



Rayner Stephens
HIGH SCHOOL

YEAR 11

KNOWLEDGE ORGANISERS

Spring Term 2024/25



Year 11 Science Wave Properties

Key Vocabulary:

1	Transverse wave	A wave where the vibration is perpendicular to the direction of travel
2	Longitudinal wave	A wave where the vibrations are parallel to the direction of travel
3	Mechanical wave	A vibration that travels through a substance (e.g. sound)
4	Frequency	The number of wave fronts passing a fixed point every second (measured in Hz)
5	Period	The time for one complete wave
6	Amplitude	Height of wave from the rest position (measured in m)
7	Wavelength	The wavelength of a wave is the distance between a point on one wave and the same point on the next wave. (m)
8	Ultrasound	Sound above 20,000Hz
9	Superposition	When two waves meet and affect each other
10	Reflection	When waves bounce off a surface

10 Wave Equation

$$v = f\lambda$$

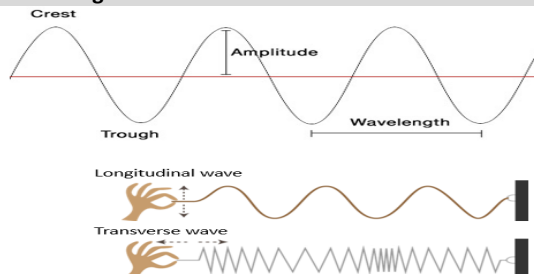
v	Wave speed (m/s)
f	Frequency (Hz)
λ	Wave length (m)

11 Period & Frequency

$$T = \frac{1}{f}$$

T	Period (s)
f	Frequency (Hz)

12 Longitudinal & Transverse



Comparing waves:	Light wave	Mechanical wave
Type of wave	Transverse	Longitudinal
Can they travel through a vacuum?	Yes	No. Mechanical waves can only pass through a solid, liquid or gas
Can they be reflected?	Yes. By smooth shiny surfaces	Yes. By smooth surfaces
Can they be absorbed?	Yes. By dark surfaces	Yes. Rough surfaces absorb sound
Can superposition occur?	Yes	Yes

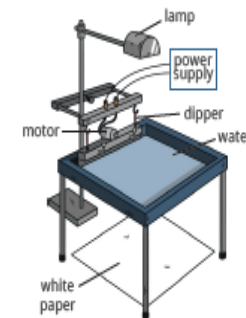
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Observing Waves-Required Practical

Make observations to identify the suitability of apparatus to measure the frequency, wavelength and speed of waves.

Waves in a Ripple Tank

The diagram shows the apparatus most commonly used for this investigation.



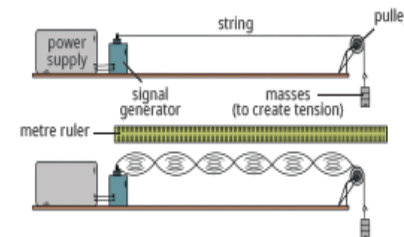
Method:

- Set up the apparatus as shown in the diagram.
- Turn on the power supply and observe the waves produced in the water. Make any necessary adjustments to the equipment, for example altering the potential difference of the power supply, so that the waves are clear to observe. **The lower the frequency of the waves, the easier it will be for measurements to be made.**
- To measure the **wavelength**, use a metre ruler to measure the length of 10 waves and divide this value by 10 to find one wavelength. Repeat this several times and calculate the mean wavelength. A **stroboscope** can be used to freeze the wave pattern to make it easier to measure the waves.
- To measure the **frequency**, mark a point on the white paper and count the number of waves that pass this point in 10 seconds. Divide the number of waves by 10 to find the number of waves that pass per second. Repeat this several times and calculate the mean frequency.
- To calculate **wave speed**, use the equation:

$$\text{wave speed} = \text{frequency} \times \text{wavelength}$$

Waves in a Solid

Waves in a solid can be observed using the apparatus shown in the diagram.



When the signal generator is switched on, the string begins to vibrate.

The frequency of the signal generator, the length of the string or the tension in the string is adjusted until a clear wave pattern can be seen. The wave should not look like it is moving.

To find the **wavelength**, count the number of half wavelengths (single loops) in 1 metre, then divide the length by the number of half wavelengths and multiply by two.

The **frequency** of the wave is the frequency of the signal generator.

Wave speed can be calculated using the equation:

$$\text{wave speed} = \text{frequency} \times \text{wavelength}$$

Year 11 Science Knowledge Organiser Spring Term – Electromagnetic Spectrum

Key Vocabulary:

1	Transverse wave	A wave where the vibration is perpendicular to the direction of travel
2	Longitudinal wave	A wave where the vibrations are parallel to the direction of travel
3	Mechanical wave	A vibration that travels through a substance (e.g. sound)
4	Frequency	The number of wave fronts passing a fixed point every second (measured in Hz)
5	Period	The time for one complete wave
6	Ultrasound	Sound above 20,000Hz
7	Superposition	When two waves meet and affect each other
8	Reflection	When waves bounce off a surface
9	Echo	Reflection of sound that can be heard
10	Electromagnetic Spectrum	Continuous spectrum of transverse waves that travel at the same speed in a vacuum or air.

11 The Electromagnetic Spectrum

The electromagnetic (EM) spectrum.

- A continuous spectrum formed from electromagnetic waves.
- EM waves are transverse waves.
- All EM waves travel at the same velocity through a vacuum or air (300 000 000 m/s).
- Grouped according to wavelength and frequency.
- The eye can only detect visible light.

Long wavelength \longrightarrow Short wavelength

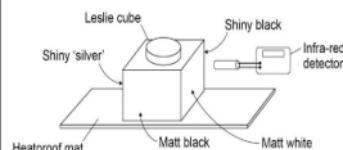
Radio waves	Microwaves	Infrared	Visible light	Ultraviolet	X-rays	Gamma rays
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Low frequency \longrightarrow High frequency

EM wave	Danger	Use
Radio	Safe.	Communications, TV, radio.
Microwave	Burning if concentrated.	Mobile phones, cooking, satellites.
Infrared		Heating, remote controls, cooking.
Visible	Damage to eyes.	Illumination, photography, fibre optics.
Ultra violet	Sunburn, cancer.	Security marking, disinfecting water.
X-ray	Cell destruction, mutation, cancer.	Broken bones, airport security.
Gamma		Sterilising, detecting and killing cancer.

12 Required Practical-Infrared Radiation

Required practical: Infrared Radiation



- Infrared radiation given out by hot objects.
- How much is absorbed or depends on the surface.

Black surfaces	Good emitters, good absorbers
White surfaces	Poor emitters, poor absorbers
Shiny surfaces	Good reflectors

13 Radiowaves

- Transmitted easily through air.
 - Can be reflected to change their direction.
 - These properties make them ideal for communications.
 - Radio waves can be produced by oscillations in electrical circuits.
- When radio waves are absorbed by a conductor, they create an alternating current.
- This electrical current has the same frequency as the radio waves.
- Information is coded into the wave before transmission, which can then be decoded when the wave is received.
- Television and radio systems use this principle to broadcast information.

14 Microwaves

- High frequency microwaves have frequencies which are easily absorbed by molecules in food.
- The internal energy of the molecules increases when they absorb microwaves, which causes heating.
- Microwaves pass easily through the atmosphere, so they can pass between stations on Earth and satellites in orbit.

15 Infrared

- Infrared light has frequencies which are absorbed by some chemical bonds.
- The internal energy of the bonds increases when they absorb infrared light, which causes heating.
- This makes infrared light useful for electrical heaters and for cooking food.
- All objects emit infrared light.
- The human eye cannot see this light but infrared cameras can detect it.

16 Wave Equation

$$v = f\lambda$$

v	Wave speed (m/s)
f	Frequency (Hz)
λ	Wave length (m)

Year Science Term Knowledge Organiser- Genetics combined Science

Key Vocabulary:

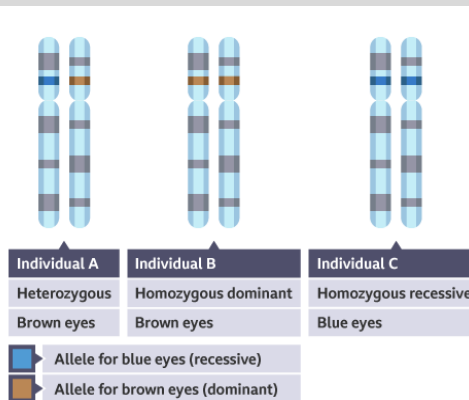
1	DNA	Genetic material. DNA is a polymer made up of two strands forming a double helix. The DNA makes up chromosomes.
2	Gene	A gene is a small section of DNA on a chromosome. Each gene
3	Chromosome	A long coil of DNA. Found in the nucleus.
4	Genome	The entire genetic material of that organism.
5	Allele	Different versions of the same gene – dominant and recessive.
6	Homozygous	Both alleles for a gene are the same (i.e. both are dominant or both are recessive).
7	Heterozygous	Both alleles for a gene are different (i.e. one is dominant, the other is recessive).
8.	Genotype.	The alleles present for a particular gene
9.	Phenotype	The physical feature expressed for a particular gene
10.	Polydactyl	Polydactyly is a condition in which a person has more than 5 fingers per hand or 5 toes per foot.
11.	Cystic fibrosis	Cystic fibrosis is a disease that causes thick, sticky mucus to build up in the lungs, digestive tract, and other areas of the body.

12 Characteristics.

Some characteristics are controlled by a single gene, such as: fur colour in mice; and red-green colour blindness in humans. Each gene may have different forms called alleles. The alleles present, or genotype, operate at a molecular level to develop characteristics that can be expressed as a phenotype. A dominant allele is always expressed, even if only one copy is present. A recessive allele is only expressed if two copies are present (therefore no dominant allele present). If the two alleles present are the same the organism is homozygous for that trait, but if the alleles are different they are heterozygous. Most characteristics are a result of multiple genes interacting, rather than a single gene.

13 Genotype and Phenotype

The genotype is the collection of alleles that determine characteristics and can be expressed as a phenotype.



14 Sex Determination

Human body cells have 23 pairs of **chromosomes** in the nucleus. Twenty two pairs are known as autosomes, and control characteristics, but one pair carries genes that determine sex - whether offspring are male or female: males have two different sex chromosomes, X Y females have two X chromosomes, XX

One pair of chromosomes carry the genes that determine sex		
	Female	Male
	XX	XY
Gametes	X	Y
X	XX	XY
X	XX	XY

15 Genetic crosses

Using a punnet square (using mouse fur colour as an example)

Parent phenotype	Black fur	White fur
Parent genotype	BB	bb
What gametes are present	In each egg B B	In each sperm b b

Gametes	b	b
B	Bb	Bb
B	Bb	Bb

The probability of black fur offspring phenotype is 100%. All offspring genotypes are heterozygous (Bb).

Crossing two heterozygous mice (Bb)

Gametes	B	b
B	BB	Bb
b	Bb	bb

The probability of black fur is 75% and white fur 25%. The ratio of black to white mice is 3:1

16 Inherited disorders

Cystic fibrosis is an inherited disorder of cell membranes that mainly affects the lungs and digestive system. They can become clogged with lots of thick, sticky mucus as too much is produced. It is caused by a faulty **recessive allele** on chromosome 7. To be born with cystic fibrosis, a child has to inherit two copies of this faulty gene - one from each of their parents. Their parents will not usually have the condition themselves, because they will only carry one faulty gene and one that works normally.

Polydactyly is an inherited condition in which a person has extra fingers or toes. It is caused by a **dominant allele** of a gene. This means it can be passed on by just one allele from one parent if they have the disorder. Someone who is homozygous (PP) or heterozygous (Pp) for the dominant allele will develop polydactyly.

Year Science Term Knowledge Organiser- Genetics Triple

Key Vocabulary:

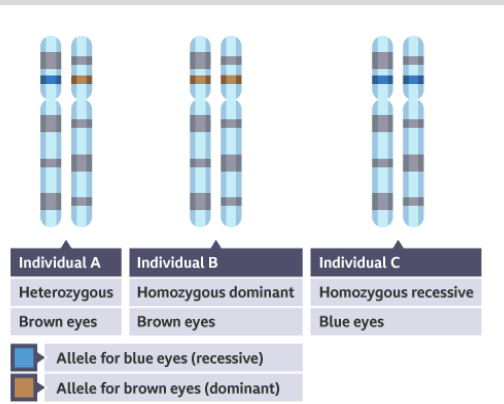
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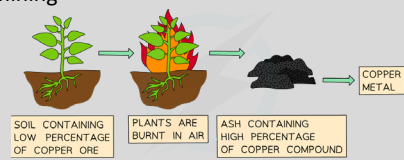
Year 11 Science Knowledge Organiser Spring Term – The Earth's Atmosphere

Key Vocabulary:	
1	Acid Rain Rain that contains dissolved acidic gases such as nitrogen oxides and sulfur dioxide.
2	Atmosphere The relatively thin layer of gases that surround planet earth.
3	Carbon Footprint The total amount of carbon dioxide and other greenhouse gases emitted over the full life cycle of a product, service or event.
4	Carbon Monoxide Poisonous gas produced during incomplete combustion.
5	Catalytic Converter Fixed to exhausts of vehicles to reduce pollutants released.
6	Climate Change The change in global weather patterns that could be caused by excess levels of greenhouse gases in the atmosphere.
7	Combustion The burning of fossil fuels releases the gases carbon dioxide, carbon monoxide, nitrogen oxides and sulfur oxides.
8	Complete Combustion Complete combustion occurs when there is excess oxygen.
9	Fossil Fuels Fossil fuels include: coal, oil, natural gas.
10	Global Dimming The gradual reduction in radiation energy which reaches the Earth's surface from the Sun due to small particles in the atmosphere which have almost certainly been produced by human activities such as burning fossil fuels.
11	Global Warming The rise in the average temperature of the Earth's surface.
12	Incomplete Combustion Incomplete combustion occurs when there is insufficient oxygen to burn.
13	Peer Review A process by which a scientific report is reviewed and checked for accuracy by other science experts before being published in a journal or on an official science website.

14	Composition of Air
	<p>OTHER INCLUDING: 0.9% ARGON 0.04% CO₂</p> <p>21% OXYGEN</p> <p>78% NITROGEN</p>
15	Earth's Early Atmosphere
	<ul style="list-style-type: none"> The surface of the early Earth was molten for millions of years during which time there was no atmosphere surrounding the planet. Eventually, cooling began to take effect and allow for molten materials to slowly solidify forming land masses. Volcanoes formed on the land masses. One theory of how the early atmosphere formed suggests that the volcanoes released gases from the Earth's interior through violent eruptions. These eruptions released large amounts of carbon dioxide and water vapour, as well as nitrogen, hydrogen, and other gases which may have included small proportions of ammonia and methane. The early atmosphere, therefore, is thought to have contained mainly CO₂ and water vapour. There was little or no oxygen present.
16	How Oxygen Increase and Carbon Dioxide Decreased
	<ul style="list-style-type: none"> Primitive plants and algae began photosynthesising which used up carbon dioxide from the atmosphere and released oxygen: $\text{Carbon dioxide} + \text{water} \rightarrow \text{glucose} + \text{oxygen}$ $6 \text{ CO}_2 + 6 \text{ H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6 \text{ O}_2$ Algae first evolved around 2.7 billion years ago and during the next billion years or so small green plants began to appear. As more and more plants began to appear the levels of oxygen began to increase which allowed for more complex life forms to evolve. When the water vapour in Earth's early atmosphere condensed large amounts of CO₂ dissolved in the oceans.

17	Greenhouse Gases and The Greenhouse Effect
	<ul style="list-style-type: none"> There are 3 main greenhouse gases in the atmosphere which are Carbon Dioxide, Methane and Water Vapour. When short wavelength radiation (e.g. ultraviolet radiation) from the sun strikes the Earth's surface, it is absorbed and re-emitted from the surface of the Earth as infrared radiation which has a longer wavelength Much of the radiation, however, is trapped inside the Earth's atmosphere by greenhouse gases which can absorb and store the energy <p>SOME HEATED MATTER ESCAPES THROUGH THE ATMOSPHERE INTO SPACE</p> <p>SOME HEAT IS CAPTURED BY GREENHOUSE GASES THAT DO NOT ESCAPE IN ALL DIRECTIONS AND SOME BECOMES TRAPPED WITHIN THE EARTH'S ATMOSPHERE. THE EARTH BECOMES WARMER AS A RESULT.</p> <p>THE SUN'S RAYS ENTER THE EARTH'S ATMOSPHERE</p> <p>ENERGY IS ABSORBED BY THE EARTH'S SURFACE AND IS RE-EMITTED AT LONGER WAVELENGTHS, SUCH AS INFRARED RADIATION (HEAT)</p>
18	Global Climate Change
	<ul style="list-style-type: none"> The vast majority of climate scientists agree that increasing levels of greenhouse gases are causing the average temperature of the Earth to increase. Temperature increases are leading to climate change. Other effects of climate change are: <ul style="list-style-type: none"> Rising sea levels Frequent and intense drought Storms Extreme heatwaves and rainfall
19	Atmospheric Pollutants
	<ul style="list-style-type: none"> The combustion of fossil fuels is the major source of atmospheric pollution. The burning of fossil fuels releases the gases carbon dioxide, carbon monoxide, oxides of nitrogen and oxides of sulfur. In addition, incomplete combustion of the fuels gives rise to unburned hydrocarbons and carbon particulates. Carbon monoxide is an extremely poisonous gas. Soot can lead to global dimming. Sulfur dioxide is responsible for acid rain.

