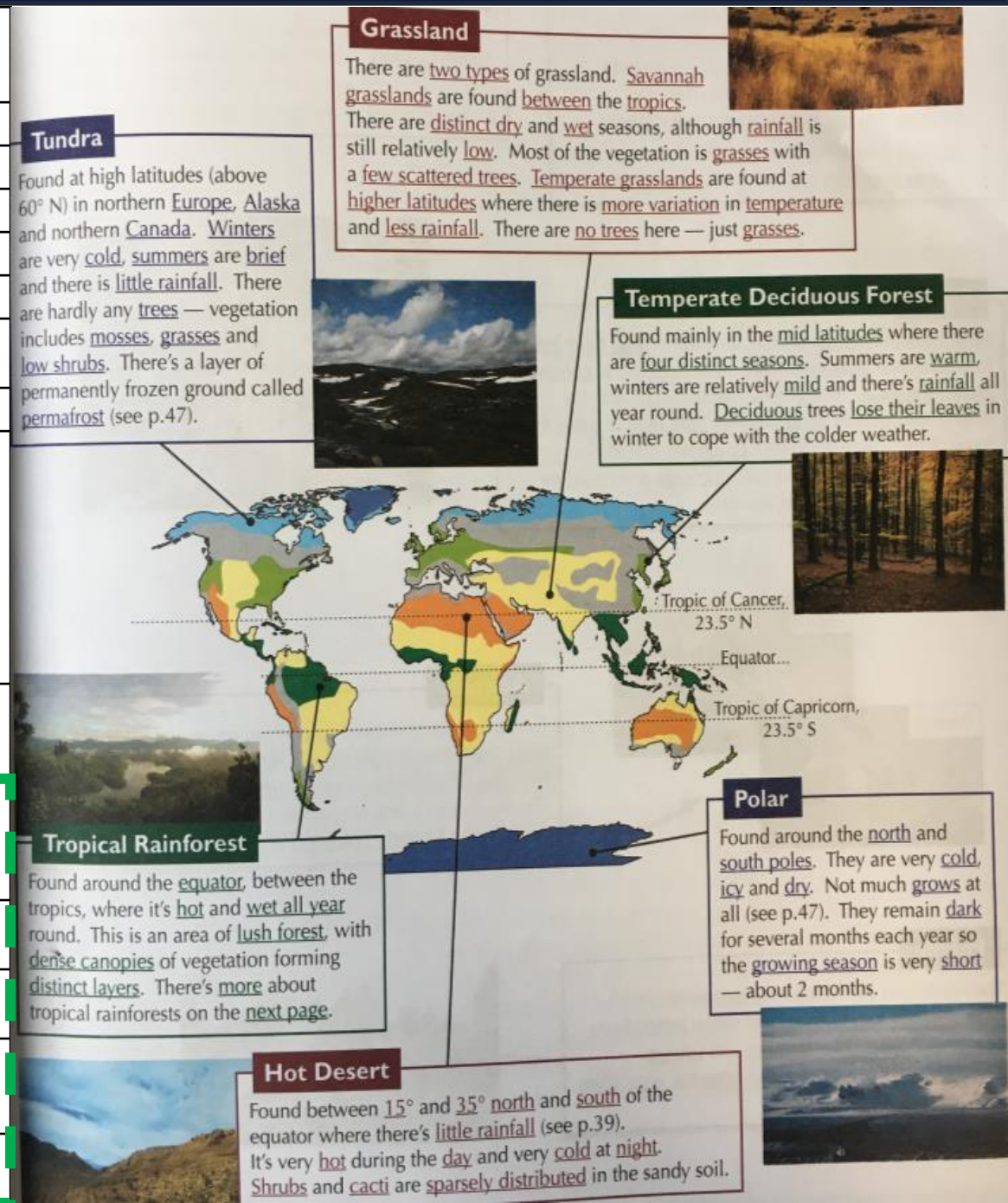
## Section A: The Challenge of Natural Hazards (1-5)

- *Tectonic hazards: **L'Aquila** and **Haiti***
- *Tropical storm: **Typhoon Haiyan***
- *Extreme weather event: **Somerset Floods***

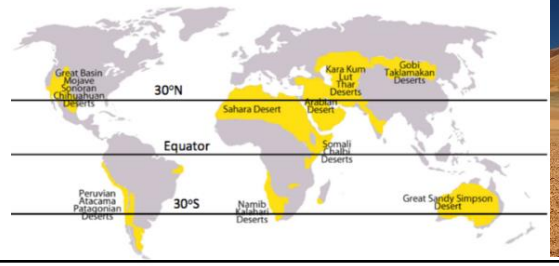
## Section B: The Living World (6-10)

- *Small scale ecosystem: **the pond***
- *Tropical rainforest: **The Amazon Rainforest***
- *Hot desert: **The Sahara Desert***
- *Fringe of a hot desert: **The Sahel***

| | |
|---|---|
| An ecosystem is… | A natural system made up of plants, animals and the environment. There are many complex interrelationships (links) between the living (plants & animal) and non-living (atmosphere & soils) components. Ecosystems can be as small as a hedgerow or pond. Larger ecosystems, on a global scale, are known as biomes, such as tropical rainforest or the desert. |
| Producer | Organisms that get their food from the natural environment (*photosynthesis*) |
| Consumer | Organisms that feed on other organisms (producers and consumers) |
| Herbivore | Consumer that only eats vegetation. |
| Omnivore | Consumer that eats vegetation and animals (meat). |
| Carnivore | Consumer that only eats animals (meat). |
| Decomposer | Decomposers (fungi, bacteria) feed on dead producers & consumers. This dead material is known as litter. They break down the litter and recycle the nutrients back to the soil. |
| Food Chain | A food chain is a single line of linkages between producers and consumers. It shows what eats what. |
| Food Web | A food web shows all the linkages between the producers and consumers in an ecosystem. A food web shows what eats what.<br>A change in one part of an ecosystem has an impact on other parts of the ecosystem. Some parts of an ecosystem depend on the others (e.g. consumers depend on producers for a source of food) and some depend on them for a habitat. So if one part changes it affects all the other parts that depend on it. Two examples can be seen to the right.<br>Hot, dry summer → Reduced plant growth → Fewer berries for birds in the winter → Numbers of sparrows and thrushes fall → Fewer birds for sparrowhawks to hunt, so number of sparrowhawks falls |
| Nutrient Cycle | The movement of nutrients around an ecosystem. *e.g. when dead material is decomposed, nutrients are released into the soil. The nutrients are then taken up from the soil by plants. The nutrients are then passed to consumers when they eat the plants. When the consumers die, decomposers return the nutrients to the soil. This is the nutrient cycle.* |
| Example of a small scale ecosystem in the UK: | Freshwater pond. It provides a variety of habitats for plants and animals, due to changes in oxygen, water and light. It is made up of the plants, fish, birds and other organisms that live within it, as well as the water, sunlight, temperature in the area. |
| Producers in a freshwater pond: | Algae, marsh marigold, waterlily |
| Consumers in a freshwater pond: | Frog, heron, fish (e.g. perch), duck, waterworms, rat tailed maggot |
| Humans affect the freshwater pond by: | • Farmers add fertilisers to their fields which leach into ponds. This causes a rapid growth of algae = sunlight and oxygen is depleted = fish and wildlife in ponds die.<br>• Ponds can be drained for irrigating fields. |
| Climate change affects the pond: | • Extreme weather is a common impact of climate change = more droughts = ponds dry up.<br>• Extreme weather is a common impact of climate change = more flooding = ponds flood. |

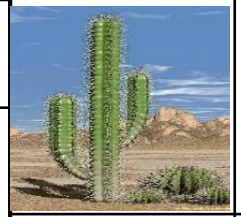


## THE DESERT: THE SAHARA DESERT




| | |
|---|---|
| Location | Deserts are located along the Tropic of Cancer & Tropic Capricorn (23.5° – 30° north and south of the equator latitude),<br>Examples: Sahara Desert: Africa (Algeria, Egypt), Mojave desert (USA) |
| Climate | Hot and dry: arid.<br>2 seasons (summer and winter).<br>Temperature range: over 40°C in the day – less than 5°C at night<br>Precipitation: less than 250mm per year. In some areas as low as 70mm per year |
| Vegetation | Very sparse (cactus, Joshua tree, desert daisy) |
| Animals | Very few (lizards, scorpion, camel, wolf spider, kangaroo) |
| Soil | • Shallow, dry and has a coarse, gravelly texture.<br>• Not very fertile as there is hardly any decaying plants to add nutrients to the soil. |
| People | • Indigenous people in the desert are usually nomadic farmers who travel with their herd (goats and sheep) in search of food, water.<br>• New groups have started to live in the desert to use their natural resources (e.g. oil, farming, tourism, renewable energy) |
| Biodiversity | The variety of organisms living in a particular area (plants and animals) |
| Biodiversity in the desert | Deserts have low biodiversity.<br>➢ Small areas of the desert, that are near water (rivers, ponds) have higher diversity of plants, animals and humans. |
| Threats to the desert | • Desertification on the fringe of the hot desert. This is causing the desert to get larger and the soils to become drier = erosion.<br>• Climate change = more extreme weather (e.g. droughts) = plants/animals unable to survive the even hotter and drier weather = loss of biodiversity. |

### VEGETATION ADAPTATIONS

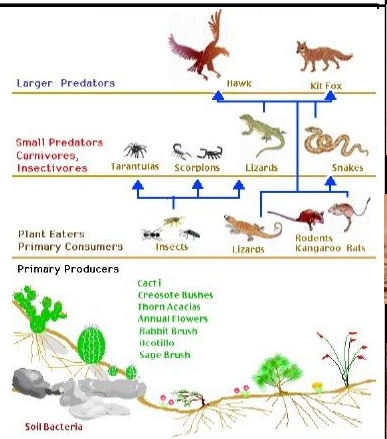
| | |
|---|---|
| Cactus  | • Some have deep roots to reach water deep under the ground<br>• Some have a very shallow horizontal root system, just below the surface, so that it can soak up water before it evaporates.<br>• Succulent: store water in the stems.<br>• Thick, waxy skin to reduce water loss from transpiration<br>• Spines reduce water loss and protect the cacti from predators who might try and steal the water stored in their stem. |
| Joshua Tree  | • Deep roots to reach water deep under the ground<br>• Small needle like leaves to reduce water loss.<br>• Leaves are covered in a waxy resin to avoid water loss |

### ANIMAL ADAPTATIONS

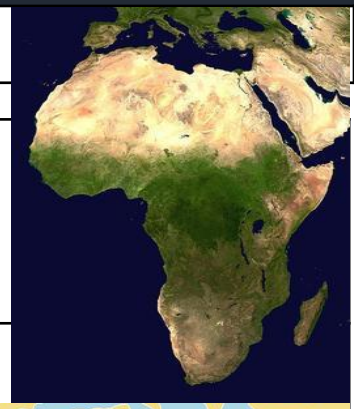
| | |
|---|---|
| Camel  | • Large, flat feet to spread their weight on the sand.<br>• Triple eye lids and long eyelashes keep sand out of their eyes.<br>• Their colour helps them camouflage (blend in)<br>• Store fat in their hump, which can be used for energy. They can also break this down into water when needed. |
| Lizard  | • Burrow during the hot days and emerge at night to feed.<br>• Their colour helps them camouflage (blend in)<br>• Nocturnal – only come out at night when cooler. |
| Other adaptations  | • Some animals sit very still in the shade during the hottest part of the day (e.g. fennec foxes).<br>• Some animals are nocturnal, meaning they burrow and sleep in the hot days and come out during the cooler evenings. |

**All parts of the desert ecosystem are linked together (climate, soil, water, animals, plants and people). If one of them changes, everything else is affected.**

- ➢ Plants get their nutrients from the soils. Animals get their nutrients from the plants.
- ➢ Animals spread seeds in their dung (poo), helping new plants to grow.
- ➢ Hot and dry climate = water is very quickly evaporated = leave salts behind = salinity/salty soils.
- ➢ Very few nutrients are recycled as there is so little vegetation = very litter decay.
- ➢ Sparse vegetation = lack of food = low density of animals
- ➢ Water supplies in the desert are caused due to low rainfall and quick evaporation. As a result humans use irrigation to water their crops using deep wells = less water available for plants and animals.



The Sahara Desert is the world's largest desert. It covers over 9 million square kilometres. It is located in Northern Africa, covering nine countries including Egypt, Algeria and Chad. The Sahara Desert provides a number of opportunities for economic development, however its harsh physical landscape and climate can cause challenges for development.



## Economic Opportunities in the Sahara Desert

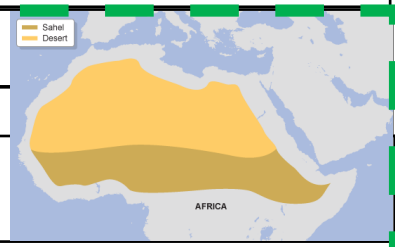
| | |
|---|---|
| Mining for Oil & Gas | What: digging under the desert for oil and gas.<br>Where: Hassi Messaoud oilfield in Algeria, Sahara Desert, Northern Africa<br>*Good: 50% of Algeria's GDP comes from oil and gas, Hassi Messaoud employs 40,000 people*<br>*Bad: must fly 40,000 workers to the remote oilfield, fly out water and food reserves, difficult to drill hundreds of metres beneath desert and hard to construct pipelines 100s of kilometres across the desert to the coastline.* |
| Solar Panels | What: solar panels are built to make use of the 12+ hours of bright sunshine in the desert<br>Where: Tunisia, Northern Africa<br>*Good: energy is sold to Western Europe = money for development, it is clean renewable energy.*<br>*Bad: sandstorms destroy solar panels & dusty conditions mean they need cleaning. This requires 10,300 gallons of water/day.* |
| Agriculture | What: using the River Nile to irrigate land and grow crops (dates, figs and fruit) to feed increasing population (20 to 79 million in last 25 years).<br>Where: Next to the River Nile, Egypt, Northern Africa.<br>*Good: accounts for 13% of Egypt's income, employs 32% of Egypt's labour force.*<br>*Bad: rapid evaporation of irrigation water, leaves salt crystals = salinity.* |
| Tourism | What: visit world's largest desert, Egyptian culture, pyramids, camel treks.<br>Where: Egypt, Northern Africa<br>*Good: income for development, employment, development of transport and infrastructure.*<br>*Bad: pollution from development, overuse of water, cultures are used as entertainment rather than tourists learning about their tradition,* |

## Challenge for Development in the Sahara Desert

| | |
|---|---|
| Extreme Temperatures | • Daily temperatures can reach over 40°C, whereas evening temperatures can go below freezing<br>• Hot temperatures can be too hot for tourists. It can also make farming and mining difficult. |
| Inaccessibility | • The Sahara is HUGE = people often have to travel long distances, usually by plane which is expensive.<br>• It is difficult to provide services across such a large area<br>• It is difficult to transport products from oil or energy fields, as extensive pipelines have to be built. |
| Water Supply | There is very low rainfall in the Sahara Desert (less than 70mm in some places). As a result providing water to workers, tourists or for irrigation difficult. Also 10,300 gallons of water is needed to wash the solar panels each day. |


The Sahel is located on the southern fringe of the Sahara Desert. It used to be a savannah ecosystem, however human activities are causing environmental harm = desertification.

