



PENISTONE GRAMMAR SCHOOL

Achieving Excellence through a Values-Driven Education

YEAR 9 BOOK 1

ESSENTIAL KNOWLEDGE SHEETS CURRICULUM BOOK

Aim High

Be Determined

Be Kind

Be Supportive

Be Proud

NAME

MENTOR GROUP



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To make the most of your essential knowledge book, you must:

1. Bring it to school every day and have it available on your desk in every lesson.
2. Keep all your essential knowledge sheet books as they provide you with the essential knowledge for each topic and subject you learn.
3. Take pride in your book, keeping it in excellent condition.
4. Write your name on the front of the book.
5. Be aware that if you lose or damage your book it is your responsibility to replace it at a cost of £4.

What is an Essential Knowledge Book?

An effective learning tool to help you retain, revise and retrieve the essential knowledge of a topic within your subjects. The Essential Knowledge Sheet for each topic is usually no more than two sides of information that includes core facts, concepts, diagrams, vocabulary and quotations that you need to know and understand to master a topic.

Why Essential Knowledge Sheets?

They provide you, your teachers and parents/carers with an overview of a topic by having the core knowledge, diagrams, explanations and key terms in one place. They allow you to routinely refer to and 'check off' what you know and understand as you are taught a topic.

Research evidence shows that the regular retrieval of knowledge helps us to know more, remember more and do more. This then allows you to store knowledge in, and recall it from your long-term memory, freeing up space in your working memory to take in new knowledge and information. The better you know the essential knowledge of a subject, the better you will be able to apply it to problems, questions, assessments, home learning, and further increase your independence within lessons and at home.

How to use your Essential Knowledge Sheets

The most powerful use of an Essential Knowledge Sheet is as a self-quizzing tool. For example:

1. **READ → COVER → WRITE → CHECK → QUIZ**

Read a chunk of information from your essential knowledge sheet (more than once is most effective), Cover it up, Write what you remember, Check to see if you have remembered the information correctly. If you haven't remembered it all correctly then re-do the process. When you are confident in your retention of the knowledge, quiz yourself (or ask a friend or family member) to see if you can apply the knowledge learned to questions, problems and practice tasks.

2. **Mind Maps**

Mind mapping is a diagram to visually represent information. It is a graphic technique you can use to translate what you know of a topic/concept into a visual picture. Use knowledge learned from your Essential Knowledge Sheet to create mind maps. Make sure to use colours and images and keep writing to a minimum. This technique embeds essential knowledge into your long-term memory.

3. **Flash Cards**

Use your Essential Knowledge Sheets to create flash cards. Write the question/key term on one side and the answer/definition on the other. Most importantly you need to quiz yourself on each question/key term until you can remember them all correctly.

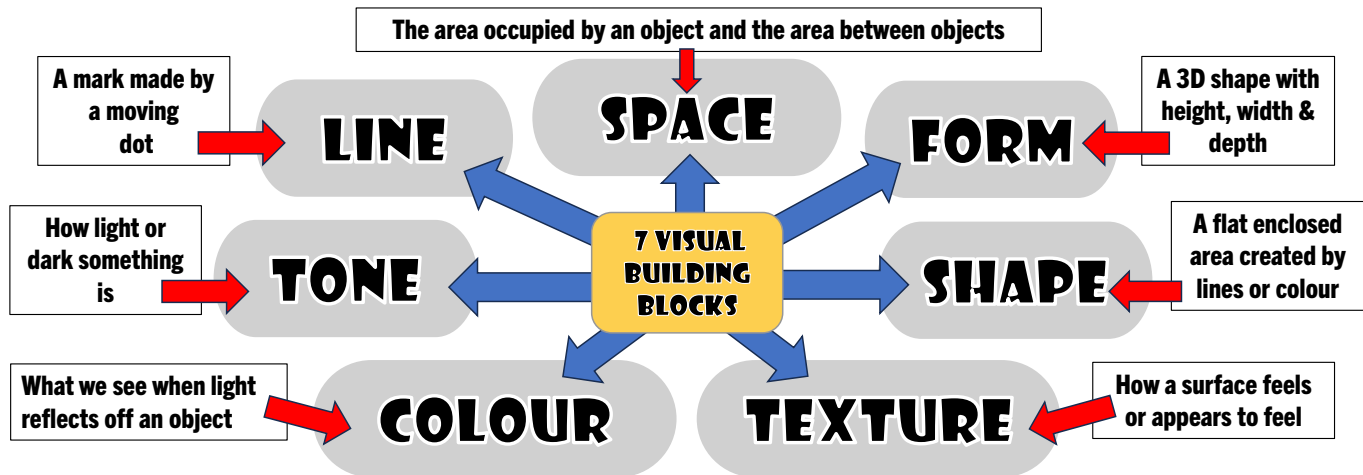
4. **Revision Clock**

Start by drawing a basic clock face. Break your Essential Knowledge Sheet into 12 sub-categories. Make notes from your Essential Knowledge Sheet in each section of the revision clock. Your brain will retain more information if you include images as well as key words and definitions. Read and Revise each section for 5 minutes, turn the clock over and then try to write out as much information as you can from one of the 12 sections on the revision clock. Repeat the process until you are confident in your learning of the essential knowledge on the revision clock.

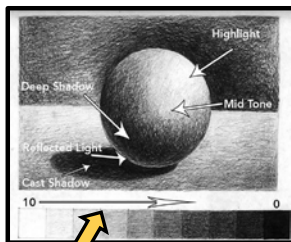
THE ELEMENTS OF ART

YEAR 9 ESSENTIAL KNOWLEDGE SHEET

The **Elements of Art** are the basic visual building blocks used to create 2D & 3D artwork such as drawings, paintings, prints, photos, ceramics and sculptures. They are the visual 'alphabet' of art.



THE ELEMENTS OF ART



TONE

LINE



sphere



cube



cylinder



cone

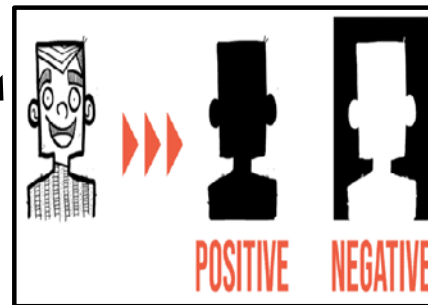


pyramid



COLOUR

SPACE

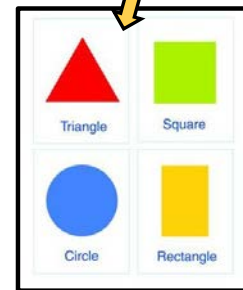


FORM

TEXTURE



SHAPE



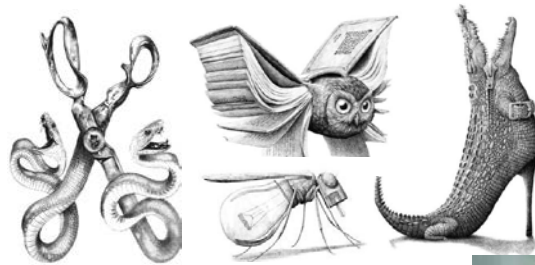
Mural Design

CLIENT DESIGN BRIEF = a written document that describes a client's requirements for the design or creative work being commissioned e.g. cost, scale, dimensions, style, colour etc.



Examples of café murals

MURAL = a painting or other work of art executed directly on a wall



METAMORPHOSIS = when something transforms into something else

ELEMENTS OF ART

**Line Tone Form Space
Colour Shape Texture**

SURREALISM is an art movement that began in the early 1920s. It was characterised by fantastic or incongruous imagery and used the imaginative powers of dreams and the unconscious mind.



Salvador Dali (1904-1989)

Surrealist artist



The Face of War (1941)



Self Portrait (1952)

COMPOSITION = how an artist arranges the different parts (elements) of an image to achieve balance and interest.



The Persistence of Memory (1931)

Ceramic Sculpture



SLIP = liquid mixture of clay and water

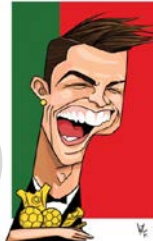
Ceramic Hand-Building Techniques

pinching, modelling, coiling, Slabbing.



CLIENT DESIGN BRIEF

CARICATURE = a humorous illustration of a person that exaggerates or distorts their identifiable characteristics to create a comic or grotesque effect.



GARGOYLE = strange or frightening human or animal face or figure that sticks out from the roof of a building and often serves as a waterspout to take water clear of the building.

ELEMENTS OF ART

Line Tone Form Space
Colour Shape Texture

Peter Lenzo
(Born 1955)
Ceramicist





Key Terms:

Codes and Conventions	Assets combined to create meaning
Typography	The appearance of printed content
Copyright	The legal rights which protects someone's work

Additional Terms:

Colour Theory	The colours that are used in media to portray an emotion
Client Brief	A set of instructions to help produce a final product.

COMPUTING

9.1 iMedia (Information Technology)

Using specialist tools to create digital resources for a specific purpose

Colour Theory Wheel:



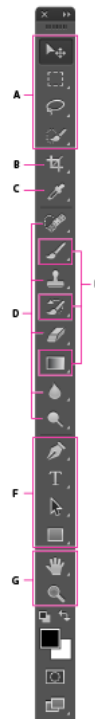


Additional Terms continued:

Visualisation Diagram	A diagram using shapes and annotation to design a product
Visual Identity	The company name, logo and a slogan.
Layers	The breakdown of a graphic
Assets	The different parts of a product (e.g. an image, title, etc)

9.1 iMedia (Information Technology)

Photoshop Tools:



A Selection tools

- Move (V)
- Rectangular Marquee (M)
- Elliptical Marquee (M)
- Single Column Marquee
- Single Row Marquee
- Lasso (L)
- Polygonal Lasso (L)
- Magnetic Lasso (L)
- Quick Selection (W)
- Magic Wand (W)

B Crop and Slice tools

- Crop (C)
- Perspective Crop (C)
- Slice (C)
- Slice Select (C)

C Measuring tools

- Eyedropper (I)
- 3D Material Eyedropper (I)
- Color Sampler (I)
- Ruler (I)
- Note (I)
- Count (I)

D Retouching tools

- Spot Healing Brush (J)
- Healing Brush (J)
- Patch (J)
- Content Aware
- Red Eye (J)
- Clone Stamp (S)
- Pattern Stamp (S)

- Eraser (E)
- Background Eraser (E)
- Magic Eraser (E)
- Blur
- Sharpen
- Smudge
- Dodge (O)
- Burn (O)
- Sponge (O)

E Painting tools

- Brush (B)
- Pencil (B)
- Color Replacement (B)
- Mixer Brush (B)
- History Brush (Y)
- Art History Brush (Y)
- Gradient (G)
- Paint Bucket (G)
- 3D Material Drop

F Drawing and type tools

- Pen (P)
- Freeform Pen (P)
- Add Anchor Point
- Delete Anchor Point
- Convert Point
- Horizontal Type (T)
- Vertical Type (T)
- Horizontal Type Mask (T)
- Vertical Type Mask (T)

- Path Selection (A)
- Direct Selection (A)

- Rectangle (U)
- Rounded Rectangle (U)
- Ellipse (U)
- Polygon (U)
- Line (U)
- Custom Shape (U)

G Navigation tool

- Hand (H)
- Rotate View (R)
- Zoom (Z)

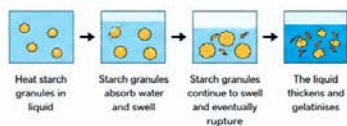
🍏 Macronutrients		
Macronutrient – a nutrient needed by our bodies in large amounts e.g. fat, protein and carbohydrate		
Nutrient	Food Example	Function in the body
 Carbohydrate	Sugar – found naturally in fruit and vegetables. Starch – potatoes, bread, rice, pasta.	Main source of energy .
 Protein	Animal – meat, fish, poultry, eggs, dairy products. Plant – peas, lentils, nuts, seeds.	Growth from childhood to adulthood. Repairs muscles and tissue after injury or illness. Makes enzymes for digestion.
 Alternative Protein	A form of protein other than meat e.g. Tofu or TVP, Mycoprotein (Quorn).	Good source of protein for vegetarians and vegans.
 Saturated Fats	Animal – meat, butter, lard, suet, dairy products.	Source of energy . Provides fat soluble vitamins (A and D).
 Unsaturated Fat	Plant – sunflower, rapeseed and olive oils. Almonds, peanuts, avocado, seeds and oily fish.	Forms an insulating layer. Layers of fat also protects our bones and organs.

💧 Water and Dietary Fibre		
Nutrient	Food Example	Function in the body
 Dietary Fibre	Vegetables – peas, beans, broccoli, potato (skins). Fruit. Brown bread, rice and pasta. Lentils, beans, seeds and nuts.	Keeps food moving through the digestive system. Helps prevent constipation, bowel and colon cancer. Recommended intake: 30g per day .
 Water	Water (6–8 glasses a day) Milk, tea and coffee. Herbal teas. Fresh fruit.	Helps transport nutrients in the blood. Regulates body temperature (sweating). Aids digestion and prevents constipation. Recommended intake: 6–8 glasses per day .

🛡️ Micronutrients		
Micronutrient – a nutrient needed by our bodies in small amounts e.g. vitamins and minerals		
Nutrient	Food Example	Function in the body
 Vitamin A	• Yellow fruit – mango, apricots • Yellow, red and green leafy vegetables – carrots, tomatoes, red peppers, spinach and kale	• Helps you see in the dark. • Supports growth and development in children. • Supports a healthy immune system.
 Vitamin B Group	• Cereals • Meat, eggs • Dark green leafy vegetables	• Releases energy from food. • B9 Folic Acid prevents spina bifida in unborn babies.
 Vitamin C	• Citrus fruits (oranges, lemons, lime, grapefruit) • Blackcurrants, kiwi, strawberries • Tomatoes, potatoes	• Fights infection and helps heal wounds. • Supports the immune system. • Helps the body absorb iron.
 Vitamin D	• Sunlight • Fortified (nutrient is added to) milk, cereals, children's bread and margarine	• Helps the body absorb calcium. • Helps form strong bones and teeth.
 Calcium	• Milk and dairy products • Fortified plant milks • Green leafy vegetables	• Helps form strong bones and teeth. • Important for muscle function.
 Iron	• Red meat • Nuts • Dark green leafy vegetables • Apricots	• Helps make healthy red blood cells. • Carries oxygen around the body. • Helps prevent tiredness.

💡 Quick Revision Tips			
	Macronutrients Needed in large amounts.		Micronutrients Needed in small amounts.
			Fibre Keeps the digestive system healthy.
			Water Helps regulate body temperature.

Where food comes from	
 Food miles	The distance a food product travels. 'From field to fork.'
 Provenance	Where your food comes from e.g. grown, raised, reared or caught.
 Food security	Always having access to enough safe, nutritious food for an active and healthy life.
 Food poverty	A person is unable to afford or access sufficient nutritious food.
 Cuisine	A style of cooking representative of a certain country or region.
 Carbon Footprint	Measures the impact your lifestyle has on the environment.
 Buy local	Buying food from the local area to reduce food miles and support the local economy.

Gelatinisation of Starch**Dextrinisation of Starch**

Golden brown colouring on starch products when heat is applied.

**Protein Denaturation**

When food is cooked, proteins denature (chemical bonds holding their structure together break down). Proteins unravel and change shape (irreversible).
Physical agitation – whisking (Swiss roll)
Temperature – coagulation (sponge)

Diet and good health	
 Obesity	Being overweight.
 Coronary Heart Disease	Heart's blood supply is blocked by fatty substances. Can cause heart attacks and strokes.
 Hypertension (High blood pressure)	Caused by being overweight (obese) and eating foods too high in salt.
 Diabetes	A disorder where blood glucose levels stay too high because the pancreas either can't produce enough insulin (Type 1) or the body resists it (Type 2).
 Vegetarian	Someone who chooses not to eat meat.
 Vegan	Someone who doesn't eat any product from animals e.g. eggs, milk, cheese or honey.
 Intolerance	Unable to eat a type of food without negative effects on the body.
 Allergy	An immune system negative response to an ingredient. (There are 14 e.g. nuts, sesame, eggs etc.) Can be fatal.
 Cholesterol	A fatty substance that can clog arteries. Too much can increase the risk of cardiovascular disease.
 Empty calories	Added sugars, no nutritional benefit other than energy.
 Celiac Disease	Digestive system is sensitive to gluten and can't digest it.
 Anaemia	A condition where you have a reduced number of red blood cells (iron deficiency).
 Lactose intolerance	The body can't digest lactose (milk sugars).

Quick Revision Tips

Macronutrients
Needed in large amounts.



Micronutrients
Needed in small amounts.



Fibre
Keeps the digestive system healthy.



Water
Helps regulate body temperature.

eatwell The 8 Healthy Eating Guidelines

- | | | | |
|----------|---|---|---|
| 1 | Base your meals on starchy foods |  | Should make up 1/3 of your diet. Examples of starch carbohydrates include bread, rice, pasta, potatoes, oats. Try to consume wholemeal varieties to increase dietary fibre. |
| 2 | Eat lots of fruit and veg |  | Should eat at least 5 portions of fruit and vegetables each day. Portions can come from fresh, frozen, dried, canned, juices and smoothies. Fruit and vegetables contain dietary fibre, vitamins and minerals essential for our diet. |
| 3 | Eat more fish – including a portion of oily fish each week |  | Should eat 2 portions per week. One being oily because it contains omega 3 which is important for brain and heart health. Fish can come from fresh, canned and frozen. Fish is a good source of protein, vitamins and minerals. |
| 4 | Cut down on saturated fat and sugar |  | Many foods are high in saturated fat, without us knowing. These are referred to as 'hidden fat'. Processed foods and food high in saturated fat should be eaten in little amounts and less often. Check the traffic light labelling system. |
| 5 | Eat less salt – no more than 6g a day for adults |  | Many foods contain 'hidden salt'. Too much salt is bad for the body. You should consume no more than 6g of salt per day (approx. 1 teaspoon). Babies and children should have a salt free diet (no more than 1g per day). |
| 6 | Get active and try to be a healthy weight |  | Exercise is important to maintain body weight, strengthen bones and the immune system. It is also important for mental wellbeing. Moderate exercise is recommended 5 times a week for a minimum of 30 minutes. (2½ hours per week.) |
| 7 | Drink plenty of water |  | Water is essential for life. You should consume 6 – 8 glasses (2 litres) per day. Your water can come from adding dilute to water for flavour and tea and coffee with little milk. |
| 8 | Don't skip breakfast |  | The most important meal of the day because it sets the body up with energy and other important nutrients. When you eat breakfast, you're less likely to feel hungry and eat snacks mid morning. Choose high fibre, unprocessed breakfast cereals. |

 The Food Standards Agency
8 tips for eating well

 Food science	
 Aeration	Air is added to a mixture to help make it lighter e.g. cakes (Swiss roll).
 Bind	Hold dry ingredients together.
 Coagulation	When eggs turn from liquid to solid e.g. quiche, Swiss roll etc. The proteins denature.
 Denaturation	Irreversible change when proteins unravel.
 Dextrinisation	When heat is applied to starch and turns golden brown.
 Gelatinisation	Starch particles swell and burst thickening a liquid. (Cheese sauce).
 Shortening	Rubbing fat into flour to give it a crumbly texture. (Pastry)
 Gluten	Protein found in wheat flour.
 Amino acids	Building blocks that make up protein.
 Raising agent	Used to make cake and dough mixtures rise.
 Yeast	Raising agent in bread making.
 Shelf life	The length of time a food can last without spoiling or losing its quality.

Essential Knowledge. Year 9 Graphics. Interior Design Project.

CAD: Computer Aided Design



CAM: Computer Aided Manufacture



In the table is an LCA (life cycle analysis). This looks at the environmental impact of your interior design project.

