

Year 8 Knowledge Organisers

Summer Term



Knowledge organiser

Painting and colour theory– Year 8

Hue is the color itself, of which there are 12 on the wheel

- **Primary colours** RED, BLUE, YELLOW
- **Secondary colours** ORANGE, GREEN, PURPLE
- **Tertiary colours** are created by mixing primary and secondary together

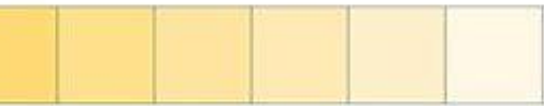


Tints, tones, and shades are created by adding white, gray, or black to a hue, thereby affecting its **value**.

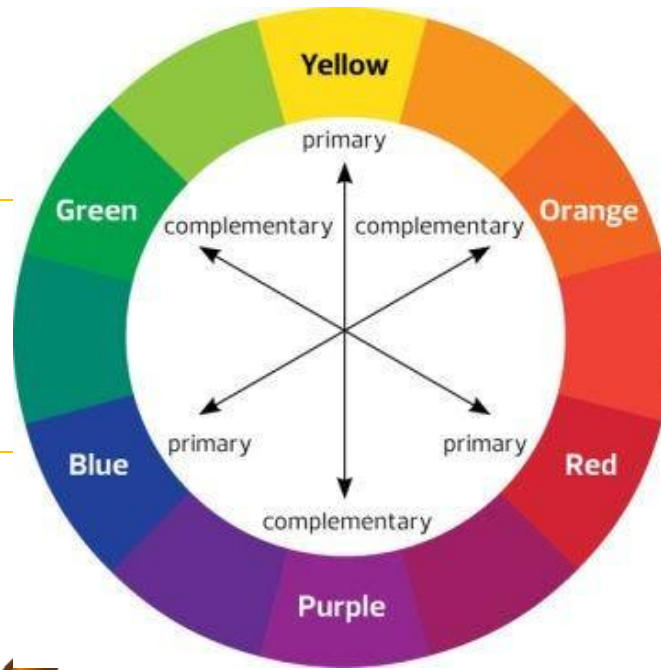
Tint = adding white



Tone = adding gray

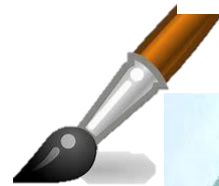


Shade = adding black



- **Layering** – You can apply your paint in layers to create darker tones or create texture.
- **Blend** – You can blend your paint using water or just your paintbrush to create gradual tone.
- **Brush strokes** – The direction and pressure on your brush and the marks you make.
- **Application** – The way in which the paint is used and the control of water.
- **Hue** – The main /dominant colour being applied
- **Complimentary** – Colours that sit opposite one another on the color wheel

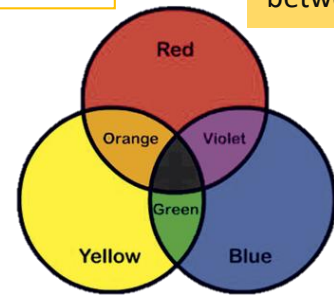
- Always hold the paintbrush near the base of the bristles.
- When painting, use a light touch and keep the brush close to the surface you are painting on.
- Be careful **not to apply too much pressure** when painting, as this can result in messy paintwork and streaks.
- To avoid paint buildup at the tip of your brush, rinse it off in between strokes.



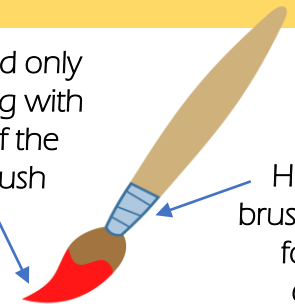
Warm colours



Cool colours



You should only be painting with the tip of the paintbrush



Hold your brush at the tip for more control

- Painting Top Tips:
- Apply a small amount of paint to the brush
 - Apply a small amount of water to the brush
 - **DO NOT** cover your paintbrush in paint
 - You can mix your paint on the table but **DO NOT** make large puddles and make a mess

[BBC bitesize painting & colour theory](#)

Justice: being fair, treating people fairly.

Injustice: not being fair, not treating people fairly.

- Poverty, homophobia, bullying, racism, homelessness, religious persecution, sexism etc.

Social Justice: refers to human rights and equality.

The law is a set of rules that a country/society will abide by in order to keep everyone safe and protected.

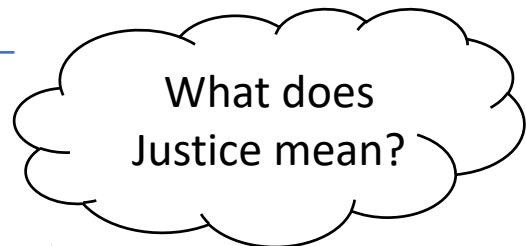
Why are laws important?

- Help to achieve justice
- Punish those who have done wrong
- Protect society
- Keep society calm and orderly

Theories of Punishment	
Protection Theory	Punishment is to protect society so that dangerous criminals are off the streets.
Retribution Theory	Punishment severity is in line with the crime committed.
Reformation Theory	Punishments aims to reform the criminal through education so that they do not reoffend.
Deterrent Theory	Punishments are so severe it puts people off committing the crimes in the first place.

Capital punishment is the death penalty, is the killing of a person by judicial (legal) process as punishment.

The last executions in the United Kingdom took place in **1964**, prior to capital punishment being abolished for murder (in **1965** in Great Britain and in **1973** in Northern Ireland).



FOR

AGAINST

- It brings justice to the victim's family.
- It brings closure to the family.
- It protects society from dangerous criminals.
- When the crime is so horrific that no other punishment seems fair.

- Two wrongs don't make a right.
- Sometimes mistakes can be made and then it is irreversible.
- It is more effective for a criminal to suffer in prison and live with their crime(s).

Most Muslims would say that they support the use of capital punishment because then Qur'an states crimes that are worthy of the death sentence (e.g. murder and adultery). They believe this is fair, protects society and what is taught in the Qur'an. Some Muslims disagree with capital punishment as they say it is 'acting as Allah', as only he has the power to give and take life.

Most Sikhs do not agree with the death penalty because they believe:

- Dignity is vital. Executing people takes away their right to human dignity.
- The **Ten Gurus** appear to be against the death penalty, as they did not use it for criminals they encountered.
- Sikhs are banned from 'killing in cold blood'. The death penalty may be regarded as 'killing in cold blood'.
- The only time when Sikhs ran an independent nation in the 19th century, no executions were used.

YEAR 8

VECTOR GRAPHICS

File Types

- **BMP** - Microsoft file type, not usually compressed, so large files, widely accepted.
- **GIF** (Lossy) - Graphics Interchange Format, limited to 256 colours, keeps transparency.
- **JPG** (Lossy) - Joint Photographic Experts Group, does not keep transparency.
- **PNG** (Lossless) - Portable Network Graphic, good for images in colour, larger file size than a jpeg, keeps transparency.
- **TIFF** (Lossless) - Tagged Image File Format, not used on the WWW due to its very large file size, file standard in printing.



Compression

Compression is used to reduce a files size so it can be uploaded/downloaded or transferred more quickly. **There are two types:**

Lossless Compression

- Takes advantage of the limitations of the human eye and removes data that cannot be seen. Losing quality.
- Data is lost and is not added back when the file is uncompressed.

Lossy Compression

- Reduces file size with no loss of data or image quality.
- Data is not lost and is added back when the file is uncompressed.
- Cannot compress to as small a file as a lossy method does.

Manipulating objects

- **Transforming** or altering an asset using methods/techniques to achieve desired results, is known as **manipulation**.
- **Composition** is the result of 2 or more images that have been combined or overlaid.
- **Layers** are like sheets of stacked acetate. Transparent areas on a layer let you see layers below. You use layers to perform tasks such as compositing multiple images.



Vectors

- Are created in graphics packages and consist of shapes called objects.
- Even if an object in a vector graphic is quite large, it doesn't need a lot of computer. memory. Therefore the file size of a vector graphic is often very small.
- **ARE** scalable - i.e. when you resize them, they do not lose quality.



Bitmaps

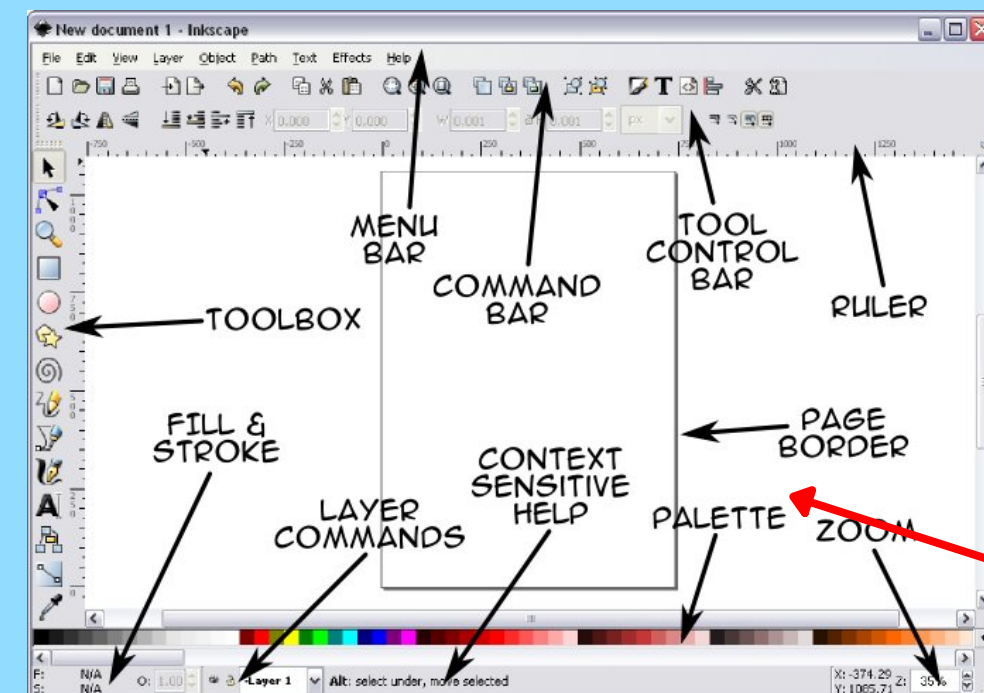
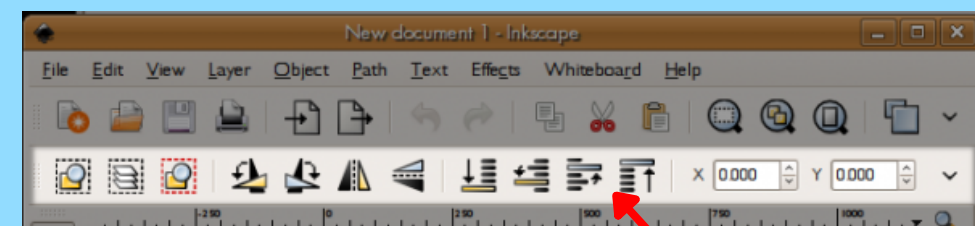
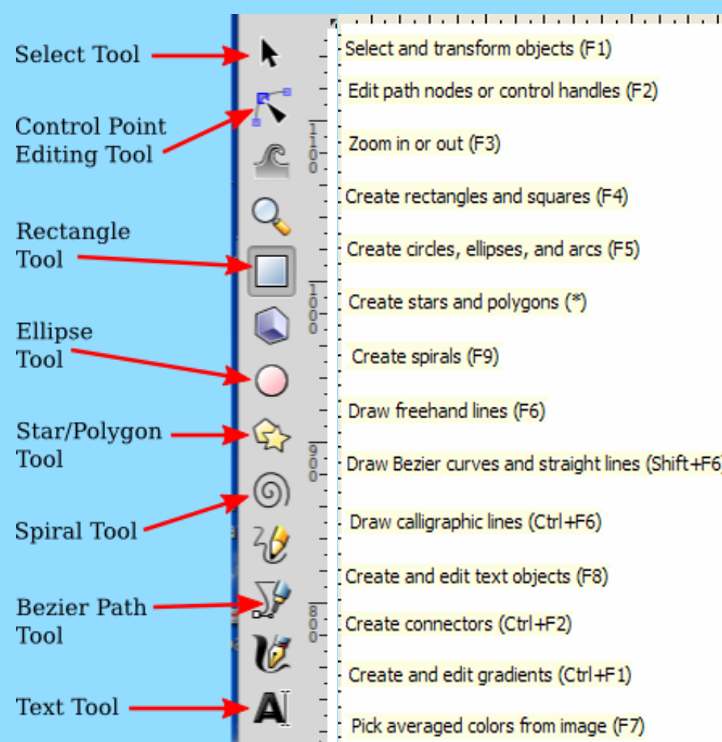
- Are composed of many tiny parts, called pixels. The pixels are often many different colours.
- It is possible to edit each individual pixel. Since the computer has to store information about every single pixel in the image, the file size of a bitmap graphic is often quite large.
- Are **NOT** scalable - i.e. when you resize a bitmap graphic, it tends to lose quality.



VS

The Interface

Inkscape is a vector graphic software package. It includes a range of tools and allows you to use a range of different techniques.



This tool bar allows you to manipulate objects on the page, it includes tools like layers, rotation and size.

This is the basic layout of your page. The size of the page can be manipulated to your requirements.



Legislation

Copyright

Copyright law protects creators of original material from unauthorized duplication or use.



Intellectual Property

Intellectual property, also known as "IP," is an overall term for ownership of and rights to creative works.



Trademarks

A symbol, word, or words legally registered or established by use as representing a company or product.



WHAT IS A STIMULUS?

In performing arts a **STIMULUS** is anything that inspires creative thought, action or ideas.

WHAT COULD BE A STIMULUS FOR DRAMA?

- A PIECE OF MUSIC
- A POEM
- A NEWS ARTICLE
- A PHOTOGRAPH
- A PAINTING
- A NOVEL
- AN HISTORICAL EVENT
- A STATEMENT
- A FAMOUS PERSON
- AN OBJECT/ARTEFACT

KEY WORDS

- **STEREOTYPE** - a widely held but fixed and oversimplified image or idea of a particular type of person or thing.
- **CONVENTIONAL** – what is normally done or believed
- **UNCONVENTIONAL** – what is not normally done or believed
- **ATMOSPHERE** - the pervading tone or mood of a place, situation, or creative work.
- **INTERACTION** - communication or direct involvement with someone or something.

KEY DEVICES

- **STILL IMAGE/TABLEAU** -a group of motionless figures representing a scene from a story
- **MIME** - theatrical technique of suggesting action, character, or emotion without words, using only gesture, expression, and movement.
- **SLOW MOTION** – performing action slowly in order to highlight detail and dramatic effect
- **DIALOGUE** – speech between two or more characters
- **FLASHBACK** – a scene which depicts an event from the past
- **IMPROVISATION** -a piece of music, drama or dance which is created spontaneously or without preparation.

INSPIRED PRODUCTIONS

CATS – inspired by the poems of TS Eliott

LES MISERABLES – inspired by the novel by Victor Hugo

SIX – inspired by the lives of the wives of Henry VIII

WE WILL ROCK YOU – inspired by the music of Queen

JOSEPH and the TECHNICOLOURED DREAMCOAT – inspired by a bible story



Verbatim Theatre

Verbatim theatre is theatre made from real people’s words. A form of documentary theatre, it allows theatre makers to explore events and themes through the words of people at the heart of them, and was hugely influential in the revival of political theatre at the beginning of the 21st Century.

Verbatim theatre is usually created from the transcription of interviews with people who are connected to a common event or subject. The interviews are then edited into a performance text. Often, actors are involved in conducting this research and feeding it back to the writer, director or company making the piece.

This research provides the both the spoken material for the play; also a play’s characters. Characters in a verbatim play often represent a specific, real person. They may be identifiable, or their name and characteristics may be changed. Sometimes, characters may be amalgamations of more than one person.

Actors in verbatim plays might attempt to mimic their counterparts exactly, or decide to represent them less literally. Indeed, actors with the company Recorded Delivery went as far as wearing earphones during performances, listen to recordings of interviewees while simultaneously portraying them in order to recreate speech patterns and hesitations precisely. Whether mimicking or not, actors often speak of a loyalty to the people they represent, and a wish to do right by them.

Vocal skills

Pitch- how high or low your voice is.

Pace- how quickly or slowly you speak

Pause- how you use pauses in your speech

Volume- how loud or quiet you speak

Accent- your sound of your voice reflecting the region you are from

Tone- how you sound when you speak (sincere, sarcastic, angry, happy etc.)

Movement/interaction

Eye contact (or lack of)- to show character relationships.

Posture – the position you hold your body when standing or sitting.

Proxemics- your awareness of distance between yourself and other actors

Stance- how you balance your weight (lunging, wide, narrow etc)

Gait- the way you walk

Expression

Facial expression- showing your character’s thoughts, feelings or emotions through by altering the appearance of your face.

Vocal expression- using your vocal skills to convey your character’s emotion through their dialogue.

Gesture- non-verbal communication through the movement of our hands or arm. Example: To show that I had done a good job in understanding gestures, my teacher gave me a thumbs up.







Body language- communicating character emotions or feelings through our bodies.











The Miner’s strikes- 1984








- The strike lasted a full year
- The strike began following the closure of 20 mining pits throughout the UK, a closure that resulted in the loss of 20,000 jobs
 - The total cost of the mining strike to the UK economy was estimated to be £3billion
- Margaret Thatcher had prepared in the event of a strike so that the country would not be brought to it’s knees in the event of a strike. This left many families destitute for long periods of time as the Government were not forced to negotiate with unions. Striker’s families were also refused benefits; this resulted in many striker’s becoming labelled as ‘scabs’
 - ‘Scabs’ were members of coal mining communities who broke the strike and returned to work.
- Striking had occurred twice before and had proved to be successful- the strike of 1984 was not to be as successful
 - In 194 there were 174 coal mines, by 1994 only 15 remained.

Wasting and abrading plastic

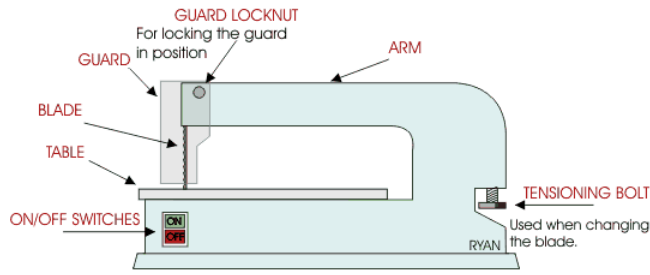
- Drilling
- Cutting and sawing
- Sanding
- Shaping
- Finishing
- Marking out

Cutting and Sawing	
	Hack saw Fine toothed saw for cutting plastic and metal
	Junior hacksaw Smaller version of hacksaw
	Coping saw Can be used to cut plastic especially curved shaped. Will leave rough edge
	Scroll (Hegner) Saw Mechanical version of coping saw
	Tenon saw – used for cutting straight lines in wood
Shaping	
	Files Come in a range of shapes, sizes and roughness <ul style="list-style-type: none"> • Used for smoothing and removing excess plastic • Cross filing – removing material quickly • Draw filing – removing scratches from cross filing

Holding Equipment	
G Clamp- portable clamp used to clamp work to the desk.	
Machine Vice – used with bench/pillar drill. Keeps your fingers away from the drill bit.	
Bench Vice (engineers vice) – bolted to work bench. To hold materials especially when sawing, drilling or filing.	
Pliers – used to hold, grip or pull objects	
Drilling	
Stepped drill Used for drilling through thin plastic and metal	
Counter sink Used to create a v shaped hole. This allows countersunk screws to be flush	
Twist drill – used to drill holes	
Marking out and measuring	
Steel rule Used for accurate measuring and marking out	
Tri square Checking and measuring 90 degree angles	
Digital Vernier: Measure the thickness or diameter of an object with accuracy	

Sanding	
Sandpaper Comes in different grades rough to smooth Wet and dry Very smooth sandpaper often used with water to polish plastic during the final finishing	
Polishing	
Polishing mop High speed rotating fabric wheel is used with a polishing compound to remove scratches	
Abrading	
Dremel Used to smooth and grind away excess material especially from models that have been 3d printed	
Cutting (snipping)	
Wire cutters Often used to remove support structures from 3d printed models	
Extras	
Heat gun Can be used to heat small pieces of plastic	
Glue gun	
Cordless drill More portable than a bench drill but not as accurate	

Fret Saw/Scroll Saw

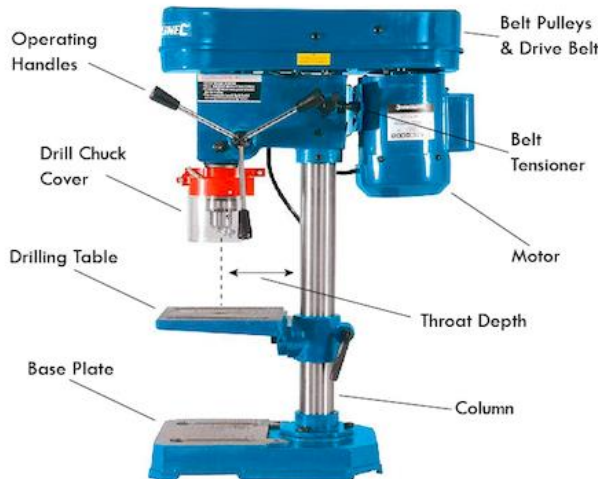


Fret Saw Safety

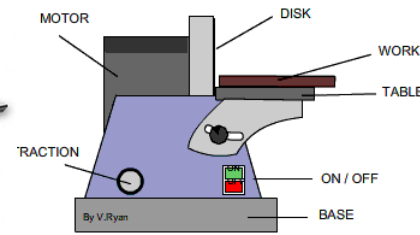
1. Always use the guard. Adjust the guard/foot to the correct height
2. Wear goggles when cutting materials.
3. Use a push stick if you think your fingers are too close to the blade
4. Follow all teacher instructions carefully.



Bench Drill



Disk Sander



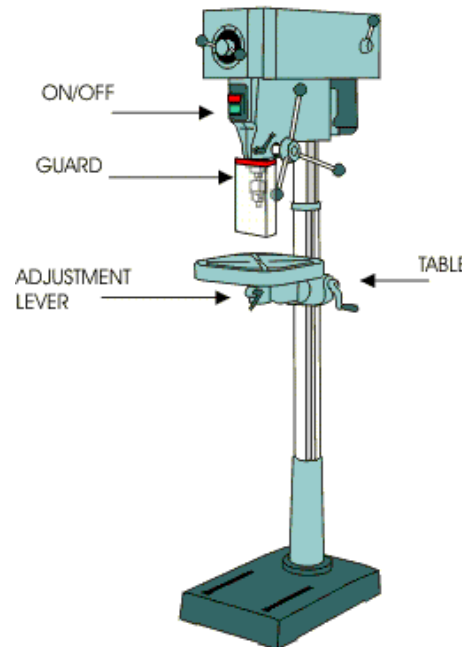
Sander Safety

1. Always use the guard. Adjust the belt sander guard to the correct height
2. Wear goggles when sanding materials.
3. Keep fingers well away from the sanding belt or disk
4. Keep the material moving gently from side to side
5. Follow all teacher instructions carefully.

Belt Sander



Pillar Drill



Drill Safety

1. Always use the guard.
2. Wear goggles when drilling materials.
3. Clamp the materials down or use a machine vice.
4. Never hold materials by hand while drilling.
5. Always allow the 'chippings' to clear the drill by drilling a small amount at a time.
6. Follow all teacher instructions carefully.

3D Printing

3d Printing

Fused Deposition Modelling (FDM) – used in schools

- This is most popular in schools and involves melting a plastic filament with the heated extrusion head
- Shapes are built up layer by layer

Stereolithography (SL)

- Uses lasers to part cure the printed shape from a bath of liquid resin
- Expensive but accurate

Digital Light Processing (DLP)

- Similar to Stereolithography
- Uses a powerful light source rather than a laser

Laser sintering

- Uses a powdered material instead of a resin bath
- The solid shape is created as the heat from the laser fuses and solidifies the powder



Keywords

- Rapid prototyping
- Additive manufacturing – adding material
- CAD – computer aided design
- CAM computer aided manufacture

3D Printer parts

1. Bed
2. Bed levelling screws
3. Nozzle
4. Extruder – heated element before nozzle. Plastic is heater and forced through the nozzle by a drive motor.
5. Plastic filament (PLA or ABS)
6. Filament guide
7. Filament spindle - reel holder/arm
8. Gantry – frame to support 3D printer
9. Stepper motor – precise electric motor
10. Cooling fan
11. Control panel

Support Structures

- Support structures allow overhanging features of your CAD model to be supported when being printed
- Any overhanging design feature will require a support structure
- A support structure is temporary and can be cut away with snips
- Without a support structure the print would collapse
- All support structures are calculated by the 3d printing software.



Health and Safety Risk

- Heat from the nozzle and extruder can cause severe burns
- Moving parts can cause fingers to be trapped
- Fumes from some materials (ABS) could be carcinogenic (cancer causing)

How to reduce risk

- 3D printer should be enclosed with a case
- Extraction fan and filter should be used with toxic materials



Materials

Plastic is the most common material 3D printed (thermoplastics)

- PLA – is used the most especially in schools. It is a bio-plastic (starch based) and will biodegrade
- ABS – can also be printed but at higher temperatures than PLA. Can give off carcinogenic (cancer causing) fumes.

How it works

1. A 3D printer builds a CAD model by adding thin layers of softened plastic one layer at a time – additive manufacturing
2. The CAD drawing is sliced into thin layers in the printer software.
3. The software tells the printer how move left to right and where to deposit (leave) plastic on each layer.
4. The print head (extruder/nozzle) is moved up one layer at a time.
5. Support structures can be added within the printing software prior to printing

Social, moral and ethical issues

- Downloading and printing working guns and weapons
- Copyright issues – printing copies of CAD models and not paying
- Job losses in manufacturing as 3d printing increases in popularity
- Body parts – could be printed. People may become reliant on medical advancements rather than healthy or safe decisions.