**DESERTIFICATION is the process where land gradually turns into a desert. It becomes drier, less fertile and is vulnerable to erosion.**




## Causes of desertification in the Sahel

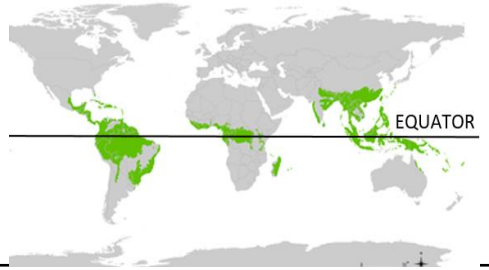
| | |
|---|---|
| Climate change | Climate change results in extreme weather, such as droughts.<br>Lack of rainfall = not enough rain for the soils to have moisture and stay healthy. Also plants die due to lack of water = roots no longer hold the soil together = vulnerable to erosion.<br>High temperatures = any water is immediately evaporated leaving the soil very dry. Also salts in the water are left on the soil after the water is evaporated = salty, dry soil that is vulnerable to erosion. |
| Over-grazing | Too many cattle and sheep eat the vegetation = the soil is no longer held together by the plants = vulnerable to soil erosion. |
| Over-cultivation | Population growth = more demand for food.<br>As a result land is being over-farmed. This uses up all the nutrients in the soil, leaving it dry and exposed to erosion. |
| Deforestation | Population growth = increased demand for fuel wood = increased deforestation.<br>The roots therefore no longer bind the soil together and the nutrient cycle is stopped = soil becomes dry and exposed to erosion. |

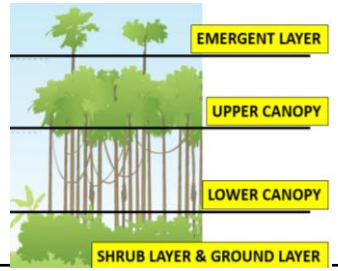
## Sustainable strategies to reduce the risk of desertification.

| | |
|---|---|
| Afforestation (planting trees) | The roots also help to hold the soil together and prevent erosion. When the plants/leaves die, their nutrients are giving back to their soil. They act as windbreakers and therefore reduce wind erosion. |
| Crop Rotation<br>Grazing Rotation | When farmers allow a field to rest between farming. This allows the soil time to repair and get their nutrients back. This prevents over-cultivation.<br>Move the animals from place to place to reduce the amount of vegetation eaten or reduce the number of farm animals. This prevents over-grazing. |
| Water Management | Grow crops that don't need a lot of water (e.g. millet or olives)<br>Use irrigation techniques that use very little water (e.g. drip irrigation) |
| Appropriate Technologies | Use cheap, sustainable and easily available materials<br>Earth Dams: collect and store water in the wet season. The stored water is then used to irrigate crops in the dry season.<br>Using Manure: animal manure is used to fertilise the soil by adding nutrients. |

# THE TROPICAL RAINFOREST: THE AMAZON RAINFOREST

| | |
|---|---|
| Location | Rainforests are located along the equator (0° latitude).<br>Examples: South America (Brazil), Asia (Indonesia), Africa (Congo). |
| Climate | Hot and wet (humid).<br>No seasons<br>Temperature range: 20-30°C (due to direct sunlight from the sun)<br>Precipitation range: 160 – 330mm/month or 2000mm per year |
| Vegetation | Very dense and varied (e.g. banana and rubber trees). |
| Animals | Very dense and varied (e.g. apes, parrots, jaguars, insects) |
| Soil | Not very fertile, as heavy rainfall washes nutrients away. This is known as leaching.<br>Most nutrients are in the top layer of the soil due to nutrient cycling from the decayed leaves. As a result most trees have a shallow root system. |
| People | Tribes have lived in rainforests for a long time (sustainable).<br>New groups of people and companies have arrived more recently, trying to make money from the rainforests through logging, energy, mining…etc (unsustainable) |
| Biodiversity | The variety of organisms living in a particular area (plants and animals) |
| Biodiversity in the rainforest | Deserts have very high biodiversity. Rainforests contain around 50% of the world's plants, animals and insect species. |
| Threats to the rainforest | Deforestation is causing a loss of biodiversity in the rainforest, as many animals and plants become endangered or extinct. |



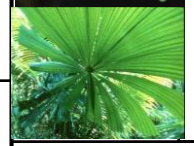




## VEGETATION ADAPTATIONS

| | |
|---|---|
| Layers | The rainforest has four layers (emergent, upper canopy, lower canopy and shrub & ground layer). Vegetation adapts to each layer. |

| | |
|---|---|
| Trees *(height, buttress roots, bark)* | • The trees can grow to over 40 meters high in order to find sunlight.<br>• To help support their height, they have buttress roots. These are large root systems above the ground that act as an anchor and support the tall trees.<br>• Trees have a smooth, thin bark = helps water to run off easily. |

| | |
|---|---|
| Lianas | Woody vines that use trees to climb up to the upper canopy where they spread from tree to tree to get as much light as possible. |

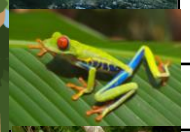


| | |
|---|---|
| Leaves | • On the shrub and ground layer, it is very dark due to the canopy. As a result, their leaves have a large surface area to catch as much sunlight as possible.<br>• Many leaves have drip tips and a waxy coating. This help shed water easily.<br>• Some plants, *e.g. the fan palm*, have large fan-shaped leaves which are segmented so that excess water drains away easily. |

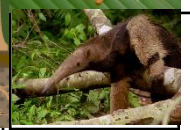
## ANIMAL ADAPTATIONS

| | |
|---|---|
| Spider monkey | Have long, strong arms and tails so they can swing between the trees in the upper canopy. Some animals spend their entire lives in the upper canopy. |

| | |
|---|---|
| Leaf-tailed gecko & chameleon | Are camouflaged so can blend into their surroundings to hide from predators |



| | |
|---|---|
| Jaguar | Can swim due to high rainfalls and many rivers. |

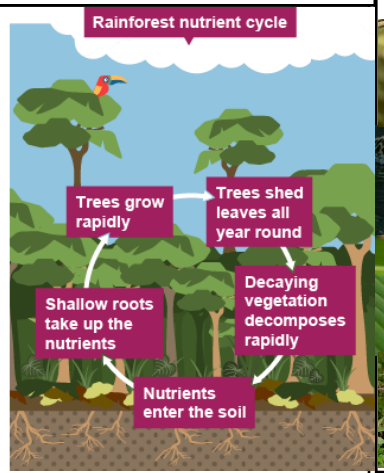


| | |
|---|---|
| Red-eyed tree frog | Have suction cups on their feet and hands to help them climb up trees and leaves. |

| | |
|---|---|
| Anteater | Some animals have adapted to the low light levels in the shrub and ground layer. Have a sharp sense of smell and hearing so they an detect predators without seeing them. This helps them survive in the low light levels in the shrub & ground layer. |

All parts of the rainforest ecosystem are linked together (climate, soil, water, animals, plants and people). If one of them changes, everything else is affected.

- The humid climate = dead plants and animals decompose quickly by decomposers (fungi and bacteria) on the forest floor = the nutrients from the decaying plants/animals makes the top layer of the soil very nutrient rich = lots of plants can grow.
- Plants pass on their nutrients when they are eaten by animals. There is a lot of vegetation = lots of animals.
- People remove trees (deforestation) = less carbon dioxide is removed from the atmosphere = more greenhouse gases = more climate change.
- Trees absorb water = this water travels through the tree to the leaves = transpiration evaporates water from the trees' leaves to the atmosphere = condensation in the atmosphere creates clouds = precipitation. The trees are one of the main reasons there is so much rainfall in the rainforest.



The Amazon Rainforest is the largest rainforest on earth, covering 8 million $km_2$ of land. It is located in South America. It covers 9 countries, including Brazil, Peru and Colombia. The largest portion of the Amazon Rainforest is located in Brazil. Since 1978, 750 000$km_2$ of land has been deforested. This is three times the size of the UK!


Uses of the rainforest:

| | |
|---|---|
| Cattle farming | Clear land for massive, commercial cattle farms. This causes 70% of deforestation in the rainforest. |
| Logging | Cutting down hardwood trees (mahogany/ebony) to sell. This causes 3% of deforestation in the rainforest. |
| Hydro-electric energy | Build dam and reservoir to create and sell hydro-electric energy.<br>➢ e.g. Belo Monte dam in Brazil Monte Dam. |
| Mining | Digging to extract iron ore, aluminum, copper, tin and gold to sell.<br>➢ e.g. The Carajas Mine in Brazil is the world's largest iron ore mine. |
| Building roads | Logging companies, cattle ranches, farms, mines need roads to reach them and transport products to the coast to export = roads built. |
| Urban growth | Increasing population = increasing urban areas. (e.g. Manaus' pop. grew 22% between 2000 – 2010 reaching 1.7million) due to job opportunities. |
| Subsistence farming | Local famers clear the land using slash and burn and grow only enough food for their family to eat. This causes 20% of deforestation in the rainforest. |

Positive and negative impacts of development in the rainforest.

**POSITIVE ECONOMIC AND ENVIRONMENTAL IMPACTS**

Economic benefits:

- Jobs in mines (Carajas mine), farms, power stations (Belo Monte Dam) and construction.
  In Peru the Buenaventura mining company employs 3100 people.
- Development. Money from companies is used to develop Brazil. In 2008 Brazil made $6.9 billion from selling cattle.
- Improved transportation make trading faster and easier = more is exported.

Environmental benefits:

- The Belo Monte Dam will be the world's 3rd largest dam and a source of **clean, renewable energy**.

**NEGATIVE ECONOMIC AND ENVIRONMENTAL IMPACTS**

Economic negative impacts:

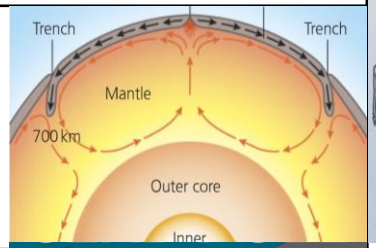
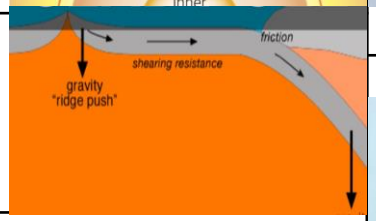
- Some famers (e.g. rubber tappers) have lost their job due to deforestation of rubber trees.

Environmental negative impacts:

- Habitat and settlement loss
  > Trees cut down = animals living in canopy lose their habitats.
  > The reservoir behind the Belo Monte Dam will flood 1000s of hectares of rainforest, destroying habitats and the livelihoods of over 2000 families.
- Loss of animal biodiversity – plants and animals are endangered or becoming extinct as trees are deforested.
- Climate change – trees remove $CO_2$ from the atmosphere during photosynthesis. If there are less trees, less $CO_2$ is removed = more greenhouse gases in atmosphere. The Amazon Rainforest stores 100 billion tons of carbon.
- Climate change – large cattle ranches contain lots of cattle. These release a lot of methane when they fart and poo).
- Soil erosion – deforested trees cannot hold the soil together. As a result heavy rains wash away the soil (erosion).

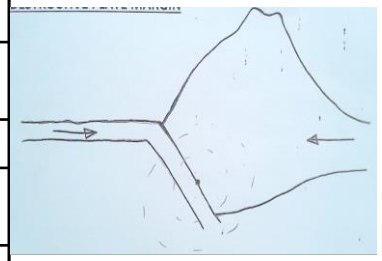
**SUSTAINABILITY IN THE RAINFOREST:** ***Allow people get what they need today, without stopping people in the future getting what they need.***

| | |
|---|---|
| Selective logging | Only some trees are cut down (usually the older ones), rather than cutting down all the trees in an area. As a result the rainforest canopy is saved where many of the animals live. |
| Afforestation | Afforestation is when new trees are planted as others are cut down. In some countries it is law to replant trees. |
| International: debt relief | HICs reduce the amount of debt LICs owe them so that they do not have to use their rainforest resources (trees, mining, cattle farming) to pay back the debt, which all cause deforestation. Unfortunately there is no guarantee the money saved, will be spent on conservation/protection instead. It is therefore better to make a conservation swap that guarantees this.<br>• *e.g. In 2008 the USA reduced the debt that Peru owed them by $25 million. In exchange Peru had to conserve/look after part of their rainforest.* |
| International: carbon sinks | Trees remove carbon dioxide during photosynthesis and are therefore known as carbon sinks. Rainforests are protected due to their role in reducing global warming.<br>• *e.g. The Gola Forest in Sierra Leone (Africa) is protected for its role in reducing global warming, using money from the European Commission, French Government and NGOs.* |
| National parks | Areas are protected from development and deforestation. It is difficult to police these areas through. As a result, illegal logging still occurs.<br>• e.g. The Tumucumaque National park in Brazil is the largest in the world. It protects over 38,000 square kilometres of rainforest. |
| Promoting responsible management | Forest Stewardship Council (FSC) and Rainforest Alliance are organisations that put their logo on hardwood trees that have been deforested in a sustainable way. Therefore consumers can choose products that are not contributing to unsustainable deforestation. |
| Ecotourism – sustainable tourism | Tourist resorts that use sustainable practices to reduce their impact. In Costa Rica eco-tourism is the largest source of income. It protects 21% of the country from development.<br>• *e.g. reduce negative environmental impacts: renewable energies, water tanks, grey water,*<br>• *e.g. improve social impacts: local employees, use local produce and materials. Money goes into local economy. If locals have a job, they do not need to illegally log.* |

| | |
|---|---|
| 4 layers of the earth | • Crust: outer layer of the earth (solid, thin layer)<br>• Mantle: layer beneath the crust (semi-liquid, thick)<br>• Outer core: layer beneath the mantle (liquid iron)<br>• Inner core: centre layer (solid iron) |
| Tectonic Plates | The crust is split into several pieces. These large pieces of rock are called tectonic plates. They float on the mantle. |
| Oceanic Crust | Crust found under the oceans (thinner (5-10km), younger, more dense) |
| Continental Crust | Crust found under land (thicker (25-100km), older, less dense) |
| Continental Drift | Theory that states the earth's continents are very slowly moving and that once all the continents were joined together to form a super-continent called Pangea. The tectonic plates move due to convection currents and slab pull. |
| Convection Currents | Circular currents within the mantle that cause the overlying tectonic plates to move.<br>*The mantle is made up of semi molten rock. Mantle rock is heated by the core. The warm material rises to earth's surface. As it rises, the material starts to cool and sink. This motion of rising and sinking rock forms circular currents known as* ***convection currents.***   |
| Slab Pull | At destructive plate margins dense/heavy plates sink into the mantle, which pulls the rest of the plate with it.   |
| Natural Hazard | A natural process that poses a threat to people and property. If it poses no threat to humans it is called a natural event. |
| Meteorological hazard | A hazard that occurs in the atmosphere (e.g. hurricane, thunder and lightening, tornado, drought |
| Tectonic hazard | A hazard that occurs due to the movement of tectonic plates (e.g. volcanoes and earthquakes) |
| Hazard risk<br>*It is affected by…* | The probability that a natural hazard occurs.<br>1. Urban vs rural: urban areas have a higher risk due to high population densities = more people at risk. Hazards that occur in urban areas (e.g. Haiti earthquake) have a higher impact.<br>2. LIC vs HIC: LICs have a higher risk as they have poor quality buildings and less planning and prediction strategies.<br>3. Type of hazard: e.g. earthquakes are harder to predict than tropical storms, floods happen more often than volcanic eruptions.<br>4. An effect of climate change is more extreme weather events. This has resulted in more tropical storms, flooding and droughts. |

