Year 7 Knowledge Organiser
Term 1

This booklet contains some of the key content we want the students to learn this term. Knowledge Organisers are placed in the relevant Google Classroom.

How students and parents can use a Knowledge Organiser to maximise learning:

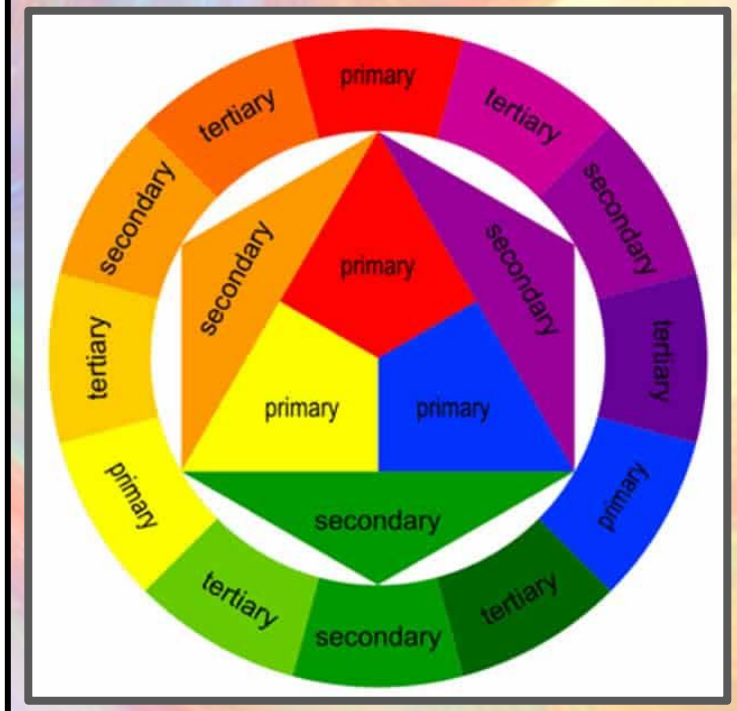
- Pick a subject to recall and memorise
- **Look** at the pages for that subject
- **Read** the page information for that subject
- **Cover** the page of information
- **Write** the information for that subject from memory
- **Check** what you have written. Correct mistakes and add anything you have missed
- Your teacher will **quiz** you in class to see what you can recall
- **Repeat** the process over time and focus on the information you keep missing or make mistakes on

Contents

Art

Year 7 – Colour Theory

The Colour Wheel



Overview of Topic

In this project you will explore the theme of colour. You will begin by learning about colour theory and will explore different materials such as painting and colouring pencil. You will focus on skills such as colour mixing and colour combinations to represent emotion. You will explore the work of Pablo Picasso, then create your own response showing an influence of their style and taking into consideration colour and emotion.

Pigment: the natural colouring of something for example our skin or hair or eyes. It can also be the word for a substance added to something to give it colour- for example paint.

Secondary colours are made from two primary colours. You need to know this to mix colours when using paint.

Red + Yellow = Orange

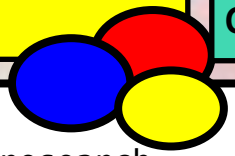
Blue + Yellow = Green

Red + Blue = Purple

Albinism is a skin condition where people are born with no pigment in their skin.

Vitiligo is a skin condition in which the pigment is lost in some areas of the skin.

Primary Colours are the three key colours- Red, Blue and Yellow. They cannot be made from any other colour but can be used to make LOTS of other colours!



Tertiary Colours are made from mixing a primary colour and a secondary colours. An example is Green Blue or Red Orange.

Tint- When you add white to a colour to make it lighter.

Shade- When you add black to a colour to make it darker.

Assessment Objectives:

AO1 – Developing ideas through research

AO2 – Using resources, experimenting with different media and ideas

AO3 – Recording ideas (photos & drawings)

AO4 – Personal response

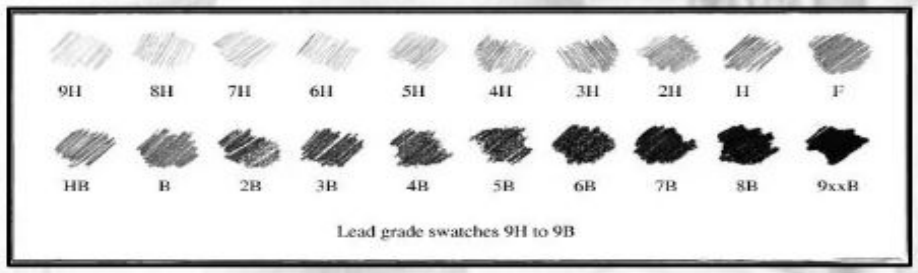
Art

Year 7 – Observational Drawing

Assessment Objectives:
AO1 – Developing ideas through research
AO2 – Using resources, experimenting with different media and ideas
AO3 – Recording ideas (photos & drawings)
AO4 – Personal response

Overview of Topic
In this project you will explore observational drawing. You will begin by learning about shape and tone. You will explore different materials such as pencil, fine liner and oil pastel. You will focus on key skills such as shading and accuracy of shape and proportion. Finally you will combine skills from colour theory and observational drawing to explore the work of Jeff Koons.

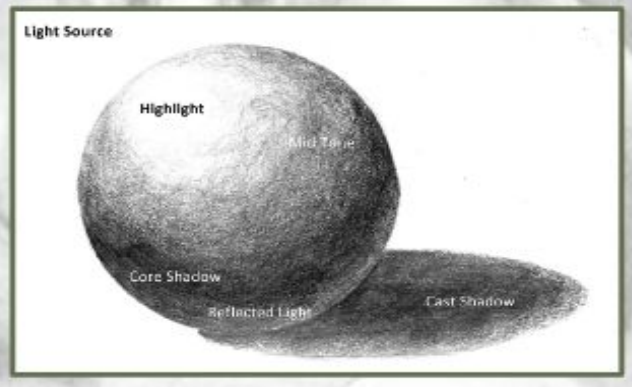
Pencil grading: H is lighter but harder- the larger the number the harder and lighter the lines, these pencils are good for technical drawings for example in Architecture or design. B is softer and darker, these are great for sketching.



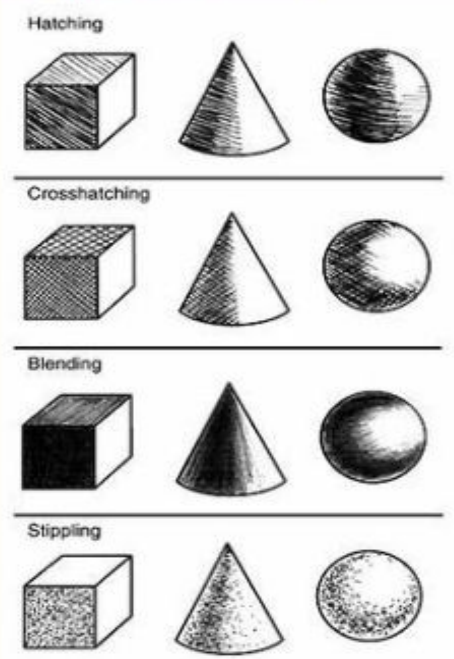
Lead grade swatches 9H to 9B

Making objects look 3D:

To create a 3D effect you need to add shading to your outline or 2D drawings. You should add a range of tones, areas f highlight (where light is reflected)and shade (darker areas where the light does not reach). To enhance your drawing you should also add shadows if they appear around your objects.



Shading techniques

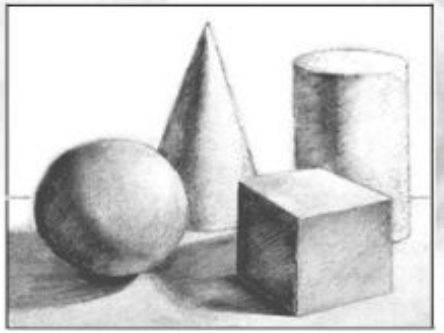


A step by step guide:
Begin by lightly mapping out accurate shapes of the objects you are drawing. Artists often break complex objects down into basic shapes such as circles, squares, rectangles and triangles.

Then begin shading. Start at the darker areas and slowly shade towards the lighter parts. Build up layers of pencil slowly- try not to start too dark!

Pencil pressure: The harder you push down the darker your shading will be. Gently press down for lighter shades.

Remember: DRAW IT LIGHT TILL YOU GET IT RIGHT!



Tonal Ladder
All tonal shades from dark to light should be present in your drawing.

Computing

Sequence

Instructions that are carried one after the other in order.

Selection

Instructions that can evaluate options and branch off to one or more alternative paths.

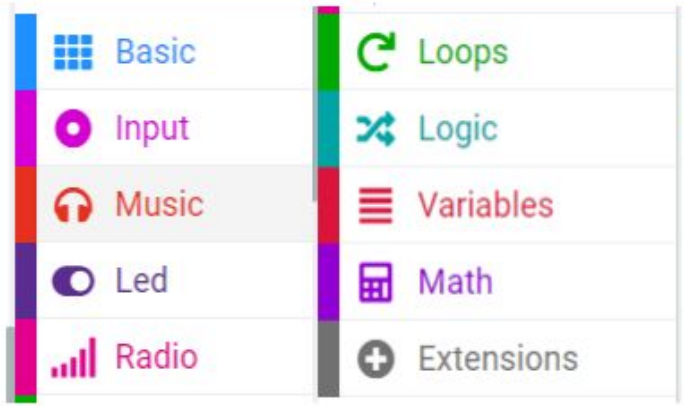
Iteration

A selection of code that can be repeated either a set number of times

Variable

A value that can change depending on conditions or information passed to the program.

Block Options

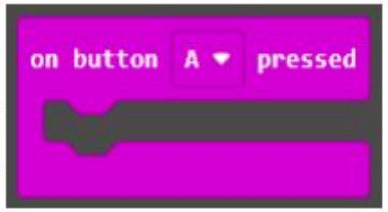


Groups of code which share similar functions. Each group is colour coded to help with identification

On Start Block

Used to identify the run a code sequence at the start of a program

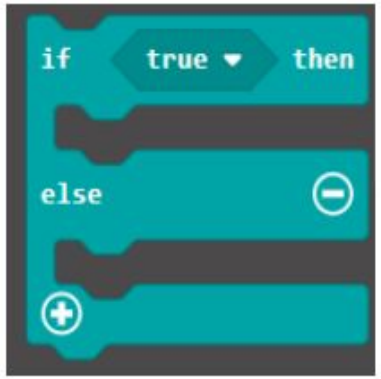
Input blocks



button press

Shake sensor

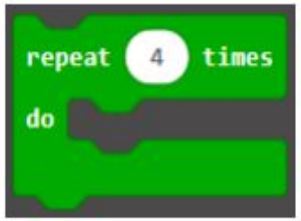
If else block



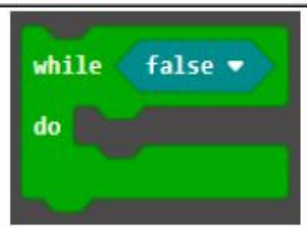
Runs the code in the first space if the condition is true.

Runs the code in the second space the condition is not true (false)

Iteration blocks



Count-controlled iteration - code inside the block repeats a set number of times

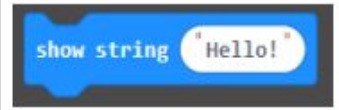


Condition-controlled iteration - code inside the block repeats until the condition is met (true)

Infinite iteration - repeats the code inside the block until the program is stopped by the user

LED blocks

Used to light selected LEDs on the microbit. Create custom patterens and images



Used to light LEDs in a sequence to show messages.

Dance

Year 7 Dance Styles

Street/Commercial Dance – Stylistic Features

Low centre of gravity
A range of styles and sub genres
Often fast and energetic
Frequent use of unison
Use of improvisation to create movement
Close relationship between dance and music

Musical Theatre – Stylistic Features

Use of musicality - movement mirrors the music
Exaggerated movements
Use of singing, dance and acting/ being a triple threat
Use of gestures
Frequent use of unison for ensemble numbers
Use of characterisation

Lindy Hop – Stylistic Features

Bouncy movements
Energetic movements
Fast footwork and kicking actions
Stamina
Partner work and lifts are used throughout

Contemporary Dance – Stylistic Features

Use of floor work
Use of release, fall and recovery
Use of stimulus to create movement
Movement in the upper body than classical ballet (contractions, releases, spirals, etc.)
Physical movement that requires strength and stamina

Key dance skills:

Stylistic features:
Qualities or features that are specific to/ define a particular dance style or genre

Unison:
When two or more dancers perform the same movement at the same time

Canon:
this technique requires dancers to take it in turns to perform a movement that is then identically copied and performed by others

Formations:
The shapes or patterns the dancers perform in, in the space

Year 7 Dance Styles

‘For a dancer to remember the steps and master the natural look of the movements there is nothing more effective than repetition and rehearsal. When dancers repeat movement over and over, motor memory kicks in and forces muscles to perform tasks.’

