Year 8 Knowledge Organisers

Topic summaries for revision and to help with homework.

Autumn Term 1.1

Student Pod is a website, just for Rye Hills students.It houses lots of school information and resources for every subject.

Here you will find Student Knowledge Organisers, which aim to support students at home. Student Knowledge Organisers are brief summaries of important key words and information for a topic. They are a great starting point for revision – use them to help make flashcards and mind maps. They are also a useful tool when completing homework.

You can access Student Pod through EASI or the school website.
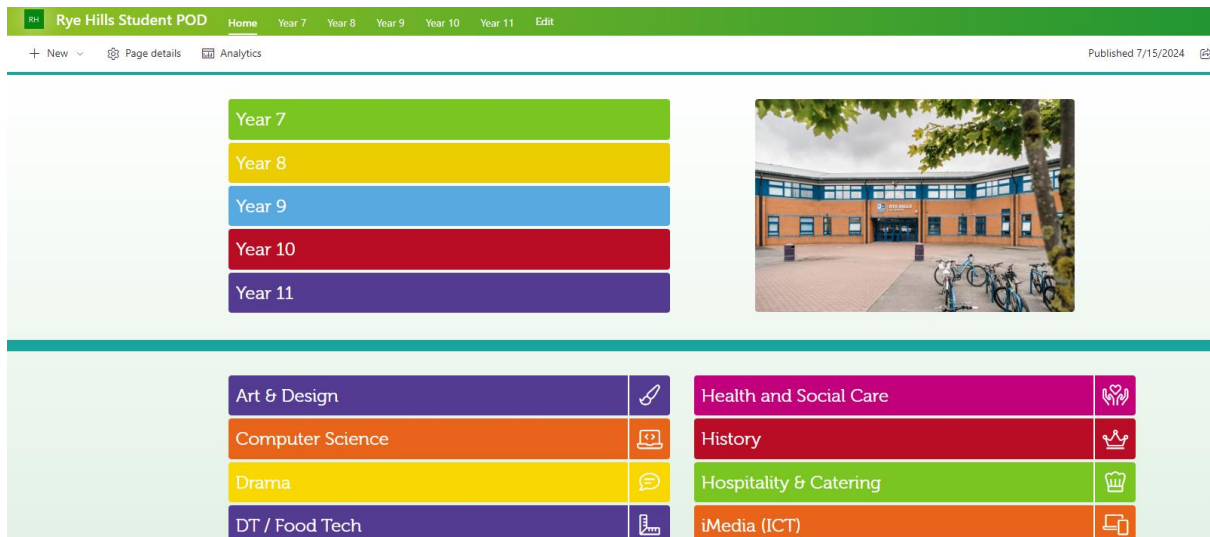
The Student Knowledge Organisers for the current half term are embedded into this booklet, alternatively you can access all the Student Knowledge Organisers for the year via each subject page.

This half term we will be hosting an information evening where we will talk about how to support students at home and how to use Student Pod and Knowledge Organisers. We will send more information soon.

Drawing Rules

Step 1: Shape
Record shape accurately. Make sure to use **light pencil** outline so that you can easily rub it out if you make a mistake

Step 2: Tone
You can create a range of tones by applying different pressures or layering with your pencil. Make sure that you start with your lightest tones first and work your way towards the darker tones. Remember to use the correct line direction, following the shape of the object.

Step 3: Texture
Create a range of textures using different mark making types. It is important to include texture in your drawings to make them appear realistic. Match the marks you make with the surface you are observing.

Shape > Tone > Texture >

Subject vocabulary
Gradual - As your tone progresses from light to dark
Composition – The placement or layout of an image
Record – To draw from observation
**Shade –** A colour with regard to how dark it is
Sketch – A rough drawing used as a study or proposal
Media – The materials that are used to create artwork.
Line direction – The way in which you apply lines to show the shape of an object
Cross-hatching – Drawing overlapping layers of lines to create tone and texture

Shape

Remember:
Most objects we are drawing do not have a line around them. we can see edges of objects because of a difference in tone (light next to dark)
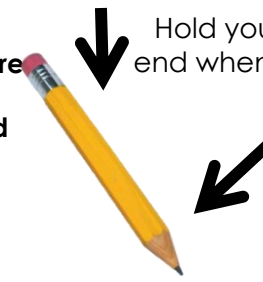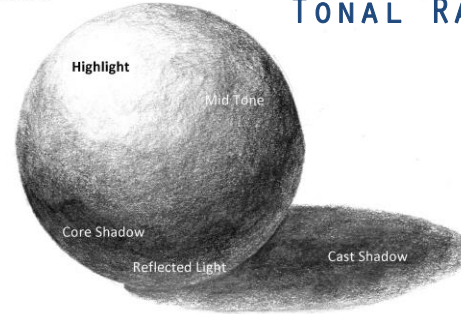
Hold your pencil at the end when applying light tone

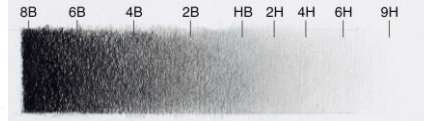Hold your pencil at the tip for more control and heavy pressure

Light Source

Tonal Range

Tone

Highlight
Mid Tone
Core Shadow
Reflected Light
Cast Shadow

Start off on the light side and blend towards the dark side

8B 6B 4B 2B HB 2H 4H 6H 9H

Mark-making

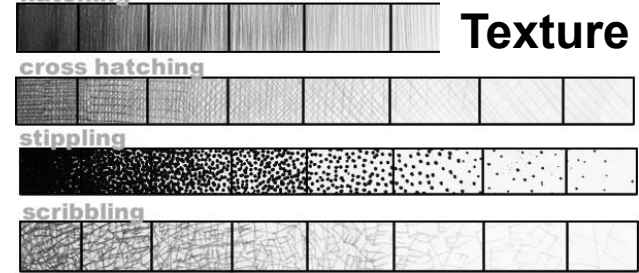Mark-making is the expression used to describe the process of applying pencil to paper.

Controlling and exploring the possibilities of the mark is an important step in developing as an artist.
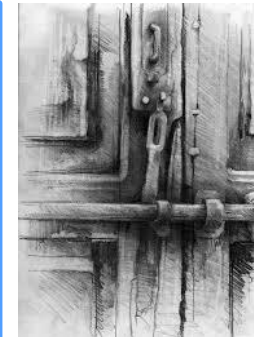
hatching
cross hatching
stippling
scribbling

Texture

Sound like an **expert**

Stereotypes – A widely help, oversimplified idea about someone/group of people.
- Assuming there's 'girl jobs' and 'boy jobs'.

Prejudice – prejudgement/preconceived opinion that is not based on reason or actual experience
- Assuming something about someone because of the way that they look e.g. they are wearing glasses so they must be a nerd/they are wearing all black so they must be a goth.

Islamophobia - dislike of or prejudice against Islam or Muslims.
- Being unkind to someone because they are Muslim, physically or verbally.
- Purposefully disrespecting someone because they are a Muslim, aimed at either how they look, their practices or their beliefs.

Discrimination – the unfair treatment of different categories of people, especially on the grounds of race, age, or sex.
- Making a negative, offensive comment about someone's colour of skin or ethnicity.
- Treating someone with disability differently.
- Making a racist remark.

What is Prejudice and Discrimination?

Gender Prejudice – sexism is prejudice or discrimination based on a person's sex or gender. Usually because of the belief that one sex or gender is better than another.
- It is prejudice to think that only one gender has the ability to do something e.g. only boys can play football.

Extremism - the holding of extreme political or religious views.

Terrorism - the unofficial use of violence/intimidation to put across extreme views/beliefs.
- Someone would begin with extremist views which would then potentially cause them to commit an act of terror. You can have extremist beliefs without acting upon them, but a terrorist would have an extreme view that is causing them to act in that way.

Hate Crime – a crime, typically one involving violence, that is motivated by prejudice on the basis of race, religion, sexual orientation, or other grounds.
- Aiming hate towards someone specifically because of who they are.
- Jews and Muslims receive the majority of hate crime in the UK.

Radicalisation - the action or process of causing someone to adopt radical positions.
- Resenting people so that anger builds up inside, wanting revenge. This can lead people to join extremist groups and go on to commit acts of terror.

Factors that affect our body image

- Young people are faced with many factors that will change how they feel about their body image.

- Puberty
- Diet
- Exercise
- Bullying
- Opinions
- Self-Esteem
- Financial
- Media/Social Media
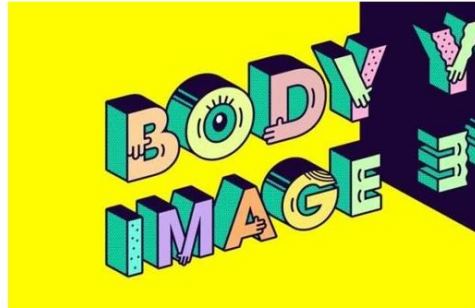
- 57% of those considering a diet, 10% considering cosmetic surgery and amount secondary school boys 10% said they would consider taking steroids.

6 WAYS TO BE #BODYPOSITIVE

1. FOCUS ON WHAT YOUR BODY CAN DO

Think of the millions of unique things your body helps you do everyday. This is a great reminder that you're so much more than the way you look.

2. QUESTION WHAT YOU SEE IN THE MEDIA

Next time you see an 'ideal' body, think: What goes into looking that way? How many people do you see in everyday life that look like that? Is it realistic or helpful to compare yourself to that standard?

3. UNFOLLOW PEOPLE WHO MAKE YOU FEEL CRAP ABOUT YOURSELF

For a positive newsfeed, try following people you admire who have all different interests – and body shapes.

4. SAY THANK YOU

Next time someone gives you a compliment, try saying thank you rather than shrugging it off. Showing gratitude can go a long way to improving how we feel about ourselves.

5. FOCUS ON OTHER PEOPLE'S GOOD QUALITIES

Looking for the good in other people creates positive vibes and can even help you focus on your own strengths.

6. HANG WITH POSITIVE PEOPLE

Surround yourself with people who get you and encourage you to feel confident.
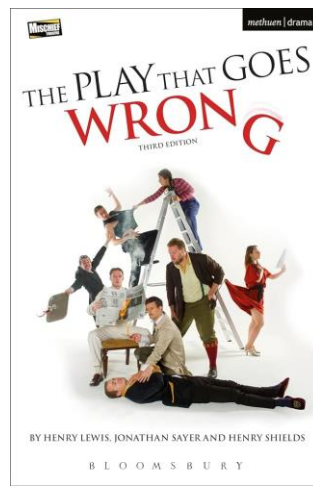
Social Media

- "Visual platforms like Facebook, Instagram and Snapchat deliver the tools that allow teens to earn approval for their appearance and compare themselves to others." – Rachel Simmons

- The rise of the "wellness" industry through social media have created a fitness celebrities, also known as, "fitspiration".

- Some of the time these regimens of eating and exercising disguised as "health", "clean eating", and "wellness" come from pro-anorexia or "thinspiration" sites.
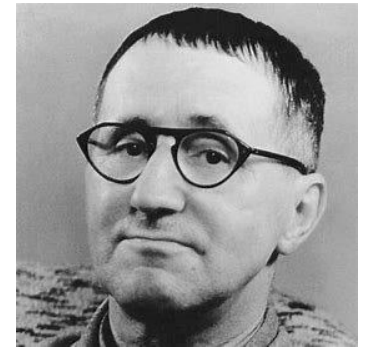
Year 8 Drama- Developing Stragecraft
The Play That Goes Wrong

What will you learn
Students will explore the style and form of non-naturalistic theatre through characterisation and performance of a scripted play.