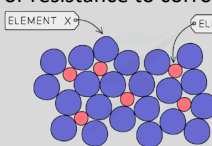
Year 11 Science Knowledge Organiser Spring Term – The Earth's Resources

Key Vocabulary:			10	Finite and Renewable Resources	13	Extracting Metals (HIGHER ONLY)
1	Desalination	The removal of salt from water. This is an energy-intensive process.		<ul style="list-style-type: none"> Natural resources are all around us and provide us with the materials we need for shelter, food, warmth and transport These resources can be: Living (plants and animals) or Non-living: (Minerals, fossil fuels, water and air). Renewable resources is those resources which can be replenished or replaced in a finite time in a human timescale. Finite or non-renewable resources are those that don't reform quickly enough or don't reform at all. 		<ul style="list-style-type: none"> Extraction of metal ores from the ground is only economically viable when the ore contains sufficiently high proportions of the useful metal, such as iron ores and aluminium ores. Phytoextraction and bioleaching (bacterial) are two relatively new methods of extracting metals that rely on biological processes. Phytomining
2	Distillation	A separation technique which involves a solution being heated so that the solvent evaporates before being cooled to form a pure liquid.				
3	Filtration	Debris such as pieces of soil and dirt, small pebbles, twigs, etc. are removed by a wire mesh screen. After this, other debris is filtered through sand beds and gravel.				
4	Finite Resources	Resource that can only be used once and is in limited supply. For example, oil is a finite resource.				
5	Life Cycle Assessment	An analysis of the overall environmental impact that a product may have throughout its lifetime.	11	Potable Water		
6	Potable Water	Water that is safe to drink.		<ul style="list-style-type: none"> The difference between pure water and potable water is that pure water is solely made up of H₂O molecules, whereas potable water may contain different substances, usually dissolved minerals and salts. Potable water should have the following characteristics: <ul style="list-style-type: none"> Have a pH between 6.5 and 8.5. The dissolved substances (e.g. salts) will be present in very small regulated quantities Be free of bacteria or potentially harmful microbes Two important steps in the process of water treatment are: filtration and sterilisation Where aquifers are not present and/or the collection of surface water is limited, the process of desalination must be used to provide potable water to the population Desalination involves the treatment of seawater to remove the salt by distillation or reverse osmosis, a process that involves the use of membranes. 	<ul style="list-style-type: none"> Bioleaching is a technique that makes use of bacteria to extract metals from metal ores. Some strains of bacteria are capable of breaking down ores to form acidic solutions containing metals ions such as copper(II). Although bioleaching does not require high temperatures, it does produce toxic substances which need to be treated so they don't contaminate the environment 	
7	Renewable Resources	Resources which will not run out in the foreseeable future. This could be because the reserves of the resources is huge, or because the current rate of extraction is low.				
8	Reverse Osmosis	A method of purifying water by forcing it under pressure through a membrane which has tiny holes in it. The molecules of water pass through the holes but most ions and molecules of dissolved substances do not pass through.				
9	Sterilisation	Ultraviolet light or ozone can be used to sterilise water or alternatively chlorine gas is bubbled through the water. This removes any dangerous bacteria or microbes	12	Treating Waste Water	14	Life Cycle Assessments (LCA's)
				<ul style="list-style-type: none"> When you run water down a drain, it passes through sewers and then finally to sewage treatment plants. 		<ul style="list-style-type: none"> A life cycle assessment is carried out using the data of a given product and the criteria of the assessment
					15	Reduce, Reuse and Recycle
						<ul style="list-style-type: none"> Everyday materials such as glass, metal, plastics, ceramics are produced from natural but finite sources. Some products made from these materials can be reused which saves energy and decreases the environmental impact. It is economically beneficial to recycle metals, especially those that are costly to extract such as aluminium. There are some disadvantages of recycling such as: Collection and transport of material to be recycled requires energy and fuel

Year 11 Science Knowledge Organiser Spring Term – Using Resources (TRIPLE ONLY)

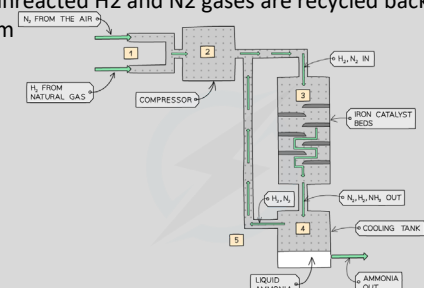
Key Vocabulary:		
1	Alloy	A mixture of two or more elements, at least one of which is a metal.
2	Barrier Method	Rust can be prevented by coating iron with barriers that prevent the iron from coming into contact with water and oxygen. Common barrier methods include: paint, oil, grease, and electroplating.
3	Composite	Materials made of two or more different materials, containing a matrix or binder surrounding and binding together fibres or fragments of another material which acts as the reinforcement.
4	Fertiliser	A nutrient added to the soil to increase the soil fertility.
5	Galvanised	Iron or steel objects that have been protected from rusting by a thin layer of zinc metal at their surface.
6	Haber Process	The industrial chemical process that makes ammonia by reacting nitrogen and hydrogen together.
7	Polymer	A substance made from very large molecules made up of many repeating units.
8	Reinforce-ment	Fibres or other material that make up the bulk of a composite material.
9	Reversible Reaction	A reaction in which the products can re-form the reactants.
10	Sacrificial Corrosion	Occurs when a more reactive metal is intentionally allowed to corrode.
11	Sacrificial Metal	A more reactive metal than iron, attached to an iron or steel object to prevent the object rusting.
12	Yield	The mass of product made in a chemical reaction. The percentage yield is a measure of the yield obtained compared to the maximum possible yield.

13	Rusting
	<ul style="list-style-type: none"> Oxygen and water must be present for rust to occur. Rusting is a redox process, and it occurs faster in salty water since the presence of sodium chloride catalyses the process. Rust is a soft solid substance that flakes off the surface of iron easily, exposing fresh iron below which then undergoes rusting. There are three rust prevention methods that can be used: Barrier Methods, Galvanising/ Sacrificial Protection and Sacrificial Corrosion.

14	Alloys
	<ul style="list-style-type: none"> Alloys are mixtures of metals where the metals are not chemically combined. Alloys often have properties that can be very different from the metals they contain, for example they can have more strength, hardness or resistance to corrosion or extreme temperatures. 

15	Polymers
	<ul style="list-style-type: none"> Polymers are poor conductors of heat and electricity, hence they are good thermal and electrical insulators These properties are extremely useful for insulating electrical wiring as they prevent electric shocks and overheating. Thermosoftening polymers consist of individual chains entwined with each other with weak intermolecular forces holding the polymer chains together. Thermosetting polymers on the other hand have strong cross-links between monomers on different polymer chains that hold the structure together.

16	Glass, Ceramics and Composites
	<ul style="list-style-type: none"> Due to their high melting points and thermal resistance, ceramics are used widely as a construction material as well as domestic appliances. These are made from two components: reinforcement and matrix. The reinforcement material is embedded in the matrix material which acts as a binder. Transparent and strong, glass insulates against heat and its transparency makes glass the ideal material for making windows.

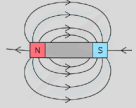
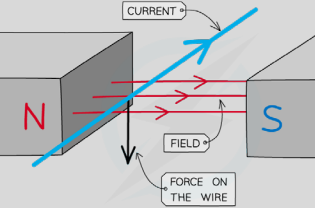
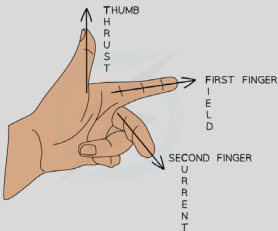
17	The Haber Process
	<ul style="list-style-type: none"> Stage 1: H₂ and N₂ gases are pumped into the compressor through pipes. Stage 2: The gases are compressed to about 200 atmospheres inside the compressor Stage 3: The pressurised gases are pumped into a tank containing layers of catalytic iron beads at a temperature of 450°C. Some of the hydrogen and nitrogen react to form ammonia N₂ (g) + 3 H₂ (g) ⇌ 2 NH₃ (g) Stage 4: Unreacted H₂ and N₂ and product ammonia pass into a cooling tank. The ammonia is liquefied and removed to pressurised storage vessels Stage 5: The unreacted H₂ and N₂ gases are recycled back into the system 

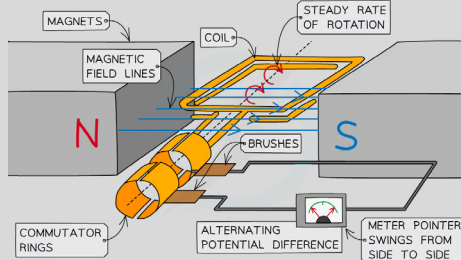
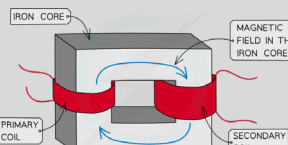
18	Making Fertilisers
	<ul style="list-style-type: none"> NPK fertilisers are formulations containing appropriate ratios of all three elements From these three essential elements: Nitrogen promotes healthy leaves, potassium promotes growth, healthy fruit and flowers and phosphorus promotes healthy roots Ammonia (NH₃) is an alkali and when it is involved in neutralisation reactions, it produces the ammonium ion (NH₄⁺) which is present in lots of fertilisers.

	Laboratory	Industrial
Equipment	Simple equipment needed, prepared using a titration apparatus	Hugely expensive and complex
Reactant concentration	Low concentrations, less heat given off	High concentrations, very exothermic reaction
Separation of product	Crystallisation is used which is a slow process	The heat produced is used to evaporate water from the reaction mixture to make very concentrated ammonium nitrate product

Year 11 Science Knowledge Organiser Spring Term – Electromagnetism

Key Vocabulary:		
1	Alternating Current (a.c.)	Electric current in a circuit that repeatedly reverses its direction.
2	Alternator *	An alternating current generator.
3	Direct Current (d.c.)	Electric current in a circuit that is in one direction only.
4	Dynamo *	A direct-current generator.
5	Electromagnet	An insulated wire wrapped round an iron bar that becomes magnetic when there is a current in the wire.
6	Electromagnetic Induction	The process of inducing a potential difference in a wire by moving the wire so it cuts across the lines of forces of a magnetic field.
7	Fleming's Left Hand Rule	A rule that gives the direction of the force on a current-carrying wire in a magnetic field according to the direction of the current in the field.
8	Induced Magnetism	Magnetisation of an unmagnetised magnetic material by placing it in a magnetic field.
9	Magnetic Field	The space around a magnet or a current-carrying wire.
10	Magnetic Flux Density	The measure of the strength of the magnetic field. $\text{Force} = \text{magnetic flux density} \times \text{current} \times \text{length}$
11	Motor Effect	When a current is passed along a wire in a magnetic field, and the wire is not parallel to the lines of the magnetic field a force is exerted on the wire by the magnetic field.
12	Solenoid	A long coil of wire that produces a magnetic field in and around the coil when there is a current in the coil.
13	Split-ring Commutator *	Metal contacts on the coil of a direct current motor that connects the rotating coil continuously to its electrical power supply.
14	Transformer	Electrical device used to change an (alternating) voltage.

COMBINED AND TRIPLE	
15	<p>Magnetic Fields</p> <ul style="list-style-type: none"> Magnetic field lines are used to represent the strength and direction of a magnetic field. When drawing magnetic field lines, they always go from north to south & never touch or cross other field lines. 
16	<p>Magnetic Fields of Electric Currents</p> <ul style="list-style-type: none"> When a current flows through a conducting wire a magnetic field is produced around the wire. The magnetic field lines around a wire are circles, centred on the wire in a plane perpendicular to the wire. Increasing the current makes the magnetic field stronger and reversing the direction of current reverses the magnetic field lines. An electromagnet is a solenoid that has an iron core, it consists of an insulated wire wrapped round an iron bar.
17	<p>The Motor Effect (HIGHER ONLY)</p> <ul style="list-style-type: none"> In the motor effect, the force is: <ul style="list-style-type: none"> Increased if the current or strength of the magnetic field or the length of the conductor is increased. Reversed if the direction of the current or magnetic field is reversed. An electric motor has a coil that turns when a current is passed through it.  
18	<p>Electromagnets in Devices</p> <ul style="list-style-type: none"> Electromagnets are used in scrapyards, circuit breakers, electric bells and relays. An electromagnet works in one of these devices by attracting an iron armature which opens a switch.

TRIPLE ONLY	
19	<p>The Generator Effect (TRIPLE HIGHER ONLY)</p> <ul style="list-style-type: none"> The generator effect is the opposite of the motor effect. Instead of using electricity to create motion, motion is being used to create electricity. When a conductor (such as a wire) is moved through a magnetic field, the wire cuts through the field's lines, this induces a potential difference in the wire. The size of the induced potential difference is determined <ul style="list-style-type: none"> By the speed at which the wire, coil or magnet is moved By the number of turns on the coils of wire By the size of the coils By the strength of the magnetic field
20	<p>The Alternating-Current Generator (TRIPLE HIGHER)</p> <ul style="list-style-type: none"> A simple a.c. generator is made up of a coil that spins in a uniform magnetic field. The waveform of the a.c. generator's induced potential difference is at its peak value when the sides of the coil cross directly through the magnetic field lines and its zero value when the sides of the coil move parallel to the field lines. 
21	<p>Transformers (TRIPLE HIGHER ONLY)</p> <ul style="list-style-type: none"> A basic transformer consists of a primary coil, a secondary coil and an iron core. Iron is used because it is easily magnetised. An alternating current is supplied to the primary coil The iron core is easily magnetised, so the changing magnetic field passes through it. As a result, there is now a changing magnetic field inside the secondary coil. This changing field cuts through the secondary coil and induces a potential difference. 

Year 11 Science Sprint Term Static Electricity (Triple Only)

Key Vocabulary:

1	Static Electricity	It's the movement of electrons from one insulator to another. The insulator that loses electrons becomes positively charged and the insulator that gains the electrons becomes negatively charged
2	Insulator	An electrical insulator does not easily allow electricity to pass through it
3	Earthing	Connecting a charged object to the ground using a conductor (e.g. copper wire) prevents build up of charge.

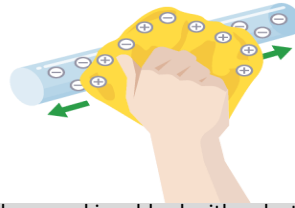
4 Static Electricity

Static electricity is all about charges which are not free to move. This causes them to build up in one place which leads to sparks or shocks when they finally do move.

Build up of static is caused by friction	When two insulating materials are rubbed together, electrons are scraped off one and dumped on the other. This leaves a positive static charge on one, and a negative static charge on the other.
Only electrons move	When electrons (negatively charged particles) move, ions form. Both positive and negative electrostatic charges form as a result.
Positive charges don't move	A positive charge is always caused by electrons being removed (so the positive charges don't move!)
Like charges repel	Two things with the same charge will repel each other.

5 Charging by Friction

When insulating materials rub against each other, they may become electrically charged. Electrons, which are negatively charged, may be 'rubbed off' one material and on to the other. The material that gains electrons becomes negatively charged. The material that loses electrons is left with a positive charge.



When a polythene rod is rubbed with a duster, the friction causes electrons to gain energy. Electrons gain enough energy to leave the atom and 'rub off' onto the polythene rod.

- the polythene rod has gained electrons, giving it a negative charge
 - the duster has lost electrons, giving it a positive charge
- If the rod is swapped for a different material such as acetate, electrons are rubbed off the acetate and onto the duster.

- the acetate rod has lost electrons, giving it a positive charge
- the duster has gained electrons, giving it a negative charge

Both the rods and the duster are made of insulating materials. Insulators prevent the electrons from moving and the charge remains static. Conductors, on the other hand, cannot hold the charge, as the electrons can move through them.

6 Examples of Static Electricity

A charged object will experience non-contact force from another charged object. The type of force will depend on the type of charge (positive or negative) on the two objects.

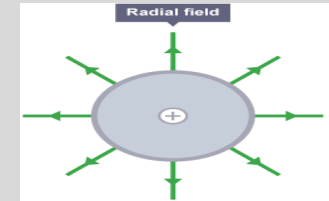
The properties of attraction and repulsion are often used to show that an object is charged:

- a charged rod can pick up small pieces of paper
- a charged balloon can stick to the wall by attraction
- a charged rod can pull a stream of water towards it

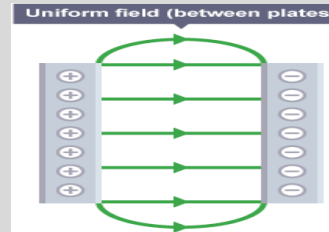
7 Electric Fields

All charged objects have an electric field around them, which shows how they will interact with other charged particles. An electric field is a region where charges experience a force. Fields are usually shown as diagrams with arrows:

- The direction of the arrow shows the way a positive charge will be pushed.
- The closer together the arrows are, the stronger the field and the greater the force experienced by charges in that field. This means that the field is stronger closer to the object.



With a radial field around a positive charge, other positive charges are repelled away. Therefore, the arrows are pointing away from the central positive charge. This is what happens with the example of the Van de Graaff generator. However, if a negative charge is placed in that field, it would attract the positive charge and feel a force in the opposite direction to the field lines.



A uniform magnetic field is shown by arrows pointing from a positively charged plate to a negatively charged plate.

- The field between two parallel plates, one positive and the other negative, would be a uniform field.
- The field lines would be straight, parallel and point from positive to negative.

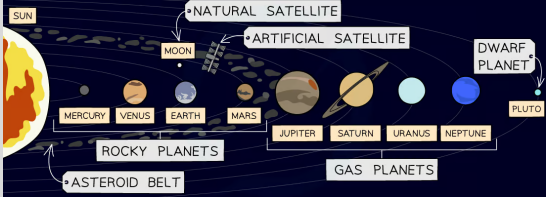
If the field is strong enough, charges can be forced through insulators such as air and a spark will occur. This is what happens during a lightning strike. It may also happen if a charged person touches a conductor. For example, a person dragging their feet across the carpet may become charged, so if they reach out to touch a door handle there is a spark and they feel a small shock.

Year 11 Science Knowledge Organiser – Space (TRIPLE ONLY)

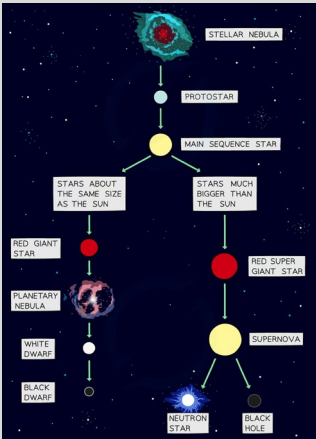
Key Vocabulary:		
1	Big Bang Theory	The theory that the universe was created in a massive explosion (The Big Bang) and that the universe has been expanding since.
2	Black Body Radiation	The radiation emitted by a perfect black body (a body that absorbs all the radiation that hits it)
3	Black Dwarf	A star that has faded out and gone cold.
4	Black Hole	An object in space that has so much mass that nothing, not even light, can escape from its gravitational field.
5	Centripetal Force	The resultant force towards the centre of a circle acting on an object moving in a circular path.
6	Dark Matter	Matter in a galaxy that cannot be seen. Its presence is deduced because galaxies would spin much faster if their stars were their only matter.
7	Neutron Star	The highly compressed core of a massive star that remains after a supernova explosion.
8	Protostar	The concentration of dust clouds and gas in space that forms a star.
9	Red Giant	A star that has expanded and cooled, resulting in it becoming red and much larger and cooler than it was before it expanded.
10	Red Supergiant	A star much more massive than the sun will swell out after the main sequence stage to become a red supergiant before it collapses.
11	Redshift	Increase in the wavelength of an electromagnetic waves emitted by a star or galaxy due to its motion away from us. The faster the speed of the star or galaxy, the greater the redshift is.
12	Supernova	The explosion of a massive star after fusion in its core ceases and the matter surrounding its core collapses on to the core and rebounds.
13	White Dwarf	A star that has collapsed from the red giant stage to become much hotter and denser.