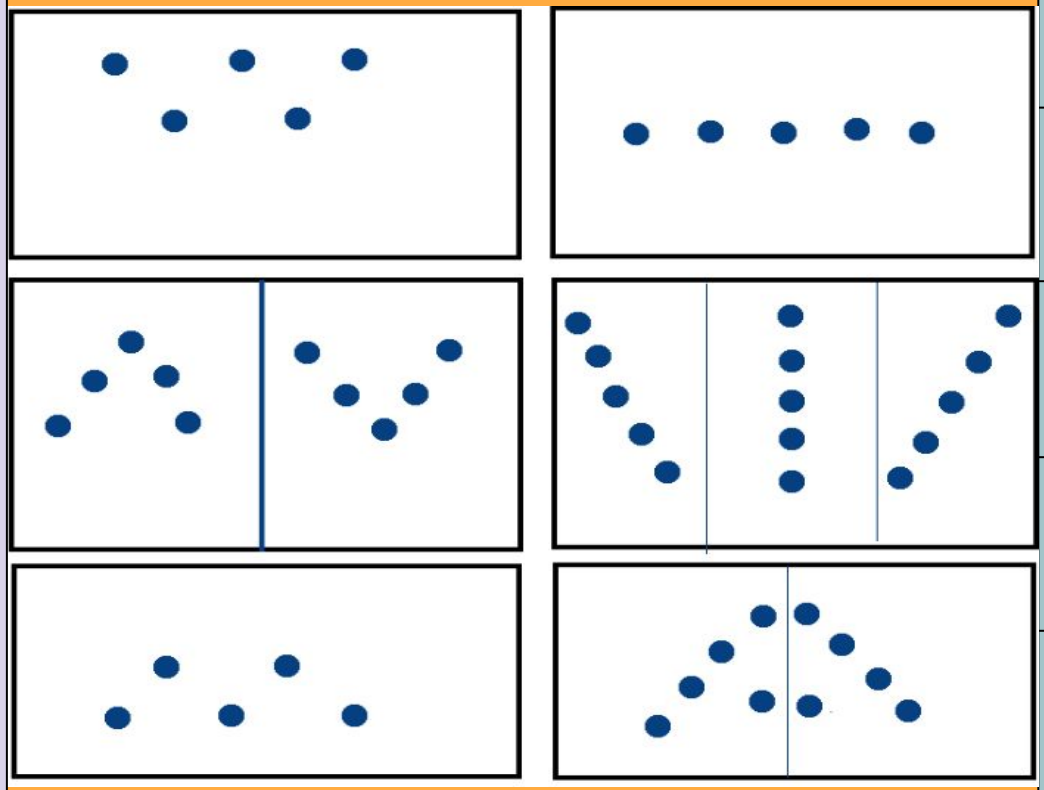
Dance

Importance of warm up/cool down

The Physical benefits of a warm-up:
- Warming up muscles/preparing the body for physical activity
- Increased body temperature
- Increased heart rate
- Flexibility of muscles and joints
- Blood flow and oxygen to muscles

The physical benefits of a cool-down:
- Helps the body's transition back to a resting state
- Increases removal of waste products such as lactic acid
- Gradually lowers heart rate
- Gradually lowers temperature
- Circulates blood and oxygen
- Gradually reduces breathing rate
- Reduces the risk of muscle soreness and stiffness
- Aids recovery by stretching muscles

Formation examples



Gesture	A movement of part of the body (especially the hand or head)
Jump	Where the whole body leaves the floor
Stillness	The whole body holds a certain position for longer than 4 seconds
Turn	Move in a circular direction around one point
Travel	Transfer weight from one leg to another to allow you to move from one part of the space to another

Health & Safety in dance

Exercise in safe spaces. Be mindful of others.	Keep your head up and know what is around you.	Warm up properly including stretching your muscle.	Bend your knees when you land from jumps.	Make sure that liquids are kept well away from the dance surface.	Remove jewellery and wear suitable clothing.	Be respectful and compassionate to others.

Materials and their Properties: Polymers (Plastics)

Thermoforming

This group of polymers are able to be formed into a different shape over and over again. Known as thermoplastics.

These are generally more flexible, especially when heated.

These are easier to recycle.

Can be formed into complex shapes.

Types:

Name	Characteristics	Uses
Polyethylene terephthalate (1 PETE)	Easily blow moulded and fully recyclable.	Bottles, food packaging, sheeting and some food wraps.
High density Polyethylene (2 HDPE)	Lightweight, rip and chemical proof.	Milk bottles, pipes, hard hats and wheelie bins.
Polyvinyl Chloride (03 PVC)	Flexible, high plasticity, tough and easily extruded.	Raincoats, pipes, Electrical tape and blow up mattresses.
Low density Polyethylene (4 LDPE)	Very flexible and tough with a high strength to weight ratio.	Plastic carrier bags and black bin bags.
Polypropylene (5 PP)	Flexible, tough, lightweight, easily cleaned and safe with food.	Kitchen, medical and stationery products.
High Impact Polystyrene (HIPS). (6 PS)	Flexible, impact resistant, lightweight and can be food safe. Toxic when burned.	Vacuum formed products such as food containers or yoghurt pots.
Acrylic (7 OTHER)	Tough but brittle, easily scratched . Common in school workshop for the laser cutter.	Car lights, display stands, trophies, jumpers, hats and gloves.

Polymorph

Non toxic, easily mouldable and re-mouldable when heated. Used for modelling or personalisation of hand grips.

Thermosetting

This group of polymers, once set in shape CANNOT be reformed. Known as thermosets.

These are generally more rigid before and after they've been heated.

These are harder to recycle.

Make excellent electrical insulators.

Types:

Name	Characteristics	Uses
Epoxy resin 	Stronger than other resins, expensive and heat resistant.	Bonding different materials together.
Melamine formaldehyde 	Food safe, hygienic and lightweight.	Kitchenware - but it can't be put in the microwave
Urea formaldehyde 	Heat resistant and very good electrical insulator	Electrical fittings, casings, buttons and handles.
Polyester resin 	Reasonably strong, heat resistant and a good electrical insulator.	Waterproof coatings and flooring.
Phenol formaldehyde 	Very hard and brittle. An excellent electrical insulator.	Electrical components, mechanical parts.

Biopolymers

Newer plastics are made from **vegetable starches** and can be composted - these are great for the environment. Here are some:

PLA - Polylactic Acid

Non toxic, easily shaped and typically used for 3D printers.

Used for pens, phone cases, disposable food and drinks containers.

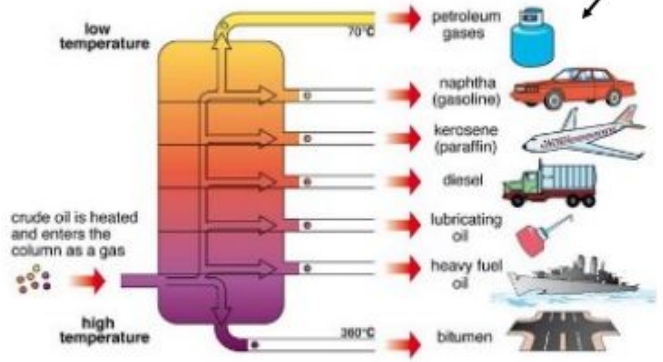
Source/Origin

Polymers come from **crude oil.** They can also come from **gas** and **coal.** This can be found beneath the Earth's surface. Below is how we get it and change it into polymers:

1. The oil is **extracted** from beneath the surface and stored. This can be done on land or in the sea.

2. This oil is then **transported** via a **crude tanker** to somewhere called an **oil refinery.**

3. When at the refinery, the oil is heated and at **different temperatures** this creates the different **products.**



Environmental Impact

Polymers are considered a **finite resource** - this means that it will run out eventually as we only have a limited amount. However with development in technology there are some **biodegradable** ones, here are some of the impacts:

✗ - Do not biodegrade easily so release harmful toxins in landfills.

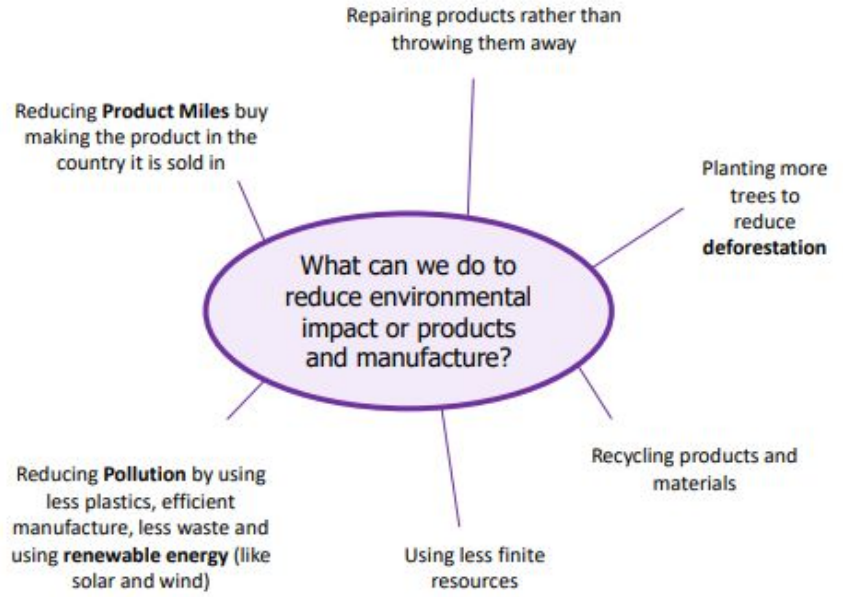
- Causes **air, visual** and **water pollution.**

- Takes a lot of energy to produce.

✓ - Some are able to be recycled so they don't use raw material (brand new e.g. crude oil).

- New technology has given way to fully biodegradable ones - **biopolymers,** so they are non toxic and not from a finite resource.

The 6Rs	Meaning
Reuse	To use a product again either for the same purpose or a different one
Reduce	To have less of material/packaging/pollution when making products by making them more efficient
Recycle	Breaking down and forming the material into another product
Refuse	Customers not buying or supporting products that make an environmental impact
Rethink	Designers and customer rethinking their decisions when making and buying products.
Repair	Fixing a product rather than throwing it away. Extending its life rather than using more resources to make another Often products are **Designed for Maintenance** so can easily be repaired. E.g. Using screws so even non-specialists can take a product apart, or using components that can easily be replaced like fuses or batteries



Life Cycle Assessment

This is when a designer looks at the environmental impact a product makes over its life time and how it could be reduced. Including:

- Impact of materials
- Impact of processes
- Product Miles (how far a product has to travel to get from factory to consumer)
- Impact while in use
- Impact when disposed of (6Rs)

Sustainability is maintaining our planet and its resources and making a minimal negative impact

Finite Resources *Will run out of eventually*	**Infinite Resources** *Can be re-grown and re-bread. Will not run out of*
Plastics	Paper
Metals	Boards
Polymers (Textiles)	Natural Timbers
	Cotton
	Leather

Planned Obsolescence	This is where products "die" after a certain amount of time. E.g. Disposable cups, Phones, Lightbulbs, Printer Ink, etc This can have a big environmental impact as customers are throwing away lots of products, and resources are being used to create new ones.

Materials and their Properties: Timbers & Manufactured Boards

Hardwoods

They are deciduous trees which means that in winter, they lose their leaves.

These trees are broadleaved, bushy and slow growing.

Overall they tend to be harder to work with and more expensive than other types of timbers.

They are less porous and denser cell structure which makes them harder wearing and less prone to rotting.

Types:

Name	Characteristics	Uses
Ash 	Flexible, tough and shock resistant, laminates well. Pale brown/cream.	Sports equipment and tool handles.
Beech 	Fine finish, tough and durable. Dense close grain with an	Children's toys, models and furniture.
Mahogany 	Easily worked, durable and finishes well. Rich reddish brown in	High end furniture and joinery.
Oak 	Tough, hard and durable, high quality finish possible. Light brown with variable grain.	Flooring, furniture, and railway sleepers.
Balsa 	Very soft, and lightweight but can snap. Pale cream/ white in colour. Unusually fast growing	Prototyping and modelling - especially in model aircraft.

Softwoods

They are coniferous trees which means that they keep their leaves in winter = evergreen.

These trees are tall and 'Christmas tree' tree shaped.

Overall they tend to be easier to work with and less expensive than other types of timbers.

They are more porous (holes) and if unprotected will rot. They have cones for leaves and grow quickly.

Types:

Name	Characteristics	Uses
Larch 	Durable, tough and good water resistance. Machines well.	Exterior cladding, flooring, machine mouldings and furniture.
Pine 	Lightweight, easy to work but can split.	Interior construction, cheaper furniture and decking.
Spruce 	Easy to work, high stiffness to weight ratio.	Construction, furniture and musical instruments.
Redwood 	Easy to work and machines well, some rot resistance.	Outdoor furniture, beams, posts and decking.
Cedar 	Easy to work, can blunt tools, finishes well and naturally resistant to rot.	Outdoor furniture, fences and cladding for buildings.

Manufactured Boards

They are sheets of processed natural timber and adhesives - so they are human made boards

These are usually made from waste wood, low-grade and recycled timber.

Can be covered by thin slices of high quality wood known as veneer to make it look aesthetically pleasing.

Cheaper than natural timber. They come in boards and have no grain.

Types:

Name	Characteristics	Uses
MDF 	Rigid and stable, good value with a smooth easy to finish surface.	Flat pack furniture, toys and kitchen units.
Plywood 	Stable in all directions as alternating layers. Flexible versions available.	Furniture, shelving, toys, interior and exterior construction.
Chipboard 	Good compressive strength, not water resistant and prone to chipping on edges.	Flooring, low end kitchen units and worktops.
OSB 	Rigid and even strength, good water resistance.	Construction in interior and exterior house building.
Block board 	Stable, tough and heavy. Finishes well.	Furniture, doors, shelving and indoor construction.
Hardboard 	Flexible, even strength and easily damaged by water.	Furniture and photo frame backing.

Source/Origin

Timber comes from **trees** - this is known as the source or origin of the material. This is how we change into timber.

1. When trees are cut down, this is known as **felling.** This can be through machine or chain saws, just like the image.

2. Branches are cut off and the logs are stored until they are transported to a **sawmill.**

3. When at the sawmill, machines such as **band saws** and **circular saws** are used to create boards/planks.

Environmental Impact

Wood is considered a **sustainable resource** as new trees can be grown to replace those felled. Here are some **issues and positives** surrounding the impact that wood is having on the environment:

- In many places, wood is being used at a greater rate which means it is unsustainable.
- Illegal felling is leading to deforestation as people aren't replanting trees.
- Deforestation helps with global warming.

- To make sure you are buying sustainable timber, you need to make sure it is approved by the **Forest Stewardship Council** or the **Endorsement of Forest Certification.**

FSC

Drama

Performance Skills

Vocal Skills	
Accent	A way of speaking in a local area or country.
Articulation	The clear and precise pronunciation of words
Diction	Clearness of the voice.
Emphasis	Rising and falling of voice in speech - to create emphasis (stress) on specific words.
Pace	The speed at which someone speaks.
Pause	A break in speaking, period of silence.
Pitch	The particular level (high or low) of a voice.
Projection	Directing the voice out of the body to be heard clearly at a distance.
Tone	Change of voice to express emotion. E.g. Happy, Sad, Anxious, Nervous, Aggressive.
Volume	Loudness or quietness of the voice.

Key Terms	
Characterisation	The way a character is portrayed through vocal skills and physical skills.
Exaggeration	Performing in an over-the-top manner.
Mime	Performing without any speech or noise.
Naturalistic	Performance that reflects realistic situations and has realistic acting, without any exaggeration.
Non-Naturalistic	Performing in a way that does not reflect realistic situations and has exaggerated acting.
Rehearsal	The period of time that involves practicing your scene.