Raw Material Extraction	Transportation	Material Processing	Product in use	End of life (recycle and/ or disposal)
Material- Papers and Boards, timbers (woods). Deforestation. Large areas of forest are destroyed to harvest wood. This kills animal habitats and scars the landscape. Machinery that runs on diesel produce lots of CO2 and creates lots of noise pollution. Foam board/ Styrofoam Oil extraction. Oil is extracted by drilling into the ground. This is often done at sea and disturbs marine habitats. Leaks and spills cause huge natural disasters by soaking animals in oil.	Oil is usually transported by oil or diesel fuelled ship. Papers and boards and also timbers are transported by trucks. Ships and trucks all emit large amounts of CO2. This can be reduced by sourcing locally, reduce mileage. Using less packaging can also mean more items can be moved at once, however if an item gets damaged it is counter productive. Using train networks can reduce transportation miles and reduce traffic on already congested roads. Transportation is needed in nearly all steps of a products life cycle.	Turing paper pulp into paper and board. This can use lots of water, however this can be filtered, cleaned and reused, reducing the reliance on fresh-water systems. It uses lots of chemicals such as bleaches (to make white paper) and dyes (to make coloured paper). These can leak into water systems and pollute habitats. Turing logs into timber. This process relies on lots of machinery. It can use lots of energy, creating lots of CO2. Making timber into Plywood (base) and MDF (walls) uses lots of glue, this is made from oil- based plastic and is harmful. Turning oil into plastic. Chemicals can be released into the air which are toxic to human and animal life. Lots of CO2 is released due to the large amount of energy needed to convert oil into plastics.	Think about how will your interior model will be used by customers that have ordered a bedroom design on the deign companies' website. It will sit on a display and be looked at and held by customers. If customers are picking up the furniture to look at it, it may get damaged over time and need replacing, increasing the amounts of materials used. If it is just placed on display for the customers, it isn't as likely to get damaged, so will not need replacing as often.	Recycling – converting waste back into useable raw materials. For effective recycling, different materials need to be separated and transported to specialist recycling centres. Papers and Boards: These can be recycled, provided they are no other materials joined to them, such as plastic. The paper/ board is re pulped and formed back into sheets of pulp, ready to be processed (made) into papers and boards again. Plastics: Some plastics such as acrylic and HDPE (milk bottles) can be recycled. Sadly, foam board and Styrofoam are very difficult to recycle because they have been expanded with air. Plywood (base) and MDF (walls) These materials are both manmade using glues and timber products. It is likely that they are recycled into MDF again, or they are quite often incinerated (burned) to generate energy in power stations.

Scale: A drawing or model that is half the size of the original is of the scale 1:2. A model that is of the scale 1:50 would be 50 times smaller than the original, so for every 1mm on the model, it is 50 times bigger.

	Solid White Board	Corrugated Board	Folding Box Board	Foil Lined Board
Description	Solid white board is made from virgin pulp, this means that the pulp has not been used before, it is taken from a tree and made into paper. The pulp is bleached to make it pure white, giving it a high quality look. It has a nice, smooth textured surface, making it feel nice in your hands too.	Corrugated board consists of layers of fluted (wavy) paper glued between two layers of an outer liner (made from paper). It is mostly made from recycled pulp, this is why it is brown in colour.	Folding box board is made up of three layers, 1) a printable bleached white virgin pulp top surface. 2) Unbleached yellowish centre 3) A bleached inside layer. Some folding box board just has the bleached outer layer and a unbleached brown centre.	A layer of aluminium foil is glued (laminated) to a layer of cardboard. In some products the card is unbleached box board, in others it is solid white board.
Examples	Premium packaging (think iphone/ Apple product cases) Book covers. Premium food packaging.	The outer packaging of products. Design modelling.	Food packaging such as cereal boxes.	Food packaging (hot or wet food). Cosmetics packaging.

TIMBER



HARDWOODS	SOFTWOODS
• Come from deciduous (leaf losing) trees. • Generally slower growing, making them denser (harder). • Some trees take up to 100 years to reach full maturity, this makes them expensive to buy. • Colours vary.	• Coniferous (cone-bearing) trees. • Generally grow faster than hardwoods (reach maturity in 30 years). • Softer to work. • Cheaper than hardwoods.

KEYWORD	DEFINITION	ADVANTAGES	DISADVANTAGES	PHOTO
Oak	A hard, durable hardwood with an attractive grain. Commonly used for furniture and flooring.	Strong, long-lasting, attractive grain.	Expensive, heavy, can split.	
Mahogany	A reddish-brown hardwood known for its smooth finish and workability.	Easy to work with, beautiful finish.	Expensive, sourcing issues.	
Ash	A pale hardwood that's flexible and shock-resistant, used for tool handles and furniture.	Tough, good shock resistance.	Can split easily.	
Pine	A softwood that's lightweight and easy to work with, often used for interior furniture.	Light, cheap, easy to shape.	Dents easily, not durable outdoors.	

PLASTIC

THERMOPLASTICS	THERMOSETTING
• Soften when heated and can be shaped when hot. • The plastic hardens when cooled, but can be reshaped if heated up again.	• Heated and moulded into shape. • Can't soften if reheated.

KEYWORD	DEFINITION	ADVANTAGES	DISADVANTAGES	PHOTO
Acrylic	A durable, lightweight thermoplastic that is strong and transparent. Used in signs, furniture, and display cases.	Can be recycled, has good environmental stability, and is available in a wide range of colours.	Scratches easily, can shatter into large pieces, and is relatively soft.	
High Impact Polystyrene (HIPS)	A tough, rigid thermoplastic with good impact strength. Used for packaging, toys, and appliance casings.	Light but strong, can be machined and painted, and is recyclable.	Limited flexibility, can become brittle over time, and is not biodegradable.	

DESIGN & TECHNOLOGY KEYWORDS

Manufactured board

Man-made wood product bonded with resin. Uses waste wood, stable, cheap. Flat-pack furniture, model bases.

MDF

Fine wood fibres pressed with resin. Smooth surface, easy to shape. Furniture, carcasses, prototypes.

Plywood

This wood veneers glued in layers. Strong, resists warping. Shelving, construction projects.

Pine

Common softwood. Light in colour, lightweight, easy to work. Furniture, interior joinery.

Hardwood

Wood from slow-growing deciduous trees. Very strong and durable. Furniture, flooring, tool handles.

Softwood

Wood from fast-growing coniferous trees. Lightweight, easy to work with. Construction, joinery.

Oak

Common hardwood. Hard-wearing, attractive grain. Furniture, flooring, tool handles.

Beech

Hard, tough hardwood. Resists dents, smooth finish. Toys, workbenches, furniture.

Safety goggles

Protective eyewear. Prevents eye injury. Used when cutting or sanding.

Apron

Protective clothing. Keeps clothing clean and safe. Used in workshop.

Vice

Holds work firmly on bench. Keeps hands free. Holding wood when cutting or drilling.

Tenon saw

Fine-toothed hand saw for straight cuts. Accurate and clean. Cutting joints in wood.

Coping saw

Narrow-blade saw for curves. Cuts intricate shapes. Model making, design work.

G-clamp

Adjustable metal clamp. Strong, holds work securely. Clamping pieces for gluing.

Bench hook

Wooden guide for sawing. Keeps work steady. Cutting wood safely.

Try square

Measuring and marking 90° angles. Accurate marking. Woodworking joints.

Steel rule

Straight metal ruler. Precise measurements. Marking out lines on materials.

Marking gauge

Tool with a pin for parallel lines. Ensures accuracy. Marking across timber.

Sandpaper

Abrasive paper for smoothing. Creates smooth finish. Finishing wood before painting.

File

Metal tool with teeth for shaping. Removes rough edges. Finishing metal or plastic.

Drill

Power or hand tool for making holes. Accurate holes quickly. Fitting screws or dowels.

Countersink bit

Drill bit for widening screw holes. Allows screw heads to sit flush. Wood joints and fixings.

www.learnituk.com

METALS

FERROUS

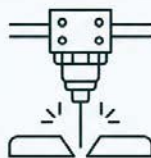
- Consist of iron, carbon, and other elements.
- Most are prone to rusting.
- Most can be picked up with a magnet (except stainless steel — designed not to rust and some grades are non-magnetic).

NON-FERROUS

- Don't contain any iron.
- Aren't attracted to a magnet.
- Don't rust when exposed to moisture (but they do tarnish and oxidise).

Keyword	Definition	Advantages	Disadvantages	Photo
Mild Steel	A strong, ductile metal commonly used in construction and car bodies.	Cheap, easy to weld.	Rusts easily, needs coating.	
Stainless Steel	A corrosion-resistant alloy used in cutlery and kitchen appliances.	Resists rust, strong, durable.	Expensive, hard to cut.	
Aluminium	A lightweight, corrosion-resistant metal often used in aircraft and cans.	Lightweight, doesn't rust.	Weak compared to steel.	
Copper	A reddish metal that conducts heat and electricity well.	Good conductor, attractive color.	Expensive, tarnishes.	
Brass	An alloy of copper and zinc, used for decorative items and instruments.	Attractive, corrosion-resistant.	Can tarnish, heavy.	

WHAT IS LASER CUTTING?



Laser cutting is a way of cutting or engraving materials using a powerful, focused beam of light (a laser).

The laser is controlled by a computer, which follows a digital design to cut shapes or patterns with very high precision.

The laser melts, burns, or vaporises the material along the lines of the design. It's often used to cut wood, plastic, acrylic, and metal — depending on the machine's power.

Fabric	Advantages	Disadvantages
Plain Weave Cotton 	Breathable, Lightweight, Biodegradable, Easy to care for, Absorbent (good for dying such as tie dye).	Takes a long time to dry, no stretch to the fabric.
Cotton Velvet 	Insulating, Soft, Luxurious sheen.	Difficult to care for, not very durable.
Plain Weave Polycotton 	Good for sublimation printing, even surface texture, easy to care for, lightweight, dries quickly, comfortable to wear, cheap to purchase.	No stretch to the fabric, thin fabric so no insulation.
Twill Weave Polyester (Synthetic) 	Strong, Durable, Drapes Well, Hydrophobic (does not absorb water) quick drying, Easy to care for, Pleats/shapes can be set with heat-good for adding structure, Diagonal pattern on surface of fabric can be used to create patterns, Cheap to purchase	Polyester can melt or misshape with high temperatures. Take care with aftercare.
Cotton Terry Towelling 	Very absorbent due to the loops (takes a long time to dry), Interesting surface texture, Soft	Loops can snag. Takes a long time to dry.
Acetate Satin (Synthetic) 	Lustrous shine, Drapes well, Strong, Durable, Pleats/shapes can be set with heat-good for adding structure, Hydrophobic (does not absorb water) so quick drying,	Can snag easier than other weaves so not suitable for everyday wear.
Knitted Wool 	Insulating, Soft, Absorbent Natural elasticity, Lots of texture.	Takes a long time to dry, Heavy when wet, Expensive.
Cotton Lace 	Breathable, Absorbent, Lightweight, Easy to clean, Biodegradable, Lots of variations of intricate designs (good to add pattern and texture), Areas of pattern alongside sheer areas.	Delicate to work with. Can snag or pull easily.
Cotton Jersey knit 	Breathable, Stretchy Soft, Lightweight, Absorbent, Biodegradable, Crease Resistant	It doesn't retain its shape well when over stretched. Unravels if cut or snagged as made from one continuous yarn.
Cotton Denim (Twill weave) 	Breathable, Biodegradable, Easy to care for, Absorbent (good for dying), durable, diagonal twill surface adds pattern and texture.	Expensive, no stretch, heavy when wet, slow drying.
Cotton Corduroy 	Insulating, Soft, Biodegradable, Absorbent (good for dying), different cord thicknesses are available.	Medium durability, the pile cord can wear down with abrasion, takes a long time to dry.

Y9 Design Technology: Textiles Essential Knowledge Organiser

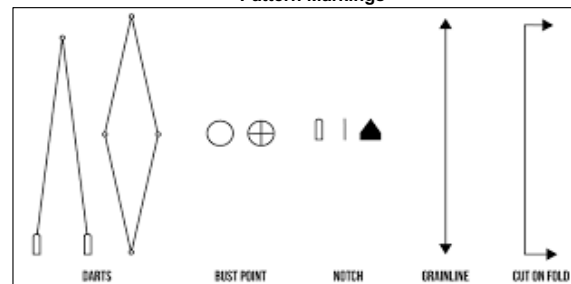


A component is something that is added to a garment to complete it.	
Component	Information
Zip 	- Metal or plastic, invisible or open. - Easy to use for all ages. - Secure fastening. - When broken cannot be fixed.
Buttons 	- Metal, Wood, plastic materials - Good for adjustable fastenings - Adds decoration - Can be uncomfortable when sat/laid on - Choking hazard for young children.
Elastic 	- High stretch and retains shape - Good to use in waist bands and cuffs for a comfortable fit - Retains body heat in garments
Velcro 	- Easy to use (so good for the young and elderly or for a quick fastening) - Not very strong or durable.
Drawstring 	- An easy fastening which can be adjusted to the user's requirements. - Drawstrings can be purchased in many colours and can be flat or circular.
Interfacing 	- This is a piece of material that is ironed or stitched onto fabrics to add strength and structure. - Used inside collars and waistbands to help them maintain shape.

Decorative Technique	Information
Applique 	When you stitch one fabric to another. This adds colour, texture and decoration. This can be done by hand or machine.
Hand embroidery 	A range of decorative hand stitches to create a pattern/picture. These add colour, texture and uniqueness to a project but can be time consuming.
Sublimation printing 	Printing photos, pictures or text on a fabric. Sublimation printing ensures you achieve a realistic, professional finish and it is quick to do. Synthetic fibres give a better finish as colours are more vibrant.
Decorative Embellishment 	Sewing sequins, beads and buttons to the fabric. This adds texture, detail and decoration but is time consuming, embellishment can fall off and can be difficult to care for.
Piping 	Aesthetically pleasing cord trim on seams. This adds a pop of colour but also strengthens the seams adding durability.
CAD/CAM Embroidery 	Machine embroidery which is programmed by you and sewn by the machine. Quick and durable with a professional finish. Used in year 9 to write letters and numbers only.
Quilting 	Two layers of fabric sandwich a layer of wadding which is stitched together. Stitches can be in a diagonal squares or with a decorative pattern. This traps air which is insulating alongside adding texture and decoration.
Tie dye 	A resist dying method which uses elastic bands or string to form a pattern. Tie dye adds colour and originality to a product but if not done correctly can look uneven and unprofessional. Natural fibres such as cotton must be used.
Patch pocket 	A patch pocket is a pocket sewn onto the surface of a garment. It can be produced in many shapes and be both decorative and functional!

Construction Technique	Information
Pleats 	To add interest, texture and volume to a product. Knife, Box and Inverted are all different types of pleats you can add!
Darts 	Add shape to a garment to create the perfect fit. Single point, double point and French darts are different types of darts and positionings on garments.
Seams 	Used to stitch two pieces of a product together. - Plain seams are cheap and quick to produce - Double stitched seam which is used on items that require strength such as jeans and coats - French seams are used on delicate fabrics
Gathers 	Adds volume and decoration to a product. Costs more due to extra fabric required.

Pattern Markings



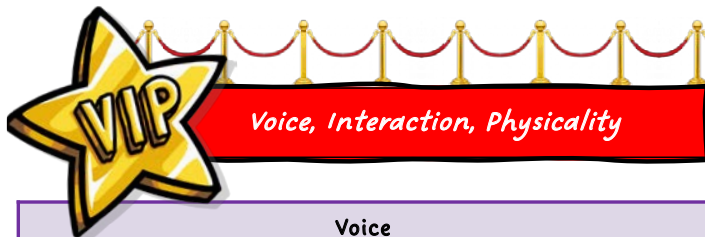
Sequin	Embroidery	<u>Key Spellings</u>	Synthetic	Sew
Aesthetically	Applique	Waist	Fibre	Seam
Design	Specification	Aesymetric	Hydrophobic	Luxurious
Scalloped	Lycra	Functional	Hydrophillic	Lustrous
Velcro	Durable	Tulle	Thermoplastic	Drape
Pattern	Occasion	Professional	Palette	Inspiration

DRAMA

Key Terminology

<u>Devising Theatre</u>	
<u>Vocabulary</u>	<u>Definition</u>
Practitioner	Someone who is a leading expert in Drama and produces new styles and techniques for performances.
Placards	Using signs to represent a character's emotions, showing their thoughts, symbolising a different prop/location, giving the audience information, or telling the audience to participate in some way.
Breaking the 4 th Wall	Speaking directly to the audience during a performance.
Spass	Having fun on stage.
Parody	This is an exaggerated imitation of a song, person or genre. It is a funny way of ridiculing a situation.
Socio-Political Message	An important message that discusses issues that affect a lot of people.
Multi-Use Props	Using a prop to represent multiple other props.
Multi-Roleplay	One actor performing more than one character.

<u>'DNA'</u>	
<u>Vocabulary</u>	<u>Definition</u>
Characterisation	How the actors develop and build a representation of character using vocal, physical, interactive and thinking skills
Cyclical Structure	A structure of play where certain scenes or moments are repeated. For example, perhaps the end of the play mirrors the beginning.
Episodic Structure	A structure of a play where there are 'episodes' of action. These episodes can be moved around in any order and still make sense. The episodes could tell individual stories that link to the overall theme(s) of the play.
Peer Pressure	How individuals and groups affect the behaviour of others. Can be socially helpful or unhelpful.
Subtext	The hidden meaning implied by characters in how they speak, what is not said, and context.
Social Issues	Problems and area of life that can be problematic, controversial; and interesting, for example, inequality or child poverty
Motivations	Exploration of why a character behaves and thinks in the way they do



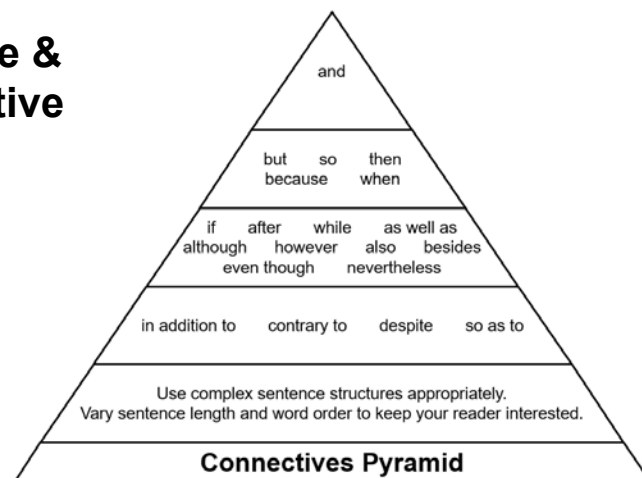
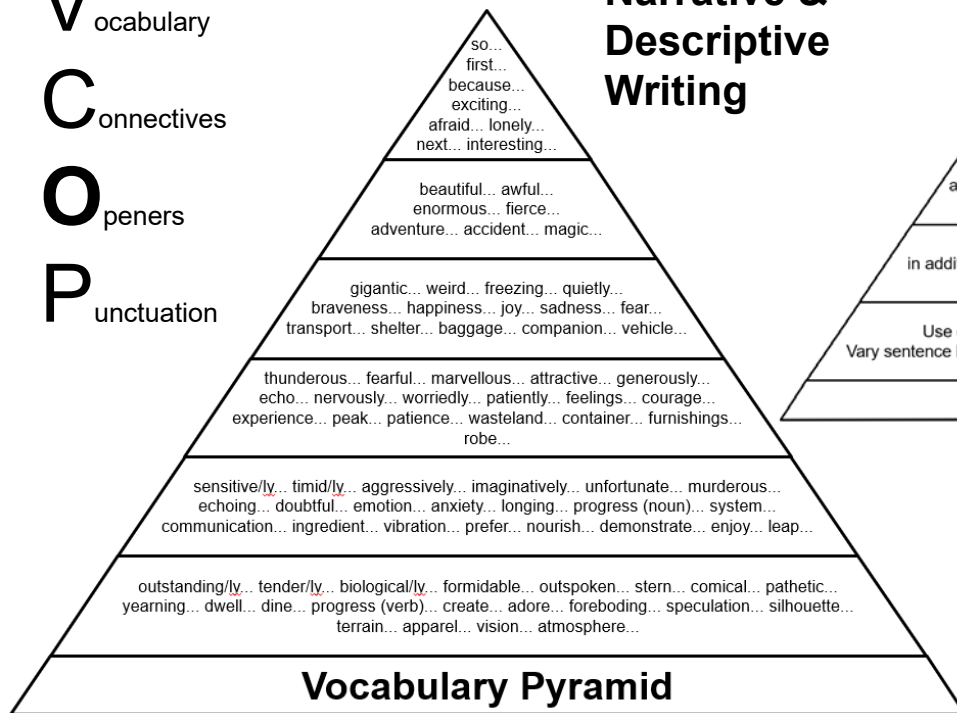
<u>Voice</u>		
<u>Vocabulary</u>		<u>Definition</u>
PPPTV	Pace	How quickly or slowly you speak
	Pitch	How high or low your voice is
	Pause	Stopping for dramatic effect
	Tone	The emotion you are showing in your voice
	Volume	How loud or quiet your voice is
Projection		Making sure your voice is loud enough to be heard without shouting
Accent		A way of pronouncing words which shows where your character is from
Emphasis		Stressing part of a word/sentence to show how your character feels