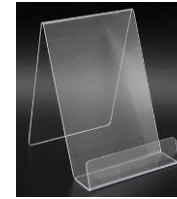
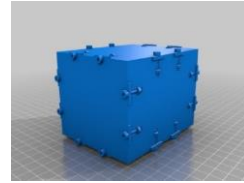
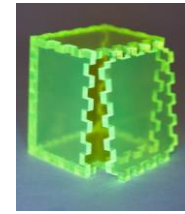
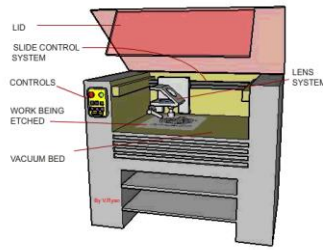


School processing techniques

- Line bending
- Vacuum forming
- Laser cutter
- 3D printing
- Adhesives

PPE – personal protective equipment

- Gauntlets – heat resistant leather gloves
- Safety goggles
- Apron



Laser cut phone stand that has been line bent using strip heater

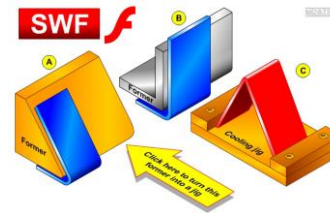
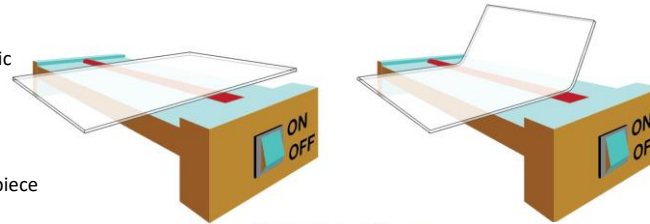
Laser Cutter

- 2D shapes can be cut and engraved (patterns applied) with a focused laser beam
 - Parts can then be glued, slotted or screwed together to make a more complex product
 - Plastic joints can be made e.g. a finger joint
1. Produce CAD drawing in 2D Design.
 2. Export as a DXF file.
 3. Open laser pro 5.3
 4. Load DXF file into laser pro software
 5. Set laser cutter powers
 6. Put material into laser cutter
 7. Focus laser cutter beam by moving the table up or down. The two red dots should come together.
 8. Turn extraction on
 9. Test cut a piece of scrap plastic/wood
 10. Cut work out

Strip Heater – heating plastic and moulding into a shape

- Bending most plastics involves heat unless they are very thin
- Strip heaters are used to create a permanent fold in a piece of thermoplastic
- Plastic can be formed around a jig (shape/mould)

1. Mark out bend lines – can be laser cut from a CAD drawing
2. Turn on the strip heater and allow it to reach working temperature
3. Put on heat-proof gloves and have a tray of water ready to cool the work piece
4. Place the marked line of the work piece across the heating strip
5. Allow the plastic to heat through then test for flexibility
6. Bend the work piece to the required angle using a former or jig
7. Once the work piece has set it can be cooled



Line colour

- Line colour can be changed in 2d design and this can be used to alter power settings to the laser and to tell the laser cutter to either engrave or cut e.g. black = cut, red = engrave
- Laser power settings can be changed, higher or lower to cut thicker or thinner materials.
- The laser cutter software can read the different coloured lines in the CAD drawing and adjust the power accordingly.
- Laser cutter must be focused to ensure accurate cuts

Vacuum forming – simple case with a uniform thickness (no complex internal structures)

Vacuum forming patterns

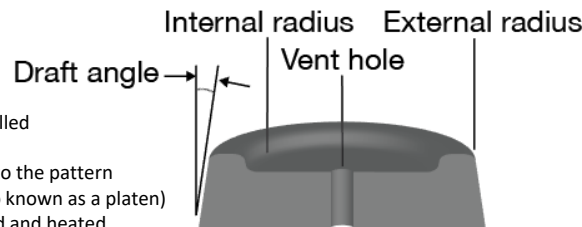
- HIPS (high impact polystyrene) is commonly used to vacuum-form small items within schools
- Commercial products include hot tub pools and egg boxes



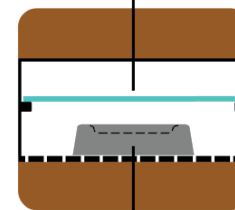
An effective former or pattern must have:

- A positive draft angle of at least 3°
- No undercuts – trap mould
- A profile that is not too deep with vent holes drilled
- Corners and edges rounded with a small radius
- A smooth finish and/or a release agent applied to the pattern

1. Mould is placed on a platform (also known as a platen)
2. A sheet of thermoplastic is clamped and heated
3. This now flexible sheet is pulled over a former (mould)
4. A vacuum sucks the air out
5. The plastic takes on the shape of the mould, then cools and hardens in position before the mould is removed

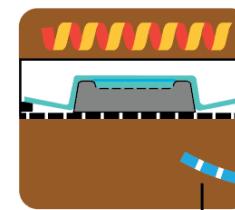
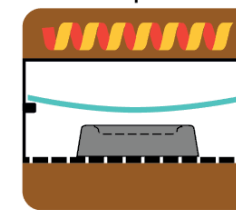


Thermoplastic



Mould or former

Heater



Air pumped out

Tier 2 Vocabulary

Discord	A disagreement between people.
Prejudice	A preconceived opinion that is not based on reason or actual experience.
Colonialism	the policy or practice of acquiring full or partial political control over another country.
Orphan	a child whose parents are dead.
Coup	a sudden, violent, and unlawful seizure of power from a government.
Genocide	the deliberate killing of a large number of people from a particular nation or ethnic group with the aim of destroying that nation or group.
Rebel	a person who rises in opposition against an established government/leader.
Asylum	The protection granted by state to someone who has left their home country as a political refugee.
Warfare	engagement in or the activities involved in war or conflict.
Refugee	A person who has been forced to leave their country due to war, persecution, or natural disaster.
Trauma	Pain or suffering
Discrimination	The unjust prejudicial treatment of different categories of people.
Superior	A high rank, status, or quality
Diversity	The state of being diverse; showing a great deal of variety; very different.
Ostracised	To exclude from a society or group.
Charitable	The assistance of those in need.
Liberated	Freed from enemy occupation.
Hostility	hostile behaviour; unfriendliness or opposition.
Contention	Heated disagreement

Hope in A Ballet Shoe – Non-Fiction Reading KO

Non-Fiction Writing	A piece of writing which is factual or real: examples are a newspaper article, speech or a letter.
Viewpoint	The views and ideas held by the writer.
Perspective	The particular attitude towards something (can shaped by time/place).
Attitude	The tone the writer adopts to emphasise or convey their ideas.
Methods	The ways in which the writer communicates their views and ideas.

Comparative Connectives

Compare	Contrast
Similarly, ...	On the other hand, ...
In the same way, ...	Whereas...
Equally, ...	In contrast to this, ...
Compared with ...	Unlike...
As with	Alternatively, ...

SQI STRUCTURE

Statement	Answers the question
	A clear point made
Quotation(s)	Precise and embedded
	Might group quotations
Inference	What is suggested/implied

Sentence Stems

Creates an image of...
Literally, this could illustrate...
Symbolically, this could mean...
Perhaps this is done to illustrate that the writer feels...
Emphasises the writer's point that...
Exemplifies the viewpoint that...

PAF

Purpose	Why are you writing? e.g. <i>To entertain, to inform</i>
Audience	Who are you writing for? e.g. <i>Young adults, children, teachers</i>
Form	What type of text are you going to write? e.g. <i>A recipe, an article, a story</i>

This Quotation

Illustrates	Reveals
Indicates	Symbolises
Highlights	Emphasises
Implies	Reinforces
Signifies	Reveals

Writing Techniques

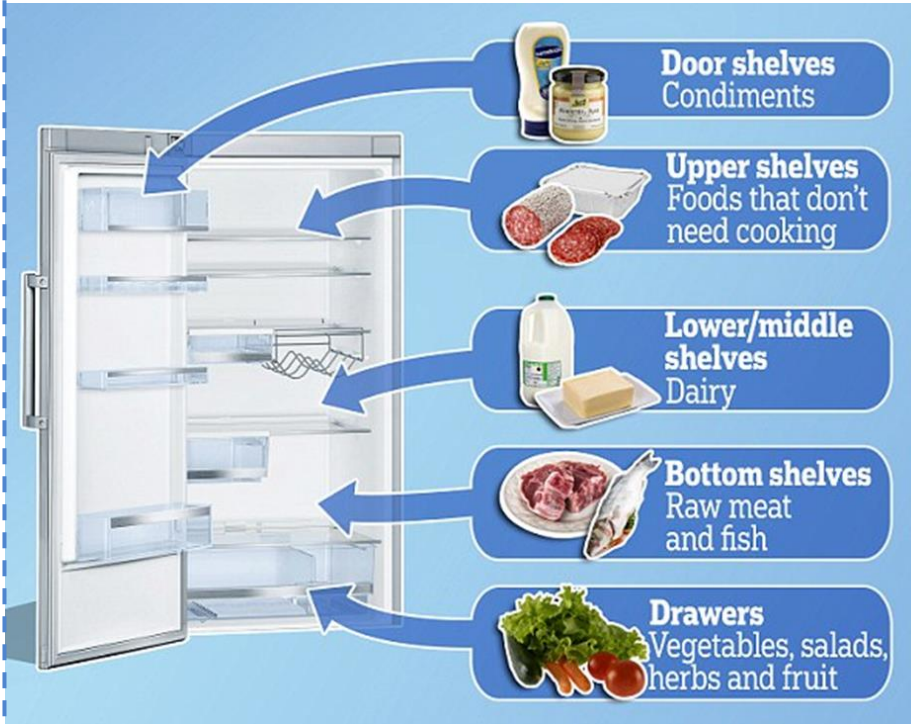
Hyperbole	The use of extreme exaggeration.
Imagery	When the writer provides mental "pictures".
Irony	Like sarcasm, where the opposite is implied.
Juxtaposition	Two ideas together which contrast each other.
List (of three)	A number of connected items (three= effect).
Metaphor	Something is presented as something else.
Oxymoron	Contradictory terms together " <i>bittersweet</i> ".
Pathos	Language used to appeal to the emotions.
Personification	Giving human traits to something non-human.
Repetition	When a word, phrase or idea is repeated.
Semantic Field	A set of words from a text related in meaning.
Simile	Something is presented as like something else.
Symbolism	An idea is reflected by an object/character etc.

Student Knowledge Organiser



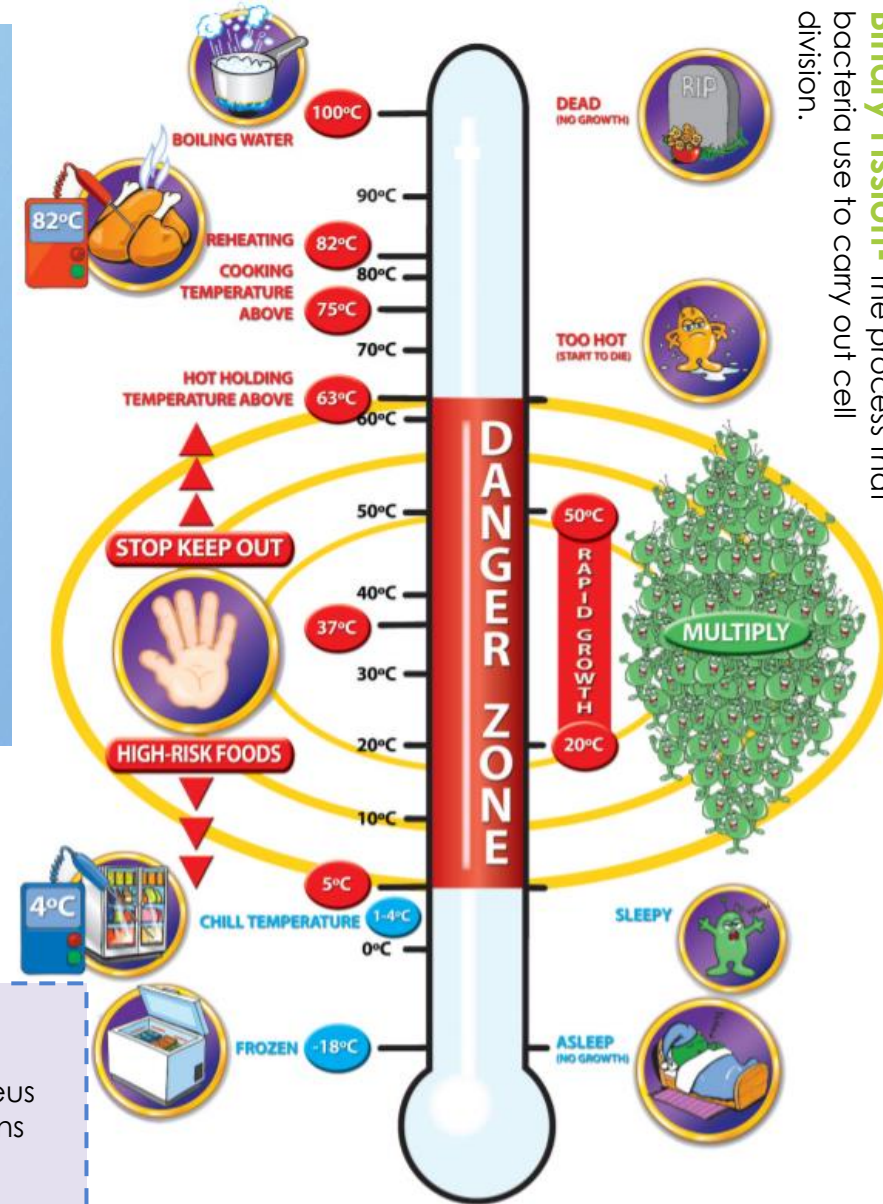
Binary Fission - the process that bacteria use to carry out cell division.

Enzymes: proteins that act as **biological catalysts**; they accelerate chemical reactions; e.g. cause fruit to ripen > spoil. **Enzymic browning** is an oxidation reaction that takes place in fruit and vegetables, causing it to turn brown. It can be slowed down/prevented by adding **acid** or **blanching**.

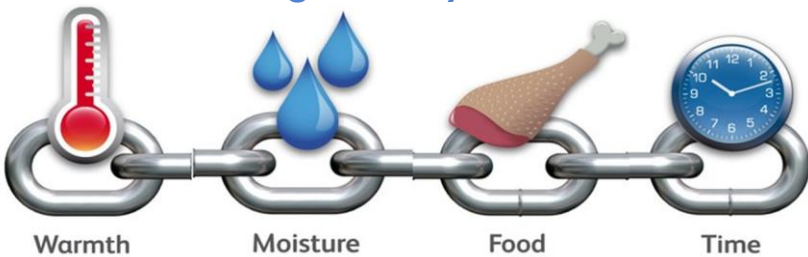


Operating temperatures and monitoring

Refrigerators usually operate between 1°C to 4°C. Temporary rises in display temperatures will occur if doors are left open or a large quantity of food/drink at room temperature is loaded into the fridge, for example, bottles of soft drinks.



For bacteria to grow they need:



Types of bacteria

- ★ Salmonella
- ★ Staphylococcus Aureus
- ★ Clostridium perfringens
- ★ Ecoli
- ★ Listeria
- ★ Campylobacter
- ★ Bacillus Cereus

food safety & hygiene

Student Knowledge Organiser

FOOD RELATED CAUSES OF ILL HEALTH

Bacteria is found in:

- ★ Soil and Water
- ★ Plant and Plant Products
- ★ Air and Dust

Bacteria can be controlled by **pasteurisation** and **vaccination**, but also **chlorination** (USA)

Microbes:

Tiny fungi which grow from spores found in the air:

- ★ Settle on food products and multiply.
- ★ When visible, food is described as 'mouldy'.
- ★ Causes food spoilage.

Desirable microorganisms

moulds > cheese **Yeast > bread** **bacteria > yoghurt**

Chemicals:

- ★ Some of the chemicals used in farming may remain on or in the food we eat. These may cause us harm.

A **hazard** is the potential to cause harm to the consumer and the main hazards are:

- ❌ **(Micro)biological**, such as **bacteria**, **viruses**, moulds and parasites, e.g. tapeworms
- ❌ **Physical**, such as glass, screws, stones and hair
- ❌ **Chemical**, such as pesticides and cleaning chemicals
- ❌ **Allergenic**, such as peanuts, tree nuts, sesame seeds, eggs and milk



ALLERGENIC HAZARDS

ALLERGIES: Some people may develop an allergy to peanuts or to the gluten in wheat. If they eat foods containing these, they may become very ill, and possibly die. **Intolerances:** Not life threatening but symptoms and restricted diet can lead to ill health.

Symptoms

- ★ **Visible and Non-Visible symptoms:** abdominal pain, diarrhea, vomiting, fever, nausea, tiredness/fatigue, headache, **death**.
- ★ **Length of time until symptoms appear:** Onset period
- ★ **Duration of symptoms:** Can vary between bacteria types and person contaminated.

Symptoms can occur anywhere from a few minutes after exposure to a few hours later, and they may include some of the following:

- ★ Swelling of the tongue, mouth or face
- ★ Difficulty breathing
- ★ Low blood pressure
- ★ Vomiting
- ★ Diarrhea
- ★ Hives
- ★ Itchy rash

Signs of SPOILAGE include:

- ❌ Off-odours
- ❌ Discolouration
- ❌ Slime/stickiness
- ❌ **Mould** growth
- ❌ Changes in texture, e.g. dry or spongy
- ❌ Unusual taste, e.g. sour
- ❌ The production of gas
- ❌ Blown cans or leaking packs



≡ **food safety & hygiene** ≡

Student Knowledge Organiser

Prevent Cross Contamination

Use correct colour coded chopping boards and knives at all times

Raw Meat

Raw Fish

Cooked Meats

Salads & Fruits

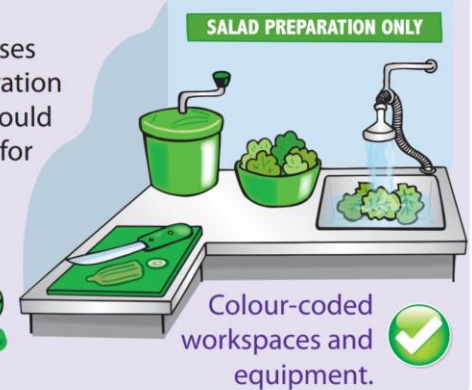
Vegetables

Dairy Products

Control of cross-contamination

- ★ Effective instruction, supervision
- ★ Training of food handlers
- ★ Separation of raw and ready-to-eat
- ★ Food (colour-coding)
- ★ Effective cleaning and disinfection
- ★ Use of disposable paper cloths or colour-coded cloths
- ★ Not using washbasins for washing food or equipment

Cross-contamination should be eliminated; clean and dirty processes and raw and high-risk food preparation must be separated. Work areas should be colour-coded. A separate area for de-boxing should be provided.



'vehicles' include...



HANDS



CLOTHS & EQUIPMENT



HAND-CONTACT SURFACES



FOOD-CONTACT SURFACES

Sources > vehicles > Routes of contamination

SOURCES → VEHICLES → READY-TO-EAT FOOD



Direct contamination

- ★ e.g. raw meat touches cooked meat, or where a raw food drips onto ready-to-eat food.

Indirect contamination

- ★ E.g. when a food handler prepares cooked meat after handling raw meat without washing their hands.

High Risk: Foods more prone to bacterial infection, e.g. raw or cooked meats, raw or cooked fish, eggs, cooked rice, gravies and soups, dairy. Contain moisture and protein; ready-to-eat.

Low Risk: Foods unlikely to contain pathogenic bacteria and will not normally support their growth e.g. grains and cereals, bread, alcohol. Dry foods, high in salt, sugar or other preservatives.



⇒ food safety & hygiene ⇒

Student Knowledge Organiser

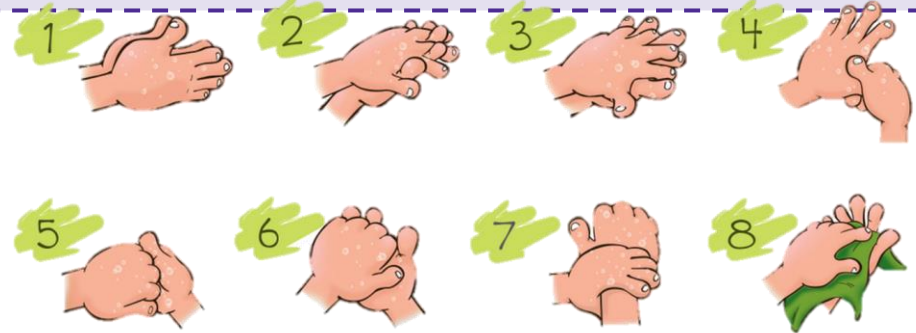
HACCP (Hazard Analysis and Critical control points) is a food safety management system which identifies and **controls hazards at critical control points** so minimising the **risk** of food poisoning or food complaints and ensuring safer food.

HACCP Principles: Supplier > Delivery > Receipt > Storage > Prepare > Cook – high risk > Serve/ chill

HACCP Worked Example- Raw chicken:

Delivery	Check the temperature of the delivery van storage, check for any damage to packaging.
Storage	Store on the bottom of the fridge, covered to prevent meat juices from dripping onto other products.
Preparation	Prepare raw meat on a red chopping board.
Cooking & serving	Cook to 75°C at the core for 2 minutes or more. Check using a food probe.
Holding & reheating	Hot hold food above 63°C for no more than 90 minutes.

Wash your hands before and after handling food to prevent cross contamination. Make sure you follow the 8 steps carefully.



Step 1: Wet your hands and apply liquid soap

Step 2: Rub palms together

Step 3: Rub the back of hands

Step 4: Interlink your fingers

Step 4: Cup your fingers

Step 5: Clean the thumbs

Step 6: Rub palms with your fingers

Step 7: Wash wrists

Step 8: Rinse with warm running water and dry with a clean, disposable paper towel.

≡ food safety & hygiene ≡

4C's (linked to HACCP)

CLEANING

CLEAN KITCHEN SURFACES AFTER PREPARING FOODS; TRY TO 'CLEAN AS YOU GO'.



COOKING

FOLLOW RECIPES AND LABEL INSTRUCTIONS ON COOKING TIMES AND TEMPERATURES. REMEMBER TO PRE-HEAT THE OVEN PROPERLY.



CHILLING

DO NOT PUT HOT FOOD DIRECTLY INTO THE FRIDGE OR FREEZER, LET IT COOL SUFFICIENTLY FIRST; BUT REMEMBER THAT COOLING SHOULD BE COMPLETED WITHIN ONE OR TWO HOURS AFTER COOKING.



CROSS CONTAMINATION KEEP RAW FOOD AND HIGH RISK FOOD SEPARATED

FOOD POISONING IS OFTEN CAUSED WHEN HARMFUL BACTERIA ON ONE FOOD ARE SPREAD VIA HANDS OR KITCHEN UTENSILS TO CROSS-CONTAMINATE OTHER FOODS. GOOD HYGIENE HELPS PREVENT THIS.



Year 8 Evolving Continents



Make sure you know the 'bare bones' of this unit.

Key facts:

1. More than 4.4 billion people live in Asia
2. There are 48 countries
3. The Yangtze River is the longest on this continent
4. The biggest lake is the Caspian Sea
5. There are more than 2300 languages spoken



Keywords:

1. Development gap: Difference in standards of living and wellbeing between the World's richest and poorest countries.
2. Development: The progress of a country in terms of economic growth, use of technology and human welfare
3. Ecotourism: Nature tourism usually involving small groups with minimal impact on the environment
4. Famine: Widespread, serious, often fatal shortages of food
5. Human Development Index: A method of measuring development where GDP per capita, life expectancy and adult literacy rates are combined to give an overview.
6. Inequalities: Differences between poverty and wealth
7. Infrastructure: The basic equipment and structures that are needed for a country or region to function properly.
8. Newly Emerging Economies (NEE): Countries that have begun to experience high rates of economic development, usually along with rapid industrialisation

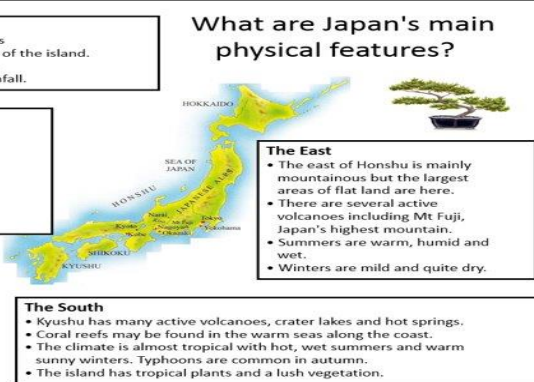
The North

- Hokkaido is remote and mountainous
- Snow capped peaks cover the centre of the island.
- Summers are relatively dry and cool.
- Winters are very cold with heavy rainfall.

The West

- The west of Honshu is mountainous with little flat land.
- The area is cut by deep, narrow valleys with steep sides.
- Short, fast flowing rivers flow down to the sea.
- Summers are warm and wet.
- Winters are cold and snowy.

Q. Which of the four islands do you think would be best to live on?
Explain your choice [4]



The South

- Kyushu has many active volcanoes, crater lakes and hot springs.
- Coral reefs may be found in the warm seas along the coast.
- The climate is almost tropical with hot, wet summers and warm sunny winters. Typhoons are common in autumn.
- The island has tropical plants and a lush vegetation.

What are Japan's main physical features?

The East

- The east of Honshu is mainly mountainous but the largest areas of flat land are here.
- There are several active volcanoes including Mt Fuji, Japan's highest mountain.
- Summers are warm, humid and wet.
- Winters are mild and quite dry.