Physical Skills	
Body language	Conveying emotions through the body. E.g. Open and closed body language.
Eye contact	Direct visual contact with the eyes of another actor or the audience. Or the withdrawal of eye contact.
Facial expression	Conveying emotions with the face.
Gesture	Any movement of the actor's head, shoulder, arm, hand, leg, or foot to convey meaning.
Interaction	The ways in which characters communicate or interact with each other. The action or relationship among two or more characters.
Levels	Physical levels of actors on the stage help to indicate status. E.g. High, Mid, Low.
Movement	Stage blocking or the movements of the actors on stage during performance.
Posture	A physical stance taken by a performer which conveys information about the character being played.
Proxemics	Use of space to signify the relationship between different performers or a performer and elements of the set.
Space	The area within which the actor may move in full view of the audience.

Drama

Pantomime

Key Vocab

Evaluation	Evaluating Live Performance – Watching a live performance and then look at what is good, what could be developed and how close it is to achieving its aims.
Exaggeration	Over the top vocals, movement and characters, often aimed at younger audiences .
Narration	Speaking directly to the audience to tell a story, give information or comment on the action of the scene, or motivations of the characters.
Pantomime	Also known as 'Panto'. This is a musical comedy style of theatre usually performed around Christmas time and including celebrities within the cast to engage audiences.
Participation	The audience get involved in the action. E.g. singing a part of a song, or shouting "he's behind you!".
Setting	Where the story is located, which might change how you act or how you create the set.
Stage Directions	The instructions included in the script, which tell the actor where to stand, what emotions they should show or how they should speak.

Key Knowledge

Pantomimes are usually performed in the Christmas period, from the start of December to the middle of January.
Panto always has a happy ending!
They are usually based on well known fairy tales and nursery stories.
Pantomime is a British creation. Most people in other parts of the world have never heard of it.

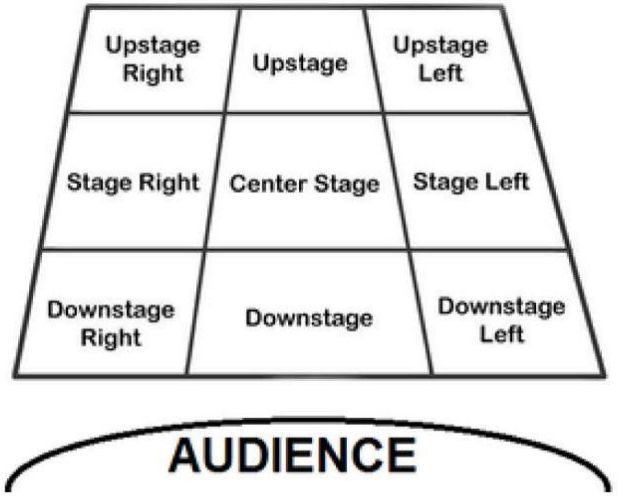
Stock Characters

Stereotypical characters that you would expect to find within a certain genre of theatre.

Dame	An over the top female character played by a man. E.g. The Ugly Step Sisters.
Hero	The male lead character who saves the day. E.g. Aladdin.
Heroine	The female lead character. Always kind but always gets into some sort of trouble. E.g. Cinderella.
Sidekick	The friend of the Heroine who speaks the most to the audience. E.g. Buttons .
Villain	The evil/bad character. E.g. The Wicked Stepmother .

Stage Positions

Different areas of the stage, which can be used in the stage directions



English

Titans	Stories
Gaia - original earth mother of 1st generation Titans.	Gave birth to Uranus and then created the first generation of Titans. Created a bladed sickle and asked Chronos to castrate Uranus as punishment for putting their first 3 children in Tartarus (in Hell).
Uranus – original sky father of 1st generation Titans.	Created by Gaia and fathered 1st generation of 12 Titans. Imprisoned 3 youngest in Tartarus. Castrated by his son Chronos. Prophesied Chronos would be overthrown by his own son, like he had been.
Chronos – first son of 2nd generation Titans, became ruler.	Chronos threw body parts of his Father in the sea, from which Aphrodite was born. Ruled with his sister Rhea as King and Queen. Swallowed all his children to prevent prophecy. Rhea hid last son Zeus in Crete, who eventually overthrew Chronos. Was tricked intro swallowing a stone and into drinking liquid that forced him to vomit back his own swallowed chlldren.
Atlas – son of Iapetus and Clymene.	Sided against the Olympians in their war against the Titans. Punished by Zeus to hold up the sky for all eternity on his shoulders.
Prometheus – brother of Atlas and champion of mankind.	Sided with Zeus and the Olympians in the war and initially avoided punishment. During the Trick at Mecone, convinced Zeus into eating bones wrapped in fat, which became the original sacrifice to the Gods. Zeus stole fire from Mankind and Prometheus gave it back. Punished by Zeus. Chained to a rock for eternity where an Eagle would eat his liver every day after it regenerated.
Epimetheus – foolish brother of Prometheus and Atlas,	Brother of Prometheus & lacked intelligence. Gave positive traits to all the animals, so Prometheus tried to help mankind by giving them fire and cvilisation. Received Pandora as a gift from the Gods. She was created to punish mankind by opening the jar containing all the evil in the world.

Olympians	Stories
Zeus – Vengeful King of the Gods. God of the sky and thunder.	Led the overthrow of the Titans & crowned as ruler of sky. Punished Prometheus. Athena born from his head. Had children with various wives, including sisters. Disguised himself as many different animals and had affairs with numerous mortals.
Poseidon – God of the Seas. Violent and ill-tempered.	Rides a chariot and wields a trident, with which he created first horse. Built walls of Troy but fought on the Greek side to spite the King, who never paid him. Competed with Athena for Athens and lost.
Hera – Goddess of Marriage.	Tricked by Zeus into marriage, by taking advantage of her love for animals. Tried to rebel against him by having him tied up, but later turned her wrath on Zeus's lovers. Tricked Hercules to kill his own children.
Hades – God of the Underworld.	Wore a helmet of invisibility. Abducted Persephone (Demeter's daughter) because he fell in love with her. Persephone spent a third of the year in Hades, which corresponds with Winter.
Demeter – Goddess of the Harvest, the cycle of life.	Fell in love with a mortal. Poseidon forced himself on her, as did Zeus. As a result, gave birth to Persephone. Attempted to rescue Persephone from Hades, which created the seasons.
Hephestus – Blacksmith God.	Zeus/Hera (in some stories) threw him from Olympus, which maimed him. Got revenge on his mother by making a Golden throne which trapped Hera with cords invisible to all but Hephaestus. Created masterworks from gold. Married to Aphrodite, who had an affair with Ares. Hephaestus caught them in a net allowing others to laugh at their shame.
Artemis – Goddess of the hunt and the moon	She guarded her chastity through her whole life. Actaeon the hunter saw her bathing naked. She transformed him into a stag and set his hounds against him. She killed her only potential lover Orion for trying to remove her clothes.
Athena – Goddess of wisdom, war and crafts.	Accidentally killed her best friend Pallas and added the two names together. Never swayed by love or passion. She competed with Poseidon to be patron of Athens. He created a stream in the middle of the city, whilst she planted an olive tree, which the King judged as superior. She competed with Arachne at weaving and turned her into a spider. She also became the main helper of heroes.
Aphrodite – The Goddess of love and beauty.	Created from the foam that rose when Uranus's body parts fell into the sea. The object of desire of all the other Gods. Zeus married her to Hephestus. She had affairs with Ares, Poseidon and Hermes. Mortals fell in love with her.
Hermes – the messenger God.	Only god capable of crossing boundary between living and dead and ushered souls to the underworld. Invented the lyre, by scooping the flesh from a tortoise shell, on day of his birth, then stole Apollo's cattle. Hermes gave him the lyre to appease his anger and they became close friends forever.
Apollo – god of music, sun, poetry & truth.	His mother Leto was banished by the dragon Python under orders from Hera. Artemis helped her mother to give birth to him. He sought revenge on the Python and wounded it with his arrows. It escaped to Delphi, where Apollo stained the temple with its blood. He claimed the temple in his name. Became the God of music and competed with Pan in a musical contest. King Midas, who voted for Pan, was given ass's ears as a result.
Dionysus – god of wine, madness and theatre.	Only god with a mortal parent. Zeus made an oath that resulted in Semele (Mother) being burnt before Dionysus was born. Zeus kept him in his thigh as a fetus until he was ready to be born. Had wild followers (Maenads) and spread ecstasy and madness through the world with wine and dance.

- When choosing food and drinks, current healthy eating guidelines should be followed.

The Eatwell Guide
- Comprises 5 main food groups.
- Is suitable for most people over 2 years of age.
- Shows the proportions in which different groups of foods are needed in order to have a well-balanced and healthy diet.
- Shows proportions representative of food eaten over a day or more.

Fruit and vegetables
- This group should make up just over a third of the food eaten each day.
- Aim to eat at least five portions of a variety each day.
- Choose from fresh, frozen, canned, dried or juiced.
- A portion is around 80g (3 heaped tbs).
- 30g of dried fruit or 150ml glass of fruit juice or smoothie count as a max of 1 portion each day.

Potatoes, bread, rice, pasta or other starchy carbohydrates
- Base meals around starchy carbohydrate food.
- This group should make up just over a third of the diet.
- Choose higher-fibre, wholegrain varieties.

Dairy and alternatives
- Good sources of protein and vitamins.
- An important source of calcium, which helps to keep bones strong.
- Should go for lower fat and lower sugar products where possible.

To find out more, go to:
https://bit.ly/2QzUMfe

Beans, pulses, fish, eggs, meat and other protein
- Sources of protein, vitamins and minerals.
- Recommendations include to aim for at least two portions of fish a week, one oily, and; people who eat more than 90g/day of red or processed meat, should cut down to no more than 70g/day.

Oil and spreads
- Unsaturated fats are healthier fats that are usually from plant sources and in liquid form as oil, e.g. olive oil.
- Generally, people are eating too much saturated fat and need to reduce consumption.

Foods high fat, salt and sugar
- Includes products such as chocolate, cakes, biscuits, full-sugar soft drinks, butter and ice cream.
- Are high in fat, sugar and energy and are not needed in the diet.
- If included, should be had infrequently and in small amounts.

8 tips for healthier eating
These eight practical tips cover the basics of healthy eating, and can help you make healthier choices.
1. Base your meals on starchy carbohydrates.
2. Eat lots of fruit and veg.
3. Eat more fish – including a portion of oily fish.
4. Cut down on saturated fat and sugar.
5. Eat less salt (max. 6g a day for adults).
6. Get active and be a healthy weight.
7. Don't get thirsty.
8. Don't skip breakfast.

Hydration
- Aim to drink 6-8 glasses of fluid every day.
- Water, lower fat milk and sugar-free drinks including tea and coffee all count.
- Fruit juice and smoothies also count but should be limited to no more than a combined total of 150ml per day.

Fibre
- Dietary fibre is a type of carbohydrate found in plant foods.
- Food examples include wholegrain cereals and cereal products; oats; beans; lentils; fruit; vegetables; nuts; and, seeds.
- Dietary fibre helps to: reduce the risk of heart disease, diabetes and some cancers; help weight control; bulk up stools; prevent constipation; improve gut health.
- The recommended average intake for dietary fibre is 30g per day for adults.

Composite/combination food
Much of the food people eat is in the form of dishes or meals with more than one kind of food component in them. For example, pizzas, casseroles, spaghetti bolognese and sandwiches are all made with ingredients from more than one food group. These are often called 'combination' or 'composite' foods.

Key terms
The Eatwell Guide: A healthy eating model showing the types and proportions of foods needed in the diet.
Hydration: The process of replacing water in the body.
Dietary fibre: A type of carbohydrate found in plant foods.
Composite/combination food: Food made with ingredients from more than one food group.

Meals and snacks can be sorted into The Eatwell Guide food groups.

Composite/combination food - Lasagne

Pasta (lasagne sheets): **Potatoes, bread, rice, pasta or other starchy carbohydrates**
Onions, garlic and chopped tomatoes: **Fruit and vegetables**
Lean minced meat (or meat substitute): **Beans, pulses, fish, eggs, meat and other protein**
Cheese sauce made with milk and cheese**: Dairy and alternatives**
Olive/vegetable oil used to cook onions and mince**: Oil and spreads**

Task
Plan a menu for a day that applies the principles of The Eatwell Guide and the 8 tips for healthier eating. Make one of the dishes, complete a sensory evaluation and calculate the energy and nutrients provided using nutritional analysis.

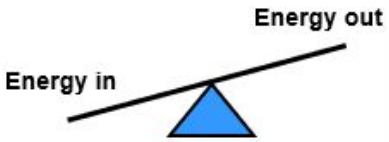
Food Technology

- Food and drinks provide energy and nutrients in different amounts, they have important functions in the body and people require different amounts during their life.
- Digestion involves different parts of the body, each having an important role.

Energy
Energy is essential for life, and is required to fuel many different body processes, growth and activities.
These include:
- keeping the heart beating;
- keeping the organs functioning;
- maintenance of body temperature;
- muscle contraction.

Different people need different amounts of dietary energy depending on their:
- age;
- gender;
- body size;
- level of
- activity;
- genes.

Energy balance
To maintain body weight, it is necessary to balance energy intake (from food and drink) with energy expenditure (from activity).



Energy in > Energy out = Weight gain

Energy from food
- Energy intake is measured in joules (J) or kilojoules (kJ), but many people are more familiar with the term calories (kcal).
- Different macronutrients provide different amounts of energy.

	Energy per 100g
Carbohydrate	16kJ (3.75 kcals)
Protein	17kJ (4 kcals)
Alcohol	29kJ (7kcals)
Fat	37kJ (9 kcals)

Energy requirements vary from person to person, depending on the Basal Metabolic Rate (BMR) and Physical Activity Level (PAL).

Total energy expenditure = BMR x PAL

Body Mass Index (BMI) can be used to identify if an adult is a correct weight for height.
BMI = **weight (kg) / (height in m)²**

Recommended BMI range (adults)

Less than 18.5	Underweight
18.5 to 25	**Desirable**
25-30	Overweight
30-35	Obese (Class I)
35-40	Obese (Class II)
Over 40	Morbidly obese

Nutrients
There are two different types of nutrients:
- macronutrients;
- micronutrients.

There are three macronutrients that are essential for health:
- carbohydrate;
- protein;
- fat.

There are two types of micronutrients:
- vitamins;
- minerals.

Carbohydrate
Free sugars include all sugars added to foods, plus sugars naturally present in honey, syrups and unsweetened fruit juice.
Fibre is a term used for plant-based carbohydrates that are not digested in the small intestine.
Sugars include a variety of different sugar molecules such as sucrose
Starchy foods are the main source of carbohydrate for most people and are an important source of energy. We should be choosing wholegrain versions of starchy foods where possible.