THE PLAY THAT GOES WRONG
THIRD EDITION

BY HENRY LEWIS, JONATHAN SAYER AND HENRY SHIELDS

BLOOMSBURY

methuen | drama

Mischief Theatre is a British theatre company that was founded in 2008 by a group of students from the London Academy of Music and Dramatic Art in West London, and directed by Henry Lewis, Jonathan Sayer, and Henry Shields.The group originally began by doing improvised comedy shows, but by 2012, they expanded into comedic theatrical performances that include choreographed routines, jokes, and stunts.

BRECHT & EPIC THEATRE
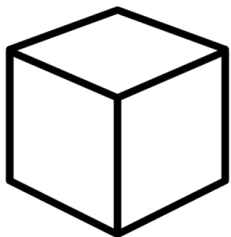Bertolt Brecht was a playwright and theatre practitioner from Germany, born in
1898. He is famous for developing the Epic Theatre movement which challenges the ideas of naturalism and realistic performances. He believed that when an audience became emotionally involved in a naturalistic performance, they lost the ability to think and judge.
Epic Theatre always carries a political message or makes a comment on society. There is the intention of encouraging an audience to think about, and even act upon, this message. Brecht wanted audiences to remain objective and to make
comments or judgements about his work. To achieve this, he created the verfremdungseffekt (or 'alienation' effect)

Key Words:

Choral Speech- ensemble speaking by a group often using various voice combinations and contrasts to bring out the meaning or tonal beauty of a passage of poetry or prose.
Physical Theatre- a type of performance where physical movement is the primary method of storytelling
Slow motion- slowly moving to emphasise dramatic moment.
Flashback- a scene in a film, novel, etc. set in a time earlier than the main story.
Tableaux- a group of models or motionless figures representing a scene from a story or from history.
Narration- the action or process of narrating a story.
Cross-cutting- In drama and theatre the term is used to describe two or more scenes which are performed on stage at the same time.

STUDENT KNOWLEDGE ORGANISER

Isometric Drawing

30 degrees

- Vertical lines are vertical
- Horizontal lines are 30 degrees and follow the grid.
- The inside (internal) lines are parallel to the exterior lines.
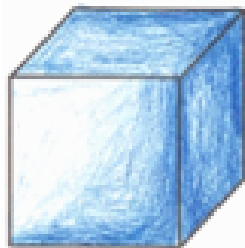
Tone

Tone is the various shades of a colour which can be achieved by how heavy we press on a pencil.
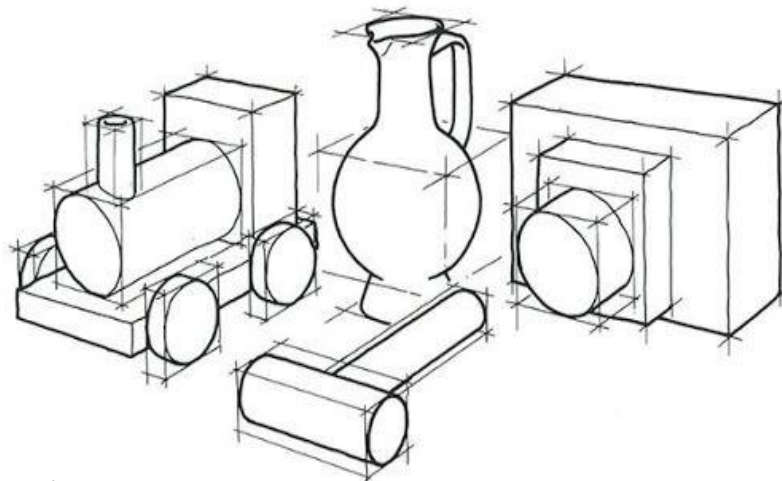
We use tone to show how light projects onto an object. This helps demonstrate the 3D

Texture

Adding colour in certain ways can help demonstrate the texture and materials on our designs/drawings.

This, paired with tone, is known as 'rendering'. Rendering is used to bring drawings to life and make them look as realistic as possible.
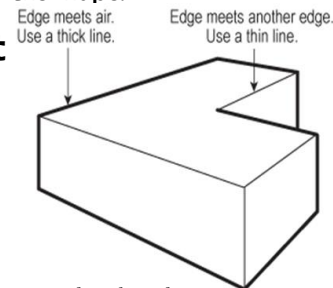
Crating

Crating is a technique used to build more complex sketches. Simple shapes are drawn in 3D isometric such as cubes, cuboids and cylinders and the detail is added within them.

This is variation in colour or brightness of a colour. We can vary this depending on how much light is hitting off the shape.

Enhancement – Line weight

Enhancements such as line weight finish a drawing off. Line weight defines outer edges of objects and helps them to stand out.

Edge meets air. Use a thick line.

Edge meets another edge. Use a thin line.

Rendering & Perspective

Rendering is a technique whereby colour or texture is added to a drawing or sketch to make it look more realistic. This might be used to show the colour or small details on the design. It helps the designer communicate materials such as metal or plastic.

Perspective can come as 1 point or 2 point or even 3 point. This is a technique used to help designers to draw things in 3D so they look realistic. As parts of the drawing go further in the distance, they get smaller but they must remain in proportion. This technique helps to get this right. Construction lines are often used which go to vanishing points. A Horizon line is the line of sight.
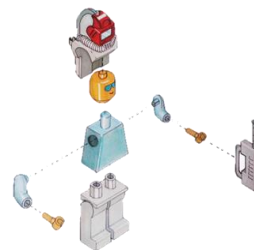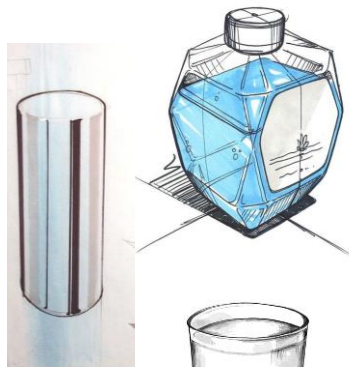
Shadows/Hatched lines

Shadows or hatched lines help those looking at the sketch understand where the light is coming from. It also makes the sketch look more 3D and realistic.

Exploded Diagrams

Sometimes a drawing needs to look more than just exciting. It needs to tell us how things go together. How they fit and how they work. An exploded drawing/diagram can be used to do that. These often have notes or arrows to indicate the function.

KO — YEAR 8 — FOOD SAFETY

4C's OF FOOD SAFETY

CLEANING, CROSS CONTAMINATION, COOKING AND CHILLING.
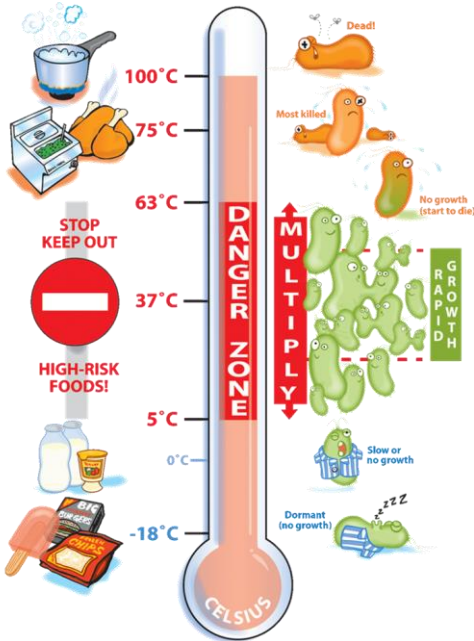
Moisture

Warmth

Time

Food

Binary fission a single cell, divides into two identical daughter cells. Bacteria need four things to multiply.

People most at risk of food poisoning are infants, pregnant women, elderly and those recovering from illness.

Critical Temperatures

Dead!
Most killed
No growth (start to die)
100°C
75°C
63°C
STOP KEEP OUT
37°C
HIGH-RISK FOODS!
5°C
0°C
Slow or no growth
-18°C
Dormant (no growth)
DANGER ZONE
MULTIPLY
RAPID GROWTH
CELSIUS

NON VISIBLE SIGNS
- Headache
- Weakness
- Feeling cold/shivery
- Stomach ache
- Nausea
- Loss of appetite
- Aching muscles

VISIBLE SIGNS
- Diarrhoea
- High temperature
- Being sick (vomiting)
- Dizziness

Remember!!
When washing your hands you use hot soapy water.
Wash your hands for 20 seconds and rinse
Use paper towel to dry hands and throw away once sued

How to wash your hands properly
1 Wet your hands
2 Liquid soap
3 Lather and scrub - 20 sec
4 Rinse - 10 sec
5 Dry your hands
6 Turn off tap
DON'T FORGET TO WASH:
- between your fingers
- under your nails
- the tops of your hands

Critical temperatures
Fridge **0-5**
Freezer -**18- -21C**
Danger zone between **5-63**

Danger zone is where bacteria is most active!!

DANGER ZONE

RAW MEAT
RAW FISH
COOKED MEATS
SALADS & FRUITS
VEGETABLES
DAIRY PRODUCTS

The importance of using colour coded equipment when preparing food is to prevent cross contamination..

Cross contamination is when bacteria transfers from one area to another

HACCP

When handling food we follow a procedure called HACCP. This is used to ensure all food produced is handle with care and reduces the risk of **cross contamination**

HACCP
HAZARD   ANALYSIS   CRITICAL   CONTROL   POINTS

Stage in the kitchen	Action
Delivery	- Check the temperature of the delivery van - Make sure ingredients have been stored correctly
Preparation	- Store food in the correct temperature such as in a fridge at 0-5C - Make sure appropriate equipment is used. For example a **red chopping board** is for raw meat
Cooking and serving	- Make sure food is cooked the whole way through using a temperature probe to record temperatures
Holding and reheating	- Do not reheat certain foods such as those that contain chicken - Only serve food when ready to be served.

How to use your knowledge organiser

Read through and highlight:

- what you already know
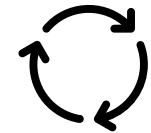- cognates

Choose a section to revise:

- foldy sheet
- flashcards
- mindmap
- look-cover-write-check
- make your own quiz

Test yourself!

Fill in a blank copy of the section you chose.

- French – English
- English to French

Go back to step 2 and repeat with the next section.

Finally, read through the model task.
Copy each section and adapt the text by changing key words.

Student Knowledge Organiser 8.1 – Le Sport

Key Questions

Tu es sportif?	Are you sporty?
Tu aimes le sport? Pourquoi/Pourquoi pas?	Do you like sport? Why/Why not?
Quel est ton sport préféré?	What is your favourite sport?
Qu'est-ce que tu fais comme exercice?	What exercise do you do?
Quand fais-tu du sport?	When do you do sport?