Tectonic hazards occur along plate boundaries/margins. There are four types of plate margin (see below.)

**Destructive Plate Margin**

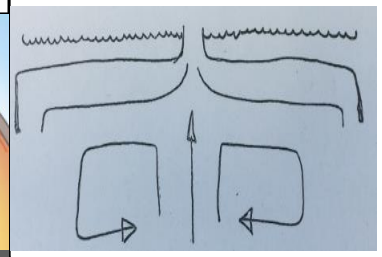


*2 plates move towards each other due to convection currents/slab pull. The denser oceanic plate is pushed beneath the lighter continental plate. This process is called SUBDUCTION and occurs at a subduction zone.*

- ***Volcanoes*** *– as the oceanic plate sinks into the mantle, it melts = magma. This rises to the earth's surface = explosive volcanic eruptions.*
- ***Earthquakes*** *– as the plates slide past each other, they can get stuck = pressure builds up. The plates suddenly move, releasing the pressure = violent earthquakes*

*Example: the Philippine plate is being subducted beneath the continental Eurasian plate along the east coast of Japan.*

**Constructive Plate Margin**

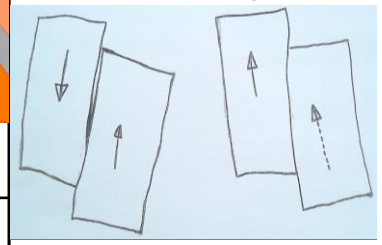


*2 plates move away from each other due to convection currents/slab pull, leaving a gap between the two plates. Magma rises up from the mantle to fill the gap, creating NEW CRUST (new land). This usually happens under the oceans. The new creation of land is called SEA-FLOOR SPREADING.*

- ***Volcanoes*** *– the magma rises to fill the gap between the two plates – gentle eruptions.*
- ***Earthquakes*** *– as the magma rises it causes small tremors (gentle earthquakes).*

*Example: Mid-Atlantic Ridge. The Eurasian and North American plate are moving away from each other.*

**Conservative Plate Margin**

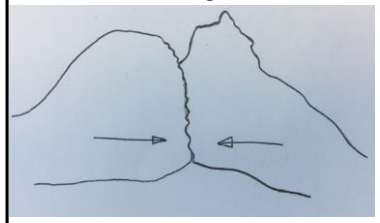


*2 plates slide past each other due to convection currents/slab pull. They can be moving in opposite directions or moving in the same direction but at different speeds. The line between the two plates is called the FAULT LINE.*

- ***No volcanoes*** *(no subduction and so no melting)*
- ***Earthquakes*** *– as the two plates slide past each other, they can get stuck = pressure builds up. The plates suddenly move, releasing the pressure = violent earthquakes.*

*Example: the North American and Caribbean plate are moving past each other near Haiti.*

**Collision Plate Margin**

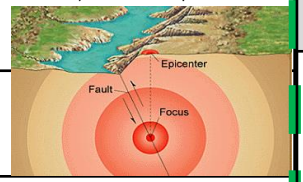


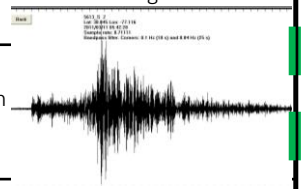
*2 plates of the same density move towards each other due to convection currents/slab pull. As they are the same density neither subducts. Instead the plates collide and are forced upwards = mountain ranges. These are known as FOLD MOUNTAINS.*

- ***No volcanoes*** *(no subduction and so no melting)*
- ***Earthquakes*** *– the two colliding plates crash together creating a huge amount of pressure which when suddenly releases causes VIOLENT EARTHQUAKES.*

*Example: the Himalayas were formed due to the collision of the Eurasian and Indian Plates.*

| | |
|---|---|
| An earthquake is…. | A sudden or violent movement within the earth's crust. It is caused by a build up and sudden release of pressure/tension. |
| Shockwaves | As the tectonic plates suddenly move, they send out SHOCK WAVES (vibrations) from the point of movement in the earth's crust. |
| Focus | The point of movement in the earth's crust. |
| Epicentre | The point directly above the focus is called the EPICENTRE. The closer you are to the focus and epicentre, the stronger the earthquake will be. |
| Magnitude | The amount of energy released during an earthquake. |
| Seismometer | The instrument that measures the strength /magnitude of an earthquake. |
| Richter Scale | The scale on which earthquake magnitude is measured. The higher the magnitude on the Richter Scale, the more powerful the earthquake. |
| LICs are worse affected by earthquakes because… | The quality of infrastructure (buildings, roads, ports) is worse in LICs. As a result they more easily fall down and trap people. Many HICs have earthquake proof buildings.<br><br>LICs are poorer than HICs. As a result they are unable to meet the costs of immediately responding to earthquakes (search and rescue, clear rubble, build temporary structures) or reconstruct cities. They rely on financial aid from other countries or organisations = less in control. HICs are able to meet many of the costs and immediately respond to the earthquake = less loss of life.<br><br>LICs do not have as many planning and prediction strategies so are unable to predict when the earthquake will occur or prepare people for when it does occur. |



## L'AQUILA EARTHQUAKE (HIC)

**Where**: L'Aquila, Italy (Abruzzo region)
**Plate Margin**: Destructive plate margin(African and Eurasian plates)
**When**:3.32am 6th April 2009 **Magnitude**: 6.3 on the Richter Scale.

| PRIMARY EFFECTS | SECONDARY EFFECTS |
|---|---|
| • 308 dead<br>• 1500 injured<br>• 10-15,000 buildings destroyed including the San Salvatore Hospital<br>• A bridge in Fossa collapsed | • 67,500 people were made homeless<br>• Fires in collapsed buildings<br>• A burst pipeline near the town of Paganio caused a landslide<br>• Cost: $11,434 million |
| **IMMEDIATE RESPONSE** | **LONG TERM RESPONSE** |
| • Camps were set up for homeless people providing food and medical care<br>• British red cross raised £171,000<br>• Ambulances, fire engines and the army were sent to rescue survivors<br>• Italian post office provided free mobile phones and SIM cards for people who had lost their homes<br>• The government suspended mortgage, gas and electric payments. | • New settlements built for 20,000 residents<br>• City centre has been rebuilt<br>• Residents did not have to pay taxes in 2010<br>• Students did not have to pay university fees for 3 years. |

## HAITI EARTHQUAKE (LIC)

**Where**: Haiti, Caribbean Islands.
**Plate Margin**: conservative plate margin (Caribbean and North American plates)
**When**: 12th January, 2010 **Magnitude**: 7.0 on the Richter Scale.

| PRIMARY EFFECTS | SECONDARY EFFECTS |
|---|---|
| • 220,000 dead<br>• 300,000 injured<br>• 300,000 homes damaged or destroyed.<br>• 8 hospitals destroyed in Port-au-Prince<br>• 5000 schools destroyed or damaged<br>• Transportation routes (roads, rail, ports, airports) destroyed by fallen buildings<br>• Service lines (water, gas, electricity) destroyed | • Trauma and diseases from dead bodies.<br>• 1.3 million Haitians in temporary camps<br>• Unemployment<br>• High crime rates<br>• Aid supplies could not reach victims.<br>• 2 million Haitians with no food, electricity, water<br>• Cost: $11.5 billion |
| **IMMEDIATE RESPONSE** | **LONG TERM RESPONSE** |
| • People were evacuated<br>• USA sent ships, helicopters and the army to search and rescue for victims and clear rubble at the port so that companies could start to export goods again.<br>• UN sent police to distribute aid & keep order.<br>• The Red Cross set up temporary hospitals<br>• The UK raised £100 million for emergency aid.<br>• USA gave $100 million for emergency aid. | • Relocation – 1000s left Port-au-Prince permanently<br>• Cash for work programs set up to clear rubble to give locals jobs in the long term.<br>• World Bank gave $100 million to support long term reconstruction in Haiti.<br>• ¾ of the buildings were repaired. |

**Why do people live in areas of risk?**
- Friends and family
- Employment
- Confident the government will protect them (planning & prediction)
- The land is very fertile near volcanoes (good for farming).
- They do not know it is unsafe – lack of education.

Monitor earthquake prone areas to PREDICT when it will occur.

| | |
|---|---|
| **Previous Earthquake Data** | Historical records can be used to show patterns and trends. These can then be used to predict future earthquakes. |
| **Measure for Small Tremors** | Before a larger earthquake often there is an increase in the number of small tremors. Scientists use seismometers to record any ground movement. |
| **Unusual Animal Behaviour** | Animals often act strangely before an earthquake. In China, the city of Haicheng was evacuated following strange animal behaviour. Days later a 7.3 magnitude earthquake struck. It is estimated it saved 150,000 lives. |

PLAN to prepare for when an earthquake occurs.

| | |
|---|---|
| **Earthquake Proof Buildings** | Buildings are designed to withstand the earthquakes<br>➢ *Using flexible steel frames which sway as the ground moves.*<br>➢ *Rubber foundations that absorb the shockwaves/shaking.*<br>➢ *Building with a larger base than top will be less likely to topple over.* |
| **Practice Drills** | Educate people about to do should an earthquake occur.<br>➢ *On 1st September everyone in Japan practices what to do in an earthquake. It is called Disaster Prevention Day.* |
| **Emergency Kit** | Residents are encouraged to have an emergency kit ready, including *a torch, canned food, batteries, radio, medical kit, dust mask, water…etc.* |
| **Hazard Mapping** | Prevent building on loose/weak ground & reduce the height of buildings in high risk areas. This means that in high-risk areas, stronger and lower buildings can be used. |

| | |
|---|---|
| Tropical storm | A storm with wind speeds of over 74mph and torrential rain. |
| Tropical storms are also known as… | *Hurricanes (USA, Caribbean)*<br>*Typhoons (Japan, Philippines)*<br>*Cyclones (SE Asia, Australia))* |
| Two conditions needed for tropical storm formation | • Warm water (>27°C). As a result they are often found in tropical areas and occur in the summer/autumn when seas are at their hottest.<br>• Latitudes between 5 -20°north and south of the equator. A tropical storm is a spinning mass of clouds. The earth's spin between 5-20° north and south of the equator is enough to spin the clouds = tropical storm. |
| Effects of tropical storms: | • Torrential rain<br>• Strong winds<br>• Storm surges |
| A storm surge is… | Tropical storms have a very low air pressure due to the rising air. This causes the sea level to rise. These high seas (3-8m higher than normal) flood huge areas of land. |
| Saffir-Simpson Scale | Tropical storms are measured using the Saffir-Simpson scale. There are 5 categories. |
| How will Climate Change affect tropical storms? | • Increase in temperature = more of the world's oceans will be >27°C = more places will have tropical storms.<br>• Increase in temperature = tropical storms become stronger. There will be more category 4 and 5 storms. |

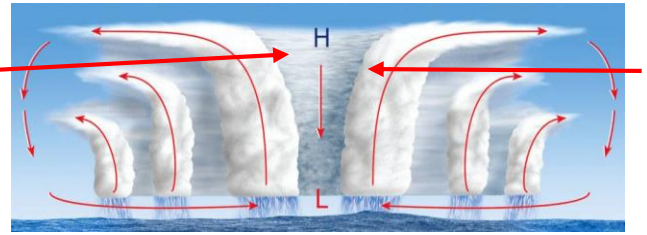
**Tropical Storm Formation:**

| | | |
|---|---|---|
| HEAVY | HEAT | The sun HEATS the sea/ocean. |
| ELEPHANTS | EVAPORATE | Warm, moist air EVAPORATES and rises. |
| REALLY | REPLACE/ REPEAT | More air rushes in to REPLACE the air that has just evaporated. It is also evaporated. |
| CAN | CONDENSATION/ CLOUDS | As the air rises it CONDENSES to form thick CLOUDS. |
| SQUASH | SPIN/SPIRAL | The earth's rotation causes the clouds to SPIN, forming the tropical storm's distinctive spinning shape. |
| SARAH | SINKING AIR = EYE | Cold air SINKS in the centre of the storm forming the EYE of the storm. |
| MARTIN | MOVE | It MOVES in the prevailing wind direction (east to west) |
| LOLS | LAND/LOSE ENERGY | It reaches LAND and LOSES energy as its energy source (warm water) is gone. Friction of the land also reduces its energy. |

**Tropical storms are circular in shape and usually lasts 7-14 days.**

Up to 400 miles across.