Protein
Protein is made up of building blocks called amino acids. There are 20 amino acids found in protein. For adults, eight of these have to be provided by the diet (this is higher in children). These are called essential amino acids, which cannot be made by the human body.

Fat
Sources of fat include:
- saturated fat;
- monounsaturated fat;
- polyunsaturated fat.

A high saturated fat intake is linked with high blood cholesterol levels.

Micronutrients
Vitamins
There are two groups of vitamins:
- fat-soluble vitamins, e.g. vitamins A and D.
- water-soluble vitamins, e.g. B vitamins (thiamin, riboflavin, niacin, folate, vitamin B12) and vitamin C.

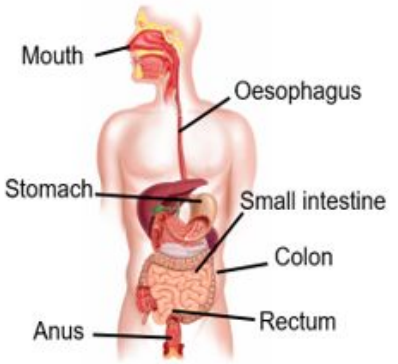
Minerals
Minerals are inorganic substances required by the body in small amounts for a variety of different functions. Examples include: calcium, sodium and iron. Most micronutrients are mostly provided by the diet. An exception is vitamin D which can be synthesised by the action of sunlight on the skin.

Calcium is essential for a number of important functions such as the maintenance of bones and teeth, blood clotting and normal muscle function.
Sodium is needed for regulating the amount of water and other substances in the body.
Iron is essential for the formation of haemoglobin in red blood cells. Red blood cells carry oxygen and transport it around the body. Iron is also required for normal metabolism and removing waste substances from the body.

Stages of digestion
Ingestion - the intake of food into the gastrointestinal (GI) tract.
Digestion - a series of physical and chemical processes which begin in the mouth, but take place mainly in the stomach and small intestine.
Absorption - the passage of digested food substances across the gastrointestinal lining into the bloodstream and lymphatic system.
Elimination - the excretion of undigested food substances (such as cellulose) or waste in faeces.

Key terms
Energy: The power the body requires to stay alive and function.
Digestion: The process by which food is broken down in the digestive tract to release nutrients for absorption.
Macronutrients: Nutrients needed to provide energy and as the building blocks for growth and maintenance of the body.
Micronutrients: Nutrients which are needed in the diet in very small amounts.

Digestion
The body requires energy from food and drink. Our bodies release the energy and nutrients from food.
The food passes down the Gastrointestinal tract (GI) tract as shown below.



To find out more, go to:
https://bit.ly/31CBjke

Tasks
1. Create an infographic on either macronutrients or micronutrients. Focus on the definition of each nutrient, recommendations and sources.
2. Draw the digestive system and label each of the body parts and the stages of digestion that occur at each part.
3. Calculate the energy and nutrients provided by a food diary for one or two days using http://explorefood.foodafactoflife.org.uk - reflect on the results.

Food Technology

- Buying, storing, preparing and cooking food safely and hygienically are vital for health.
- There is a range of additional food skills and cooking techniques, which enable a wide range of dishes to be made.

Food can spoil and decay due to the action of microbes, insects and other pests/pets.

Microorganisms
Microorganisms are everywhere. They can be carried by food, people, dirty equipment, animals and pests. Most are harmless.

Food spoilage
When food spoils, the following may change:
- appearance;
- taste;
- texture;
- smell.

Food can be purchased from a variety of sources.

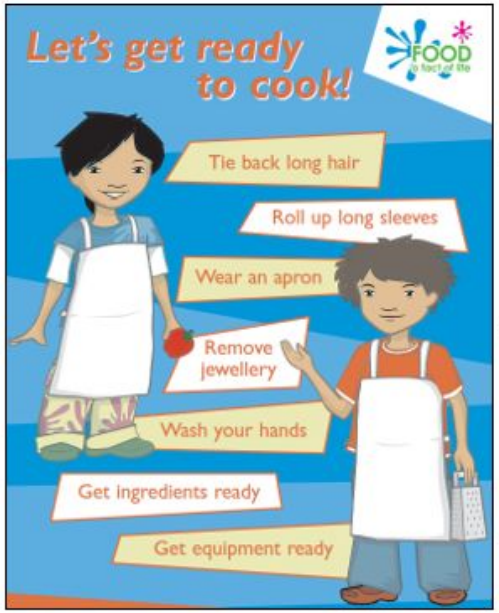
Food labels provide useful information to the consumer.

Baby leaf salad
Keep refrigerated.
Once opened consume within 24 hours and by the 'use-by' date shown.

Food needs to be stored properly and within its date mark.

USE BY:	BEST BEFORE:
25/08/20	25/08/21
KEEP REFRIGERATED	STORE IN A COOL DRY PLACE

Good personal hygiene is vital when cooking to avoid the risk of food poisoning.



There are a number of basic food skills which enable you to prepare a variety of simple dishes.

These can include:
- cutting (with a knife);
- grating.
- juicing;
- kneading;
- measuring;
- peeling;
- rolling-out;
- rubbing-in;
- stirring;
- washing;
- weighing.

There are lots of food skills which enable you to extend the range of dishes you can already cook.

It is important to take care when using sharp and/or hot equipment so that you don't hurt yourself or someone else.

The bridge hold and claw grip should be used when cutting food to avoid harm.

Bridge hold

Claw grip

Basic cooking skills are required to make a dish.

Grate

Knead

Measure/weigh

Peel

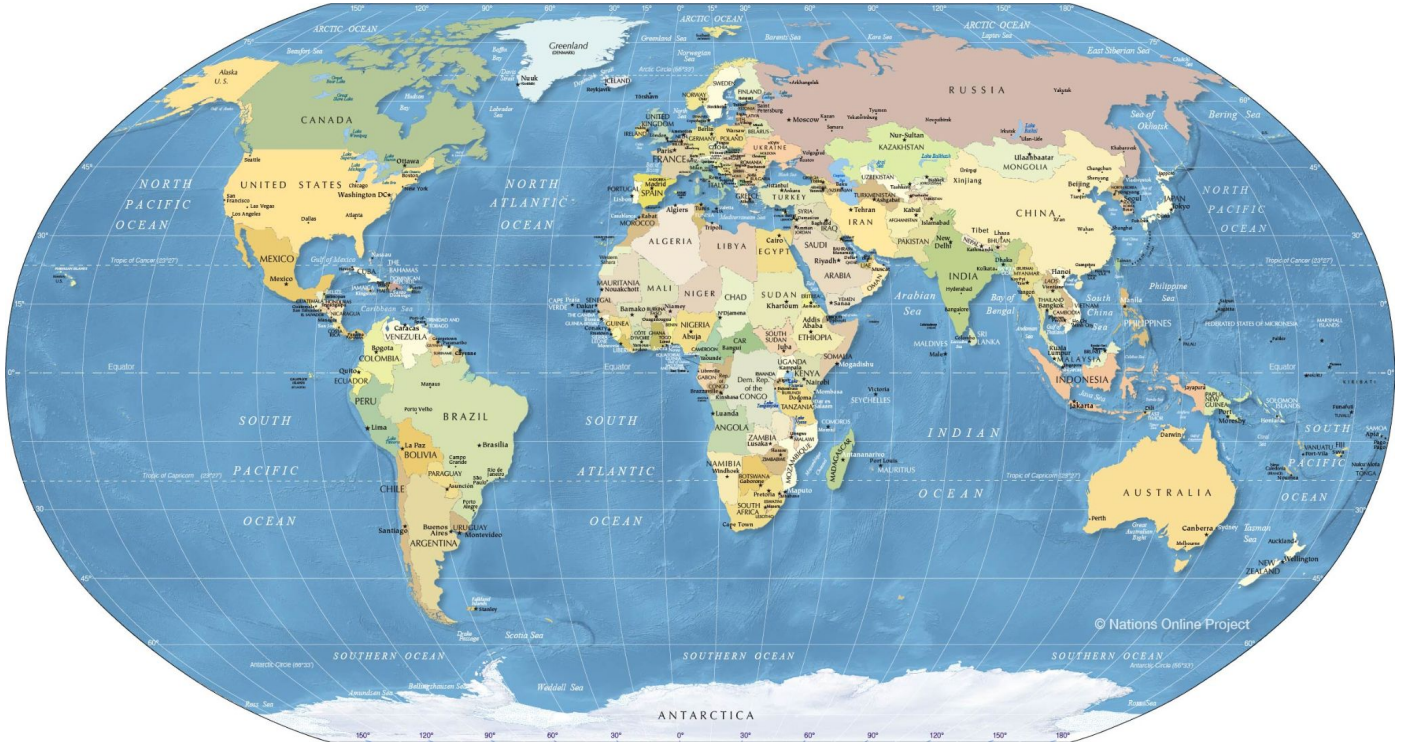
Roll-out

Rub-in

Task: Make a list of the steps you would take before, during and after cooking to make sure you follow good food hygiene and safety practices.

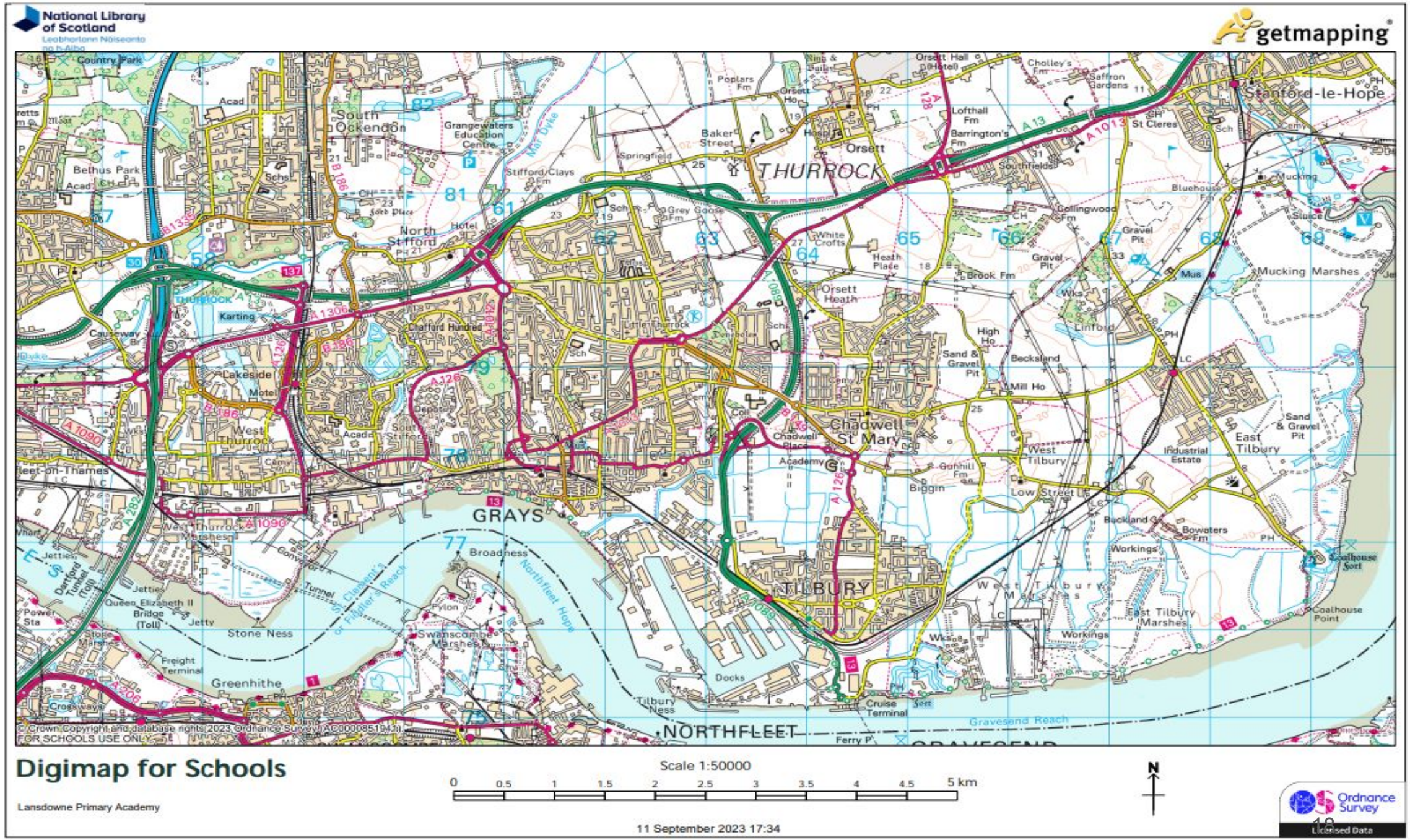
Geography

Key term:	Definition:
Nation	A territory where all people are led by the same government
Continent	A large landmass encompassing a number of nations
Ocean	A continuous body of salt water on the earth's surface
Latitude	The distance from the equator using lines of latitude
Longitude	Distance from the Prime Meridian
Physical geography	The study of natural geographic features e.g. rivers, ice & the sea
Human geography	The study of how and where humans live and complex change
Environmental geography	The study of habitats and interactions with the humans and physical world



Processes:	Explanation:	Example:
Physical geography	The study of natural processes and landforms.	Tectonic hazards such as volcanic eruptions in Hawaii or river flooding in Spain
Human geography	The study of how and where people live on Planet Earth.	Rapid urbanisation across Asian (India) and African (Nigeria) nations and the complexity of change in the global economy.
Environmental geography	The study of habitats and their interactions with the physical and human world.	Deforestation in the Amazon Rainforest and the impact on biodiversity levels in the region.
Place specific locations	Using latitude and longitude to locate key physical and human features. Locational knowledge has an understanding of the topography of a region.	The understanding that an earthquake in Morocco is due to their physical location and the movement of tectonic plates on the earth's crust.
Map skills	The use of grid references to identify precise locations as well as the use of other geographic features such as relief & distance.	Ordnance Survey produces a wide array of maps which allow us to study any geographic location in the UK.

Geography



Digimap for Schools

History

Year 7
Anglo-Saxon England- 1066-1080

INEQUALITY

CONFLICT

MIGRATION

Why was there a succession crisis?

In 1066 Edward the Confessor the King of Anglo-Saxon England died without an heir. Many believed that they could claim the throne and become the next king.