14 **The Solar System**

- The Sun lies at the centre of the Solar System.
- There are 8 planets and an unknown number of dwarf planets which orbit the Sun.
- Some planets have moons which orbit them.
- Asteroids and comets also orbit the sun. An asteroid is a small rocky object which orbits the Sun.
- Comets are made of dust and ice and orbit the Sun in a different orbit to those of planets.



15 **Life History of a Star**

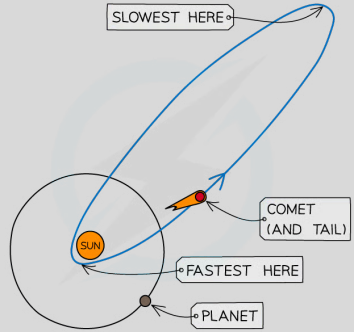


16 **Circular Orbits**

- There are many orbiting objects in our solar system and they each orbit a different type of planetary body.
- The gravitational force always acts towards the centre of the larger body.
- The gravitational force is the centripetal force as it will cause the body to move and maintain in a circular path.
- Planets travel around the Sun in orbits that are (approximately) circular. Objects in circular orbit are travelling at a constant speed.
- Objects that orbit in circular orbits are planets, moons and artificial satellites.

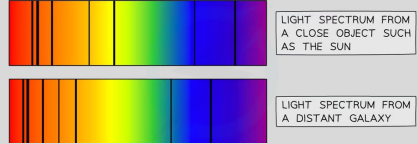
17 **Non-Circular Orbits**

- The orbits of comets are very different to those of planets:
- The orbits are highly elliptical (very stretched circles) or hyperbolic.
- This causes the speed of the comets to change significantly as its distance from the Sun changes.



18 **The Expanding Universe**

- If an object moves towards an observer the wavelength of light decreases. This is known as blueshift as the light moves towards the blue end of the spectrum.
- If an object moves away from an observer the wavelength of light increases. This is known as redshift as the light moves towards the red end of the spectrum.



19 **The Beginning and Future of the Universe**

- Around 14 billion years ago, the universe began from a very small region that was extremely hot and dense.
- Then there were a series of explosions, which we call the Big Bang.
- By observing the light spectrums from supernovae in other galaxies there is evidence to suggest that distant galaxies are receding (moving further apart) ever faster.
- Over the past two or three decades, astronomers have gathered plenty of evidence helping us to understand the universe much better.
- Measurements of the expansion of the Universe using supernovae suggest that the Universe is starting to expand at a faster rate.

Year Science Spring Term Knowledge Organiser – Variation and Evolution Combined Science

Key Vocabulary:

1	Variation	The differences between organisms. Can be caused by genes (e.g. eye colour), the environment (e.g. scars) or both the environment and genes (e.g. weight). All variation in genes is caused by mutations
2	Mutation	Mutations are changes in genes. Most have no effect on the phenotype. Occasionally mutations have a positive effect on phenotype and organisms with these mutations are more likely to survive.
3	Evolution	The change in the genes of a population over time. Occurs through natural selection.
4	Natural selection	The process by which the individuals best adapted to the environment survive and pass on their genes.
5	Speciation	Occurs when two populations are so different that they can no longer breed to produce fertile offspring. Two new species are formed.
6	Selective Breeding (Artificial Selection)	The process by which humans breed plants and animals for particular genetic characteristics.
7	Inbreeding	Selective breeding can lead to 'inbreeding' where some breeds are particularly prone to disease or inherited defects.
8	Genetic Engineering	Genetic engineering, also called genetic modification or genetic manipulation, is the modification and manipulation of an organism's genes using technology
9.	Evolution	A change in inherited characteristics over time due to natural selection.

10 Causes of variation

Individuals in a population are usually similar to each other, but not identical. Some of the **variation** within a **species** is **genetic**, some is environmental - the conditions in which they have developed and some is a combination of both. Examples of features that show environmental variation include:
 scars
 language and accent
 flower colour in hydrangeas as these plants produce blue flowers in **acidic** soil and pink flowers in **alkaline** soil
 Examples of genetic variation in humans include blood group, skin colour and natural eye colour.
 Whether you have lobed or lobeless ears is due to genetic causes.

11 Natural Selection

Natural selection is a process where organisms that are better adapted to an environment will survive and have more offspring. This means their genes are passed on to the future generations. This process is fundamental to the process of **evolution**.
 Charles Darwin was a famous English naturalist, who during his life came up with a theory of evolution. He is associated with the term 'survival of the fittest' which describes how natural selection works, by selecting the best examples of an organism to survive
 Darwin's Theory states

- There is always variation within a species
- There is competition for resources
- The best adapted (fittest) will survive and pass on their genes to the next generation.

12 Selective breeding

Selective breeding or artificial selection is when humans breed plants and animals for particular genetic characteristics. Humans have bred food crops from wild plants and domesticated animals for thousands of years
Process of selective breeding:

1. Choose parents with correct characteristics from the population.
2. Breed them together.
3. Choose the offspring with the desired characteristics and breed them together.
4. Continue over many generations.

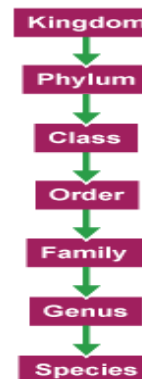
Examples of desired characteristics:

- Disease resistance in food crops.
- Animals which produce more meat or milk.
- Domestic dogs with a gentle nature.
- Large or unusual flowers.

13 Classification

Linnaean system of classification
 Living organisms are classified into groups depending on their structure and characteristics. This system was developed in the eighteenth century by Carl Linnaeus.
 The classification of species allows the subdivision of living organisms into smaller and more specialised groups.

Linnaeus's system of classification



Kids prefer candy over fresh green salad

The **binomial** system of naming species uses Latin words. Each name has two parts, the genus and the species

14 Genetic Engineering

The main steps of genetic engineering:
 Enzymes are used to isolate the required **gene**, this gene is inserted into a **vector**, which is usually a bacterial **plasmid** or a virus.
 The vector inserts the gene into required cells.
 The genes are transferred to animal, plant or microorganism cells, during early development. This allows them to develop with the desired characteristics.

Year Science Spring Term Knowledge Organiser Variation and Evolution Triple

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Kingdom-> Phylum-> Class-> Order-> Family-> Genus-> Species

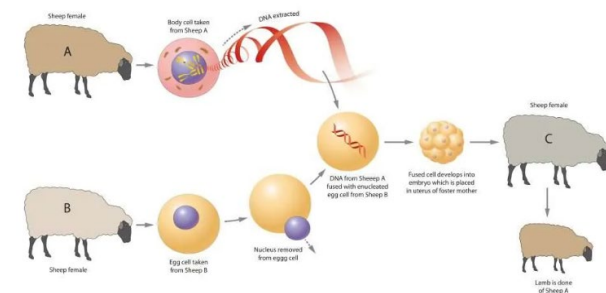
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14 Genetic Engineering

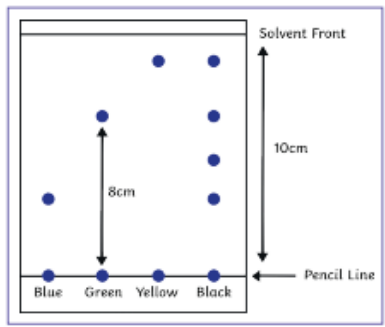
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The vector inserts the gene into required cells.
The genes are transferred to animal, plant or microorganism cells, during early development.
This allows them to develop with the desired characteristics.

15 Cloning



Year 11 Science Knowledge Organiser Spring Term – Chemical Analysis

Key Vocabulary:		
1	Chromatography	The process whereby small amounts of dissolved substances are separated by running a solvent along a material such as absorbent.
2	Data	Information, either qualitative or quantitative, that has been collected.
3	Flame Emission Spectroscopy	A method of instrumental analysis in which the light given off when a sample is placed in a flame produces a characteristic line spectra to identify and measure the concentration of metal ions in the sample.
4	Formulation	A mixture that has been designed as a useful product. <i>e.g. medicines, paint, cleaning products</i>
5	Impure Substance	A mixture of two or more different elements or compounds.
6	Mobile Phase	Phase in chromatography that moves, usually a solvent or mixture of solvents.
7	Pure Substance	Compounds or elements that only contain one element.
8	Stationary Phase	Phase in chromatography that does not move, for instance, the paper in chromatography.
9	Qualitative Data	Data that is descriptive or categorical.
10	Quantitative Data	Data that is numerical or a measurement.
11	Rf (retention factor) Value	$R_f = \frac{\text{distance moved by substance}}{\text{distance moved by solvent}}$

COMBINED AND TRIPLE	
12	Pure Substances and Mixtures <ul style="list-style-type: none"> You can use boiling points and melting points to identify pure substances. The melting points and boiling points of an element or a compound are called its fixed points. Pure substances have characteristic, specific temperatures that they melt and boil. The melting point and boiling point of a mixture will vary, depending on the composition of the mixture. A mixture does not have a sharp melting point or boiling point and impurities tend to lower the melting point of a substance and raise its boiling point.
13	Chromatography <ul style="list-style-type: none"> Paper chromatography is used to separate mixtures of soluble substances. (often coloured substances such as food colouring, ink, dyes or plant pigments) 
14	Testing for Gases <p>Test for Hydrogen Place a burning splint at the opening of a test tube. If hydrogen gas is present, it will burn rapidly with a squeaky-pop sound.</p> <p>Test for Oxygen Place a glowing splint inside a test tube. The splint will relight if oxygen is present.</p> <p>Test for Carbon Dioxide Limewater is used to test for the presence of carbon dioxide. When carbon dioxide is bubbled through or shaken with limewater, the limewater turns cloudy.</p> <p>Test for Chlorine Damp litmus paper is used to test for chlorine gas. The litmus paper becomes bleached and turns white.</p>

TRIPLE ONLY																																																			
15	Testing for Positive Ions <ul style="list-style-type: none"> When heated, metal ions produce a variety of coloured flames. Flame tests are used to identify the metal ion that is present and each metal ion produces a different coloured flame. <table border="1" data-bbox="1304 307 1903 471"> <thead> <tr> <th>Test Solution</th> <th>Metal Ion Present</th> <th>Colour of Flame</th> </tr> </thead> <tbody> <tr> <td>Lithium chloride</td> <td>Lithium Li⁺</td> <td>Crimson</td> </tr> <tr> <td>Sodium chloride</td> <td>Sodium Na⁺</td> <td>Yellow</td> </tr> <tr> <td>Potassium chloride</td> <td>Potassium K⁺</td> <td>Lilac</td> </tr> <tr> <td>Calcium chloride</td> <td>Calcium Ca²⁺</td> <td>Orange-Red</td> </tr> <tr> <td>Copper (II) chloride</td> <td>Copper Cu²⁺</td> <td>Green</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Metal ions can also be tested for with sodium hydroxide. <table border="1" data-bbox="1342 506 1864 792"> <thead> <tr> <th rowspan="2">Test Solution</th> <th rowspan="2">Metal Ion Present</th> <th colspan="2">Observation with sodium hydroxide</th> </tr> <tr> <th>Colour of Precipitate</th> <th>Does it dissolve in excess NaOH?</th> </tr> </thead> <tbody> <tr> <td>Magnesium sulfate, MgSO₄ (aq)</td> <td>Magnesium Mg²⁺</td> <td>White precipitate</td> <td>No</td> </tr> <tr> <td>Calcium chloride, CaCl₂ (aq)</td> <td>Calcium Ca²⁺</td> <td>White precipitate</td> <td>No</td> </tr> <tr> <td>Aluminium sulfate, Al₂(SO₄)₃ (aq)</td> <td>Aluminium Al³⁺</td> <td>White precipitate</td> <td>Yes</td> </tr> <tr> <td>Iron (II) sulfate, FeSO₄ (aq)</td> <td>Iron(II) Fe²⁺</td> <td>Green precipitate</td> <td>No</td> </tr> <tr> <td>Iron (III) chloride, FeCl₃ (aq)</td> <td>Iron(III) Fe³⁺</td> <td>Brown precipitate</td> <td>No</td> </tr> <tr> <td>Copper (II) sulfate, CuSO₄ (aq)</td> <td>Copper(II) Cu²⁺</td> <td>Blue precipitate</td> <td>No</td> </tr> </tbody> </table>			Test Solution	Metal Ion Present	Colour of Flame	Lithium chloride	Lithium Li ⁺	Crimson	Sodium chloride	Sodium Na ⁺	Yellow	Potassium chloride	Potassium K ⁺	Lilac	Calcium chloride	Calcium Ca ²⁺	Orange-Red	Copper (II) chloride	Copper Cu ²⁺	Green	Test Solution	Metal Ion Present	Observation with sodium hydroxide		Colour of Precipitate	Does it dissolve in excess NaOH?	Magnesium sulfate, MgSO ₄ (aq)	Magnesium Mg ²⁺	White precipitate	No	Calcium chloride, CaCl ₂ (aq)	Calcium Ca ²⁺	White precipitate	No	Aluminium sulfate, Al ₂ (SO ₄) ₃ (aq)	Aluminium Al ³⁺	White precipitate	Yes	Iron (II) sulfate, FeSO ₄ (aq)	Iron(II) Fe ²⁺	Green precipitate	No	Iron (III) chloride, FeCl ₃ (aq)	Iron(III) Fe ³⁺	Brown precipitate	No	Copper (II) sulfate, CuSO ₄ (aq)	Copper(II) Cu ²⁺	Blue precipitate	No
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Calcium chloride, CaCl ₂ (aq)	Calcium Ca ²⁺	White precipitate	No																																																
Aluminium sulfate, Al ₂ (SO ₄) ₃ (aq)	Aluminium Al ³⁺	White precipitate	Yes																																																
Iron (II) sulfate, FeSO ₄ (aq)	Iron(II) Fe ²⁺	Green precipitate	No																																																
Iron (III) chloride, FeCl ₃ (aq)	Iron(III) Fe ³⁺	Brown precipitate	No																																																
Copper (II) sulfate, CuSO ₄ (aq)	Copper(II) Cu ²⁺	Blue precipitate	No																																																
16	Testing for Negative Ions <p>Test for Carbonate (CO₃²⁻) ions Add dilute acid to a carbonate and deliver the gas into limewater. Limewater will turn milky/cloudy white if a carbonate ion is present.</p> <p>Test for Sulfate (SO₄²⁻) ions Add barium chloride followed by hydrochloric acid to sample. Positive result for sulfate ions will produce a white precipitate.</p> <p>Test for Halide (I-, Br-, Cl-) ions Add drops of dilute nitric acid then silver nitrate. Chloride produces a white precipitate, Bromide produces a cream precipitate and Iodide produces a yellow precipitate.</p>																																																		
17	Flame Emission Spectroscopy <p>The benefit of instrumental methods of analysis are that it is rapid, accurate and sensitive. Negatives of such methods are that it is expensive and requires special training. It is a technique that is used to identify metal ions in a solution.</p>																																																		

Year 11 Art and Design Spring Term Knowledge Organiser

Key Vocabulary:

1	The Formal Elements of Art	The formal elements of art are used to make a piece of artwork. The art elements are line, tone, texture, shape, pattern and colour. They are often used together, and how they are organised in a piece of art determines what the finished piece will look like.
2	A01	Development of ideas and understanding of different artists. This could include artist research, and analysis work, moodboards, reproductions of artists' work or use of these ideas in their own work.
3	A02	Refinement of skills and experimentation using materials and media. This could include drawing, painting, mixed media work, 3D work, edited photography and combination of materials together.
4	A03	Recording of skills using drawing, photography and annotation. This could include observational drawings, realistic photography and mind maps.
5	A04	Present a personal or final response/s. This is usually a final piece. This could include a final piece or concluded pieces of work in their preparatory work. The work must link to artists researched or on a chosen starting point.
6	Artist Research	Showing your understanding of an artist/s work or style and how they have influenced you.
7	Critical Understanding	Ability to analyse others artwork. Engaging with ideas, images and identifying how values and meanings are conveyed.
8	Annotation	Writing notes and descriptions besides work in order to understand what has been created, why and how work has progressed.
9	Artist Response	Showing your understanding of an artists work or style and how they have influenced you.

10	develop	Develop knowledge and ideas through research.
11	investigations	Research into other artists both through practical and written work.
12	sources	Primary sources: Gallery visits, interviews. Secondary sources: books and internet information.
13	media	Different materials.
14	annotation	Writing notes and descriptions beside your work in order to understand what it is you have created.
15	composition	The arrangement of lines colors and form.
16	reflect	Looking back at your work and deciding how you could improve something.

Year 11 DT Knowledge Organiser Theory - Spring Term

Key Vocabulary:

1	Contextual Challenges	All design and technology happens within a context. It is important for designers to understand the context they are designing within, as this will impact on the wants and needs of users as well as the requirements for the design.
2	Investigation of Needs and Research	Identify the need of the end user. Outline a design problem from the context provided and identify a need for a product that could solve the problem.
3	Exploration of Context and Research	The context of a study is important because it helps to clarify the meaning and relevance of the research, and can provide insight into the ways in which the findings might be applied in practice.
4	Market Research. Primary Research & Results	The term market research refers to the process of evaluating the viability of a new product through research conducted directly with potential customers.
5	Product Analysis	Investigate existing products to inform the product specification for the prototype, from past and present designers.
6	Design Brief and Specification	Production of a design brief, that address all needs previously identified. Production of a product specification that includes statement that are technical, measurable and justifiable.

Key Concepts

7. Design ideas

Communication of design ideas consider how designers develop, communicate, record and justify design ideas using a range of appropriate techniques such as: freehand sketching, schematic drawings, annotated drawings, exploded diagrams, working drawings, computer modelling and physical modelling.

Prototype development develop a knowledge and understanding of how the development of prototypes satisfy the requirements of the brief, respond to clients wants and needs, demonstrate innovation, functional and consider aesthetics.

Material management develop a knowledge and understanding of how to cut materials and minimize waste, the importance of planning the cutting and shaping of materials, how additional material may be removed by cutting methods, using appropriate marking out methods, data points and co-ordinates, quality assurance and quality control systems.