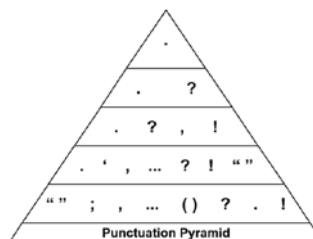
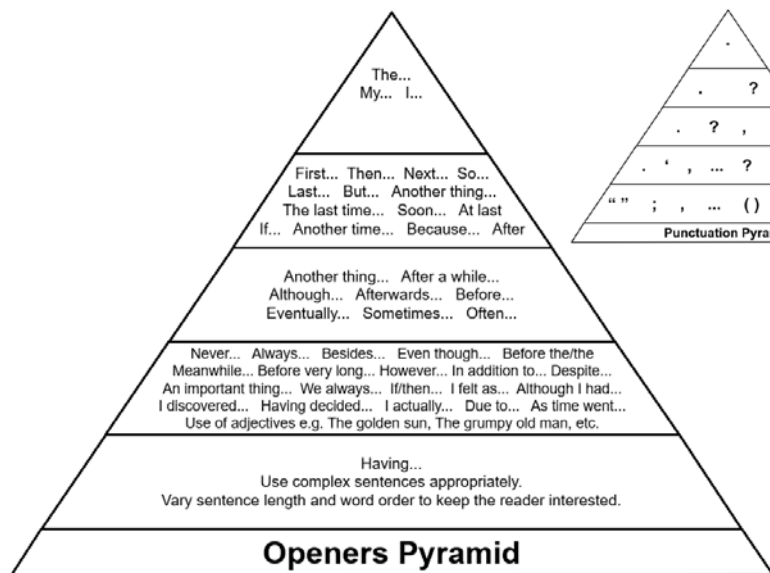
<u>Interaction</u>	
<u>Vocabulary</u>	<u>Definition</u>
Audience Sightlines	What the audience can see from their seats
Corpsing	Laughing unintentionally in a performance
Naturalistic Acting	Performing in a style that is believable – like real life
Non-Naturalistic Acting	Performing in a style that could be full of symbolism, exaggeration, silliness, song and dance – not like real life
Proxemics	Using distance between characters to show their relationship (e.g. close = friends)

<u>Physicality</u>	
<u>Vocabulary</u>	<u>Definition</u>
Facial Expressions	Using your face to show your emotions
Body Language	Using your body to show emotions
Gestures	Using your hands to communicate feelings
Stance	The way your character stands
Gait	The way your character walks
Levels	Using different heights onstage (it could be used to show your character's power)
Body as Prop	Using yours and your group members' bodies to represent an object

Vocabulary
Connectives
Openers
Punctuation

Narrative & Descriptive Writing





Punctuation Essentials		
Full stop .	Ends a sentence	She smiled.
Comma ,	Separates clauses and items	After dinner, we left.
Apostrophe '	Shows possession or contraction	It's Sam's book so don't touch
Question mark ?	Indicates a question is being asked	Where are you?
Exclamation mark !	Used to emphasise something	Watch out!
Colon :	Introduces a list or extra information	He had one goal: to win. I have three pets: a cat, a dog and a parrot.
Semi-colon ;	To link related clauses	It was late; she was tired.
Dash -	Adds interruption or extra information	He stopped – suddenly.
Speech marks "..."	Denotes direct speech	"Hello," she said

Narrative & Descriptive Writing

Descriptive Techniques	
Alliteration	When words start with the same letter/sound
Cyclical structure	A story that ends where it started
Foreshadowing	Clues for later events
Imagery	Words that create pictures in your mind
Metaphor	A comparison that says something is something else.
Pathetic fallacy	Using the weather to create a mood
Personification	Giving human features to something not human
Simile	A comparison using like or as
Zoomorphism	Giving animal qualities/characteristics to things that aren't animals

Crafting Sentences

Suggestion	Example	Your turn...
A short sentence of three verbs	<u>Watching, listening, waiting.</u>	
Starting with an adverb	<u>Ominously</u> , the alarm filled the empty city...	
Starting with a simile	<u>Like a concrete wall</u> , the noxious cloud of gas surrounded them.	
Start with a preposition	<u>Above</u> the trench, the explosion was very sudden.	
Include sensory language	<u>The deafening screech of car wheels and police sirens filled the air.</u>	
Use a fronted adverbial (where, when, how)	Before darkness arrived... As the candle dimmed... At midnight...	
Include dynamic verbs.	Paul's right hand <u>shot</u> out and down, <u>gripping</u> the deadly thing. It <u>hummed</u> and <u>twisted</u> in his hand, but his muscles were <u>locked</u> on it in desperation.	

Key Vocabulary

Novel	A story with a hidden meaning
Theme	A main idea or message in a text
Protagonist	The main character in the story
Antagonist	The enemy of the protagonist
Social class	A person's position in society determined by wealth
Patriarch	A male leader
Patriarchy	A male dominated society
Capitalism	A type of society motivated by making money and profit

Reading**Literary Devices**

Alliteration	When words start with the same letter/sound	She sells seashells along the seashore.
Hyperbole	An over-exaggeration	My suitcase weighs a ton!
Juxtaposition	Placing opposite ideas nearby	Spring remained a distant memory as winter soon crept in
Metaphor	A comparison that says something is something else.	The classroom was an encyclopaedia.
Onomatopoeia	Words that sound like the noise they make	Buzz, hiss, crack
Oxymoron	Two opposite ideas/words placed right next to each other	The deafening silence A happy war
Personification	Giving human features to something not human	The stars winked at me.
Simile	A comparison using like or as	She was as happy as a lark.

PEACH	
Point	The writer presents...as/as an exploration of...
Evidence	This is shown through the quote, '...'
Analysis (meaning, method, connotations, effects)	The use of [method] implies...because the word '...' means...which has connotations of... Furthermore, it could also suggest that...
Context	At the time the poem/text is set,... The writer may have wanted to show...through his/her exploration of [theme] because...
Have You Checked Your Work?	Make sure you leave time to check your work, correcting where needed.

Step by Step Guide to Analysis	
1. Pick a quote	Choose a short, relevant word or phrase from the text.
2. Identify a Technique	Say what it is (e.g. metaphor, simile, adjective, repetition)
3. Zoom in on a word	Focus on one interesting word
4. Explain what it suggests	Say what the word (or phrase) makes you think or feel.
5. Link to meaning	Explain what it shows about a character, theme, idea
6. Add deeper thought	Consider why the writer did this or how it affects the reader.

Analytical Language		
Simple	Developed	Deeper Thinking
Describes	Conveys	Challenges
Explains	Demonstrates	Contrasts with
Highlights	Emphasise	Criticises
Presents	Explores	Exemplifies
Reveals	Illustrates	Reinforces
Shows	Implies	Symbolises
Suggests	Represents	Questions

Y9 French Term 1

French Phonics

French	Pronunciation
ou	oo
oi	wa
en-in-on-un	Nasal sounds the "n" is silent
o-au-eau	o
eu	errr
é	it
er-et-ez at the end of a word	
è-ê-ai	bet
h	is silent
u	
gn	nya
ch	sh
ill	y
qu	k
ç	s
tion-sion-ssion	see on

KS3 Tier 3 Vocabulary: Year 9

Key word	Definition
Annotate	Label a text with key words/meanings
Intonation	Voice going up and down based on emphasis or stress – caused by accents
Exception	Something that doesn't follow the (grammar) rules
Tense	When an action is happening – <i>past, present or future</i>
WOW Phrase	A high level GCSE phrase to include in your work that increases your quality of language

Les jours de la semaine

(The days of the week)

lundi	Monday
mardi	Tuesday
mercredi	Wednesday
jeudi	Thursday
vendredi	Friday
samedi	Saturday
dimanche	Sunday

Les mois de l'année

(The months of the year)

janvier	January
février	February
mars	March
avril	April
mai	May
juin	June
juillet	July
août	August
septembre	September
octobre	October
novembre	November
décembre	December

Quelle est la date?



Les nombres 0-31

(Numbers 0-31)

0	zéro	8	huit	16	seize	24	vingt-quatre
1	un	9	neuf	17	dix-sept	25	vingt-cinq
2	deux	10	dix	18	dix-huit	26	vingt-six
3	trois	11	onze	19	dix-neuf	27	vingt-sept
4	quatre	12	douze	20	vingt	28	vingt-huit
5	cinq	13	treize	21	vingt et un	29	vingt-neuf
6	six	14	quatorze	22	vingt-deux	30	trente
7	sept	15	quinze	23	vingt-trois	31	trente et un

1.1 Où vas-tu en vacances? Quand? Avec qui?

SB1.1	Où vas-tu en vacances? (Where do you go on holiday?) Quand vas-tu en vacances? (When do you go on holiday?) Avec qui vas-tu en vacances? (With whom do you go on holiday?)			
Normalement (Normally)	je vais (I go)	au bord de la mer (to the seaside) à la plage (to the beach) à la campagne (to the countryside)	avec (with)	ma famille (my family) mes amis (my friends) mes grandparents (my grandparents) en été (in the summer) au printemps (in spring) en automne (in autumn) en hiver (in winter)
D'habitude (Usually)	on va nous allons (We go)	à la montagne (to the mountains) à l'étranger (abroad) sur la côte (on the coast)	Je voyage (I travel) Nous voyageons (We travel) On voyage (We travel)	en avion (by plane) en voiture (by car) en train (by train) en bus (by bus) en bateau (by boat) à vélo (by bike) à pied (on foot)
J'ai (I have)	une semaine (one week) deux semaines (two weeks) six semaines (six weeks) dix jours (ten days)		de vacances en (on holiday in)	janvier (January) février (February) mars (March) avril... (April)

1.2 Où es-tu allé(e) l'année dernière?

SB1.2	Où es-tu allé(e) l'année dernière? (Where did you go last year?)			
L'année dernière (last year)	je suis allé(e) (I went) on est allé(e) (we went)	en Espagne (to Spain) en Grèce (to Greece) en France (to France) en Italie (to Italy) en Tunisie (to Tunisia) au Pays de Galles (to Wales)	avec (with)	ma famille (my family) mes amis (my friends) mes grandparents (my grandparents) en avion (by plane) en voiture (by car) en train (by train) en bus (by bus) en bateau (by boat) à vélo (by bike) à pied (on foot)
C'était (It was)	un peu (a bit) très (very)	cher (expensive) intéressant (interesting) trop marrant (so funny)	fascinant (fascinating) relaxant (relaxing)	ennuyeux (boring) calme (calm) historique (historic)
Ce n'était pas mal (It wasn't bad)				

1.3 Qu'est-ce que tu as fait pendant les vacances?

SB1.3	Qu'est-ce que tu as fait pendant les vacances? (What did you do on holiday?)			
D'abord (First)		la cathédrale (the cathedral) le stade (the stadium) la mosquée (the mosque)		j'ai joué au tennis / au foot (I played football/soccer) j'ai mangé des glaces / une pizza (I ate an ice-cream / a pizza)
Ensuite (Next)		le lac (the lake) le musée (the museum) le parc (the park) le château (the castle) la chocolaterie (the chocolate shop)	en plus (furthermore) aussi (also)	j'ai acheté un tee-shirt (I bought a t-shirt) j'ai écouté de la musique (I listened to music) j'ai nagé dans la mer / la piscine (I swam in the sea / the swimming pool) j'ai dormi (I slept) j'ai pris des photos (I took photos)
Puis (Then)	j'ai visité (I visited) je n'ai pas visité (I didn't visit)			
Après (Afterwards)				
Finalement (Finally)				
Cependant (However)				

1.4 Où voudrais-tu aller? / Où vas-tu aller?

SB1.4	Où voudrais-tu aller l'année prochaine? (Where would you like to go next year?)		Où vas-tu aller l'année prochaine? (Where are you going to go next year?)	
Un jour (One day)	je voudrais aller (I would like to go) je vais aller (I am going to go)	en (to)	Belgique (Belgium) Écosse (Scotland) Espagne (Spain) France (France) Italie (Italy) Suisse (Switzerland)	aux grottes (to the caves) à la montagne (to the mountains) au parc national (to the national park) à la mer (to the sea) aux temples (to the temples)
L'année prochaine (Next year)	je voudrais visiter (I would like to visit) je vais visiter (I am going to visit)	la		
Le weekend prochain (Next weekend)	je voudrais aller (I would like to go) je voudrais visiter (I would like to visit) je voudrais aller (I would like to go) je voudrais visiter (I would like to visit)	au (to) le aux (to) les	Maroc (Morocco) Sénégal (Senegal) États-Unis (United States)	une spécialité (a speciality) du couscous (couscous) du poisson (fish) du poulet (chicken) de la glace (ice cream) des frites (chips)
				On va manger (We are going to eat)

Important irregular verbs (present tense)

Aller - to go			
je vais	I go	nous allons	we go
tu vas	you go	vous allez	you go
il/elle/on va	s/he goes we go	ils/elles vont	they go

Avoir - to have				Être - to be			
j'ai (je + ai)	I have	nous avons	we have	je suis	I am	nous sommes	we are
tu as	you have	vous avez	you have	tu es	you are	vous êtes	you are
il/elle/on a	s/he has we have	ils/elles ont	they have	il/elle/on est	s/he is we are	ils/elles sont	they are

Two important modal verbs (present tense)

Vouloir - to want to			
je veux	I want	nous voulons	we want
tu veux	you want	vous voulez	you want
il/elle/on veut	s/he wants we want	ils/elles veulent	they want

Pouvoir - to be able to			
je peux	I can	nous pouvons	we can
tu peux	you can	vous pouvez	you can
il/elle/on peut	s/he can we can	ils/elles peuvent	they can

2.1 Qu'est-ce que tu veux faire comme métier?

SB2.1	Qu'est-ce que tu veux faire comme métier ? (What job do you want to do?)			
À mon avis je suis (In my opinion I am) Je pense que je suis (I think I am)	ambitieux/ ambitieuse (ambitious)	alors (so/therefore)	je voudrais (I would like)	scientifique (a scientist)
	créatif/ créative (creative)		je veux (I want)	mécanicien/mécanicienne (a mechanic)
	organisé(e) (organised)			danseur/danseuse (a dancer)
	patient(e) (patient)	donc (therefore)	j'espère (I hope)	acteur/actrice (an actor/actress)
	responsable (responsible)			dessinateur/dessinatrice (a designer)
	sociable (sociable)			infirmier/infirmière (a nurse)
	travailleur/ travailleuse (hard-working)			policier/policière (a police officer)
				ingénieur/ingénieure (an engineer)
				professeur/professeure (a teacher)
				seul(e) / en équipe (alone / in a team)
				avec des animaux / enfants (with animals / children)
				varié (varied)
				dangereux (dangerous)
				facile (easy)
				passionnant (exciting)
				difficile (difficult)
				pratique (practical)
				ennuyeux (boring)
				fatigant (tiring)
				utile (useful)

2.2 Qu'est-ce que tu vas faire à l'avenir?

SB2.2 Qu'est-ce que tu vas faire à l'avenir? (What are you going to do in the future?)			
		avoir (to have)	cinq enfants (five children)
	je vais (I'm going)	faire (to do)	un apprentissage (in apprenticeship) du travail bénévole (voluntary work)
	tu vas (you're going)	être (to be)	heureux/heureuse (happy) riche et célèbre (rich and famous)
	il/elle va (he/she is going)		avocat(e) (a lawyer) / médecin (a doctor)
Dans dix ans (In ten years)		acheter (to buy)	une grande maison (a big house) une Ferrari rouge (a red Ferrari)
À l'âge de 16ans (At the age of 16)		aller (to go)	au lycée (to sixth form)
Après l'université (After university)	je voudrais (I would like)	habiter (to live)	à l'étranger (abroad)
Plus tard (Later)	je veux (I want)	étudier (to study)	les sciences et l'histoire à l'université (science and history at university)
	j'espère (I hope)	Ce sera (It will be)	fantastique (fantastic)
		C'est (It's)	très cool (very cool) assez utile (quite useful)
		Ce serait (It would be)	intéressant (interesting)

2.3 Les langues, sont-elles importantes?

SB2.3	Les langues, sont-elles importantes ? (Are languages important?)		
Si on veut (If you want)	être <u>journaliste</u> (to be a <u>journalist</u>)	parler une autre langue, c'est (speaking another language is)	essentiel (essential)
	travailler avec les gens (to work with people)	parler une autre langue, ce n'est pas (speaking another language isn't)	
Avec les langues on peut (With languages you can)	travailler dans un <u>hôtel</u> (to work in a <u>hotel</u>)	un plus/un avantage (a bonus/an advantage)	important (important)
	découvrir le monde (to discover the world)	parler une langue étrangère, c'est (speaking a foreign language is)	
	trouver un bon emploi (to find a good job)	parler une langue étrangère, ce n'est pas (speaking a foreign language isn't)	
	travailler dans un autre pays (work in another country)		
	voyager (travel)		
	communiquer avec les jeunes de son âge (communicate with young people of your age)		
	habiter à l'étranger (live abroad)		
	comprendre les gens (to understand people)		
	regarder la télé ou écouter de la musique dans une autre langue (watch TV or listen to music in another language)		

Comment décrire une image – how to describe a picture

Sur l'image...	In the image...
Dans la photo...	In the photo...
...il y a...	...there is/are...
...je peux voir...	...I can see...
...on peut voir...	...you can see...
au premier plan	in the foreground
à l'arrière-plan	in the background
à la gauche de	on the left of
à la droite de	on the right of
près de	near to
devant	in front of

il/elle porte...	he/she is wearing...
il/elle travaille...	he/she is working...
il/elle joue...	he/she is playing...
il/elle mange...	he/she is eating...
il/elle boit...	he/she is drinking...

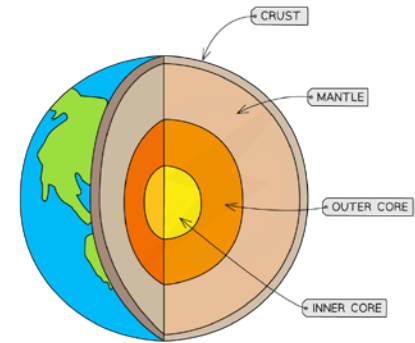
un homme	a man
une femme	a woman
un enfant	a child
un jeune	a young person
un garçon	a boy
une fille	a girl
une famille	a family

il/elle est...	he/she is...
ils/elles sont...	they are...