The Anglo-Saxons were proud warrior people so the person who ruled them would need to be able to take control and protect their throne and the people of England. The Witan would have the deciding vote on who became the next king.

Who believed they had a claim?

There were four main claimants to the Anglo-Saxon throne:

1. Edgar the Atheling
2. Harold Godwinson
3. Harald Hardrada
4. William Duke of Normandy

Each had a different claim- for example Edgar the Atheling was related by blood. Harold Godwinson had ruled alongside Edward the Confessor and an advisor and was an Anglo-Saxon. William had been promised the throne by Edward and Haralds family had once ruled England.

Key words

Monarch: A ruler such as a King or Queen
Claimant: A person who made a claim for the throne
Successor: The person next in line
Witan: The Anglo-Saxon government
Strategy: A plan of action
Coronation: The crowning of a monarch

Shield Wall: A defensive strategy
Rebel: To go against authority.
Feudal system: The hierarchical system used by the Normans in England
Domesday Book: A record book of the people living under William during his reign
Heir: The next line to succeed a monarch.
Feigned retreat: A battle strategy used to draw out an army and leave them defenceless.

The Battles

Gate Fulford: The first battle to claim the Anglo-Saxon throne. It occurred on the 20th September 1066, between Anglo-Saxon Nobles Edwin and Morcar and the Viking invaders led by Harald Hardrada. The victory of this battle went to Harald who had better military strategies and better trained soldiers.

Stamford Bridge: The second battle of the claimants began on the 25th September 1066. It saw Harold Godwinson march his army North from London to battle the Vikings. He ultimately won the battle as he gained the element of surprise on the unorganised Vikings.

Battle of Hastings: The final battle occurred on the 14th October 1066. William landed in the South and organised his army waiting for Harold, who marched his army from the North to fight. This tired army was unable to defeat the clever Duke who used the feigned retreat to defeat the Anglo-Saxon shield wall.

Who won the throne?

William Duke of Normandy claimed the Anglo- Saxon throne after he defeated Harold Godwinson at the Battle of Hastings. He was crowned King of England on the 25th of December 1066

Who rebelled against William?

Not everyone was content to allow William the conqueror to rule. The Anglo-Saxon nobles, Morcar, Edwin and Edgar the Atheling all launched rebellions against William that failed.

The final full-scale rebellion was answered by William with the Harrying of the North, which was the large-scale destruction of York.

How did England change?

William wanted to have complete control of England. One way that he achieved this was by building Motte and Bailey castles around England. These had never been seen before by the Anglo-Saxons and sparked feelings of fear and intimidation. They were also used as a defensive feature against attack and a position of attack.

How did England change?

William also introduced the Feudal system, this was how society was to be organised. The King- William would be at the top with all the power and all people of England owed loyalty to him. Earls came under him, they owned some land and had control of knights and peasants. They provided the king with wealth and military when asked. Knights worked for earls and the King and protected England. The peasants were poor and worked the land for their lord.

Maths

Knowledge Organiser: Decimals

What you need to know:

Column addition and subtraction

$$\begin{array}{r} {\scriptstyle 1\ \ \ 1} \\ 5.649 \\ +\ 39.27 \\ \hline 44.919 \end{array}$$

Addition: Starting with the digit on the right, add each column in turn. Regroup tenths, tens, hundreds etc as required.

$$\begin{array}{r} {\scriptstyle 2\ 13\ 17} \\ 3.47 \\ -\ 1.59 \\ \hline 1.88 \end{array}$$

You must remember to borrow if you can't subtract with the numbers you have.

Subtraction: Starting with the digit on the right, subtract each column in turn. Exchange tenths, tens, hundreds etc as required.

Column multiplication

Question: 1.54 x 2.6

Now 154 x 26

1	~~3~~	~~2~~	
	1	5	4
×		2	6
	9	2	4
3	0	8	0
4	0	0	4
1	1		

We multiplied by 1000 to get rid of the decimal points because there are 3 numbers in total after the point in the question.

Multiply the whole numbers.

Divide your answer by 1000.

Multiplication: Remove any decimal points from your values before multiplying. Then multiply as you would normally. When you have finished multiplying and have added to get your total remember to then divide by the multiple of 10 that you multiplied by to remove the decimal point at the beginning.

Answer = 4.004

Key Terms:

Add: Finding the total of 2 or more number.
Subtract: Finding the difference between 2 numbers.
Multiply: Increasing a value by a given times table.
Divide: Share a given number using a specific times table.
Decimal: A number that has digits that are smaller than one whole. It has a decimal point.
Round: Changing the given number to a value that it is close to.
Estimate: Calculate an approximate answer to a calculation by rounding the values.
Compare: Examine the difference between the quantities.

You need to be able to:

- Add and subtract decimals using the column method.
- Multiply decimals by whole numbers and decimals by decimals using a written method.
- Divide decimals using the bus stop method.
- Use rounding to estimate values to calculations.
- Order decimals from smallest to biggest.
- Round values to the nearest integer.
- Round answers to a given number of decimal places or significant figures.

Maths

Knowledge Organiser: Decimals

What you need to know:

Division: Set up your question as shown. Starting from the left divide the number under the bus stop by the number on the outside. Any remainders must be carried to the next value along. Continue this process until you have got to the end of the number you are dividing.

8.12 ÷ 4

	2	.	0	3
4	8	.	1	2

You must carry any remainders here.

0.5) 6.85

5) 68.5 → 5) 68.5

don't need

To divide a decimal by a decimal we need to multiply both values until the number we are dividing by is a whole number. Then we would divide as before.

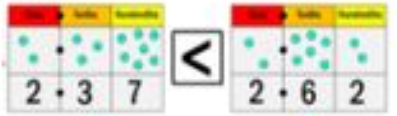
Rounding

To make a number simpler but keep its value close to what it was.
If the digit to the right of the rounding digit is less than 5, round down. If the digit to the right of the rounding digit is 5 or more, round up.
For example:
7.44 rounded to 1 decimal place is 7.4, because 7.44 is closer to 7.4 than 7.5.
0.38 rounded to 1 decimal place is 0.4 because 0.38 is closer to 0.4 than 0.3.

When rounding to significant figures we need to look at the first non zero value and use this to round appropriately.
7.44 rounded to 1 significant figure is 7 because 7.44 is closer to 7 than 8.
0.567 rounded to 2 significant figures is 0.57 because 0.567 is closer to 0.57 than 0.56.

Always check whether the question wants you to round to a given number of decimal places or significant figures because they are different.

Comparing decimals: It is important when comparing decimals to compare each digit which is in the same place value. For example, compare the tenths with each other because they are in the same place.



Compare the tenths – 3 is less than 6 so we know that 2.37 must be smaller than 2.62.

Ordering decimals: When ordering decimals it is important to ensure that all of the decimals have the same number of digits.

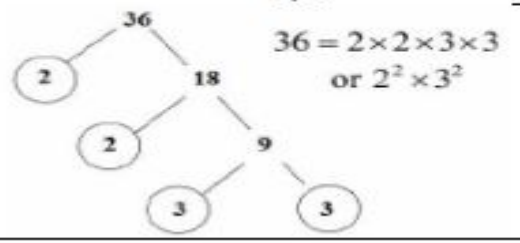
For example:
0.3, 0.43, 0.03, 0.043 would become 0.300, 0.430, 0.030, 0.043

It is then easy to order them: 0.03, 0.043, 0.3, 0.43

You must only use the additional zeros to help you order the decimals, they must be written as they were in the question as your answer.

Maths

Topic: Factors and Multiples

Topic/Skill	Definition/Tips	Example
1. Multiple	The result of multiplying a number by an integer. The **times tables** of a number.	The first five multiples of 7 are: 7, 14, 21, 28, 35
2. Factor	A number that **divides exactly** into another number without a remainder. It is useful to write factors in pairs	The factors of 18 are: 1, 2, 3, 6, 9, 18 The factor pairs of 18 are: 1, 18 2, 9 3, 6
3. Lowest Common Multiple (LCM)	The **smallest** number that is in the **times tables** of each of the numbers given.	The LCM of 3, 4 and 5 is 60 because it is the smallest number in the 3, 4 and 5 times tables.
4. Highest Common Factor (HCF)	The **biggest** number that **divides exactly** into two or more numbers.	The HCF of 6 and 9 is 3 because it is the biggest number that divides into 6 and 9 exactly.
5. Prime Number	A number with **exactly two factors**. A number that can only be divided by itself and one. The number **1 is not prime**, as it only has one factor, not two.	The first ten prime numbers are: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29
6. Prime Factor	A factor which is a prime number.	The prime factors of 18 are: 2, 3
7. Product of Prime Factors	Finding out which **prime numbers multiply** together to make the **original** number. Use a **prime factor tree.** Also known as 'prime factorisation'.	 $36 = 2 \times 2 \times 3 \times 3$ or $2^2 \times 3^2$

Maths

PRIME NUMBERS, HCF AND LCM KNOWLEDGE ORGANISER

2 3 5 7 11 13 17 19 23 29 31 37 41 43...

Content:

- A prime number (or a prime) is a natural number greater than 1 that has no positive divisors other than 1 and itself.
- Any number can be written as the product of prime factors – you can use the factor tree method to do this.
- Any number can be broken down into a string of prime factors all multiplied together – this is called 'prime factor decomposition' or 'prime factorisation'.
- Product means 'times' or 'multiply'.
- We can write the product of a number in the form of index notation.
  e.g. $2^3 \times 5$

HCF & LCM:

When you have found the prime factors of a number you can use this information in order to find out the LCM and HCF.

Common Misconceptions

- 0 and 1 are not considered prime numbers.

Key Facts

Prime numbers:
Only divisible by 1 and itself. Only two factors

Square numbers:
Multiply by itself 2 x 2. Written as 2^2

Cube numbers:
Multiply by itself three times 2 x 2 x 2. Written as 2^3

Factors:
Numbers which divide into another number with no remainder

Multiples:
Times tables of a number

Key Facts	
Prime Numbers under 50	2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47
Square Numbers to 15^2	1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225
Cube Numbers to 10^3	1, 8, 27, 64, 125, 216, 343, 512, 729, 1 000
Factors of 24	1, 24, 2, 12 3, 8, 4, 6
Multiples of 24	24, 48, 72, 96, 120

Finding the HCF:

1) List all the PRIME FACTORS that appear in BOTH numbers.
2) MULTIPLY these together to find the HCF.

EXAMPLE: $180 = 2^2 \times 3^2 \times 5$ and $84 = 2^2 \times 3 \times 7$.
Use this to find the HCF of 180 and 84.

$180 = 2 \times 2 \times 3 \times 3 \times 5$ $\quad 84 = 2 \times 2 \times 3 \times 7$

2, 2 and 3 are prime factors of both numbers, so
HCF = 2 × 2 × 3 = 12

Finding the LCM:

1) List all the PRIME FACTORS that appear in EITHER number.
2) If a factor appears MORE THAN ONCE in one of the numbers, list it THAT MANY TIMES.
3) MULTIPLY these together to give the LCM.

EXAMPLE: $18 = 2 \times 3^2$ and $30 = 2 \times 3 \times 5$.
Find the LCM of 18 and 30.

$18 = 2 \times 3 \times 3$ $\quad 30 = 2 \times 3 \times 5$

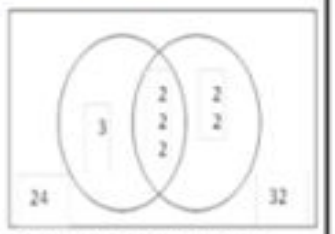
So the prime factors that appear in either number are: 2, 3, 3, 5 — List 3 twice as it appears twice in 18.

LCM = 2 × 3 × 3 × 5 = 90

Key Concept: Using Venn Diagrams to find the HCF and LCM

E.g. Find the HCF and LCM of 24 and 32
Express these numbers as a product of their primes then put them into a Venn diagram

$24 = 2 \times 2 \times 2 \times 3$ or $2^3 \times 3$
$32 = 2 \times 2 \times 2 \times 2 \times 2$ or 2^5



The **HCF** is found by multiplying together the numbers in the intersection of the two circles.
HCF: 2 x 2 x 2 = 8

The LCM is found by multiplying together the numbers from all three sections of the circles.
LCM: 3 x 2 x 2 x 2 x 2 x 2 =96

Maths

Topic: Indices

Topic/Skill	Definition/Tips	Example
1. Square Number	The number you get when you **multiply a number by itself**.	**1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225…** $9^2 = 9 \times 9 = 81$
2. Square Root	The **number you multiply by itself** to get another number. The reverse process of squaring a number.	$\sqrt{36} = 6$ because $6 \times 6 = 36$
3. Solutions to $x^2 =$ ….	**Equations** involving **squares** have **two solutions**, one **positive** and one **negative**.	Solve $x^2 = 25$ $x = 5$ *or* $x = -5$ This can also be written as $x = \pm 5$
4. Cube Number	The number you get when you **multiply a number by itself and itself again**.	1, 8, 27, 64, 125… $2^3 = 2 \times 2 \times 2 = 8$
5. Cube Root	The **number you multiply by itself and itself again** to get another number. The reverse process of cubing a number.	$\sqrt[3]{125} = 5$ because $5 \times 5 \times 5 = 125$
6. Powers of…	The powers of a number are that **number raised to various powers**.	The powers of 3 are: $3^1 = 3$ $3^2 = 9$ $3^3 = 27$ $3^4 = 81$ etc.