Négatives

ne … pas	not
ne … jamais	never
ne … plus	no longer

Les Verbes / Verbs

Les Verbes	Verbs
jouer	to play
faire	to do
aller	to go
avoir	to have
être	to be
regarder	to watch
pouvoir	to be able

Les Sports / Sports

Les Sports	Sports
l'exercice	exercise
la danse	dancing
l'escalade	climbing
la gymnastique	gymnastics
la natation	swimming
la promenade	walk
le foot	football, soccer
le golf	golf
le hockey sur glace	ice hockey
le kayak	kayaking
le rugby	rugby
le sport	sport
le surf	surfing
le tennis	tennis
le vélo	bike, bicycle
le VTT	mountain biking

Les Opinions / Opinions

Les Opinions	Opinions
amusant	fun, funny
bon pour la santé	good for your health
cher	expensive
dangereux	dangerous
difficile	difficult
ennuyeux	boring
facile	easy
fatigant	tiring
génial	great
intéressant	interesting
mauvais pour la santé	bad for your health
nul	rubbish
passionnant	exciting
rapide	fast
relaxant	relaxing
sportif	sporty

Time phrases

après le collège	after school
chaque jour	every day
deux fois par semaine	twice per week
de temps en temps	from time to time
quelquefois	sometimes
rarement	rarely
le soir	in the evening
souvent	often
le weekend	at the weekend

La semaine / The week

La semaine	The week
lundi	Monday
mardi	Tuesday
mercredi	Wednesday
jeudi	Thursday
vendredi	Friday
samedi	Saturday
dimanche	Sunday

Verbs and activities

jouer à	to play (sport)
faire de	to do (sport)

Attention!

à + le = au   de + le = du
à + les = aux   de + les = des

Depuis quand? / Since when?

Depuis quand?	Since when?
depuis	since
toujours	always
récemment	recently
longtemps	a longtime
cinq ans	5 years

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Verbs and activities

jouer à	to play (sport)
faire de	to do (sport)

Attention!

à + le = au	de + le = du
à + les = aux	de + les = des

Talking about plans – Near Future Tense

To talk about what you are going to do, use aller in the present tense with the infinitive.
e.g. je vais jouer au foot demain
     il va faire de l'escalade ce week-end

Direct Object Pronoun

Je l'adore – I love it!
je les adore – I love them!

Making a sentence negative

To do this you make a <u>verb</u> burger with the **negative phrase** as the two parts of the bun.

je **ne** <u>joue</u> **pas** au foot
je **ne** <u>joue</u> **jamais** au foot
je **ne** <u>joue</u> **plus** au foot

Regular Verb Endings – Present Tense

Pronouns		er	re	ir
I	je	e	s	is
you (s)	tu	es	s	is
he/she	il/elle	e		it
we	on	e		it
we	nous	ons	ons	issons
you (pl)	vous	ez	ez	issez
they (m)	ils/elles	ent	ent	issent

The Core Four!

aller – to go	avoir – to have	être – to be	faire – to do
je vais – I'm going	j'ai – I have	je suis – I am	je fais – I do
tu vas – you're going	tu as – you have	tu es – you are	tu fais – you do
il va – he's going	il a – he has	il est – he is	il fait – he does
nous allons – we're going	nous avons – we have	nous sommes – we are	nous faisons – we do
vous allez – you're going	vous avez – you have	vous êtes – you are	vous faites – you do
ils vont – they're going	ils ont – they have	ils sont – they are	ils font – they do

Model Text

J'adore le sport et je suis extrêmement sportif!	I love sport and I am extremely sporty!
Mon sport préféré c'est le hockey sur glace ou le kayak.	My favourite sport is ice hockey or kayaking.
Je les adore car ils sont rapides et passionnants mais dangereux quelquefois.	I love them because they are fast and exciting, but sometimes dangerous.
Normalement je fais du kayak chaque week-end	Normally, I do kayaking every weekend
et je joue au hockey sur glace trois fois par semaine après le collège.	and I play ice hockey three times per week after school.
Ma sœur déteste le sport – elle n'est jamais sportive!	My sister hates sport – she is never sporty!
Je pense qu'elle est paresseuse car elle préfère rester dans sa chambre.	I think that she's lazy because she prefers to stay in her room.
Le week-end prochain je vais regarder	Next weekend I'm going to watch
un match de hockey sur glace au stade.	an ice-hockey match at the stadium

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

Keywords:

Geology – the science that deals with the earth's physical structure and substance, its history, and the processes that act on it.

Impermeable - not allowing fluid to pass through

Relief – The shape and height of the land

Weathering - the breakdown of rocks at the Earth's surface, by the action of rainwater, extremes of temperature, and biological activity without movement.

Erosion - the action of surface processes that removes soil, rock, or dissolved material from one location on the Earth's crust, and then transports it to another location where it is deposited.

Sedimentary, metamorphic, igneous – Categories of rock in rock cycle

Pangea – supercontinent which existed in early geological time encompassing almost all of the land on Earth into one continent.

Oceanic crust - the relatively thin part of the earth's crust which underlies the ocean, younger than continental crust

Continental crust - the relatively thick part of the earth's crust which forms the large land masses.

Magma - molten rock which is stored in the Earth's crust,

Lava - molten rock that reaches the surface of the Earth .

Natural Hazard - extreme natural events that can cause loss of life, extreme damage to property and disrupt human activities

Supervolcano - an unusually large volcano having the potential to produce an eruption with major effects on the global climate and ecosystem

Weathering Examples –
Freeze Thaw, Onion skin biological and chemical

The rock cycle

Constructive margin
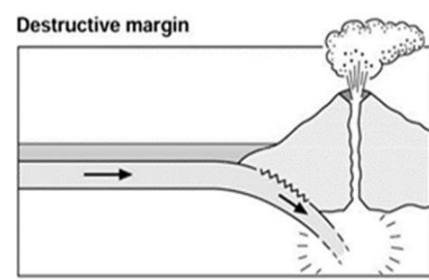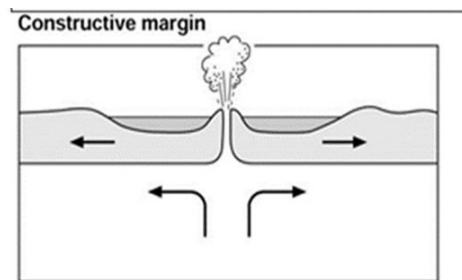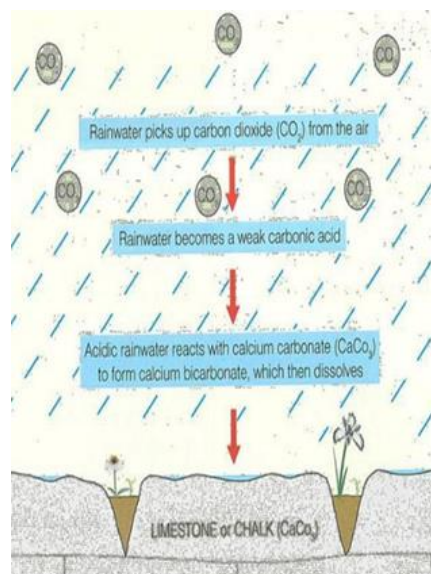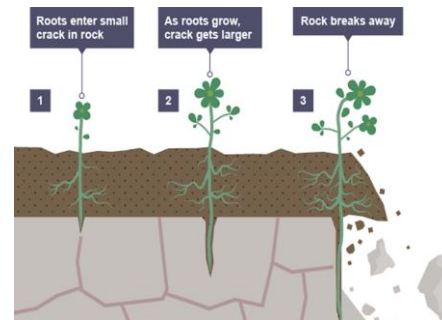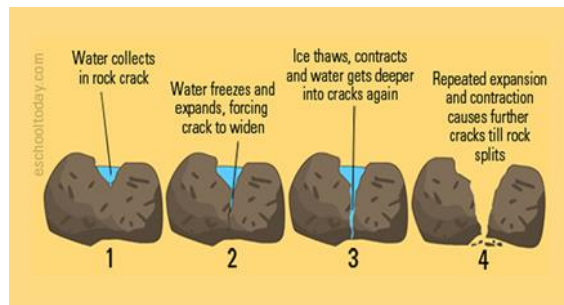
Destructive margin
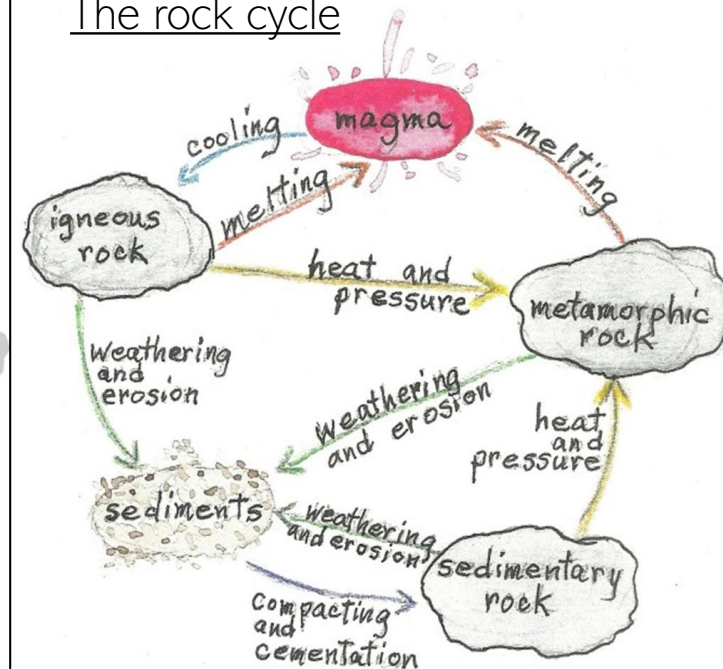
A plate margin is just **the edge of a tectonic plate.** At a **constructive plate margin** the plates move **apart** from one another. When this happens the magma from the mantle rises up to make (or construct) new land in the form of a **shield volcano.**

A **destructive plate margin** usually involves an **oceanic** plate and a **continental** plate. As the plates collide, the oceanic plate is forced beneath the continental plate. This is known as **subduction.** This happens because the oceanic plate is denser (heavier) than the continental plate.

When the plate sinks into the mantle it melts to form magma. The pressure of the magma builds up beneath the Earth's surface. The magma escapes through weaknesses in the rock and rises up through a **composite volcano.** The volcanic eruptions are often violent, with lots of steam, gas and ash.

Type of Volcano	Composite	Shield
Diagram	Composite volcano – layers of ash and lava, viscous lava travels short distances	Shield volcano – layers of lava, runny lava travels long distances
What are the eruptions like?	VIOLENT AND INFREQUENT	MILD AND FREQUENT
What is the lava like?	SLOW FLOWING AND THICK – GASSES DO NOT ESCAPE, DOESN'T FLOW FAR	GASSES STAY DISSOLVED IN LAVA. HOT AND RUNNY. FLOWS OVER LONG DISTANCES
Which margin is this found on?	DESTRUCTIVE	CONSTRUCTIVE
Why does this happen?	WHEN PLATES COLLIDE AT DESTRUCTIVE MARGIN THE COOLER, DESNER PLATE IS SUBDUCTED INTO THE MANTLE. HEAT MELTS THE PLATE AND GENERATES MAGMA.	WHERE PLATES DIVERGE, THE CRUST FRACTURES AND MAGMA RISES TO THE SURFACE. THIS ADDS NEW CRUST TO SEA FLOOR. SOME VOLCANES GROW TALL ENOUGH TO RISE ABOVE SEA LEVEL AND NEW ISLANDS FORM
Examples	MOUNT ST HELENS – USA (LAST ERUPTION 1980	MOUNT LOA, HAWAII
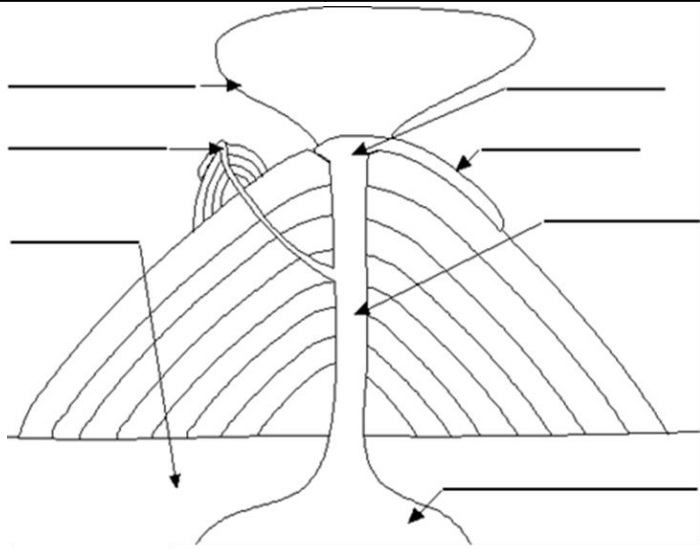
Active volcanoes have a recent history of eruptions; they are likely to erupt again.