8. CAD/CAM

CAD (Computer Aided Design) is the use of a computer to help you visualise the product. CAD allows us to change the design quickly and allows the design to shared easily via email etc. Multiple people can be working on the same design and the same time making the process very efficient.

CAM (Computer Aided Manufacturing) It is important to remember that CAD can happen on its own because its just a design, but for CAM to occur, CAD must be involved. CAM is when machines (such as the laser cutter) produces the work that you have created using CAD. The process is to send your CAD design to the CAM machine, and with a few simple instructions the CAM machine will make the product or part.

9. Evaluation

The evaluation of your product often is left to the end, but you should evaluate your product at every stage in order to make alterations and corrections as you go.

It is useful to use a structure when evaluation such as a **SWOT analysis**. Using a SWOT analysis tool allows you to check all the main aspects of your product have been considered. A good evaluation DOES NOT only focus on the good parts of your product, but makes honest judgements that all you to make improvements next time, or as you go.

SWOT Evaluation Method

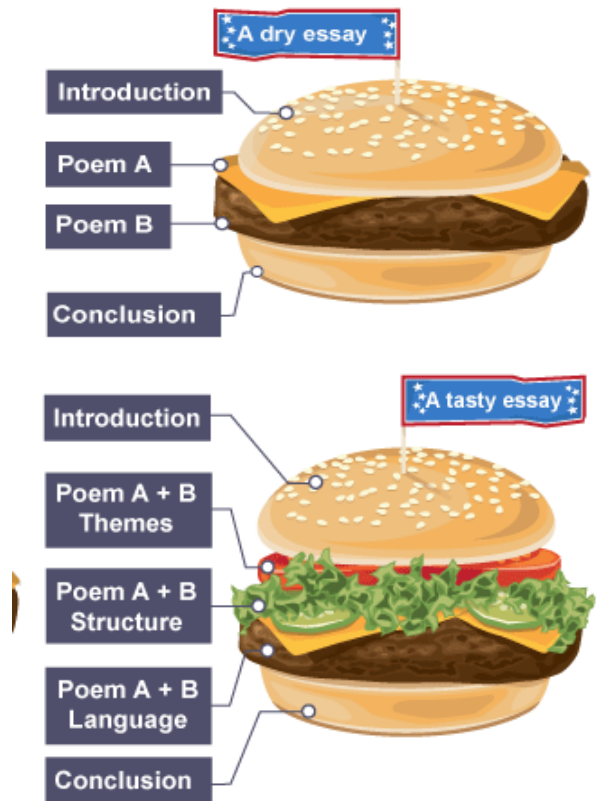


Year 11 Conflict Poetry Knowledge Organiser Spring Term

Key Vocabulary:			Poem Synopsis	
1	Caesura	Punctuation used in the middle of a line of poetry.	13. A Poison Tree	A <i>Poison Tree</i> is a short and deceptively simple poem about repressing anger and the <i>consequences</i> of doing so. The speaker tells of how they fail to communicate their <i>wrath</i> to their <i>foe</i> and how this continues to grow until it develops into poisonous hatred.
2	Enjambment	When a phrase or sentence runs over the end of one line and into the next.		
3	Stanza	A group of lines in a poem (similar to a paragraph).	14. Catrin	This poem, ' <i>Catrin</i> ', displays the love and turmoil in the parent-child relationship. This particular poem centres around a <u>conflict</u> that seems to have escalated into fury rather quickly. Through her use of <u>imagery</u> , the <u>speaker</u> is able to convey feelings of love and affection along with the frustration of dealing with the conflict that inevitably arises between the parent and the child.
4	Dramatic monologue	A form of poetry that is written like a speech and is spoken to an audience.		
5	Narrative	A form of poetry that tells a story		
6	Free verse	A poem that doesn't rhyme.	15. Cousin Kate	The <u>speaker</u> in ' <i>Cousin Kate</i> ' was lured away by a lord. Her whole life, she was taught that a woman's role was to obey men, especially a man in a position of authority. Thus, when the lord sought her out, it was natural for her to obey. Her cousin, Kate, watched the whole thing. Then, when the lord was tired of the speaker, he went after her cousin, Kate.
7	Rhyme scheme	A pattern of rhymed lines throughout the poem.		
8	Rhyming couplet	A pair of rhymed lines.	16. The Class Game	The 'Class Game' is a dramatic monologue addressed to an imagined middle-class listener. Casey's title suggests that class differences are just a game; however, it's a game that benefits people who see themselves as superior to the working class. Therefore, the poem challenges middle-class prejudice against the working class.
9	Anaphora	Repetition of a word or phrase at the beginning of a line of poetry.		
10	Form	The type of poem	17. No Problem	<i>No Problem</i> ' by Benjamin Zephaniah says that the poet is not a problem in a white-dominated society. It's their problem that they can't accept the poet as he is. His colour isn't the actual problem, it's the mindset that sees the only colour.
11	Metaphor	A comparison formed of tenor, vehicle and ground.		
12	Imagery	Descriptions that create a clear picture for the reader.	18. Half Caste	Half-Caste explores the use of the word "half-caste," a derogatory term referring to people of mixed race. This is done through an unidentified speaker who, in response to being deemed "half-caste," provides a very tongue-in-cheek exploration of what this descriptor actually means

19. The Prelude
The Prelude is a book-length autobiographical poem by William Wordsworth. It focuses on Wordsworth's spiritual development, which is often spurred on in the poem by the surrounding natural environment. In this early passage from *The Prelude*, the speaker recalls a night when he, as a young boy, steals a boat and rows out into the middle of a lake.

20. How to structure an essay.



Year 11 Unseen Poetry Knowledge Organiser Spring Term

Key Vocabulary:

1	Caesura	Punctuation used in the middle of a line of poetry.
2	Enjambment	When a phrase or sentence runs over the end of one line and into the next.
3	Stanza	A group of lines in a poem (similar to a paragraph).
4	Dramatic monologue	A form of poetry that is written like a speech and is spoken to an audience.
5	Narrative	A form of poetry that tells a story
6	Free verse	A poem that doesn't rhyme.
7	Rhyme scheme	A pattern of rhymed lines throughout the poem.
8	Rhyming couplet	A pair of rhymed lines.
9	Anaphora	Repetition of a word or phrase at the beginning of a line of poetry.
10	Form	The type of poem
11	Metaphor	A comparison formed of tenor, vehicle and ground.
12	Imagery	Descriptions that create a clear picture for the reader.

How to approach the question

13.	Step 1: Read the titles of the poems to decide what they are about.
14.	Step 2: Read both poems and write a short summary next to each one.
15.	Step 3: Highlight any key words and phrases that stand out.
16.	<p>Writing frame for answering the question: Both poems are on the topic of..... Poem 1 is about Whereas/ similarity, Poem 2 is about</p> <p>Both poets use lexical fields to present their ideas. In poem one the writer uses words such as, and which emphasise Equally/ In contrast, in poem two the writer uses words such as, and which emphasizes</p> <p>Both poets use language techniques to present their ideas. In poem 1, the writer uses the technique/s of, '.....' Here the writer is describing which gives the reader the impression that..... However/ Similarly, in poem 2 the writer uses the technique/s of, '.....' Here the writer is describing which now also gives the reader the impression that</p> <p>Both poets use different structural techniques to present the topic. In poem 1 the writer structures their poem with which could shows However in poem 2, the writer structures their poem with which could reflect</p>

17. Tips for answering questions

<p>PERSONIFICATION METAPHOR SIMILE ALLITERATED SOUND REPETITION CONTRAST ONOMATOPOEIA ASSONANCE</p>	<p>Look out for words that can have more than one meaning. What further ideas or images could they create?</p>	<p>Which specific emotion are you encouraged to feel as a result of the words used?</p>
<p>Identify the specific techniques that have been used in the text. Consider what impact they have upon the tone?</p>	<p>Analysing LANGUAGE could be...</p>	<p>Choose adjectives, adverbs, verbs and nouns to explode- how do these words suggest what the character or setting is like?</p>
<p>Consider the language a character uses in his or her speech. Is it timid? Authoritative? Apologetic? Something else? What might this reveal about their character?</p>	<p>Which words help you identify the tone or mood of the character? How do the words imply his or her feelings or attitude? What are the reasons why?</p>	<p>RHETORIC EMOTIVE LANGUAGE MOPAL VERBS DIRECT ADDRESS PREPOSITIONS IMPERATIVE VERBS HYPERBOLE</p>
<p>Narrative viewpoint Repeated symbols Sentence structure and punctuation Opening and Closing Semantic field Rhythm Timeframe</p>	<p>How the sentence structures or specific punctuation reflect feelings or emotions within the text. How does it change or develop?</p>	<p>Are there groups of words that belong to a particular semantic field? What difference does this make to the atmosphere of the text?</p>
<p>Considering how the <u>narrative choice</u> enhances the meaning of the text overall. WHY do we hear the 'story' from that perspective?</p>	<p>Analysing STRUCTURE could be...</p>	<p>Can you identify a rhythm to the text? Is it written in a particular style or form?</p>
<p>Analysing how a repeated symbol (motif), idea of theme runs through a whole text.</p>	<p>Looking at the <u>opening and closing</u> lines to see how they are connected. What impact do they have on the reader?</p>	<p>Is the timeline straightforward, or is there a flash back or flash forward? Does the event occur in the distant past, recent past or does it describe an ongoing event? Why would this matter?</p>

Y11 SPRING Knowledge Organiser Enterprise R069

Business Scenario – R068

Class Designs is a small business producing t-shirts. The business has been trading as a partnership for three years and is run by two partners. It produces and sells the t-shirts from a unit on a local business park. The business uses word-of-mouth and social media advertising to promote the t-shirts.

Class Designs is currently selling to customers in the local area only. The partners would like to increase brand awareness and sell the t-shirts nationwide. To grow the business a new website has been created that will accept online orders.

To help support the launch of the new website, Class Designs want to create a new range of t-shirt designs that they can sell on their new website. You have been asked to carry out market research to see what t-shirt designs customers would like. Using this information, they would like you to create a new t-shirt design.

1. Branding

A brand is an identity for a product and/or business. Brands help build a personality for a product or business; some brands are perceived as value for money, for example. Other brand personalities include being durable, luxurious, sporty or exciting

A brand can be created through a brand name, logo, sound (or jingle), strapline, characters or celebrity endorsement and brands often use a combination of these branding methods.

2. Brand Identity

In addition to a brand name and logo, the colour scheme a business uses, the font style they use and the placement of their logo can all help build their brand identity. Ask anyone to name a 'green colour supermarket brand' for example!

3. Why is branding used?

- A. Trust** – people often trust products that are branded compared to non-branded items.
- B. Brand recognition** – having a brand name and logo helps people recognise a product and/or business.
- C. Product image** – the perception of a product and/or business is often a result of branding.
- D. Differentiation** – having a brand can support a business's aim to be different to what's already on the market (it could convey this message through a strapline, for example).
- E. Adding value** – branded products are often priced higher than non-branded products.
- F. Customer loyalty** – it is often the case that people repeatedly buy the same brand of product, with branding helping to secure repeat purchases.

4. Competitor Analysis

When launching a new product, a business often looks at their competitors to find out what is already available on the market. Businesses look at their competitors' strengths, weaknesses, unique selling points and how their product idea is different to what brands already exist.

5. The External Environment

When developing new products, businesses often look at opportunities and threats that exist outside of the business itself (externally).

6. Economic Factors relating to the economy such as inflation and unemployment.	7. Social Trends in fashion, changes in taste and changing buying habits.
8. Technological Changes and advances in technology which can affect new product development.	9. Ethical The morals and values people have including environmental factors.

10. Promotional Objectives

A promotional campaign is a series of activities a business plans to help promote a product. The reason the business carries out a promotional campaign is known as their promotional objectives.

Promotional objectives could be:

- A. To raise awareness of a product or service
- B. To differentiate
- C. To create market presence
- D. To increase market share

11. Promotional Campaigns

The material used as part of a promotional campaign (such as a poster) must be appropriate for the product and the target customer profile.

A successful promotional campaign needs planning in advance with a clear timeframe for the whole campaign and each activity within the campaign. Promotional campaigns also need to be reviewed so, beforehand, a business will identify what they think will be the outcomes if the campaign is to be considered a success; these are known as key performance indicators (KPIs).

Business Scenario – R069

Pitching your product proposal

You are a product designer and you have carried out market research to create a new product design which you want to bring to market.

You are now ready to develop a brand for your product, make recommendations as to how to promote it, and prepare a pitch to show an audience that your product proposal will be successful if introduced to the market.

Your pitch will include:

- Your product design.
- Your brand personality.
- Your pricing recommendation.
- Your proposed promotional campaign.
- Any other relevant information from your findings in R068.

12. Professional Pitches

A professional pitch is a presentation of

a new product or service to an audience, similar to those you see on Dragon's Den. When someone prepares a professional pitch, they consider a number of factors beforehand:

The objectives

The objectives of the pitch are to inform the audience or to persuade the audience. This influences the presenter's style and language used.

The audience

The presenter needs to be aware of who they are pitching their ideas to, tailoring the content and style of pitch to match.

The venue

A suitable venue needs to be selected based on size, layout and equipment.

Media/materials

The type of media (such as a presentation) used will be considered beforehand.

Personal Appearance

The presenter needs to consider their appearance and ensure it suits the style of pitch being delivered (formal).

Pitch Structure

Considering the order in which the pitch will be presented is an important factor;

starting with an introduction, ending with a conclusion and with logically sequenced information.

Use of Visual Aids

Including presentations and video clips.

Audience Questions

Presenters often plan answers to audience questions before their pitch.

Year 11 GCSE Geography Spring Term Knowledge Organiser Changing Economic World Part 2

Key Vocabulary:

1	Economic	This is progress in economic growth through levels of industrialisation and use of technology.
2	Social	This is an improvement in people's standard of living. For example, clean water and electricity.
3	Environmental	This involves advances in the management and protection of the environment.
4	Gross Domestic Product per capita	This is the total value of goods and services produced in a country per person, per year.
5	Infant mortality	The number of children who die before reaching 1 per 1000 babies born.
6	Human Development Index (HDI)	A number that uses life expectancy, education level and income per person.
7	LICs	Poorest countries in the world. GNI per capita is low and most citizens have a low standard of living.
8	NEEs	These countries are getting richer as their economy is progressing from the primary industry to the secondary industry. Greater exports leads to better wages.
9	HICs	These countries are wealthy with a high GNI per capita and standards of living. These countries can spend money on services.

Consequences, ways of reducing economic gap and case studies

10	Consequences of Uneven Development
Levels of development are different in different countries. This uneven development has consequences for countries, especially in wealth, health and migration.	
<ul style="list-style-type: none"> • Wealth: People in more developed countries have higher incomes than less developed countries. • Health: Better healthcare means that people in more developed countries live longer than those in less developed countries. • Migration: If nearby countries have higher levels of development or are secure, people will move to seek better opportunities and standard of living. 	
11	Case Study: Economic Development in Nigeria
Location & Importance: Nigeria is a NEE in West Africa. Nigeria is just north of the Equator and experiences a range of environments. Nigeria is the most populous and economically powerful country in Africa. Economic growth has been based on oil exports.	
12	Influences upon Nigeria's development
<ul style="list-style-type: none"> • Political: Suffered instability with a civil war between 1967-1970. From 1999, the country became stable with free and fair elections. Stability has encouraged global investment from China and USA. • Social: Nigeria is a multi-cultural, multifaith society. Although mostly a strength, diversity has caused regional conflicts from groups such as the Boko Haram terrorists. • Cultural: Nigeria's diversity has created rich and varied artistic culture. The country has a rich music, literacy and film industry (i.e. Nollywood). A successful national football side. • Industrial Structures: Once mainly based on agriculture, 50% of its economy is now manufacturing and services. A thriving manufacturing industry is increasing foreign investment and employment opportunities • The role of TNCs: TNCs such as Shell have played an important role in its economy. + Investment has increased employment and income. - Profits move to HICs. - Many oil spills have damaged fragile environments. • Changing Relationships: Nigeria plays a leading role with the African Union and UN. Growing links with China with huge investment in infrastructure. Main import includes petrol from the EU, cars from Brazil and phones from China. • Environmental Impacts: The 2008/09 oil spills devastated swamps and its ecosystems. Industry has caused toxic chemicals to be discharged in open sewers - risking human health. 80% of forest have been cut down. This also increases CO² emissions. • Aid & Debt relief: + Receives \$5billion per year in aid. + Aid groups (ActionAid) have improved health centres, provided anti-mosquito nets and helped to protect people against AIDS/HIV. - Some aid fails to reach the people who need it due to corruption • Effects of Economic Development: Life expectancy has increased from 46 to 53 years. 64% have access to safe water. Typical schooling years has increased from 7 to 9. 	

The Demographic Transition Model

13	Reducing the Global Development Gap
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The demographic transition model (DTM) shows population change over time. It studies how birth rate and death rate affect the total population of a country

STAGE 1 High DR High BR Steady e.g. Tribes
 STAGE 2 BR Low Declining DR Very High e.g. Kenya
 STAGE 3 Rapidly falling DR Low BR High e.g. India
 STAGE 4 Low DR Low BR Zero e.g. UK
 STAGE 5 Slowly Falling DR Low BR Negative e.g. Japan

14	Economic change in the UK
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The UK has one of the largest economies in the world. The UK has huge political, economic and cultural influences. The UK is highly regarded for its fairness and tolerance. The UK has global transport links i.e. Heathrow and the Eurostar.