Tourism in Thailand

1. Positives	1. Negatives
<ol style="list-style-type: none"> 1. Lots of jobs are available in bars, restaurants, hotels and as trekking guides and porters 2. Some villagers make money out of selling traditional cultural items 3. Tourism accounts for around 6% of Thailand's GDP 	<ol style="list-style-type: none"> 1. Modern hotels use lots of water and energy 2. Loss of local traditions as more Westernised tourists visit the area 3. Money paid to package holiday companies stays in the UK

Impacts of poverty on Yemen

- **Hunger and Malnutrition:** The U.N. estimates that approximately 80% of Yemenis are vulnerable to hunger. About 14.3 million need medical assistance to combat malnutrition along with other issues.
- **Water:** Almost 18 million Yemeni citizens simply have no access to clean water. UNICEF reports that only around 30% of the population uses piped drinking water services. Contaminated water results in many infant deaths.
- **Humanitarian Crisis:** The Yemeni rial, the official currency of Yemen, lost 75% of its value in the past four years. With a GDP of around \$27 billion, Yemen must rely on humanitarian aid.
- **Education:** As poverty in Yemen continues to worsen, about 2 million children remain out of school.
- **The Economy:** The World Bank reports that more than 40% of households lost their main source of income, placing people under the poverty line.

Why do some parts of Africa have slow economic development?

- Growth of population
- War and crises: Of the world's 20 war-related conflicts in 2013, 11 alone were fought on the African continent - all in sub-Saharan Africa.
- Climatic conditions: The African continent has been suffering more and more from climate change in recent decades: devastating floods and extraordinary drought periods lead to crop failures.
- Illnesses: Diseases such as AIDS, malaria or Ebola are the cause but also the result of poverty in Africa.
- Inadequate agricultural infrastructure: Roads, wells, irrigation systems, storage facilities, agricultural machinery - in many regions of Africa, agriculture lacks both infrastructure and expertise.



English Civil War

Summary

Key Words



1. **The Stuart era: the Tudors were replaced by their Scottish cousins and descendants of Mary, Queen of Scots.**

Key Events

2. **1603** – Elizabeth died and her closest relative James VI of Scotland became James I of England. He was the first king to rule all 4 countries of the British Isles.
3. **5th November 1605** – A Catholic plot to blow up Parliament and the king.
4. **1620**– The Puritan Pilgrim Fathers, set sail on the Mayflower for a new life in America. They celebrated their survival with a Thanksgiving meal of turkey. Americans still remember this event each November on "Thanksgiving Day"
5. **1625** – James died was succeeded by his son Charles I.
6. **1642-9**- The English Civil War was fought between Charles I and Parliament.
7. **January 1649** – Charles I was beheaded.
8. **1653**- Oliver Cromwell becomes "Lord Protector" until his death in 1658
9. **1660**- the restoration of the monarchy – Charles II (son of Charles I) becomes king until his death in 1685.
10. **1665**- The Great Plague in London kills 100,000 people.
11. 1666- The Great Fire of London started in a Baker's shop in Pudding Lane
12. 1688- The Glorious Revolution when Parliament replaced the Catholic James II with his Protestant daughter Mary and her husband William of Orange.

14	Divine Right of Kings	Belief that Kings power came from God and therefore nobody could defy them
15	Treason	A crime against your own people or monarch
16	Republic	A country without a king or queen
17	Parliament	Two parts: the House of Lords who were unelected and the House of Commons who were elected - MPs
18	Regicide	The act of killing a monarch
19	Cavaliers	Soldiers who fought for the king
20	Roundheads	Soldiers who fought for parliament
21	Exile	Forced to live outside your country
22	Civil War	A war between two sides from the same country
23	Puritan	Very strict Protestant
24	Musketeer	Soldiers who fought with muskets (early form of rifles)
25	New Model Army	New type of army of paid, full time soldiers created by Cromwell
26	Lord Protector	Title given to Oliver Cromwell instead of king
27	Bill of Rights	Limits on the monarchs power agreed by William and Mary as part of the Glorious Revolution
28	Levellers	Group during the Civil War wanting equality for all people
29	Miasma	Poisonous cloud of bad air believed to cause the plague
30	Revolution	A huge change
31	Interregnum	Period from the execution of Charles I in 1649 to the return of Charles II as king

13

Key People



James I

James was both King of England and Scotland, and joined the two nations together. He was the target of the Gunpowder Plotters. He believed in the Divine Right of Kings, the belief that God gave King's their power, and therefore could not be argued with by anyone.



Charles I

The eldest son on James I, Charles also believed in the Divine Right of Kings. This led to arguments with Parliament, which in the end led to the English Civil War. Charles eventually loses, and is the only King to be put on trial and executed by the country.



Oliver Cromwell

Oliver Cromwell was an MP, who rose to fame due to New Model Army in the English Civil War. After the war, he was one of the MP's who signed Charles I death warrant. He later became Lord Protector of England, leader of England until his death in 1658.



Charles II

Charles II, son of Charles I, was in hiding in France after his father was beheaded. When Oliver Cromwell died he started to plan his return. In 1660, he successfully landed and paraded through London to cheering crowds. Often called "The Merry Monarch"

Key Vocab	Definitions
Empire	A group of countries under a single authority; for example the Queen.
Triangular Trade	A trading system which operated from the late 16 th to early 19 th centuries, operating in a triangle. (see image)
The Middle Passage	The Middle Passage was the part of the trade where Africans, were packed onto ships and transported across the Atlantic to the West Indies.
Slave Auction	This was an event where Slave families often were separated and sold to slaveholders in distant states.
Plantation	An estate where crops are grown on a large scale, usually where slaves work.
Underground Rail Road	A network of people and safe houses which slaves used to escape to the north of the United States; it was not run by anyone person or group; it relied on the generosity and support of many people.
Emancipation	When a slave is legally freed from his/her owner.
Abolition	When a government law is passed to officially stop or end something; slavery.

Year 8 - The Slave Trade



Olaudah Equiano

Olaudah was a Black, freed slave who settled in Britain. His autobiography was influential in showing people the horrors of slavery and the slave trade. He describes how he was kidnapped with his sister at around the age of 11, sold by local slave traders and shipped across the Atlantic to Barbados and then Virginia. While working as a deckhand, valet and barber, Equiano earned money by trading on the side. In only three years, he made enough money to buy his own freedom.

Harriett Tubman

Harriett was a Black, American slave who escaped slavery. She then helped free many others using the Underground Railroad and worked to abolish slavery. She was known as a 'conductor'. During a ten-year span she made 19 trips into the South and escorted over 300 slaves to freedom. And, as she once proudly pointed out in all of her journeys she "never lost a single passenger."



Key Questions

How did the Slave Trade benefit Britain?

Traders grew rich, as did ports such as Bristol, Liverpool, Glasgow and London. The raw cotton from the Americas helped to feed the growing number of cotton mills (as part of Britain's Industrial Revolution) British landowners also owned plantations in the West Indies which benefitted from cheap supply of Labour. The profits from the slave trade were invested in Britain's industries.

What were conditions like on the Middle Passage?

Slaves were chained together in the ships hold. Diseases quickly spread; if a slave died, the body would remain still chained to their other slaves for hours. The slaves were often unable to digest the food given to them. Sick slaves would be denied food and left to die. Slaves developed sores where their chains rubbed against their skin. Many slaves tried to kill themselves by refusing to eat or by jumping overboard. Once a day slaves were taken up from the hold to dance on the deck to keep them fit.



How did the Slaves Resist?

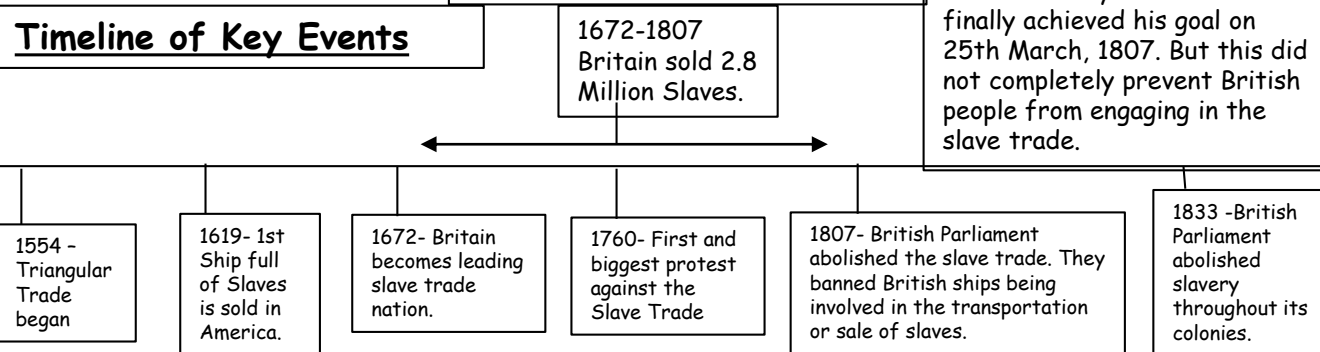
Day-to-day resistance for field slaves involved breaking tools, faking illness, and committing acts of arson and sabotage. Slaves would run away, often making use of the Underground Railroad to escape to the north of America. Slave revolts took place during the Middle Passage and in the Americas.

William Wilberforce


William was an English White Quaker and Member of Parliament. He campaigned to abolish the slave trade, giving speeches in Parliament. He regularly introduced anti-slavery motions in parliament. The abolition campaign made him have many enemies. He finally achieved his goal on 25th March, 1807. But this did not completely prevent British people from engaging in the slave trade.



Timeline of Key Events



Year 8: American Civil Rights

Key Vocabulary	Definitions 
Creed	A system of beliefs; a guiding belief.
Discrimination	Prejudice or unjust behaviour to others based on differences in age, race, gender, and so on.
Oppression	The act of treating people in a cruel and unjust way.
Segregation	The act or practice of keeping people or groups apart.
Boycott	To refuse to buy something or to take part in something as a way of protesting.
Integrate	To include people of all races.
Retaliate	To do something unpleasant to someone because the person has done something unpleasant to you.
Segregate	To separate or keep people or things apart from the main group.
Unconstitutional	Not in keeping with the basic principles or laws set forth in the constitution of a state or country, especially the Constitution of the United States.
Civil Rights	The rights of citizens to political and social freedom and equality.

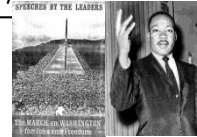
Rosa Parks

Rosa Parks was instrumental in spurring on the civil rights movement in 1955. Parks boarded a bus in Montgomery, Alabama, and refused to give up her seat to a white man because the "whites only" seating area was full. Her subsequent arrest led to Martin Luther King Jr. to organise the Montgomery Bus Boycott of public transport, which lasted for over a year. On 5 June 1956, the federal district court ruled that bus segregation was unconstitutional, and in November 1956 the U.S. Supreme Court affirmed the ruling and struck down laws requiring segregated seating on public buses.



Martin Luther King Jr.

King was one of the major civil rights leaders and was active in the movement during the 1950's and 1960's. King came to the nation's attention when he spoke out against the arrest of Rosa Parks who would not give up her seat to a white man on public transport. King utilised peaceful protest as a political tool and was instrumental in forming the Southern Christian Leadership Conference (SCLC). He delivered an iconic speech, which became known as the 'I have a dream' speech, at the Lincoln Memorial for the 1963 March on Washington for Jobs and Freedom. King was later assassinated on 4 April 1968, Memphis, Tennessee, United States by James Earl Ray.



Malcolm X

Malcolm X was a major figure in the civil rights movement and a figurehead for the Nation of Islam during the 1950's. X was a passionate and inspiring speaker who fought for independence for African-Americans using violent methods if necessary. To some, such as Martin Luther King Jr. who preached of peace X was the flip side of the civil rights movement. If the American authorities did not want to deal with the peaceful protests of King then Malcolm X would be the alternative. On February 21, 1965, Malcolm X took the stage for a speech at the Audubon Ballroom in Manhattan. He had just begun addressing the room when multiple men rushed the stage and began firing guns. Struck numerous times at close range, Malcolm X was declared dead after arriving at a nearby hospital.



President John F. Kennedy

Kennedy at first did not fully support the civil rights movement for fear of alienating voters. However, he did plant the seeds for the Civil Rights Act 1964. After the riots in Birmingham Kennedy decided to support fully regardless of whether or not he would lose the next election. He supported the March on Washington for Jobs and Freedom and had plans to implement a stronger civil rights act. He would never see the Civil Rights Act 1964, as he was assassinated on 22 November 1963, Elm Street, outside the Texas School Book Depository, Dallas, Texas, United States.



LAWS

Civil Rights Act of 1964: Prohibiting discrimination based on race, colour, religion, sex and national origin, by federal and state governments as well as some public places

The Voting Rights Act of 1965: This made it much easier for Black people to vote.

The Agricultural Revolution

Population boom.

Source A	1750	1800	1850	1900
Population	7 million	11 million	21 million	37 million

Enclosure Movement

Before

After



New Machinery - more crop was collected and so produced more profit.

Source D	1700	1750	1790	1820
Wheat output - A quart is about 13 kg.	13 million quarts	15 million quarts	19 million quarts	25 million quarts

New animals - could be 'selectively' bred to produce better meat and wool.

Source F	1700	1800
Average sheep weight	28 lbs	80 lbs
Average cow weight	370 lbs	800 lbs

The Domestic System / Cottage Industry.

- Merchants provided people with raw material in their own homes they could make things like cloth. The merchant would then sell it for profits.



The Industrial Revolution



New inventions

New inventions such as John Kay's **Flying Shuttle** (1733), James Hargreave's **Spinning Jenny** (1764) and Richard Arkwright's **Water Frame** (1769) changed the textile industry forever; they were too big to fit in people's homes. This led to the birth of the first factories and the **Factory System**.

In 1768, Scientist James Watt and businessman Matthew Boulton developed a new kind of **steam engine** that could power all the other machines.

Factories

Factories were dangerous places with low wages and long hours. Workers could be fined or beaten if they did not work hard enough.



Laws were introduced to try and make factories safer and give workers some rights - but they remained unsafe for many years.

Iron Industry

The iron industry was incredibly important to the Industrial Revolution. Without iron, many of the new machines would not have been developed, including transport systems such as the railways.



Conditions of towns

Towns grew rapidly and as the amount of people and factories grew so did the problem of overcrowding, poor sanitation, disease, poverty and crime. Smoke and fog created a deadly combination of very poor air quality—totally unlike the countryside.



Rebellion

People hated the new changes and wanted better living and working conditions but they were helpless—so they resorted to revolts and rebellions. Such as: - Luddites, Swing Riots, Peterloo, Tolpuddle Martyrs, Chartist, Rebecca Riots to name but a few...



Public Health in Industrial Towns

Living conditions — poor sanitation, lack of clean water, cramped and low quality accommodation, close to factories, poor diet.

Killer diseases — Miasma and contagion theories — people didn't know what caused the diseases; these were the most popular theories. Diseases such as TB, cholera, typhus and typhoid were caused by the poor living conditions and killed thousands.

The cholera epidemics of the 19th century — There were cholera epidemics in a number of places throughout the 19th century, until Dr John Snow discovered the cause; a hand pump in Soho was proven to be the source of infected water. A number of people made significant changes to the conditions in industrial towns, such as Joseph Bazalgette, who developed the sewerage system in London.



Medical improvements — How did Britain become a healthier nation? — Surgeons such as Morton and Simpson developed methods of anaesthetic, so operations became less painful. In the meantime, Pasteur and Lister developed ways of preventing germs and bacteria from causing infection. As a result, Britain became a healthier nation.

History Knowledge Organiser: Suffragettes and Suffragists

Keywords

NUWSS:

National Union for Women's Suffrage Societies (also known as Suffragists)

WSPU:

Women's Social and Political Union (also known as Suffragettes)

suffrage:

The right to vote

petition:

Formal written request signed by large numbers of people

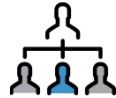
Cat and Mouse Act:

Suffragettes on hunger strike were released, then re-arrested when better.

Votes of Women



WSPU



Emmeline Pankhurst, Christabel & Sylvia (daughters)



Green, White and Purple



"Deeds not Words"



Breaking windows, chaining to railings, slashing paintings, militant action



Arrested, undertook hunger strikes in prison. Released under Cat and Mouse Act.



NUWSS



Millicent Fawcett



Green, White and Red



No slogan



Petitions, marches, rallies, posters, leaflets and lobbying MP's

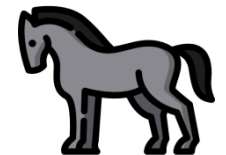


No reaction from authorities, but missed opportunity of attracting large numbers



3rd June 1913

Emily Wilding Davison, trying to place a scarf around the King's horse, was hit and later died by the horse.



Epsom Racecourse

Knowledge Organisers and Practice questions



Year 8 Topic 1 Number and Calculations Student Knowledge Organiser

Key words and definitions

- Odd numbers – a number ending in 1, 3, 5, 7 or 9, can **not** be divided by 2
- Even numbers – a number ending in 2, 4, 6, 8 or 0, **can** be divided by 2
- Factors – numbers which divide into another number with no remainder
- Multiples – answers to multiplications of the number
- Prime numbers – a number that has exactly 2 factors: 1 and itself
- Square numbers – multiply by itself, e.g. $2 \times 2 = 4$ written as 2^2
- Cube numbers – multiply by itself 3 times e.g. $2 \times 2 \times 2 = 8$ written as 2^3

Multiplication and division

$$\begin{array}{r} 12 \\ \times 26 \\ \hline 72 \\ 240 \\ \hline 312 \end{array}$$

So $1.24 \times 0.26 = 0.3224$

$$\begin{array}{r} 28 \cdot 8 \\ 15 \overline{) 432 \cdot 0} \\ \underline{30} \\ 132 \\ \underline{120} \\ 120 \\ \underline{120} \\ 0 \end{array}$$

Answer: 28.8

Addition and subtraction

Line up the decimal points

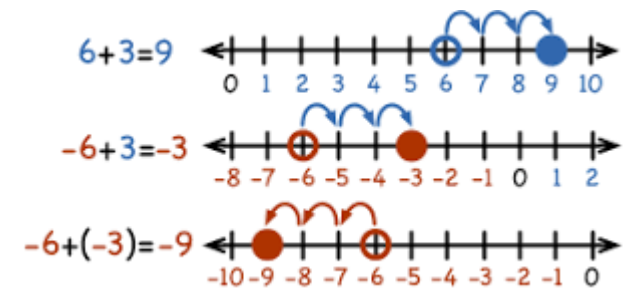
$$\begin{array}{r} 1.234 \\ + 4.1 \\ \hline 5.334 \end{array}$$

Borrow as usual

$$\begin{array}{r} 2 10 13 10 \\ 31.40 \\ - 27.59 \\ \hline 3.81 \end{array}$$

Line up the decimal points

Negative numbers - directed



Adding/Subtracting

$$\begin{array}{l} 5 + -7 = 5 - 7 = -2 \\ -5 - 8 = -13 \\ 5 - -2 = 5 + 2 = 7 \end{array}$$

Multiplying

$$\begin{array}{l} 5 \times -2 = -10 \\ -3 \times 7 = -21 \\ -6 \times -2 = 12 \end{array}$$

Dividing

$$\begin{array}{l} -30 \div 2 = -15 \\ 20 \div -2 = -10 \\ -6 \div -2 = 2 \end{array}$$

Hegarty Maths Skills Links

Addition and Subtraction	9, 18, 19, 20, 40, 41, 47
Multiplication and division	6, 10, 11, 21, 22, 23, 48, 49, 50, 144, 145
Order of operations	24, 44, 120, 150
Negative numbers	37, 38, 39, 40, 41, 42, 43, 44



Year 8 Topic 1 Number and Calculations Practice Questions

Addition and subtraction

- 1) $3.4 + 0.57$
- 2) $2.37 + 64.5$
- 3) $6.4 - 3.7$
- 4) $2.34 - 1.48$
- 5) $2.3 + 5.07$
- 6) $5.91 - 0.36$
- 7) $2.45 + 0.46$
- 8) $10 - 0.0329$

Multiplication and division

- 1) 6.2×7.1
- 2) 3×1.7
- 3) 2.34×2.7
- 4) 0.24×3.57
- 5) $28 \div 7$
- 6) $5.096 \div 14$
- 7) $93.10 \div 15$
- 8) $1.24 \div 0.4$

Negative numbers

- 1) -3×-4
- 2) -5×4
- 3) 10×-5
- 4) -7×-2
- 5) 4×-6
- 6) -5×8
- 7) -2×-5
- 8) 6×10
- 9) -10×9
- 10) 8×-5
- 11) $18 \div -3$
- 12) $-20 \div 10$
- 13) $-24 \div -6$
- 14) $-6 + -3$
- 15) $6 - -5$
- 16) $-7 + 10$
- 17) $8 + -10$
- 18) $12 - -6$
- 19) $-2 - -5$
- 20) $-12 - -7$

Applying knowledge

- 1) Mrs Smith buys a pen for everyone in Year 7. There are 125 students in Year 7. A pack of 6 pens costs £2.40. How much does Mrs Smith spend for the pens?
- 2) Molly gets paid £11.50 for each hour she works from Monday to Friday. She gets paid £14.40 for each hour she works on Saturday.

Last week Molly worked 12 hours from Monday to Friday and 4 hours on Saturday.
Show that Molly was paid more than £160 last week.

City	Temperature
Cairo	15 °C
Copenhagen	-1 °C
Helsinki	-9 °C
Manchester	3 °C
Moscow	-14 °C
Sydney	20 °C

- 1) Which city has the **lowest** temperature?
- 2) How much warmer is Sydney than Moscow?
- 3) One day in summer, Helsinki's temperature rises by 22 degrees Celsius. What is the temperature on that day?

Year 8 Topic 2 Area and Volume Student Knowledge Organiser

Key words and definitions

Area – the area of a 2D shapes is the amount of space inside it

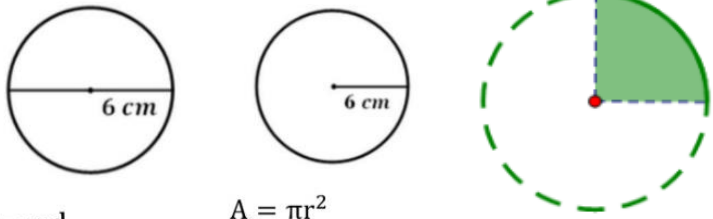
Perimeter – the perimeter is the total distance around the outside of a shape

Circumference – the distance around the outside of a circle

Surface area – sum of the areas of all the faces in a 3D shape

Volume – the amount of 3D space occupied by an object

Area and Circumference



$$C = \pi d$$

$$= 3.142 \times 6 \text{ cm}$$

$$= 18.85 \text{ cm}$$

$$A = \pi r^2$$

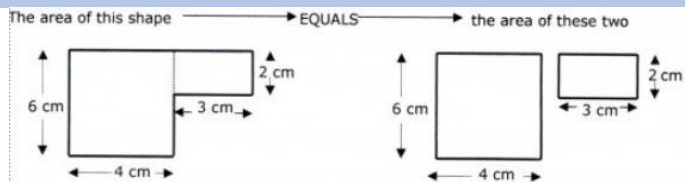
$$= 3.142 \times 6^2$$

$$= 3.142 \times 36$$

$$= 113.11 \text{ cm}^2$$

$$\text{Area} = \frac{90}{360} \pi r^2 = \frac{1}{4} \pi r^2$$

Compound area



$$\text{The area of this shape} = (6 \times 4) + (2 \times 3)$$

$$= 24 + 6$$

$$= 30 \text{ cm}^2$$



Area

<p>SQUARE</p> $A = \text{Length}^2$	
<p>RECTANGLE</p> $A = \text{Length} \times \text{width}$	
<p>TRIANGLE</p> $A = \frac{1}{2} \text{Base} \times \text{height}^*$	
<p>TRAPEZIUM</p> $A = \frac{1}{2} (a + b) \times \text{height}^*$	
<p>PARALLELOGRAM</p> $A = \text{Base} \times \text{height}^*$	

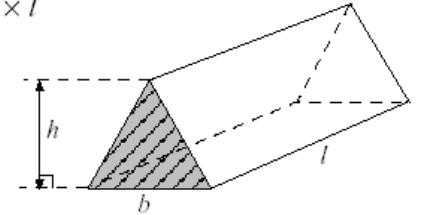
Perimeter



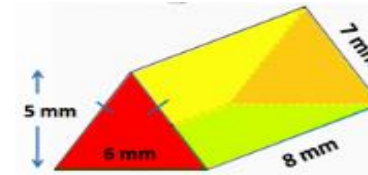
Volume of a prism

Volume of triangular prism = area of cross-section \times length

$$= \frac{1}{2} \times b \times h \times l$$



Surface area of a triangular prism



The "Total Surface Area" =

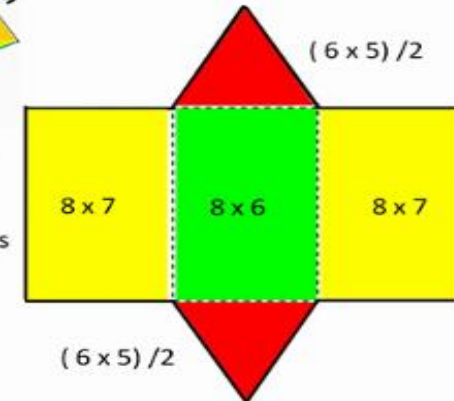
$$2 \times (6 \times 5) / 2 \quad : \text{Two Reds}$$

$$+ 2 \times (8 \times 7) \quad : \text{Two Yellows}$$

$$+ 1 \times (8 \times 6) \quad : \text{One Green}$$

$$= 2 \times 15 + 2 \times 56 + 1 \times 48$$

$$= 190 \text{ mm}^2 \quad \checkmark$$



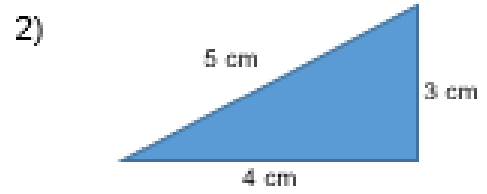
Hegarty Maths Links

Area	553, 554, 555, 556, 557, 558
Perimeter	548, 549, 550, 551, 552
Circles	534, 535, 536, 537, 538, 539, 540, 541, 542, 543
Volume	567, 568
Surface area	584, 590