Dormant volcanoes have not erupted for a very long time but may erupt at a future time.

Extinct volcanoes are not expected to erupt in the future.

Nyiragongo is a steep-sided, active volcano. It is located in the Democratic Republic of Congo. Nyiragongo and the shield volcano of Nyamuragira, 40 km away, are part of the East African Rift Valley. This is an area of many faults where the plates are being stretched as they move away from each other.

Cause of the eruption

The eruption happened on 17 January 2002. The volcano has a lava lake in its crater. Fissures opened up to the south side of the volcano and three streams of lava from the lake drained through the fissures. The lava reached speeds of 60 km/h. There was little warning as the lava reached the city of Goma. The unrest in the country has made it difficult to monitor the volcano and put emergency responses in place.

Effects of the eruption

Homes were destroyed by ash and lava.

45 people died in the first 24 hours.

People lost their businesses and jobs.

People returned to Goma hoping to find aid. One month after the eruption, 350,000 people were dependant on aid.

Aviation fuel stores exploded as the lava flow damaged Goma airport

If the lava was to reach Lake Kivu, or tectonic activity disrupted the lake, then dangerous gases of carbon dioxide and methane could be released from the floor of the lake.

Around 50 people were killed when fuel exploded while they were trying to get it at a petrol station.

The lava flow made it difficult to travel around Goma as it filled the roads.

The lava took a long time to cool and it burnt people as they tried to return to their homes.

Cholera spread because of lack of sanitation in areas that people fled to.

14 nearby villages were destroyed in the lava flow.

Lava covered 15 per cent of the city of Goma and destroyed 30 per cent of the city.

Aid agencies were unable to access some areas of Goma.

In April 2010 the Eyjafjallajökull volcano in Iceland erupted. Eyjafjallajokull is a strato volcano built by many layers of hardened lava, tephra, pumice and volcanic ash. Due to the glacier on top of Eyjafjallajokull eruptions are explosive and contain lots of ash.

Facts about the eruption

The eruption started on 20 March.

A 500 metre fissure opened up.

The eruption happened underneath an ice sheet.

Dissolved gases in the molten rock along with steam generated from the melting ice caused a large column of volcanic ash.

Effects of the eruption within Iceland

Areas were flooded because of the glacier melt water which lay above the volcano.

Agricultural land was damaged, and farms were hit by heavy ash fall.

The ash fall poisoned animals in nearby farms.

Some roads were destroyed.

People were asked to stay indoors because of the ash in the air.

Effects of the eruption within Europe

Travel was severely disrupted as many flights were cancelled between 14 and 21 April 2010.

Businesses lost trade.

Air operators lost millions of pounds each day.

Perishable foods were wasted as they could not be transported.

People were not able to get to work because they were stranded.

The timing of the disruption was during the Easter holidays when levels of tourism are high.

Graphic Design

Graphic design is the art of creating **visual** content, which includes using typography, images, colours, and shapes to **communicate messages or ideas**. Its ultimate goal is to make information easy to comprehend.
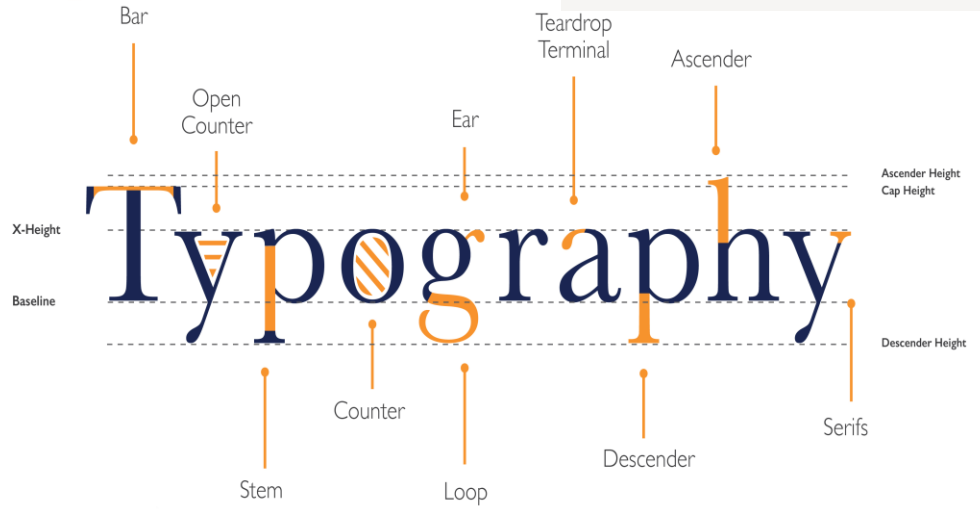
Serif – easy to read, looks traditional.

Sans serif – strong, bold and clear. Modern looking. Often used for titles and headings.

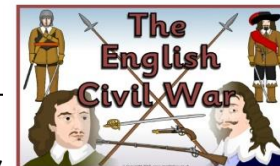**Script** – looks more personal, and depending on the styles used, historical. Can be difficult to read.

Decorative – attracts attention, and gives text a particular feel or association. Can be difficult to read. Best used for main titles.

PET	HDPE	PVC	LDPE	PP	PS	OTHER
1	2	3	4	5	6	7
POLYETHYLENE TEREPHTHALATE	HIGH-DENSITY POLYETHYLENE	POLYVINYL CHLORIDE	LOW-DENSITY POLYETHYLENE	POLYPROPYLENE	POLYSTYRENE	OTHER
WATER BOTTLES; JARS; CAPS	SHAMPOO BOTTLES; GROCEY BAGS	CLEANING PRODUCTS; SHEETINGS	BREAD BAGS; PLASTIC FILMS	YOGURT CUPS; STRAWS; HANGERS	TAKE-AWAY AND HARD PACKAGING; TOYS	BABY BOTTLES; NYLON; CDS

E E E — not connected / connected

drop line — make it as bold and thick as you want

drop shade — imagine the sun is there to more easily add shadows

drop shadow — play with its texture and intensity / add a vanishing point and connect all edges to it

W for wave

T for TRAPEZE

for JAZZ

K for KARATE

Google, Apple, McDonald's, adidas, Starbucks, NIKE, Coca-Cola, facebook, amazon

Typography

- Bar
- Open Counter
- Ear
- Teardrop Terminal
- Ascender
- X-Height
- Baseline
- Ascender Height / Cap Height
- Descender Height
- Stem
- Counter
- Loop
- Descender
- Serifs

Year 8: The Stuarts

The English Civil War

Key Vocabulary	Definitions
Monarch	The king or queen.
Treason	The crime of **betraying** one's king or country
Civil War	A war between groups of people in the **same country.**
Roundheads	**Parliamentarian** soldiers in the English Civil War. Led by **Oliver Cromwell.**
Cavaliers	**Royalist** soldiers in the English Civil War. Led by **Prince Rupert.**
Divine Right of Kings	The idea that a monarch has a **God-given right** to rule, and their power cannot be challenged.
Parliament	The group of **lawmakers** in the **government.** Led by the Prime Minister.
Republic	Country with no king or queen.
Puritan	A **very strict Protestant** who believes in purifying the Chuch of England.
Execution	The carrying out of a **death sentence.**
Tyranny	Cruel, harsh, unfair government by someone with unlimited power.

King James I (1603-25)
When Queen Elizabeth I died childless, her closest relative – **King James VI of Scotland** became king. This began a period of reign by the **House of Stuart**. Some English people didn't like the idea because they thought of him as a **foreigner**, but others were pleased to have a king in charge after many years of having a woman on the throne. James was the **first monarch to rule both countries** and the first to call himself **'King of Great Britain'**.

The Gunpowder Plot (5th Nov 1605)
Many English Catholics were upset that James I did nothing to help them worship more freely. A group of **12 Catholics**, led by **Robert Catesby**, plotted to **blow up the Houses of Parliament** & King James I. **36 barrels of gunpowder** were placed in the cellar beneath Parliament. **Guy Fawkes** was caught before he lit the fuse. The plotters were found guilty of **treason** & were **hung, drawn & quartered.**

King Charles I (1625-49)
Charles upset Protestants by marrying **Henrietta Maria**, a French **Catholic**. His adviser **Archbishop William Laud** made changes to the Church, which Puritans believed seemed like a return to Catholic ways. Charles **quarrelled with Parliament** lots over **religion & money e.g. Ship Money Tax,** & ruled without parliament from 1629-40 (The '**11 Years Tyranny**' or '**Personal Rule**'). Charles believed strongly in the **divine right of kings**. In 1642, the struggle between king & Parliament led to **civil war**!

The English Civil Wars (1642-49)
Roundheads vs. Cavaliers. Most big towns, & the south-east, supported Parliament. Wales, the north & west of the country supported Charles. The war was very bloody, with around **250,000 deaths**.
Key battles
1642: Battle of **Edgehill** (indecisive)
1644: Battle of **Marston Moor** (Parliament won)
1645: Battle of **Naseby** (Parliament won)
Armies
- **Pikemen** carried long, wooden spears called pikes.
- **Musketeers** fired heavy guns called muskets.
- **The cavalry** were mounted on horses & had swords & pistols
- **Cromwell** set up the **New Model Army** in 1645. This was a well trained, **professional** army. It's Commander was **General Fairfax.**

Execution of King Charles I (30th January 1649)
Charles was put on **trial for treason.** 59 judges, including Cromwell, signed his **death warrant**. He was executed in **Whitehall** as a '**Tyrant, Traitor, Murderer and public enemy'.**
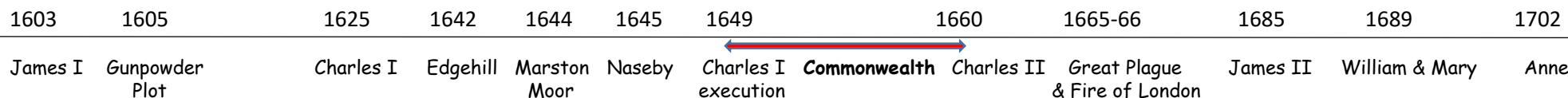
The Commonwealth (1649-1660)
After Charles's execution England became a **republic.** Parliament ruled at first, but in 1653 **Oliver Cromwell** closed Parliament & ruled as **Lord Protector.** Under the **Protectorate** England was ran by **11 Major-Generals.** The **Puritans** became powerful. Churches had to be plain, & dancing, theatre, pubs, gambling, maypoles and even Christmas were banned.