The eye – in the centre of the tropical storm cold air sinks. There are no clouds or wind. It is very calm.




On either side of the eye is the eyewall – a tall bank of cloud. Here are very strong winds, heavy rain, thunder & lightening.

Heavy rain & possible thunderstorms

Heavy rain and thunderstorms.

## TYPHOON HAIYAN

**Where**: Philippines, Asia
**When**: November, 2013
**Saffir-Simpson Scale:** category 5 with wind speeds of 170mph and waves 15m high

| PRIMARY EFFECTS | SECONDARY EFFECTS |
|---|---|
| • 6,300 dead<br>• 27,000 injured<br>• 40 000 homes destroyed = 90% of Tacloban<br>• 30,000 fishing boats destroyed<br>• Schools, hospitals and shops destroyed.<br>• 400mm of rain flooded agricultural land.<br>• Transportation routes (roads, rail, ports, airports) blocked by trees and debris (e.g. the Tacloban airport was damaged)<br>• Service lines (water, gas, electricity) destroyed | • Trauma and diseases from dead bodies.<br>• 600,000 people in temporary camps<br>• 6 million lost their income/employment (*farmers & fishing companies*)<br>• Crops destroyed = loss of $53million due to rice crops not being exported<br>• Crime rates increased<br>• Aid supplies could not reach victims.<br>• Some areas had no power for 1 month<br>• Shortages of water, food & shelter = disease. |

| IMMEDIATE RESPONSE | LONG TERM RESPONSE |
|---|---|
| • People were evacuated to 1200 evacuation centres that were created<br>• USA – search and rescue (aircraft/helicopters)<br>• People cleared rubble<br>• Emergency food from Philippine Red Cross<br>• Emergency hospitals from France, Belgium and Israel (FBI)<br>• Emergency shelter kits from UK | • Reconstruction – 1000s of new homes built in flood safe areas<br>• Reconstruction of roads, bridges & airports<br>• NGOs (e.g. Oxfam) replaced fishing boats.<br>• UN, EU, UK, Australia, Japan and USA provided long-term medical supplies and financial aid to start new lives.<br>• Cash for work programmes were created to help people earn money in the long term |

**How can we protect ourselves from future tropical storms?**

We cannot prevent a tropical storm from occurring, however we can protect ourselves.

- Monitor tropical storms to PREDICT when it will occur.
- PLAN to prepare for when a tropical storm occurs.

Monitor earthquake prone areas to PREDICT when it will occur.

| | |
|---|---|
| Satellite Imagery | We can watch the hurricane progress using satellites, radar and aircraft |
| Previous Tropical Storm Data | We can use previous data and computer models to create a predicted path for the storm. |

PLAN to prepare for when an earthquake occurs.

| | |
|---|---|
| Evacuation Routes & Practice Drills | Educate people about what they need to do and where they need to go, should a tropical storm occur. |
| Emergency Kit | Residents are encouraged to have an emergency kit ready in case of a tropical storm (*e.g. a torch, canned food, batteries, radio, medical kit, dust mask, water…etc)* |
| Warning Systems | A warning alarm is used to alert people of an approaching tropical storm. |
| Building regulations | ➢New homes built in low risk areas.<br>➢Buildings designed to withstand tropical storms (reinforced concrete)<br>➢Flood defences placed around coastlines (sea wall) and rivers (levee) |

| | |
|---|---|
| Weather | The day-to-day conditions of the atmosphere. |
| Extreme weather | Weather events that are significantly different from the normal. |
| Evidence that weather is becoming more extreme | ➢ International Disaster Database shows the number of floods has increased since 1960s.<br>➢ 2003 Heatwave affected the whole of Europe between June to August. Tourism increased in the UK due to hot weather, however 2045 people died in the UK due to heat.<br>➢ It is raining more. 2007 Gloucestershire Floods, 2004 Boscastle Floods (1000 residents affected) and 2014 Somerset Floods due to heavy rain.<br>➢ 2010 Big Freeze due to heavy snow. In December, 2010, temperatures dropped to -20C in Scotland, schools and businesses closed, motorways/airports/railways closed, crops were destroyed. |

## An example of a recent extreme weather event in the UK: THE SOMERSET FLOODS

| | |
|---|---|
| Where | Somerset, south-west England |
| Physical landscape | Somerset is low lying farmland. There are several rivers, including the Tone and Parrett, which flow into the Severn Estuary. |
| When | January and February, 2014 |
| Why | 350mm of rain in January and February (100mm above average), high tides, storm surges, rivers had not been dredged in 20 years and so were clogged with sediment |
| Social Effects | • 600 houses flooded. People in temporary accommodation for months.<br>• 16 farms were evacuated<br>• Villages (e.g. Moorland) were cut off by the floodwater. This meant residents could not attend school, work or shop.<br>• Power supplies were cut off.<br>• Local roads and railway lines were flooded. |
| Economic Effects | • Somerset County Council estimated the cost at £10 million.<br>• 14,000 hectares of farmland under water for weeks = could not sell crops.<br>• Over 1000 livestock had to be evacuated, which was very expensive for farmers and insurance companies.<br>• Local roads and railway lines were flooded. These needed to be repaired. |
| Environmental Effects | • Floodwater contained sewage and chemicals which contaminated farmland.<br>• Habitats were lost. |

## To reduce the risk of future floods, a £20 million Flood Action Plan was launched.

| | |
|---|---|
| Dredging | In March 2014, 8km of the River Tone and the River Parratt were dredged. This is when material/soil/mud is removed from the river bed. As a result the river channel is larger and can hold more water. This prevents the river overflowing its banks. |
| Elevated roads | Roads have been elevated in places. As a result even if a flood occurs, people can still drive on the elevated roads. This also helps the economy by allowing import/export. |
| Flood defences | Settlements in areas of flood risk have flood defences. As a result they are able to protect themselves. |
| Embankments | River banks have been raised. These are called embankments. This means the river channel can hold more water and therefore it is less likely to overflow. |

## GLOBAL ATMOSPHERIC CIRCULATION

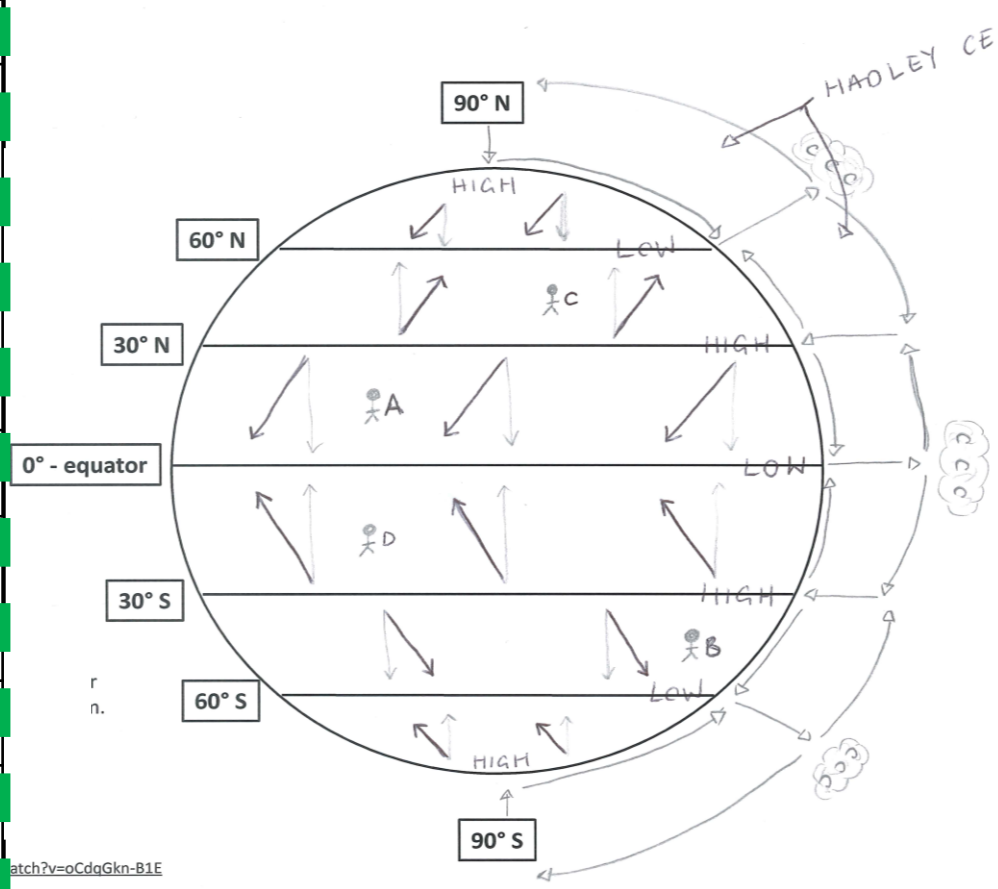
Global atmospheric circulation is the world's system of winds, which transport heat from equator to poles. It is the main factor determining global weather and climate patterns.

- Warm air rises = low pressure.
- Cold air sinks = high pressure
- Air moves from areas of high pressure to areas of low pressure.

It is hot and rainy (humid) at the equator (0°). It is hot because there is direct sunlight. It is rainy because the hot air rises creating a low pressure system. As it rises, it cools, condenses and forms clouds. Once the clouds reach saturation, they precipitate.

*It is hot and dry (arid) at the 30°N and 30°S. It is It is hot because there is direct sunlight. It is dry because the air sinks creating a high pressure system. As the air sinks, no condensation occurs resulting in clear skies.*

It is cold and dry at the north pole (90°N) and south pole (90°S). It is cold because there is no direct sunlight. Also many of the sun's rays are deflected off the earth's surface. It is dry because the air sinks creating a high pressure system. As the air sinks, no condensation occurs resulting in clear skies.




**Air moves from high pressure to low pressure.**

Due to the earth's rotation, the winds move at an angle. This is called the Coriolis Effect.

- Northern hemisphere – winds are deflected to the **right**.
- Southern hemisphere – winds are deflected to the **left**.

These deflections affect the prevailing winds (the most common wind direction)

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**CLIMATE CHANGE IS A CHANGE IN THE EARTH'S CLIMATE.** There is a lot of evidence that shows climate change has been occurring during the Quaternary Period (covers from 2.6 million years ago to today).

| | |
|---|---|
| Thermometer recordings | Show that average global temperatures have risen by 0.74°C during the last 100 years and by 0.5°C since 1980. |
| Photographs | Show many of the world's glaciers have retreated in the last 50-100 years. It is estimated up to 25% of global mountain glacier ice could disappear by 2050 |
| Paintings | Show that the River Thames was frozen over in 1677. People are shown ice skating over the frozen river |

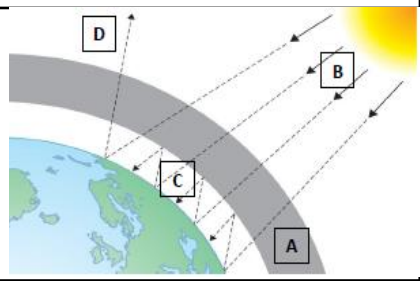
| | |
|---|---|
| Ice cores | Ice sheets are made up of layers of ice (1 layer is formed each year). Scientists drill into ice sheets to get long cores of ice. By analysing the gases trapped in the layers of ice, they can tell what the temperature was each year. One ice core from Antarctica shows the temperature changes over the last 400,000 years. |
| Tree Rings | As a tree grows it forms a new ring each year. The tree rings are thicker in warm, wet weather. Scientists take tree cores and look at the rings to see what the climate was like in previous years. |

## Natural causes of climate change

| | |
|---|---|
| Solar output | A sunspot is dark patch on the sun that appears from time to time. Every 11 years the number of sunspots changes from very few to lots to very few again.<br>*Lots of sunspots = warmer* *Very few sunspots = cooler*<br>*Between 1645 – 1715 there were very few sunspots. During this time, there was a very cold period known as the 'Little Ice Age'. Paintings show that the Thames completely froze over.* |
| Volcanic Activity | Violent volcanic eruptions blast lots of ash, gases (e.g. sulphur dioxide) and liquids into the atmosphere. Major volcanic eruptions lead to a brief period of global cooling. This is because the ash, gases and liquids can block out the sun's rays, reducing the temperature.<br>• *e.g. Krakatoa 1883 eruption = world temperatures fell by 1.2°C for a year.*<br>• *e.g. Pinatubo 1991 eruption = world temperatures fell by 0.5°C for a year.* |
| Orbital Change | Orbital change refers to changes in how the earth moves round the sun. It affects how close the earth is to the sun and therefore how much energy we get from the sun. When the earth is very close to the sun, it is warmer. When the earth is further away from the sun, it is cooler.<br>***a) Eccentricity: how the earth orbits the sun. Every 100,000 years the orbit changes from circular to elliptical (egg-shaped).***<br>*b) Axial tilt: the angle of the earth changes every 41,000 years between 22.5° to 24.5°.*<br>*c) Precession: the natural wobble of the earth around its axis. Wobble cycles take 26,000 years.* |

## Human causes of climate change

| | |
|---|---|
| The Greenhouse Effect | A) Greenhouse gases create a blanket around earth.<br>B) Sunlight travels to earth as shortwave radiation.<br>C) Sunlight bounces off the earth's surface as long-wave radiation. This reflected sunlight is trapped in the earth's atmosphere by the greenhouse gases = earth heats up. |
| The Enhanced Greenhouse Effect | Due to human actions, there are extra greenhouse gases in the atmosphere which trap more heat = global warming. |




| | |
|---|---|
| Methane | Produced by cattle and sheep. Rising incomes and population = increased demand for meat = more animals farmed = more methane produced. *250% rise since 1850.* |
| Carbon dioxide | Produced by burning fossil fuels. Rising population = increased demand for electricity = more carbon dioxide produced. *30% rise in carbon dioxide production since 1850.* |
| Nitrogen dioxide | Produced by car exhausts and airplanes. Rising incomes and population = increased cars and air travel = more nitrogen dioxide produced. *16% rise in nitrous oxide since 1850.* |
| Deforestation | = less trees = less photosynthesis = less CO2 removed from the atmosphere. |

To respond to climate change we can use mitigation. :

- Mitigation: remove greenhouse gases from the atmosphere to slow down climate change.