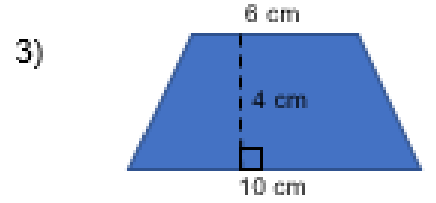
Year 8 Topic 2 Area and Volume Student Knowledge Organiser

Area and perimeter

Calculate the area and perimeter of the following shapes:

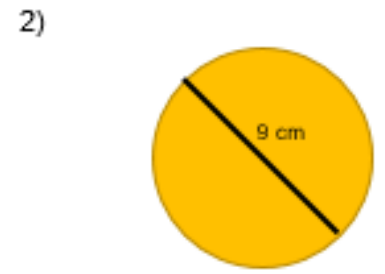
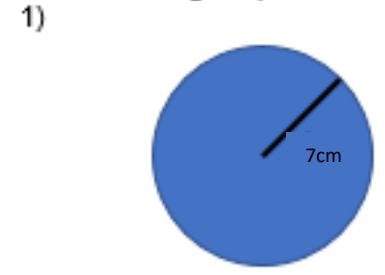


Calculate the area of the following shapes:



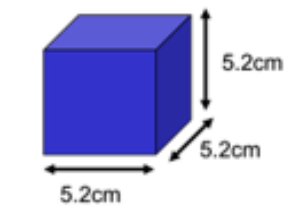
Circles

Calculate the area and circumference of the following shapes:



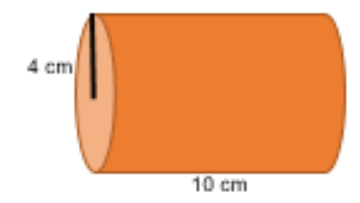
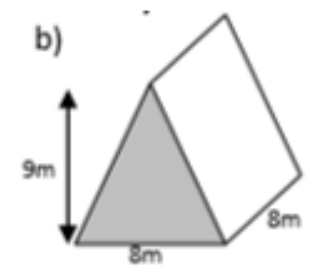
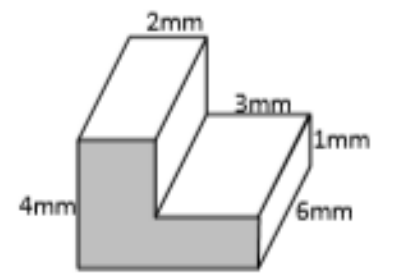
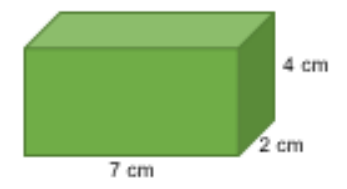
Surface Area

- How many vertices does a cube have?
- Draw the net of a cube
- Calculate the surface area of the following:



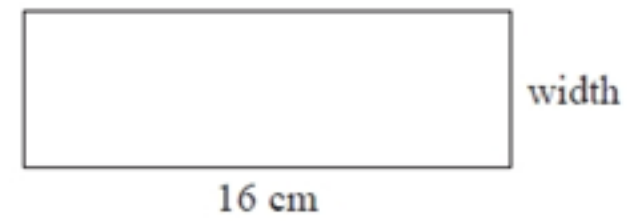
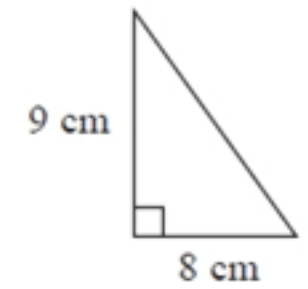
Volume

Calculate the volume of the following



Problem Solving

Here are a triangle and a rectangle.



The area of the rectangle is 6 times the area of the triangle.
Work out the width of the rectangle.

Year 8 Topic 3 Expressions Student Knowledge Organiser

Key words and definitions

Expression – numbers, symbols and operators grouped together

Term – number or variable or numbers and variables multiplied together

Equation – a mathematical statement that shows two things are equal

Expand – multiply to remove brackets

Factorise – the reverse of expanding, taking out a common factors

Substitution – putting numbers in place of letters

Simplify – collect like terms

Simplifying expressions

$$t + t + t = 3t$$

add powers
 $a^1 \times a^1 = a^2$

$$t \times t \times t = t^3$$

subtract powers
 $a^{10} \div a^3 = a^7$

Simplifying

$$3e + 6r - e + 5t$$

$$2e + 11t$$

If there is **no sign** in front of the term,
it is **POSITIVE**

Substitution

Evaluate $3a - 2b$, for $a = 10$ and $b = 4$

$$\begin{aligned} 3a - 2b & \quad (a = 10 \quad b = 4) \\ &= 3(10) - 2(4) \\ &= 30 - 8 \\ &= 22 \quad \checkmark \end{aligned}$$

Expand a single bracket

Expanding single brackets

$$3(x + 2)$$

$$3x + 6$$

Expand a double bracket

Expanding double brackets

$$(x + 3)(x + 4)$$

$$x^2 + 4x + 3x + 12$$

$$x^2 + 7x + 12$$

Factorising

$$4x + 16$$

4 is a factor of both 4 and 16.

$$4(x + 4)$$

Factorising a quadratic

$$x^2 + 5x + 4$$

1. Find factors of 4 which sum (add) to 5
2. They are $4 \times 1 = 4$ and $4 + 1 = 5$
3. Result is: $(x + 4)(x + 1)$

Writing expressions

5 less than a number k $k - 5$

a number x divided by 11 $\frac{x}{11}$

4 times the sum of n and 5 $4(n + 5)$

Hegarty Maths Links

Simplifying - 156, 157, 158, 159

Substitution - 780, 781, 782, 783, 784, 785

Expanding - 160, 161, 162, 163, 164, 165

Factorising - 168, 169, 223, 224

Year 8 Topic 3 Expressions Student Knowledge Organiser

Simplifying

- $3x + 6y - 4y + 2x$
- $y + y$
- $3p \times 5q$
- $p \times p \times p \times p$

Expanding

- $3(a + 4)$
- $5(c + 6b)$
- $4(x - 3y)$
- $a(a + 5)$
- $x(4y - 2x)$

Factorising into double brackets

- $x^2 + 5x + 6$
- $x^2 + 8x + 12$
- $x^2 + 13x + 30$
- $x^2 - 7x + 12$
- $x^2 - 2x + 1$
- $x^2 + 2x - 8$
- $x^2 + 7x - 30$

Substituting

- Find $3x + 5y$ when $x = 4$ and $y = 2$
- Find abc when $a = 2$, $b = 3$ and $c = 5$
- Find $7s - 2t$ when $s = 4$ and $t = -3$
- Find $4(2n - 3)$ when $n = 5$

Expanding and simplifying

- $4(2x + 3y) + 2(x + 2y)$
- $5(a + 3b) + 3(a - b)$
- $2(3a - 4b) - 3(2a + 1)$
- $(x + 2)(x + 3)$
- $(x + 5)(x + 2)$
- $(x - 6)(x - 6)$
- $(x + 10)(x - 4)$
- $(x + 3)(x - 5)$

Factorising into a single set of bracket

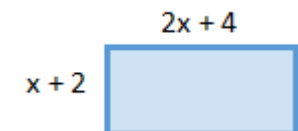
- $3x + 33$
- $5y + 25$
- $4a - 18$
- $x^2 + 4x$
- $y^3 - 2y$
- $4a^2 + 20a$

Writing expressions

My age is C , write expressions for the ages of the members of my family if:

- My brother is 3 years older than me
- My sister is 2 years younger than me
- My mum is double my age

Write an **expression** for the **area** of the rectangle.



Year 8 Topic 4 Fractions, decimals and percentages Student Knowledge Organiser

Key words and definitions

Fraction – represents part(s) of a whole

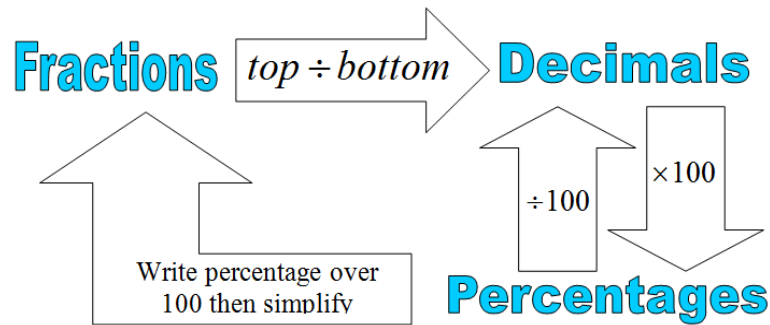
Percentage – how many parts per hundred

Equivalent – equal in value

Improper – a fraction where the numerator (top number) is larger than the denominator (bottom number)

Fraction, decimal and percentage equivalence

Fractions	Decimals	Percentages
$\frac{1}{5}$	0.2	20%
$\frac{3}{4}$	0.75	75%
$\frac{1}{8}$	0.125	12.5%
$\frac{1}{2}$	0.5	50%



Calculations with fractions

Add $\frac{1}{2} + \frac{1}{3} = \frac{1 \times 3}{2 \times 3} + \frac{1 \times 2}{3 \times 2} = \frac{3}{6} + \frac{2}{6} = \frac{5}{6}$

Subtract $\frac{7}{8} - \frac{1}{3} = \frac{7 \times 3}{8 \times 3} - \frac{1 \times 8}{3 \times 8} = \frac{21}{24} - \frac{8}{24} = \frac{13}{24}$

Multiply $\frac{3}{4} \times \frac{1}{3} = \frac{3}{12} = \frac{1}{4}$

Divide (KFC) $\frac{1}{2} \div \frac{1}{3} = \frac{1}{2} \times \frac{3}{1} = \frac{3}{2} = 1\frac{1}{2}$

$\frac{14}{3}$ How many 'whole' 3's fit into 14? $4\frac{2}{3}$

$7\frac{2}{5}$ $(5 \times 7) + 2 = \frac{37}{5}$

Finding a fraction of an amount

**multiply by the numerator
and
divide by the denominator**

For example,

$$\begin{aligned} \frac{2}{3} \text{ of } 18 \text{ litres} &= 18 \text{ litres} \div 3 \times 2 \\ &= 6 \text{ litres} \times 2 \\ &= 12 \text{ litres} \end{aligned}$$

Finding a percentages

% of an amount

15% of £200

10% = 20
5% = 10
Answer: £30

Increase by a %

Increase £200 by 15%

15% of 200 = 30
Add it on or use the multiplier (1.2)
(200 x 1.2)
Answer: £230

Decrease by a %

Decrease £200 by 15%

15% of 200 = 30
Subtract it or use the multiplier (0.85)
(200 x 0.85)
Answer: £170

Standard Form

- | | |
|-----------------------|-----------------------|
| 1) 4733 | 4) 0.00000081 |
| 4.733×10^3 | 8.1×10^{-7} |
| 1) 0.00765 | 5) 7277.66 |
| 7.65×10^{-3} | 7.27766×10^3 |

Hegarty Maths Skills Links

Fraction, decimal, percentages	73, 74, 75, 76
Equivalent fractions	59, 60, 61, 62
4 operations with fractions	65, 66, 67, 68, 69, 70, 71, 72
Fraction of an amount	77, 78
Improper fractions/mixed numbers	63, 64
Percentage of an amount	84, 85, 86, 87, 88, 89

Year 8 Topic 4 Fractions, decimals and percentages Student Knowledge Organiser

Simplifying Fractions

- 1) Simplify $\frac{9}{18}$
- 2) Simplify $\frac{12}{20}$
- 3) Simplify $\frac{16}{24}$
- 4) Write as an improper fraction $2\frac{3}{4}$
- 5) Write as a mixed number $\frac{27}{6}$

Calculating with fractions

Give your answers in their simplest form.

- 1) $\frac{1}{2} + \frac{1}{4}$
- 2) $\frac{5}{12} \times \frac{6}{15}$
- 3) $\frac{16}{27} \div \frac{8}{9}$
- 4) $2\frac{1}{3} - 1\frac{2}{3}$

Equivalent fractions

1) Complete the table below.

Fraction	Decimal	Percentage
$\frac{1}{2}$		
	0.6	
		15%
$\frac{1}{4}$		

2) Would you rather have $\frac{3}{4}$, 70% or 0.72 of a pizza? Why?

Standard form

Write the following numbers in standard form:

- 1) 7 650 000
- 2) 534 000 000 000
- 3) 0.00057
- 4) 0.000807

Write the following as ordinary numbers:

- 1) 8.76×10^6
- 2) 1.106×10^8
- 3) 1.6×10^{-5}
- 4) 7.31×10^{-2}

Percentage of an amount

- | | | |
|--|---|---------------------------|
| 1) Claire improves her further distance for running by 19%. She used to be able to run 4km. How far can she run now? | 1) Calculate 40% of 600 ml. | 2) Calculate 67% of £120. |
| 2) Michael gets 42% better at kick ups. He used to be able to do 32. How many can he do now? | 3) Bobby went to the shop and there was a 20% sale. He was going to buy a top for £24. How much does he save? | |
| 3) Ben loses 36% of his Instagram followers. He used to have 380. How many does he have now? | 4) Sarah went to the shop and there was a 15% sale. She was going to buy a CD for £8. How much does she save? | |
| 4) Red bull has 94% more sugar than Coke Life. Coke Life has 1.2g of sugar. How much does Red Bull have? | | |

Year 8 Topic 5 Probability Student Knowledge Organiser

Key words and definitions

Probability – the likelihood of an event happening

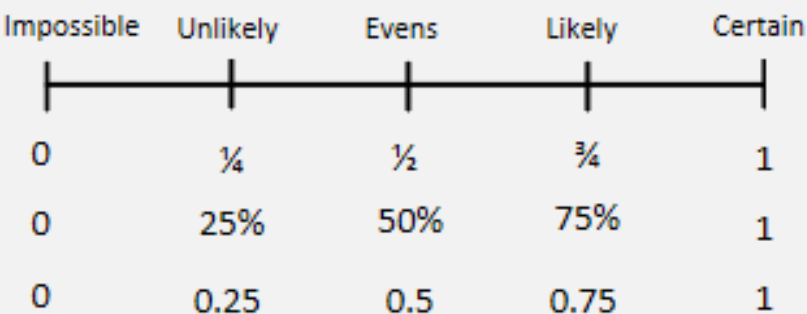
Mutually exclusive events – events which may not occur at the same time.

Exhaustive - Events are exhaustive if they include all possible outcomes

Sample space diagram - shows all the possible outcomes. It is used to find theoretical probability.

Outcome – A possible result of an experiment or trial.

Probability Scale



$$\text{Probability} = \frac{\text{number of successful outcomes}}{\text{total number of possible outcomes}}$$

Probability of an event not happening

$$P(\text{not } A) = 1 - P(A)$$

Ex: The probability of NOT tossing a  of a die.

$$P(A) = \frac{1}{6} \text{ (Probability of Event A)}$$

$$\text{therefore } P(\text{not } A) = 1 - P(A) = 1 - \frac{1}{6} = \frac{5}{6}$$

Sample space diagrams

Represent the results from **adding** two 6-sided dice in a sample space diagram.

- The probability of getting a total of 7? $\frac{6}{36}$
- The probability of getting a total of a 1? $\frac{0}{36}$
- The probability of getting a total of a 10? $\frac{30}{36}$

		First die					
		1	2	3	4	5	6
Second die	1	2	3	4	5	6	7
	2	3	4	5	6	7	8
	3	4	5	6	7	8	9
	4	5	6	7	8	9	10
	5	6	7	8	9	10	11
	6	7	8	9	10	11	12

Relative Frequency

$$\text{Relative Frequency} = \frac{\text{number of 'successful' trials}}{\text{total number of trials}}$$

Item	Frequency	Relative frequency
1	4	4/20 (or 20%)
2	5	5/20 (or 25%)
3	5	5/20 (or 25%)
4	2	2/20 (or 10%)
5	4	4/20 (or 20%)
Total	20	

Experimental Probability

$$\text{Estimated/Experimental Probability} = \frac{\text{frequency of event}}{\text{total frequency}}$$

Predicted number of outcomes = probability x number of trials

Hegarty Maths Links

Probability scale - 349

Theoretical probability – 350, 351. 352

Probability of an event not happening - 353

Relative frequency - 357

Experimental probability – 355, 356

Sample space diagrams – 358, 359

Year 8 Topic 5 Probability Student Knowledge Organiser

Probability

- I roll a normal, 6 sided dice. What is the probability that I get:
 - a 6?
 - an even number?
 - a number less than 2?
- The spinner shown in spun. What is the probability that the spinner lands on:
 - red?
 - red or yellow?
 - not blue?
- I put the letters from the word EXERCISE on cards, place them face down and then mix them up. I pick one card at random. What is the probability that the card is:
 - an X?
 - a vowel?
 - not an E?
- The probability that I win a 100m race is $\frac{3}{10}$. What is the probability that I don't win the race?
- The probability that it rains tomorrow is 0.14. What is the probability that it doesn't rain tomorrow?



Probability scale

On the probability scale below, mark

- with the letter S, the probability that it will snow in London in June,
- with the letter H, the probability that when a fair coin is thrown once it comes down heads,
- with the letter M, the probability that it will rain in Manchester next year.



Sample space diagrams

Two fair dice are thrown together and the scores are added together.

- Complete the sample space diagram showing all the possible outcomes

	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						

- How many outcomes are there altogether?
- What is the most likely score?
- What are the least likely scores?
- What is probability of scoring 10 or more?
- What is the probability of scoring less than 5?

Listing

- Three friends Andrew, Billy and Chris are sitting in the same row at a concert. Show the different seating arrangements that are possible.
- A restaurant menu allows a choice of one each of starter, main course and sweet. The choices are:

<u>Starter</u>	<u>Main Course</u>	<u>Sweet</u>
Melon	Pasta	Gateaux
Soup	Fish	Ice-cream
	Chicken	

Relative Frequency

- The probability that a biased dice will land on a five is 0.3. Megan is going to roll the dice 400 times. Work out an estimate for the number of times the dice will land on a five.
- Jack sows 300 wildflower seeds. The probability of a seed flowering is 0.7. Work out an estimate for the number of these seeds that will flower.

Year 8 Topic 6 Equations Student Knowledge Organiser

Key words and definitions

Equation – a statement linking two expressions as equal

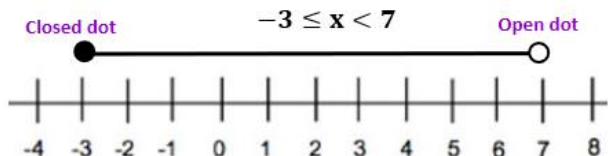
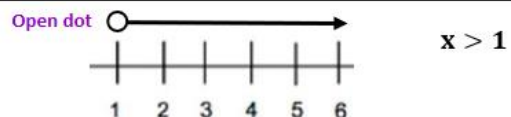
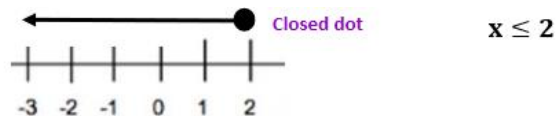
Variable – a symbol that may take any value

Constant – a value that does not change

Coefficient – a constant attached to the front of a variable

Formula – a statement, often written as an equation, that shows the exact relationship between different variables e.g. $y=mx+c$.

Inequalities on number lines



$$3 \leq x < 7$$

This is asking what values would represent x . They are 3, 4, 5, and 6. This is because \leq includes the 3 but $<$ does not include the 7

Simple equations

$$y + 7 = 10$$

$$y = 3$$

$$10 - 7 = 3$$

$$2y - 3 = 9$$

$$2y = 12$$

$$y = 6$$

To solve the question, we use the inverse operation to get the variable (letter) on its own

Equations with brackets

$$2(4p + 1) = 18$$

{Use Distributive Law}

$$8p + 2 = 18$$

{Subtract 2 from both sides}

$$8p + 2 - 2 = 18 - 2$$

$$8p = 16$$

{Divide both sides by 8}

$$\frac{8p}{8} = \frac{16}{8}$$

$$p = 2$$

Rearranging formulae

Rearrange the formula to make a the subject

This means we want to rearrange the formula so it says $a =$

$$b = 5a + 21$$

$$b - 21 = 5a$$

$$b - 21 = 5a$$

$$b - 21 = 5a$$

$$b - 21 = 5a$$

$$b - 21 = 5a$$

$$b - 21 = 5a$$

$$b - 21 = 5a$$

$$b - 21 = 5a$$

$$b - 21 = 5a$$

Our answer should say ... $a = \frac{b - 21}{5}$

Unknown on both sides

$$5y - 8 = 2y + 7$$

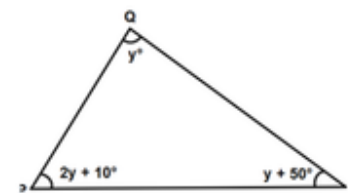
$$3y - 8 = 7$$

$$3y = 15$$

$$y = 5$$

Forming and solving equations

PQR is a triangle. Form and solve an equation to find the value of y .



What do the angles in a triangle add up to?

180

How can we write an equation for this?

$$2y + 10 + y + y + 50 = 180$$

Can we collect like terms?

$$4y + 60 = 180$$

$$4y = 120$$

$$y = 30$$

Hegarty Maths Links

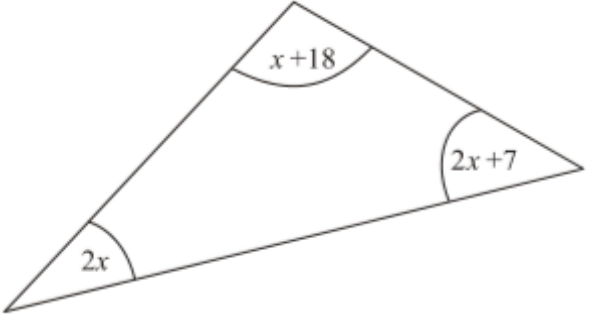
Inequalities – 265, 266, 267, 268, 269

Solving – 178, 179, 180, 181, 182, 183, 184, 185, 186, 187

Forming and solving – 176, 188

Rearranging formulae – 280, 281, 282, 283, 284, 285

Year 8 Topic 6 Student Knowledge Organiser

Solving		Inequalities		Forming and solving
1)	$x + 4 = 11$	1)	$6(x - 2) = 24$	<p style="text-align: center;">  </p> <p>The sizes of the angles, in degrees, of the triangle are</p> <p style="margin-left: 20px;">$2x + 7$</p> <p style="margin-left: 20px;">$2x$</p> <p style="margin-left: 20px;">$x + 18$</p> <p>(a) Use this information to write down an equation in terms of x.</p> <p style="text-align: right;">.....</p> <p>(b) Use your answer to part (a) to work out the value of x.</p>
2)	$w - 6 = 23$	2)	$5(4y + 2) = 70$	
3)	$5d = 70$	3)	$2x + 4 = 5x - 8$	
4)	$\frac{k}{4} = 7$	4)	$4x - 3 = 2x + 2$	
5)	$2x + 6 = 12$	5)	$3(x + 6) = 4(x + 5)$	

Year 8 Topic 7 Shapes and Angles Student Knowledge Organiser

Key words and definitions

Polygon - A **polygon** is any 2-dimensional shape formed with straight lines. The name tells you how many sides the shape has. For example, a triangle has three sides, and a quadrilateral has four sides.

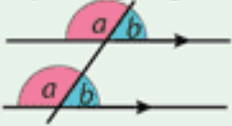
Parallel lines – lines which never meet, they stay the same distance apart

Plan view – looking down on an object from above

Elevation – view from the front or side of an object

Angles in parallel lines

Corresponding Angles



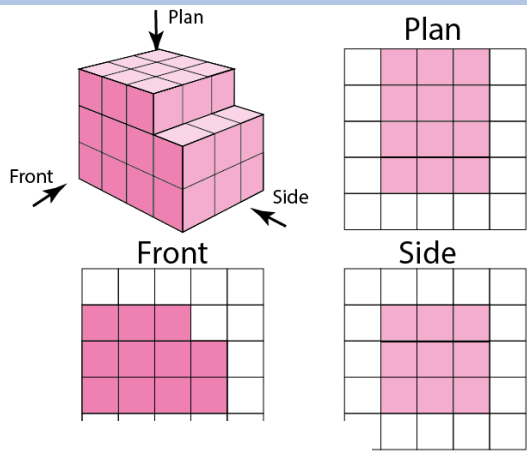
Corresponding angles are equal. They can be found in F shapes.

Alternate Angles



Alternate angles are equal. They can be found in Z shapes.