7. Multiplication Index Law	When **multiplying** with the same base (number or letter), **add the powers**. $\boldsymbol{a^m \times a^n = a^{m+n}}$	$7^5 \times 7^3 = 7^8$ $a^{12} \times a = a^{13}$ $4x^5 \times 2x^8 = 8x^{13}$
8. Division Index Law	When **dividing** with the same base (number or letter), **subtract the powers**. $\boldsymbol{a^m \div a^n = a^{m-n}}$	$15^7 \div 15^4 = 15^3$ $x^9 \div x^2 = x^7$ $20a^{11} \div 5a^3 = 4a^8$
9. Brackets Index Laws	When raising a power to another power, multiply the powers together. $\boldsymbol{(a^m)^n = a^{mn}}$	$(y^2)^5 = y^{10}$ $(6^3)^4 = 6^{12}$ $(5x^6)^3 = 125x^{18}$
10. Notable Powers	$\boldsymbol{p = p^1}$ $\boldsymbol{p^0 = 1}$	$99999^0 = 1$
11. Negative Powers	A negative power performs the reciprocal. $\boldsymbol{a^{-m} = \frac{1}{a^m}}$	$3^{-2} = \frac{1}{3^2} = \frac{1}{9}$
12. Fractional Powers	The denominator of a fractional power acts as a 'root'. The numerator of a fractional power acts as a normal power. $a^{\frac{m}{n}} = (\sqrt[n]{a})^m$	$27^{\frac{2}{3}} = (\sqrt[3]{27})^2 = 3^2 = 9$ $\left(\frac{25}{16}\right)^{\frac{3}{2}} = \left(\frac{\sqrt{25}}{\sqrt{16}}\right)^3 = \left(\frac{5}{4}\right)^3 = \frac{125}{64}$

Topic: Standard Form

Topic/Skill	Definition/Tips	Example
1. Standard Form	$A \times 10^b$ *where* $1 \leq A < 10$, $b = integer$	$8400 = 8.4 \times 10^3$ $0.00036 = 3.6 \times 10^{-4}$
2. Multiplying or Dividing with Standard Form	Multiply: **Multiply the numbers** and **add the powers**. Divide: **Divide the numbers** and **subtract the powers**.	$(1.2 \times 10^3) \times (4 \times 10^6) = 8.8 \times 10^9$ $(4.5 \times 10^5) \div (3 \times 10^2) = 1.5 \times 10^3$
3. Adding or Subtracting with Standard Form	**Convert** in to **ordinary** numbers, **calculate** and then **convert back** in to standard form	$2.7 \times 10^4 + 4.6 \times 10^3$ $= 27000 + 4600 = 31600$ $= 3.16 \times 10^4$

Systematic Listing

Topic/Skill	Definition/Tips	Example
1. Combination	A collection of things, where the **order does not matter**.	How many combinations of two ingredients can you make with apple, banana and cherry? Apple, Banana Apple, Cherry Banana, Cherry 3 combinations
2. Permutation	A collection of things, where the **order does matter**.	You want to visit the homes of three friends, Alex (A), Betty (B) and Chandra (C) but haven't decided the order. What choices do you have? ABC ACB BAC BCA CAB CBA
3. Permutations with Repetition	When something has n different types, there are $\boldsymbol{n}$ **choices each time**. Choosing r of something that has n different types, the permutations are: $n \times n \times \ldots (r\ times) = \boldsymbol{n^r}$	How many permutations are there for a three-number combination lock? 10 numbers to choose from $\{1, 2, \ldots .10\}$ and we choose 3 of them → $10 \times 10 \times 10 = 10^3 = 1000$ permutations.

4. Permutations without Repetition	We have to **reduce the number of available choices each time**. One you have chosen something, you cannot choose it again.	How many ways can you order 4 numbered balls? $4 \times 3 \times 2 \times 1 = 24$
5. Factorial	The factorial symbol '!' means to multiply a series of descending integers to 1. Note: $0! = 1$	$4! = 4 \times 3 \times 2 \times 1 = 24$
6. Product Rule for Counting	If there are ***x* ways of doing something** and ***y* ways of doing something else**, then there are ***xy* ways of performing both**.	To choose one of $\{A, B, C\}$ and one of $\{X, Y\}$ means to choose one of $\{AX, AY, BX, BY, CX, CY\}$ The rule says that there are $3 \times 2 = 6$ choices.

Calculator buttons

A **scientific calculator** can work out complicated calculations, including fractions, very quickly. The buttons vary on different calculators, so make sure you know how your own calculator works.

Index buttons

Use these buttons to work out powers and roots.

- squares a number
- cubes a number
- square root
- cube root
- higher powers

On some calculators this button is labelled x^y

- numbers in standard form

For a reminder on powers and roots turn to page 9. For a reminder on standard form turn to page 10.

Entering fractions

You can use the and buttons and the arrow keys to enter fractions and mixed numbers.

To enter $\frac{2}{3}$ press and then press 2 to enter the numerator. Then press the down arrow and press 3 to enter the denominator.

To change an answer on your calculator from a fraction to a decimal, press the key. Experiment using your own calculator.

Problem solved!

If you can't work out what calculation to do, try using easier numbers. If an egg has a mass of 80 grams and there are 12 in a box the total mass is $12 \times 80 = 960$ grams. So to find the total mass you need to multiply the two numbers.

You will need to use problem-solving skills in all areas of maths – **be prepared!**

Worked example

(a) Work out 6.2^3

238.328

(b) Find the value of $\sqrt{60}$ correct to 2 decimal places.

7.745966692 = 7.75 (2 d.p.)

Use the button for part (a). You might need to use the button to get your answer as a decimal number:

6.2^3 → 6.2^3 238.328

For part (b) write down all the digits from your calculator display before rounding your answer.

Worked example

A grain of sand has a mass of 4.4×10^{-6} kg. There are 5.1×10^9 grains of sand on a beach volleyball court. Estimate the total mass of the sand on the beach volleyball court.

$5.1 \times 10^9 \times 4.4 \times 10^{-6} = 22440$kg

To enter 4.4×10^{-6} on your calculator press 4 . 4 ×10ˣ (−) 6. Then press × and enter the second number. You don't have to press × before ×10ˣ.

PE

Warm Up

- Pulse Raiser
- Stretches
- Sport specific skills/drills

Muscles

Gastrocnemius Hamstring

Quadricep Tricep

Deltoid

Definition of Health

Health is a state of physical, social and emotional wellbeing not me absence of disease or infirmity.

Physical Health

- Stronger bones/ Reduce risk of osteoporosis
- Reduced risk of Coronary Heart Disease
- Reduced risk of stroke
- Reduced chance of obesity

Social Health

- Make new friends
- Get together with friends
- Improve cooperation

Emotional Health

- Stress relief
- Aesthetic appreciation
- Reduced boredom
- Competition

Muscle	Location
Deltoid	Top of the shoulder
Triceps	Back of upper arm
Hamstrings	Back of upper leg
Gastrocnemius	Back of lower leg
Quadriceps	Front of leg

Components of Fitness

Cardiovascular Fitness Muscular Endurance

Flexibility Reaction Time Power Speed
Agility Balance Coordination Body Composition

Strength

PE

RUGBY

Rules of The Game

- The game is broken down into two 40-minute halves with a 10-minute rest period in between. The game carries no stoppage time and will end exactly on 80 minutes.
- Each team can start with 15 players and up to 7 substitutes. Players that have left the field are only allowed to return if they have been treated for an injury.
- The game must have one referee and two touch judges. It is the referee's job to time keep, make decisions throughout the game, and keep order on the field. The two touch judges can assist the referee with decisions and notify the referee when players are in touch (out of playing boundaries).
- The game will stop if a player is fouled, the ball goes out of play or a try or drop goal is scored.
- The defending team must tackle a player by grabbing a hold and pulling them to the floor. A tackle cannot be made above shoulder height and doing so will cause the referee to award a foul.
- Once the ball goes into touch a line out is called. Up to 7 players can enter a line-out and any of these players can be lifted in order to catch the ball being thrown in. Both teams can compete to win the ball.
- A scrum will be called for minor infringement of the Laws (for example, a forward pass or knock on) or the ball becoming unplayable in a ruck or maul.
- A successful conversion, penalty or kick at goal only occurs when the player manages to kick the ball through the top section of the goal. If a player is unsuccessful the ball is still in play until it crosses one of the playing fields boundaries.
- Attacking players must remain behind the ball whilst active or run the risk of being called offside. Players not interfering with play can be in front of ball but must get back behind the ball before then again interfering with play.

Positions

A rugby team has 15 positions. Each one wears a specific number and has individual responsibilities:

1-8 refer to as the *pack* or the *forwards*. This group's main goal is to win possession of the ball. These players are usually the heavyweights of the team, using their bulk and strength to try to overpower their opponents.

9-15 refer to the *backs*. This group provide speed and agility and evasiveness required in many cases to score tries.

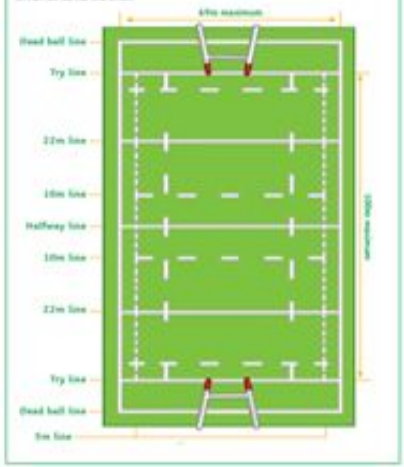
Forwards
1 Loosehead Prop
2 Hooker
3 Tighthead Prop
4 Lock (Second Row)
5 Lock (Second Row)
6 Blindside Flanker
7 Openside Flanker
8 Number 8

Backs
9 Scrum Half
10 Fly Half
11 Left Wing
12 Inside Centre
13 Outside Centre
14 Right Wing
15 Full Back

Pitch Markings and Equipment

The pitch is split up into three sections; one main playing area which must not exceed 100 metres and two dead goal areas which can range from 10 to 20 m. The pitch must then be equal to 70 metres wide. The goal posts are in an 'H' shape and are roughly 5 to 6 meters apart with no restrictions on height.

Studded boots can be worn along with gum shields, head guards, shoulder pads and shin pads. Each team must wear the same coloured shirts with matching shorts and socks.



RUGBY

Scoring

The aim of rugby is to score more points than the opposition within 80 minutes. This is done in four different ways:

Try: The most valuable play is to score a try, which means touching the ball down in the opponent's in-goal area or on their goal line. Doing so is worth five points and earns that team the right to attempt a conversion kick.

Conversion kick: This kick is worth an additional two points. The conversion kick is taken from a spot in line with where the ball was originally grounded, so scoring as close to the posts as possible is best.

Penalty kick: Penalties for various infractions can be used to take a kick at goal, which is worth three points.

Drop goal: A dropped goal, which occurs when the player drops the ball on the ground and then kicks it just as it bounces, is worth three points if it goes through the uprights.

Key Terms

Lineout: Both teams line up opposite each other, but one team then throws the ball down the middle of the tunnel. Lineouts restart play after the ball, or a player carrying it, has gone out of bounds.

Maul: Occurs when a player carrying the ball is held by one or more opponents, and one or more of the ball-carrier's teammates bind on the ball-carrier. All the players involved are on their feet and moving toward a goal line. Open play has ended.

Ruck: One or more players from each team, who are on their feet and in contact, close around the ball on the ground. Once a ruck has been formed, players cannot use their hands to get the ball, only their feet.

Scrum: A contest for the ball involving eight players who bind together and push against the other team's assembled eight for possession of the ball. Scrums restart play after certain minor infractions.

Offload: Offloading means you are trying to keep the attack alive. At times when you cannot beat your opposition, offload the ball to a support runner before going to ground.

Advantage: Period after an infringement in which the non-offending side have the opportunity to gain sufficient territory or tactical opportunity to negate the need to stop the game due to the infringement.

PE

Netball

Rules of The Game

The object of netball is to score more points than your opponent.

- A netball game lasts for a regulation 60 minutes. This is split into four quarters, with each quarter lasting 15 minutes. Between the first and second quarter, and the third and fourth quarter, there is an interval of three minutes. Between the second and third quarter -half-time - there is an interval of five minutes.
- A referee or umpire is allowed to call time and when they do, the timekeeper will stop the timer, which begins again when play starts again. There is a maximum of two minutes allowed for an injury
- Each team can have a maximum of 7 players and a minimum of 5.
- The court must be divided unto 3 sections, with each player holding a specific position on the court.
- If a player moves into a position that they should not be in, they will be deemed to be offside.
- Players cannot hold the ball for more than three seconds.
- You cannot throw the ball over two transverse lines without interception (Over a Third)
- Players cannot take more than 1.5 steps when in possession of the ball.
- The ball must go through the ringed hoop for a goal to be given.

Positions

There are seven playing positions in a team. Each has an important role to play for their team:

Goal Shooter: To score goals and to work in and around the circle with the GA
Goal Attack: To feed and work with GS and to score goals
Wing Attack: To feed the circle players giving them shooting opportunities
Centre: To take the centre pass and to link the defence and the attack
Wing Defence: To look for interceptions and prevent the WA from feeding the circle
Goal Defence: To win the ball and reduce the effectiveness of the GA
Goalkeeper: To work with the GD and to prevent the GA/GS from scoring goals

Pitch Markings

The netball court measures up at 30.5 metres (or 100ft) long and 15.25 metres (50 ft) wide.

The netball court is divided into three sections and this impacts on where players can move. The sections are referred to as the two goal thirds and the centre or middle-third.

A netball game can be played with a court, two goals, colour coded bibs and a ball.

Netball

Scoring

A goal is scored in netball when the ball is passed to a player in the goal third who shoots the ball through their opponent's goal ring.

Only the goal shooter or goal attack can score goals in netball and they must be within the semi-circle when they shoot.

If the ball passes through the ring thrown by any player other than the GA/GS then the ball is still in play and no goal is scored.

Key Terms

0.9m or 3ft: distance players must stand when defending
Centre pass: The first pass used to start the game and restart after every goal that is scored
Contact: Any action that results in players touching or bumping into each other
Dodging: The art of moving from side to side to confuse the opponent before sprinting off to catch the ball
Feed: Any pass made to the shooters within the shooting circle
Footwork rule: This is the rule unique to netball which limits the movement of the player's feet after catching the ball
Held ball: holding the ball for longer than you are allowed to
Landing foot: The first foot to be grounded after catching the ball
Marking: The art of staying close to an opponent to prevent her from catching the ball
Offside: When a player makes contact with a part of the court which is not included in her own playing area
Pivot: When the landing foot stays grounded, and the player turns on the spot in order to face and throw in another direction
Shooting circle: The marked circle which the shooters must land in before attempting to make a goal
Simultaneous contact: When two players from opposite sides bump into each other and the umpire cannot decide who made the first contact
Transverse lines: The lines on the court that divide them into thirds

PE

Basketball

Rules of The Game

Attacking Rules

- The player must bounce, or dribble, the ball with one hand while moving both feet. If, at any time, both hands touch the ball or the player stops dribbling, the player must only move one foot. The foot that is stationary is called the pivot foot.
- The basketball player can only take one turn at dribbling. In other words, once a player has stopped dribbling, they cannot start another dribble. A player who starts dribbling again is called for a double-dribbling violation and loses the basketball to the other team. A player can only start another dribble after another player from either team touches or gains control of the basketball, this is usually after a shot or pass.
- The ball must stay in bounds. If the offensive team loses the ball out of bounds the other team gets control of the basketball.
- The players hand must be on top of the ball while dribbling. If they touch the bottom of the basketball while dribbling and continue to dribble this is called carrying the ball and the player will lose the ball to the other team.
- Once the offensive team crosses half court, they may not go back into the backcourt. This is called a backcourt violation. If the defensive team knocks the ball into the backcourt, then the offensive team can recover the ball legally.