King Charles II (1660-1685)
He returned from Holland in 1660 to claim the throne in the **restoration of the monarchy**. He is known as the '**merry monarch**' as he spent most of his time enjoying himself!

1603	1605		1625	1642	1644	1645	1649	1660	1665-66	1685	1689	1702
James I	Gunpowder Plot		Charles I	Edgehill	Marston Moor	Naseby	Charles I execution	Commonwealth → Charles II	Great Plague & Fire of London	James II	William & Mary	Anne

Knowledge Organisers and Practice questions

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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 x 2 = 4 written as 2^2

Cube numbers – multiply by itself 3 times e.g. 2 x 2 x 2 = 8 written as 2^3

Multiplication and division

So $1.24 \times 0.26 = 0.3224$

Answer: 28·8

Addition and subtraction

Line up the decimal points

1.234
+ 4.1
5.334

Borrow as usual

31.40
- 27.59
3.81

Line up the decimal points

Negative numbers - directed
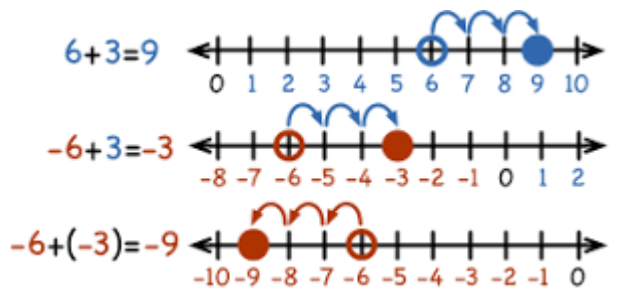
$6+3=9$

$-6+3=-3$

$-6+(-3)=-9$

Adding/Subtracting

$5 + -7 = 5 - 7 = -2$

$-5 - 8 = -13$

$5 - -2 = 5 + 2 = 7$

Multiplying

$5 \times -2 = -10$

$-3 \times 7 = -21$

$-6 \times -2 = 12$

Dividing

$-30 \div 2 = -15$

$20 \div -2 = -10$

$-6 \div -2 = 2$

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

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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) 5.9 1– 0.36

7) 2.45 + 0.46

8) 10 – 0.0329

Multiplication and division

1) 6.2 x 7.1

2) 3 x 1.7

3) 2.34 x 2.7

4) 0.24 x 3.57

5) 28 ÷ 7

6) 5.096 ÷ 14

7) 93.10 ÷ 15

8) 1.24 ÷ 0.4

Negative numbers

1) -3 x –4

2) -5 x 4

3) 10 x -5

4) -7 x -2

5) 4 x -6

6) -5 x 8

7) -2 x -5

8) 6 x 10

9) -10 x 9

10) 8 x -5

11) 18 ÷ -3

12) -20 ÷ 10

13) -24 ÷ -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?

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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
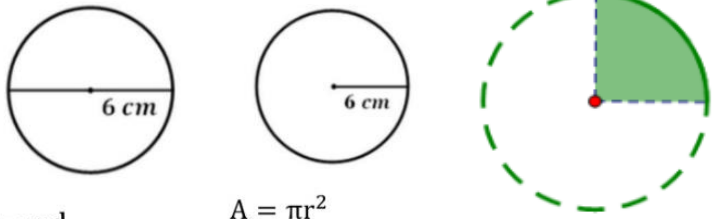
$C = \pi d$

$= 3.142 \times 6$ cm

$= 18.85$ cm

$A = \pi r^2$

$= 3.142 \times 6^2$

$= 3.142 \times 36$

$= 113.11$ cm^2

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

Compound area

The area of this shape → EQUALS → the area of these two
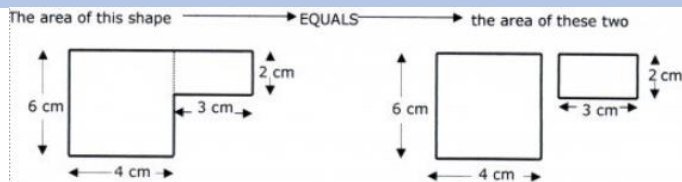
The area of this shape $= (6 \times 4) + (2 \times 3)$
$= 24 + 6$
$= 30$ cm^2

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Area

SQUARE	
$A = Length^2$	
RECTANGLE	
$A = Length \times width$	
TRIANGLE	
$A = \dfrac{1}{2} Base \times height*$	
TRAPEIZUM	
$A = \dfrac{1}{2}(a + b) \times height*$	
PARALLELOGRAM	
$A = Base \times height*$	

Perimeter

10cm

5cm

Add the sides
$10 + 10 + 5 + 5$
$= 30$cm

Volume of a prism

Volume of triangular prism = area of cross-section × length

$= \dfrac{1}{2} \times b \times h \times l$
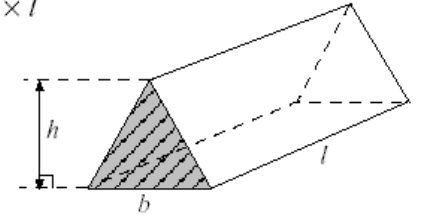
Surface area of a triangular prism
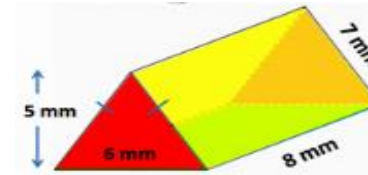
The "Total Surface Area" =

$2 \times (6 \times 5)/2$: Two Reds
$+ 2 \times (8 \times 7)$: Two Yellows
$+ 1 \times (8 \times 6)$: One Green

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

$= 190$ mm^2 ✓

$(6 \times 5)/2$

8×7 8×6 8×7

$(6 \times 5)/2$
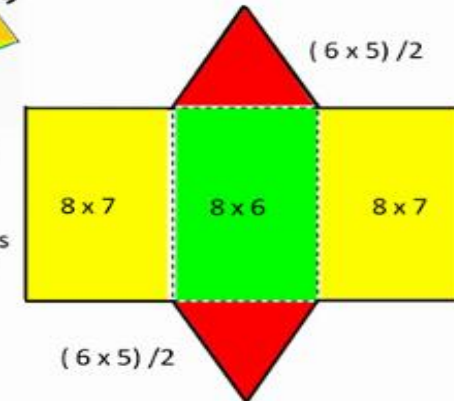
Hegarty Maths Links

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:

1)

8 cm
5 cm

2)

5 cm
3 cm
4 cm
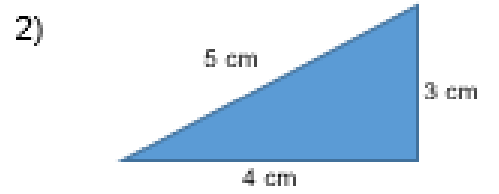
Calculate the area of the following shapes:

3)

6 cm
4 cm
10 cm
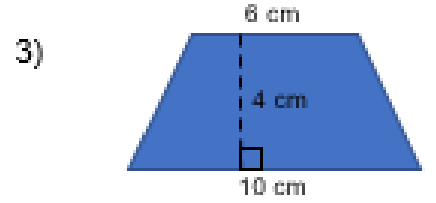
Circles

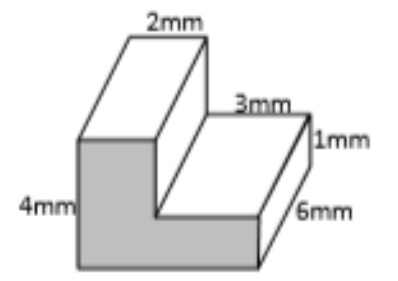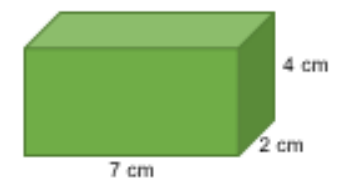Calculate the area and circumference of the following shapes:

1)

7cm

2)

9 cm
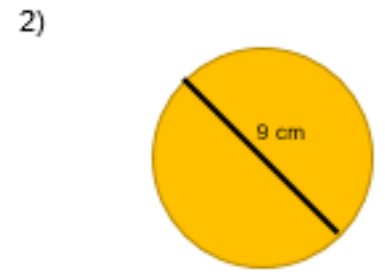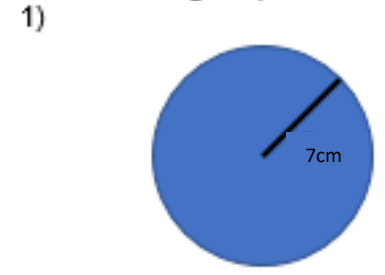
Surface Area

1) How many vertices does a cube have?

2) Draw the net of a cube
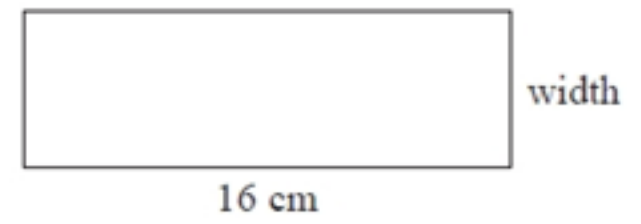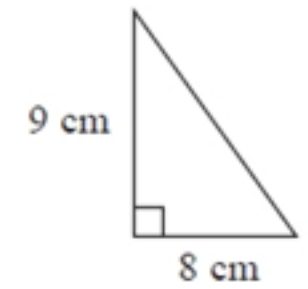
3) Calculate the surface area of the following:

5.2cm
5.2cm
5.2cm
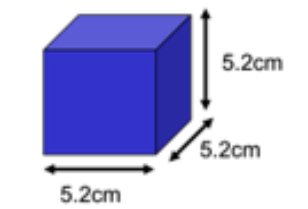
Volume

Calculate the volume of the following

4 cm
2 cm
7 cm

2mm
3mm
1mm
4mm
6mm

b)

9m
8m
8m

4 cm
10 cm
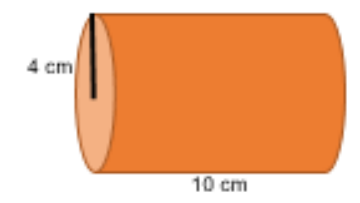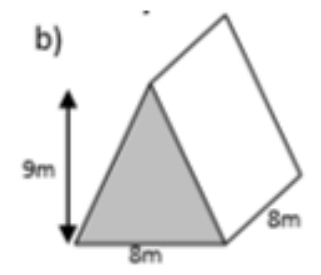
Problem Solving

Here are a triangle and a rectangle.

9 cm
8 cm

width
16 cm

The area of the rectangle is 6 times the area of the triangle.

Work out the width of the rectangle.