Plans and elevations

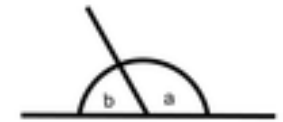


Types of special quadrilaterals

Quadrilateral	Properties	
Rectangle	4 right angles and opposite sides equal	
Square	4 right angles and 4 equal sides	
Parallelogram	Two pairs of parallel sides and opposite sides equal	
Rhombus	Parallelogram with 4 equal sides	
Trapezium	Two sides are parallel	
Kite	Two pairs of adjacent sides of the same length	

Angle facts

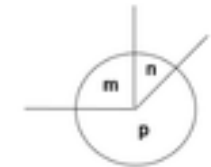
The angles on a straight line add up to 180° .
 $a + b = 180^\circ$



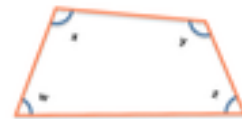
The angles in a triangle add up to 180° .
 $a + b + c = 180^\circ$



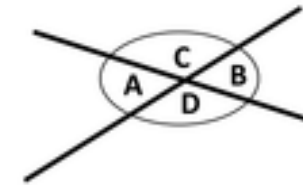
The angles at a point add up to 360° .
 $m + n + p = 360^\circ$



The angles in a quadrilateral add up to 360° .
 $w + x + y + z = 360^\circ$



Vertically opposite angles are equal.
 $A = B$
 $D = C$



Angles in polygons

Angle Sum

$(n - 2) \times 180^\circ$
number of triangles

4 $\times 180^\circ = 540^\circ$

3 triangle, 4 quadrilateral, 5 pentagon, 6 hexagon, 7 heptagon, 8 octagon, 9 nonagon, 10 decagon

Polygons

interior angle

angle sum / number of sides

OR

$180^\circ - \text{exterior angle}$

exterior angle

360° / number of sides

OR

$180^\circ - \text{interior angle}$

Hegarty Maths Links

Properties of quadrilaterals and triangles – 823, 824, 825, 826

Basic angle facts – 477, 478, 479, 585, 486, 487

Angles in parallel lines – 481, 483

Angles in polygons – 561, 562, 563, 564

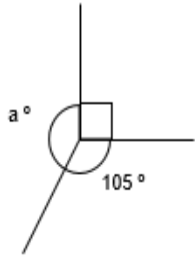
Plans and elevations – 837, 838, 839, 840, 841, 842, 843, 844

Year 8 Topic 7 Shapes and Angles Knowledge Organiser

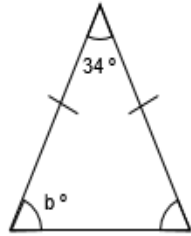
Angles

Calculate the missing angles in each of these diagrams and give reasons for your answers.

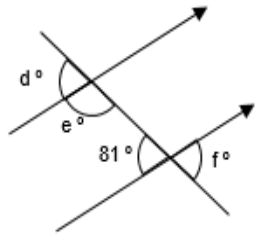
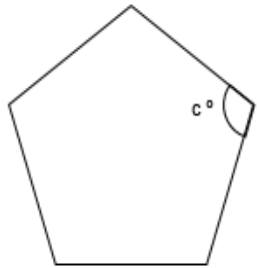
1)



2)



3) Diagram shows a regular pentagon 4)

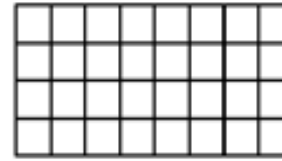


Plans and elevations

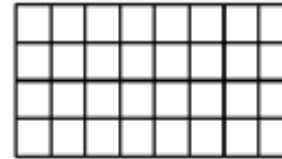
Draw the front, side and plan view.



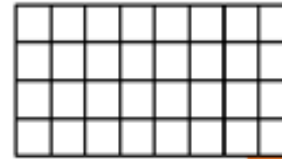
Front



Side

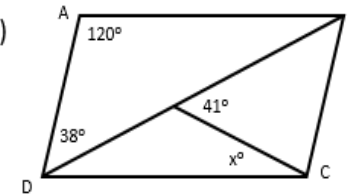


Plan



Apply your knowledge

1)



ABCD is a parallelogram

Angle ADB = 38°

Angle BEC = 41°

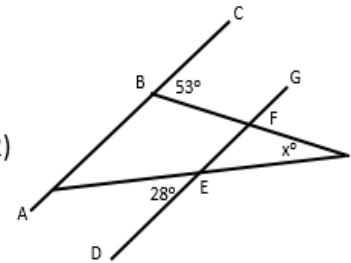
Angle DAB = 120°

Calculate the size of angle x

You must give reasons for your answer.

Diagrams NOT accurately drawn

2)

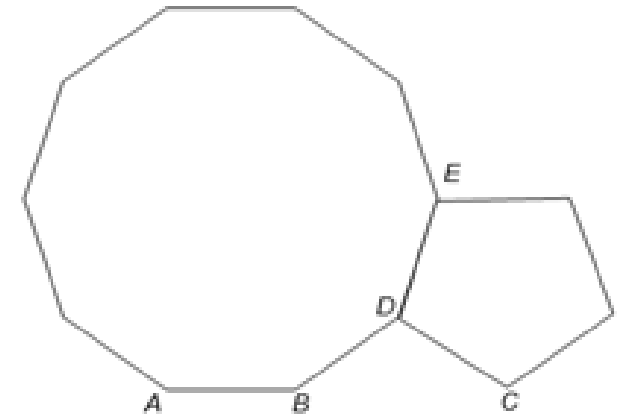


ABC and DEFG are parallel.

AEH and BFH are straight lines.

Work out the size of the angle marked x .

A regular decagon and a regular pentagon have sides the same length. They are joined as shown.



Prove that ABC is a straight line.

Year 8 Topic 8 Ratio Student Knowledge Organiser

Key words and definitions

Ratio – A **ratio** shows the relative sizes of two or more values.

Direct proportion – There is a **direct proportion** between two values when one is a multiple of the other.

Inverse Proportion – a relation between two quantities such that one increases in proportion as the other decreases.

Simplify – To **simplify** a **ratio** means to reduce it to its simplest form. In order to do this you need to find the highest common factor for both terms in the **ratio**.

Highest common factor – the highest number that can be divided exactly into each of two or more numbers.
"6 is the highest common factor of 12 and 18"

Simplify ratio

Ratios can be fully **simplified** just like fractions.

Simplify: 6 : 12

To simplify a ratio, divide all of the numbers in the ratio by the same number (**highest common factor**) until they cannot be divided any more.

Divide both by 6

1 : 2

Write in the form 1:n

When asked to write a ratio in the format 1 : n, you need to **divide BOTH sides** by **the ratio where the 1 is**.

Write **7 : 21** in the ratio **1 : n**

7 : 21 divide both sides by **7**

1 : 3

Share in a given ratio

Monty and Mosaurus get A TOTAL of £72 pocket money.

They share it in the **ratio 5 : 3**
How much do they each get?

- **Add the ratios: 3 + 5 = 8**
- **Divide 72 by 8 (72 ÷ 8 = 9)**
Each ONE portion is worth £9

Monty has 5 portions

$$5 \times 9 = \text{£}45$$

Mosaurus has 3 portions

$$3 \times 9 = \text{£}27$$

In a school the ratio of boys to girls is 9 : 4.

There are 270 boys in the school.
How many students are there in the school altogether?

Divide the total number of boys by the boy's ratio

$$270 \div 9 = 30$$

This gives the number for 1 'portion'

Girls

$$4 \times 30 = 120$$

$$\text{Total} = 270 + 120 = 390$$

Recipes

A recipe for 6 people uses 900g of mince. How much mince is needed for

a 12 people

P : M

$$\begin{array}{l} 6 : 900\text{g} \\ \times 2 \left(\begin{array}{l} 6 : 900\text{g} \\ 12 : 1800\text{g} \end{array} \right) \times 2 \end{array}$$

b 3 people

P : M

$$\begin{array}{l} 6 : 900\text{g} \\ \div 2 \left(\begin{array}{l} 6 : 900\text{g} \\ 3 : 450\text{g} \end{array} \right) \div 2 \end{array}$$

c 9 people?

6 people + 3 people = 9 people

$$900 + 450 = 1350\text{g}$$

Exchange rates

The exchange rate is:

£1 buys \$2.12

Find how many dollars (\$) can be bought for £1500

$$\begin{array}{l} \left(\begin{array}{l} \times 1500 \\ \text{£}1500 = \end{array} \right) \text{£}1 = \$2.12 \left(\begin{array}{l} \times 1500 \\ \end{array} \right) \\ \$ \dots\dots\dots (1) \end{array}$$

Maps and scales

6. Each diagram is part of a map. Find the actual distance between the two places for each map. Give your answers in metres.

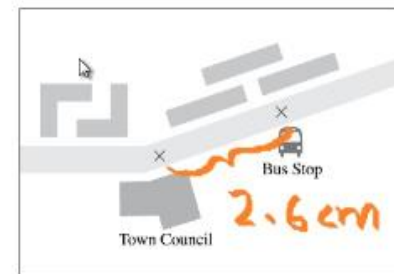
(a) Scale 1 : 12 500

$$\begin{array}{l} 1 \text{ cm} : 12\,500 \text{ cm} \\ 2.6 \text{ cm} : 32\,500 \text{ cm} \end{array} \times 2.6$$

if 100 cm is 1m

$$32\,500 \text{ cm is } \frac{325}{100} \text{ m}$$

$$32500$$



Inverse proportion

Best seen with an example usually builders!

If it takes **2** builders **10** days to dig a hole, how long will it take **1** builder?

$$\begin{array}{l} B \quad D \\ 2 : 10 \\ \div 2 \left(\begin{array}{l} 2 : 10 \\ 1 : 20 \end{array} \right) \times 2 \end{array}$$

Hegarty Maths Links

Simplify ratio - 329

Write in the form 1:n - 331

Share in a given ratio – 332, 333, 334

Recipes – 739, 740, 741, 742

Exchange rates – 707, 708

Maps and scales – 864, 865, 866, 867, 868

Inverse proportion - 342

Year 8 Topic 8 Ratio Student Knowledge Organiser

Simplify ratio

- 1) Simplify 16 : 8
- 2) Simplify 11 : 22
- 3) Simplify 24 : 12
- 4) Simplify 50p : £2.50
- 5) Simplify 4 : 8 : 12
- 6) There are 32 pupils in a class. 20 of them are girls. What is the ratio of boys to girls in its simplest form?

Write in the form 1:n

The ratio 20 minutes to 1 hour can be written in the form 1 : n .

Find the value of n .

The scale 1 cm represents 25m can be written in the form 1 : k .

Find the value of k .

Ratio – sharing

- 1) Paul is making grey paint. He mixes black and white paint in the ratio 1 : 3. He makes 35 litres of grey paint. How much white paint does he use?
- 2) The ratio of adults to children in the sports club is 5 : 2. There are 120 adults in the club. How many children are there?
- 3) Tim, Shula and Carol share the running costs of the car in the ratio 1 : 2 : 3. Last year it cost £1860 to run the car. How much did Carol pay?

Proportion - recipes

Here is a list of ingredients for making **10** Flapjacks.

Ingredients for 10 Flapjacks

80 g rolled oats

60 g butter

30 ml golden syrup

36 g light brown sugar

Work out the amount of each ingredient needed to make **15** Flapjacks.

Proportion - inverse

A farmer has enough food for 200 chickens for 20 days. He buys 50 more chickens. How long will the food now last?

Apply your knowledge

400 g of raspberries and 300 g of strawberries cost a total of £7.46
500 g of strawberries cost £4.10

Work out the total cost of 200 g of raspberries and 200 g of strawberries.

Colin, Dave and Emma share some money.

Colin gets $\frac{3}{10}$ of the money.

Emma and Dave share the rest of the money in the ratio 3 : 2

What is Dave's share of the money?

Key words and definitions

Basic trigonometry is used to calculate **angles** and **side lengths** in **right-angled triangles**.

Trigonometry involves **three ratios**: **sine**, **cosine** and **tangent** which are abbreviated to: **sin**, **cos** and **tan**.

Hypotenuse- The longest side of a right-angled triangle. It is opposite the right angle.

Pythagoras – short side

Finding a hypotenuse



Always begin by identifying the hypotenuse. This is the longest side, and is always opposite the right angle.

$a=3$
 $b=5$

$$a^2 + b^2 = h^2$$

$$3^2 + 5^2 = x^2$$

$$9 + 25 = x^2$$

$$34 = x^2$$

$$\sqrt{34} = x$$

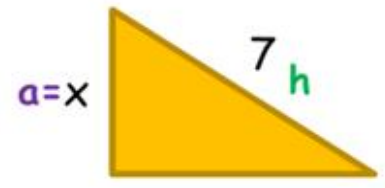
You might also want to label the other two sides with a and b (either way round).

Substitute the values then work out the left hand side.

Square root to "undo" the squaring operation.

Pythagoras – long side

Finding a short side



$$a^2 + b^2 = h^2$$

$$x^2 + 4^2 = 7^2$$

$$x^2 + 16 = 49$$

$$x^2 = 49 - 16$$

$$x^2 = 33$$

$$x = \sqrt{33}$$

Make sure you can rearrange formulae confidently!

Label the sides, write down the formula and substitute as before.

Subtract 16 so the left hand side reads $x^2 = \dots$

Square root to "undo" the squaring operation as before.

Trigonometry – Finding a side

Steps:

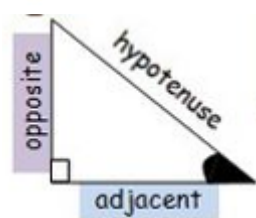
1. Label the sides of the triangle (opp, adj, hyp)
2. Identify which trig identity? (sin, cos, tan)

SOHCAHTOA

3. Form an expression

e.g. $\sin \theta = \frac{\text{opp}}{\text{hyp}}$

4. Solve to find the unknown side



Trigonometry – Finding an angle

SOH

$$\sin \theta = \frac{O}{H}$$

CAH

$$\cos \theta = \frac{A}{H}$$

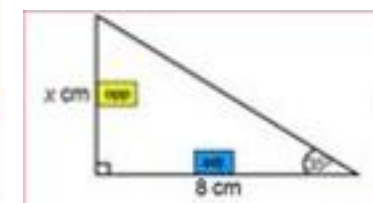
TOA

$$\tan \theta = \frac{O}{A}$$

Cover the term you are looking for.

Example:
Using Cos ratio:

To work out 'A', cover A and my calculation is Cos θ x Hypotenuse



$$\tan A = \frac{\text{opp}}{\text{adj}}$$

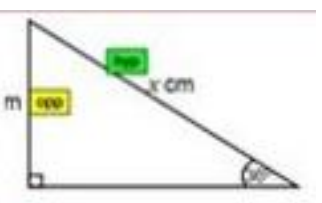
$$\tan 35^\circ = \frac{x}{8}$$

$$8 \times \tan 35^\circ = x$$

$$5.6016603 = x$$

$$5.6 \text{ cm} = x$$

Finding a side



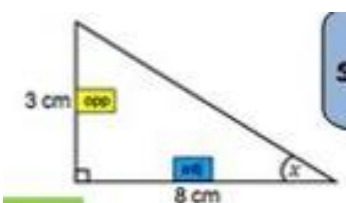
$$\sin A = \frac{\text{opp}}{\text{hyp}}$$

$$\sin 36^\circ = \frac{11}{x}$$

$$x = \frac{11}{\sin 36^\circ}$$

$$x = 18.7 \text{ cm}$$

Finding an angle



$$\tan x = \frac{\text{opp}}{\text{adj}}$$

$$\tan x = \frac{3}{8} = 0.375$$

$$x = \tan^{-1} 0.375$$

$$x = 20.556045$$

$$x = 20.6^\circ$$

Hegarty Maths Links

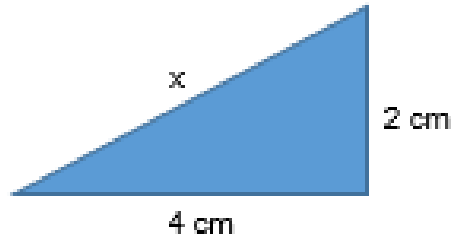
Pythagoras- 497, 498, 499

Trigonometry – 508, 509, 510, 511, 512

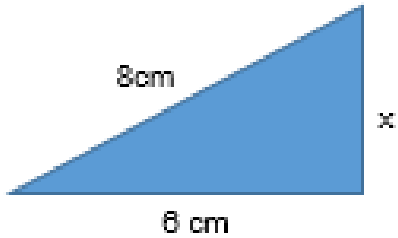
Pythagoras

Calculate the missing side

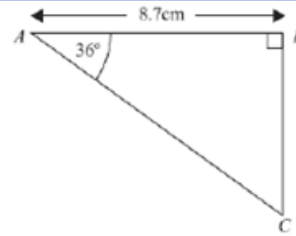
1)



2)



Trigonometry

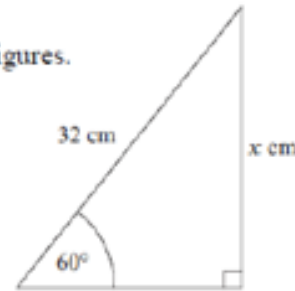


ABC is a right-angled triangle.

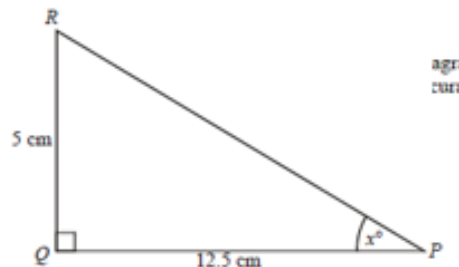
Angle $B = 90^\circ$.
 Angle $A = 36^\circ$.
 $AB = 8.7$ cm.

Work out the length of BC .
 Give your answer correct to 3 significant figures.

Calculate the value of x .
 Give your answer correct to 3 significant figures.



Calculate the value of x .
 Give your answer correct to 1 decimal place.

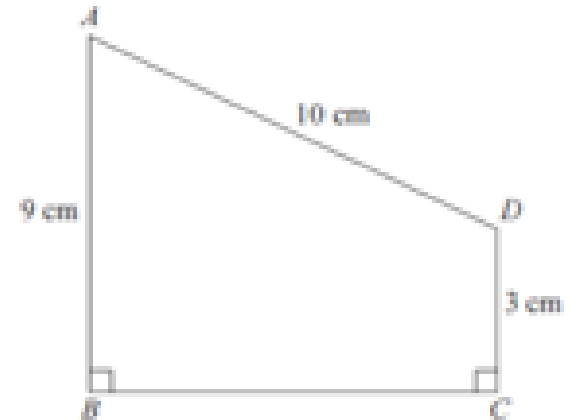


Apply your knowledge

$ABCD$ is a trapezium.

$AD = 10$ cm
 $AB = 9$ cm
 $DC = 3$ cm
 Angle $ABC = \text{angle } BCD = 90^\circ$

Calculate the length of AC .
 Give your answer correct to 3 significant figures.



Year 8 Topic 10 Graphs Student Knowledge Organiser

Key words and definitions

Coordinate – used to indicate the position of a point

Gradient – how steep the graph is

Y-intercept- where the graph crosses the y axis

Midpoint- the middle coordinate of the line segment

Axis – a fixed reference line for the measurement of coordinates

Horizontal – parallel to the plane of the horizon at right angles to the vertical.

Parallel- Lines which have the same distance continuously between them.

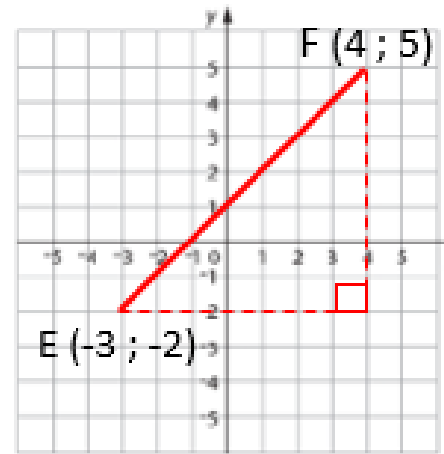
Midpoint

Add the two x values and $\div 2$

Add the two y values and $\div 2$

$$\frac{(-3 + 4)}{2} \quad \frac{(-2 + 5)}{2}$$

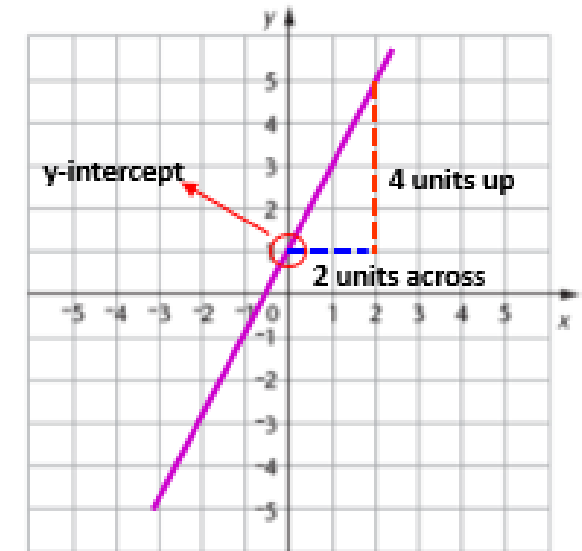
$$= \left(\frac{1}{2} ; \frac{3}{2} \right)$$



Gradient

$y = mx + c$ is the equation of a straight-line graph
 \downarrow \downarrow
Gradient **y-intercept**

$$\text{Gradient} = \frac{\text{change in } y}{\text{change in } x} = \frac{4}{2} = 2$$



Equation is therefore $y = 2x + 1$

Coordinates

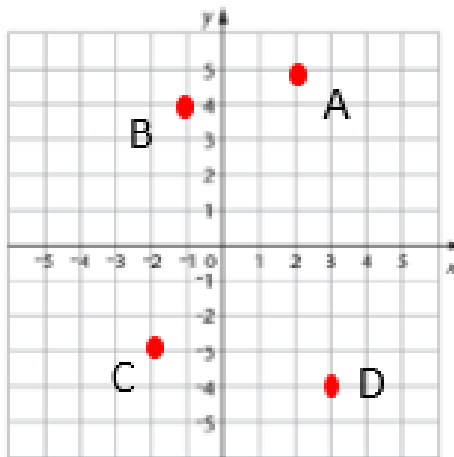
Always **write the X first** (across), then Y (up)

A (2 ; 5)

B (-1 ; 4)

C (-2 ; -3)

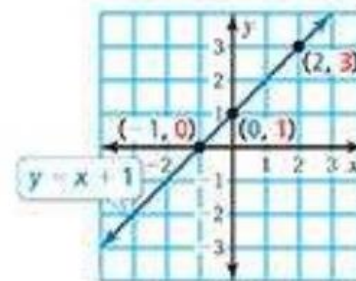
D (3 ; -4)



Linear graphs

- ▶ A **linear equation** is an equation whose graph is a line.
- ▶ The points on the line are **solutions** of the equation.

x	y	(x, y)
-1	0	(-1, 0)
0	1	(0, 1)
2	3	(2, 3)



Hegarty Maths Links

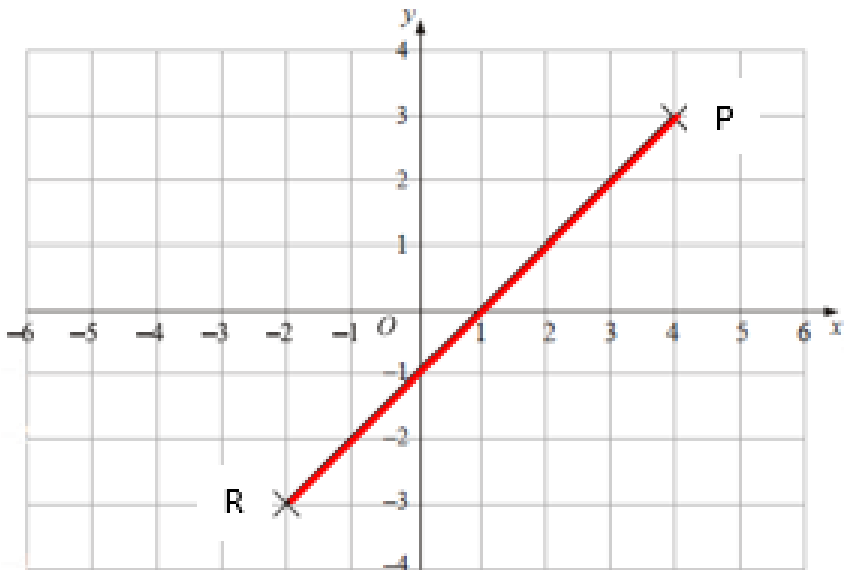
Coordinates - 199 -

Midpoints - 200

Linear graphs = 206, 207, 208, 209

Coordinates and midpoint

- 1a) Write down the coordinate of R and P
 b) Calculate the midpoint of the line segment RP

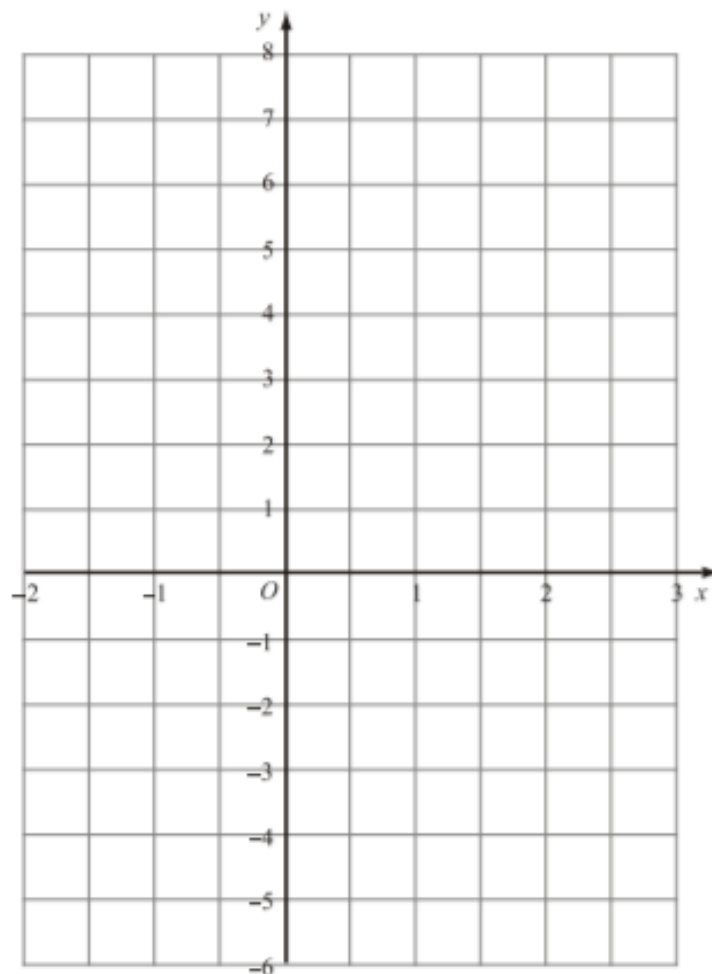


Linear Graphs

- (a) Complete the table of values for $y = 2x + 1$

x	-2	-1	0	1	2	3
y		-1	1			

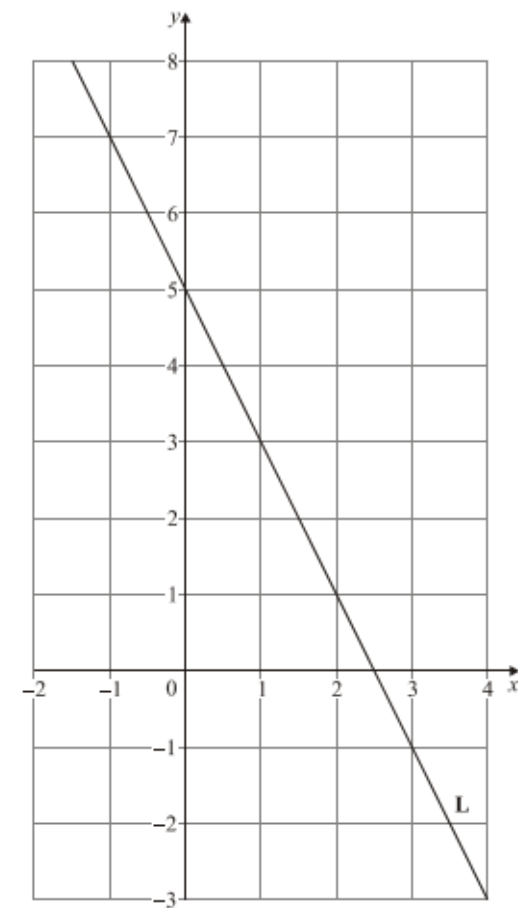
- (b) On the grid, draw the graph of $y = 2x + 1$



Equation of a line

The equation of a straight line is $y = 3x - 2$.