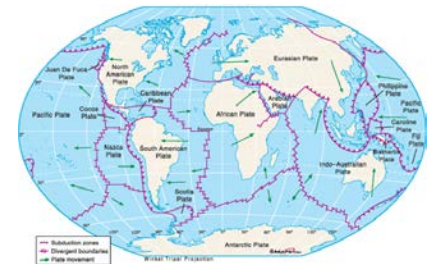
À mon avis...	In my opinion...
...il/elle est...	...he/she is...
...ils/elles sont...	...they are...
...heureux/heureuse	...happy
...triste	...sad
...fatigué(e)	...tired
...en colère	...angry

Key terms, the structure of the earth and convection currents:

Key words and processes	Definition
Continental Drift	Continents slowly moving across Earth's surface.
Convection Current	Heat-driven movement in mantle rock.
Crust	Earth's thin, outermost solid layer. 6-70 km thick.
Mantle	The thick layer of hot rock between the Earth's crust and core. It is semi-molten. 1300°C - 5000°C.
Outer Core	This layer is liquid and made up largely of iron.
Inner Core	A solid, hot centre of the Earth. 5500°C. Made up of iron.
Continental Crust	Thick crust forming Earth's continents. Lighter and older.
Oceanic Crust	Thin crust under Earth's oceans. Heavier and younger.
Tectonic Plates	Large crust pieces that move and shift.
Magma	Molten rock beneath Earth's surface.
Lava	Magma that erupts onto Earth's surface..

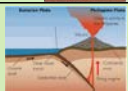
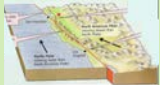


The structure of the Earth:



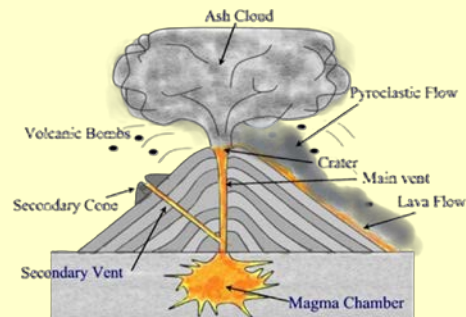
Tectonic Plates:

Plate boundaries, earthquakes and volcanoes:

Plate Boundaries:				
Boundary		Movement	Volcanoes	Earthquakes
Constructive		Apart	Yes	Small
Destructive		Together	Yes	Powerful
Conservative		Slide past	No	Powerful

Volcanoes:	
Volcano	Mountain that erupts magma, gas, and ash from Earth's crust.
Magma Chamber	Underground pool where magma collects beneath a volcano.
Main Vent	Main path magma travels to reach the surface.
Crater	Bowl-shaped opening at the top of a volcano.
Pyroclastic Flow	Fast-moving mix of hot gas, ash, and rock

Earthquakes:	
Earthquake	Sudden shaking of the ground from tectonic plate movement.
Focus	Exact underground point where an earthquake starts.
Epicentre	Point on Earth's surface above the focus.
Seismic Wave	The wave of energy given out in an earthquake, that shakes the ground.
Aftershock	Vibrations caused by earthquakes that travel through Earth.



Main Features of a Volcano

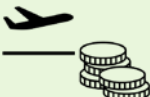
Montserrat volcanic eruption 1995

Effects of the eruption:		Responses to the eruption:	
Primary Effects –	Secondary Effects –	Immediate responses -	Long term responses -
<i>A direct effect of the eruption</i>	<i>An indirect effect of the eruption</i>	<i>Actions taken within a few days and weeks</i>	<i>Actions taken in the months and years after</i>
Plymouth, the capital, was buried under pyroclastic flows.	Businesses, especially in tourism and farming, were ruined.	People were moved to safer areas or off the island.	Large areas, including Plymouth, were declared unsafe to live in
Around 19 people died, and many were injured by hot ash and debris.	Schools, hospitals, and roads were destroyed, reducing access to essential services.	The UK and other countries sent food, water, and temporary shelters	New towns and housing were built in the north of the island.
Pyroclastic flows started forest fires that destroyed farms, schools, and hospitals, putting even more people at risk.	Thousands of people had to leave the island, many moving abroad	Teams helped find survivors and provide medical care.	Efforts to revive tourism, farming, and local businesses over time.



Yellowstone Super Volcano Impacts:		
Local Effects – within 100 miles:	Fast-moving clouds of hot gas and rock (up to 100 mph) would destroy nearby towns like Bozeman, Montana.	
	About 100,000 tourists in Yellowstone could be caught by pyroclastic flows if evacuated too late.	
Regional Effects – within the USA:	A huge ash cloud would blow east. People breathing in the ash could have their lungs damaged.	
	Many farm animals would die from the ash, which would make food more expensive and impact the US economy.	
Worldwide Effects across the world:	Less sunlight and ash falling globally could reduce food production, leading to food shortages and higher prices around the world.	
	Volcanic ash in the atmosphere would ground airplanes across continents, affecting global transport and trade.	
	Ash and gases would reach the atmosphere, blocking sunlight and causing a "volcanic winter," making the world colder for months or years.	

Why do people live in areas that are at risk from a tectonic hazards?

Advantages:	
Geothermal energy: 	Why: Areas near volcanoes often have hot rocks underground, which can be used to generate clean, cheap energy. Example: Iceland uses geothermal energy for heating and electricity.
Tourism opportunities: 	Why: Volcanoes, hot springs, and geysers attract tourists, creating jobs and income for local people. Example: Yellowstone National Park in the USA.
Mineral resources: 	Why: Volcanic areas can contain valuable minerals, such as gold, silver, or copper, which can be mined. Example: The Andes in South America.
Farming & Natural beauty: 	Why: Fertile soils, lakes, and mountains created by volcanoes make the area beautiful to live in and good for farming. Example: The slopes of Mount Etna in Italy have very fertile farmland.

Disadvantages:	
Volcanic eruptions: 	Can destroy homes, farmland, and infrastructure; pyroclastic flows and lava are deadly.
Earthquakes: 	Can collapse buildings, damage roads and bridges, and injure or kill people.
Tsunamis: 	Large waves caused by undersea earthquakes can flood coastal areas, destroying property and killing people.
Uncertainty and fear: 	People live with the constant risk of a sudden disaster, which can affect mental health.
Limited insurance options: 	Insurance may be expensive or unavailable, making recovery after a disaster harder.

Urbanisation:

Key Term:	Definition:
Urbanisation: 	An increase in the percentage of the population living in towns and cities.
Megacity:	A city with a population of over 10 million.
Push factor: 	A negative reason(s) that makes people leave an area. <i>For example; lack of employment, famine, drought and high levels of crime</i>
Pull factor: 	A positive reason(s) that makes people come to an area. <i>For example; better education and more job opportunities</i>
Regeneration:	Improving a run-down area by rebuilding or investing into it. <i>For example: Glassworks, Barnsley</i>
Deindustrialisation: 	The decline of manufacturing in an area
Sanitation: 	Providing clean water and human waste disposal

Transport systems in urban areas:

Key Term:	Definition:
Integrated transport system:	Different types of transport (like buses and trains) connected to make travel easier and more efficient <i>e.g. Barnsley Interchange</i>
Public transport: 	Buses, trains, trams, and other shared travel services available to everyone.
Transport Solutions:	A planned way to improve how people travel, making it easier, quicker, or more efficient <i>e.g. Sheffield Supertram</i>
South Yorkshire Transport Solutions:	Sheffield Super Tram, Park and Ride – Penistone Station, Bus Priority infrastructure, pedestrianisation in Barnsley town centre.

CBD and Inner city

CBD	The city's main area for businesses, shops, and money-making services.
Case Study: Barnsley Town Centre	
Causes of decline in Barnsley's CBD:	Solutions to improve Barnsley's CBD:
Deindustrialisation <i>(The decline of manufacturing in an area) in Barnsley</i>	£200 million regeneration <i>(improving an area) project</i> ; the Glass Works made Barnsley more attractive to shoppers.
Changing of shopping habits <i>e.g. out of town retail parks</i>	Affordable units to support local and independent businesses <i>e.g. Dollys Desserts</i>
Barnsley's CBD had become outdated, tired and unattractive.	Free public events like "Flavours Food Festival" increasing footfall in the town centre.

Inner city	The area around the city centre (CBD)
Case Study: Park Hill Flats, Sheffield	
Problems in the original Park Hill flats:	Solutions to improve the flats:
The original terraced houses lacked basic facilities, were overcrowded and unsanitary.	£100 million invested by Sheffield City Council to renovate Park Hill flats
They were demolished and Park Hill flats was built in the 1960's	Mixed use housing, with a mixture of social, private and student accommodation
Park Hill flats was not maintained which led to neglected homes, and an unsafe area with high amounts of crime.	Bright coloured panels and modern materials to give the flats a new identity.



Shanty Towns – Dharavi, Mumbai, India		
Shanty towns:	An unplanned, illegal settlement	
Informal sector:	Jobs that are unregulated, illegal, and not taxed.	
Challenges in Dharavi, Mumbai, India:	1 million people living in 1 square mile 4,000 cases of disease a day - Water available for 2 hours a day – 5:30 – 7:30 am 1 toilet shared amongst 500 people	
Solutions to improve Dharavi, Mumbai, India:	- Provide building materials (e.g. concrete) so homes can be safely improved and extended - Provide a reliable clean water supply - Provide a legal and safe electricity supply - Improve sanitation (toilets and waste disposal systems)	
Air Pollution:		
Air pollution:	The presence or introduction into the air of a substance which has harmful or poisonous effects.	
Solutions to reduce air pollution in Delhi, India	Odd-even car rule days so it reduces traffic and car emissions Banned firecrackers during festivals so there is less harmful smoke in the air. More electric buses introduced therefore diesel usage is reduced Closed polluting industrial units so it stops the release of toxic gases	
Water Pollution:		
Water pollution	This is the contamination of water bodies, usually as a result of human activities	
Solutions to reduce water pollution in the River Ganges, India:	Improve sewage treatment e.g. The Ganges Action Project Educate people on how to cremate bodies more efficiently Enforce environmental laws and legal standards for water pollution from leather factories and other industries on the banks of the Ganges	

Urban sustainability - BedZED

Sustainable	This means something that causing little or no damage to the environment (good for the environment), benefits local people (good for local people) and can continue for a long time.
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Case Study: Urban Sustainability – BedZED, London		
60% of household waste is recycled (3x UK average) → <i>reduces landfill waste</i>	Solar panels generate electricity; LED lights and efficient appliances reduce electricity use by 45% → <i>reduces energy use and emissions</i>	Dual flush toilets, aerated taps and low-water washing machines → <i>reduces water use</i>
Wind cowls provide natural ventilation → <i>reduces need for heating/cooling</i>	30cm insulation between bricks → <i>reduces heat loss and energy for heating</i>	Electric car charging points reduce fossil fuel car use by 65% → <i>reduces air pollution and CO₂ emissions</i>
Large south-facing windows → <i>reduces need for artificial lighting and heating</i>	Green community spaces → <i>improves wellbeing and community life</i>	Good public transport links and cycle storage → <i>reduces car use and traffic emissions</i>



Year Nine History: Topic One Conflict—Causes of World War One

	Key dates and events you should know.
May 1882	The major powers in Europe began to divide into two armed groups .The members of the Triple Alliance were; Austria-Hungary, Germany and Italy.
March 1905	The Moroccan crisis —Morocco wanted independence from France. Germany declared support for the Moroccans against the French. War was avoided following negotiations which allowed France to keep possession of Morocco.
1905-06	The Bosnian crisis —Austria took control of Bosnia angering Serbia. Serbia threatened Austria-Hungary with war. Russia, allied to Serbia, mobilised its forces. Germany mobilised its forces and threatened Russia. War was avoided when Russia backed down.
August 1907	The Triple Entente was formed between Britain, France and Russia and stated that they had a "moral obligation" to support each other.
March 1908	Germany launched its first Dreadnought sparking the naval race between itself and Britain.
28 th June 1914:	Assassination of Archduke Franz Ferdinand, carried out by Gavrilo Princep, a member of the Black Hand. Tensions rise across Europe triggering several countries and alliances to declare war.
23rd July 1914	Austria Hungary sent an ultimatum to Serbia forcing them to accept an enquiry into the assassination and accept that they would allow the Austro Hungarians to take over their legal system to do this or a war would be declared. Serbia refused.
24th July 1914	Russia offered its support to Serbia
28th July 1914	Austria Hungary declared war on Serbia
3rd August 1914	Germany launched the Schlieffen plan , invading France to capture Paris by going through Belgium.
4th August 1914	Britain declared war on Germany, sending members of the British Expeditionary Force to stop the invasion of France. Trenches were dug along the Western Front

Key historical skills covered in this topic:

Chronology—ordering historical events

Cause and consequence—giving reasons why events happened and their effects

Explanation—Sharing your understanding using historical knowledge

Significance—making judgements about the importance and impact of an historical event.

Interpretations—Identifying and comparing the different views of historians about an event/person

Key vocabulary

Conflict	Disagreements between two or more sides which sometimes leads to war
Alliances	An agreement between countries to help each other in a war.
Nationalism	Putting the interest of your country above others
Imperialism	Making your country bigger and more powerful by taking over other countries and their resources
Militarism	The belief that your country should build and maintain a powerful military
Empire	A group of countries ruled by one powerful country
Assassination	a political murder, where an individual is deliberately targeted.
Ultimatum	a final demand with consequences
Conscription:	A law forcing men to join the army
Patriotism	love and support for your country
Propaganda	media designed to influence your view
Armistice	A peace agreement
Reparations	Compensation for damage done

Triple Alliance—formed in 1882 between Germany, Austria—Hungary and Italy as an agreement to mutually support each other if attacked.

Triple Entente—formed in two stages: 1904 (Britain and France) and 1907 (Britain and Russia), a group of 3 countries with a pact to co-operate and defend each other.

What were the short and long term causes of World War One?

Long term causes—fear, competition and problems which had been building up over many years before the war began

- Alliance systems—created suspicion between different countries. When war began between any two countries this made it more likely that war would spread across Europe. Also led up to the long term build up of military capability in Europe.
- Militarism—no country wanted to be in a position not be able to defend itself so all countries (with the exception of Britain) began actively recruiting into their armies in the years before 1914. For Britain and Germany this also included building new battleships called Dreadnoughts.
- Nationalism—all countries in Europe believed their countries should be seen as the strongest and most powerful. This was particularly the case for Germany, whose leader, Kaiser Wilhelm, wanted to prove himself by getting Germany its 'place in the sun'.
- Imperialism—all countries wanted to increase their political power and wealth by building empires. By 1900 Britain was considered to have the biggest and wealthiest empire with land in India, Canada, the West Indies and Africa. Other countries were also trying to expand, leading to competition in Morocco and Bosnia which also created conflict.
- The Treaty of London—this was signed by countries across Europe declaring they would defend Belgium if it was attacked as its neutrality was to be protected.

Short term causes—events that happened in the weeks and months before the war began

- The assassination of Archduke Franz Ferdinand – The Serbian 'Black Hand Gang' killed Franz Ferdinand and his wife Sophie whilst they were visiting Sarajevo. This led to Austria Hungary giving the Serbians an ultimatum. When Serbia refused war was declared.
- Austria-Hungary's declaration of war on Serbia – this led to Russia getting ready for war to protect Serbia and brought Germany into the conflict because of their alliance with Austria-Hungary.
- The Schlieffen plan and the invasion of Belgium – Germany used the declaration of war as an opportunity to begin their plan to attack France by going through Belgium.
- Britain's defence of Belgium – Britain sent troops to Belgium to help stop the German attack on France.

World War One Alliances 1914

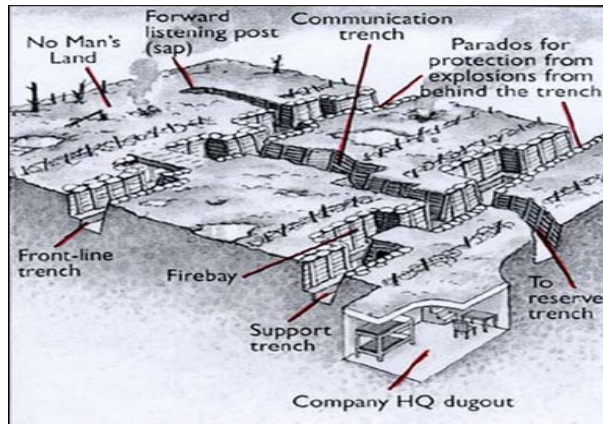
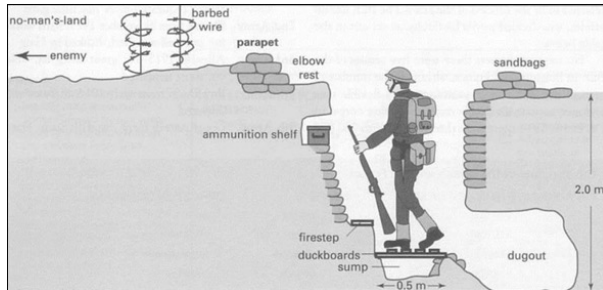


'Bravo Belgium' - A British Cartoon published 12th August 1914

Year Nine History: Topic Two Conflict – Trench warfare

	Key dates and events
August 1914	Britain joined the First World War. British troops halted the German advance through France. The first trenches were built by both sides defended by barbed wire and machine guns after neither side retreated.
October 1914	The Battle of Ypres begins. This was a vital area to control as it gave access to the ports along the English channel. The battle to control this area of northern Belgium continued throughout the war.
1915:	Germany used chlorine gas in Ypres for the first time. Allied casualties were estimated at 60,000, German at 35,000
December 1915	The Thomas Splint began to be used on the front line for leg fractures improving survival rates from 20% to 82% for men with this kind of injury.
July—Nov 1916	The Battle of Verdun and the battle of the Somme (July-Nov). There were 60,000 casualties on the first day alone and 400,000 by the time the battle ended. British forces gained just 5 miles during this time of fighting.
April 1917	The Battle of Arras. The British used tunnels to attack German trenches. Some of these tunnels were also used for men to live in and even included a hospital.
October 1917	At the Battle of Cambrai, the British army used a large number of tanks to attack German trenches. These were very effective for attacking across No Man's land but also further destroyed land making transportation of injured men difficult.
1917	The first use of stored blood (blood bank) for doing blood transfusions on the front line.
November 1918	The First World War ended

Keywords and their meanings	
Trench fever	illness spread by lice; caused headaches, shivering and pain.
NYD.N	Stood for 'Not yet diagnosed. Nervous.' This was also known as shell shock caused by the fear and conditions of trench warfare.
Trench foot	A condition caused by soldiers' feet being in wet trenches causing gangrene to develop.
Shrapnel	Shells broke into fragments and became embedded in the bones of soldiers
Gas	Chlorine, mustard and phosgene was used from 1914. Could cause blindness, coughing and even suffocation
Evacuation route	The journey soldiers took to get treatment if injured in battle.
Regimental Aid Post	The first stage in the evacuation route, they were close to the front line and gave immediate treatment.
Casualty Clearing station	Large, well equipped medical facilities for the wounded, 7-12 miles from the fighting
Base Hospitals	Converted hospitals or buildings with operating theatres, x-ray departments and some specialist centres close to railway lines.
Thomas Splint	Helped injured legs to heal after bones had been fractured, helped reduce pain and blood loss.
Carrel Dakin method	A way of cleaning injuries by sterilising with sterilised salt solution.



Skills spotlight

On this topic you will be asked to describe a 'feature' of things you have been learning about.

A 'feature' is any aspect of that event/person/place. It could be why something happened, what it looked like, what it was used for, what impact it had. You can choose.

You must identify a feature and then add some supporting knowledge/detail.

Have a look at the one below as an example.

Describe one feature of a front line trench.

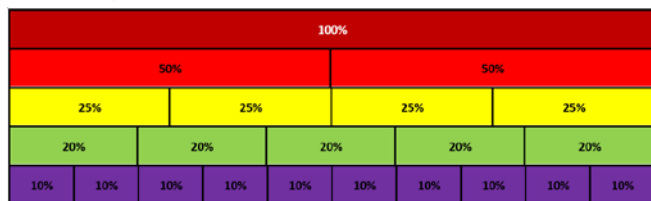
One feature of a front line trench was that **it had duckboards** built into the bottom. These were added to **keep soldiers feet out of water** and mud so that they stayed dry and did not develop trench foot.

Describe one feature of the evacuation route for injured soldiers.