| | |
|---|---|
| Carbon capture | Carbon dioxide is captured from the power stations, transported in pipes and stored deep underground or in oceans so it doesn't go into the atmosphere. |
| Afforestation | Planting trees = more trees = more photosynthesis = more carbon dioxide removed from the atmosphere = fewer greenhouse gases = less global warming. Trees remove 3 billion tons of carbon every year! *e.g. China has had afforestation programs since 1970s. Forest cover has increased from 12% to 16%.* |
| Renewable energies | Generating energy from natural renewable sources (e.g. solar panels, hydro-electric power, wind turbines, tidal energy). They do not produce greenhouse gases. |
| International agreements | Climate change is a global issue and requires global solutions. International agreements are when countries come together to agree on large scale, international strategies.<br>➢ **The Kyoto Protocol (1997):** over 170 countries agreed to reduce carbon emissions by 5.2%.<br>➢ **Copenhagen meeting (2009):** world leaders agreed to reduce carbon emissions, with HICs giving LICs financial support to help them cope with impacts of climate change.<br>➢ **The EU** agreed to cut carbon emissions by 20% between 1990 and 2020. |

To respond to climate change we can also use adaptation:

- Adaptation: respond to the likely effects of climate change to reduce their impact.

| | |
|---|---|
| Changes in agriculture: | **Problem:** changing rainfall patterns and temperatures will affect productivity of farms.<br>**Adaptation**: use drought-resistant crops, grow different types of crops, implement irrigation systems to water crops during droughts, plant trees to shade vulnerable crops from strong sunlight, change crops grown. |
| Changes to water supply: | **Problem:** dry areas are likely going to get drier = water shortages.<br>**Adaptation – decrease the use of water:** drip irrigation, recycle water, water meters, dual flush system.<br>**Adaptation – increase the supply of water:** build reservoirs, collect rainwater. |
| Reduce risk of sea level rise: | **Problem:** melting glaciers = sea level rise (rise of 20cm since 1900 and estimated future rise of 82cm by 2100).<br>**Adaptation**: coastal management (sea walls, rock armour, gabions), build houses on stilts in flood prone areas, invest in monitoring and prediction strategies, invest in planning strategies (e.g. hazard mapping, warning alarm, emergency kits). |

# 20th Century: c.1900-Present

## New Definitions of Crime

**SIMILARITY & DIFFERENCE**

- ***NEW * methods of crime but same act.**
- ❑ **Driving Offences**: speeding, drink driving.
- ❑ **Drug Taking and dealing (social crime)**
- ❑ **Cyber Crimes**: fraud, theft, copyright.
- ❑ **Slavery: people trafficking.**
- ❑ **Terrorism**: Remember 1605?
- ❑ **Smuggling**: Advanced gangs & methods.
- ***NEW* Crimes due to changing attitudes.**
- ❑ **Homophobic crime** – homosexuality decriminalised & Sexual Offences Act 1967.
- ❑ **Race/hate crime**: Race Relations Act 1968.
- ❑ **Dom. Violence** Domestic Violence Act 1976
- ❑ **Abortion**: Decriminalised in 1967.

## Main causes of change

- ❑ Technology & science
- ❑ Public attitudes and democracy
- ❑ Politics
- ❑ Trade and economy
- ❑ Liberal attitude towards reform and rehabilitation.
- ❑ Immigration & population.

## Methods of Law Enforcement

**CHANGE**

- ***NEW*** A range of technological and scientific developments to help law enforcement.
- ***NEW*** An emphasis on crime prevention, targeting youth & education.
- ***NEW* Specialist police units** to target specific groups – Special Branch, Fraud Squad, Dog Unit.
- ***NEW*** A standardised set of rules for policing the whole country and police training.

**SAME**

**Neighbourhood Watch** a form of Collective Responsibility.
A re-introduction of police '**on the beat**' with the use of Community Support Officers.

## KEY EXAMPLE:
## The treatment and attitudes towards Conscientious Objectors.

**The Military Services Act 1916**

- ❑ Reasons for not joining the army and becoming a C.O. or 'Conchie'.
- ❑ Attitudes of the **media** towards C.O.s in WW1
- ❑ Attitude of the **government** towards C.O.s in WW1
- ❑ Attitude of the **public** towards C.O.s in WW1
- ❑ Punishment of the C.O.s in WW1
- ❑ How attitudes stayed the same and changed by WW2.

## Punishments

**CHANGE**

- ❑ **Abolition of the Death Penalty 1969** – Know the reasons why.
- ❑ **Further Prison Reforms**: Borstals, Education, Criminal Justice Act 1948, Increase in prison numbers, Mental hospitals,
- ❑ **Non-Custodial Sentences**: Youth Detention Centre, probation, parole, community service, electronic tagging, ASBO, treatment programmes, restorative justice, fines.
- ❑ **Hard Labour abolished.**

# Industrial Revolution: c.1700 - c.1900

## New Definitions of Crime

**SIMILARITY**

**SMUGGLING**: Still a social crime, still hard to tackle, declined as import duty reduced.
**POACHING**: Still a social crime by the poor, not often reported, enforced by the rich.
**HIGHWAY ROBBERY**: A very minor crime in previous era.
**WITCHCRAFT**: Still some poorer, rural belief in witchcraft.

**CHANGE**

**SMUGGLING**: Increased, gangs, punished harshly, rich supported it for luxury goods.
**POACHING**: Increased, gangs, harsher punishments, 1723 Black Act..
**HIGHWAY ROBBERY**: Dramatic increase with use of transport and trade.
**WITCHCRAFT**: Was decriminalised in 1735. Most educated attitudes no longer believed in witchcraft.

## KEY INDIVIDUAL: Home Secretary & Prime Minister Robert Peel.

- Major changes to Prison Reform and police. Known as the 'Father of Modern Policing'.
- 1823 Gaols Act, 1829 Metropolitan Police Act

## Main causes of change

- Decline in religious beliefs
- Politics, population increase, voting.
- Exploration, economy of the Industrial Revolution.
- Improved transport & trade.
- Changing attitudes, humanitarianism, & education.

## KEY EXAMPLE: Pentonville & the Separate System

- Prison first of its kind.
- Emphasised hard work & isolated prisoners
- Split prisoners into different groups.
- However, health was taken into account through sanitation.
- **KEY TERMS**: The Crank, treadwheel, discipline, separate system, silent system, religion, cells, religious teaching, toilets, deterrent, reform.

## Methods of Law Enforcement

**CHANGE**

*NEW* 1748 Bow Street Runners
*NEW* 1829 First police force by Robert Peel and **Metropolitan Police Act**
*NEW* Rural Constabulary Act
*NEW* 1842 Start of the C.I.D.
*NEW* 1856 Police Act – National Force.

**SAME**

- **Rural areas** still dealt with crime
- **Parish Constables** dealt with local crime
- **Watchmen** still employed by the rich.
- **Soldiers/army** could still be brought in.
- **Collective Responsibility** still expected.

## Punishments

**MUCH CHANGE**

*NEW* Humanitarianism & prison reform
*NEW* Elizabeth Fry and John Howard.
*NEW* Bloody Code ended.
*NEW* Laws to improve prisons.
*NEW* Religion influenced prison changes.
*NEW* Robert Peel influenced change.
*NEW* Technology improved prison health
*NEW* Emphasis on reform & rehabilitation
Transportation & capital punishment ended in 1869.

| Year 9 French : Free Time Activities, Film: Les Choristes | | | | | |
|---|---|---|---|---|---|
| 1 | Aller au cinéma | To go to the cinema | 18 | La salle de classe | Classroom |
| 2 | Regarder un film | To watch a film | 19 | Le fond de l'étang | Bottom of the pond/rock bottom |
| 3 | Chanter | To sing | 20 | La chorale | Choir |
| 4 | Former une chorale | To form a choir | 21 | La chanson | song |
| 5 | Le dessin animé | Cartoon | 22 | Le directeur | Headteacher |
| 6 | Le film de guerre | War film | 23 | Le pion | (school) monitor |
| 7 | Le film policier | Detective film | 24 | Le superviseur | (school) supervisor |
| 8 | Le Western | Western film | 25 | Le musicien raté | Failed musician |
| 9 | Le film d'amour | Love film | 26 | Émouvant(e) | Moving |
| 10 | Le film d'action | Action film | 27 | Passionnant(e) | Exciting |
| 11 | La comédie | Comedy | 28 | Gentillesse | Kindness |
| 12 | Le film de science-fiction | Science Fiction film | 29 | Action – Réaction ! | Action – Reaction! |
| 13 | Mon personnage préféré | My favourite character | 30 | Incendier | To set fire to |
| 14 | Timide | Shy | 31 | Le feu | The fire |
| 15 | Chauve | Bald | 32 | Il y a | There is |
| 16 | Gentil(le) | Kind | 33 | Il y avait | There was |
| 17 | Méchant(e) | Bad/baddy | 34 | Il y aura | There will be |

## Year 9 Spanish – Free Time Activities, Film: Voces Inocentes

| | | | | | |
|---|---|---|---|---|---|
| 1 | Ir al cine | To go to the cinema | 18 | Un niño | A boy |
| 2 | Ver una película | To watch a film | 19 | La Guerra civil | Civil war |
| 3 | La película | film | 20 | La violencia | Violence |
| 4 | La ciencia ficción | science fiction | 21 | La vida | life |
| 5 | Los dibujos animados | cartoons | 22 | El pueblo | Town |
| 6 | El documental | documentary | 23 | Advertir | to warn |
| 7 | La historia | story | 24 | Hacer daño | to injure ; to harm |
| 8 | El papel | role | 25 | Los jóvenes | Young people |
| 9 | Policíaco | police | 26 | Matar | To kill |
| 10 | La película de guerra | War film | 27 | Bailar | To dance |
| 11 | La comedia | comedy | 28 | Luchar (contra) | To fight (against) |
| 12 | La película de oeste/el western | Western film | 29 | Morir | To die |
| 13 | La película romántica | Love film | 30 | Unirse | To join |
| 14 | Mi personaje favorito | My favourite character | 31 | Huir | To run away |
| 15 | Los personajes principales | Main characters | 32 | Sufrir | To suffer |
| 16 | Emotivo/a | emotional | 33 | Emplear | To employ |
| 17 | Apasionante | Exciting | 34 | Enamorarse de | To fall in love with |

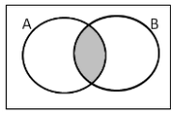
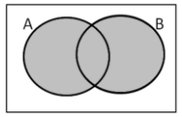
| Theme 1: Customs and Festivals | | | | | |
|---|---|---|---|---|---|
| 1 | El mundo hispánico | The Hispanic world | 18 | Las fallas | The ‘fallas’ festival |
| 2 | Una fiesta | A party | 19 | La Tomatina | The Tomatina festival |
| 3 | Una celebración | A celebration | 20 | El día de los muertos | Day of the Dead |
| 4 | América Latina | Latin America | 21 | Los Castallers | Castellers festival |
| 5 | España | Spain | 22 | La noche de San Juan | The night of San Juan |
| 6 | Chile | Chile | 23 | Celebrar | To celebrate |
| 7 | Perú | Peru | 24 | Participar | To participate |
| 8 | Argentina | Argentina | 25 | Empezar | To start |
| 9 | Bolivia | Bolivia | 26 | Quemar | To burn |
| 10 | Puerto Rico | Puerto Rico | 27 | Figuras | Figures |
| 11 | Costa Rica | Costa Rica | 28 | Pasarlo bien | To have a good time |
| 12 | Paraguay | Paraguay | 29 | Un disfraz | A costume |
| 13 | Uruguay | Uruguay | 30 | Un desfile | A procession |
| 14 | El país | The country | 31 | Una batalla | A battle |
| 15 | La capital | The capital | 32 | Unas casetas | Some huts |
| 16 | Idioma principal | The main language | 33 | Un cohete | A firework |
| 17 | Exportación | The export | 34 | Fuegos artificiales | Fireworks |

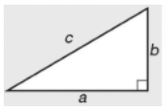
| | | | | | |
|---|---|---|---|---|---|
| 35 | Una fiesta religiosa | A religious festival | 52 | Se celebra | It is celebrated |
| 36 | Tomates | Tomatoes | 53 | Una hoguera | A bonfire |
| 37 | Tirar | To throw | 54 | Disfrazarse | To get dressed up (in costume) |
| 38 | Trajes | Outfits/suits | 55 | Comprar | To buy |
| 39 | Regalos | Presents | 56 | Decorar | To decorate |
| 40 | Comida | Food | 57 | Encender velas | To light candles |
| 41 | Los fuegos | Fires | 58 | Las tumbas | The tombs |
| 42 | Un castillo | A castle | 59 | Visitar | To visit |
| 43 | Las luces | The lights | 60 | Morir | To die |
| 44 | Representar | To present | 61 | Asistir | To attend |
| 45 | Llevar | To bring/wear | 62 | Cocinar | To cook |
| 46 | Coleccionar | To collect | 63 | Una ofrenda | An offering |
| 47 | Crear | To create | 64 | Dar | To give |
| 48 | Carnaval | Carnival | 65 | Ver | To watch/see |
| 49 | Comida típica | Typical food | 66 | Correr | To run |
| 50 | Bailar | To dance | 67 | Los toros | The bulls |
| 51 | Cantar | To sing | 68 | San Fermín | San Fermin festival |

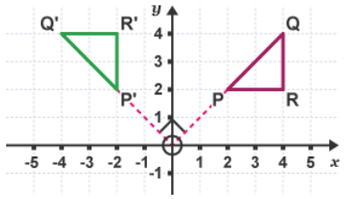
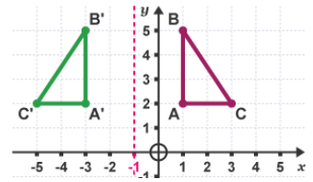
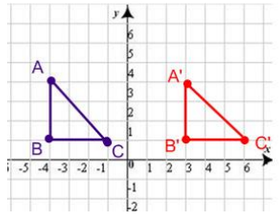
# Year 9 French: Customs and Festivals

| | | | | | |
|---|---|---|---|---|---|
| 1 | la fête | festival; celebration | 18 | la Saint-Sylvestre | New Year's Eve |
| 2 | fêter | to celebrate | 19 | le défilé | procession |
| 3 | le cadeau | present | 20 | la chorale | choir |
| 4 | les feux d'artifice [m] | fireworks | 21 | féliciter | to congratulate |
| 5 | religieux(-euse) | religious | 22 | s’amuser | to have fun |
| 6 | la mosquée | Mosque | 23 | se déguiser | to dress up/fancy dress |
| 7 | musulman | Muslim | 24 | se lever | To get up |
| 8 | juif(-ive) | Jewish | 25 | se coucher | To go to bed |
| 9 | l'église [f] | church | 26 | se réveiller | To wake up |
| 10 | le Jour de l'An | New Year's Day | 27 | avoir lieu | to take place |
| 11 | la fête des rois | Celebration of Kings; Epiphany | 28 | se déroule | to take place |
| 12 | la Saint Valentin | St. Valentine's Day | 29 | le jour férié | public holiday |
| 13 | Pâques [m] | Easter | 30 | un pays | a country |
| 14 | le poisson d'avril | April Fool | 31 | en | in/to (fem. countries) |
| 15 | la fête des mères | Mother's Day | 32 | au | in/to (masc. countries) |
| 16 | la Toussaint | All Saints' Day | 33 | à | in/to (cities/towns) |
| 17 | la veille de Noël | Christmas Eve | 34 | aux | in/to (plural countries) |