- **Causes of Economic Change:** De-industrialisation and the decline of the UK's industrial base. Globalisation has meant many industries have moved overseas, where labour costs are lower. Government investing in supporting vital businesses
- **Towards Post-Industrial:** The quaternary industry has increased, whilst secondary has decreased. Numbers in primary and tertiary industry has stayed the steady. Big increase in professional and technical jobs.
- Development of Science Parks
- North-South Divide
- Improvements to transport

Year 11 GCSE Geography Spring Term Knowledge Organiser Changing Economic World



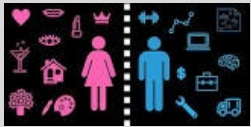
Key Vocabulary:			Causes of uneven development		Consequences, ways of reducing economic gap and case studies	
1	Economic	This is progress in economic growth through levels of industrialisation and use of technology.	10	What are they? Development is globally uneven with most HICs located in Europe, North America and Oceania. Most NEEs are in Asia and South America, whilst most LICs are in Africa. Remember, development can also vary within countries too.	13	Reducing the Global Development Gap
2	Social	This is an improvement in people's standard of living. For example, clean water and electricity.	11	Physical factors affecting uneven development: <ul style="list-style-type: none"> • Natural resources: Fuel sources such as oil. • Minerals and metals for fuel. • Availability for timber. • Access to safe water. • Natural Hazards: Risk of tectonic hazards. • Benefits from volcanic material and floodwater. • Frequent hazards undermines redevelopment. • Climate: Reliability of rainfall to benefit farming. • Extreme climates limit industry and affects health. • Climate can attract tourists. • Location/terrain: Landlocked countries may find trade difficulties. • Mountainous terrain makes farming difficult. • Scenery attracts tourists 	<ul style="list-style-type: none"> • Microfinance Loans: This involves people in LICs receiving small loans from traditional banks. + Loans enable people to begin their own businesses - Its not clear they can reduce poverty at a large scale. • Foreign-direct investment: This is when one country buys property or infrastructure in another country. + Leads to better access to finance, technology & expertise. - Investment can come with strings attached that country's will need to comply with • Aid: This is given by one country to another as money or resources. + Improve literacy rates, building dams, improving agriculture. - Can be wasted by corrupt governments or they can become too reliant on aid. • Debt relief: This is when a country's debt is cancelled or interest rates are lowered. + Means more money can be spent on development. - Locals might not always get a say. Some aid can be tied under condition from donor country. • Fair trade: This is a movement where farmers get a fair price for the goods produced. + Paid fairly so they can develop schools & health centres. -Only a tiny proportion of the extra money reaches producers. • Technology: Includes tools, machines and affordable equipment that improve quality of life. + Renewable energy is less expensive and polluting. - Requires initial investment and skills in operating technology 	
3	Environmental	This involves advances in the management and protection of the environment.	12	Human factors affecting uneven development: <ul style="list-style-type: none"> • Aid: Aid can help some countries develop key projects for infrastructure faster. • Aid can improve services such as schools, hospitals and roads. • Too much reliance on aid might stop other trade links becoming established. • Trade: Countries that export more than they import have a trade surplus. This can improve the national economy. • Having good trade relationships. • Trading goods and services is more profitable than raw materials. • Education: Education creates a skilled workforce meaning more goods and services are produced. • Educated people earn more money, meaning they also pay more taxes. This money can help develop the country in the future. • Health: Lack of clean water and poor healthcare means a large number of people suffer from diseases. • People who are ill cannot work so there is little contribution to the economy. • More money on healthcare means less spent on development. • Politics: Corruption in local and national governments. • The stability of the government can effect the country's ability to trade. • Ability of the country to invest into services and infrastructure. • History: Colonialism has helped Europe develop, but slowed down development in many other countries. • Countries that went through industrialisation a while ago, have now develop further. 		
4	Gross Domestic Product per capita	This is the total value of goods and services produced in a country per person, per year.				
5	Infant mortality	The number of children who die before reaching 1 per 1000 babies born.				
6	Human Development Index (HDI)	A number that uses life expectancy, education level and income per person.				
7	LICs	Poorest countries in the world. GNI per capita is low and most citizens have a low standard of living.			14	CS: Reducing the Development Gap In Jamaica Location and Background: Jamaica is a LIC island nation part of the Caribbean. Location makes Jamaica an attractive place for visitors to explore the tropical blue seas, skies and palm filled sandy beaches Tourist economy: -In 2015, 2.12 million visited. -Tourism contributes 27% of GDP and will increase to 38% by 2025. -130,000 jobs rely on tourism. -Global recession 2008 caused a decline in tourism. Now tourism is beginning to recover. Multiplier effect: -Jobs from tourism have meant more money has been spent in shops and other businesses. -Government has invested in infrastructure to support tourism. -New sewage treatment plants have reduced pollution. Developmental problems: Tourists do not always spend much money outside their resorts. - Infrastructure improvements have not spread to the whole island. - Many people in Jamaica still live in poor quality housing and lack basic services such as healthcare.
8	NEEs	These countries are getting richer as their economy is progressing from the primary industry to the secondary industry. Greater exports leads to better wages.				
9	HICs	These countries are wealthy with a high GNI per capita and standards of living. These countries can spend money on services.				





A - Factors that affect health and wellbeing

Key Vocabulary:

1	Physical	Things that affect a persons body and how it functions
2	Lifestyle	Choices a person makes everyday
3	Cultural	Relating to the ideas, customs, and social behaviour of a society
4	Social	Interactions with others and affect on growth and development
5	Economic	How a persons job or income can affect on growth and development
6	Environmental	Growth and development can be affected by where someone lives and who they live with
7	Circumstances	The conditions and facts that are connected with and affect a situation, an event or an action
8	Changes	An act or process through which something becomes different
9	Events	A thing that happens or takes place, especially one of importance

A1 Factors affecting health and wellbeing

10	<p>Definition of health and wellbeing:</p> <p>A combination of physical health and social and emotional wellbeing, and not just the absence of disease or illness.</p>
11	<p>Physical Factors</p> <ul style="list-style-type: none"> - inherited conditions - physical ill health - mental ill health - physical abilities 
12	<p>Social Factors</p> <ul style="list-style-type: none"> - supportive and unsupportive relationships - inclusion & exclusion - Bullying - discrimination. 
13	<p>Cultural Factors</p> <ul style="list-style-type: none"> - Religion - gender roles, identity and expectations - sexual orientation - Community 

14	<p>Lifestyle Factors</p> <ul style="list-style-type: none"> - Nutrition - physical activity - Smoking - Alcohol - Substance misuse 
15	<p>Economic Factors</p> <ul style="list-style-type: none"> - employment situation - financial resources – income, inheritance, savings 
16	<p>Environmental Factors</p> <ul style="list-style-type: none"> - housing needs, conditions, location - exposure to pollution – air, noise and light - home environment 
17	<p>The impact on physical, intellectual, emotional and social health and wellbeing of different types of life event:</p> <ul style="list-style-type: none"> - physical events - relationship changes - life circumstances 

B - Interpreting health indicators

Key Vocabulary:

1	Physiological indicators	Used to measure how well a person's body is functioning
2	Measure	The extent, quantity, amount, or degree of something, as determined by measurement or calculation
3	Lifestyle	Choices a person makes everyday
4	Interpret	Explain the meaning of something/findings
5	Data	Facts and statistics collected together for reference or analysis
6	Heart rate	Your heart rate (also known as your pulse rate) is the number of times your heart beats per minute (bpm).
7	Nutrition	The process of providing or obtaining the food necessary for health and growth
8	BMI	The body mass index (BMI) is a measure that uses your height and weight to work out if your weight is healthy.
9	Blood Pressure	The force of circulating blood on the walls of the arteries

B1 Physiological indicators

10 Resting Heart Rate

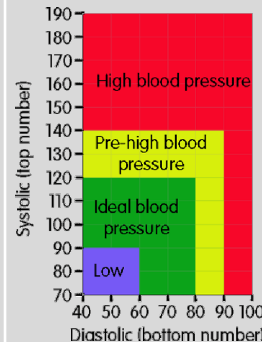
A resting heart rate chart shows the normal range for resting heart rate by age and physical condition. The average heart rate generally increases with age. But many factors determine your heart rate at any moment. These factors include the time of day, activity, and stress level.

Men (beats per minute)							
Age	18-25	26-35	36-45	46-55	56-65	65+	
Athlete	49-55	49-54	50-56	50-57	51-56	50-55	
Excellent	55-61	55-61	57-62	58-63	57-61	56-61	
Great	62-65	62-65	63-66	64-67	63-67	62-65	
Good	66-69	65-70	67-70	68-71	68-71	66-69	
Average	70-73	71-74	71-75	72-76	72-75	70-73	
Below Average	74-81	75-81	76-82	77-83	76-81	74-79	
Poor	82+	82+	83+	84+	82+	80+	

Women (beats per minute)							
Age	18-25	26-35	36-45	46-55	56-65	65+	
Athlete	54-60	54-59	54-59	54-60	54-59	54-59	
Excellent	61-65	60-64	60-64	61-65	60-64	60-64	
Great	66-69	65-68	65-69	66-69	65-68	65-68	
Good	70-73	69-72	70-73	70-73	69-73	69-72	
Average	74-78	73-76	74-78	74-77	74-77	73-76	
Below Average	79-84	77-82	79-84	78-83	78-83	77-84	
Poor	85+	83+	85+	84+	84+	83+	

11 Blood Pressure

Systolic blood pressure. This is the first, or top, number. This is the highest level your blood pressure reaches when your heart beats, forcing blood around your body. Diastolic blood pressure. The second number, or bottom number, is the lowest level your blood pressure reaches as your heart relaxes between beats.



12 Body Mass Index (BMI)

It's an estimate of how much body fat a person has, and it's calculated by dividing a person's weight in kilograms by his or her height in square meters.



B2 Lifestyle indicators

13 Nutrition

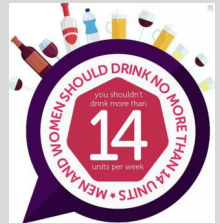
The Eatwell guide shows what kind of foods you should eat, and in what proportions, to have a healthy and balanced diet and more sustainable food.



14 Alcohol

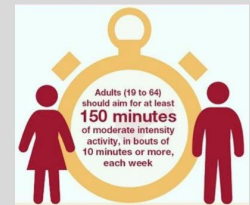
The Chief Medical Officers' guideline for both men and women is that:

- You are safest not to drink regularly more than 14 units per week.
- If you do drink as much as 14 units per week, it is best to spread this evenly over 3 days or more.



15 Physical Activity

The UK Chief Medical Officers' Guidelines recommend each week adults do: at least 150 minutes moderate intensity activity, 75 minutes' vigorous activity, or a mixture of both. strengthening activities on two days.



16 Smoking

Smoking substantially increases the risk of heart disease, strokes, many cancers, dementia and lung disease among others. It harms those around the smoker, including children and unborn babies.



17 Substance misuse

People with addiction often have one or more associated health issues, which could include lung or heart disease, stroke, cancer, or mental health conditions.



C - Person-centred approach to improving health and wellbeing

Key Vocabulary:		
1	Person-centred	Allowing users to be involved in their own care.
2	Recommendations	A suggestion or proposal as to the best course of action
3	Support	Give assistance to someone
4	Barriers	Prevent an individual from accessing a service
5	Obstacles	Something relating to an individual that stops them from receiving care or makes receiving care difficult
6	Overcome	Succeed in dealing with
7	Improve	Make or become better
8	Unique	Everyone has their own needs that are different
9	Benefits	A helpful or good effect

C1 Person-centred approach	
10	<p>The ways in which a person-centred approach takes into account an individual's:</p> <ul style="list-style-type: none"> - needs: to reduce health risks - wishes: their preferences and choices - circumstances: to include age, ability, location, living conditions, support, physical and emotional health
11	<p>The importance of a person-centred approach for individuals:</p> <ul style="list-style-type: none"> - makes them more comfortable with recommendations, advice and treatment - gives them more confidence in recommendations, advice and treatment - ensures their unique and personal needs are met - increases the support available to more vulnerable individuals - improves their independence - they are more likely to follow recommendations/actions to improve their health - they are more motivated to behave in ways that positively benefit their health - they feel happier and more positive about their health and wellbeing
12	<p>The benefits of a person-centred approach for health and social care workers and services:</p> <ul style="list-style-type: none"> - it improves job satisfaction for health and social care workers - it saves time for health and social care services - it saves money for health and social care services - it reduces complaints about health and social care services and workers.

C2 Recommendations and actions to improve health and wellbeing					
13	<p>Established recommendations for helping to improve health and wellbeing:</p> <ul style="list-style-type: none"> - improving resting heart rate and recovery rate after exercise - improving blood pressure - maintaining a healthy weight - eating a balanced diet - getting enough physical activity - quitting smoking - sensible alcohol consumption - stopping substance misuse 				
14	<p>Support available when following recommendations to improve health and wellbeing:</p> <ul style="list-style-type: none"> - formal support from professionals, trained volunteers, support groups and charities - informal support from friends, family, neighbours, community and work colleagues 				
C3 Barriers and obstacles to following recommendations					
16	<table border="1"> <thead> <tr> <th>Definition of barriers:</th> <th>Definition of obstacles:</th> </tr> </thead> <tbody> <tr> <td>Something unique to the health and social care system that prevents an individual accessing a service.</td> <td>Something personal to an individual that blocks a person moving forward or when action is prevented or made difficult.</td> </tr> </tbody> </table>	Definition of barriers:	Definition of obstacles:	Something unique to the health and social care system that prevents an individual accessing a service.	Something personal to an individual that blocks a person moving forward or when action is prevented or made difficult.
Definition of barriers:	Definition of obstacles:				
Something unique to the health and social care system that prevents an individual accessing a service.	Something personal to an individual that blocks a person moving forward or when action is prevented or made difficult.				
17	<p>Potential barriers as appropriate to the individual and the recommendation:</p> <ul style="list-style-type: none"> - physical barriers - barriers to people with sensory disability - barriers to people with different social and cultural backgrounds - barriers to people that speak English as an additional language or those who have language or speech impairments - geographical barriers - resource barriers for service provider - financial barriers <p>Potential obstacles as appropriate to the individual and the recommendation:</p> <ul style="list-style-type: none"> - emotional/psychological - availability of resources - time constraints - unachievable targets - lack of support. 				

Year 11 GCSE History Spring Term Knowledge Organiser Hitler's Rise to Power 1919-1933

Key Vocabulary:			Early development of the Nazi Party and the Lean Years		Growth in Support and how Hitler becomes chancellor		
1	NSDAP	Nazi Party	16	German Workers' Party		20	The growth in support for the Nazis 1929-32
2	25 Point Programme	The political manifesto of the Nazi Party	1919 – Hitler joined the German Worker's Party (DAP), a right-wing group led by Anton Drexler. 1920: Hitler the leading public speaker/ propagandist. 1920 – Changes name to National Socialist German Workers Party (NSDAP) – or Nazis for short. 1921 – Hitler was elected leader of the Nazis 1923- Nazi Party had 55,000 members		The Wall Street stock market in America crashed so the US could no longer prop up the German economy and recalled their loans. So the German economy collapsed and Germany entered the Great Depression so by Feb 1932 6 million people were unemployed. Weak opposition: The government's response to the economic crisis was not popular with Germans. For example, unemployment benefits and wages were cut while taxes increased. Everyday life became hard. The government starting using article 48 and became less democratic. Appeal of the Nazis: Promised to solve the problems of the depression (e.g. create jobs, get rid of ToV), used communists and Jews as scapegoats for all of Germany's problems. Hitler was a powerful public speaker and was charismatic. The SA were strong and intimidated the communists which appealed to those who feared the increase in support for the Communists after the Wall Street Crash. Nazi Propaganda: used new technology such as radio and planes and Joseph Goebbels was the chief of propaganda, used clear simple appealing messaging on their propaganda posters		
3	Swastika	Emblem of the Nazi Party	17	Features of the Nazi Party		21	How Hitler becomes Chancellor 1932-33:
4	SA or Sturmabteilung	Private army of the Nazi Party headed by Himmler	Key Nazi beliefs contained in the 25 Point Programme: A strong Germany - the Treaty of Versailles should be abolished and all German-speaking people united in one country. Führer - the idea that there should be a single leader with complete power rather than a democracy . Social Darwinism - the idea that the Aryan race was superior and Jews were 'subhuman'. Autarky - the idea that Germany should be economically self-sufficient. That Germany was in danger - from communists and Jews, who had to be destroyed. Lebensraum - the need for 'living space' for the German nation to expand. SA also very important Their nickname was the Brownshirts and their role was to protect party meetings and intimidate political opponents by breaking up their meetings		1932 April – Presidential election. Hitler (37%) came second to Hindenburg (53%), May – Brüning resigned as Chancellor. Hindenburg appointed Franz Von Papen, a conservative, as his replacement. July – Reichstag elections. The Nazis became the largest party with 230 seats. Hitler demanded to be made Chancellor but Papen remained. November – Reichstag elections called by Von Papen to try to win a majority in parliament. Nazis lost 34 seats but remained the largest party with 196 seats. December – Von Papen resigned. Hindenburg appointed Kurt Von Schleicher as Chancellor. Von Schleicher tried to split the Nazis by asking a leading Nazi called Gregor Strasser to be his Vice Chancellor. Hitler forced Strasser to decline. 1933 January – Von Papen and Hindenburg turned to Hitler, appointing him as Chancellor with Von Papen as Vice Chancellor. They believed they could control Hitler and get him to do what they wanted		
5	Aryan	Pure German people	18	Munich Putsch (1923):		During the Hyperinflation crisis Hitler saw an opportunity to seize power and he also wanted to copy Mussolini. Even though a failure and the Nazi Party banned, Hitler was given a lenient prison sentence, he gained publicity, he wrote Mein Kampf and he realised that if he was to win power, he needed to do this by votes and not by force.	
6	Anti-Semitism	Hatred of the Jewish people	19	The Lean Years (1923-29):		The Nazis lacked working class support (they tended to vote for the communists), it was a time of peace and prosperity (Stresemann had solved many of Germany's problems) and the Nazis ideas were too extreme (SA were very violent). Hitler did take the time to strengthen his authority, he also began building a national party structure to attract members and develop policies and campaign	
7	Mein Kampf	Hitler's autobiography					
8	Putsch	An attempt to get power illegally					
9	Blood Martyrs	16 Nazis who died at the Munich Putsch					
10	SS or Schutzstaffel	Hitler's bodyguards					
11	KPD	German Communist Party					
12	coalition	A government of two or more political parties.					
13	Propaganda	Goebbels attempted to make people think in a certain way					
14	Hindenburg	The currency of Germany after November 1923					
15	Hyperinflation	The President of the Republic from 1925 to 1934					