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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

	add powers
$t + t + t = 3t$	$a^1 \times a^1 = a^2$
	subtract powers
$t \times t \times t = t^3$	$a^{10} \div a^3 = a^7$

Simplifying

3e + 6r - e +5t

2e + 11t

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

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Substitution

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

$3a - 2b$ (a = 10   b = 4)

$= 3(10) - 2(4)$

$= 30 \quad - \quad 8$

$= \quad 22$ ✓

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 4x1 = 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

Simplifying

a) $3x + 6y - 4y + 2x$

b) $y + y$

c) $3p \times 5q$

d) $p \times p \times p \times p$

Substituting

1) Find $3x + 5y$ when $x = 4$ and $y = 2$

2) Find abc when $a = 2$, $b = 3$ and $c = 5$

3) Find $7s - 2t$ when $s = 4$ and $t = -3$

4) Find $4(2n - 3)$ when $n = 5$

Expanding

1) $3(a + 4)$

2) $5(c + 6b)$

3) $4(x - 3y)$

4) $a(a + 5)$

5) $x(4y - 2x)$

Expanding and simplifying

1. $4(2x + 3y) + 2(x + 2y)$

2. $5(a + 3b) + 3(a - b)$

3. $2(3a - 4b) - 3(2a + 1)$

4. $(x + 2)(x + 3)$

5. $(x + 5)(x + 2)$

6. $(x - 6)(x - 6)$

7. $(x + 10)(x - 4)$

8. $(x + 3)(x - 5)$

Factorising into a single set of bracket

1. $3x + 33$

2. $5y + 25$

3. $4a - 18$

4. $x^2 + 4x$

5. $y^3 - 2y$

6. $4a^2 + 20a$

Factorising into double brackets

1. $x^2 + 5x + 6$

2. $x^2 + 8x + 12$

3. $x^2 + 13x + 30$

4. $x^2 - 7x + 12$

5. $x^2 - 2x + 1$

6. $x^2 + 2x - 8$

7. $x^2 + 7x - 30$

Writing expressions

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

a) My brother is 3 years older than me

b) My sister is 2 years younger than me

c) My mum is double my age

Write an **expression** for the **area** of the rectangle.
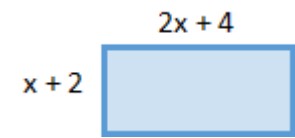
2x + 4

x + 2

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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%

Fractions — $top \div bottom$ → **Decimals**

Write percentage over 100 then simplify

$\div 100$ $\times 100$

Percentages
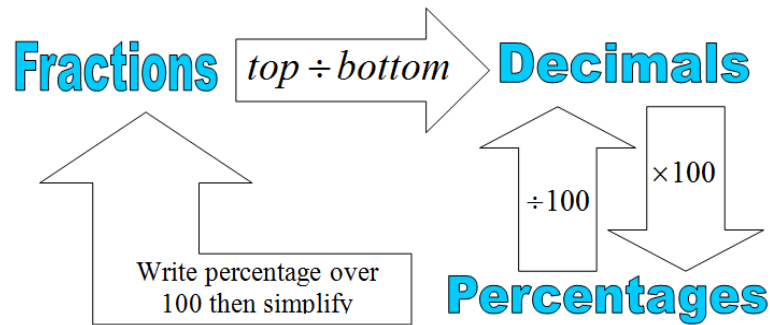
Calculations with fractions

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,

$\frac{2}{3}$ of 18 litres = 18 litres $\div$ 3 $\times$ 2

= 6 litres $\times$ 2

= 12 litres

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
   4.733×10^3

4) 0.00000081
   8.1×10^{-7}

1) 0.00765
   7.65×10^{-3}

5) 7277.66
   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

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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
½		
	0.6	
		15%
¼		

2) Would you rather have ¾, 70% or 0.72 of a pizza? Why?

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?

2) Michael gets 42% better at kick ups. He used to be able to do 32. How many can he do now?

3) Ben loses 36% of his Instagram followers. He used to have 380. How many does he have now?

4) Red bull has 94% more sugar than Coke Life. Coke Life has 1.2g of sugar. How much does Red Bull have?

1) Calculate 40% of 600 ml.

2) Calculate 67% of £120.

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?

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?

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}

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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

Impossible   Unlikely   Evens   Likely   Certain

0	¼	½	¾	1
0	25%	50%	75%	1
0	0.25	0.5	0.75	1
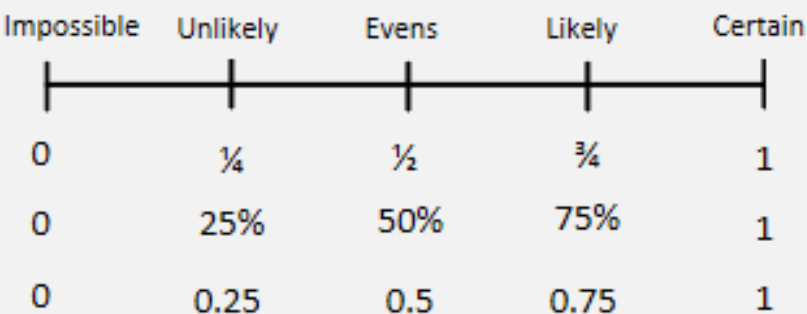
$$\text{Probability} = \frac{number\ of\ successful\ outcomes}{total\ number\ of\ possible\ outcomes}$$

Probability of an event not happening

$$P(not\ A) = 1 - P(A)$$

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

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

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

Sample space diagrams

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

a) The probability of getting a total of 7? $\frac{6}{36}$

b) The probability of getting a total of a 1? $\frac{0}{36}$

c) 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

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

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

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

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

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Probability

1) I roll a normal, 6 sided dice. What is the probability that I get:
a) a 6?
b) an even number?
c) a number less than 2?

2) The spinner shown in spun. What is the probability that the spinner lands on:
a) red?
b) red or yellow?
c) not blue?

3) 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:
a) an X?
b) a vowel?
c) not an E?

4) The probability that I win a 100m race is 3/10. What is the probability that I don't win the race?

5) The probability that is rains tomorrow is 0.14. What is the probability that it doesn't rain tomorrow?

Probability scale

On the probability scale below, mark

(i) with the letter S, the probability that it will snow in London in June,

(ii) with the letter H, the probability that when a fair coin is thrown once it comes down heads,

(iii) with the letter M, the probability that it will rain in Manchester next year.

```
|_____|_____|
0                                          1
```
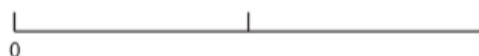
Sample space diagrams

Two fair dice are thrown together and the scores are added together.
1) Complete the sample space diagram showing all the possible outcomes

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

2) How many outcomes are there altogether?
3) What is the most likely score?
4) What are the least likely scores?
5) What is probability of scoring 10 or more?

6) What is the probability of scoring less than 5?

Listing

1) Three friends Andrew, Billy and Chris are sitting in the same row at a concert. Show the different seating arrangements that are possible.

2) A restaurant menu allows a choice of one each of starter, main course and sweet. The choices are:

Starter	Main Course	Sweet
Melon	Pasta	Gateaux
Soup	Fish	Ice-cream
	Chicken	

Relative Frequency

1) 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.

2) 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.

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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 statemnt, often written as an equation, that shows the exact relationship beyween different variables e.g. y=mx+c.

Inequalities on number lines

Closed dot $x \leq 2$

-3 -2 -1 0 1 2

Open dot $x > 1$

1 2 3 4 5 6

Closed dot $-3 \leq x < 7$ Open dot

-4 -3 -2 -1 0 1 2 3 4 5 6 7 8
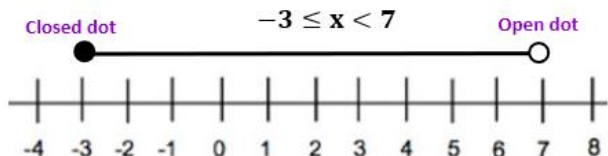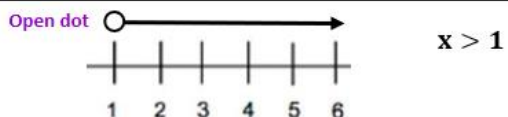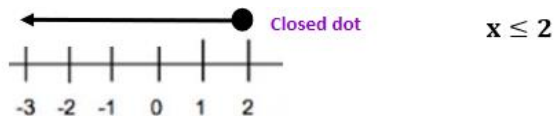
$3 \leq x < 7$

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

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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 =

$$b = 5a + 21$$
-21   -21
$$b - 21 = 5a$$
÷5   ÷5
$$\frac{b - 21}{5} = a$$

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

Unknown on both sides

$$5y - 8 = 2y + 7$$
$$3y - 8 = 7$$
$$3x = 15$$
$$y = 5$$

Forming and solving equations

PQR is a triangle. Form and solve an equation to find the value of y.
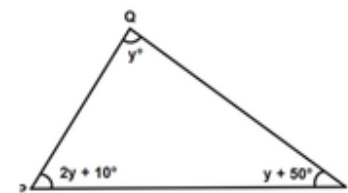
What do the angles in a triangle add up to?

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
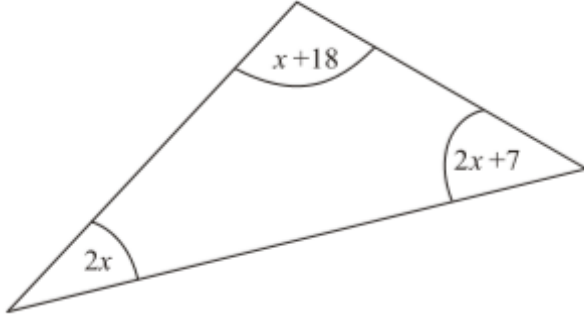
Inequalities – 265, 266, 267, 268, 269

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

Forming and solving – 176, 188

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

Solving

1) $x + 4 = 11$

2) $w - 6 = 23$

3) $5d = 70$

4) $\frac{k}{4} = 7$

5) $2x + 6 = 12$

1) $6(x - 2) = 24$

2) $5(4y + 2) = 70$

3) $2x + 4 = 5x - 8$

4) $4x - 3 = 2x + 2$

5) $3(x + 6) = 4(x + 5)$

Inequalities

List the integers which satisfy these inequalities and display on a number line

$2 < x < 7$

$1 < x < 3$

$-3 \leq x < 3$

$-1 \leq x \leq 1$

$27 \leq x \leq 33$

$55 < x \leq 59$

Forming and solving

The sizes of the angles, in degrees, of the triangle are

$2x + 7$
$2x$
$x + 18$

(a) Use this information to write down an equation in terms of x.

....

(b) Use your answer to part (a) to work out the value of x.

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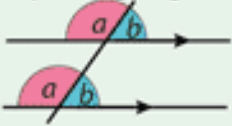
Corresponding angles are equal. They can be found in F shapes.

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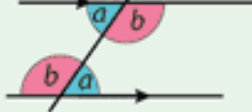
Alternate angles are equal. They can be found in Z shapes.