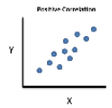
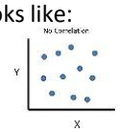
# Math KO Year 9

| Unit 18 – probability | | |
|---|---|---|
| **No.** | **Question** | **Answer** |
| 18.1 | What is an outcome? | The result of an experiment |
| 18.2 | What is a sample space? | A table showing all the possible outcomes of an event |
| 18.3 | What is theoretical probability? | The expected outcome of an experiment |
| 18.4 | What is relative frequency? | The actual outcome of an experiment |
| 18.5 | What does mutually exclusive mean? | Two events that cannot happen at the same time |
| 18.6 | How do I write probability of A and B? | P(A ∩ B)   |
| 18.7 | How do I write probability of A or B? | P(A ∪ B)   |

| Unit 15 – Pythagoras | | |
|---|---|---|
| **No.** | **Question** | **Answer** |
| 15.1 | What is Pythagoras Theorem?   | $a^2 + b^2 = c^2$ <br> Used to find a missing **side** in right angled triangles when you know two sides |
| 15.2 | What is the hypotenuse? | Longest side in a right angled triangle (c) |

| Unit 16 – transformations | | | |
|---|---|---|---|
| **No.** | **Question** | **Answer** | **Example** |
| 16.1 | Rotation | Must include:<br>• Centre of rotation<br>• Direction<br>• Degrees | *This shape has been **rotated** from **centre (0,0) anti-clockwise 90°***   |
| 16.2 | Reflection | Must include:<br>• Line of symmetry | *This shape has been **reflected** in the **line x = -1***   <br> *This shape has been **translated** by **vector** $\binom{7}{0}$* |
| 16.3 | Translation | Must include:<br>• Vector<br>e.g.<br>$\binom{2}{5}$ 2 right, 5 up<br>$\binom{-2}{-5}$ 2 left, 5 down |   |
| 16.4 | $\binom{a}{b}$ | a right, b up | |
| 16.5 | $\binom{-a}{-b}$ | a left, b down | |

# Math KO Year 9

| Unit 21 - correlation | | |
|---|---|---|
| **No.** | **Question** | **Answer** |
| 21.1 | What does positive correlation mean? | As one variable <u>increases</u> the other variable <u>increases</u>, this looks like:  |
| 21.2 | What does negative correlation mean? | As one variable <u>increases</u> the other variable <u>decreases</u>, this looks like:  |
| 21.3 | What does no correlation mean? | There is <u>no relationship</u> between the two variables, this looks like:  |
| 21.4 | What is a line of best fit? | A straight line drawn with a ruler that goes through the data with roughly the same number of points on each side of the line |
| 21.5 | What does interpolation mean? | Estimating a value within a given data set |
| 21.6 | What does extrapolation mean? | Estimating a value outside the give date set by assuming a trend |

| Unit 21 – Averages and range | | | |
|---|---|---|---|
| **No.** | **Question** | **Answer** | **Example** |
| 21.1 | How do you calculate the mean? | Add up all the data sets<br>Divide by how many pieces of data there are | 6, 3, 4, 7<br>$\frac{6+3+4+7}{4} = 5$ |
| 21.2 | How do you calculate the median? | Put all the data in ascending order and find the middle value. | 7, 2, 4, 8, 3, 9, 1<br>1, 2, 3, **<u>4</u>**, 7, 8, 9<br>4 is the median as it is in the middle |
| 21.3 | How do you calculate the mode? | Find the value that occurs the most | 7, 2, 4, 8, 3, 9, 1, 9, 9<br>9 is the mode as it appears the most |
| 21.4 | How do you calculate the range? | Subtract the smallest value from the largest | 7, 2, 4, 8, 3, 9, 1, 9, 9<br>9 – 1 = 8 therefore 8 is the range |
| 21.5 | How do you calculate mean from a frequency table? | $\frac{Total\ Fx}{Total\ F}$ | |
| 21.6 | How do you calculate mean from a grouped frequency table? | 1. Find the mid point of each group<br>2. $\frac{Total\ Fx}{Total\ F}$ | |

# Year 9 – Knowledge Organiser
# Musical Futures – arranging and performing a song

| 1. Key Words | |
|---|---|
| **Chord** | A group of two or more notes played at the same time. They do not normally clash. |
| **Melody** | In a song the melody is the tune that the lead vocalist sings. |
| **Lyrics** | The words to a song. |
| **Riff** | A repeated melody, rhythm or chord pattern. Normally the most recognisable part of the song. |
| **Structure** | The order of sections within a song. Example: Verse, Chorus. |
| **Homophonic** | Refers to the texture of a song – generally meaning there is a melody part accompanied by chords. |
| **Accompaniment** | Backing part which supports the melody/tune . |

| 2. Song Structure | |
|---|---|
| **Verse** | The verse is what sets the scene of a song and usually tells a story. The melody will stay the same but the words may change between each verse. |
| **Chorus** | The main hook of the song, usually the part that gets stuck in your head! The lyrics are usually the same in every chorus of a song. |
| **Bridge** | A linking section normally used between a verse and chorus section. |
| **Middle 8** | 8 bars in the middle of a song that sounds completely different to the rest of the song. |
| **Intro/ Outro** | The beginning/ending section of a song. |
| **Solo** | A section of the song where the main melody isn't provided by the voice. This is usually played by an electric guitar. |

# Biology Topic 3: Infection and response

| 1. Keywords | |
|---|---|
| Communicable (infectious) disease | A disease which can be spread to others. |
| Pathogen | Micro-organisms that cause infectious disease (eg bacteria, protists, fungi and viruses). |
| Bacteria | Prokaryotic cells. Some can cause disease by making toxins. |
| Protists | Eukaryotic cells. Some can cause disease. |
| Fungi | Class of organisms that includes mushrooms. Some can cause disease. |
| Virus | The smallest organisms. Much smaller than bacteria. They reproduce inside host cells damaging them and causing disease. |
| Droplet inhalation | When a disease is spread through coughs and sneezes. |
| Direct contact | When a disease is only spread from physical contact. |
| Antibiotics | A group of chemicals which can kill bacteria (eg penicillin). |
| Antiviral drugs | A group of chemical which can prevent viruses reproducing. Hard to develop safe ones. |
| Fungicides | A group of chemicals which kill fungi. |
| Painkillers | A type of drug that treats pain symptoms but does not kill pathogens. |
| Lymphocyte | White blood cell. |

2. Examples of infectious disease

| | Disease | Infects | Symptoms | Spread by | Fatal | Treatment |
|---|---|---|---|---|---|---|
| Virus | Measles | Human | Fever<br>Skin rash | Droplet inhalation | Yes | vaccination |
| | HIV | Human | Reduced immune system | Unprotected sex | Yes | Antiviral drugs |
| | Tobacco mosaic virus (TMV) | Plants | Discolours leaves<br>Stunts growth | Direct contact | No | Remove infected leaves and burn |
| Bacteria | Salmonella | Human | Fever<br>Stomach cramps<br>Vomiting<br>Diarrhoea | Food | No | Take fluids to prevent dehydration |
| | Gonorrhoea | Human | Thick yellow/green discharge from vagina or penis | Unprotected sex | No | Antibiotics (if not resistant) |
| Fungal | Rose black spot | Plants | Black spots on leaves<br>Stunts growth | Direct contact | No | Fungicides |
| Protist | Malaria | Human | Fever | Mosquito bite | Yes | Drugs to kill/prevent parasite. Prevention by using nets to stop bites |

| 3. Non-specific defence systems | |
|---|---|
| Skin | Physical barrier |
| Nose | Hairs trap pathogens |
| Trachea and bronchi | Mucus traps pathogens |
| Stomach | Acid destroys pathogens |

| 4. Specific defence by white blood cells | |
|---|---|
| Phagocytosis | Ingesting (take in) pathogens digesting and destroying them |
| Antibody production | Target a specific pathogen. Stick them together and target them for destruction. Gives you a 'memory' of that pathogen so you can fight it more quickly next time |
| Antitoxin production | Cancel out toxins released by pathogens |

| 5. Vaccination | |
|---|---|
| Vaccine | Small amount of dead or inactive pathogen to stimulate white blood cells to produce antibodies |
| How vaccines work: | |
| 1 | Weak or dead pathogen injected |
| 2 | White blood cells generate antibodies to destroy pathogen |
| 3 | White blood cells that make those antibodies remain and make you immune to future infections |

| 6. Drug development | |
|---|---|
| Drug/medicine | A chemical which alters the body. Often extracted from plants (eg aspirin) and microorganisms (eg penicillin) |
| Toxicity | If it is toxic |
| Efficacy | How well it works |
| Dose | How much of a drug you need to take to make it work |
| Placebo | A pill without the drug in it. Taken to check drug effectiveness |
| Double blind trials | When the doctor does not know if they are giving the medicine or a placebo. Prevents bias |

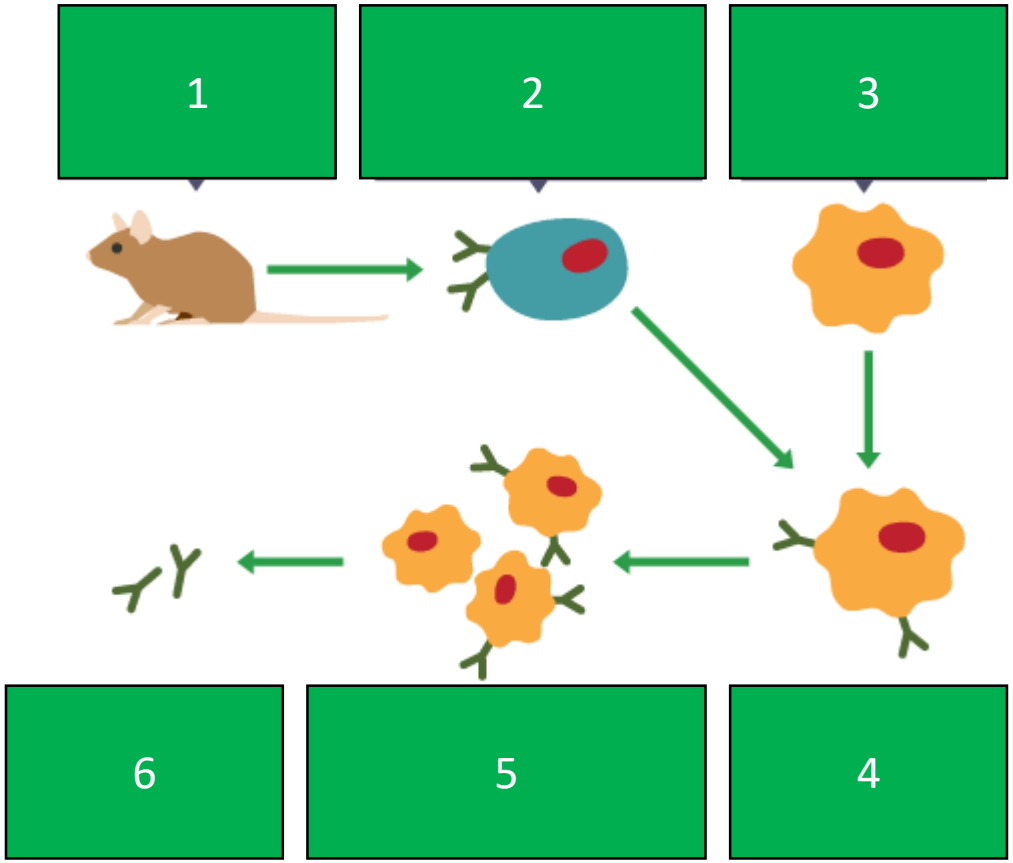
| Stages of drug development | | | Time taken (yrs) |
|---|---|---|---|
| 1 | Drug discovery | New possible medicines are identified | 4.5 |
| 2 | Preclinical trials | New drugs are tested in lab for toxicity and efficacy on cells, tissues and sometimes animals | 1.5 |
| 3 | Clinical trials | Low doses tested on human volunteers. Then patients suffering with the disease over 3 phases. These are double blind trials | 5.5 |
| 4 | Publishing results | Findings are checked by other scientists (peer review) Drug is approved by NHS | 1.5 |

## 7. Monoclonal antibodies (HT TRIPLE ONLY)

| | |
|---|---|
| What are they? | Antibodies produced from a single clone of cells. |
| Why are they useful? | Bind to only on binding site on a specific chemical or cell in the body |
| Uses | Pregnancy tests<br>Measure levels of hormones or other chemicals in blood<br>Locate specific molecules in cells<br>Treat cancer |

### How are monoclonal antibodies made?

| | |
|---|---|
| 1 | Mouse vaccinated to start production of antibodies |
| 2 | Lymphocyte: Produce antibodies but cant divide |
| 3 | Tumour cell: No antibodies but divides |
| 4 | Cells fused to form a single hybridoma |
| 5 | Single hybridoma cell cloned to make identical cells |
| 6 | A large amount of identical antibodies collected |




## 8. Detecting plant disease (HT TRIPLE ONLY)

| | | | |
|---|---|---|---|
| Symptoms: | • Stunted growth<br>• Spots on leaves<br>• Areas of decay<br>• Growths<br>• Malformed stems and leaves<br>• Discolouration<br>• Presence of pests | Identified by: | • Reference to book or internet<br>• Taking to a lab<br>• Testing kits containing monoclonal antibodies |

| 9. Plant disease (TRIPLE ONLY) | | |
|---|---|---|
| Type | Disease | How it damages plants |
| Pest | Aphid | A insect which injects toxins into plants as they eat them |
| Fungal | Black spot | Damages leaves |
| Virus | Tobacco mosaic virus | Damages leaves |

| 10. Plant mineral deficiency (TRIPLE ONLY) | | |
|---|---|---|
| Mineral | Symptom | Reason |
| Nitrates | Stunted growth | Cant make enough protein |
| Magnesium | Chlorosis: yellow leaves | Cant make enough chlorophyll |