Write down the coordinates of the point where this line crosses the y-axis.



Find the equation of line L

Year 8 Topic 11 Sequences Student Knowledge Organiser

Key words and definitions

Sequence – A set of quantities ordered in the same manner as the positive integers.

Pattern – a set of numbers or objects in which all the members are related with each other by a specific rule.

nth term – a formula that enables you to find any number in a sequence of numbers.

Position-to-term – a rule that defines the value of each term in a sequence.

Term-to-term – is the difference between the numbers in the sequence

Linear – A number pattern which increases (or decreases) by the same amount each time

Using a term-to-term rule

Find the next term in the sequence 28, 37, 46, 55, 64, ...

① ② ③ ④ ⑤ ⑥

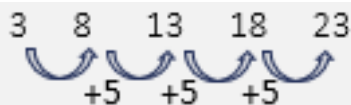
28, 37, 46, 55, 64, 73, ...

+9 +9 +9 +9 +9

← ARITHMETIC SEQUENCE

Answer 73

nth term of a linear sequence



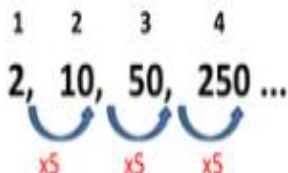
1. Find the *difference* between each term:
5
2. Always put 'n' next to it (n = term number)
5n
3. Add or subtract to get the first term in the sequence?
5 - 2 = 3

The n^{th} term is $5n - 2$

Geometric sequence

A geometric sequence is one where to get from one term to the next you multiply by the same number each time. This number is called the **common ratio, r**.

Eg



r=5

Sequences from patterns



Shape number	1	2	3	4	5	6	7	8	9	10	50
Number of matchsticks	3	5	7	9	11	13	15	17	19	21	101
Function rule	Number of matchsticks = Shape number \times <u>2</u> + <u>1</u>										

Finding missing terms

Find the missing terms and rule for: 48, __, 70, __, 92

48 \rightarrow 70 (2 jumps!) gives us: Add 22

So our rule for **one jump** is half this \rightarrow Add 11 (common diff = +11)

Number after 48 $\rightarrow 48 + 11 =$ **59**

[CHECK: 59 $\rightarrow 59 + 11 = 70!$]

Number after 70 $\rightarrow 70 + 11 =$ **81**

Hegarty Maths Links

Linear sequences from pictures- 196

Term to term rule – 197

Nth term - 198

Geometric Sequences - 264

Year 8 Topic 11 Sequences Student Knowledge Organiser

Sequences

- 1) Find the next three terms and the rule of the sequence 6, 10, 14, 18,

- 2) Find the next three terms and the rule of the sequence 5, 10, 20, 40,.....

- 3) Find the first three terms of the sequence with n th term $3n - 2$

- 4) Find the first three terms of the sequence with n th term $2n + 4$

Nth term

- Find the n^{th} term of the following sequences
- 1) 5, 8, 11, 14, 17,

 - 2) 9, 14, 19, 24, 29,.....

 - 3) 3, 9, 15, 21, 27,.....

 - 4) 2, 4, 6, 8, 10,.....

Patterns

Here are some patterns made up of dots.

Pattern number 1 Pattern number 2 Pattern number 3

(a) In the space below, draw Pattern number 4.

(b) Complete the table.

Pattern number	1	2	3	4	5
Number of dots	10	14	18		

(c) How many dots are used in Pattern number 10?

Year 8 Topic 12 Charts and Averages Student Knowledge Organiser

Key words and definitions

- Primary data – data collected first hand, in a survey or experiment
- Secondary data – data collected by someone else
- Discrete – can only take certain values, usually something you can count
- Continuous – data that can be measured, can take any value
- Average – a typical value for some data, see mean, mode and median
- Distribution – how data is spread out, takes account of average & range

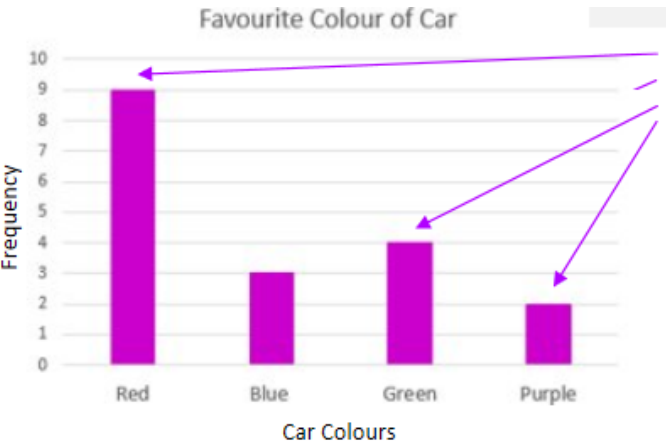
Averages

	Average	Advantages	Disadvantages
Mode Most common			
Mean Sum of values Number of values		Every value makes a difference	Affected by extreme values
Median Middle value in ascending order		Not affected by extreme values. Can be non-numerical	May not change if a data value changes There may not be one. There may be more than one.

Tally Charts and bar charts

Complete a tally chart for the most popular colour of car
 Red, blue, red, green, red, purple, red, green, red
 purple, green, blue, red, green, blue, red, red, red

Colour	Tally	Frequency
Red		9
Blue		3
Green		4
Purple		2



The number of red, blue, green and purple cars is the frequency (height of the bars).

IMPORTANT

- The bars are the SAME width
- The gaps between the bars are the SAME width
- Both axes are labelled
- The graph has a title
- Frequency starts at 0

Range

Range
 Largest value – smallest value

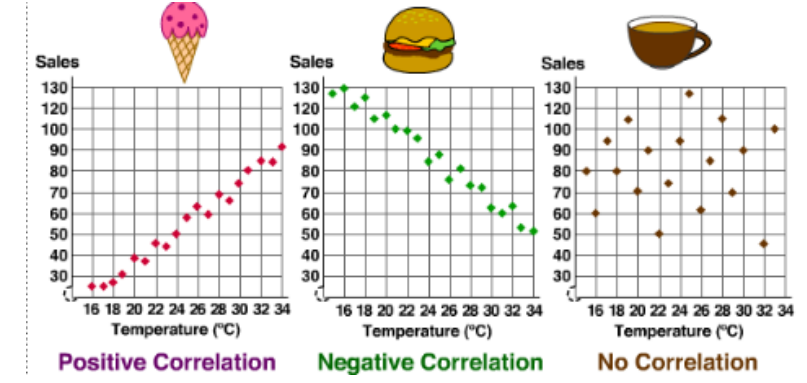
Pie chart

1	Sum (add up) the frequency	
2	$360^\circ \div \text{frequency}$	
	$360^\circ \div 72 = 5$	
3	Multiply each category x5 to find sector size	
Fish	Frequency	
Perch	10	$x 5 = 50^\circ$
Bream	23	$x 5 = 115^\circ$
Carp	39	$x 5 = 195^\circ$
TOTAL	72	360°
$360^\circ \div 72 = 5$		

Draw an accurate pie chart to show this information.
 This table give information about then number of fish in a lake.



Scatter graphs



Hegarty Maths Skills Links

- Averages: 404, 405, 406, 407, 408, 409, 410, 413
- Tally and bar charts: 401, 425
- Scatter graphs: 453, 454
- Pie charts: 427, 428, 429

Averages

Bar Charts

Pie charts

1) Here are fifteen numbers.
10 12 13 15 15 17 19 20 20 20 21 25
25 25 25

- a) Find the mode.
- b) Find the median.
- c) Work out the range.

2) A rugby team played 7 games.
Here is the number of points they scored in each game.
3 5 8 9 12 12 16

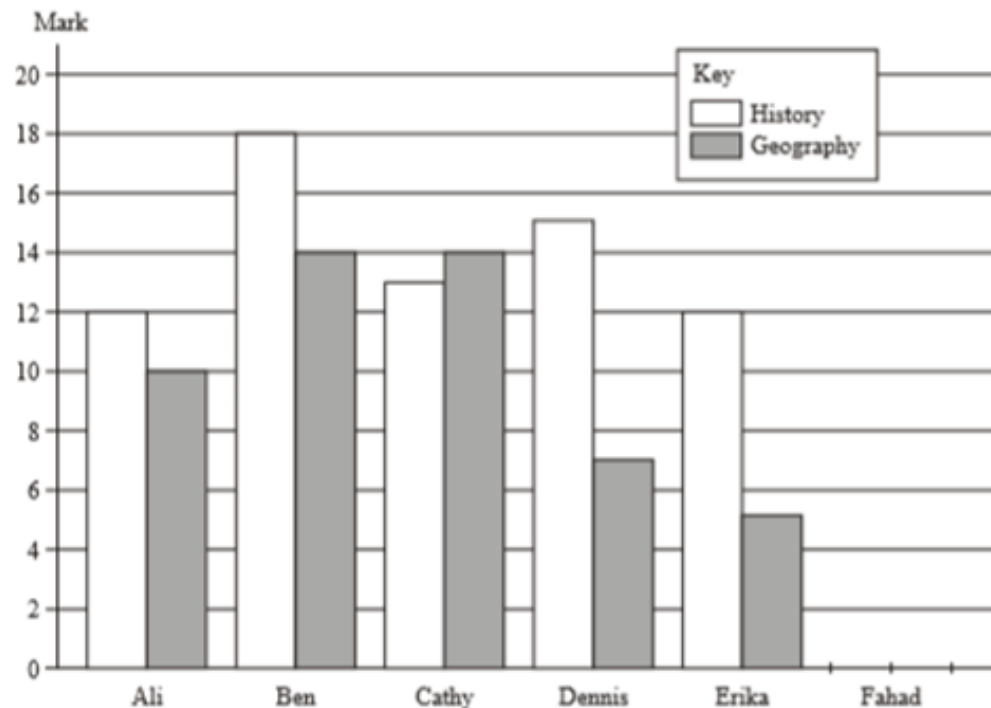
- a) Find the median.

The rugby team played another game.
They scored 11 points.

- b) Find the median number of points scored in these 8 games.

3) The mean of eight numbers is 41
The mean of two of the numbers is 29
What is the mean of the other six numbers?

Six students each sat a history test and a geography test.
The marks of five of the students, in each of the tests, were used to draw the bar chart.



- (a) How many marks did Ali get in his history test?
.....
- (b) How many marks did Dennis get in his geography test?
.....
- (c) One student got a lower mark in the history test than in the geography test.
Write down the name of this student.

Harry asked each student in his class how they travelled to school that day.
He used the results to draw this pie chart.

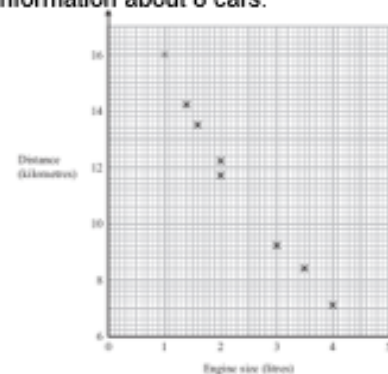


How did most of the students travel to school?

Harry asked a total of 24 students.
Work out the number of students who cycled to school.

Scatter Graphs

The scatter graph shows some information about 8 cars.



What type of correlation does the scatter graph show?

A car has an engine size of 2.5 litres.
Estimate the distance travelled on one litre.

The Baroque Period (1600-1750)

Baroque sounds **ORNATE, DECORATED and EXTRAVAGANT**

- **ORNAMENTS** – decorations added to the melodies
- **POLYPHONIC TEXTURE** – dense overlapping with lots of interweaving melodies **IMITATION**- copying of the melody
- **TERRACED DYNAMICS** – either loud or soft
- **TIMBRE & SONORITY** – mainly strings, simple woodwind (recorders) and trumpets and timpani for dramatic moments.
- **HARPSICHORD** ('tinkling' sound) plays the (**BASSO**) **CONTINUO** (or **ORGAN**) with cello/double bass to provide an accompaniment and support harmonies

The Romantic Period (1810-1910)

Romantic music sounds **LYRICAL, EMOTIONAL, DRAMATIC and DESCRIPTIVE**

- **THEMES** – much music based on an emotion, place, dreams, the supernatural or stories
- **LEITMOTIFS** – short melodies linked to a character or emotions
- **EXTRAVAGANT DYNAMICS** – extremes used to portray intense emotion
- **CHROMATICISM** – use of notes outside the key to create **DISSONANCE** **RICHER HARMONIES** – extended chords and unusual keys to help show emotion
- **NATIONAL INFLUENCES** – music influenced by folk music and national pride
- **TIMBRE & SONORITY** – huge increase in size and range of orchestral instruments. Harps, Tuba, Piccolo, Bass Clarinet, Cor Anglais and Double Bassoon added with large range of percussion . Piano popular – solo piano pieces



Music

Through Time

The Classical Period (1750-1810)

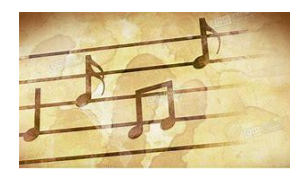
Classical music sounds **BALANCED, ELEGANT, ORDERED and SYMMETRICAL**

- **BALANCED REGULAR PHRASES** (4 and 8 bars)
- **HOMOPHONIC TEXTURE** – clear melody with an accompaniment
- **ALBERTI BASS** – Pattern of Root, 5 th, 3rd, 5th as an accompaniment
- **FUNCTIONAL HARMONY** – clear keys, cadences and modulations
- **VARIETY IN DYNAMICS** – wider range and use of **CRESCENDO** and **DIMINUENDO**
- **TIMBRE & SONORITY** – orchestra enlarged – clarinets added, piano invented (replaced harpsichord)

The 20th Century 1900-

20th Century music has more **VARETY and UNUSAL COMBINATIONS of moods, styles, textures, keys and harmonies.**

- **MINIMALISM** – music which uses a lot of repetition, a limited range of musical ideas, often very detailed.
- **DYNAMICS**- may be extreme or subtle but often very detailed.
- **TEXTURES** – various, sometimes simple, sometimes complex
- **MELODY** may be clear or may be just fragments. **TONALITY** may be tonal or atonal (no key, weird).
- **HARMONY** – there may be clashing chords (dissonance) or notes which sound a bit "odd " to start with
- **TEMPO** may vary a lot or stay same
- **TIMBRE & SONORITY** – huge increase in size and extreme range of orchestral instruments.



Key words

Melody

Pitch
Conjunct
Disjunct
Ornamentation
Virtuoso
Leitmotif
Theme

Dynamics

Pianissimo
Piano
Mezzo-piano
Mezzo-forte
Forte
Fortissimo
Diminuendo
Crescendo
Terrace dynamics

Texture

Unison
Monophonic
Homophonic
Polyphonic

Timbre/sonority

Brass
Woodwind
Strings
Percussion
Orchestra
Piano
Harpsichord
Basso continuo

Tonality

Major
Minor
Atonal

Rhythm

Long duration
Short duration
Quaver
Crotchet
Minim
Semibreve

Tempo

Accelerando
Ritardando
Rubato
Fast
Slow

Structure

Binary
Ternary
Rondo

Structures

Binary- **A B**

Ternary -**A B A1**

Rondo - **A B A C A**

Methods to Create

Contrast

Tempo/ Rhythm/

Melody/

Tonality/ Dynamics/

Articulation/

Texture/ Modulation

Knowledge Organiser - Athletics



What is Athletics?

- Athletics is a collection of sporting events across a number of disciplines, including running, jumping and throwing events.
- Athletics is a collection of sporting events that consist of three main areas:
 - track events
 - field events
 - combined events
- Athletics is often associated with the Olympics. However, it is not just for elite athletes. Each week athletes also compete at national, county, school or club level events which can be held indoors or outdoors.
- Athletics events are very specialised and often do not require a full combination of fitness components, therefore offering something for everyone.

Officials

An athletics competition requires a large number of volunteers each day. These include:

- **starter** – this person starts all track events
- **starter's marshals** – these people line up competitors in correct order ready for starting
- **timekeepers** – these volunteers provide official times for all track competitors
- **place judges** – these helpers ensure the correct order of positions are given
- **field event judges** – these judges measure, record and let athletes know when it is safe to compete
- **relay judges** – these make sure runners at change-overs are in the correct lane and within the change-over box



FAB FACTS!



The Olympic games:

In 1896, the first Modern Olympic Games were held in Athens. It was a fantastic success and in 1912 the International Amateur Athletic Federation (IAAF) was established. The Olympic games are held every four years, including lots of new events as well as some traditional ones.

Did you know ... We held the Olympic games in London 2012!

Scoring

Success in athletics is not judged on points or goals, but rather on times and distance.

Track events – these races are started with an electronic pistol which is only sounded again on a false start. In races that are very close, officials use a digital line-scan camera across the finish line to give them a photo finish picture. The clock stops when an athlete has passed through the finish line.

Jumping events – these events are measured from the front edge of the take-off board to the first mark made in the sand by the athlete. The distance is always measured to the nearest centimetre and athletes will always be given a minimum of three jumps.

Throwing events – these events are measured from the front edge of the throwing line to the first mark made in the ground by the implement. The distance is always measured to the nearest centimetre and athletes will always be given a minimum of three attempts.

Knowledge Organiser - Athletics

Key Skills

Speed- Especially for running events e.g. 100m/200m/400m sprints and hurdles.

Cardiovascular endurance –Especially for long distance activities e.g. 1500m.

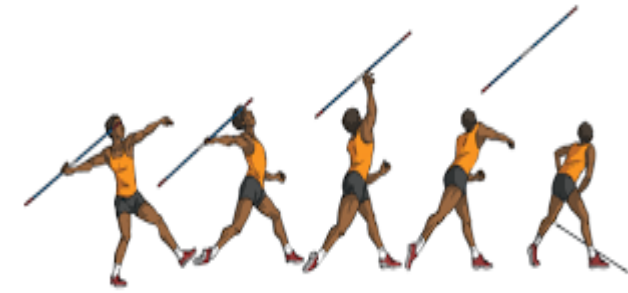
Strength – For throwing and jumping events.

Co-ordination – To be able to move different body parts in different events/ to be able to aim a throw in a certain direction

Power – To be able to put in power behind throwing events/excelling of the ground.

Muscular endurance – for all events to allow the muscles to keep working during an event to avoid them getting fatigued.

Athletics for beginners



twinkl.com

Health and safety in Athletics:

Throwing events:

- Keep well away from a person throwing.
- Stand to the side when a person throwing NOT behind!
- Wait until everyone has thrown collect your equipment.
- Do not walk past a person who has throwing equipment in their hand.
- Always hold a Javelin vertically.

Running events:

- Ensure the track is fully clear before running
- Ensure that shoe laces are ALWAYS tied before running

General Safety:

- Ensure that all Jewellery is removed before performing any event.
- Ensure that correct kit is always worn – including the correct footwear.
- Ensure you are always warmed up before participating in any athletics activities.



Rules and Regulations

Athletics has a set of rules for competition and a series of official notification periods for proposed changes to them.

UK Athletics (UKA) is the governing body for the sport of athletics in the United Kingdom. Its responsibilities include overseeing the governance of athletics events in the UK as well as athletes, their development, and athletics officials. UK Athletics governs the rules for competition for the following disciplines:

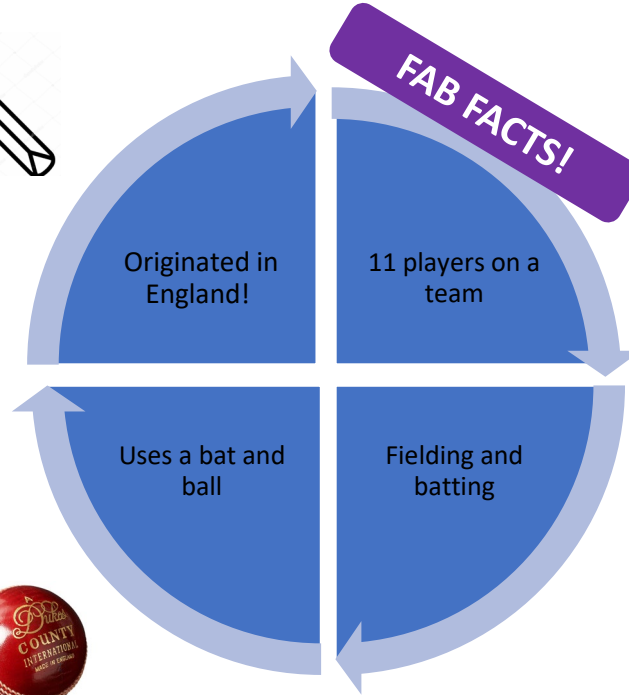
- track and field competition
- road running competition
- cross country running
- fell and hill running
- race walking
- trail running

The UK Athletics Rules for Competition are published every two years.

Knowledge Organiser - Cricket

What is Cricket?

- Cricket can be described as a sporting combination of strategy, skill and athleticism.
- The game is contested by two teams of 11 players and involves a bowler delivering a ball at a batsman, who attempts to hit it.
- From this simple premise comes a number of strategies, tactics and techniques to achieve overall success.
- Each team takes it in turns to bat, trying to score runs, while the opposing team fields.

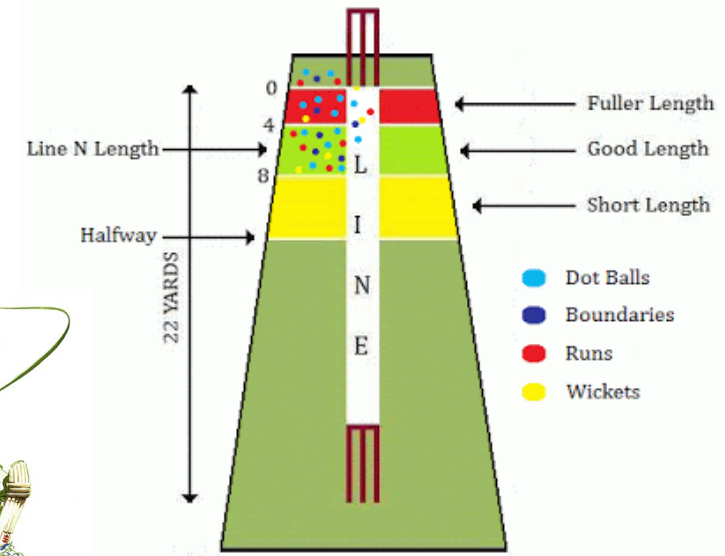


Players in Cricket

A cricket team consists of 11 players per side and one team bats while the other fields. Unique to cricket, the captain of the fielding team has complete control of their team's fielding positions. In all, there are 35 different fielding positions and the captain can utilise every one to try to stop the batter from scoring runs or to try to get them out.