Plans and elevations

Plan

Front

Side

Plan

Front

Side

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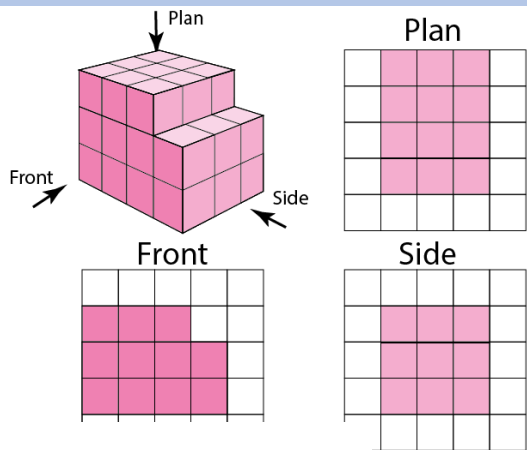
Types of special quadrilaterals

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	

Angles in polgons

Angle Sum

$(n - 2) \times 180^0$

number of triangles

$4 \times 180^0 = 540^0$

| 3 | triangle | 4 | quadrilateral |
| 5 | pentagon | 6 | hexagon |

7 - heptagon

8 octagon

9 - nonagon

10 - decagon

Polygons

interior angle

$\frac{\text{angle sum}}{\text{number of sides}}$

OR

$180^0 - $ exterior angle

exterior angle

$\frac{360^0}{\text{number of sides}}$

OR

$180^0 - $ interior angle

Angle facts

The angles on a straight line add up to 180°.
$a + b = 180°$
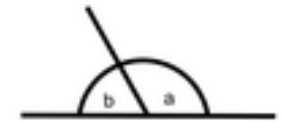
The angles in a triangle add up to 180°.
$a + b + c = 180°$

The angles at a point add up to 360°.
$m + n + p = 360°$
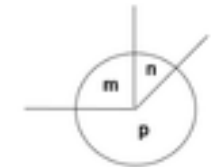
The angles in a quadrilateral up to 360°.
$w + x + y + z = 360°$

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

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

Angles

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

1)

a °

105 °

2)

34 °

b °
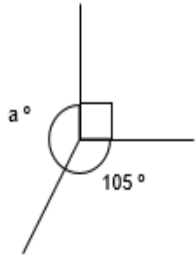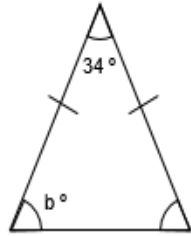
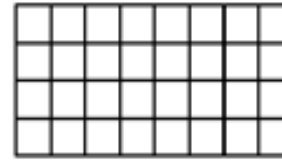3) Diagram shows a regular pentagon

c °

4)

d °

e °

81 °

f °
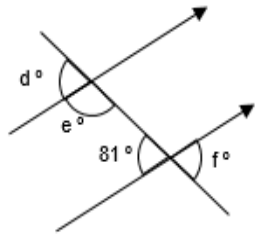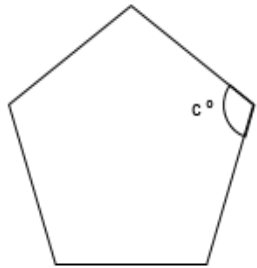
Plans and elevations

Draw the front, side and plan view.

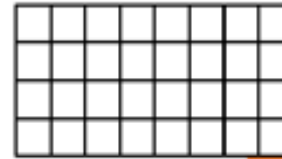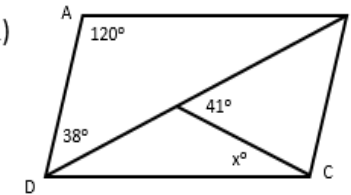**Front**

Side
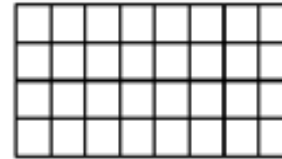
Plan

Apply your knowledge

1)

A   120°   B

41°

38°

x°

D   C

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)

C

B   53°   G

F

x°   H

28°   E

A

D
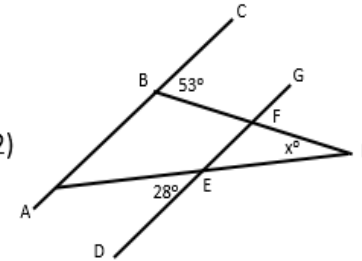
ABC and DEFG are parallel.
AEH and BFH are straight lines.
Work out the size of the angle marked x°

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

E

D

A   B   C
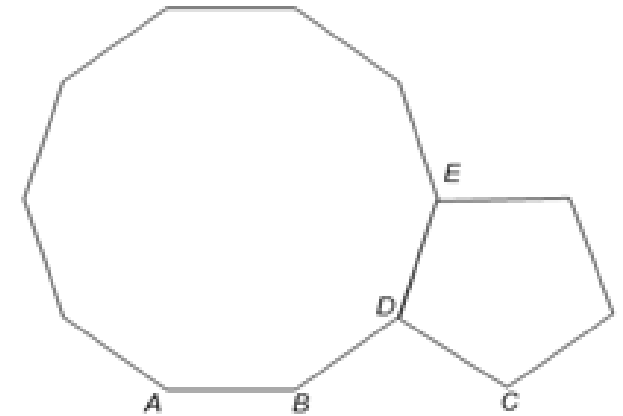
Prove that ABC is a straight line.

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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"

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 $(72 \div 8 = 9)$
  Each ONE portion is worth £9

Monty has 5 portions
$5 \times 9 = £45$
Mosaurus has 3 portions
$3 \times 9 = £27$

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
$4 \times 30 = 120$
Total $= 270 + 120 = 390$

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.

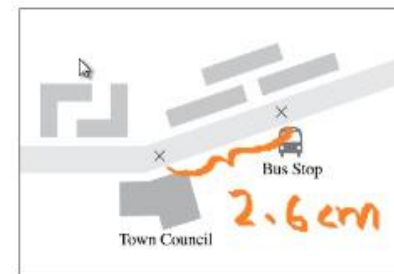(a) Scale 1 : 12 500

1 cm : 12 500cm
2.6 cm : 32 500 cm } ×2.6

if 100 cm is 1m

32 500cm is _325_ 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?

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

Simplify ratio

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

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.

Simplify: 6 : 12

Divide both by 6

1 : 2

Recipes

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

a 12 people
P : M
X2 (6 : 900g) X2
12 : 1800g

b 3 people
P : M
÷2 (6 : 900g) ÷2
3 : 450g

c 9 people?
6 people + 3 people = 9 people
$900 + 450 = 1350g$

Hegarty Maths Links

Simplify ratio - 329

Write in the form 1:n - 331

Share in a given ratio – 332, 333, 334

Recipies – 739, 740, 741, 742

Exchange rates – 707, 708

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

Inverse proportion - 342

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

Exchange rates

The exchange rate is:
£1 buys $2.12

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

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

$ ....
(1)

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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 for 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 25 m 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 m*l* 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 $^3/_{10}$ 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?

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Key words and definitions

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

Trigonometry involves <u>**three ratios**</u>: **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.

$a = 3$

$b = 5$

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

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

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

$9 + 25 = x^2$

$34 = x^2$
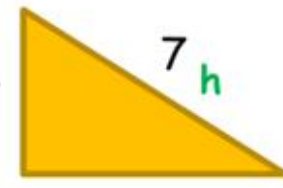
$\sqrt{34} = x$

Substitute the values then work out the left hand side.

Square root to "undo" the squaring operation.

Pythagoras – long side

Finding a short side

Make sure you can rearrange formulae confidently!

$a = x$

7 h

$b = 4$

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

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

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

$x^2 + 16 = 49$

$x^2 = 49 - 16$

$x^2 = 33$

$x = \sqrt{33}$

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

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. $\sin \theta = \dfrac{opp}{hyp}$

hypotenuse
opposite
adjacent

4. Solve to find the unknown side

Trigonometry – Finding an angle

SOH

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

$\dfrac{O}{S^\theta \times H}$

CAH

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

$\dfrac{A}{C^\theta \times H}$

TOA

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

$\dfrac{O}{T^\theta \times A}$

Cover the term you are looking for.

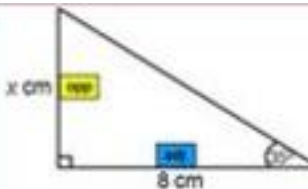**Example:**
Using Cos ratio:

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

Finding a side

x cm   opp
8 cm

Tan A = $\dfrac{opp}{adj}$

Tan 35° = $\dfrac{x}{8}$
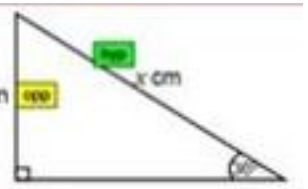
8 × Tan 35° = x

5.6016603 = x

5.6cm = x

m opp
x cm

Sin A = $\dfrac{opp}{hyp}$

Sin 36° = $\dfrac{11}{x}$
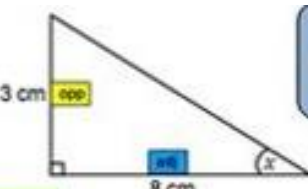
$x = \dfrac{11}{Sin\ 36°}$

x = 18.7cm

Finding an angle

3 cm   opp
8 cm

Tan x = $\dfrac{opp}{adj}$

Tan x = $\dfrac{3}{8}$ = 0.375

x = tan⁻¹ 0.375

x = 20.556045

x = 20.6°

sin

Hegarty Maths Links

Pythagoras- 497, 498, 499

Trigonometry – 508. 509, 510, 511, 512

North East Learning Trust

Pythagoras

Calculate the missing side

1)

x

2 cm

4 cm

2)

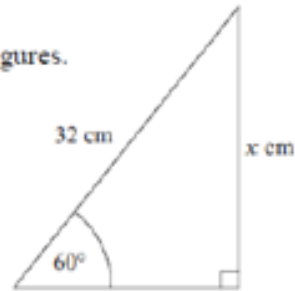8cm

x

6 cm

Trigonometry

8.7cm

A 36° B

C
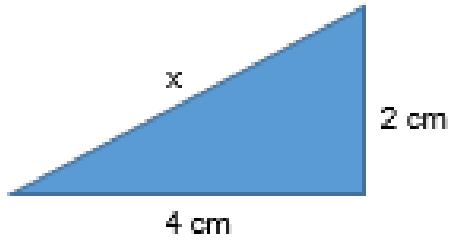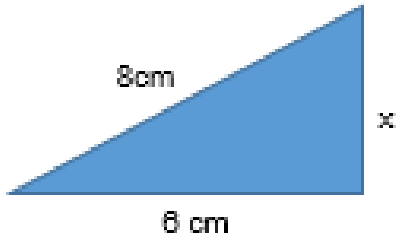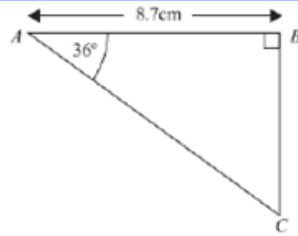
ABC is a right-angled triangle.
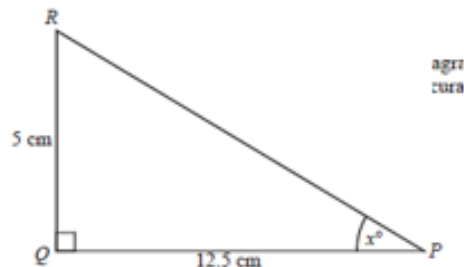
Angle B = 90°.
Angle A = 36°.
AB = 8.7 cm.

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.

32 cm

x cm

60°

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

R

agri
cura

5 cm

Q 12.5 cm $x°$ P

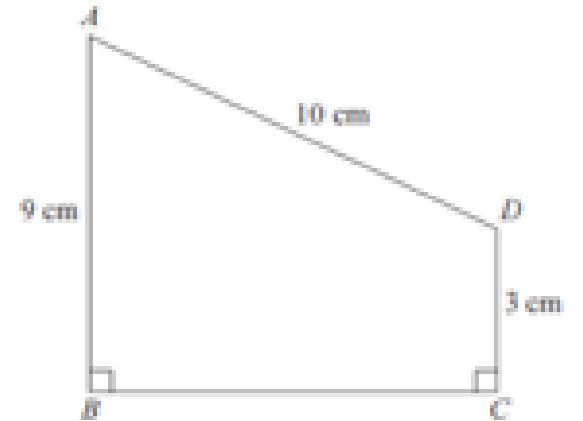## Apply your knowledge

$ABCD$ is a trapezium.