Year 11 GCSE History Spring Term Knowledge Organiser The Weimar Republic 1918-29

Key Vocabulary:			Origins and challenges of the Weimar Republic		Recovery and changes in society	
1	Abdication	When a monarch leaves the throne	16	End of the War	21	Stresemann and the economy
2	Republic	A country without a King or a Queen	Losing the war was a shock for Germany and the Kaiser abdicated. Germany was humiliated, faced psychological problems, political problems, anarchy and poor conditions in Germany due to lack of food. The Weimar Republic was set up but faced much opposition, It was disliked by the left wing who wanted Germany to be like Communist Russia and it was disliked by the right wing who wanted the monarchy back.		Stresemann solves hyperinflation by destroying the old money and printing the Rentenmark, helps rebuild the economy by getting loans from the US (Dawes Plan 1924) and decreasing the amount of reparations by 20% (Young Plan 1929). However these were short term solutions e.g. Germany became dependant on the USA, unemployment never fell below 1 million people, middle class never recovered their savings	
3	Armistice	An agreement to end war	17	Stabbed in the Back by the Treaty of Versailles	22	Stresemann and international relations:
4	Treaty of Versailles	The peace agreement that Germany was forced to sign at the end of WW1	Germans felt they should have won the war and felt they had been stabbed in the back by their politicians who signed the humiliating Treaty of Versailles. In the Treaty Germany was blamed for WW1 (Article 231), forced to pay reparations of £6.6 billion, reduced their army to 100,000 & lost 13% of land.		Stresemann improves relations with other countries by signing the Locarno Pact (1925 agreement to keep borders) and joining the League of Nations (1926) and the Kellogg Briand Pact. (1928 agreement to solve problems peacefully)	
5	Diktat	An enforced peace	18	Weimar Constitution:	23	Changes for workers:
6	Reparations	Money Germany was forced to pay to the Allies as compensation for WW1	Advantages: <ul style="list-style-type: none"> All people over 18 can vote 75% of the Reichstag must agree for the constitution to be changed Article 48 allows quick actions in a crisis Disadvantages: <ul style="list-style-type: none"> most governments were formed with a coalition which caused arguments Article 48 could be used to make a dictatorship Laws were not easily passed as a number of parties had to agree for it to be voted through 		Hourly wages rose every year from 1924 to 1929 and by 10 per cent in 1928 alone. Generous pension, health and unemployment insurance schemes which covered 17 million workers were introduced from 1927. However, some workers, such as farmers missed out on these changes and suffered declining incomes.	
7	Ebert	The first President of the Republic	19	Challenges to the Republic:	24	Changes for women:
8	Stresemann	The Chancellor of Germany from the Summer of 1923 and Foreign Minister	Spartacist Rising 1919: Communist try to take over the country led by Rosa Luxemburg. The army and Freikorps stop it and over 100 workers were killed. Kapp Putsch 1920: Freikorps try to take over after they are disbanded after the ToV, people go on strike to stop them, they are forced to give up.		Women could vote and become politicians, they increasingly taking white collar jobs such as teachers, lawyers and doctors. The classic image of German women in the 1920s was as the 'New Woman' who was short-haired, wore make up, liberated and having fun. However life for a lot of women, especially outside of Berlin did not change and most women voted conservatively.	
9	Constitution	This is an agreement about how the country would be ruled	20	The Year of Crisis: 1923	25	Change in culture:
10	Reichstag	German parliament	Invasion of the Ruhr: France invades as Germany stops paying reparations. In the Ruhr are Germany's iron and coal resources. The German workers strike in protest. German industry is devastated. Hyperinflation: Germany continues to pay the striking workers which causes hyperinflation, a loaf of bread costs 200,000 billion marks.		Weimar experienced a flourishing of culture, in Berlin especially, that saw developments in architecture, art and the cinema. This expression of culture was greatly helped by the ending of censorship in the new republic. Architecture changed with the Bauhaus School founded by Walter Gropius in 1919 Art: Dada and New Objectivity were two new art movements, artists included Otto Dix and George Grosz . Cinema boomed in this time period and one of the most famous directors of the time was Fritz Lang . Not everyone appreciated these cultural changes.	
11	Article 48	A rule in the new constitution that allowed the president to rule on his own without the Reichstag in times of emergency				
12	coalition	A government of two or more political parties.				
13	Freikorps	Ex military soldiers who wanted to overthrow the Republic				
14	Rentenmark	The currency of Germany after November 1923				
15	Hyperinflation	When money becomes worthless				

Year 11 GCSE History Spring and Summer Term Knowledge Organiser Life in Nazi Germany 1933-39

Key Vocabulary:			Nazi policies towards Women and the young		Employment, living standards and persecution of minorities	
1	Kinder, Küche, Kirche	Children, Kitchen, Church. This summed up the Nazi ideal of womanhood	16	Nazi policies towards women	21	How the Nazis reduced unemployment:
2	The Motherhood Cross Award	Given to women for large families. E.g a bronze award for a woman with 4 children.	<p>The Nazis didn't allow women much freedom. They believed that women should stay at home and look after the family. They were banned from being lawyers in 1936 and they were expected to dress plainly and not wear make-up or smoke. Nazis gave awards to women who had lots of children and encouraged women to marry with marriage loans</p>		<p>Public Works: Hitler created jobs with the building of autobahns, hospitals, schools and public buildings such as the 1936 Olympic Stadium. National Service: making any man between 18-24 join the National Labour Service. Rearmament: Hitler also created more jobs with building tanks and weapons and joining the army. Invisible unemployment: Not counted by Hitler in his unemployment figures: 1.4 million men in the army and men working on public works schemes, Jews who were sacked and women who had to give up their jobs for men.</p>	
3	Lebensborn	Where unmarried women were impregnated by SS men.				
4	Napola	Schools intended to train the future leaders of Germany	17	Successes and failures of these policies	<p>22 Did the Nazis improve living standards? Yes: By 1937, agricultural prices had increased by 20 per cent. Beauty of Labour encouraged factory owners to improve conditions for workers and Strength through Joy gave rewards to workers for their work such as very cheap holidays. No: Workers couldn't join trade unions or go on strike for campaign for better conditions and the Nazi Labour Front (which had replaced trade unions) nearly always sided with the employers. Wages remained low and the cost of living rose by 25%.</p>	
5	Nazi Teachers League	All teachers had to swear an oath of loyalty to the Nazis	<p>Failure: female labour was cheap and between 1933 and 1939 the number of women in employment actually rose by 2.4 million. Some Nazi policies reversed e.g. women with marriage loans allowed to work (1937) Success: German Women's Enterprise had 6 million members; birth rate increased to 20 per 1,000 in 1939</p>			
6	Reich Labour Service	A scheme to provide young men with manual labour jobs				
7	Invisible unemployment	The Nazi unemployment figures did not include women, Jews, opponent and unmarried men under 25	18	Nazi Policies towards the young:	<p>23 Nazi racial beliefs and policies: Nazis believed certain groups, such as Slavs, gypsies, homosexuals, the disabled and Jews were inferior to and a threat to the Aryan race. Mentally and physically disabled were first sterilized and then between 1939-1941 over 100,000 were euthanized. Other such as homosexuals, prostitutes, Jehovah's Witnesses and gypsies sent to concentration camps.</p>	
8	Autobahn	Motorway	<p>Youth groups such as the Hitler Youth taught children Nazi ideas so they would be loyal to the Nazi Party when they grew up. By 1936 boys had to join the Hitler Youth, they went on camping trips and had sports competitions. Girls joined the League of German Maidens where they were trained in domestic skills like cooking. Schools also indoctrinated young people. All teachers had to join the Nazi Teachers' Association and the curriculum altered: History lesson included the rise of the Nazi Party, a new subject called Race study was introduced and PE was taught 5 times a week</p>			
9	Rearmament	Building up the armed forces in readiness for war				
10	Volksgemeinschaft	The Nazi community	19	Successes and failures of these policies:	<p>24 Jewish persecution: 1933- Boycott of Jewish shops, books by Jewish authors publicly burnt, Jewish teachers, lawyers and civil servants sacked. 1935- Nuremberg Laws- stripped Jews of German citizenship, outlawed marriage between Jews and Germans, took away all civil and political rights 1938,- Jews had to have the name Israel (men) or Sarah (women), Jewish children forbidden to go to school. Kristallnacht - 9 Nov. The SS organised attacks on Jewish homes, businesses and synagogues in retaliation for the assassination of the German ambassador to France by a Jew.</p>	
11	Strength Through Joy	An attempt to improve the leisure time of German workers	<p>Failure: Attendance at Hitler Youth meeting by 1938 was only 25% so by 1939 the authorities made attendance compulsory. Success: 1939 90 per cent of German boys aged 14 and over were members.</p>			
12	Beauty of Labour	Tried to improve working conditions of German workers.				
13	Volkswagon	People's car				
14	Nuremberg Laws	Jews were stripped of their citizenship rights and marriage between Jews and no Jews was forbidden				
14	Kristallnacht (Night of the Broken Glass)	A Nazi sponsored event against the Jewish community				

Year 11 GCSE History Spring and Summer Term Knowledge Organiser Nazi Control and dictatorship, 1933-39

Key Vocabulary:			Creation of a dictatorship and the police state		Opposition, resistance and conformity			
1	Marinus van der Lubbe	The Reichstag Fire was blamed on this Dutch Communist	16	Creation of a dictatorship 1933-34	19	Extent of support for the Nazis		
2	Reichstag	German parliament	<p>Reichstag Fire Feb 1933: Hitler had become chancellor but needed more power in order to pass the laws he wanted to. He used the Fire to whip up anti-communist feelings and gain emergency powers to round up 4000 communist members and intimidate communist voters</p> <p>Enabling Act March 1933: In the March 1933 elections, the Nazis gained more seats in the Reichstag but still didn't have an overall majority. He banned the Communist Party so he had enough votes to pass the Enabling Act. With this act he is able to: pass any laws without needing the support of the Reichstag, he banned all trade unions and all political parties apart from the Nazi Party.</p> <p>Night of the Long Knives 1934: Hitler used the SS to kill Ernst Rohm, the leader of the SA (the Nazis private army) and several hundred other SA members and politicians. This stamped out any opposition to Hitler in the Nazi Party.</p> <p>Death of Hindenburg: Hindenburg was the President of Germany. When he died, Hitler made himself both Chancellor and President of Germany. He called himself the Fuhrer and reorganised the government so he was in absolute control and made the army swear an oath of loyalty to himself.</p>		Exact figures for those who opposed the Nazis are difficult to obtain. However, it is clear that the Nazis were incredibly popular when they came to power and many Germans welcomed the stability and economic growth an authoritarian regime brought – something missing with the Weimar democracy. The Nazi regime restored Germany's international prestige through rearmament and the dismantling of the Treaty of Versailles .			
3	Emergency Decree	Hindenberg is persuaded to pass this after the Reichstag Fire, it restricted civil liberties.			20		Opposition from the Churches	
4	Enabling Act	Gave the Nazis full power for the next 4 years			There were approximately 45 million Protestants and 22 million Catholic Christians in Germany in 1933. Hitler saw Christianity as a threat and a potential source of opposition to Nazism because it emphasised peace. The Protestant church was re-organised and fell under Nazi control, in 1936 all Protestant churches merged into the Reich Church and it made a National Socialist version of Christianity. The Pope signed an agreement (the Concordat) with Hitler agreeing to stay out of German politics. There was little opposition overall but some Church members such as Martin Niemoller (Protestant) and von Galen (Catholic) preached against the Nazis. Niemoller was sent to a concentration camp, but von Galen forced the Nazis to keep their killing of the disabled a secret.			
5	Gleichschaltung	Hitler's attempt to bring German society into line with Nazi philosophy			17		The police state	
6	German Labour Front (DAF)	Set up to replace Trade Unions			Germany became a police state and the Nazis used terror and violence. Himmler was in charge of the Gestapo and the SS who listened into telephone calls, interrogated and arrested people.		21	
7	Lander	State Parliaments			Judges had to swear an oath of loyalty to Hitler and make sure their judgements were in line with Nazi ideas. In 1933 the first concentration camp was opened in Germany at Dachau.		Opposition from the young	
8	Dachau	First concentration camp			18		Nazi Propaganda	
9	Purge	To get rid of opposition			The Ministry of Enlightenment and Propaganda, headed by Dr Joseph Goebbels. It aimed to brainwash people into obeying the Nazis and idolising Hitler. It did this by censoring the press, controlling radio broadcasts, holding mass rallies (the biggest one was at Nuremberg each year in August) and using sporting events such as Berlin Olympics of 1936 to showcase the success of the regime and the superiority of the Aryan Race		The main youth opposition group was the Edelweiss Pirates, based in the Rhineland. They reacted to the discipline of the Hitler Youth by daubing anti-Nazi slogans and singing pre-1933 folk songs. In 1942 over 700 of them were arrested and in 1944, the Pirates in Cologne killed the Gestapo chief, so the Nazis publicly hanged 12 of them. During the war, 'Swing Youth' and 'Jazz Youth' groups were formed. These were young people who rejected Nazi values, drank alcohol and danced to jazz. The Nazis rejected jazz music as degenerate and called it Negro music, using their racial ideas against this cultural development. These youths were closely monitored by the Gestapo, who regularly raided illegal jazz clubs.	
10	Night of the Long Knives	Removal of internal and external opposition to the Nazi Party and Hitler						
11	Sicherheitsdienst (SD)	The intelligence body of the Nazi Party						
12	Concordat	In July 1933 the Pope agreed to stay out of political matters if the Nazis did not interfere with Catholic affairs						
13	Confessional Church	Followed traditional German Protestantism and refused to allow the Nazification of religion. Led by Pastor Martin Niemoller						
14	Edelweiss Pirates and Swing Youth	Groups who opposed the Hitler Youth						
14	Mit Brennender Sorge (With Burning Concern)	The Pope wrote to priests in Germany about his concerns over the Nazi attempts to control religion						

Year 11 Music Component 3 Knowledge Organiser

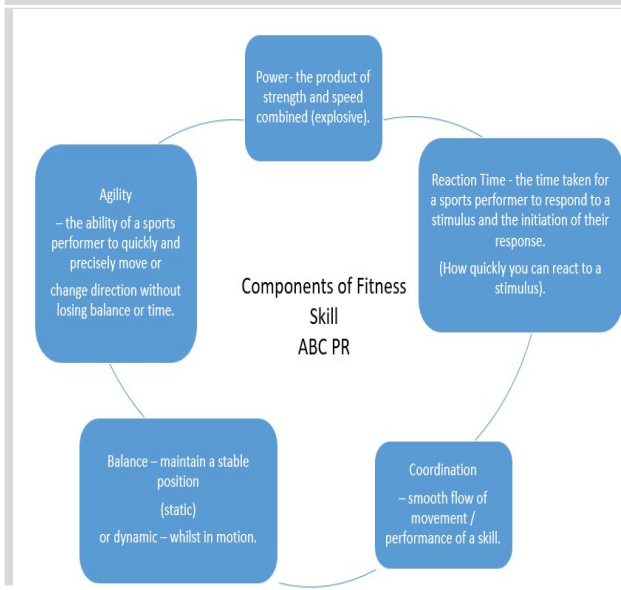
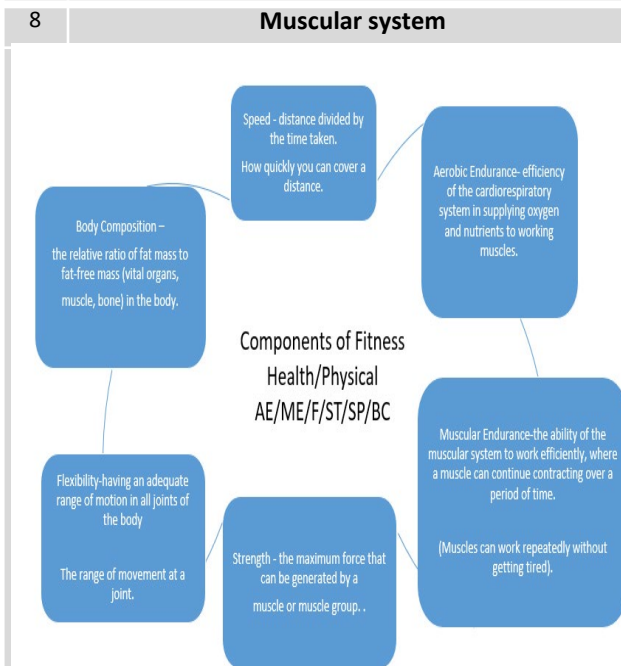
Key Vocabulary:			Requirements		Requirements	
1	Time Management	Using time appropriately to a given deadline	12	Professional skills	15	Apply development processes for music skills and techniques
2	Health and safety	Maintaining equipment and planning a safe working environment		Target audience		Development process: Routines
3	Skills Audit	Being be to critique own ability and create a plan for your own development		Using equipment		Technical exercises
4	Warm ups	Ways to begin a rehearsal – using scales and exercises to improve instrument skills		Health and safety in performances		Goal setting
5	SMART targets	Targets that are achievable but push you to learn new music techniques		Discipline		Monitoring and tracking progress
6	Performance techniques	Ways of performing to you best – timing, phrasing etc	13	Development if skills	16	Apply development processes for music skills and techniques
7	Stage presence	Is the audience going to want to watch your performance?				Developing musical skills – style, context, content: Timing and phrasing
8	Composition techniques	Use of sequence, ostinato, melody to begin and develop your piece				Rhythm and pitch
9	Effects	Use of software to change the sounds of the music. Adding reverb/distortion etc.				Equipment
10	Audio recording	Using microphones and mixing desks/audio interfaces to record live music				Expression
11	MIDI and DAW techniques	Ways to use MIDI and Daw to create music				Stylistic accuracy
					17	Apply development processes for music skills and techniques
						Developing musical skills: Performance: Learning the piece stylistically
			14	Presenting a final piece		Instrumental techniques
				Review – does it meet the brief, target audience		Following the accompaniment
				Quality – final mix of audio, balance in DAW mix		Composition: Use of structure
				Evidence of the process :		Development of harmony
				<ul style="list-style-type: none"> key points highlighted Screenshots Annotations Ability to describe layout, decisions made 		Music production: Editing and inputting audio
				Creative decisions:		Using effects and manipulation
				<ul style="list-style-type: none"> Use of musical elements Application of skills/technical ability Changes of ideas 		

KS4 Physical Education Spring Term Knowledge Organiser

Key Vocabulary:

1	Methods of training	Different ways you can exercise the body to improve you health and well-being
2	Muscular system	The muscular system is an organ system consisting of skeletal, smooth, and cardiac muscle
3	Principles	Principles of training means exercising regularly to improve skills and fitness.
4	Cardio-respiratory system	The parts of the body that allow us to breathe and circulate oxygen.
5	Acceleration	Acceleration describes how quickly you can increase your velocity towards maximum speed.
6	Reps and sets	Rep = repetition of an exercise. E.G. perform 6 repetitions of an exercise before resting. Set = a group of repetitions (or reps) of that exercise
7	Body composition	Body composition is a method of describing what the body is made up of. Ratio of fat and fat free mass (bone / muscle).

Physiology - The human body



Body components

9 **Methods of training**

Aerobic Endurance Training

Continuous - a steady pace, moderate intensity 30mins+
Interval - periods of higher and lower intensity
Fartlek - form of continuous training where intensity is changed by running at different speeds or different terrains.

Circuit Training - circuit training involves a series of different activities performed at stations.