One feature of the evacuation route for injured soldiers was that the first medical care they would receive was from **the Regimental Aid Post**. This was a temporary medical station sometimes in a dugout or shelter where **immediate care could be given** before soldiers were moved further behind the lines to safety.

Maths Working Wall

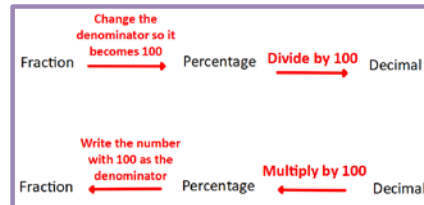
Percentages:



To find...

50% divide by 2
10% divide by 10
25% divide by 4
1% divide by 100

FDP:



Types of number:

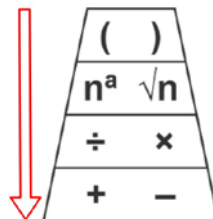
CUBES 1 8 27 64 125

SQUARES 1 4 9 16

25 36 49 64 81 100
121 144 169 196 225

PRIME NUMBERS
2 3 5 7 11
13 17 19 23 29
31 37 41 43 47
53 59 61 67 71
73 79 83 89 97

Order of operations



Fraction	Percentage	Decimal
$\frac{1}{2}$	50%	0.5
$\frac{1}{4}$	25%	0.25
$\frac{1}{5}$	20%	0.20
$\frac{1}{10}$	10%	0.10
$\frac{1}{100}$	1%	0.01
$\frac{3}{4}$	75%	0.75



Maths Working Wall

Pythagoras:

$$a^2 + b^2 = c^2$$

Trigonometry:

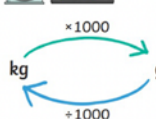
SOH|CAH|TOA

$$\sin \vartheta = \frac{O}{H} \quad \cos \vartheta = \frac{A}{H} \quad \tan \vartheta = \frac{O}{A}$$

Converting Measurements:



1000ml = 1 litre
 $\frac{1}{10}l = 0.1l = 100ml$
 $\frac{1}{4}l = 0.25l = 250ml$
 $\frac{1}{2}l = 0.5l = 500ml$
 $\frac{3}{4}l = 0.75l = 750ml$
 $\frac{1}{100}l = 0.01l = 10ml$



1000g = 1kg
 $\frac{1}{10}kg = 0.1kg = 100g$
 $\frac{1}{4}kg = 0.25kg = 250g$
 $\frac{1}{2}kg = 0.5kg = 500g$
 $\frac{3}{4}kg = 0.75kg = 750g$

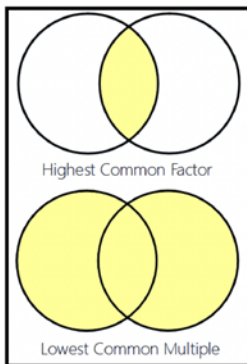
Index Laws:

$$a^m \times a^n = a^{m+n}$$

$$a^m \div a^n = a^{m-n}$$

$$a^0 = 1$$

HCF & LCM:



AND/OR rules:

and = multiply, or = add

Number	1	2	3	4	5
Probability	x	0.15	0.05	0.2	0.35

$$P(2 \text{ and } 3) = 0.15 \times 0.05 = 0.0075$$

$$P(2 \text{ or } 3) = 0.15 + 0.05 = 0.2$$

Graphs:

Equation of a straight line:

$$y = mx + c$$

$$\text{gradient}(m) = \frac{\text{change in } y}{\text{change in } x} \quad \text{OR} \quad \text{gradient}(m) = \frac{y_2 - y_1}{x_2 - x_1}$$



1000 metres = 1 kilometre
 $\frac{1}{4}km = 0.25km = 250m$
 $\frac{1}{2}km = 0.5km = 500m$
 $\frac{3}{4}km = 0.75km = 750m$
 $\frac{1}{10}km = 0.1km = 100m$

Quadratic Formula:

$$ax^2 + bx + c = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Factors & Multiples:

Factors of 18 : 1, 2, 3, 6, 9, 18

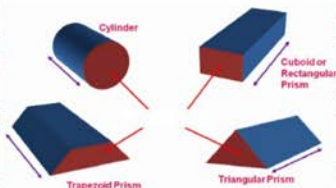
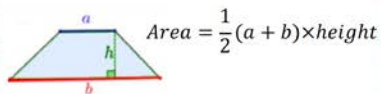
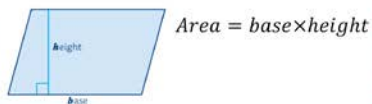
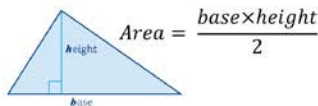
Multiples of 18 : 18, 36, 54, 72, 90, 108...

Factors are numbers that multiply to get that number

Multiples are numbers in that times table

Maths Working Wall

Shape



$$\text{Volume of a prism} = \frac{\text{area of cross-section}}{\text{cross-section}} \times \text{length}$$

$$\text{Sum of interior angles in a polygon} = (\text{number of sides} - 2) \times 180$$

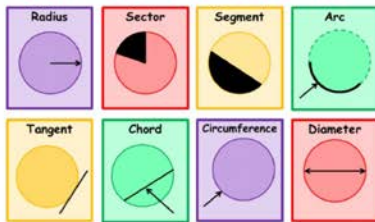
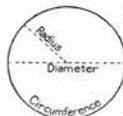
$$\text{Sum of exterior angles in a polygon} = 360 \div \text{number of sides}$$

$$\text{Circumference} = \pi \times D$$

$$\text{Area} = \pi \times r^2$$

$$\text{Sector Area} = \pi \times r^2 \times \frac{\text{angle}}{360}$$

$$\text{Arc length} = \pi \times D$$



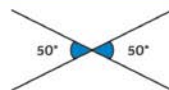
Angles



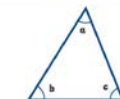
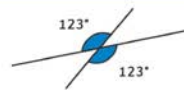
Angles on a straight line always total 180° .



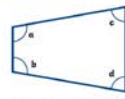
Angles around a point always total 360° .



Opposite angles that share a vertex are equal.



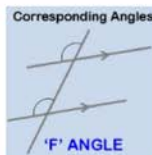
$$a + b + c = 180^\circ$$



$$a + b + c + d = 360^\circ$$



Alternate angles are equal



Corresponding angles are equal



Co-interior angles add to 180

Retrieval Core Maths Knowledge

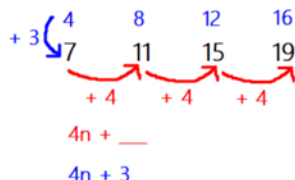


Be Determined

Core knowledge 1— Nth term

Find the nth term of
7, 11, 15, 19, ...

$$= 4n + 3$$



Core knowledge 2— Non-calculator percentages

Find 45% of 40

$$\begin{aligned} &+2 \left\{ \begin{array}{l} 5\% = 2 \\ 10\% = 4 \end{array} \right. +2 \\ &\times 4 \left\{ \begin{array}{l} 40\% = 16 \end{array} \right. \times 4 \end{aligned}$$

$$\begin{aligned} 45\% &= 40\% + 5\% \\ 45\% &= 16 + 2 = 18 \end{aligned}$$

Core knowledge 3— Speed

I travel at 40mph, how far do I go in...

a) 30 minutes

b) 3 hours

$$\begin{aligned} +2 \left\{ \begin{array}{l} 20 \text{ miles} = 30 \text{ minutes} \\ 40 \text{ miles} = 60 \text{ minutes} \end{array} \right. +2 \end{aligned}$$

$$\begin{aligned} \times 3 \left\{ \begin{array}{l} 40 \text{ miles} = 1 \text{ hour} \\ 40 \text{ miles} = 3 \text{ hours} \end{array} \right. \times 3 \end{aligned}$$

Core knowledge 4— Adding and subtracting fractions

Calculate

$$\begin{aligned} &\frac{5}{6} + \frac{1}{10} \\ &\times 5 \left\{ \begin{array}{l} \frac{25}{30} + \frac{3}{30} \end{array} \right. \times 3 \\ &\frac{28}{30} \xrightarrow{+2} \frac{14}{15} \end{aligned}$$

Choose the lowest common denominator

Core knowledge 5— Dividing fractions

Calculate

$$\begin{aligned} &\frac{5}{6} \div \frac{1}{10} \\ &\frac{5}{6} \times \frac{10}{1} \\ &\frac{50}{6} \xrightarrow{+2} \frac{25}{3} = 8\frac{1}{3} \end{aligned}$$

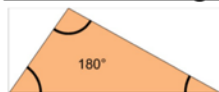
Multiply by the reciprocal

Retrieval Core Maths Knowledge

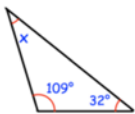


Aim High

Core knowledge 1— Angles in a triangle



Angles in a triangle
add to 180



$$180 - 109 - 32 = 41$$

Core knowledge 2— Expand double brackets

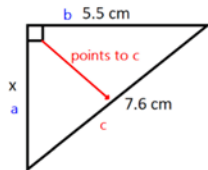
Expand $(x + 4)(x - 6)$

$$= x^2 + 4x - 6x - 24$$

$$= x^2 - 2x - 24$$

	x	$+4$
x	x^2	$4x$
-6	$-6x$	-24

Core knowledge 3— Pythagoras



1. Label the triangle

2. Use $a^2 + b^2 = c^2$

$$x^2 + 5.5^2 = 7.6^2$$

$$x^2 + 30.25 = 57.76$$

3. Rearrange if needed

$$x^2 = 57.76 - 30.25$$

$$x^2 = 27.51$$

4. Find x

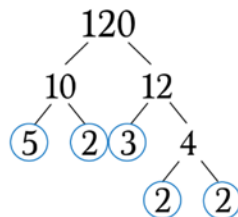
$$x = \sqrt{27.51} = 5.2\text{cm}$$

Core knowledge 4— Prime factors

Find the prime factor
decomposition of 120

$$120 = 2 \times 2 \times 2 \times 3 \times 5$$

$$120 = 2^3 \times 3 \times 5$$



Core knowledge 5— Fraction arithmetic

Calculate

$$\frac{5}{6} + \frac{1}{10}$$

$$\frac{25}{30} + \frac{3}{30}$$

$$\frac{28}{30} \xrightarrow{\div 2} \frac{14}{15}$$

Choose the lowest
common denominator

Calculate

$$\frac{5}{6} \times \frac{1}{10}$$

$$\frac{5}{60} \xrightarrow{\div 5} \frac{1}{12}$$

Multiply
numerators
Multiply
denominators

Calculate

$$\frac{5}{6} \div \frac{1}{10}$$

$$\frac{5}{6} \times \frac{10}{1}$$

$$\frac{50}{6} \xrightarrow{\div 2} \frac{25}{3} = 8\frac{1}{3}$$

Multiply by the
reciprocal

Retrieval Core Maths Knowledge



Be Brave

Core Knowledge 1— Solving Equations with 'x' on both sides

$$\begin{aligned}
 5(2x + 5) &= 2x + 9 \\
 \text{Expand } 10x + 25 &= 2x + 9 \\
 -2x \quad 8x + 25 &= 9 \quad -2x \\
 -25 \quad 8x &= -16 \quad -25 \\
 \div 2 \quad x &= -2 \div 2
 \end{aligned}$$

Core knowledge 2— Negative Index Laws

$$\left(\frac{2}{3}\right)^{-3} = \left(\frac{3}{2}\right)^3 = \frac{3^3}{2^3} = \frac{27}{8}$$

find the reciprocal and make the power positive *cube the numerator and denominator*

Core knowledge 3— Factorising Quadratic Expressions

$$\begin{array}{r|rr}
 & 12 & \\
 1 & 12 & \\
 2 & 6 & \\
 \hline
 3 & 4 &
 \end{array}
 \quad (x + 3)(x + 4)$$

'I want two numbers that multiply to give 12, that add to give 5'

$$\begin{array}{r|rr}
 & 9 & \\
 -1 & -9 & \\
 \hline
 -3 & -3 &
 \end{array}
 \quad (x - 3)(x - 3) = (x - 3)^2$$

'I want two numbers that multiply to give 9, that add to give -6'

Core knowledge 4— Change the Subject

make w the subject

$$c = \frac{4 + w}{w + 3}$$

multiply up by the denominator

$$c(w + 3) = 4 + w$$

expand the bracket

$$cw + 3c = 4 + w$$

get all the subject variables on one side

$$cw - w = 4 - 3c$$

factorise

$$w(c - 1) = 4 - 3c$$

divide

$$w = \frac{4 - 3c}{c - 1}$$

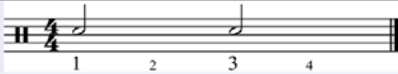
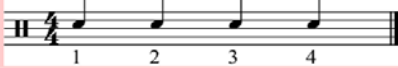
Core knowledge 5— Finding the gradient – given two points

Find the gradient of the line these two points fall on

(3, 4) and (-5, 2)

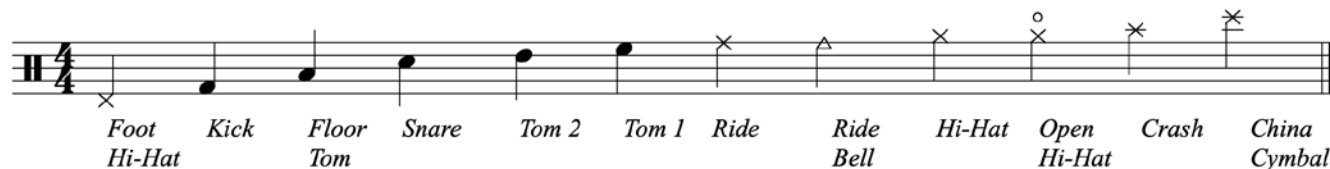
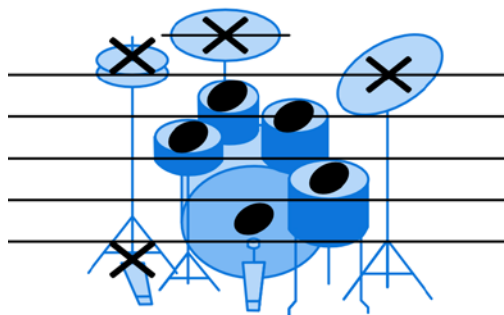
$$m = \frac{y_2 - y_1}{x_2 - x_1} \quad m = \frac{4 - 2}{3 - -5} \quad m = \frac{2}{8} = \frac{1}{4}$$

RHYTHM

Note	Note Value	Rests	Beats	Example in a 4 Beat Bar
Semibreve			4 beats	
Minim			2 beats	
Crotchet			1 beat	
Quaver	 ()		$\frac{1}{2}$ beat	
Semiquaver	 ()		$\frac{1}{4}$ beat	

⚡ Basic Drum Notation ⚡

There are several symbols musicians should know when starting to read drum notation:



PIANO

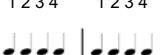
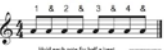
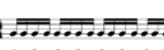
The diagram illustrates the musical alphabet C through B across three levels: a treble clef staff, a piano keyboard, and a bass clef staff. The treble clef staff shows the notes C, D, E, F, G, A, B ascending. The piano keyboard shows the corresponding keys, with the C key highlighted in red. The bass clef staff shows the notes C, D, E, F, G, A, B descending. A doghouse illustration is placed between the keyboard and the bass staff, and a house illustration is placed to the right of the keyboard.

Middle C

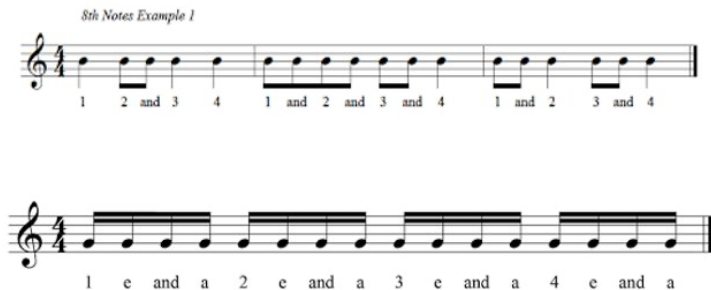
Remember!
To find a **D** note, think of a 'Dog in a kennel'.

The **two black keys together** are the 'kennel', with the Dog inside it!

Remember!
To find **G** and **A**, think of 'Gary and Aнна' living in a house (three black keys).

Symbol	Name	Value	How To Count
	Semibreve	4	Counting Whole Notes Hold the note for four beats. 
	Minim	2	
	Crotchet	1	1 2 3 4 1 2 3 4 
	Quaver	1/2	Counting Eighth Notes  Hold each note for half a beat.
	Semiquaver	1/4	 1 e & a 2 e & a 3 e & a 4 e & a

Try tapping out some of these rhythms while you count:



Pitch	Visual Representation	Features	Description
Low Pitch		Bass, Cello, Tuba, Trombone use this clef	This is the bass clef, sometimes called the F clef.
Low Pitch Notes	 G B D F A  A C E G	There is an easy way to remember the lines and spaces. Great Big Dogs Frighten Auntie All Cows Eat Grass	The bass clef is used to notate low pitch instruments.
High Pitch		Violin, Clarinet, Right hand piano	This is the treble clef, sometimes called the G clef.
High Pitch Notes	 E G B D F  F A C E	There is an easy way to remember the lines and spaces. Every Green Bus Drives Fast FACE 😊	The treble clef is used to notate higher pitch instruments.
Accidentals	Sharp Flat   	We have 7 natural notes ABCDEFG Plus 5 sharps and flats (each black note on the piano has a flat and sharp name) C# / Db – D# / Eb – F# / Gb – G# / Ab – A# / Bb	Sharp means you play the very next note up in pitch Flat means you play the very next note down in pitch

Benefits of Physical Activity and Warm-Ups

Benefits of Exercise	
Physical activity and exercise are important for everyone and has many benefits which can be split into three different categories	
Physical	Physical benefits refer to the well-being of the body and the proper functioning of the body's systems
Mental	Mental benefits refer to the well-being of your feelings, thoughts and emotions
Social	Social benefits refer to how well people interact with others and form healthy relationships

Benefits of Exercise		
	Short Term	Long Term
Physical	- Increased heart rate – Improved circulation - Increased flexibility – - Immediate calorie burn - Boosted energy levels	- Reduced resting heart and blood pressure - Helps sustain a healthy weight - Improved muscle mass and bone density - Reduced risk of heart disease and strokes
Mental	- Mood enhancement – Serotonin - Stress Relief - Improved alertness and concentration levels - Improved sleep patterns	- Enhanced mental health – can reduce symptoms of depression and anxiety - Improved self esteem - Improved stress management – coping mechanisms-
Social	- Increased social interaction - Teamwork and co-operation - Motivation and support	- Expanded social connections – make new friends - Improved social skills – communication - Sense of community and belonging

Reasons why we Warm Up	
Before every PE lesson you will be asked to take part in a warm-up. The reasons for doing so are outlined below	
To increase heart rate	Increasing the heart rate helps to increase blood flow to the muscles, ensuring that they receive more oxygen and nutrients, which are important for energy production during exercise.
To increase body temperature	A warm-up gradually raises the body's temperature, which helps to prepare the muscles for more intense activity. Warmer muscles are more flexible, contract more efficiently, and are less prone to injury.
To prevent injury	During a warm up both dynamic and stretches will increase the flexibility of the muscles which will make them less likely to strain or tear
Practice Skills	Warm-ups often incorporate sport-specific drills and activities. This not only prepares the body but also helps to refine and practice key skills and techniques relevant to the activity.