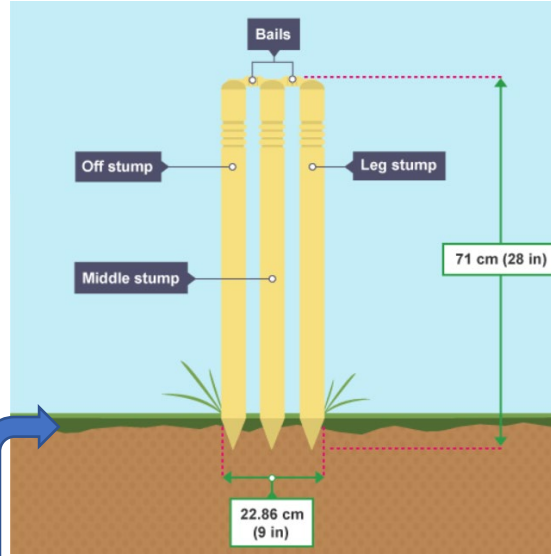
Bowlers Pitch Map



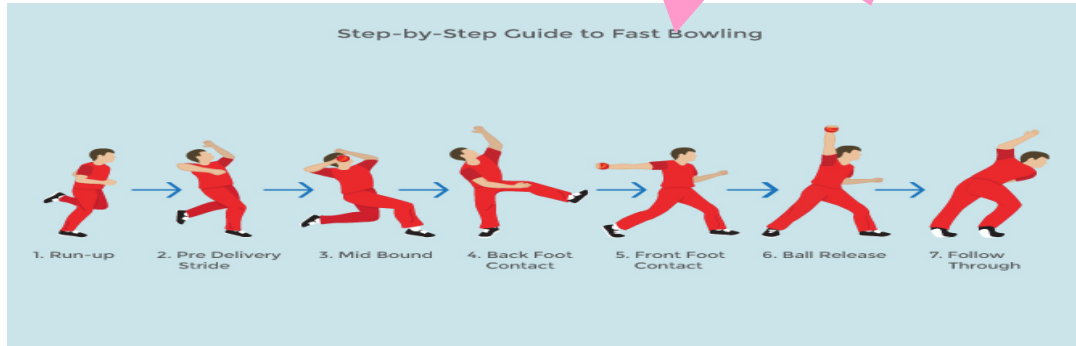
Scoring in Cricket:

- The aim for the batter in cricket is to try to score as many runs as possible throughout their innings.
- To score a run requires the batter to strike the ball and run to the opposite end of the pitch while their batting partner runs in the other direction.
- To record the scoring run, both batters need to touch the floor behind the popping crease with either their bat or body. In situations where the fielding team has not recovered the ball, the batters return back to score two or more runs.
- It is also possible to score runs without running the length of the pitch, if a batter can hit the ball past the boundary line (four runs) or over the line without bouncing (six runs).

Knowledge Organiser - Cricket

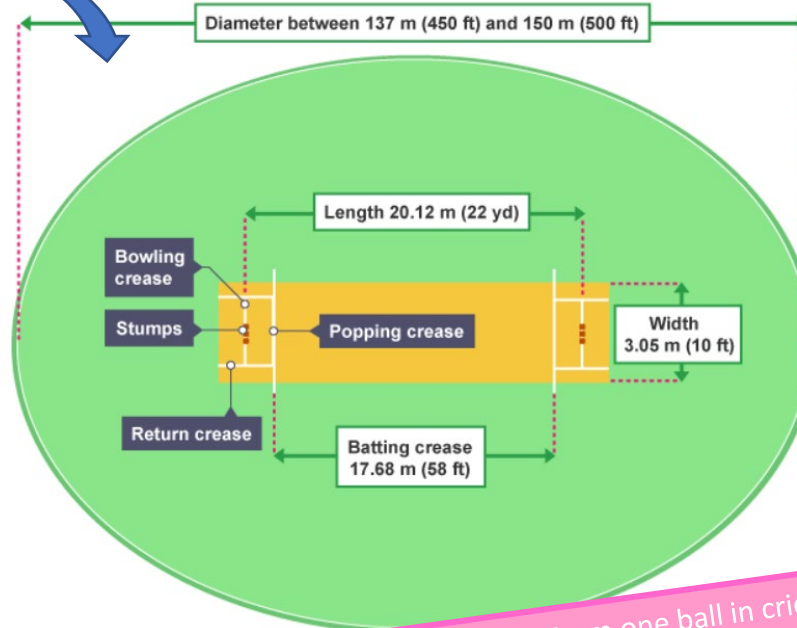


Bowling action



Pitch dimensions

- **Popping crease** - a bowler must have part of their foot behind this line when the ball is delivered or the umpire will call 'no ball'.
- **Bowling crease** - in all competitive games of cricket the length of a pitch is 20.12 m (or, in imperial measurements, 1 chain or 22 yards) long and this is measured as the distance between the two bowling creases. The pitch is 3.05 m (10 ft) wide.
- **Wicket** - the two wickets are placed on each of the bowling creases and consist of three wooden stumps and two wooden bails. The bails are positioned on the stumps in grooves made along the top of each stump. The bails must be knocked off the stumps to bowl a batter out.
- **Stumps** - these each have their own name and when viewed from the front, the left stump is called the off stump, middle stump and the right stump is called the leg stump.



Did you know... From one ball in cricket the highest number of runs is 286?

Cricket for beginners

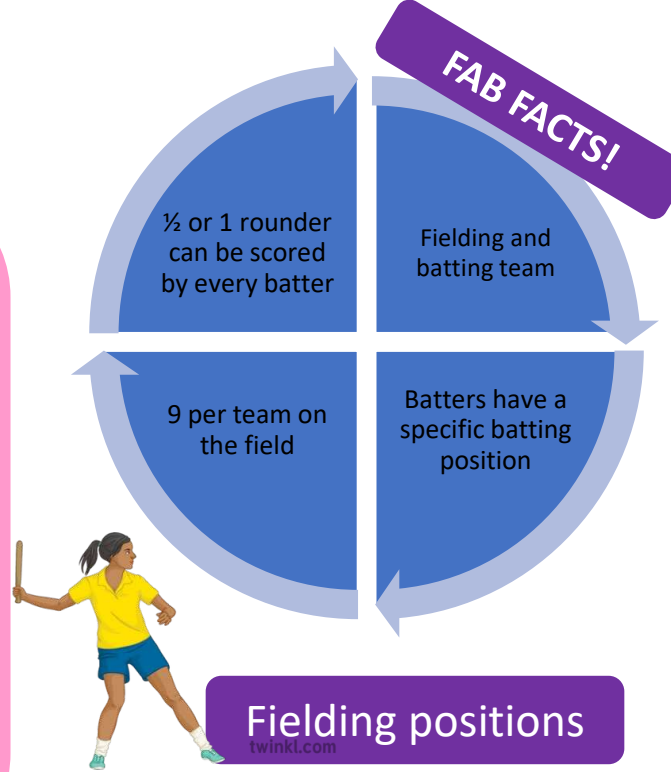
Rules and Regulations

- The winning team in cricket is the side that scores the most runs, although in some situations a draw is recorded if they both get the same number of runs.
- A cricket team consists of 11 players and they take it in turns to bat and bowl.
- The bowler must not throw the ball, but bowl the ball overarm at the stumps, which are at either end of a 22-yard area called a wicket.
- A batter is declared out if the bowler knocks off the bails of the stumps with a delivery.
- A batter is declared out if a fielder or wicketkeeper catches the ball directly off the bat and before it hits the ground.
- A batter is declared out if the umpire believes that the bowler's ball would have hit the stumps if the batter had not obstructed the ball with their pads. This is known as leg before wicket (or LBW).
- A batter is declared run-out when they are going for a run but do not make the batting crease before fielding team knocks off the cricket stumps.
- A batter is declared out if the wicketkeeper stumps them.
- A batter is declared out if they knock over their stumps while playing a shot or avoiding a delivery.
- There are other, less common ways of being out in cricket, but these are quite rare.
- A batter is declared out if the umpire believes the batter has purposely obstructed a fielder who is about to take a catch or attempt a run-out.
- The end of an innings is called when 10 of the 11 batting team are given out. At this point, both teams swap over. In competitive games, teams can have one or two innings.

Knowledge Organiser - Rounders

What is Rounders?

- Rounders is a game where 2 teams play against each other to get as many players from the opposite side out at the same time as trying to score as many rounders as they can.
- Games are played between two teams. Each team has a maximum of 15 and a minimum of 6. No more than 9 may be on the field at any one time.
- Players once substituted may return during the game, but batters only in the position of their original number.
- A rounders match normally consists of two innings which is over when all players are out. An inning is equal amount of turns both sides have to bat and score.



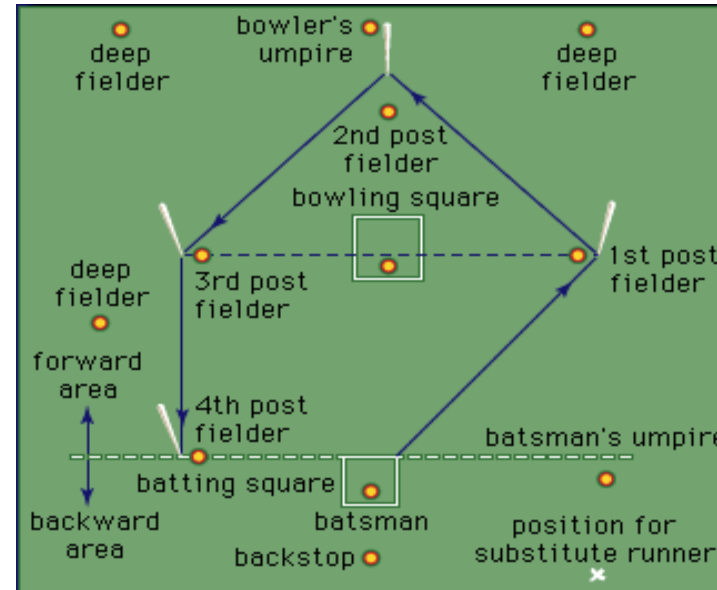
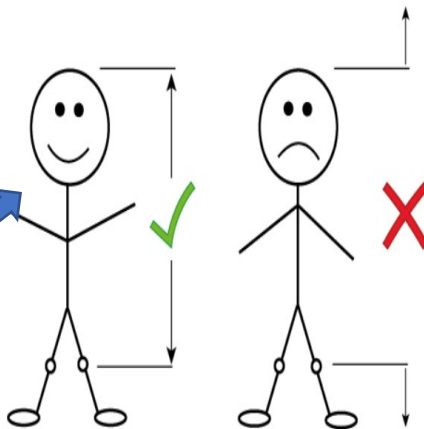
Scoring in rounders

- 1 Rounder if ball is hit and 4th post is reached and touched before next ball is bowled
- 1 Rounder if ball is hit and 4th post reached on a no ball (you can't be caught out)
- 1/2 Rounder if 4th post reached without hitting the ball
- 1/2 Rounder if ball is hit and 2nd post reached and touched before next ball is bowled - but if you continue this run and are put out before reaching 4th post, the score will be nullified
- Penalty 1/2 Rounder for an obstruction by a fielder
- Penalty 1/2 rounder for 2 consecutive no balls to same batter
- 1 Rounder for a backward hit if 4th post reached (you stay at 1st while ball is in the backward area)

Key Words

- **A rounder** - the ball is hit, even if a no ball was thrown, and the batter touches the 4th post before the post is stumped or the ball is back with the bowler in the bowlers square.
- **1/2 Rounder** - 1/2 rounder can be scored if a player reaches the 2nd or 3rd post in one hit.
- **Backwards hit** - If the ball is hit backwards the player must stay at the first post until the ball is thrown forwards. If the player then makes it to the 4th post before it is stumped a rounder is scored.
- **Obstruction** - Penalty 1/2 rounders can be scored if a fielder obstructs where the batter is running or if the bowler throws 2 consecutive no balls to the next player.
- **No ball** - this is called when the bowler does not bowl the ball between the head and knee or is too far wide.

The bowler should aim to bowl the ball in between the head and knee.



Knowledge Organiser - Rounders

Batting the ball Skill Card

Skills Practice

With a rounders tee, practise hitting a static ball using the correct technique. Try throwing a ball up for yourself and hit them as best as you can. Can you hit the ball at different heights? Experiment with your stance and holding position. Which one do you find the most comfortable? Which one helps you connect with the ball the most?

Technique

- 1 Hold the bat with either one or two hands, using the 'handshake' grip.
- 2 Stand side-on to the bowler, holding the bat behind you.
- 3 Keep your weight over your back leg.
- 4 Watch the ball throughout.
- 5 As the ball gets closer, begin to swing your bat forward.
- 6 Transfer your weight to your front leg, leaning into the swing as you make contact with the ball.

Rounders for beginners



Key Skills

Speed- to run around the pitch before a fielder stumps you out
Strength – to apply great force when batting the ball
Agility – to rapidly change your position with precise control to run around the pitch.
Power – To hit the ball as hard as you can.
Co-ordination – To be able to bowl the ball to the batter.

How do you get out in rounders?

- A fielder catches the ball (Caught)
- Foot over front/back line of batting square before hitting or missing a good ball
- Running inside post (unless obstructed)
- The post you are running to is stumped
- You lose contact with post during bowlers action when he has possession in the square
- You overtake
- You obstruct (you have right of way on track only)

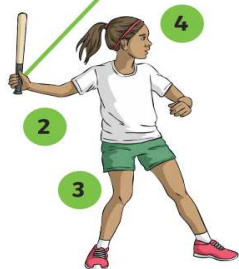
Rules and Regulations

The batter:

- Wait in the backward area well away from 4th post
- If out, wait in the backward area well away from 1st post
- You will have one good ball bowled to you
- No ball if: - Not smooth underarm action - Ball is above head - below knee - Ball bounces on way to you - Is wide or straight at body - The bowlers foot is outside the square during the bowling action - You can take or run on a no ball, but once you reach 1st post you cannot re turn. You score in the normal way.

Running around the track:

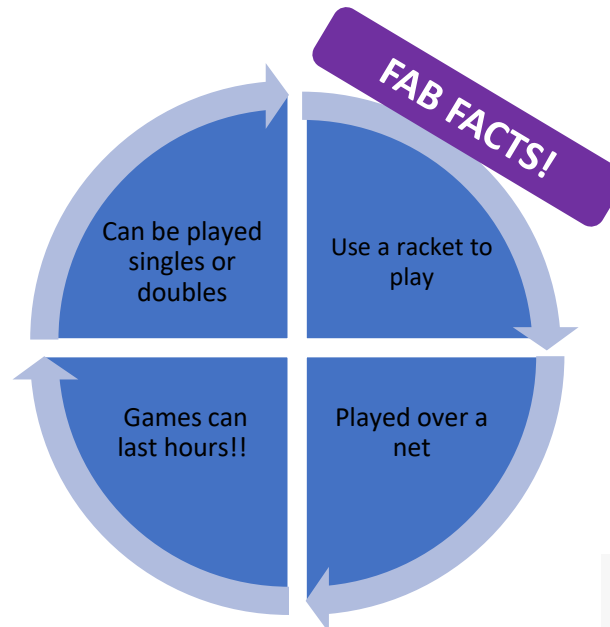
- If you stop at a post you must keep contact with the post, with hand or bat. If you don't the fielding side can stump the following post to put you out
- You can run on to a post even if it has been previously stumped (you don't score if the post immediately ahead has been stumped)
- When the bowler has the ball in his square you cannot move on, but if you are between posts you can carry on to the next
- You cannot have two batters at a post. The Umpire will ask the first to run on when the second one makes contact
- At a post you do not have to move on for every ball bowled



Knowledge Organiser -Tennis

What is Tennis?

- Tennis is a racket sport played in singles or doubles formats.
- Players aim to hit a tennis ball over the net and into their opponent's court without their opponent being able to return the ball back
- The aim of the game is to win points by hitting a tennis ball across the net and into your opponent's court to force your opponent to make an error and be unable to return the ball back.
- The simple rules, physical requirements and enjoyable nature of the game have made tennis very popular throughout the world and enjoyed by all ages and abilities.



Players

A tennis match can have either two or four players on a court at a given time. Singles has one player on each side, while doubles has two players on each side.

In a game of doubles, after a service is returned, both players are then able to hit the ball and are not required to take it in turns.

Competitive tennis games have five different types of matches.

These are:

- 1.men's singles
- 2.women's singles
- 3.men's doubles
- 4.women's doubles
- 5.mixed doubles (each team is made up of a man and a woman)

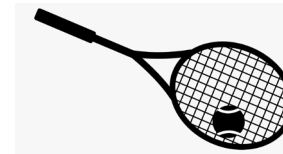
Scoring in Tennis

At the beginning of a game both players begin with 'love' (zero) points. Unlike other racket sports, the points do not increase in standard increments, instead they follow the set system below:

- No points – 'Love'
- First point – '15'
- Second point – '30'
- Third point – '40'
- Fourth point – 'Game'

To win a game, a player must beat their opponent by two clear points. However, it is very common for both players to reach 40-40 (40-all) - this is called "deuce".

At deuce, a player is still required to win by two more points. Therefore, if the server wins the next point the score is "advantage server". If the player with "advantage" wins the next point they win the game, but if the player without "advantage" wins the next point, the score reverts to "deuce". There is no limit to the number of times a game can go to deuce and, as a result, a game can go on for an extended period of time.



Court markings:

•A competitive tennis court is a large rectangle that can be played on grass, clay and hard courts, which can be of concrete or rubber composition. All courts are marked out to play both singles and doubles. Recreational courts can also be artificial, carpet-based surfaces.

•A tennis court is 23.77 m (78 ft) long. For singles matches, it is 8.23 m (27 ft) wide and for doubles it is 10.97 m (36 ft) wide. Additional lines accommodate both singles and doubles play.

•The tennis net should stretch 91.4 cm (3 ft) past the doubles court, stand 1.07 m (3 ft 6 in) high at the ends and drop to 91 cm (3 ft) in the middle of the net.

Knowledge Organiser -Tennis

Key Skills

Speed-to move around the court as quickly as possible to ensure you return the tennis ball.

Strength – to apply great force when hitting the tennis ball with your racket.

Agility – to rapidly change your position with precise control to reach the tennis ball at different areas on the court.

Footwork -Making sure that you are always on your toes so you can move back and forward and side to side to reach the tennis ball.

Co-ordination – To be able to serve the ball and be able to also return the ball when playing.

Power – To be able to hit powerful shots during a game.

Muscular endurance – A tennis game can last a long time so requires muscular endurance.

Tennis for beginners



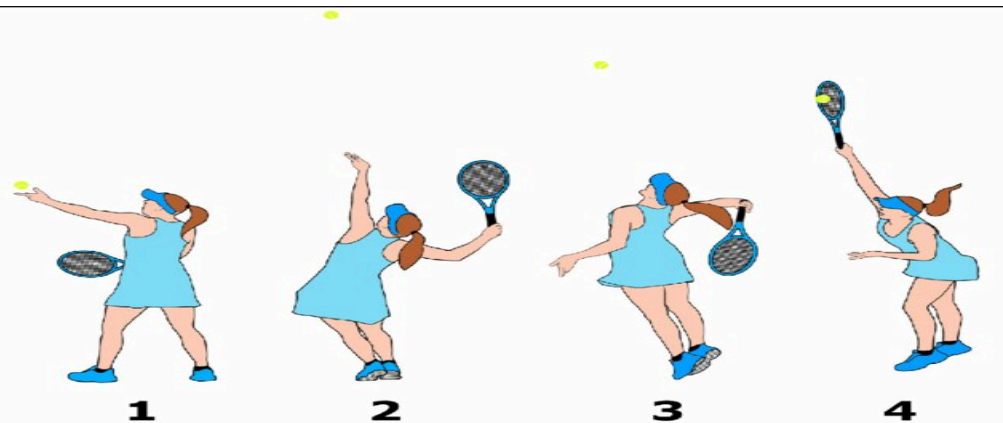
Rules and Regulations

- A match must start with a coin toss to decide who serves first and which side they want to serve from.
- After each point, the server will alternate either side on the baseline.
- The server must hit their serve from behind their baseline.
- If the first serve is called out, then the server may take advantage of a second serve. If the second serve fails then a 'double fault' is called and the point is lost.
- If the serve hits the net but travels over and into the service area, then a 'let' is called and the server may take the serve again without penalty.
- To receive a serve, the player is allowed to stand where they wish but they must allow the ball to bounce once first.
- If a player touches the net, distracts their opponent or impedes them in any way, the umpire will award the point to the other player.
- Throughout a game, the ball is allowed to hit the lines to be awarded in. Anything outside of the lines and the ball is out.
- In competitive games, new tennis balls are introduced after the first seven games and then every nine games after that.



Top tip:

Aim to hit the ball at waist height. It's easier to hit the ball after it has bounced and is on its way down after it's reached the highest point in the air.



Key Events

- 1 Ball Release
- 2 Trophy Position
- 3 Racquet Low Point
- 4 Impact

Phases

- 1-2 Preparation
- 2-3 Propulsion
- 3-4 Forwardswing

Year 8 - Knowledge Organiser - Light Waves

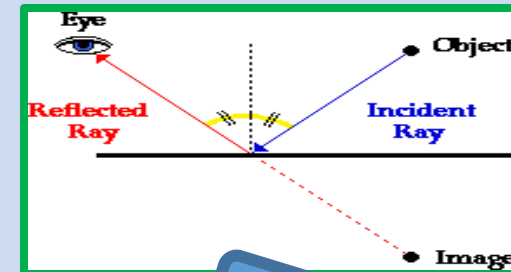
1. Key Words!

- Incident ray:** The incoming ray.
- Reflected ray:** The outgoing ray.
- Normal line:** From which angles are measured, at right angles to the surface.
- Angle of reflection:** Between the normal and reflected ray.
- Angle of incidence:** Between the normal and incident ray.
- Refraction:** Change in the direction of light going from one material into another.
- Absorption:** When energy is transferred from light to a material.
- Scattering:** When light bounces off an object in all directions.
- Transparent:** A material that allows all light to pass through it.
- Translucent:** A material that allows some light to pass through it.
- Opaque:** A material that allows no light to pass through it.
- Retina:** Layer at the back of the eye with light detecting cells and where an image is formed.

Light travels as transverse waves and faster than sound. It can be reflected, refracted and dispersed. Ray diagrams show what happens to light in mirrors and lenses. Eyes and cameras detect light. *When drawing ray diagrams, light travels in **STRAIGHT LINES** so should always be drawn with a **SHARP PENCIL** and a **RULER!!!***

The LAW of REFLECTION!

Angle of incidence = Angle of Reflection



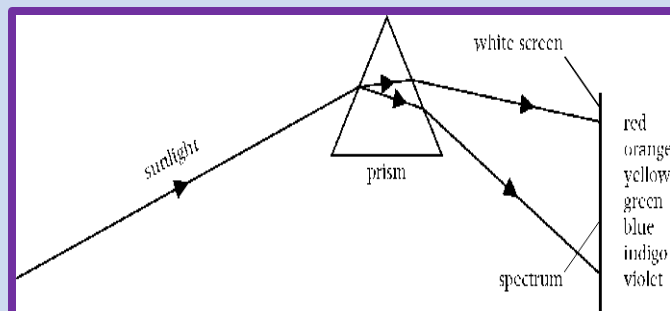
2. Reflection

Good reflectors are...
Light colours flat
plane shiny

Light waves change speed when they pass across the boundary between two substances with a different **density**, such as air and glass. This causes them to change direction, an effect called **refraction**.

As light enters a more dense medium it slows down and bends **TOWARDS** the normal. As light leaves a more dense medium it speeds up and bends **AWAY** from the normal.

3. Refraction



A red filter absorbs all colours...



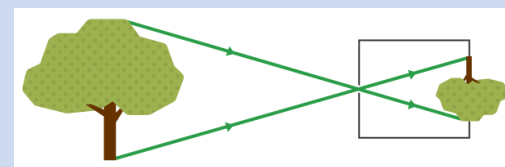
4. Colours



White light consists of seven colours (ROYGBIV)
We see colour as 6/7 are absorbed and one is reflected.

Filters only allow certain wavelength (colours) through. The others are absorbed.
Two different filters in front of each other = Black as all light absorbed

6. Vision Problems

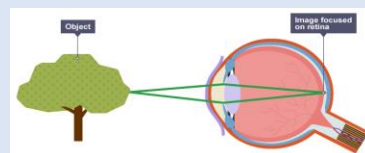


A pinhole camera consists of a box or tube with a translucent screen at one end and a tiny hole (the pinhole) made in the other end. Light enters the box through the pinhole and is focused by the pinhole onto the translucent screen. The image is upside down and smaller than the object.

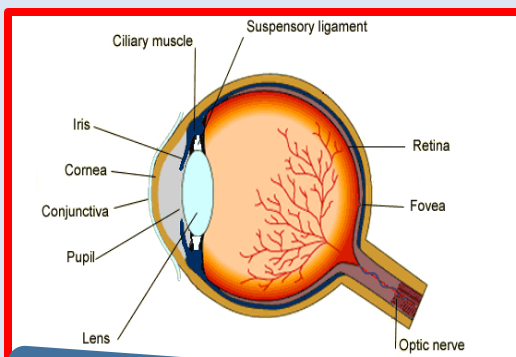
Times people may suffer from damage to their eyes and/or sight. Sometimes people are born with these problems and sometimes these problems can develop. Some common eye related problems are: blurred vision (which can be corrected using glasses with lenses, contact lenses or laser eye surgery), age related sight loss, cataracts, colour blindness. Lots of these conditions are treatable, but it is important to remember to protect your eyes where possible for example, not looking directly at bright lights and wearing sunglasses.



The organ we use for seeing!



We see objects because light reflects from an object **INTO** the pupil.
Coloured part = **IRIS**
PUPIL = black middle bit
LENS focusses light onto the **RETINA**.
Retina consists of **RODS (Shades)** and **CONES (Colours)**

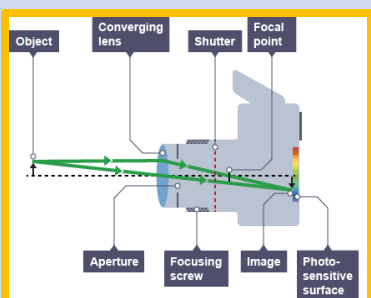


5. The Eye

7. The camera

Cameras are devices that focus light from an object onto a **photo-sensitive material** using a lens. In an old-fashioned camera, the photo-sensitive material was camera film. When the film absorbed light, a chemical change produced an image in the film, called the 'negative'. This was used to produce a photograph on photo-sensitive paper.

In a modern camera or the camera in a mobile phone, the photo-sensitive material produces electrical impulses, which are used to produce an image file. This can be viewed on the screen, or its information sent to a printer.