Speed Training

Interval - Work high intensity and rest
Hollow - Fast slow fast
Acceleration - Increase speed through zones

Weight Training - using free weights or resistance machines. It involves using ratios (high, medium or low) of weights, reps and sets to improve either strength, endurance or power.

Flexibility Training

Static stretches - no movement and active or passive
Dynamic - involve movement (e.g. heel flicks)

Plyometrics - exercises performed quickly to improve power

10 **Careers**

Developing - name sporting careers

Advancing - Describe key qualities needed in different sporting careers

Mastering - Explain sporting careers and how you can access them

Year 11 Drama Spring Term Knowledge Organiser

Key Vocabulary:

1	Stage Levels	To show power, status or just different locations for the scenes.
2	Genre	Comedy, Thriller, Melo drama
3	Creative Intentions	What was the director/ writer/ creator thinking about? Themes / issues / response to stimulus / style/genre / contextual influences / collaboration with other practitioners / influences by other practitioners.
4	Purpose	Why was it made? to educate / to inform / to entertain to provoke/ to challenge viewpoints / to raise awareness / to celebrate...
5	Theme	The topic of the performance e.g. Conflict, Family
6	Stylistic Qualities	How a performance is structured – Musical, Inclusivity, Epic theatre - storytelling
7	Processes used in development, rehearsal and performance	Responding to stimulus to generate ideas for performance material / exploring and developing ideas to develop material / discussion with performers / setting tasks for performers / sharing ideas and intentions / teaching material to performers / developing performance material / organising and running rehearsals / refining and adjusting material to make improvements / providing notes and/or feedback on improvements.

Component 3- Learning Aim A Developing ideas in response to a brief

8	A1
Target Audience: What age and gender are you aiming your work?	
Performance Space: Configuration-End on, Traverse, Thrust or in the round?	
Planning and managing resources: What do we need? Props? Sound? Lighting? Research?	
Running Time: Must be in the timeline – 10-15minutes	
Style of work: Naturalistic – Stanislavski? Epic-Brecht?	
Starting points: Using the given theme, issue, social background.	
Props/Costume: Influence the work?	
Individual and group contribution: What did you suggest?	
Period of time: past, present or future?	

9 Learning Aim B1 Selecting and developing skills and techniques in response to a brief

Skills and techniques of the individual performer e.g. vocal, physical.

- Skills and techniques of the performers as a group e.g. comedy, improvisation.
- Skills and techniques of the designer e.g. understanding implications of selected performance skills and techniques in relation to design, research, shaping and refining ideas.
- The style and/or genre of the work being created e.g. street dance, physical theatre.
- The influence of selected practitioners e.g. Brecht and Stanislavski
- Appropriate skills for the target audience e.g. young children, the elderly.
- Taking part in skills development classes or workshops.
- Taking part in the rehearsal process, including individual preparation and group rehearsals.

Component 3 – Learning Aim C Contributing to a workshop performance

10	C1 - Skills and Techniques
Skills may include:	
<ul style="list-style-type: none"> • Vocal skills • Physical skills • Interpretative skills: showing time and place, presenting a character, creating humour or emotion. • If performing, demonstrating and sustaining in performance the following skills: <ul style="list-style-type: none"> • energy o focus o concentration o commitment. • Responding to a stimulus • Exploring and developing ideas • Sharing ideas and intentions • Teaching material to performers • Refining and adjusting material 	
11	C2 Working effectively with others
<ul style="list-style-type: none"> •Communicating effectively with other performers: <ul style="list-style-type: none"> in preparation for performance (if performing) during performance. •Taking part in final group preparations, which may include: o setting up/get in o get out/strike taking part in/contributing to a workshop performance. 	
12	C3 Communicating ideas through performance
<ul style="list-style-type: none"> •Taking part in/contributing towards a performance for an audience. •Communicating ideas and intentions effectively to an audience. •An explanation of creative intentions and processes 	
13	D1 Evaluating the development process and performance; •Contributing to initial ideas and exploring activities in response to: o the brief o the stimulus o contributions from other members of the group. <ul style="list-style-type: none"> •Contributing to the development process. <ul style="list-style-type: none"> • development and/or adaptation o application o individual strengths and areas for improvement o overall individual contribution to the group. D2 Reflect on the outcome <ul style="list-style-type: none"> o effectiveness of the response to the brief o individual strengths and areas for improvement o overall impact of the work of the group.

Year 11 Spring Term Knowledge Organiser- Hacia un mundo mejor

1. Los problemas medioambientales / Environmental problems	
Me preocupa(n) mucho – I'm really worried about	la deforestación – deforestation la lluvia ácida – acid rain las mareas negras – oil spills la sobrepoblación – overpopulation
Lo que más me preocupa es (que) – the thing I'm most worried about is (that)	los problemas del medio ambiente – environmental problems las especies amenazadas/en peligro de extinción – threatened/endangered species la polución de los mares y los ríos – sea and river pollution la destrucción de los bosques – destruction of woods/forests los combustibles fósiles se acaban – fossil fuels are running out hay demasiada basura en las calles – there's too much litter/rubbish in the streets hay demasiado tráfico – there's too much traffic el tráfico causa mucho ruido – the noise causes a lot of noise mucha gente usa el coche todos los días – lots of people use their cars everyday hay demasiadas fábricas – there are too many factories no hay espacios verdes – there are no green spaces la gente no recicla – people don't recycle el calentamiento global – global warming la contaminación – pollution la sequía – drought
El problema más grave es (que) – the most serious problem is (that)	
causa – it causes amenazar – to threaten echa la culpa - to blame	es nocivo – it's harmful agotar – to use up una multa – a fine
un terremoto – an earthquake una tormenta de nieve – a snow storm un incendio forestal – a forest fire	el verdadero – the tip provocar – to provoke/cause contribuir – to contribute
	un atasco – a traffic jam el combustible - fuel una fábrica – a factory
	un huracán – a hurricane las inundaciones - floods un temblor – a tremor un tornado – a tornado

2. Las soluciones / Solutions	
Para proteger el medio ambiente/ el planeta – to protect the environment/ the planet	(no) se debe – you must(n't) (no) se debería – you should(n't)
	apagar la luz – turn off the light ducharse en vez de bañarse – shower instead of having a bath separar la basura – separate the rubbish reciclar el plástico y el vidrio – recycle plastic and glass desenchufar los aparatos eléctricos – unplug electrical appliances ahorrar energía – save energy cerrar el grifo – turn off the tap hacer todo lo posible – do everything possible malgastar agua – waste water usar bolsas de plástico – use plastic bags
Es esencial que – it's essential that Es importante que – it's important that	cuidemos el planeta – we look after the planet hagamos proyectos de conservación – we do conservation projects compremos/usamos productos verdes - we buy use eco-friendly products productos de comercio justo – we fair trade products ahorremos agua – we save water cambiemos la ley – we change the law consumamos menos – we consume less

No corte tantos árboles – Don't cut down so many trees No tire basura al suelo – don't throw rubbish on the floor No malgaste energía – Don't waste energy Plante más bosques y selvas – plant more forests and trees Use energías renovables – use renewable energy No construya tantas casas grandes – don't build so many big houses No vaya en coche si es posible ir a pie – Don't go by car if it's possible to walk No eche tantos desechos químicos – Don't release so much chemical waste Reduzca las emisiones de los vehículos – reduce vehicle emissions

3. Model Text:		
1	En mi opinión hay tantos problemas medioambientales	In my opinion there are so many environmental problems
2	como la sobrepoblación y la deforestación	like overpopulation and deforestation
3	pero pienso que el problema más grave es	but I think that the most serious problem is
4	la contaminación del aire ya que	air pollution because
5	es nociva y causa el calentamiento global .	it's harmful and causes global warming .
6	Las fábricas y los atascos contribuyen a la contaminación del aire	Factories and traffic jams contribute to air pollution
7	y por eso es esencial que usemos el transporte público	and therefore it's essential that we use public transport
8	y que compremos productos verdes .	and that we buy eco-friendly products .
9	En el pasado me preocupaba más la deforestación	In the past I was most worried about deforestation
10	y la destrucción de los bosques	and the destruction of forests
11	dado que causa las especies amenazadas y	because it causes endangered animals and
12	organice un evento para recaudar dinero.	I organised an event to raise money.
13	Para proteger el planeta	To protect the planet
14	no corte tantos árboles y plante más bosques y selvas .	don't cut down so many trees and plant more woods and forests ,
15	Yo, voy a intentar usar menos energía .	I'm going to try to use less energy .
16	Apagaré la luz y desenchufaré los aparatos eléctricos .	I will turn off the light and I will unplug electrical items .
17	Voy a hacer todo lo posible.	I'm going to do everything possible.

Component 3: Developing Fitness to Improve Other Participants Performance in



Key Vocabulary:		
1	Physical Fitness	A general state of health and well-being or more specifically as the ability to perform physical activities associated with daily life without getting overly tired.
2	Skill-related Fitness	Skill- or performance-related fitness involves skills that will enhance one's performance in athletic or sports events.
3	Principles of Training	The principles of training are guidelines that, if applied, ensure that training is effective. Effective training results in adaptations to a person's body.
4	Methods of Training	A type of fitness training used to improve fitness (such as weight training). All methods of training need to be specific to the individual performer, component of fitness, and the activity.
5	Fitness Testing	Fitness testing is simply taking measurements of the body and its responses to exercise so that we can work out where a component of someone's fitness is, at any given moment in time.
6	Motivation	The internal mechanisms and external stimuli that arouse and direct behaviour. Types of motivation: <ul style="list-style-type: none"> o intrinsic – internal factors o extrinsic – external factors SMART targets – goal setting

Explore the importance of fitness for sports performance					
7	Components of Fitness				
	<table border="1"> <tr> <td>PHYSICAL Aerobic Endurance Muscular Endurance Muscular Strength Speed Flexibility Body Composition</td> <td>SKILL Power Agility Reaction Time Balance Co-ordination</td> </tr> </table>	PHYSICAL Aerobic Endurance Muscular Endurance Muscular Strength Speed Flexibility Body Composition	SKILL Power Agility Reaction Time Balance Co-ordination		
PHYSICAL Aerobic Endurance Muscular Endurance Muscular Strength Speed Flexibility Body Composition	SKILL Power Agility Reaction Time Balance Co-ordination				
8	The importance of fitness for successful participation in sport				
	Basketball – a basketballer will need high levels of power to out jump an opponent to win a rebound. Badminton – a badminton player will need high levels of muscular endurance in the racket arm to keep hitting the shuttle with control. Boxing – a boxer will need high levels of reaction time to dodge and block punches . Gymnasts - require high levels of flexibility, strength and balance				
9	Exercise intensity and how it can be determined				
	<table border="1"> <tr> <td>Target heart rate zones and training thresholds: o calculate training zones o apply HR max to training o aerobic training zone o anaerobic training zone.</td> <td>1 Rep Max Used to calculate ratios for types of strength training. Muscular Endurance 50-60% Elastic Strength (power) 75% Strength – 90%</td> </tr> <tr> <td>The Borg (6–20) Rating of Perceived Exertion (RPE) Scale o RPE x 10 = Heart Rate (HR). The relationship between RPE and heart rate where: RPE x 10 = HR (bpm).</td> <td>Reps/weight Ratios Muscular Endurance Low weight – high reps Elastic Strength (power) Med weight – med reps Strength High weight – low reps</td> </tr> </table>	Target heart rate zones and training thresholds: o calculate training zones o apply HR max to training o aerobic training zone o anaerobic training zone.	1 Rep Max Used to calculate ratios for types of strength training. Muscular Endurance 50-60% Elastic Strength (power) 75% Strength – 90%	The Borg (6–20) Rating of Perceived Exertion (RPE) Scale o RPE x 10 = Heart Rate (HR). The relationship between RPE and heart rate where: RPE x 10 = HR (bpm).	Reps/weight Ratios Muscular Endurance Low weight – high reps Elastic Strength (power) Med weight – med reps Strength High weight – low reps
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10	Provision for taking part in fitness training methods				
	Public provision – advantages and disadvantages. Private provision – advantages and disadvantages. Voluntary provision – advantages and disadvantages.				
11	The effects of long-term fitness training on the body systems				
	Adaptations to the cardiovascular and respiratory systems E.G. cardiac hypertrophy / decreased resting HR / respiratory muscles Adaptations to the muscular and skeletal systems E.G. increased tendon and ligament strength & flexibility / bone density. Increased range of movement at joints (flexibility)				

12	Fitness Testing	
	Pre-test procedures: o calibration of equipment / complete informed consent / PAR-Q / participant pre fitness test check / warm-up	
	Reliability/validity/practicality of test: o consistency of procedures affecting of results o Is it the right test / partial or full (validity)	
	Practicality – cost / time / number of participants / equip	
13	Types of Fitness Tests Examples	
	Agility – Illinois Balance – Stork Power – Vertical jump	Aerobic – MSFT / Havard ME – 1 min sit/press up Flexibility – sit & reach
14	Fitness Training Methods	
	Agility: o Speed Agility and Quickness training (SAQ) – drills used to develop physical ability and motor skills. ● Power: o plyometrics – lunging, bounding, incline press-ups, barrier hopping and jumping. ● Balance: o use of specific training exercises that require balancing on a reduced size base of support. ● Coordination: o use of specific training exercises using two or more body parts together. ● Reaction time: o use of specific training exercises to practise quick responses to an external stimulus.	Aerobic endurance: o continuous training – steady pace and moderate intensity for 30 mins o Fartlek training – intensity varied by running at different speeds or over different terrain o interval training – work period followed by a rest or recovery period o circuit training – use of a number of stations/exercises completed in succession Flexibility: o static active / static passive / Proprioceptive Neuromuscular Facilitation (PNF) technique Muscular strength/endurance: o free weights / fixed resistance machines ● Speed: o acceleration sprints / interval training / resistance drills

Year 11 Mathematics – Knowledge Organiser – Manipulating Expressions – Spring Term

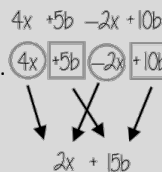
Key Vocabulary

1	Expression	Numbers, symbols and operators (e.g. + and x) grouped together with a minimum of two terms and one maths operation. An expression does not have any of these: =, ≠, <, >, ≤, ≥
2	Identity	An equation where both sides have variables that cause the same answer. It may include the symbol \equiv
3	Algebraic Fraction	A fraction which has an algebraic expression in either/or both the numerator and denominator.
4	Equation	An equation says that two things are equal. It will always have an equals sign =
5	Inequalities	An inequality compares two values, showing if one is less than, greater than, or equal to another.
6	Coefficient	The number used to multiply a variable.
7	Denominator	The bottom number or expression in a fraction.
8	Numerator	The top number or expression in a fraction.
9	Reciprocal	A pair of numbers that multiply to give one.

10 Simplify Algebraic Expressions

Collect 'like terms.'

The \equiv symbol means equivalent to. It is used to identify equivalent expressions. Only **like terms** can be combined.



Check any powers are the same before collecting together. For example, x and x^2 are not like terms.

11 Identities

An equation that is true for all values of the variables.

An identity uses the symbol \equiv

Examples:

$$2x \equiv x + x$$

Check equivalence by substitution.

E.g. $m = 10$

$5m$	$2 \times 2m$	$7m - 3m$
5×10	$2 \times (2 \times 10)$	$(7 \times 10) - (3 \times 10)$
$= 50$	$= 2 \times 20$	$= 70 - 30$
	$= 40$	$= 40$
	Equivalent expressions.	

12 Solve Equations with Fractions

Remember when solving equations to do the same to both sides. To eliminate a denominator, multiply every term by the denominator.

Example:

$$\begin{aligned} \times 2 \quad \left(\frac{x+3}{2} = 4 \right) \quad \times 2 \\ \hline x+3 = 8 \\ -3 \quad \left(\right) \quad -3 \\ \hline x = 5 \end{aligned}$$

13 Solve Inequalities with Fractions

When solving inequalities, treat them as equations and remember to do the same to both sides. To eliminate a denominator, multiply every term by the denominator. Always include the inequality sign in your answer.

Example:

$$\begin{aligned} \times 2 \quad \left(\frac{x+3}{2} > 4 \right) \quad \times 2 \\ \hline x+3 > 8 \\ -3 \quad \left(\right) \quad -3 \\ \hline x > 5 \end{aligned}$$

14 Add and Subtract Algebraic Fractions

For fractions in the form:

$$\frac{a}{b} \pm \frac{c}{d} \quad \text{the common denominator is } bd.$$

$$\frac{a}{b} \pm \frac{c}{d} = \frac{ad}{bd} \pm \frac{bc}{bd} = \frac{ad \pm bc}{bd}$$

Example:

$$\begin{aligned} \frac{1}{x} + \frac{x}{2y} \\ = \frac{1(2y)}{2xy} + \frac{x(x)}{2xy} \\ = \frac{2y + x^2}{2xy} \end{aligned}$$

15 Multiply Algebraic Fractions

For fractions in the form: $\frac{a}{b} \times \frac{c}{d}$

Multiply the numerators together and the denominators together. Remember to simplify where appropriate.

$$\frac{a}{b} \times \frac{c}{d} = \frac{ac}{bd}$$

Example:

$$\begin{aligned} \frac{x}{3} \times \frac{x+2}{x-2} \\ = \frac{x(x+2)}{3(x-2)} \\ = \frac{x^2 + 2x}{3x - 6} \end{aligned}$$

16 Divide Algebraic Fractions

For fractions in the form: $\frac{a}{b} \div \frac{c}{d}$

Multiply the first fraction by the reciprocal of the second fraction. Remember to simplify where appropriate.

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c} = \frac{ad}{bc}$$

Example:

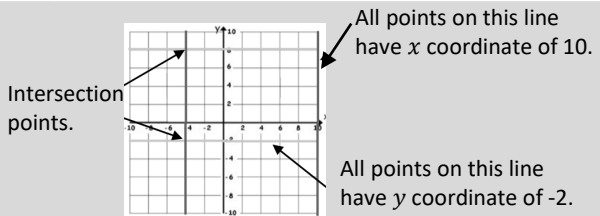
$$\begin{aligned} \frac{x}{3} \div \frac{2x}{7} \\ = \frac{x}{3} \times \frac{7}{2x} \\ = \frac{7x}{6x} = \frac{7}{6} \end{aligned}$$

Year 11 Mathematics – Knowledge Organiser – Gradients and Lines – Spring Term

Key Vocabulary

1	Linear	Linear graphs (straight line) have common difference by addition or subtraction.
2	Gradient	The steepness of a line.
3	y – intercept	Where a line crosses the y – axis.
4	Coordinates	A set of values that show an exact position.
5	Substitute	Replace one variable with a number or a new variable.
6	Parallel	Lines that never meet with the same gradient.
7	Perpendicular	Two lines that meet at a right angle.
8	Reciprocal	A pair of numbers that multiply to give one.
9	Negative Reciprocal	A pair of numbers that multiply to give negative one.