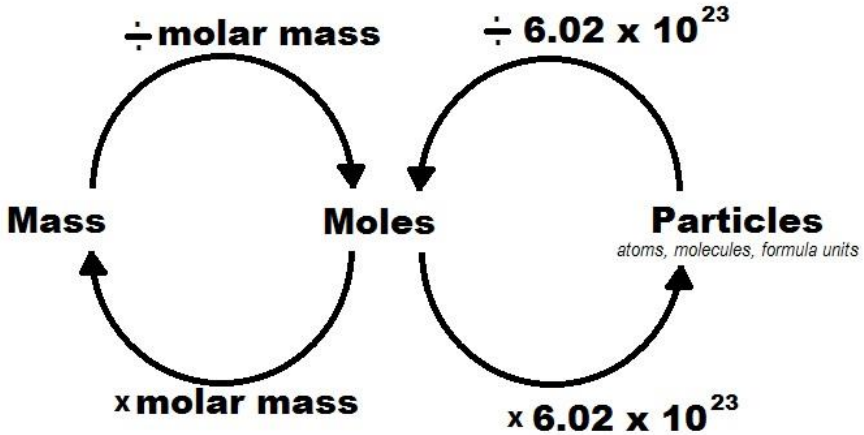
| 11. Plant defence responses (TRIPLE ONLY) | |
|---|---|
| Type | Examples |
| Physical | • Cellulose cell wall<br>• Waxy cuticle on leaves<br>• Layers of dead cells (bark on trees) |
| Chemical | • Antibacterial chemicals<br>• Poisons to stop animals |
| Mechanical | • Thorns and hairs stop animals<br>• Leaves which droop or curl when touched<br>• Mimicry to trick animals |

Bee orchid flower resembles a female bee closely enough to attract males in search of a mate

# Chemistry Topic 3: Quantitative chemistry

| 1. Keywords | |
|---|---|
| Conservation of mass | No atoms are made or lost during a chemical reaction. The mass before the reaction must equal the mass after a reaction IN A CLOSED SYSTEM |
| Closed system | A container which no chemicals can escape. Eg a sealed bottle |
| Relative formula mass (Mr) | Sum of relative atomic masses from periodic table |
| Balanced equation | When the sum of the Mr on the left equals the sum of the Mr on the right |
| Uncertainty | The percentage of a result that might be wrong. Shown from differences between repeats |
| Limiting reactant | The reactant which runs out first |

| 2. Moles (HT ONLY) | |
|---|---|
| Mole | The number of particles needed to make the mass equal the atomic mass |
| Avogadro constant | $6.022 \times 10^{23}$ particles in 1 mole |




| 3a. Concentration | | |
|---|---|---|
| $C = \frac{mass}{V}$ | | |
| $C$ | Concentration | g/dm$^3$ |
| $mass$ | mass | g |
| $V$ | volume | dm$^3$ (litres) |

| 3b. Concentration (HT ONLY) | | |
|---|---|---|
| $C = \frac{m}{V}$ | | |
| $C$ | Concentration | mol/dm$^3$ |
| $m$ | mole | |
| $V$ | volume | dm$^3$ (litres) |

## 4. Percentage yield (TRIPLE ONLY)

$$\%\text{Yield} = \frac{mass \text{ of actual}}{\text{Maximum mass}} x\ 100$$

| | | |
|---|---|---|
| %Yield | Percentage yield | % |
| $mass$ of actual | Mass of product actually obtained | g |
| Maximum mass | The theoretical maximum mass possible | g |

## 5. Atom economy (TRIPLE ONLY)

$$\%\ \text{Atom economy} = \frac{Mr\ of\ desired\ product}{\text{Sum of Mr for all reactants}} x\ 100$$

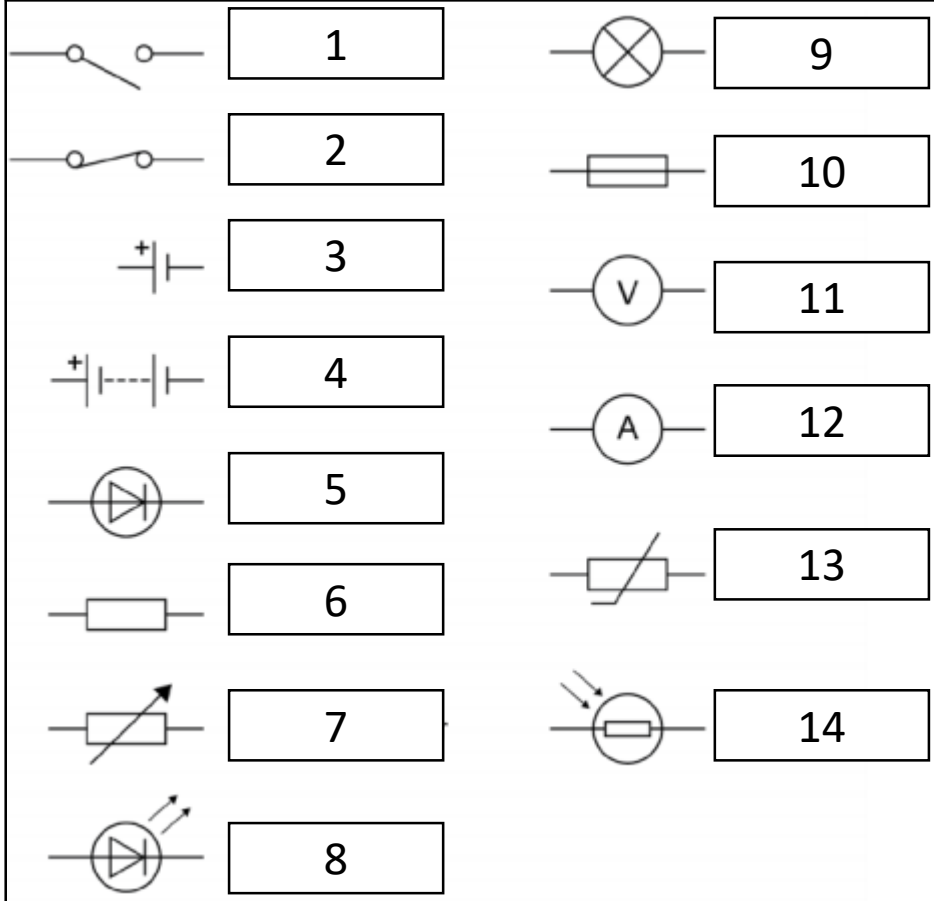
| | | |
|---|---|---|
| % Atom economy | Percentage atom economy | % |
| $Mr\ of\ desired\ product$ | Relative formula mass of the product you want | g/mol |
| Sum of Mr for all reactants | The total of all the react Mr added together | g/mol |

## 6. Volume of gases (TRIPLE HT ONLY)

| | |
|---|---|
| 1 mole of gas occupies 24 $dm^3$ | If 20°C and 1 atmosphere pressure |
| Equal moles occupy the same volume | |

# Physics Topic 2: Electricity

## 1. Standard circuit diagram symbols




| | | | |
|---|---|---|---|
| 1 | Switch (open) | 8 | LED (light emitting diode) |
| 2 | Switch (closed) | 9 | Lamp (bulb) |
| 3 | Cell | 10 | Fuse |
| 4 | Battery | 11 | Voltmeter |
| 5 | Diode | 12 | Ammeter |
| 6 | Resistor | 13 | Thermistor |
| 7 | Variable resistor | 14 | LDR (light-dependent resistor) |

## 2. Electrical charge and current

Charge flow = current x time

$Q = I \times t$

Q = Charge (in coloumbs C)
*I* = Current (in amps A)
*t* = Time (in seconds s)

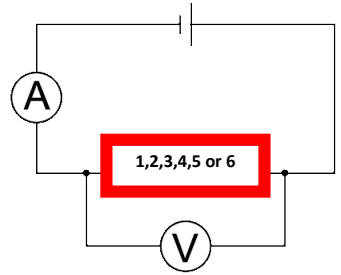
## 3. Resistance

Potential difference = current x resistance

$V = I \times R$

V = Potential difference/voltage (in volts V)
I = Current (in amps A)
R = Resistance (in ohms Ω)

## 4. IV characteristics and required practical

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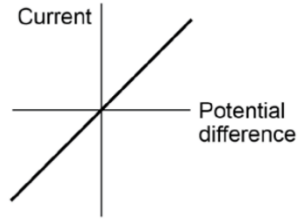


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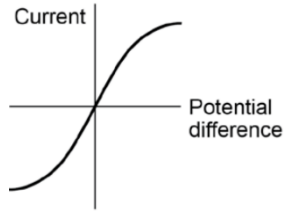


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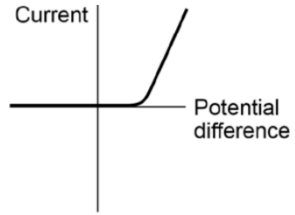


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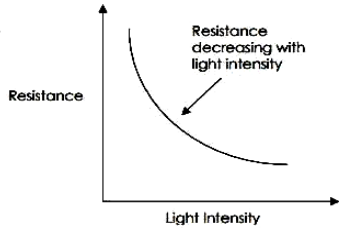


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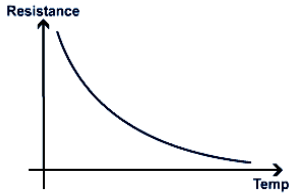


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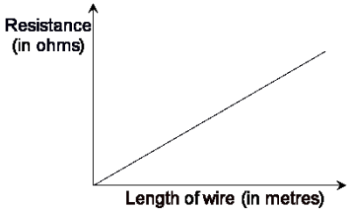
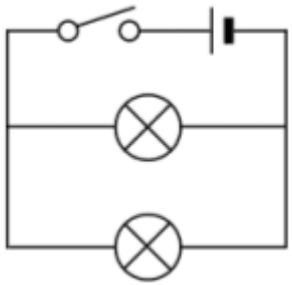



| | |
|---|---|
| 1 | Ohmic resistor |
| 2 | Filament bulb |
| 3 | Diode |
| 4 | LDR |
| 5 | Thermistor |
| 6 | Resistance in a wire |

## 5. Series and parallel circuits

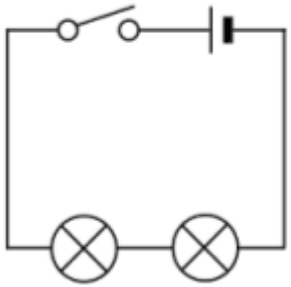
Parallel Circuits

- The current splits at the junction.
- The voltage is the not shared.



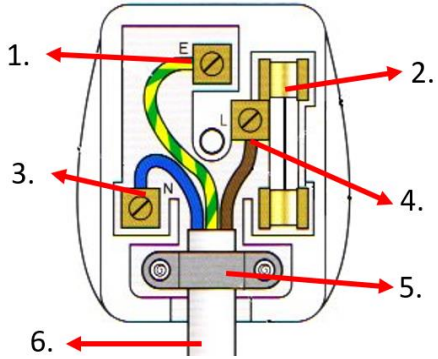
Series Circuits

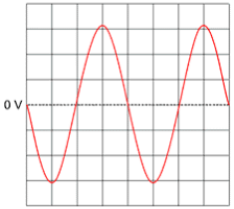
- The current does not split and is the same everywhere
- The voltage is shared
- $R_{TOTAL} = R_1 + R_2 + R_3 \ldots$



## 6. Mains electricity keywords

| | |
|---|---|
| 1. Earth wire | Prevents danger from short circuits |
| 2. Fuse | Melts if current gets too high |
| 3. Neutral wire | Carries the current away from plug |
| 4. Live wire (230v) | Carries current to plug |
| 5. Cable grip | Prevents a loose wire if cable is pulled |
| 6. Double insulated cable | Prevents electric shock |
| 7. Alternating current (AC) | Current which changes direction 50 times a second (50 Hz). Found in the mains. |
| 8. Direct current (DC) | Current that only travel in one direction. Found in batteries. |

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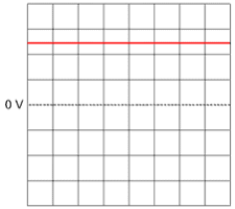



8.