What should a warm-up consist of?	
During your PE lessons you may be asked to lead a warm-up. To do this effectively you will need to know what your warm-up should include	
Pulse-Raiser	Exercise and movements designed to gradually increase the heart rate. E.g. jogging on the spot, side steps, star jumps
Dynamic Stretches	A type of stretch that involves movement. E.g. leg swings, arm circles and walking lunges
Static Stretches	A type of stretch where the muscle is stretch and then held in the same position, there is no movement. E.g. Touch your toes, cross-arm body stretch
Skill familiarisation	Sport-specific drills designed to half practice key skills and techniques for the activity. E.g. possession based 3v1 for football

Badminton – Y9

Rules and Regulations

Serving System LO/RE	At the beginning of the game (0-0) and when the server's score is even, the server serves from the right service court. When the server's score is odd, the server serves from the left service court. Left Odd Right Even
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Tactics and Strategies

During your badminton lessons you will be asked to perform a variety of tactics to explore the different ways of winning a point	
Attacking the Serve	This means trying to put pressure on them right from the start of the rally. Here's how you can do it: <i>Be ready and react quickly / Aim for the corners / Be aggressive</i>
The use of deception and disguise	Using disguise and deception means making your opponent think you're going to hit the shuttle one way, but then surprising them by hitting it another way. Here's how you can do it: <i>Change direction at the last minute / Use different speeds / Look one way and hit the other</i>

Badminton Tier 3 Vocabulary

Vocabulary	Definition
Baseline	The back boundary line of the court.
Clear	A high, deep shot that sends the shuttlecock to the back of the opponent's court.
Court Coverage	The ability to move effectively and cover all areas of the court during play.
Deception	Using techniques to disguise the true direction or speed of a shot to trick the opponent.
Drive	A fast, low, and flat shot that travels horizontally over the net.
Drop Shot	A soft shot that just clears the net and falls quickly into the opponent's front court.
Fault	A violation of the rules, such as hitting the shuttlecock out of bounds or into the net.
Flick Serve	A quick, high serve aimed to catch the opponent off guard, often sent to the backcourt.
Footwork	The movement and steps taken by players to position themselves for shots.
Let	A situation where the point is replayed due to interference or accidental occurrences.
Net Kill	A powerful, downward shot played close to the net to finish the rally.
Service Fault	A violation during the serve, such as striking the shuttlecock above the waist or stepping on the service line.
Smash	A powerful, downward shot aimed to finish the rally quickly.

Football – Y9

Rules and Regulations	
Direct Free-Kick	Awarded for a foul that takes place outside of the box.
Indirect Freekick	A foul inside the box but is not a penalty.
Offside	When an attacking player receives the ball from a member of their team when they are closer to the opposing team's goal than any of the opposition (except the keeper)

Tactics and Strategies	
During your football lessons you will be asked to perform a variety of tactics to explore the principles of attack v defence	
Maintain Possession	This tactic is important for a team to create goal scoring opportunities. To be successful at this tactic attacking players need to - Create Space, Communicate, Move the ball quickly and accurately
Use of Width	Using the full width of the field in attack to stretch the opposing defence and create more space. This helps in opening passing lanes and creating opportunities for crosses into the box or making space for central attacks.
High Press	A strategy where players aggressively press the opponent high up the pitch, near their goal, to win the ball back quickly. This puts pressure on the opponent's defenders and can force mistakes, leading to scoring opportunities.
Low Block	A defensive strategy similar to the low press, where the team stays very compact and close to their own goal. Most players are positioned in and around the penalty area, making it difficult for the opponent to break through and score.

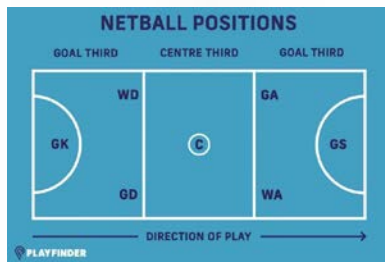
Football Tier 3 Vocabulary	
<u>Vocabulary</u>	<u>Definition</u>
Attacker	A player whose main job is to score goals and create chances to score.
Counter-Attack	A quick move from defending to attacking, trying to catch the opposing team off guard.
Defender	A player whose primary role is to stop the opposing team from scoring.
High Press	A strategy where players try to win the ball back close to the opponent's goal.
Low Block	A defensive strategy where most of the team's players stay close to their own goal to make it hard for the opponent to score.
Midfielder	A player who plays in the middle part of the field and helps both in attacking and defending.
Overlap	When a player runs around and ahead of a teammate who has the ball to provide an extra attacking option.
Pressing	When players put pressure on the opponent to win back the ball quickly.
Transition	The switch from attacking to defending or from defending to attacking.
Width	Using the full width of the field to stretch the opponent's defence and create space.
Wing-Play	Using the sides of the field to attack and create scoring opportunities.

Gymnastics / Trampolining Y9

Gymnastics Tier 3 Vocabulary	
Vocabulary	Definition
Aesthetically Pleasing	Movements, balances, or routines that look graceful, beautiful, and well-executed.
Tuck	A tuck is a position where you pull your knees to your chest and wrap your arms around them. This helps you spin faster when you do flips.
Straddle	A straddle jump is when you jump up and spread your legs apart to the sides, reaching your arms towards your toes before bringing your legs back together for the landing.
Seat drop	A seat drop is when you jump up and land on your bottom, with your legs straight out in front of you. Your hands should touch the trampoline beside your hips to help you bounce back up.
twist jumps	A twist is when you rotate your body sideways while you're in the air. It's like spinning around without moving your feet.
Split jumps	A split jump is when you jump up and split your legs apart, one in front of you and one behind you, while in the air. Your legs should be straight, and your arms should reach towards your toes to make a nice, straight line. You then bring your legs back together before landing.
'Piked' straddle jump	A piked straddle jump is a combination of a pike and a straddle jump. When you jump, you spread your legs apart to the sides (like in a straddle jump) while keeping them straight, and bend at your hips to reach your hands towards your toes (like in a pike). Your body should form an "M" shape in the air. After reaching, you bring your legs back together before landing.
Back landing on a mat	A back landing on the mat is when you jump up and purposefully land on your back on a crash mat placed on the trampoline or next to it. This helps you practice control and balance, and the mat makes sure you land safely and softly. After landing, you can bounce back up or roll to a stop.

Gymnastics Tier 3 Vocabulary	
Vocabulary	Definition
Pike	A pike is a position where you keep your legs straight and bend at your hips, reaching your hands towards your toes. It looks like an upside-down "V" shape when you're in the air.
Somersault	A somersault is a flip where you rotate your body forward or backward in the air. It's like doing a roll but while you're off the ground.
Routine	A routine is a sequence of different trampoline moves you put together in a performance. It's like a dance, but on a trampoline.
Spotter	A spotter is someone who stands near the trampoline to watch and help make sure you're safe while you're practicing. They can help catch you if you fall or give you tips.
Half Twist	A half twist is when you rotate your body 180 degrees in the air, turning to face the opposite direction before landing.
Front Drop	A front drop is when you jump and land flat on your stomach with your arms stretched out in front of you, then bounce back up.
Swivel Hips	Swivel hips is a move where you do a seat drop, then twist your hips 180 degrees in the air to land back in a seat drop facing the opposite direction.
Trampoline Bed	The trampoline bed is the part of the trampoline that you jump on. It's made of a strong, stretchy material that helps you bounce high.
Bounce	Bounce is when you jump on the trampoline, and it pushes you back up into the air. The harder you jump, the higher you bounce.

Netball – Y9



Tactics and Strategies

During your netball lessons you will be asked to perform a variety of tactics to explore the principles of attack v defence

Man-to-Man Defence	Each defender marks a specific opponent, staying close to them to prevent them from receiving the ball
Zoning	Defenders cover specific areas rather than marking individual players. This helps to intercept passes and restrict the opposition's movement.
Fast Break	Quickly transitioning from defence to attack, aiming to catch the opponents off guard and create scoring opportunities before they can set up their defence.
Dodging:	Players use sudden changes in direction to lose their defenders and create space to receive passes.
	A player passes the ball and immediately moves

Netball Tier 3 Vocabulary

<u>Vocabulary</u>	<u>Definition</u>
Backline Pass:	A pass taken from the backline (goal line) after the ball has gone out of bounds over the goal line by the opposing team.
Double Marking	A defensive strategy where two players mark the same opponent to prevent them from receiving the ball.
Feeding:	The act of passing the ball to the shooters within the goal circle
Offside:	A rule violation where a player enters an area of the court that they are not allowed to be in according to their position.
Rebound:	The act of gaining possession of the ball after a missed shot on goal, either by the attacking team (to shoot again) or by the defending team (to clear the ball).
Set Play:	A pre-arranged strategy used during a stoppage in play, such as a centre pass or throw-in, to gain an advantage over the opposition.
Court	The rectangular playing area where the game takes place. The court is made Attacking Third: The area from the goal circle to the transverse line nearest to the opponent's goal. Centre Third: The middle section where the game restarts after each goal with a centre pass. Defending Third: The area from the goal circle to the

Rugby Union – Y9

<u>Rules and Regulations</u>	
Players and Positions	Each team has 15 players on the field. Forwards (8); Backs (7)
Tackling and Rucks	Players can tackle the ball carrier to the ground to stop them. After a tackle, players from both teams try to win the ball by forming a ruck and pushing over it
Offside and Penalties	Players must stay behind the ball; being in front of the ball puts them offside. Penalties are given for offside, dangerous play, or other rule violations. The opposing team can kick for goal, kick for touch, or take a scrum.
Scrum and Line-Outs	Scrum: After minor rule infringements, 8 forwards from each team bind together and push against each other to win the ball. Lineout: When the ball goes out of bounds, players line up and the ball is thrown back into play.

<u>Tactics and Strategies</u>	
<u>Tactic</u>	<u>Strategies for Success</u>
Attack v Defence 3v2	Run Straight – Draw the defender towards the ball, making it harder for the defender to cover all attacking players Use Deception – Ball carrier should consider using a dummy pass or quick changes of direction to deceive the defender Support the Ball carrier - The support player should run a supportive line that is close enough to receive a pass but far enough to avoid the defender. Constant communication between the two attacking players is crucial. The support player should call for the ball and indicate their position

<u>Rugby1 Tier 3 Vocabulary</u>	
<u>Vocabulary</u>	<u>Definition</u>
Alignment	The way players position themselves on the field. Good alignment helps the team stay organized and ready to attack or defend.
Backs	The seven players who are generally faster and responsible for running with the ball, creating plays, and scoring tries.
Conversion	A kick at goal worth 2 points, taken after scoring a try. The ball must go through the goalposts and over the crossbar.
Deception	Using body movements or fake actions to trick the defenders and create opportunities to advance the ball.
Depth	The distance players stand behind each other. More depth allows players to run onto the ball at speed and make it harder for defenders to intercept.
Dummy Pass	Pretending to pass the ball to a teammate but keeping it instead to trick the defenders.
Forwards	The eight bigger and stronger players who are responsible for winning the ball in scrums and lineouts, and for making powerful runs.
Knock-On	When a player accidentally drops the ball forward, resulting in a scrum to the opposing team.
Maul	When the ball carrier is held up by one or more opponents, and one or more of the ball carrier's teammates bind on as well. The players try to move forward while staying bound together.
Offside	A player is offside if they are in front of a teammate who last played the ball, or in front of the ball itself, and they interfere with play.
Ruck	Formed when the ball is on the ground and players from both teams bind over the ball, trying to push each other off to win possession
Scrum	formation where eight forwards from each team bind together and push against the other team to win the ball after a minor infringement.
Scrum Half	he player who feeds the ball into the scrum and usually links the forwards and backs. They pass the ball out from scrums, rucks, and mauls.

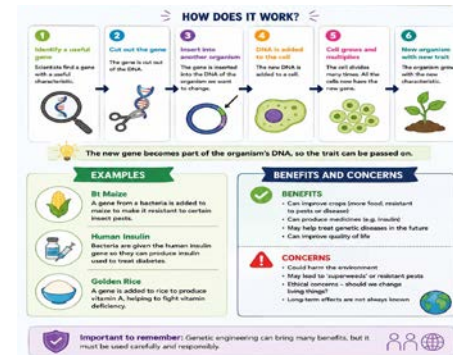
Ultimate questions: Does science and religion conflict?

Lesson 1: Ethical Dilemmas 	
Ethics	Understanding the difference between right and wrong and making good choices about how we behave and treat others.
Ethical Dilemma	Difficult decisions that have no clear right or wrong answer.

Lesson 2: Abortion, L1	
Abortion	Deliberate termination of a pregnancy, intended to stop new life.
Conception	When the sperm fertilises the egg in the mothers' womb.
An embryo	The early stage of human development.
A foetus	An unborn offspring beginning in the 11th week of pregnancy.
Quality of Life	How good or comfortable life is considered by an individual to be.
Sanctity of life	The Christian view that all life is sacred (holy) and a gift from God.

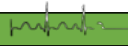
Lesson 3: Abortion, L2 	
Abortion and the law	Abortion was legalised in the UK in 1967. However, it is not legal everywhere. It remains illegal in some US states such as Louisiana and Arkansas.
Grounds for an abortion in the UK	- Two doctors must agree - Risk to physical or mental health of the mother - Risk to the mother's life - Issues with the foetus (being born with serious physical and mental disabilities.)
Time limitations	Abortion is legal for the first 24 weeks of pregnancy in the UK unless the mother's life is at risk or a serious disability where there is no upper limit.
Pro-life	The belief that abortion is wrong and it should be illegal to terminate a pregnancy. The life of the unborn baby should be protected. This is sometimes due to religious beliefs such as the sanctity of life.
Pro-choice	A belief that a person should have the right to decide for themselves whether to continue or end the pregnancy.
Autonomy – abortion	In medical practice, autonomy is usually expressed as the right of competent adults to make informed decisions about their own medical care.

Lesson 4: Genetic Engineering	
Cloning	The process of producing individuals of an organism with identical or virtually identical DNA.
Genetic engineering 	The deliberate changing of an organism's genetic material. Examples: Creating superfoods, determining the sex of a baby, removing faulty genes that lead to diseases.
Agape	Unconditional Christian love for all; including those we do not know.



Ultimate questions: Does science and religion conflict?

Lesson 5: Organ donation 	
Transplant	Giving a healthy body part to another so their body can work better. For example, if someone's kidney fails, they might receive a kidney transplant from a donor to help stay healthy.
Donor	A person who gives a part of their body to help save/improve someone else's life.
Opt-out	When you are automatically registered unless you opt out. The UK law changed to the opt-out system in Spring 2020.

Lesson 6: Euthanasia 	
Euthanasia/Assisted Suicide	The termination (ending) of a very ill person's life to relieve them of their suffering.
The Law	It is illegal in the UK, but legal in Switzerland, Sweden and the Netherlands. For example, DIGNITAS is an organisation that supports people considering euthanasia. Currently, the UK government is in consultation on whether to change this law.
Religious views	Many Christians oppose euthanasia because life is a gift from God – 'Thou Shall not Kill'.
Autonomy	The view that we have ownership over our own bodies.
Passive	Accepting or allowing what happens or what others do, without active response or resistance.

Lesson 7: Environment	
Civil Disobedience	The active refusal of a citizen to obey certain laws or demands, by the government. EG, extinction rebellion. 
Stewardship	The Christian view we have a <u>duty</u> to look after the animals and earth.
Dominion	The Christian view that we have a right to <u>rule over</u> the planet/animals as God gave it us. 
Khalifah	The Islamic view that we should protect the earth as its guardian.
Plastic Pollution	The accumulation of plastic objects and particles in the Earth's environment that adversely affects humans, wildlife and their habitat.
Climate Change	The long-term shifts in temperatures and weather patterns. These shifts can be natural but since the 1800s, human activities have been the main cause due to the burning of fossil fuels like coal, oil and gas.

Lesson 8: Animal Testing	
Animal Rights	The rights of animals to live free from human exploitation and abuse.
Cosmetic & Medical Testing	Refers to procedures performed on living animals for research purposes into the effectiveness of new medical products and cosmetic/ consumer products for human usage.
PETA 	People for the Ethical Treatment of Animals (PETA) is the largest animal rights organisation in the world.
Religious beliefs regarding animals:	• God entrusted animals to the stewardship of humans, as God made humans in His image. • Medical and scientific experimentation on animals is a morally acceptable practice if it contributes to caring for or saving human lives. • Humans have souls and the ability to reason but animals do not. <i>"Rule over the fish in the sea and the birds in the sky"</i> (Bible) <i>"A good deed done to an animal is like a good deed done to a human being,"</i> (Prophet Muhammad) 

THE CRIMINAL JUSTICE SYSTEM

Lesson 1: Young Offenders	
Criminal age of responsibility	The age of criminal responsibility in England and Wales is 10 years old. This varies across the world from age 7 to 18.
Young offenders	An individual aged between 10 and 17 who has committed a criminal offence.
Punishments	Minor offences: Community resolution (an apology), youth caution (warning), conditional caution (education), fines, youth rehabilitation order. Major offences: Custodial sentences (young offenders' institution), detention order (half prison, half in the community), long-term detention.



The current UK prison population as of June was 87,342. This is expected to increase to as high as 100,000 by June 2027.

Lesson 2: Police, courts & CPS	
CPS	Organisation in England and Wales that decides whether someone who has been accused of a crime should be taken to court and prosecuted.
Courts in England and Wales	Magistrates: Where minor crimes are dealt with (shoplifting). Crown: Where major crimes are dealt with (serious assault) County: Where civil issues are resolved (money disputes). Family: Where family issues are resolved (custody of children)
Police	Job is to enforce the law, prevent crime and protect the public. There are 45 police forces across the UK.

Lesson 3: How offenders are punished	
Prison	Secure place where people who have been found guilty of a crime are kept as a punishment to protect the public.
Community service	Punishment where an offender must do unpaid work in the community instead of going to prison. In the UK, an offender can get between 40-300 hours of unpaid work and must be completed in 12 months of sentencing.
Fines	A financial penalty for breaking the law (speeding).
Criminal Justice Act 2003	This Act states 5 aims of punishment 1. Punishing the offender 2. Deterrence 3. Reformation of the offender 4. Protection for the community 5. Reparation
Ancillary orders	Additional conditions added to a sentence to control what an offender can/cannot do. For example, a driving ban for someone who has been caught excessively speeding.

Lesson 4: Inside A court room	
The Prosecution	The legal party responsible for presenting the case in a criminal trial against the defendant.
Defendant	The accused, the person the prosecution think is guilty of a crime.
Defence	The legal party responsible for defending the defendant.
Judge	The individual who controls the way the case is conducted in accordance with relevant law and practice.
Jury	12 people selected from the electoral roll to decide innocence or guilt in a court case.
Barristers	A type of lawyer that often works in a court room.



The Royal Arms appear in every courtroom in England and Wales, demonstrating that justice comes from the monarch, and a law court is part of the Royal Court.

Citizenship

THE CRIMINAL JUSTICE SYSTEM



Lesson 5: Criminal Trial	
Beyond reasonable doubt	Being almost completely sure that someone is guilty based on evidence. For example, if a person accused of robbery and the police/court has CCTV clearly showing their face, fingerprints on the stolen item and a key witness recognises them.
Circumstantial evidence	Suggests that something might have happened but does not prove it. This will give investigating officers clues to find more evidence later.
Burden of proof	On the prosecution (side accusing the person) to prove the defendant is guilty beyond reasonable doubt. For example, someone is accused of robbery, the prosecution must provide evidence (CCTV/witnesses). The accused does not prove they are innocent.
Witness	A person who gives information in court about what they saw, heard or known about a crime.
Ushers	Court staff who organise the courtroom and assist everyone during a trial. For example, showing witnesses where to go.
Clerk	Trained legal officer who helps guide the judge/magistrate by giving legal advice during the case. For example, helping understand legal rules and keeping an accurate record of what happens.



Key: 1 Witness 2 Magistrates 3 Clerk of the court
4 Lawyers for the prosecution and the defence
5 Court usher 6 Defendant 7 Others

Lesson 6: Impact of a criminal record	
Criminal record	A formal record maintained by law enforcement agencies that documents an individual's encounters with the criminal justice system.
Spent Conviction	A conviction which, under the terms of Rehabilitation of Offenders Act 1974, can be effectively ignored after a specified amount of time.
Unspent Convictions	A criminal conviction that still must be declared because a certain amount of time has not yet passed.
Travel and Employment restrictions	Some convictions can prevent you from travelling to certain parts of the world, particularly those where you require a visa. Similarly, some careers are unobtainable for people with certain convictions

Lesson 7: The Death Penalty	
Abolish	- Formally and legally put an end to a system, practice, or law. - The Death Penalty was abolished in 1965.
Countries that have the death penalty	- United States (27 states) - Egypt - Nigeria - Iran - Uganda
Amnesty International	A non-governmental organisation with its headquarters in the United Kingdom focused on protecting human rights of citizens around the world.