8. Further Reading

Colour Spectrum

<https://www.youtube.com/watch?v=Gf33ueRXMzQ>

Reflection and Refraction

<https://www.youtube.com/watch?v=BL2MtP7j-xk>

The Eye

<https://www.youtube.com/watch?v=syaQgmxb5i0>

1. Key Words!

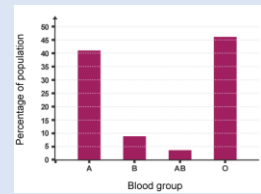
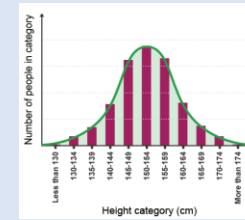
Knowledge Organiser - Year 8 - Genetics and Evolution

2. Variation

- Population:** Group of organisms of the same kind living in the same place.
- Natural selection:** Process by which species change over time in response to environmental changes and competition for resources.
- Extinct:** When no more individuals of a species remain.
- Biodiversity:** The variety of living things. It is measured as the differences between individuals of the same species, or the number of different species in an ecosystem.
- Competition:** When two or more living things struggle against each other to get the same resource.
- Evolution:** Theory that the animal and plant species living today descended from species that existed in the past.
- Inherited characteristics:** Features that are passed from parents to their offspring.
- DNA:** A molecule found in the nucleus of cells that contains genetic information.
- Chromosomes:** Thread-like structures containing tightly coiled DNA.
- Gene:** A section of DNA that determines an inherited characteristic.

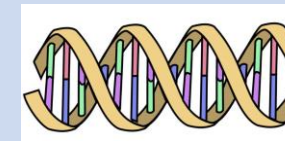
Variation is the differences between individuals of the same species, caused by genetic (e.g. eye colour) and environmental factors (e.g. scars) or both (e.g. height). Surveys into variation give data that are continuous, which means to come in a range, or discontinuous, which means to come in groups.

Continuous variation	Discontinuous variation
Height	Blood group
Weight	Hand used to write with
Arm span	Eye colour
Head circumference at birth	Ability to roll tongue



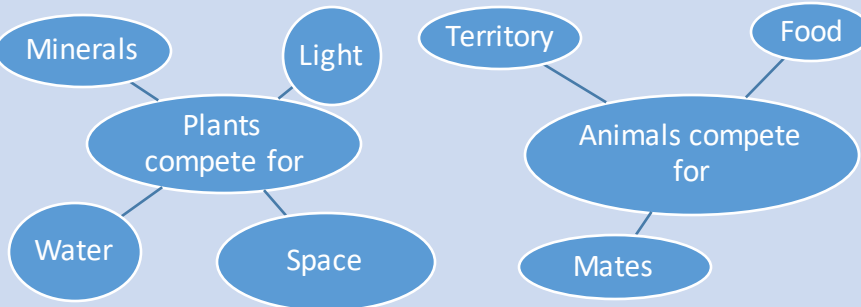
DNA: A molecule found in the nucleus of cells that contains genetic information. It stands for deoxyribonucleic acid. It is a chemical made up of two strands. The strands are twisted into a spiral shape called a double helix.

The structure of DNA was discovered using the work of several scientists. Rosalind Franklin used x-rays to make images of DNA. Watson and Crick used information from one of these images to describe the structure of DNA. Wilkins supported their model.



4. Competition and adaptations

In order to survive, plants and animals compete for different things...



Living organisms have special features known as **adaptations**. These are features which help them to survive in a particular environment, even when the conditions are extreme.



Small ears - prevents heat loss

Camouflage - helps them hide from prey

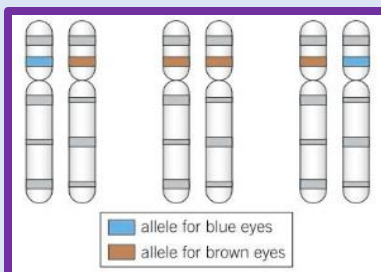
Thick fur and layer of blubber - provides insulation

Sharp claws - helps grip onto ice and catch prey

Large, flat feet - prevents sinking in the snow

6. Genetics

For each characteristic you have two genes, one from your mother and one from your father. Each gene has a different form. These are called alleles. Alleles can be dominant or recessive. The combination of these alleles determines your characteristic.



The dominant allele for eye colour is brown. To have brown eyes you need to have at least one dominant allele. To have blue eyes you must have two recessive alleles.

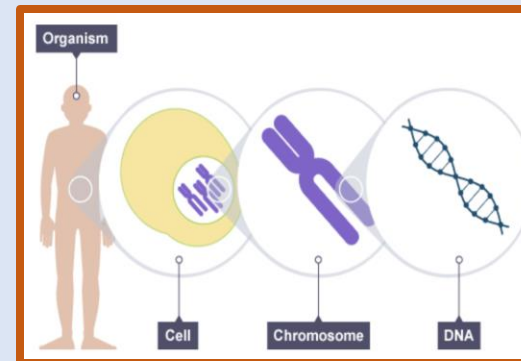
If we know the genotype (the alleles) that parents have, we can predict the inheritance of their offspring using a Punnett square.

	Father	
	B	b
Mother	b	Bb
	b	bb

This shows that 50% of the offspring would have brown eyes and 50% blue.

5. Inheritance

Chromosomes are long strands of coiled DNA. They are found in the nucleus of cells. A section of a chromosome that codes for a characteristic such as eye colour is called a gene. One copy of each of your genes is called your genome.



During sexual reproduction gametes fuse. In human sperm and egg cells each carry 23 chromosomes. When they fuse a fertilised egg cell is created with 23 pairs of chromosomes.

Each pair contains a chromosome from each parent which is why offspring may look similar but never identical to their parents.

7. Further Reading



- <https://www.youtube.com/watch?v=vnktXHBvE8s>
- <https://www.youtube.com/watch?v=sjeSEngKGrq>
- https://www.youtube.com/watch?v=GK_vRtHJZu4
- <https://www.youtube.com/watch?v=jphrpR9ffKA>
- <https://www.youtube.com/watch?v=zwibgNGe4aY>

Darwin went on an expedition around the Galapagos islands. Darwin noticed that on different islands the birds had different shaped beaks. He suggested this was because of the food they had available on each island was different and so the finches had adapted to their surroundings.



Darwin developed the theory of Natural Selection based upon his findings. At the same time a scientist called Alfred Wallace was developing his theory of evolution at the same time. They read each others work. Checking another scientist's work like this is called peer review.

Darwin's theory went against the idea that God created all organisms and was very controversial. His theory is now accepted by most due to evidence in the form of fossils, extinction of animals and antibiotic resistant bacteria.

Biodiversity means having as wide a range of different species in an ecosystem as possible. It is important to conserve the variety of living organisms on Earth. Not only do we have moral and cultural reasons for conserving endangered species, but conservation:

- maintains the future possibility that plant species might be identified for medicines
- keeps damage to food chains and food webs to a minimum
- protects our future food supply

Conservation measures

Some species in Britain are endangered, including the skylark, red squirrel and grass snake. They could be helped by conservation measures such as:

- education programmes
- captive breeding programmes
- legal protection and protection of their habitats
- making artificial ecosystems for them to live in

10. Biodiversity

If a species is unable to adapt quickly enough to its environment, then it is at risk of becoming extinct.

This can happen for many reasons:

New Predators

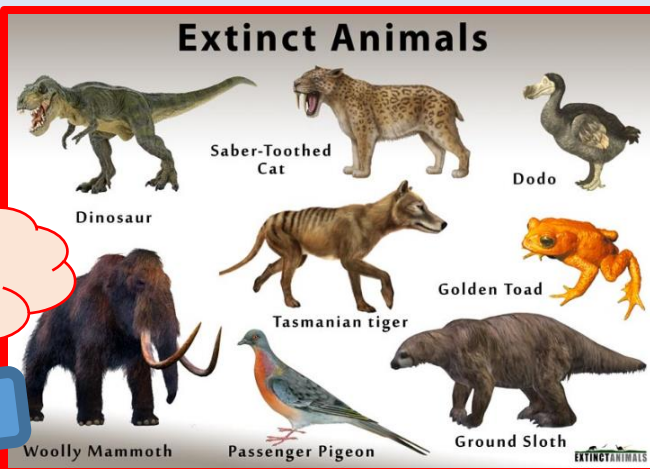
New Diseases

Destruction of habitats

Changes to the environment

Increased competition for resources

11. Extinction



9. Natural Selection

Natural selection is a process by which a species **changes** over time in response to changes in the **environment**, or **competition** between organisms, in order for the species to **survive**.

The members of the species with the most desirable characteristics are able to survive and reproduce to produce the **best-adapted** offspring. If a species is unable to adapt then it is at risk of becoming extinct.

<p>Giraffes and Natural Selection</p> <p>In the safari of Africa there was an perfect, open spaces for species to begin. Throughout the safari and the story the giraffes are going to change and adapted and only some will survive.</p>	<p>Overproduction of Offspring</p> <p>The giraffes produced lots of offspring and the offspring then make more offspring and so on. This is in hopes that most of the giraffes will survive to create a growing population.</p>	<p>Variation of the Population</p> <p>The new population of giraffes varied in size. Some of the giraffes had long necks that could touch the sky. Other giraffes had short necks. Both variations of the giraffe lived together for a little bit.</p>
<p>Adaptions</p> <p>Sadly the giraffes with the small necks died out. There was not enough plants on the ground to sustain them with their short necks and they were unable to adapt. The giraffes with the long necks survived because they could easily reach the top of the trees. The long neck giraffes went from tree to tree eating.</p>	<p>Inherited Characteristics</p> <p>The safari was still filled giraffes, but the safari looked different than it did before. Before there were giraffes with long and short necks, but now there is only giraffes who have long necks. The giraffes being born today have long necks long necks is now an inherited characteristic and now apart of the gene pool. The long neck giraffes will live a good life for a couple million of years.</p>	<p>The Constantly Changing Safari</p> <p>The safari became full of long necked giraffes eating all the trees they could. The safari went from giraffes of all sizes to tall giraffes only. The tall giraffes survived, but they are now faced with a new problem of changing weather. Since the Earth is constantly changing they will have to adapt and change there way or they will not survive.</p>

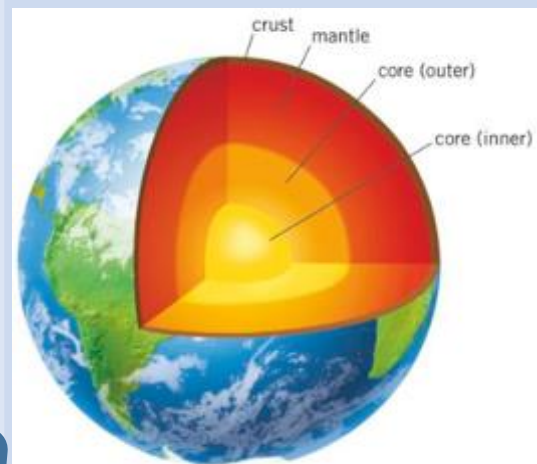
Create your own at Storyboard That

These are the key points of evolution by natural selection:

- Individuals in a species show a wide range of **variation**.
- Inherited variation is due to differences in their **genes**.
- Individuals with the features that are best suited to the environment are more likely to survive and reproduce.
- The genes that allow these individuals to be successful are passed to their offspring.
- Individuals that are poorly adapted to their environment are less likely to survive and reproduce. This means that their genes are less likely to be passed to the next generation.
- Over many generations these small differences add up to the new evolution of species.

Knowledge Organiser - Year 8 - Earth and Atmosphere

2. Structure of the Earth



The Earth is made of 3 layers:

Crust	Relatively thin outer layer made of solid rock.
Mantel	Mostly solid but deep down it can flow very slowly (like a liquid).
Core	Made from iron and nickel. The outer core is liquid and the inner core is solid.

The Earth's crust, its atmosphere and oceans are the only sources of the resources that humans need.

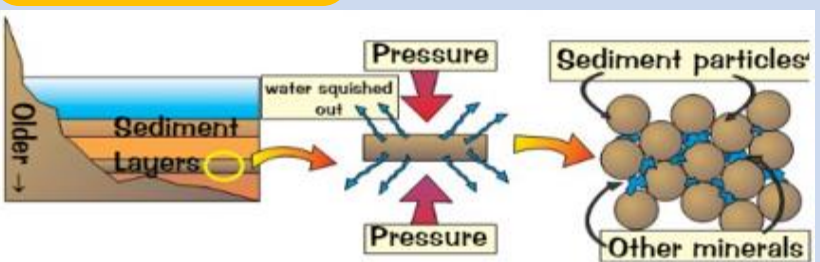
1. Key Words!

- Rock cycle:** Sequence of processes where rocks change from one type to another.
- Weathering:** The wearing down of rock by physical, chemical or biological processes.
- Erosion:** Movement of rock by water, ice or wind (transportation).
- Minerals:** Chemicals that rocks are made from.
- Sedimentary rocks:** Formed from layers of sediment, and which can contain fossils. Examples are limestone, chalk and sandstone.
- Igneous rocks:** Formed from cooled magma, with minerals arranged in crystals. Examples are granite, basalt and obsidian.
- Metamorphic rocks:** Formed from existing rocks exposed to heat and pressure over a long time. Examples are marble, slate and schist.
- Strata:** Layers of sedimentary rock.
- Porous:** Something that allows water to pass through it.

3. Sedimentary Rocks

Properties: small round grains in layers, porous, soft, scratch easily and may contain fossils.

- 1. Weathering:** Rocks are broken down into smaller pieces called sediments.
- 2. Erosion and transport:** Wearing down of sediments and moving away from the original rock.
- 3. Deposition:** Sediments stop moving and settle in one place. Sediments build up and form layers (strata). Fossils can form here.
- 4. Compaction:** The weight of sediments above squashes together the sediments below and water is squeezed out.
- 5. Cementation:** Minerals crystallise gluing grains together.



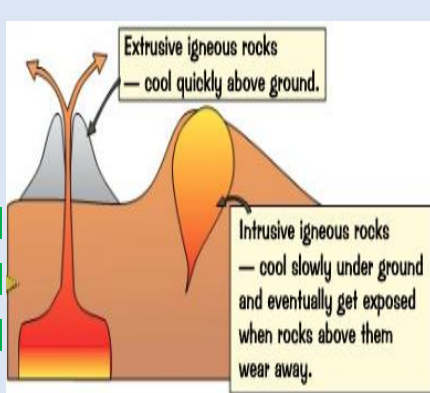
Properties: interlocking crystals in a disorderly arrangement, do not contain any fossils (fossils in the original rock will have melted when the rock melted to form magma), hard and strong/durable.

Formed when molten (liquid) rock called **magma** cools and **solidifies**. The size of the crystals depends on how quickly the molten magma solidifies:

Lava that **cools quickly** above ground will form an igneous rock with **small** crystals. These are known as **extrusive** igneous rocks e.g. obsidian and basalt.

Magma that **cools slowly** below ground will form an igneous rock with **large** crystals. These are known as **intrusive** igneous rocks e.g. granite and gabbro.

4. Igneous Rocks



6. Weathering

Physical: When it is hot, minerals in rocks expand (get bigger). When they cool they contract (get smaller). This can cause the rock to crack. It can cause sheets of rock to peel off. This is called **onion-skin weathering**. If water gets trapped in rocks it freezes and expands, forcing the rock apart. The water melts and can run further into the crack. If this freezes again, the crack will get bigger and bits may break off. This is called **freeze-thaw action**.

Chemical: Weathering of rocks by chemicals. Rainwater is naturally slightly acidic because CO₂ from the air dissolves in it. Minerals in rocks may react with the rainwater, causing the rock to be weathered. Also caused by acid rain.

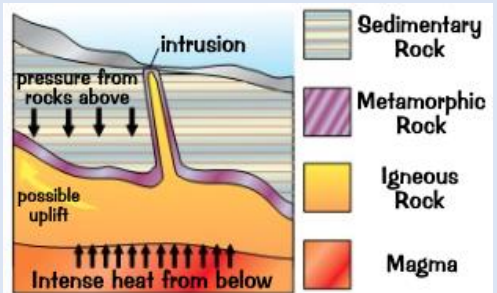
Biological: Caused by animals and plants. For example, rabbits and other burrowing animals can burrow into a crack in a rock, making it bigger and splitting the rock. Roots of plants/trees push open the cracks and make them wider and deeper. Eventually pieces of rock may fall away.

5. Metamorphic Rocks

Properties: tiny interlocking grains arranged in layers, rarely contain any fossils, (would not normally survive the heat and pressure), not porous, dense and hard.

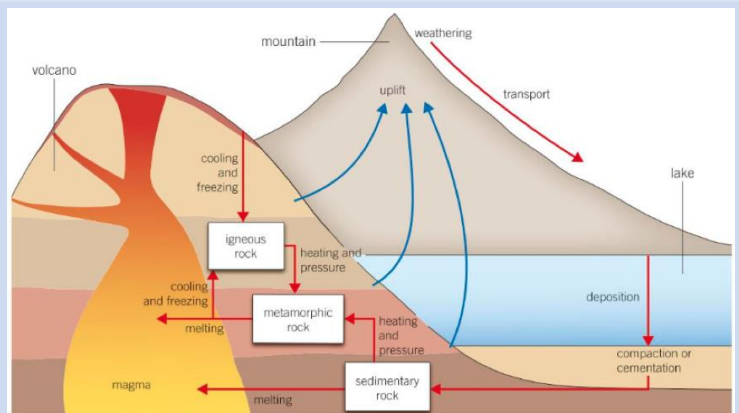
Formed from other rocks that are changed because of **heat or pressure**. They are **not** made from molten rock.

Earth movements can cause rocks to be deeply buried or squeezed. As a result, the rocks are heated and put under great pressure. They do not melt, but the minerals they contain are changed chemically (their particles rearrange).



7. The Rock Cycle

The Earth's rocks do not stay the same forever. They are continually changing because of processes such as weathering, erosion and large earth movements. The rocks are gradually recycled over millions of years. This is called the **rock cycle**.



8. Further Reading

General	https://www.bbc.com/bitesize/topics/z3fv4wx
The Earth	https://www.youtube.com/watch?v=Cn8Rdujngws
Rocks	https://www.youtube.com/watch?v=CeuYx-AbZdo



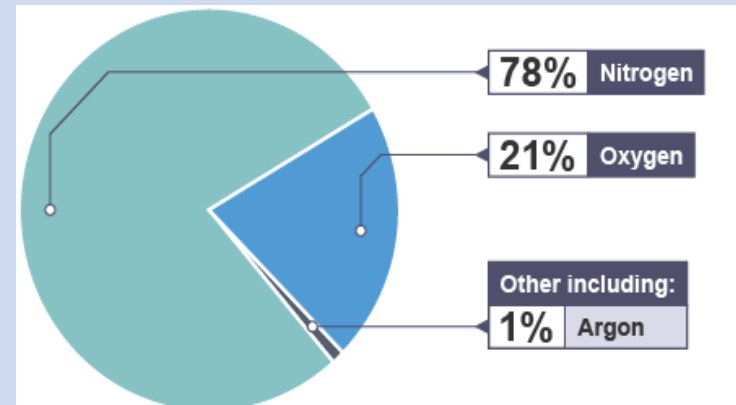
Uplift happens when huge forces inside the Earth pushes rock upwards

8. Key Words!

Knowledge Organiser - Year 8 - Earth and Atmosphere

9. Composition of the Atmosphere

The Earth's atmosphere is the relatively thin layer of gases that surround the planet. It provides us with the oxygen we need to stay alive.



11. Global Warming



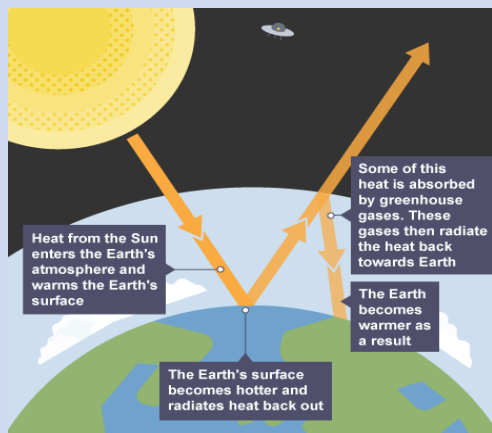
Extra greenhouse gases in the atmosphere causes global warming. Global warming can cause:

- Changes changes to local weather patterns
- Increased rainfall and floods
- Droughts and heatwaves leading to crop failure

Humans are contributing to global warming by:

- Burning fossil fuels to generate electricity
- Deforestation to make space for crops and cattle
- Farming animals for products such as meat.

10. Greenhouse Effect



- 1 The Earth is warmed by light from the Sun.
- 2 The Earth produces infrared radiation.
- 3 Some infrared radiation escapes into outer space. Some is trapped/absorbed by greenhouse gases.
- 4 The Earth maintains a temperature suited to life
- 5 Greenhouse gases in the atmosphere increase.
- 6 More infrared radiation is trapped and the Earth's temperature increases.

13. Recycling

Recycling reduces the need to extract resources.

Advantages
Limits the consumption of the Earth's natural resources and uses less energy than obtaining materials from scratch.

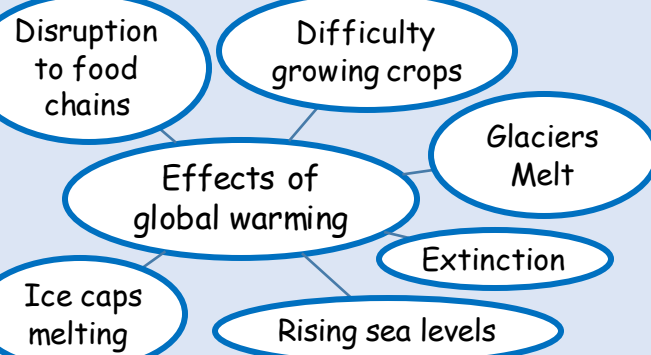
Disadvantages
Lorries collecting rubbish burn fossil fuels contributing to global warming and the process is expensive.

Materials are collected and taken to a recycling plant

Items are washed, and labels are removed

Items are compressed and shredded

Melting, cooling and remoulding.



We can reduce these effects by burning fewer fossil fuels and using more renewable energy sources, plant more trees and eating less meat.



12. Climate Change

14. Further Reading

General	https://www.bbc.com/bitesize/topics/z3fv4wx
Carbon Cycle	https://www.youtube.com/watch?v=r75NL3gN5yU
Global Warming	https://www.youtube.com/watch?v=oJAbATJCugs
Recycling	https://www.youtube.com/watch?v=b7GMpjx2jDQ
Extracting Metals	https://www.youtube.com/watch?v=fxBIGbRT8fw



Y8 HT5 - Los Medios y la tecnología

<p>sacar fotos hablar por Skype mandar SMS jugar leer mis SMS descargar melodías y aplicaciones chatear con mis amigos compartir mis vídeos favoritos ver videos o películas leer libros digitales</p>	<p>to take photos to talk by Skype to send SMS to play to read my SMS to download ringtones and apps to chat with my friends to share my favourite videos to watch videos or films to read e-books</p>	<p>Mi cantante/grupo favorit@ es ... porque / dado que es / son ...</p> <p>relajante(s) pegadiz@(s) interesante(s) animad@(s) original(es) creativ@(s) divertid@(s)</p>	<p>My favourite singer / group is ... because / given that (he/she) is / they are ...</p> <p>relaxing catchy interesting animated / lively original creative fun</p>	<p>una película de... acción animación aventuras ciencia ficción fantasía superhéroes terror</p> <p>me hace ... reír llorar feliz triste me fascina me estresa me interesa me releja</p>	<p>An ... film action animated adventure science-fiction fantasy superhero horror</p> <p>it makes me ... laugh cry happy sad it fascinates me it stresses me out it interests me it relaxes me</p>
<p>(casi) todos los días dos o tres veces a la semana a veces de vez en cuando nunca</p>	<p>(almost) everyday two or three times a week</p> <p>sometimes from time to time never</p>	<p>la letra la melodía el ritmo la canción</p> <p>Lo / La encuentro ...</p>	<p>the lyrics the melody / tune the rythm the song</p> <p>I find it ...</p>		
<p>normalmente el fin de semana pasada este fin de semana</p>	<p>normally at the weekend this weekend</p>	<p>Preterite (1st person)</p> <p>-AR verbs = remove -AR and add é (bailar -> bailé)</p> <p>-ER / -IR verbs = remove -ER / -IR and add í (comer -> comí) (vivir -> viví)</p>			
<p>Me chifla Me flipa Me mola</p>	<p>I really like</p>	<p>un programa de deportes un concurso un documental un reality una serie policiaca el telediario las noticias una telenovela</p>	<p>A sports programme a game show a documentary a reality TV show a police drama the news the news a soap opera</p>	<p>buen@ mal@ útil práctic@ gratis necesari@ peligros@ adictiv@, fácil de usar difícil de usar</p> <p>Se debe Hay que</p> <p>Pagar ver anuncios cargar la batería, guardar tus datos personales utilizar una contraseña segura</p>	<p>good bad useful practical free necessary dangerous addictive easy to use difficult to use</p> <p>You must It's necessary to</p> <p>pay watch adverts charge the battery guard your personal data use a secure password</p>
<p>el rap el RnB el rock la música clásica la música electrónica la música pop</p>	<p>Rap RnB Rock Classical music Electronic music Pop music</p>	<p>más / meno ... que tan ... como informativ@(s) interesante(s) emocionante(s)</p>	<p>More / less ... than as ... as informative interesting exciting</p>	<p>Te engancha una pérdida de tiempo no puedo estar sin</p>	<p>It hooks you A waste of time I can't be without</p>



"Pienso que mi móvil es muy práctico para leer libros digitales pero por otro lado, es malo dado que se debe cargar la batería todo el tiempo".