Defending Rules

- The main rule for the defensive player is not to foul. A foul is described as gaining an unfair advantage through physical contact. There is some interpretation that has to be made by the referee, but, in general, the defensive player may not touch the offensive player in a way that causes the offensive player to lose the ball or miss a shot.
- Basketball players cannot kick the ball or hit it with their fist.

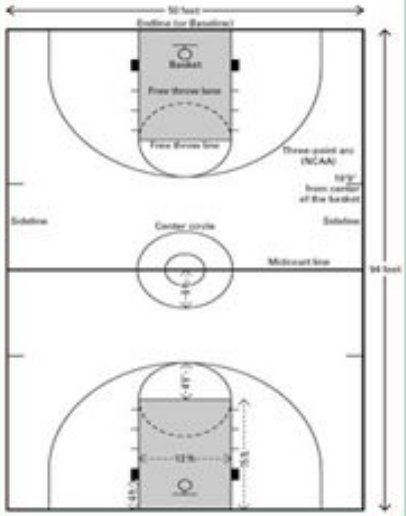
Positions

The Centre is usually the team's tallest and strongest player and is positioned under the basket. They are required to be physically domineering with more physical strength and athleticism.
Power Forward are usually the second tallest in the team and are the closest to the centre in terms of physical attributes and playing style but with more speed.
The Small Forward is usually the shorter of the two forwards on the team but plays the most versatile role out of the main five positions.
Shooting guard Potentially the shortest player on the team, the Shooting Guard is the team's best outside shooter. Besides being able to shoot well, they need to be good at dribbling fast, passing and having court vision.
The Point Guard is usually the shortest but the best ball handler on the team. Also known as the 'coach on the floor' or the 'floor general', a point guard is responsible for directing plays.

Basketball

Pitch Markings

Along the length of the court, the borders are the side-lines. Along the ends, the borders are the end-lines, or baselines. Separating both halves of the court is a midcourt line. In the very centre of the midcourt line is the centre circle (12 feet in diameter), where the centre toss takes place to begin the game.



Scoring

The winner of a basketball game is the team with the most points. You get points by throwing the basketball through the opponent's hoop or basket.

In regular play a basket made from within the three-point line is worth 2 points and a basket shot from outside the three point line is worth three points. When shooting a free throw, each free throw is worth 1 point.

When a player is shooting a foul shot, the remaining nine players on the court must stand in designated locations. They can stand in the blocks along the sides of the free-throw lane or back behind the free-throw shooter. The team whose player is not shooting free throws must be allowed to stand closest to the rim during the shot.

Key Terms

Alley-Oop: When one player jumps and catches a pass from another player and simultaneously dunks the ball or shoots it in before landing.
Box Out: When a shot goes up, players use this technique, which involves widening their stance and arms and using their body as a barrier to get in better rebounding position.
Carry: This penalty, which results in a turnover, occurs when a player holds the ball excessively at the apex while dribbling.
Charge: This penalty, which results in a turnover, occurs when an offensive player with the ball runs into a stationary defensive player and knocks him or her over.
Double Dribble: This penalty, which results in a turnover, occurs when a player dribbles the ball with both hands. It also occurs when a player dribbles, stops dribbling, and then begins to dribble again.
Fast Break: An offensive action where a team attempts to advance the ball and score as quickly as possible after a steal, blocked shot or rebound.
Free Throw: A free shot given to a player after a foul or a technical foul. The player shoots from the 15-foot free throw line while the rest of the players line up along the outside of the key.
Lay-Up: A shot taken close to the hoop, usually when a player is moving toward the basket.
Man-to-Man: A defensive strategy in which each player on the defensive team guards one person on the opposing team.

Religious Studies

Key Ideas

What is the Cosmological Argument

The cosmological argument is an attempt to prove the existence of God by the fact that things exist. It assumes that things must have a cause, and that the chain of causes can only end by a supernatural event. ... The first cause is claimed to be God.

What is the Design Argument?

Some Christians believe that it is possible to prove the existence of God by observing the nature of the world we live in. The world shows signs of ORDER and things working to achieve a PURPOSE. This, they believe, is evidence of DESIGN. In other words, God is the DESIGNER of an ordered and purposeful world. William Paley supported this argument by way of ANALOGY. He drew a similarity between the world and an old-fashioned pocket watch. He argued that if you went for a walk and stumbled across a pocket watch in a field you would know that a skilful watchmaker must have designed it. Similarly, he believed that the world shows evidence of order and purpose which must have a designer. This designer must be God.

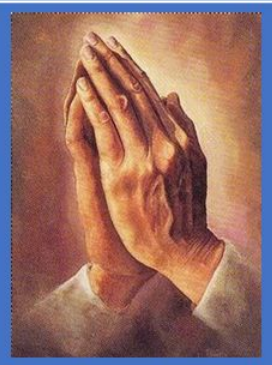
Problem: If the world is designed by an omnipotent God, then why is there so much evil and suffering in the world?

Why does evil and suffering exist

The existence of evil and suffering is a significant problem for religious people who have tried to understand and explain their presence.

If someone is not religious, then evil is just part of our world and has to be accepted - there is nothing we can do about it. However, for religious people there are significant questions:

- Religions such as Christianity claim that God made everything. Does that mean He also made evil?
- Religion teaches that God is good, so why does God allow evil to exist?
- If God is powerful enough to create the world, why does He not stop evil and suffering? Is He not powerful enough?
- If God is all powerful, does that mean He does not love us enough to stop evil and suffering?
- If evil exists, does God really exist?



What are religious experiences

Religious experience, specific experience such as wonder at the infinity of the cosmos, the sense of awe and mystery in the presence of the sacred or holy, feeling of dependence on a divine power or an unseen order, the sense of guilt and anxiety accompanying belief in a divine judgment, or the feeling of peace that follows faith in divine forgiveness. Some thinkers also point to a religious aspect to the purpose of life and the destiny of the individual.

Scientific truth vs Religious truth

Scientific truths focus on "what" and "how" questions. observation and testing of hypotheses. However, focus on "why" questions. information from Holy Books to support it. "why" questions. Books to support it.

It relies on religious truths tend to It rely on belief and However, religious truths tend to focus on It rely on belief and information from Holy

Key Words

Agnosticism	Not being sure whether God exists	Numinous	The feeling of the presence of something greater than you.
Atheism	Believing that God does not exist	Omni-benevolent	The belief that God is all-good
Conversion	When your life is changed by giving yourself to God	Omnipotent	The belief that God is all-powerful
Free will	The idea that humans are free to make their own choices	Omniscient	The belief that God knows everything that has happened and everything that is going to happen.
miracle	Something which seems to break a law of science and makes you think only God could have done it	Prayer	An attempt to contact God, usually through words
Moral evil	Actions done by humans which cause suffering	Design Argument	The universe seems to be designed. Anything that is designed must have a designer. Therefore God must exist because only God could have designed the Universe.
Natural evil	Things which cause suffering but have nothing to do with humans	Ontological Argument	The ontological argument is the attempt to prove, simply from an examination of the concept of God, that the being to which that concept would apply must in fact exist

How Does Causation Link to Belief in God?

- Aquinas argues that everything has a cause.
- If we were to go back in time, we could follow this chain of causes back to the beginning of the universe.
- At this point, Aquinas says something special must have happened. This is because nothing can cause itself. The universe cannot have created itself.
- According to Aquinas, the only thing that could have started the universe is God. This is because God is eternal and not caused by anything else. He was present at the start of the universe and is therefore its only possible creator.

The Causation Argument

The most famous version of the causation argument was created by Saint Thomas Aquinas. He was a Catholic priest and philosopher who lived in the 13th century. Another name for the causation argument is the cosmological argument, as it is adapted from the theories of Aristotle and Plato about the first cause of the universe (cosmos).

Aquinas' argument starts from the idea that everything has a cause. This is proven by our everyday experience. If a person buys a sandwich for lunch, the sandwich was caused to exist by someone making it. Similarly, the person's hunger caused them to buy it.

Aquinas then argues that there are chains of causes that can be followed back through time. An example of this is family trees. You were caused to exist by your parents, who were in turn caused to exist by your grandparents and so on.

If we follow these chains back far enough, we would eventually reach the beginning of the universe. As nothing can cause itself to exist, something outside the universe must have caused it to exist. The only thing that is outside of the universe is God, who is eternal (meaning he has always existed) and is not caused by anything else. Therefore, Aquinas says, God must exist. He is the only thing which could have started the universe.

Religious Studies

William Paley's **Design Argument - Knowledge Sheet**

William Paley, who was born 1743, was a Christian philosopher. He tried to find a way to prove God's existence that was not based on The Bible. It would therefore hopefully convince anyone, even atheists, that God exists.

Paley's argument begins with a story...

Imagine a man is walking along and he finds a watch. He opens it up and sees that the watch is a very complex mechanism with many interlinking parts. Thinking about this, he realises that the watch cannot just have appeared out of nowhere. The watch must have been made by someone with the intelligence to make something so complex. The watch, he says, must have a designer.

Paley then goes on to link this story to the existence of God. He argues that if you look around the world, you will notice that many natural objects are incredibly complex. For example, the human eye is very complicated and made up of many tiny parts. Paley says that if the watch must have a designer, these other complex objects must too. Unlike a watch though, the designer of the eye cannot be human. The only person that could have designed it is God. Therefore, God must exist.

Criticisms

Some people disagree with the design argument and say that there is no proof that God designed things on Earth. To support this, they might turn to scientific ideas like the Big Bang and the theory of evolution. The Big Bang, they say, shows that the world came about by chance; it was not designed. Evolution, meanwhile, shows things like the eye are complex because they evolved over time; not because God made them.

DESIGN ARGUMENT SUMMARY

- Anything that has been designed needs a designer.
- Evidence of design (Laws of science, DNA, evolution, beauty of nature.)
- If the world has been designed, the world must have a designer.
- This designer must be God. (Paley's watch.)
- Therefore the design of the world proves that God exists.

Science

Asking Questions

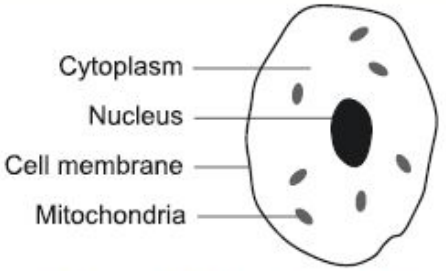
1. Science is about
   a. **observing** the world (watching and listening)
   b. **asking questions** about nature and how the world works
   c. coming up with **ideas and explanations** that explain what we see
   d. **testing** our ideas to see if they are true
   e. using our knowledge and skills to **solve problems and improve lives**
2. A scientific question is one that
   a. Can be **answered**
   b. Can be **tested** or measured

Staying Safe

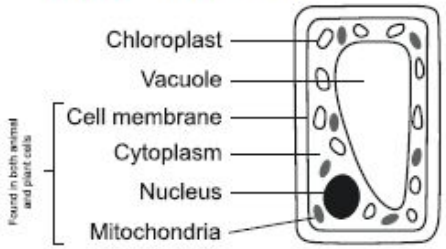
3. A **hazard** is something that can cause harm
4. A **risk** is the harm that might happen to you or someone else
5. A **precaution** is what you do to prevent a hazard from causing harm

Cells

6. Living things are called organisms
7. All organisms carry out the 7 **life processes**: movement, respiration, sensitivity, growth, reproduction, excretion and nutrition
8. All living things are made of cells
9. **Unicellular** organisms are made of only one cell e.g. bacteria
10. **Multicellular** organisms are made of many cells e.g. humans
11. Animal and plant cells contain a **nucleus**, **cell membrane**, **mitochondria** and **cytoplasm**



12. Only plant cells contain a cell wall, vacuole, and chloroplasts



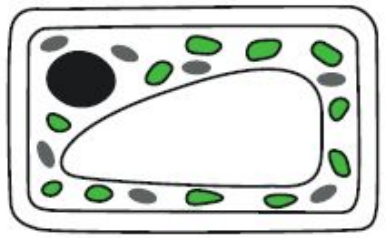
13. The **nucleus** controls the cells activities because it contains DNA
14. The **cell membrane** controls what enters and leaves the cell
15. The **cytoplasm** is a jelly-like substance where reactions happen
16. The **cell wall** surrounds plant cells and provides strength and support
17. The **chloroplasts** are where photosynthesis take place to make food (glucose) for the plant and contain chlorophyll to absorb sunlight
18. The **vacuole** contains a liquid that stores substances for the cell and keeps it rigid

Specialised Cells

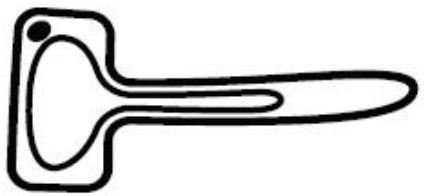
19. Specialised cells have different structures that let them carry out their function
20. **Sperm cells:** Their function is to swim to the egg cell for fertilisation. The structure that helps them to do this is a tail for swimming

21. **Neurons** (nerve cells): Their function is to send messages to control the body. The structure that helps them to do this is a long axon and connections at the ends

22. **Leaf cells:** Their function is to take in lots of sunlight (for photosynthesis to make food). Their structure helps them to do this as they have lots of chloroplasts

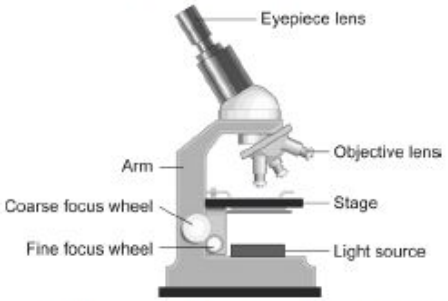


23. **Root hair cells:** Their function is to take in lots of water. To help them to do this, their structure consists of a large surface area to take water in



Microscopes

24. A microscope is used to make something small appear much larger
25. The parts of a microscope are: eye piece lens, stage, objective lenses, handle/arm, light/mirror, coarse focusing wheel, fine focusing wheel