10 Lines Parallel to the Axes



Lines parallel to the **x axis** take the form $y = a$ and are **horizontal**.

Lines parallel to the **y axis** take the form $x = a$ and are **vertical**.

'a' can be ANY positive or negative value including 0.

11 Completing a Table of Values

Substitute the x value into the equation of the line to generate the y value.
Example:

$$y = 3x - 1$$

Take the x value \rightarrow multiply by 3 \rightarrow then -1

Complete the table.

x	-3	-2	-1	0	1	2	3
y	-10	-7	-4	-1	2	5	8

This represents the coordinate pair (3, 8)

12 Plotting $y = mx + c$ Graphs

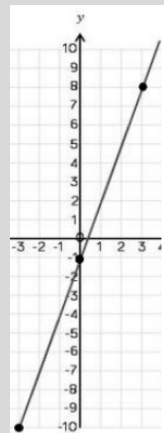
Plot the points using a pencil – they should form a straight line. This will help you to check that your calculations are correct.

Remember to join the points with a straight line using a ruler!

Example:

$$y = 3x - 1$$

(Using the table of values from above.)

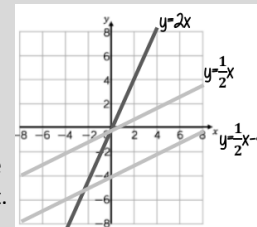


13 Using $y = mx + c$

$y = mx + c$
Compare Gradients
The **coefficient of x** (the number in front of x) tells us the gradient of the line.

The **greater** the gradient – the steeper the line.

Parallel lines have the **same** gradient.



Positive gradients.
Negative gradients.

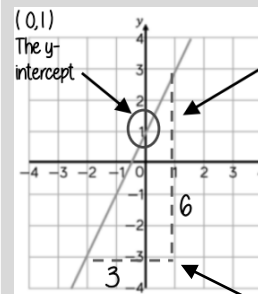
$y = mx + c$
Compare Intercepts
The value of **c** is the point at which the line crosses the y – axis. This is the y – intercept.

The coordinate of a y – intercept will always be $(0, c)$.

Lines with the **same** y – intercept cross in the **same** place.

$y = mx + c$
 x and y are **coordinates**.

14 Find the Equation from a Graph



Gradient $y = 2x + 1$

$$\frac{6}{3} = 2$$

Find the gradient by calculating the

$\frac{\text{change in } y}{\text{change in } x}$ also known as $\frac{\text{rise}}{\text{run}}$

The y – intercept is the point the graph crosses the y – axis.

Try finding a “nice” triangle (with lines that go through points that are easy to read) on the graph to help you calculate the change in y and the change in x .

Year 11 Mathematics – Knowledge Organiser – Non-Linear Graphs – Spring Term

Key Vocabulary

1	Quadratic	A curved graph with the highest power being 2. e.g. $y = x^2 + 1$
2	Cubic	A curved graph with the highest power being 3. e.g. $y = x^3 + 1$
3	Reciprocal	A curved graph where a number is divided by x . e.g. $y = \frac{1}{x}$
4	Parabola	A "U" or an "∩" shaped curve that has mirror symmetry.
5	Asymptote	A line that a curve approaches as it heads towards infinity.
6	Roots	Where a graph equals zero. These are the points where the curve intersects with the x -axis.
7	Exponential	A curved graph where a number is raised to a power of x . e.g. $y = 2^x$
8	Origin	The coordinate (0, 0). Where the x -axis and the y -axis intersect.
9	Tangent	A line that just touches a curve or circle at a point.

10 Completing a Table of Values

$$y = x^2 + 4x + 3$$

Substitute the x value into the equation of the line to generate the y value.

Example:

$$y = x^2 + 4x + 3$$

Take the x value \rightarrow $()^2 \rightarrow$ then add to $4 \times x \rightarrow$ then $+3$

Complete the table.

x	-4	-3	-2	-1	0	1	2
y	3	0	-1	0	3	8	23

This represents the coordinate pair (-1, 0)

11 Quadratic Graphs

If x^2 is the highest power in your equation, then you have a quadratic graph.

Plot all of the coordinate pairs. Join the points with a curve (freehand) using a pencil. There should be no straight lines on a quadratic curve.

Example:

$$y = x^2 + 4x + 3$$

(Using the table of values from above.)

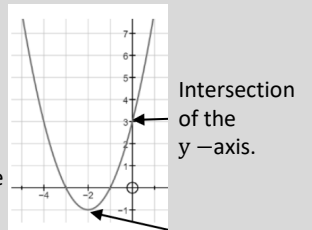
12 Cubic Graphs

Example:

$$y = x^3 + 2x^2 - 2x + 1$$

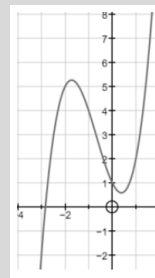
If x^3 is the highest power in your equation, then you have a cubic graph.

Complete a table of values to generate the coordinate pairs to plot the graph.



Quadratic graphs are always symmetrical with the turning point in the middle.

Parabola shape.



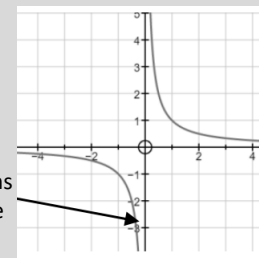
13 Reciprocal Graphs

If a value is divided by x then you have a reciprocal graph.

Complete a table of values to generate the coordinate pairs to plot the graph.

Example:

$$y = \frac{1}{x}$$



This is because x cannot be zero.

This is an **asymptote**.

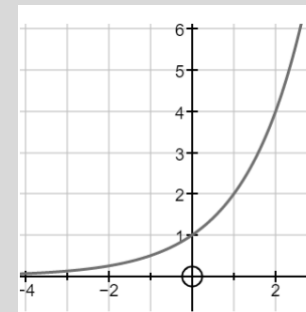
14 Exponential Graphs

If a value is raised to a power of x then you have an exponential graph.

Complete a table of values to generate the coordinate pairs to plot the graph.

Example:


$$y = 2^x$$



Here the graph intercepts the y -axis at 1
This is because $2^0 = 1$

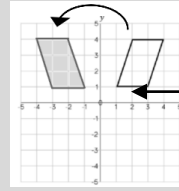
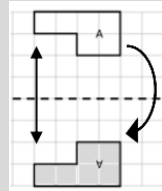
Year 11 Mathematics – Knowledge Organiser – Using Graphs – Spring Term

Key Vocabulary

1	Gradient	How steep a line is.
2	Intercept	The point where the line or curve of a graph crosses an axis.
3	Distance	Length. A measurement of how far something has travelled.
4	Speed	How fast something is moving. Measured as distance travelled per unit of time.
5	Constant	A fixed value. On distance time graphs, this is indicated by a straight line.
6	Acceleration	How fast velocity changes. Usually measured as m/s^2
7	Estimate	To find a value that is close enough to the actual solution.
8	Solution	When solving graphically, the solution is found when the graph intersects with either an axis or another equation.
9	Trapezium	A 2D shape with 4 straight sides that has a pair of opposite parallel sides. E.g. 

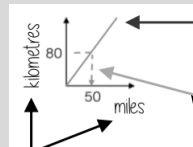
10 Reflect Shapes

All points need to be the same distance away from the line of reflection.



Reflection in the y -axis. This is also a reflection in the line $x = 0$.

11 Conversion Graphs



This is always a straight line because as one variable increases so does the other at the same rate.

Labelling of both axes is vital.

To make comparisons between units you need to find the point to compare – then find the associated point by using your graph. Using a ruler helps for accuracy. Showing your conversion lines helps as a “check” for solutions.

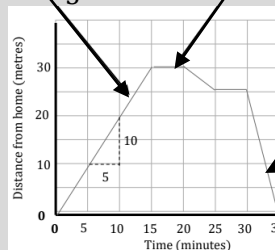
Conversion graphs compare two variables.

12 Distance – Time Graphs

The steeper the gradient the faster the speed.

$$\frac{10}{5} = 2 \text{ metres per minute.}$$

Horizontal lines represent staying still.



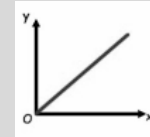
The distance coming closer to home shows the return journey.

Gradient = Speed

Units are important. E.g. Metres per minute. y variable per x variable.

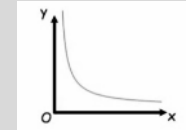
13 Graphs of Direct and Inverse Proportion

Proportion graphs show the relationship between two variables.



Direct Proportion Graph

As one value increases so does the other value. Direct proportion graphs are always **straight** lines. Always goes through the origin (0, 0).



Inverse Proportion Graph

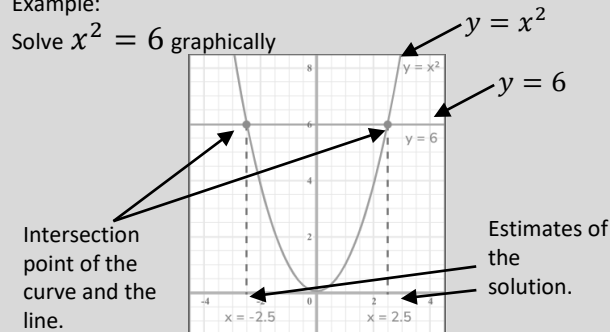
As one value increases the other quantity decreases. Inverse proportion graphs are always reciprocal graphs with a **smooth curve**. Never touches or intersects with either axis at any point.

14 Solve Equations Graphically

Solving quadratic equations graphically is a way to find estimated solutions or roots for quadratic equations.

Example:

Solve $x^2 = 6$ graphically



Plot the graph of the quadratic equation $y = x^2$ and the linear equation $y = 6$ on the same graph.

The intersection points of the line and the curve are the solutions to the quadratic equation $x^2 = 6$

Note: These solutions are estimates.

When solving graphically – draw lines from the intersection points to the x -axis to find the estimates of the solutions. Try and be as accurate as you can when reading the values.

Year 11 Mathematics – Knowledge Organiser – Expanding and Factorising – Spring Term

Key Vocabulary		
1	Expand	To multiply everything inside the bracket by what is outside the bracket.
2	Factorise	The inverse of expanding brackets. Putting an expression back into brackets by finding the HCF.
3	Coefficient	A number used to multiply a variable. E.g. in $3x^2$ the 3 is the coefficient.
4	Bracket	Symbols used in pairs to group things together. E.g. ()
5	Quadratic	An expression or equation where the highest power of a variable is 2.
6	Solutions	The answer(s) to the equation.
7	Roots	Also known as the solutions – where the graph crosses the x –axis.
8	Simplify	Grouping and combining similar terms.
9	Expression	A maths sentence with a minimum of two numbers and at least one maths operation but does not have an equals sign.

10 Expand a Single Bracket

Different representations of how to expand $3(2x + 4)$

×	2x	+4
3	6x	+12

$3(2x + 4) = 6x + 12$

11 Factorise into a Single Bracket

Example: $8x + 4$

The two values multiply together (also the area) of the rectangle.

Look for the HCF of the terms in the expression. This goes outside the bracket. Here the HCF is 4. What do you multiply 4 by to turn it into $8x$ and 1?
 $8x + 4 \equiv 4(2x + 1)$

Note:
 $8x + 4 \equiv 2(4x + 2)$
 This is factorised, but the HCF has not been used.

12 Expand Binomials

Example:
 Expand and simplify $(x + 3)(x + 5)$
 Every term in one bracket is multiplied by every term in the other bracket.

	$(x + 5)$	
	$+x$	$+5$
$(x + 3)$	$+x$	$+x^2$
	$+3$	$+3x$
		$+15$

Complete the grid by multiplying the terms. Then simplify your expression by collecting the like terms.

$(x + 3)(x + 5) = x^2 + 5x + 3x + 15$
 $(x + 3)(x + 5) = x^2 + 8x + 15$

13 Factorise Quadratic Expressions

A quadratic expression is of the form:
 $ax^2 + bx + c$
 where a, b and c are numbers, $a \neq 0$.

To factorise a quadratic expression in the form $x^2 + bx + c$ find two numbers that **add to give b** and **multiply to give c** .

Example 1: $x^2 + 7x + 10 = (x + 5)(x + 2)$
 because 5 and 2 add to give 7 and multiply to give 10.

Example 2: $x^2 + 2x - 8 = (x + 4)(x - 2)$
 because $+4$ and -2 add to give $+2$ and multiply to give -8 .

An expression of the form $a^2 - b^2$ can be factorised to give $(a + b)(a - b)$

Example 3: $x^2 - 25 = (x + 5)(x - 5)$
 Example 4: $16x^2 - 81 = (4x + 9)(4x - 9)$

When a quadratic is of the form $ax^2 + bx + c$

Example: Factorise $6x^2 + 5x - 4$

<ol style="list-style-type: none"> Multiply a by $c = ac$ Find two numbers that add to give b and multiply to give ac. Re-write the quadratic, replacing bx with the two numbers you found. Factorise in pairs – you should get the same bracket twice. Write your two brackets – one will be the repeated bracket, the other will be made of the factors outside each of the two brackets. 	<ol style="list-style-type: none"> $6 \times -4 = -24$ Two numbers that add to give $+5$ and multiply to give -24 are $+8$ and -3 $6x^2 + 8x - 3x - 4$ Factorise in pairs: $2x(3x + 4) - 1(3x + 4)$ Answer $= (3x + 4)(2x - 1)$
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14 Solve Quadratic Equations by Factorising

To solve a quadratic equation by factorising it **must always be equal to 0**.

Example: Solve $x^2 + 3x - 10 = 0$

Make sure that the equation is equal to zero first. Then factorise. Here this would be:

$x^2 + 3x - 10 = 0$
 $(x + 5)(x - 2) = 0$

Set each bracket equal to zero and solve.

$(x + 5) = 0$ or $(x - 2) = 0$
 $x = -5$ or $x = 2$

Year 11 Mathematics – Knowledge Organiser – Changing the Subject – Spring Term

Key Vocabulary		
1	Equation	Says that two things are equal and will have a = symbol.
2	Solve	To find the answer/value of something.
3	Coefficient	A number used to multiply a variable. E.g. in $3x^2$ the 3 is the coefficient.
4	Inequality	Two expressions that are not equal to each other and will have < or > symbols and not an = symbol.
5	Subject	The subject of a formula is the variable that is being worked out. It can be recognised as the letter on its own on one side of the equals sign.
6	Rearrange	Change a formula to have a different subject.
7	Inverse	The opposite of something. The inverse of addition is subtraction. The inverse of multiplication is division.
8	Solution	The answer to an equation.
9	Change	Make something different.

10	Solve Linear Equations				
	<p>Solve: $3(2x + 4) = 30$</p> <p>$3(2x + 4) = 30$</p> <p><i>Expand the brackets.</i></p> <p>$6x + 12 = 30$</p> <p>$-12 \quad -12$</p> <p>$6x = 18$</p> <p>$\div 6 \quad \div 6$</p> <p>$x = 3$</p> <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p>Substitute to check your answer. This could be a negative or a fraction or a decimal.</p> </div>				
11	Solve Linear Inequalities				
	<p>Solve inequalities in the same way you would solve an equation – by balancing both sides.</p> <p>$3(2x + 4) < 30$</p> <p><i>Expand the brackets.</i></p> <p>$6x + 12 < 30$</p> <p>$-12 \quad -12$</p> <p>$6x < 18$</p> <p>$\div 6 \quad \div 6$</p> <p>$x < 3$</p>				
12	Change the Subject of a Simple Formula				
	<p>Example:</p> <p>$x = y + z$</p> <p>Rearrange to make y the subject.</p> <table border="1" style="display: inline-table; margin-right: 20px;"> <tr> <td colspan="2" style="text-align: center;">x</td> </tr> <tr> <td style="text-align: center;">y</td> <td style="text-align: center;">z</td> </tr> </table> <p>$y = x - z$</p> <p>Using inverse operations or fact families are ways to rearrange formulae.</p> <p>$y \rightarrow +z \rightarrow x$ $y \leftarrow -z \leftarrow x$</p> <p>Rearranging can be checked by substitution.</p> <p>Other ways in which changing the subject can be referred to are:</p> <p>Change the subject... Make XXX the subject... Rearrange...</p>	x		y	z
x					
y	z				

13	Change the Subject of a Complex Formula
	<p>The steps are the same for solving and rearranging equations.</p> <p>Example: Solve $4x - 3 = 9$ Find the value of x</p> <p>$4x - 3 = 9$ $+3 \quad +3$ $4x = 12$ $\div 4 \quad \div 4$ $x = 3$</p> <p>Example: Make x the subject of: $yx - s = a$ $+s \quad +s$ $yx = a + s$ $\div y \quad \div y$ $x = \frac{a + s}{y}$</p>
	<p>Example: Solve $\frac{1}{2}x^2 = 50$ Find the value of x</p> <p>$\frac{1}{2}x^2 = 50$ $\times 2 \quad \times 2$ $x^2 = 100$ $\sqrt{\quad} \quad \sqrt{\quad}$ $x = 10$</p> <p>Example: Make x the subject of: $\frac{1}{2}mx^2 = T$ $\frac{1}{2}mx^2 = T$ $\times 2 \quad \times 2$ $mx^2 = 2T$ $\div m \quad \div m$ $x^2 = \frac{2T}{m}$ $\sqrt{\quad} \quad \sqrt{\quad}$ $x = \sqrt{\frac{2T}{m}}$</p>
14	Change the Subject Where the Subject Appears More than Once
	<p>When the subject appears more than once, rearrange the equation to get the subjects on one side first, then factorise.</p> <p>Example: Make x the subject of: $a = \frac{x+4}{x+2}$</p> <p>$a = \frac{x+4}{x+2}$ <i>Multiply both sides by the denominator.</i></p> <p>$a(x+2) = x+4$ <i>Expand the brackets.</i></p> <p>$ax + 2a = x + 4$ <i>Rearrange to get the x's on one side.</i></p> <p>$ax - x + 2a = 4$ <i>Rearrange to get all other terms on the other side.</i></p> <p>$ax - x = 4 - 2a$ <i>Factorise x.</i></p> <p>$x(a - 1) = 4 - 2a$ <i>Divide both sides by the expression in the bracket.</i></p> <p>$x = \frac{4 - 2a}{a - 1}$</p>