Citizenship



Ultimate questions: Does religion cause conflict?



Lesson 1: What are the Causes of War?

Peace	A state of quiet; especially freedom from public disturbance or war.
Conflict	A clashing or sharp disagreement (between ideas, interests, or purposes). An example of ongoing conflict is the Israel and Palestine war.
Holy War	A religious war sanctioned by God or a religious authority, for example, the Pope.
What causes war?:	• Over land and territory • Greed • Revenge • Resources • Opposing political or religious beliefs • An evil dictator

Lesson 2: What does it mean to be a pacifist?

Pacifism	 The belief of people who refuse to take part in war and any other form of violence. This can be driven by theological beliefs.
Peace-maker	A person who works to establish peace in the world or in a certain part of it.
Conscientious objectors	A person who refuses to do something because of their conscience, the biggest example of this is refusing to serve in the armed forces.
Conscience	A person's moral sense of right and wrong, viewed as acting as a guide to one's behaviour, some believe it is God.

Lesson 3: What is a Just War?

Just	Morally acceptable; considered fair or right.
Just War Theory	 Largely a Christian philosophy that attempts to reconcile three things. The set criteria limits wars and ensures they are fought for the right reasons and in the right way. For example: there is a Just Cause, it is a last resort or that it is fought for the right intentions.
Saint Thomas Aquinas	A catholic priest, philosopher and theologian who refined and structured the Just War Theory.

Lesson 4: Christianity Case Studies

Reconciliation	Fixing a broken relationship and restoring friendly or amicable relations. Reconciliation is a sacrament in Catholicism, where forgiveness must be obtained to restore a broken relationship with God.
The Troubles	 Violent conflict from about 1968 to 1998 in Northern Ireland (NI) between the Protestant unionists who wanted NI to remain part of the UK, and the Roman Catholic nationalists who wanted to form part of the republic of Ireland.
Good Friday Agreement	A peace agreement signed on April 10, 1998, to end decades of conflict in Northern Ireland known as <i>The Troubles</i> .
Outcomes of the Good Friday Agreement	• Peace and stability after years of conflict. • Devolved government in Northern Ireland. • Release of prisoners and disarmament of paramilitary groups. • Human rights protections and equality laws.



Ultimate questions: Does religion cause conflict?

Lesson 5: What is the true meaning of Jihad?

Greater Jihad	Refers to the personal spiritual struggle of every Muslim to follow the teachings of Allah in their daily lives. This could include overcoming evils such as anger, greed, pride and hatred.
Lesser Jihad	Muslims believe it is justifiable to struggle to defend Islam, for justice of those who are weak, or in self-defence.
Ummah	Worldwide community of Muslims who should work together to support each other.

Lesson 6: Terrorism: 9/11

Terrorism	The unlawful use of violence to inflict fear on innocent civilians. This may lead to injury or death.
9/11	Four coordinated terrorist attacks by the Islamist terrorist group Al-Qaeda against the United States on the morning of Tuesday, September 11, 2001.
7/7	A series of coordinated Islamist suicide attacks in London that targeted commuters travelling on the city's public transport system during the morning rush hour.
Islamophobia	Irrational hatred, fear or violence towards the Muslim community. In 2024, the UK saw a record 6,313 anti-Muslim hate incidents. This was a 43% increase from the previous year.
#Nofinmyname	A campaign by the Muslim community in response to terror attacks worldwide.
World changes post 9/11	- Airport security became far stricter worldwide - U.S. and allies launched military campaigns in Afghanistan (2001) to dismantle al-Qaeda and remove the Taliban and Iraq (2003) under claims of weapons of mass destruction. - Muslims and those perceived as Muslim faced increased discrimination and hate crimes - Media, film, and literature began to reflect themes of terrorism, surveillance and identity

Lesson 7: Nuclear War

Weapons of mass destruction	A weapon that can kill and bring significant harm to numerous humans or cause great damage to the environment. These can be nuclear, biological or chemical weapons.
Hiroshima & Nagasaki	The United States detonated two nuclear weapons over the Japanese cities of Hiroshima and Nagasaki 6 th & 9 th August 1945. The bombings killed between 129,000 and 226,000 people, most of whom were civilians, and remain the only use of nuclear weapons in armed conflict.
Theological attitudes to WMD:	Christians: 'Thou shall not kill' (10 Commandments) Sanctity of Life – God gives life only God has the right to take it away 'Love thy neighbour' (Jesus) Muslims: 'He who kills an innocent man, it is as though he has killed all of mankind.' Just War Theory – 'Do not destroy a building' 'Do not harm women or children.'



Lesson 8: Victims of War

Victim	A person who has been harmed by the consequences of an internationally unlawful act.
Short-term aid	Immediate relief in emergencies such as war which helps immediately saves lives. This includes money, food, blankets, tents and medical supplies.
Long-term Aid	Involves providing local communities with education, resources and skills for sustainable development. EG, a water well or a school.
Refugee	A person who has been forced to leave their country in order to escape war, persecution, or natural disaster. It is essential misconceptions are addressed regarding refugees. The UK ranks 16th in Europe for asylum applications.
Civil War	A war between organised groups within the same state or country. EG, to overpower the government. For example, the Civil War in Syria.
Persecution	Systematic mistreatment of an individual or group by another individual or group. The most common forms are religious persecution, racism, and political persecution.



Biology Vocabulary



9B1

Gene	Section of DNA coding for a protein
DNA	Chemical which makes chromosomes
Chromosome	DNA structure made of genes
Allele	A different version of a gene
Genotype	The combination of alleles
Homozygous genotype	Two of the same alleles (aa/AA)
Heterozygous genotype	Two different alleles (Aa)
Phenotype	Observable characteristics
Continuous	Uninterrupted data
Discontinuous	Data in categories

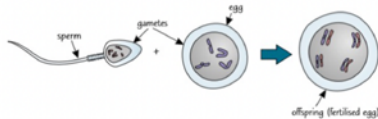
9B2

Capillary	Smallest type of blood vessel
Alveoli	Structure in the lungs where gases are exchanged
Artery	Blood vessel with small lumen and thick elastic and muscular tissue
Vein	Blood vessel with wide lumen and thin elastic and muscular tissue
Lumen	Space where blood travels in a blood vessel
Respiration	Chemical reaction to release energy
Aerobic	Needs oxygen
Anaerobic	Does not need oxygen
Debt	Something that is owed

9B3

Photosynthesis	Using light to make glucose
Transpiration	Movement of water upwards through a plant
Xylem	Vessel in a plant that transports water
Phloem	Vessel in a plant that transports food
Stomata	Gap in the bottom of a leaf
Palisade	Plant cell containing lots of chloroplasts
Mesophyll	Layer of tissue in a leaf
Epidermis	Outer layer of cells
Pollination	Type of reproduction in plants

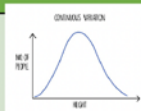
DNA, Genes & Chromosomes
Describe the structure of DNA
DNA is a double helix . 2 strands join and twist around one another.
Each DNA strand is made up of nucleotides that join together.
What is a gene?
A gene is a section of DNA that has the genetic code to make a specific protein and controls the characteristics we develop.
What is a chromosome?
Chromosome is a strand of DNA, each chromosome contains many genes . There are 46 chromosomes (23 pairs) in a human cell nucleus. 23 chromosomes from a sperm cell and 23 from the egg cell and join during fertilisation



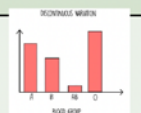
What is Sexual reproduction?
Sexual reproduction involves the fusion of male and female gametes (sex cells). Because there are two parents the offspring contain a mixture of the parents' genes so are genetically different to their parents this creates variation .

Variation between members of a species can be continuous or discontinuous variation

Continuous variation: characteristics like height or weight are affected by genes and the environment. They show a range of intervals and can be measured e.g. a person could be 178cm or 180 cm etc... when plotted on a frequency graph we get a normal distribution curve



Discontinuous variation: characteristics like blood group, they are only affected by genes. Characteristics are categoric (can be grouped), for example blood type A or B. When plotted on a frequency graph we draw a bar chart.



9B1 Inheritance Essential Knowledge Sheet

Selective breeding The stages of selective breeding

- 1 Select parents with the desired features
- 2 Breed these together
- 3 Pick the offspring produced with the desired features
- 4 Breed these together
- 5 Repeat this process over many generations until all offspring have the desired features.

Predicting inheritance: Punnett square diagram

		father is the cystic fibrosis allele	
		F	f
mother	F	FF	Ff
	f	Ff	ff

- Cystic fibrosis is caused by a recessive allele
- If parents are carriers (heterozygous) 25% chance that the child will have cystic fibrosis (ff)

Genetics key terms

Allele	A different version of a particular gene represented by a letter e.g. D (dominant) or d (recessive)
Genotype	The pair of alleles a person inherits e.g. Dd or DD or dd
Homozygous genotype	Two of the same alleles in the genotype e.g. DD or dd
Heterozygous genotype	Two different alleles in the genotype e.g. Dd
Phenotype	The feature or characteristic determined by the genotype

Pros of selective breeding

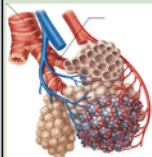
New varieties may be economically important, by producing more or better quality food

Animals can be selected that cannot cause harm, for example cattle without horns

Cons of selecting breeding

Inbreeding depression
Reduced genetic variation
rare disease genes being unknowingly selected as part of a positive trait, leading to problems with specific organisms, eg a high percentage of Dalmatian dogs are deaf

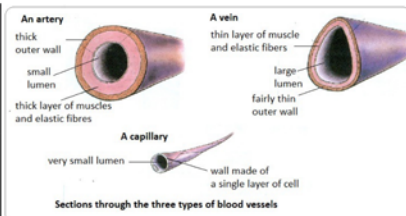
Adaptations of the lungs



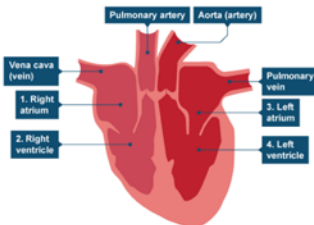
Alveoli walls are one cell thick so a **short diffusion path for oxygen into blood**

Lots of **highly folded alveoli** increases the surface area to speed up diffusion.

Good blood supply for rapid exchange and transport of gases.



9B2 Respiration



Aerobic respiration

What is the word equation for aerobic respiration?

glucose + oxygen $\rightarrow$ carbon dioxide + water
(energy is released)

Where does the glucose for respiration come from?

Food from our digestive system which is absorbed into the blood in the **small intestine**

Where does the oxygen for aerobic respiration come from?

Breathing – the respiratory system (lungs) absorb oxygen into the bloodstream. Red blood cells deliver oxygen to all cells.

Anaerobic respiration

What is the word equation for anaerobic respiration?

glucose $\rightarrow$ lactic acid
(less energy is released compared to aerobic)

When do people use anaerobic respiration?

During high intensity exercise and at high altitudes when there is a **limited supply of oxygen** to cells

What does anaerobic respiration in microorganisms such as yeast produce?

Yeast produce **ethanol** (alcohol) and **carbon dioxide**. This is used to make bread rise and produce beer and wine.

Breathing vs Respiration

Breathing

- Breathing is a **physical process** where we move air in and out of our lungs
- The **diaphragm** and **rib muscles** contract and relax to **inhale** and **exhale** air.
- Oxygen **diffuses** into bloodstream and waste carbon dioxide diffuses out to be then exhaled (excreted).

Respiration

- Is a **chemical reaction** that happens in every cell in the body.
- Aerobic respiration **releases energy** for life processes e.g. muscle contraction
- Aerobic respiration takes place in the **mitochondria** of cells.

The effect of exercise

What happens to your heart rate during exercise?

Increases

Why does this happen?

- To pump more blood around the body.
- to transport more oxygen (and glucose) to cells for **aerobic respiration**
- to release more energy for **muscle contraction**.

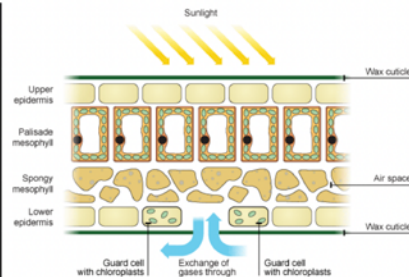
Why might we get muscle pain or cramp when doing intense exercise?

Build up of **lactic acid** from anaerobic respiration

What is an oxygen debt?

Oxygen debt is the amount of oxygen needed after exercise to break down harmful lactic acid into carbon dioxide and water.

Photosynthesis
What is photosynthesis?
Photosynthesis is a chemical reaction that takes place in plants (and some microorganisms) that makes glucose which is the food for plants.
Where does photosynthesis take place in plant cells?
Inside chloroplasts (which are found in any green plant cell – mainly palisade cells)
What is the word equation for the photosynthesis reaction?
Carbon dioxide + water $\rightarrow$ glucose + oxygen
What do plants need to carry out photosynthesis?
Light energy , carbon dioxide (from the air) and water (from the soil), plants also need a special green pigment: chlorophyll

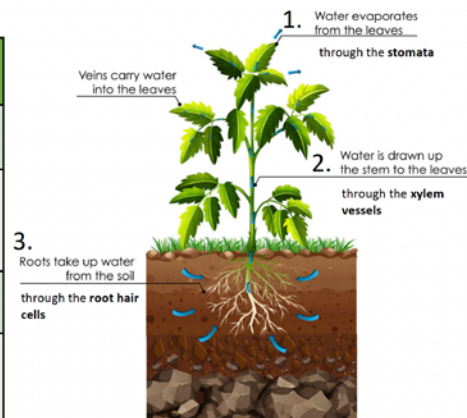


How are plant leaves adapted to maximise photosynthesis?	
Leaves are wide and flat	Large surface area to absorb as much light as possible.
Leaves have many chloroplasts	Palisade cells have many chloroplasts near the surface of the leaf to absorb lots of light needed for photosynthesis
Leaves have stomata	Tiny pores/holes to allow carbon dioxide to diffuse into the leaves from the air.
Leaves have many vessels (xylem vessels)	Many xylem vessels transport water to cells from the soil.

The stages of plant reproduction
1. Pollination happens when pollen moves from one flower to another or some plants can fertilise themselves with their own pollen.
2. The pollen granule lands on the stigma and travels down the style in a pollen tube to the ovary.
3. Fertilisation involves the fusion of the nucleus of the male gamete (pollen) with the nucleus of the female gamete (ovule).
4. Once this has happened the ovule starts to produce a seed or a fruit can form.
5. The seed is dispersed and germinates – the seedling develops into a new plant.

Type of seed dispersal	How it happens
Wind	The seed carried by the wind (Dandelion, sycamore helicopters)
Animal	Animals eat the seed and excrete it as waste elsewhere. They can also stick to the animal's fur who can take it other places.
Water	Seeds land in water (e.g. coconuts) and then transported elsewhere down the river
Bursting	Some plants burst open releasing their seeds. The seeds travel from the pressure when the plant bursts

TRANSPIRATION



Chemistry Vocabulary



9C1

Word	Definition
Metal	Element on the left and centre of the periodic table
Non-Metal	Element on the right and top of the periodic table
Malleable	Easily shaped
Oxidation	When a substance gains oxygen
Alkali	A substance with pH above 7
Displacement	When a more reactive metal replaces a less reactive metal in a compound
Exothermic	When a reaction gives off heat energy.
Endothermic	When a reaction takes in heat energy.
Reduction	When a substance loses oxygen
Observation	What you see during a reaction
Reactivity Series	A list in order of how reactive a metal is from most to least reactive

9C2

Word	Definition
Acid	A substance with pH below 7
Base	A substance that neutralises an acid
Alkali	A base that dissolves in water with a pH above 7
Neutral	A substance with a pH of 7
Neutralisation	When an acid and base react together
Excess	Too much of a chemical
Crystallisation	Heating a solution and then leaving for crystals to form
Reactants	The chemicals at the start of a reaction
Products	The chemical at the end of a reaction
Conservation of Mass	The mass of the reactants is the same as the mass of the products
Balanced equation	The same number of each type of atom on both sides of a reaction

9C3

Word	Definition
Potable Water	Water that is safe to drink.
Pure Water	Water that contains only water particles
Fresh Water	Water in rivers and lakes
Sea Water	Water from oceans and seas that contains dissolved salt
Desalination	Removing salt from salt water
Distillation	Evaporating and then condensing a substance
Greenhouse Gas	A gas that traps heat from escaping the Earth's atmosphere
Acid Rain	Rain that has a pH more acidic than normal rain
Incomplete Combustion	A substance that burns in a limited supply of oxygen
Carbon Footprint	How much greenhouse gas given off by an activity
Climate Change	How the environment is changed by greenhouse gases

9C1: Reactivity of Metals

Reactivity Series

Reactivity Series			
Metal	Reaction with cold water	Reaction with dilute acids	Reactivity
Potassium	Violent	Violent	 Most reactive
Sodium			
Lithium			
Calcium	Fast	Rapid	
Magnesium	Very slow		
(Carbon)			
Zinc	Usually no reaction	Slow	
Iron	Rusts slowly		
(Hydrogen)			
Copper	No reaction	No reaction	
Gold			

Key Terms

Term	Essential Knowledge
Metal	Found at the left and bottom of the periodic table. Form positive ions.
Non-metal	Found at the top and right of the periodic table. Form negative ions.
Oxidation	Reaction with oxygen.
Halogen	Group 7 elements.
Reactivity series	A list of elements from most reactive to least reactive.
Displacement	A more reactive metal can displace a less reactive metal from a compound.
Alkali Metal	Group 1 elements.
Observations when group 1 metals react with water.	Metal moves on surface. Fizzing. Universal indicator becomes purple. Flame – orange if Na, lilac if K. Na and K melt to form a sphere.

General Equations

$$\text{Metal} + \text{Oxygen} \rightarrow \text{Metal Oxide}$$

$$\text{Metal} + \text{Acid} \rightarrow \text{Salt} + \text{Hydrogen}$$

$$\text{Metal} + \text{Water} \rightarrow \text{Metal Hydroxide} + \text{Hydrogen}$$


9C2: Chemical Reactions

Preparing a Salt

1.



Pour 10cm³ of acid into a beaker.

Add half a spatula of base at a time, until it is in excess.

2.



Filter the solution to remove the unreacted base.

3.



Separate the salt solution using crystallisation. A water bath is used to allow for gentle, even heating and prevent the break down of the salt.

Naming a Salt

The first part of the name for the name of the metal in the base.

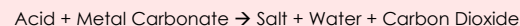
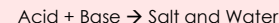
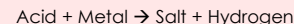
The second part of the name comes from the acid:

Acid Used	Salt Produced
Hydrochloric acid	Metal chloride
Sulfuric acid	Metal sulfate
Nitric acid	Metal nitrate

Key Terms

Term	Essential Knowledge
Acid	Substances that produces hydrogen ions H⁺ when dissolved in water. Examples: Hydrochloric Acid – HCl, Sulfuric Acid – H ₂ SO ₄ , Nitric Acid – HNO ₃
Base	Substances that react with acid to produce a salt. Example: metals, metal oxides, metal carbonates
Alkali	Bases that dissolve in water, producing hydroxide ions OH⁻ . Example: metal hydroxides (e.g. sodium hydroxide – NaOH)
Neutralisation	A reaction where an acid reacts with a base.
Simplest ionic equation of neutralisation.	$H^+ + OH^- \rightarrow H_2O$
Conservation of Mass	During a chemical reaction, no atoms are made or destroyed therefore the total mass of the reactants equals the total mass of the products.