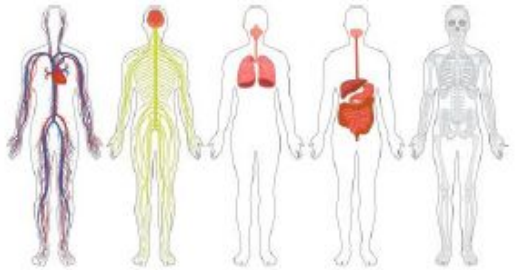


26. To calculate the magnification of an image seen under the microscope, this equation can be used:
    Magnification = eyepiece magnification x objective lens magnification
27. The following method should be used to observe something under the light microscope:
    a. Place the specimen under the clips on the stage
    b. Move the objective lenses so that the lowest magnification is facing the specimen
    c. Move the stage up towards objective lens using the coarse focus wheel ensuring that is does not touch it
    d. Place your hand on coarse focus wheel and look through the eyepiece lens
    e. Move the coarse focus wheel slowly away from you so that the stage moves down
    f. When the image becomes clearer, use the fine focus wheel instead and focus the image to make it clear

Science

Cell Organisation

28. A group of the same cells working together is called a **tissue**
29. A group of tissues working together for the same function is called an **organ**
30. A group of organs working together for the same function is called an **organ system**
31. There are many organ systems in the human body including: respiratory, excretory, nervous, muscular, circulatory, skeletal and digestive



32. Multicellular organisms require organ systems to carry out life processes

The Three States of Matter

1. The three states of matter are **solids, liquids and gases**
2. Solids, liquids and gases have different physical properties:

Property	Solid	Liquid	Gas
Does the object flow?	No	Yes	Yes
Can the object be compressed?	No	No	Yes
Does the object fill to fit the container?	No	No	Yes
Does the object have a fixed shape?	Yes	No	No
Does the object have a fixed volume?	Yes	Yes	No

The Particle Model

3. All matter is made from tiny particles
4. The arrangement of particles affects the properties of the substance
5. The three states of matter can be represented by a simple model, in which the particles are represented by small circles

Solid liquid gas

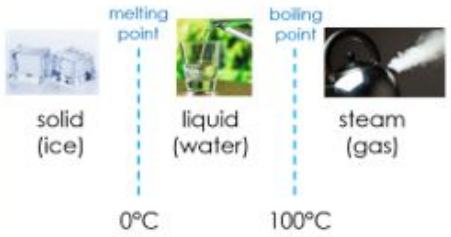
6. Particles in a **solid** are arranged in a regular pattern, touch each other and vibrate on the spot
7. Particles in a **liquid** are arranged randomly, are touching and move freely
8. Particles in a **gas** are arranged randomly, do not touch and move freely
9. Some substances expand when heated. This is because when heated, particles have more energy. They vibrate more. The space between particles is bigger.

Changing State

10. Changes of state involve the rearrangement of particles. The particles themselves do not change.
11. A substance **melts** when it changes from a solid to a liquid
12. When a solid melts, the particles gain **energy** from the surroundings, so they begin to **vibrate faster**. The particles move away from their places in the arrangement and start to move around more.
13. A substance **freezes** when it changes from a liquid to a solid
14. When a liquid starts to freeze, its particles move more slowly as they lose **energy** to the surroundings. The particles form a **regular arrangement** and vibrate on the spot.
15. Melting and freezing of a substance happens at a certain temperature called the **melting point**
16. A substance **boils** when it changes from a liquid to a gas
17. During boiling, a **liquid is heated.** The particles **gain energy.** They **move further apart.** This **forms a gas.**
18. A substance **condenses** when it changes from a gas to a liquid
19. During condensation, a **gas cools.** The particles **lose energy.** They **move closer together until they are touching.** This **forms a liquid.**
20. Boiling and condensing take place at the **boiling point.**
21. The **boiling point** is the temperature at which a liquid changes into a gas.

Science

22. When boiling occurs, Bubbles **of the substance** rise up to the surface and escape into the air.
23.

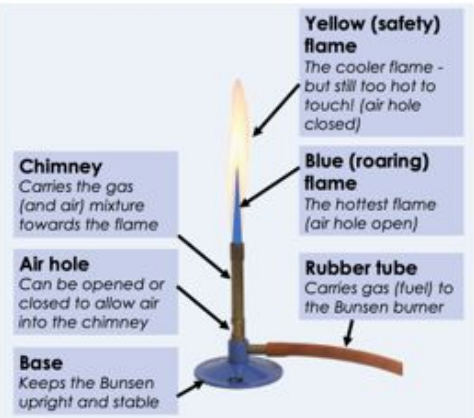


24. The **particles in a solid** can **vibrate in a fixed position** and cannot move from place to place because there are strong forces, which attract the particles towards each other

25. The **particles in a liquid** are able to **move around each other** because the bonds are strong enough to keep the particles close together, but weak enough to let them move around each other

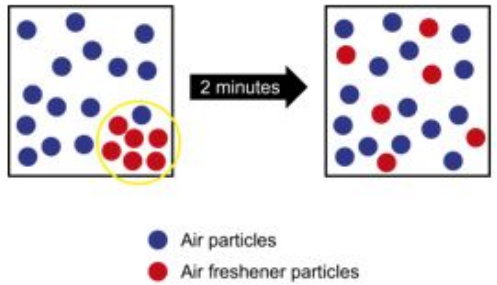
Heating substances

26. A Bunsen burner, electric heater and water bath can all be used to heat substances.



Diffusion

27. Diffusion is the movement of particles from a **high concentration** to a **low concentration**.



The particles of red gas diffuse over 2 minutes. The particles of the red gas move from a higher concentration to where the concentration is lower.

28. **Diffusion happens in liquids and gases** because particles are free to move
29. **Diffusion cannot happen in solids** because particles in a solid are not free to move
30. **Diffusion happens faster** when the particles in a liquid or gas are moving **faster after heating**

Variables

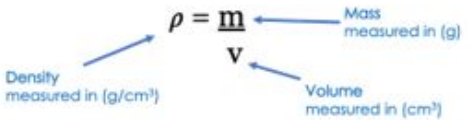
31. A **variable** is anything that can change or be changed.
32. The **independent variable** (IV) is the variable you **change** (the variable you want to investigate)
33. The **dependent variable** (DV) is the variable you **measure** because it depends on the IV
34. The **control variables** (CV) are the variables you **keep the same** because they could affect the dependent variable

Gas Pressure

35. **Gas pressure** happens because of particles colliding with the walls of a container
36. Increasing the size of the container decreases the gas pressure as there will be less collisions.
37. Decreasing the size of the container increases the gas pressure as there will be more collisions.
38. The deeper underwater you travel, the greater the pressure.
39. The higher up you go into the atmosphere, the less the pressure.
40. Greater pressure compresses gas particles so they are closer together and have a smaller volume

Density and volume

41. Density is defined as the mass per unit volume of a substance.
42. Density = mass ÷ volume

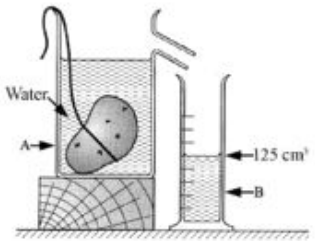


volume = length x width x height

(cm^3) (cm) (cm) (cm)

43. If an object has an **irregular shape**, the volume can be measured using a **displacement can**, or **Eureka can**.

44. The **displaced** water in the cylinder occupies the same amount of space as the irregular object. **The volume of water in the graduated cylinder is equal to the volume of the object.**



Knowledge organiser
Spanish year 7

Our learning journey

Spanish

Los números:

10 – diez
20 – veinte
21 – veintiuno (veintiún before a noun)
22 – veintidós
23 – veintitrés
30 – treinta
31 – treinta y uno (treinta y ún)
40 – cuarenta
50 – cincuenta
60 – sesenta
70 – setenta
80 – ochenta
90 – noventa
100 - cien

¡Ojo! If you put the number one in front of años, it changes to un/ún, ie: un ano.

Page 1

buenas tardes- Good afternoon
buenas noches- Good night
buenos días- Good day
Adiós- Good bye
Hola -Hi
por favor- please
Gracias – thank you
Señorita -Miss
Señora - Mrs
Señor - Sir
encantado/a – pleased to meet you
hasta luego– see you later

Qué tal – how are you ?
cómo estas how are you?
muy bien –very well
Regular - ok
mal bad
Fatal- awful
buenos días - Good morning
como te llamas what is your name
me llamo my name is
se ecribe it is spelt
Estoy I am (use with health)

Greetings and age

Verbo clave:
Tener – to have
Tengo – I have
Tienes – you have
Tiene – he/she has
Tenemos – we have
Tenéis – you have
Tienen – they have

Questions/answers:

¿Cuántos años tienes?
How old are you?
Tengo doce años

¿Cuántos años tiene tu hermana?
How old is your sister?
Mi hermana tiene ocho años

¿Cuántos años tienen los gemelos?
How old are the twins?
Los gemelos tienen veinte años

¿Cuántos años vas a cumplir en diciembre?
How old are you going to be in December?
En diciembre voy a cumplir dieciocho años.

Los cumpleaños - Birthdays

Los meses del año:
enero – January
febrero – February
marzo – March
abríl – April
mayo – May
junio – June
julio – July
agosto – August
septiembre – September
octubre – October
noviembre – November
diciembre - December

¡Ojo! Months do not begin with capital letters in Spanish unless they are at the beginning of a sentence

Key questions/answers::
¿Cuándo es tu cumpleaños?
When is your birthday?
Mi cumpleaños es el dos de mayo
My birthday is the 2nd of May
¿Cuándo es el cumpleaños de tu madre?
When is your mother's birthday
El cumpleaños de mi madre es el ocho de abril

El Alfabeto Español	a	b	c	ch	d
	ah	beh	theh	cheh	deh
e	f	g	h	i	j
eh	eff-eh	heh	atch-eh	ee	hota
k	l	ll	m	n	ñ
ka	el-eh	el-yeh	em-eh	en-eh	en-yeh
o	p	q	r	s	t
oh	peh	coo	er-eh	ess-eh	teh
u	v	w	x	y	z
oo	oo-beh	oo-beh-doh-leh	eh-kees	ee-gree-eh-ga	theh-ta

Spanish

Vocabulario clave:

Sustantivos masculinos

Un bisabuelo – a great grandfather
Un abuelo – a grandfather
Un padre – a father
Un padrastro – a step father
Un suegro – a father-in-law
Un tío – an uncle
Un cuñado – a brother-in-law
Un hermano – a brother
Un hijo – a son
Un primo – a boy cousin
Los gemelos – the twins

Sustantivos femininos

Una bisabuela – a great grandmother
Una abuela – a grandmother
Una madre – a mother
Una madrastra – a step mother
Una suegra – a mother-in-law
Una tía – an aunt
Una cuñada – a sister-in-law
Una hermana – a sister
Una hija – a daughter
Una prima – a girl cousins

Los Miembros de La Familia

los pronombres posesivos

Mi/Mis – My
Tu/tus – your
Su/sus – his/her/their

Ejemplo:

Mi padre – my father
Mis padres – my parents
Sus abuelos – their grandparents

Verbos claves:

Hay – there is/are
Tengo – I have
Se llama – is called
Se llaman – are called
Tiene – has
Tienen – have
Es – is
Son - are

¡Ojo!
i.e: los padres = parents
los tíos = aunts & uncles

Key question/answers:

¿Cuántas personas hay en tu familia?
En mi familia hay tres personas; mis padres y yo

¿Cómo se llama tu madre?
Mi madre se llama Silvia

¿Cómo se llaman tus hermanos?
Mis hermanos se llaman Jack, Jane y Josh

SPANISH

Las descripciones
Descriptions

Verbos clave:

Tener – to have

Tengo – I have
Tienes – you have
Tiene – he/she has
Tenemos – we have
Tenéis – you have
Tienen – they have

Llevar – to wear
Llevo – I wear
Llevas – you wear
Lleva – he/she wears
Llevamos – we wear
Lleváis – you plural wear
Llevan – they wear

Ejemplo:
Mi padre tiene el pelo rubio y lleva gafas grandes

Adjetivos claves:

El pelo – hair
Rubio – blonde
Canoso – grey
Negro – black
Moreno – dark brown
Castaño – light brown
Blanco – white
Largo – long
Corto – short
Liso – straight
Ondulado – wavy
Rizado – curly
Bonito – pretty
Tintado – dyed

Los ojos:
Marrones – brown
Azules – blue
Morenos – dark brown
Verdes – green
Grandes – big
Pequeños - small

¡Ojo!
Adjectives go after the noun and they agree with the noun.

Pregunta clave:
¿Cómo es tu padre?
What is your dad like?

Mi padre tiene el pelo negro, corto y liso y los ojos azules. También tiene un bigote largo y lleva gafas grandes.

SPANISH

Vocabulario clave:

Sustantivos masculinos

Un perro – a dog
Un perrito – a puppy
Un gato – a cat
Un gatito – a kitten
Un conejo – a rabbit
Un pez – a fish
Un ratón – a mouse
Un pájaro – a bird
Un papagayo – a parrot
Un caballo – a horse
un cuerpo – a body
El pelo - fur

Sustantivos femininos

Una Tortuga – a tortoise
Una mascot – a pet
Una rata – a rat
Una paloma – a dove
Una araña – a spider
Una cola – a tail
Unas patas – paws
Unas orejas – ears

Las Mascotas - pets

los pronombres posesivos

Mi/Mis – My
Tu/tus – your
Su/sus – his/her/their
Nuestro/a/os/as – our
Vuestro/a/os/as – your (plural)

Ejemplo:

Mi conejo se llama Blanquito
Su Tortuga es enorme
Nuestros gatitos son muy pequeños

¡Ojo! To make nouns plural, just add an "s". If they end in a consonant "es" but Pez - peces

Page 5

Verbos claves:

Tengo – I have
Se llama – is called
Se llaman – are called
Tiene – has
Tienen – have
Es – is
Son – are
Come – it/he/she eats comen – they eat
Me gustaría tener – I would like to have

Preguntas y respuestas clave:

¿Tienes una mascota?
Do you have a pet?
Sí, tengo un perro, se llama Henrique

¿Cómo es tu mascota?
Mi perro es blanco y negro y tiene la cola larga

SPANISH

EUROPA


España


Alemania


Italia


Francia


Reino Unido


Holanda


Rusia


Noruega


Bélgica

AMÉRICA


Estados Unidos


Canadá


Brasil


Argentina


Chile


México


Colombia


Uruguay


Perú

ASIA


China


India


Japón


Corea del Sur


Malasia


Singapur


Vietnam


Tailandia


Filipinas

ÁFRICA


Sudáfrica


Tanzania


Guinea


Camerún


Egipto


Marruecos

OCEANÍA


Nueva Zelanda


Australia