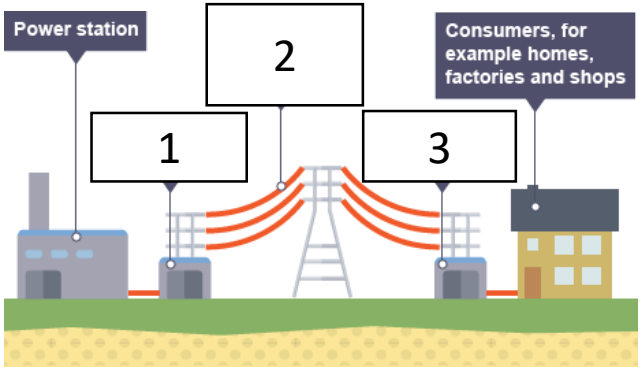
## 7. Electrical power

| | |
|---|---|
| power = current$^2$ x resistance | $P = I^2R$ |
| power = current x potential difference | $P = IV$ |
| energy transferred = charge flow x potential difference | $E = QV$ |

### Symbols and their units

| Symbol | Meaning | Unit | Meaning |
|---|---|---|---|
| V | Potential difference | V | Volts |
| I | Current | A | Amps |
| R | Resistance | Ω | Ohms |
| Q | Charge | C | Coulombs |
| P | Power | W | Watts |
| E | Energy | J | Joules |

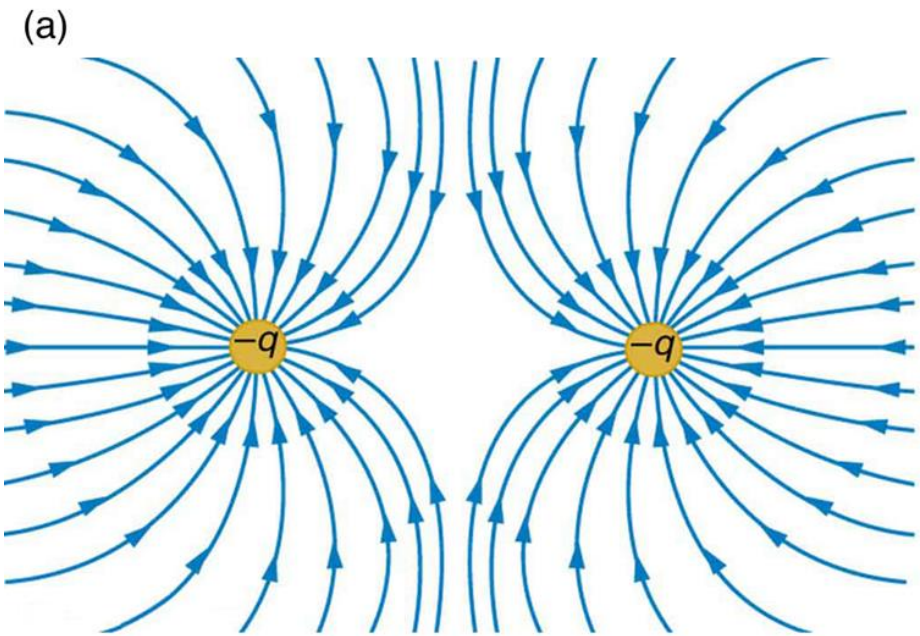
## 8. The National grid

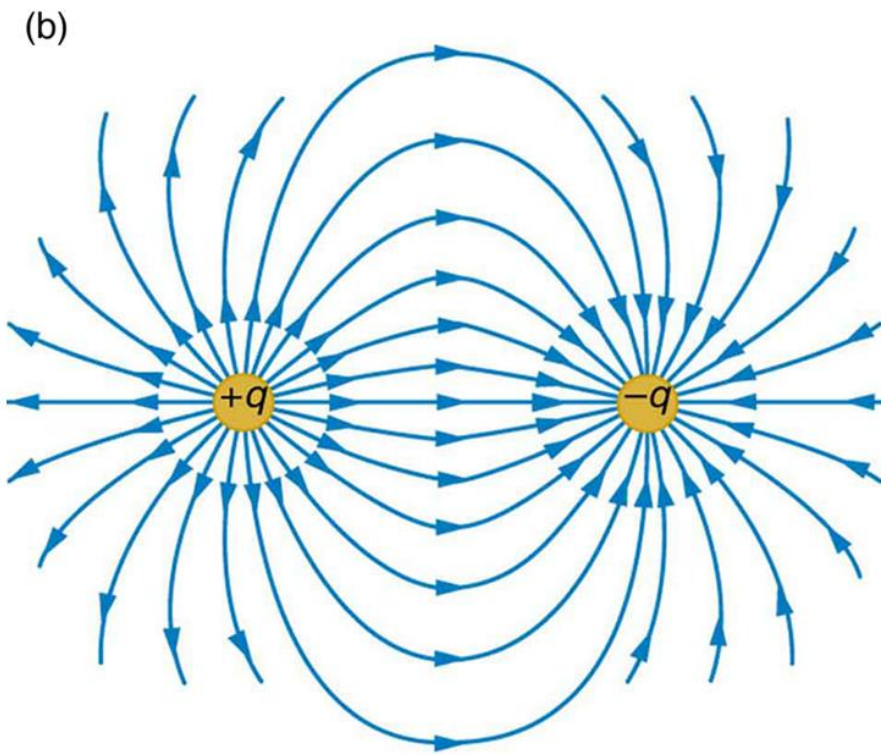



| | |
|---|---|
| 1.Step up transformer | Increase the voltage of the AC |
| 2.High voltage transmission cables | High voltage reduces energy loss |
| 3.Step down transformer | Decreases the voltage of the AC |

| 9. Static electricity keywords (TRIPLE ONLY) | |
|---|---|
| Insulator | Material which holds electrical charge and does not conduct it |
| Friction | Force which transfers electrons from one insulator to the other |
| Electrons | Negatively charged particles in atoms. They are the only charges that can move |
| Electrostatic force | The force between two charges |
| Van der Graaff generator | Machine used to generate static electricity |

| Electrostatic force rules (TRIPLE ONLY) | | |
|---|---|---|
| Charges | Force | Diagram |
| - and - | repel | (a) |
| + and - | attract | (b) |
| + and + | repel | (a) But with positive charges |



# GCSE Physical Education

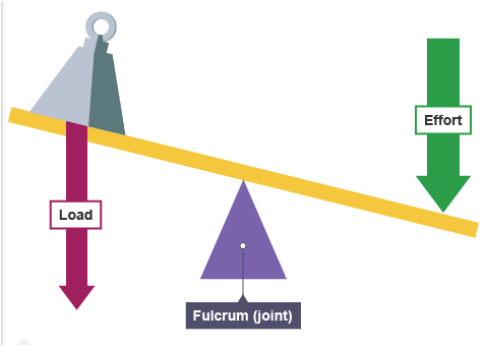
## 1.1c – Movement Analysis

**GCSE PE KS4 Knowledge Organiser**

| Component | % of overall GCSE (9-1) in Physical Education (J587) | | | |
|---|---|---|---|---|
| | AO1 | AO2 | AO3 | AO4 |
| 1: Physical factors affecting performance | 12.5 | 10 | 7.5 | 0 |

| Assessment Objectives | |
|---|---|
| AO1 | Demonstrate knowledge and understanding of the factors that underpin performance and involvement in physical activity and sport. |
| AO2 | Apply knowledge and understanding of the factors that underpin performance and involvement in physical activity and sport. |
| AO3 | Analyse and evaluate the factors that underpin performance and involvement in physical education and sport. |

**Movement Analysis**



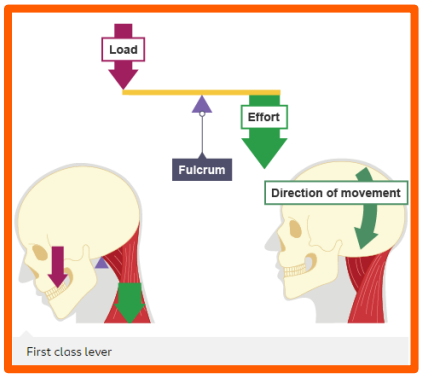

**Levers**

A lever consists of:

- A rigid structure (Bone)
- A Force acting upon it (agonist muscle) to produce a turn movement (angular motion)
- A fulcrum which is a fixed point (joint)
- A load or resistance that is placed on the rigid structure (weight or body part being moved and anything it is carrying)

**First-Class Lever**

The fulcrum is in the **middle** of the effort and the load.

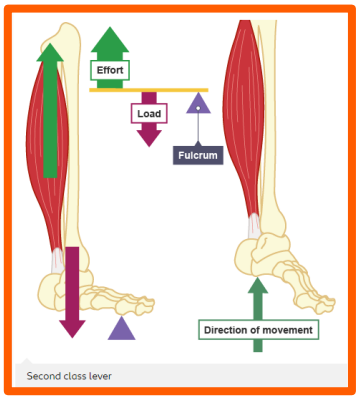



Example: This type of lever is found in the neck when raising your head to head a football.

Neck muscle provides the effort, the neck joint is the fulcrum and the weight of the head is the load.

**Second-Class Lever**

The load is in the **middle** of the effort and the fulcrum.

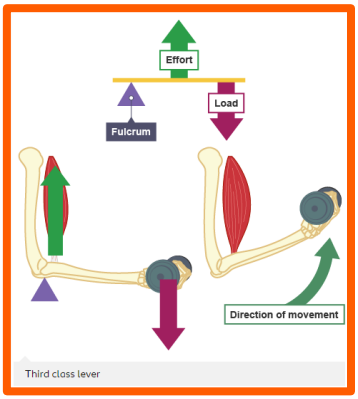



Example: This type of lever is found in the ankle when standing on your tiptoes during the take-off of a jump in a jump shot in basketball.

The gastrocnemius provides the effort, the big toe joint is the fulcrum and the weight of the body is the load.

**Third-Class Lever**

The effort is in the **middle** of the load and the fulcrum.

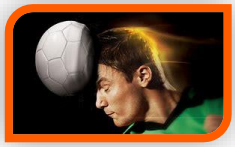



Examples: This type of lever is found in the elbow when performing a bicep curl in weightlifting.

The bicep provides the effort, the elbow joint is the fulcrum and the weight forearm, hand and dumbbells and the load.

# GCSE Physical Education

## 1.1c – Movement Analysis



F → 1

L → 2

E → 3

Levers are used to multiply force. This means that they allow you to move a large output load with a smaller effort. Load and effort are forces measured in Newtons (N).
In a lever, if the distance from the effort to the fulcrum is longer than the distance from the load to the fulcrum, this gives a greater mechanical advantage. First-class and second-class levers have mechanical advantage.

Second class levers have the best mechanical advantage, so they can move a large load with a relatively small effort.

**Mechanical Advantage**

**Exam Question:** Explain why a second-class lever has the best mechanical advantage.

The further away the effort is from the fulcrum, the easier it is to lift the load. This requires a long lever arm.
In a second-class lever, the effort is further away from the fulcrum that the load therefore less effort is required.

**Example:**

Load = 500N  Effort = 100N

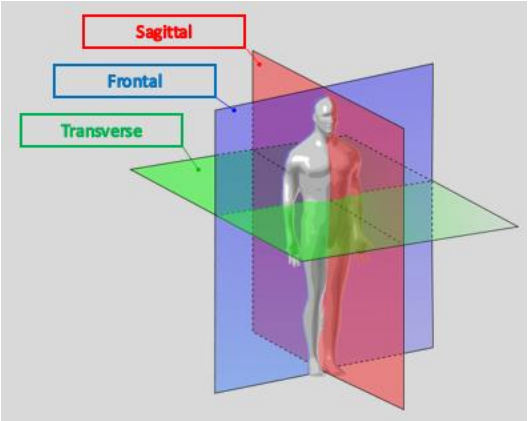
500N ÷ 100N = 5

At take-off, the high jumper applies large forces to the ground through their ankle. The ankle operates with mechanical advantage in order to resist these forces and enable the jumper to achieve flight

## Mechanical Advantage = Load ÷ Effort

**Planes of Movement**

All body movements occur in different planes and around different axes.
A plane is an imaginary flat surface running through the body.




**Sagittal Plane**

The sagittal plane divides the body vertically into left and right. Movements in this plane are flexion and extension.

Example: Somersault in trampolining – Sprinting in athletics

**Frontal Plane**

The frontal plane divides the body in anterior and posterior (front and back). Movements in this plane are abduction and adduction.

Example: Star Jump in gymnastics – Diving save in football

**Transverse Plan**

The transverse plane divides the body horizontally into superior and inferior (upper and lower). Movements in this plane are rotational.

Example: Pivoting in netball – full twist in trampolining.

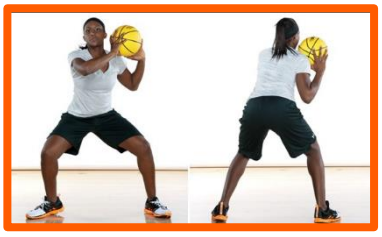
Sagittal – Side to side

Frontal – Front and back

Transverse – Top and bottom

# GCSE Physical Education

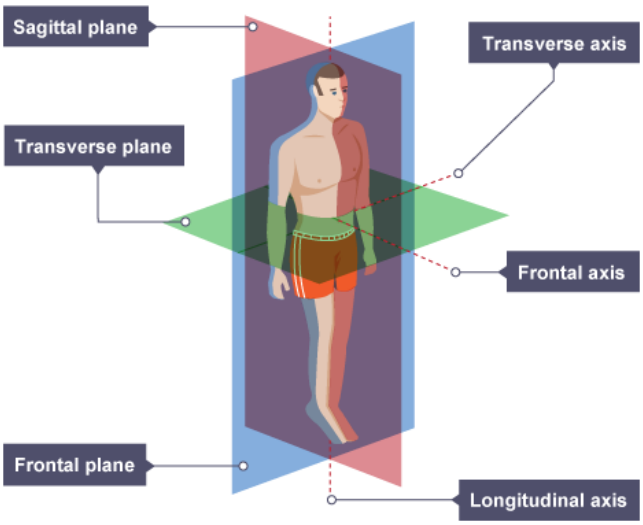
## 1.1c – Movement Analysis



**Axes of Rotation**

All body movements occur in different planes and around different axes.

An axis is an imaginary line at right angles to the plane, about which the body rotates or spins.




**Transverse Axes**

The transverse axis runs from left to right through the centre of the body.

Example: Summersault in trampolining – Sprinting in athletics

**Frontal Axes**

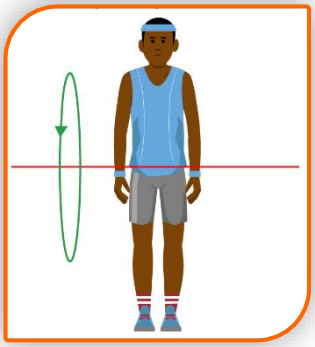
The frontal axis runs from front to back through the centre of the body.

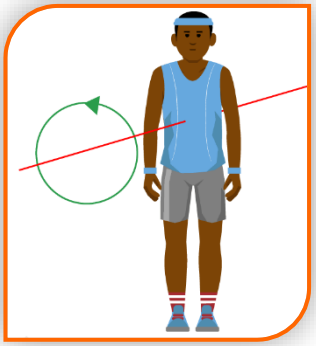
Example: Star Jump in gymnastics – Diving save in football

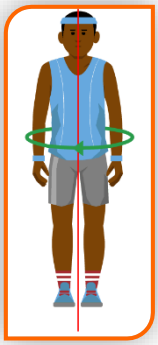
**Longitudinal Axes**

The longitudinal axis runs from top to bottom through the centre of the body.

Example: Pivoting in netball – full twist in trampolining.







# GCSE Physical Education

## 1.1c – Movement Analysis

Sagittal Plane → Transverse Axes  Frontal Plane → Frontal Axes  Transverse Plane → Longitudinal Axes

**Exam Question:** Using examples of movement explain how a netball player uses all three planes of movement during a match [4]

During a netball match a netball will use the sagittal plane of movement when flexing and extending their knees when running. A netball will use the frontal plane of movement when performing abduction at the shoulder when blocking their opponent from passing. A netballer will use the transverse plane of movement when performing pivot to turn when in possession of the netball.