General Equations



9C3: Resources and Pollutants

Combustion and Greenhouse Effect

Term	Essential Knowledge
Hydrocarbon	A molecule made of hydrogen and carbon only.
Complete combustion	Combustion in a good supply of oxygen. Complete combustion of a hydrocarbon always forms CO_2 and H_2O .
Incomplete combustion	Combustion in a limited supply of oxygen. Incomplete combustion always forms H_2O and either C, CO or a mixture of the two.
Greenhouse effect	The Sun emits short-wavelength radiation (mostly visible light) that passes through the Earth's atmosphere and reaches the surface. The Earth absorbs this energy and warms up, then emits long-wavelength radiation. Greenhouse gases absorb this infrared radiation and re-radiate it in all directions, including back towards the Earth's surface, which increases the temperature of the Earth's surface. This is the greenhouse effect.
Greenhouse gas	Gases that contribute to the greenhouse effect. Primarily carbon dioxide and methane.
Global warming	Increasing temperature of the earth surface.
Climate change	Changes in long term weather patterns.
Effects of climate change	- Melting of polar ice caps and sea levels rising. - More frequent and severe storms. - Flooding and drought.

Water

Term	Essential Knowledge
Potable water	Water that is safe to drink, contains dissolved solids. Produced from freshwater by filtering to remove solids, then sterilising using UV/chlorine or ozone to kill bacteria.
Pure water	Contains water molecules only. Has a fixed boiling point.
Desalination	Making potable water from sea water.
Distillation	Distillation is a separation technique used to separate a <i>solvent</i> from a <i>mixture</i> . For example, water can be separated from salt <i>solution</i> by distillation. Can be used for desalination.
Reverse osmosis	A method of desalination. Water is put under high pressure and passed through a <i>membrane</i> which has tiny pores (holes) in it. Water molecules pass through, but most <i>ions</i> and other molecules cannot.

Pollutants

Pollutant	Effect
Carbon dioxide	Climate change
Sulfur dioxide	Acid rain
Nitrogen Oxides	Acid rain / respiratory issues
Carbon Monoxide	Toxic gas
Particulates (unburnt C)	Global dimming



Physics Vocabulary



9P1

Component	A piece used to make an electrical circuit
Electron	A particle that is free to move in metal
Conductor (electrical)	A material which electrons can pass through
Insulator (electrical)	A material which electrons cannot pass through
Positive Ion	An atom with an electron removed
Charge	The negativeness that an electron carries
To charge up	To move electrons from one place to another
Current	How quickly electrons flow through something
Potential difference	The amount of energy electrons will carry around a circuit
Resistance	The opposition to current in the components of a circuit
Series circuit	A circuit where the components are in one loop
Parallel circuit	A circuit where the components are connected in separate loops
Static electricity	When electrons are moved between insulators by friction

9P2

Speed	How fast, calculated by the distance travelled in a certain amount of time
Force	A push or pull
Velocity	Speed with a direction
Distance time graph	A graph with time on the x-axis and distance on the y-axis
Air resistance	The force against an object moving through air
Water resistance	The force against an object moving through water
Drag	For example: Air resistance and Water resistance
Gravity	A force pulling objects towards the earth
Terminal Velocity	The maximum speed a falling object will reach
Friction	The force between two objects touching and moving past each other
Average speed	The distance of a whole journey divided by all the time it took

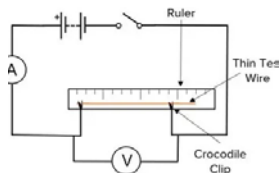
9P3

Deformation /deforming	An object changing shape
Extension	The increase in length of an object
Compression	The decrease in length of an object
Elastic (material)	Goes back to original shape after deformation
Plastic/inelastic	Does not go back to original shape after deformation
Elastic potential energy store	Where energy is stored when an elastic object is deformed
Force extension graph	A graph with extension on the x-axis and force on the y-axis
Spring constant	How stiff, calculated from force needed for a certain extension
Directly proportional	When two quantities increase together and when you double one the other doubles
Hooke's law	A rule that says an object extension is directly proportional to the force on it

9P1: Electricity

Term	Essential Knowledge	Component	symbol	purpose
Series Circuit	A circuit where all the components are connected in one loop. There is only one route for current to flow.	Cell		Provides energy for circuit
		Battery		Provides energy for circuit.
		Switch		Allows circuit to be switched on and off.
Parallel Circuit	A circuit with multiple loops. There are multiple loops for current to flow around.	Bulb/filament lamp		Light up when provided with current and potential difference.
		resistor		Controls how much current can flow in a circuit.
Current (I)	Current is the rate of flow of charged particles (electrons in wires). It is measured in Amps.	ammeter		Measures the amount of current at a particular point in a circuit.
		voltmeter		Measures the potential difference across two points of a circuit.
Potential Difference (V)	Potential difference is a measure of the difference in energy between two parts of a circuit. It is measured in Volts.			
Resistance (R)	Resistance is the opposition to the flow of current. All components have resistance. It is measured in Ohms			

Resistance of a wire Circuit Diagram:



Formulae:

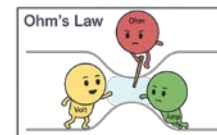
Potential Difference (V) = Current (I) x Resistance (R)

Units:

Potential Difference = Volts

Current = Amps

Resistance = Ohms



Static Electricity:

When two insulating materials are rubbed together, electrons can move from one material to the other.

This creates a static charge: the material that loses electrons becomes positive, and the one that gains electrons becomes negative.

The charge can be released (discharged) through a conductor such as metal.



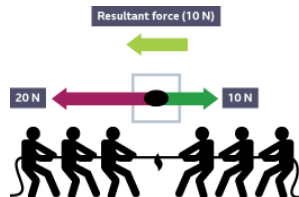
9P2: Speed & Force

Term	Essential Knowledge
Force	Forces are pushes or pulls that change an object's speed, direction, or shape in everyday situations.
Resultant Force	Resultant force is the overall force on an object after combining all acting forces.
Speed	How fast something moves measured in m/s, km/h or mph.
Distance	The space between two points Measured in metres, miles or kilometres.
Terminal Velocity	The maximum constant speed an object falls at. It occurs when air resistance and weight are balanced.

Calculating Resultant Force (Fr):

1. Forces acting in the same direction – **Add** the forces together
2. Forces acting in opposite directions – **Subtract** the forces
3. State the size of the force and the direction.

The resultant force below is **10N to the left**.



Formulae:

$$\text{Velocity (v)} = \text{Distance (s)} / \text{Time (t)}$$

Units:

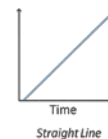
Velocity = m/s, km/h, mph

Distance = Metres, Kilometres, Miles

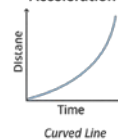
Time = Seconds, Hours

Distance-Time Graph Summary

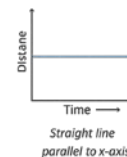
Constant Speed



Non-Uniform Acceleration



Stationary Object



Scalar



A scalar is a quantity that is completely defined by its magnitude only.

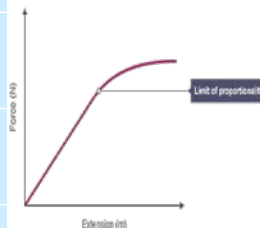
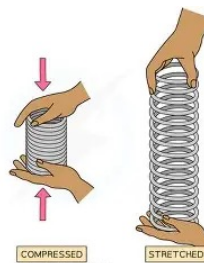
Vector



A vector is a quantity characterized by both magnitude and direction.

9P3: Elasticity

Term	Essential Knowledge
Hooke's Law	Hooke's Law states that the extension of a spring is directly proportional to the force applied, as long as the spring is not stretched beyond its limit of proportionality.
Deformation	Deformation is the change in shape or size of an object caused by a force acting on it.
Extension	Extension is the increase in length of an object, such as a spring, when a force is applied to it.
Elastic Object	An object is elastic if it can return to its original shape or length after the force causing the change is removed.
Directly proportional	Directly proportional means that when one quantity increases, the other increases in a constant ratio.
Elastic Energy (E_e)	Elastic energy is the energy stored in an object when it is stretched or compressed and can return to its original shape.
Spring Constant (k)	Spring constant is a measure of the stiffness of a spring up to its limit of proportionality.



Formulae:

$$\text{Force (F)} = \text{Spring Constant (k)} \times \text{Extension (e)}$$

$$\text{Elastic Energy (E}_e\text{)} = \frac{1}{2} \times \text{Spring Constant (k)} \times \text{Extension}^2 (\text{e}^2)$$

Units:

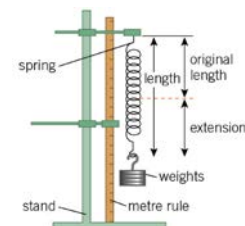
Force = Newtons

Spring Constant = Newtons per metre

Extension = Metres

Elastic Energy = Joules

Hooke's Law Required Practical:



Y9 Spanish Term 1

Spanish phonics			
Spanish	Pronunciation	Spanish	Pronunciation
a	ah	h	is silent
e	ay	j	h
i	ee	ll	y
o	oh	ñ	nya
u	oo	que	kay
ci	thee	qui	key
ce	thay	v	b
ge	hey	y	ee
gi	hee	z	th

KS3 Tier 3 Vocabulary: Year 9

Key word	Definition
Annotate	Label a text with key words/meanings
Intonation	Voice going up and down based on emphasis or stress – caused by accents
Exception	Something that doesn't follow the (grammar) rules
Tense	When an action is happening – past, present or future
WOW Phrase	A high level GCSE phrase to include in your work that increases your quality of language



Los días de la semana (The days of the week)	
lunes	Monday
martes	Tuesday
miércoles	Wednesday
jueves	Thursday
viernes	Friday
sábado	Saturday
domingo	Sunday

Los meses del año (The months of the year)	
enero	January
febrero	February
marzo	March
abril	April
mayo	May
junio	June
julio	July
agosto	August
septiembre	September
octubre	October
noviembre	November
diciembre	December

Los números (Numbers)					
0	cero	8	ocho	16	dieciséis
1	uno	9	nueve	17	diecisiete
2	dos	10	diez	18	dieciocho
3	tres	11	once	19	diecinueve
4	cuatro	12	doce	20	veinte
5	cinco	13	trece	21	veintiuno
6	seis	14	catorce	22	veintidós
7	siete	15	quince	23	veintitrés
24	veinticuatro	25	veinticinco	26	veintiséis
27	veintisiete	28	veintiocho	29	veintinueve
30	treinta	31	treinta y uno		
40	cuarenta	60	sesenta	80	ochenta
50	cincuenta	70	setenta	90	noventa
				100	cien
				101	ciento uno

Los números 20 - 100 Numbers 20 - 100

veinte	20	setenta	70
treinta	30	ochenta	80
cuarenta	40	noventa	90
cincuenta	50	cien	100
sesenta	60		

Examples of regular verbs in the present tense

Hablar - to talk			
hablo	<i>I talk</i>	hablamos	<i>we talk</i>
hablas	<i>you talk</i>	habláis	<i>you talk</i>
habla	<i>s/he talks</i>	hablan	<i>they talk</i>

Leer - to read			
leo	<i>I read</i>	leemos	<i>we read</i>
 lees	<i>you read</i>	leéis	<i>you read</i>
lee	<i>s/he reads</i>	leen	<i>they read</i>

Vivir - to live			
vivo	<i>I live</i>	vivimos	<i>we live</i>
vives	<i>you live</i>	vivís	<i>you live</i>
vive	<i>s/he lives</i>	viven	<i>they live</i>

An important irregular verb (present tense)

ir - to go			
voy	<i>I go</i> <i>I am going</i>	vamos	<i>we go</i> <i>we are going</i>
vas	<i>you go</i> <i>you are going</i>	vais	<i>you go</i> <i>you are going</i>
va	<i>s/he goes</i> <i>s/he is going</i>	van	<i>they go</i> <i>they are going</i>

1.1 ¿Qué haces con tu móvil?

SB1.1 ¿Qué haces con tu móvil? (What do you do with your mobile phone?)					
Con mi móvil (With my mobile)	todos los días (every day)	chateo con mis amigos (I chat with my friends)	porque es (because it is)	bastante (quite)	divertido (fun)
	dos o tres veces a la semana (two or three times a week)	comparto mis vídeos favoritos (I share my favourite videos)			entretenido (entertaining)
	Con mi portátil (With my laptop)	descargo aplicaciones/música (I download apps/music)			interesante (interesting)
	Con mi tableta (With my tablet)	hablo por Whatsapp (I talk on <u>Whatsapp</u>)			útil (useful)
Con mi ordenador (With my computer)	a veces (sometimes)	juego (I play)	porque no es (because it's not)	muy (very)	aburrido (boring)
	de vez en cuando (from time to time)	leo mis SMS / mensajes (I read my texts / messages)			divertido (fun)
	nunca (never)	mando SMS / mensajes (I send texts / messages)			entretenido (entertaining)
		saco fotos (I take photos)			interesante (interesting)
		veo vídeos o películas (I watch videos or films)			
		uso Snapchat (I use Snapchat)			

1.2 ¿Qué aplicaciones usas?

SB1.2 ¿Qué aplicaciones usas? (What apps do you use?)					
Uso (I use)	Snapchat	subir y ver vídeos (to upload and watch videos)	porque es (because it is)	ya que es (because it is)	práctico/a (practical)
		compartir fotos (to share photos)			fácil de usar (easy to use)
		pasar el tiempo (to pass the time)			popular (popular)
		organizar las salidas (con mis amigos) (to organise to go out (with my friends))			útil (useful)
Me gusta usar (I like to use)	Instagram	para (in order)	porque es (because it is)	ya que es (because it is)	gratis (free)
Se puede usar (You can use)	Youtube	contactar con (mi) familia/(mis) amigos (to contact (my) family/(my) friends)			rápido/a (fast)
Voy a usar (I'm going to use)	Spotify	descargar música (to download music)			la mejor app (the best app)
	Teams	chatear con (mis) amigos (to chat with (my) friends)			mi red social preferida (my favourite social network)

1.3 ¿Qué tipo de música te gusta?

SBI.3	¿Qué tipo de música te gusta? (What type of music do you like?)				
Me gusta (mucho) (I (really) like)	el rap (rap)	y mi grupo favorito es ____ (and my favourite group is ____)	es entretenido (it's entertaining)	porque (because)	es guay (it's cool)
Me encanta (I love)	el R'n'B (R'n'B)				
No me gusta (nada) (I (really) don't like)	el rock (rock)				
Odo (I hate)	el reguetón (reggaeton)				
Escucho (I listen to)	la música clásica (classical music)	y mi cantante favorita/a es ____ (and my favourite singer is ____)	es interesante (it's interesting)	es relajante (it's relaxing)	es popular (it's popular)
	la música electrónica (electronic music)	y mi canción favorita es ____ (and my favourite song is ____)	es aburrido (it's boring)		
	la música pop (pop music)		es horrible (it's horrible)		
	rap R'n'B rock reguetón música clásica música electrónica música pop	porque (because)	me gusta (I like)		es triste (it's sad)
		la letra (the lyrics)	el ritmo (the rhythm)		la melodía (the tune)

1.4 ¿Qué tipo de película vas a ver?

SBI.4	¿Qué tipo de película vas a ver? (What type of film are you going to watch?)				
Me gustan (I like)	las películas de acción (action films)	las películas de fantasía (fantasy films)	porque (because)	son (they are)	emocionantes (exciting)
No me gustan (I don't like)	las películas de aventuras (adventure films)	las películas de terror (horror films)			
	las películas de animación (animation films)	las películas de superhéroes (superhero films)			
	las películas de ciencia ficción (science fiction films)	las comedias (comedies)			
Las películas de acción (Action films)	son (are)	más (more)	divertidas (fun/funny)	que (than)	las comedias (comedies)
Voy (I am going)	a	ir al cine (to go to the cinema)	comer palomitas (to eat popcorn)	en mi opinión va a ser (in my opinion it is going to be)	guay (cool)
Va (He/she is going)		ver una comedia (to watch a comedy)	reír (mucho) (to laugh (a lot))		divertido (fun)
Vamos (We are going)					

2.1 ¿A qué famosos sigues en las redes sociales?

SBI.1	¿A qué famosos sigues en las redes sociales? (Which celebrities do you follow on social media?)			
Sigo a (I follow)	deportistas (sportspeople)	y (and)	me gusta porque (and I like it because)	aprendo mucho (I learn a lot)
	cantantes (singers)		me interesa porque (and it interests me because)	los vídeos son emocionantes (the videos are exciting)
	influencers de moda (fashion influencers)	dado que (because)	me ayuda a relajarme (it helps me to relax)	
	videojuegos (videogame players)		me ayuda a mejorar mis habilidades (it helps me to improve my skills)	
Sigo (I follow)	canales de cocina (cooking channels)	para (in order)	ser más creativo/creativa (to be more creative)	
			pasar el rato (to pass the time)	

2.2 ¿Quién es tu famoso favorito?

SBI.2	¿Quién es tu famoso favorito? (Who is your favourite celebrity?)				
Mi famoso favorito es (My favourite celebrity is)	un actor (an actor)	británico (British)	que se llama... - none (called...)	Es una persona (he/she is a... person)	inteligente (intelligent)
	un músico (a musician)	español (Spanish)			trabajadora (hard-working)
	un deportista (a sportsperson)	inglés (English)			ambiciosa (ambitious)
	un influencer (an influencer)				fuerte (strong)
Mi famosa favorita es (My favourite celebrity is)	una actriz (an actress)	italiano (Italian)		Se le da bien (he/she is good at)	actuar (acting)
	una música (a musician)	española (Spanish)			cantar (singing)
	una deportista (a sportsperson)	inglesa (English)			jugar al fútbol (playing football)
	un influencer (an influencer)				
Lo sigo porque (I follow him because)	tiene mucho talento / éxito (he/she has a lot of talent / success)		y además (and furthermore)	ayuda a otras personas (he/she helps other people)	
La sigo porque (I follow her because)	tiene una vida de lujo (he/she has a luxury lifestyle)			sube muchas fotos (he/she uploads lots of photos)	
	es un buen modelo a seguir (he/she is a good role model)				

Contratiempo



2.4 ¿Cómo es el personaje?

2.3 ¿Cómo han tenido éxito?

SB2.3	¿Cómo han tenido éxito? (How have they been successful?)		
El año pasado (Last year)	ganó un premio/muchos premios (he/she won a prize/many prizes)	y más tarde (and later)	escribió una biografía/una novela (he/she wrote a biography/a novel)
Hace dos años (Two years ago)	jugó en... + place/name of tournament (he/she played in...)		dio dinero a organizaciones benéficas (he/she gave money to charities)
Cuando era joven (When he/she was young)	actuó en... + place/name of film etc (he/she performed in...)		montó su propio negocio (set up their own business)
De joven (As a young person)	participó en... (he/she took part in...)		se convirtió en un buen modelo a seguir (became a good role model)
Cuando tenía...años (When he/she was...years old)	empezó su carrera... (he/she began their career...)		usó su fama para ayudar a los demás (used his/her fame to help others)

SB2.4	¿Cómo es el personaje? (What is the character like?)			
Uno de los personajes se llama... (One of the characters is called...)	es hombre de negocios he is a business man es mecánico he is a mechanic	y es and he/she is	alto/alta / bajo/baja / de talla mediana tall / short / average height	
		y parece and he/she seems	fuerte / débil / alegre / paciente / optimista strong / weak / cheerful / patient / optimistic ambicioso/ambiciosa trabajador/trabajadora ambitious hard-working	
	es fotógrafa she is a photographer es abogada she is a lawyer es ama de casa she is a housewife	y tiene and he/she has	el pelo ...hair	largo / corto long/short moreno / castaño / rubio / gris dark brown/light brown/blond/grey
		y lleva and he/she wears	gafas glasses ropa formal/ropa de moda/ropa cómoda formal clothes/fashionable clothes/comfortable clothes	

Aim High

Be Determined

Be Kind

Be Supportive

Be Proud



PENISTONE GRAMMAR SCHOOL

Achieving Excellence through a Values-Driven Education