AD = 10 cm
AB = 9 cm
DC = 3 cm
Angle ABC = angle BCD = 90°

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

A

10 cm

9 cm

D

3 cm

B C

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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.

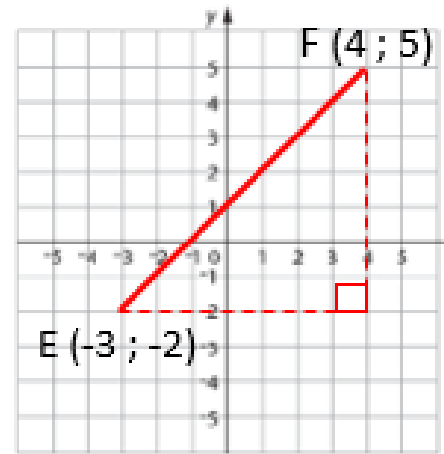**Parallel**- Lines which have the same distance continuously between them.

Coordinates

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

A (2 ; 5)

B (-1 ; 4)

C (-2 ; -3)

D (3 ; - 4)

Midpoint

Add the two x values and ÷ 2

Add the two y values and ÷ 2

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

$$= \quad (½ \ ; 1½)$$

F (4 ; 5)

E (-3 ; -2)

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)

y = x + 1

Gradient

$y = \mathbf{mx} + \mathbf{c}$ is the equation of a straight-line graph

Gradient   y-intercept

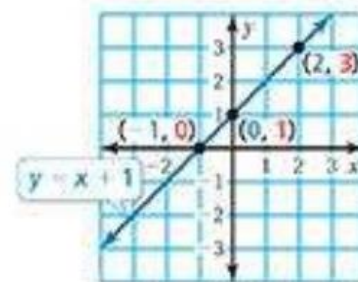$$\text{Gradient} = \frac{\text{change in y}}{\text{change in x}} = \frac{4}{2} = 2$$

y-intercept

4 units up

2 units across
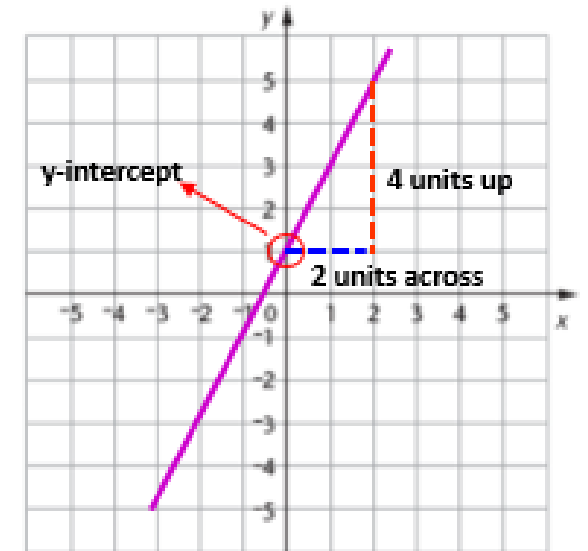
Equation is therefore y = 2x + 1

Hegarty Maths Links

Coordinates - 199 -

Midpoints - 200

Linear graphs = 206. 207, 208, 209

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Coordinates and midpoint

1a) Write down the coordinate of R and P

b) Calculate the midpoint of the line segment RP
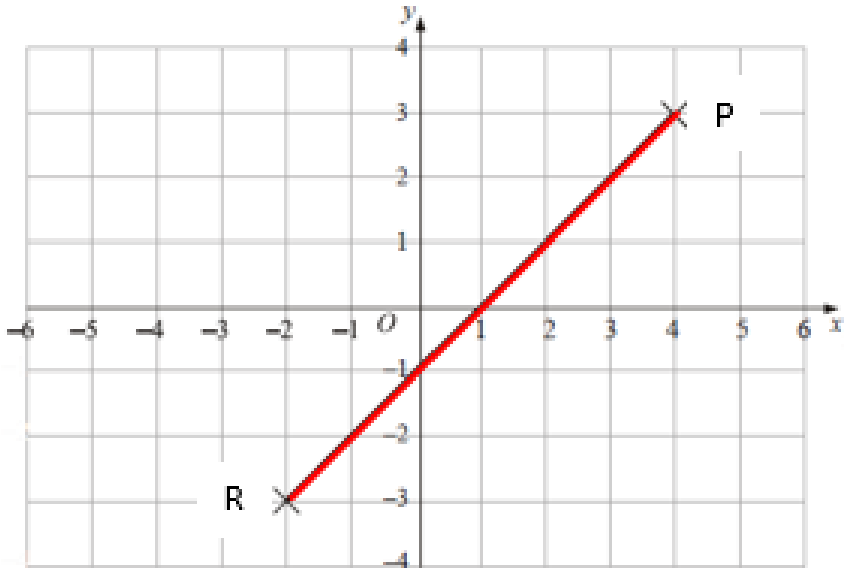
Linear Graphs
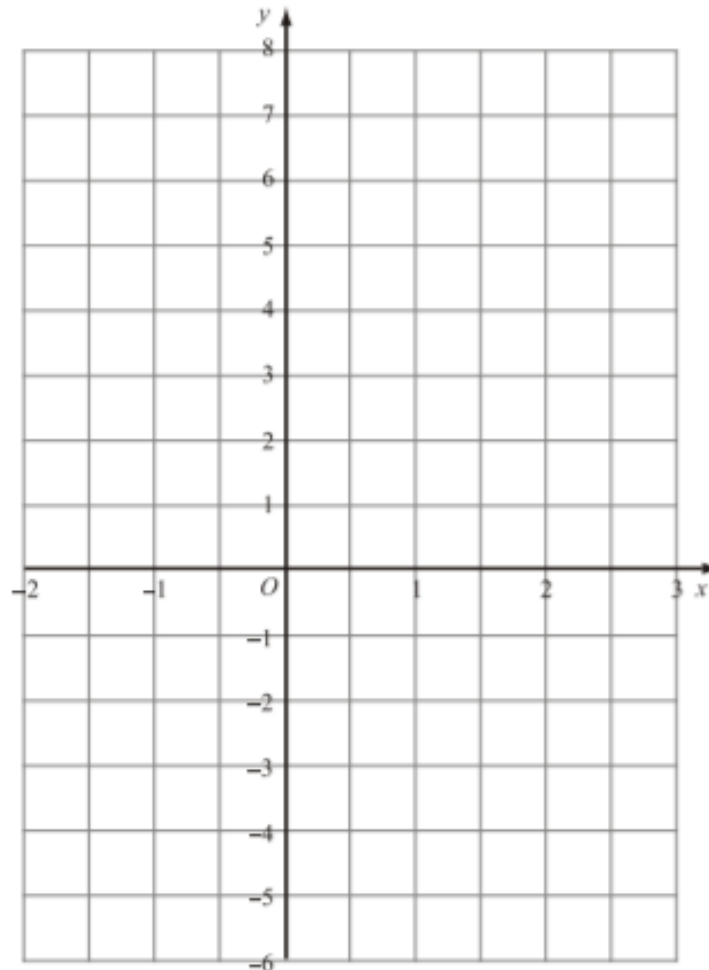
(a) Complete the table of values for $y = 2x + 1$

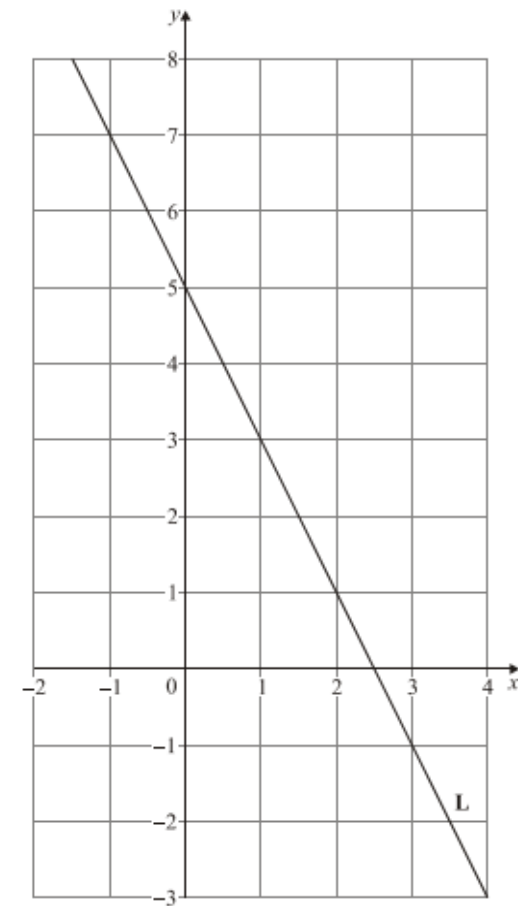| x	−2	−1	0	1	2	3
y		−1	1			

(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**

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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

nth term of a linear sequence

$$3 \quad 8 \quad 13 \quad 18 \quad 23$$
$$+5 \quad +5 \quad +5$$
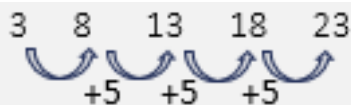
1. Find the *difference* between each term:
   5

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 nth term is **5n -2**

Using a term-to-term rule

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

① ② ③ ④ ⑤ ⑥

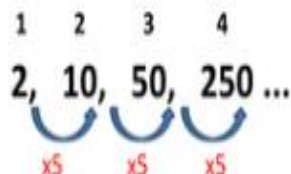28, 37, 46, 55, 64, 73 , ...
+9 +9 +9 +9 +9   ← ARITHMETIC SEQUENCE

Answer 73

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

$$1 \quad 2 \quad 3 \quad 4$$
$$2, \ 10, \ 50, \ 250 \ ...$$
$$\times 5 \quad \times 5 \quad \times 5$$

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 × 2 + 1										

Finding missing terms

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

48 → 70 (2 jumps!) gives us: Add 22
So our rule for one jump is half this → Add 11 (common diff = +11)
Number after 48 → 48 + 11=   59
[CHECK: 59 → 59 + 11 = 70!]
Number after 70 → 70 + 11 =   81

Hegarty Maths Links

Linear sequences from pictures- 196

Term to term rule – 197

Nth term - 198

Geometric Sequences - 264

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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 nth term **3n – 2**

4) Find the first three terms of the sequence with nth term **2n + 4**

Nth term

Find the nth 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?

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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

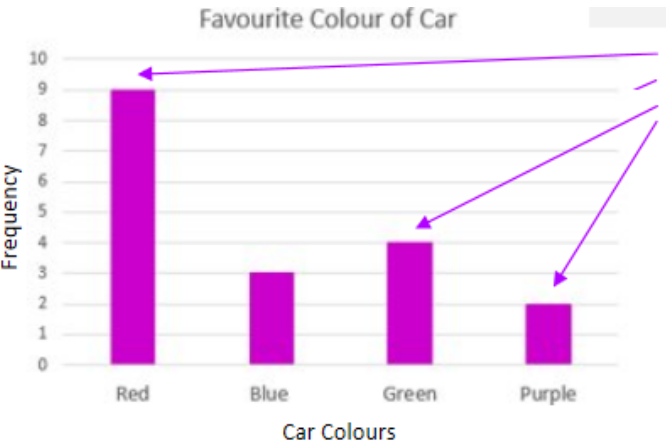Distribution – how data is spread out, takes account of average & range

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	卌 IIII	9
Blue	III	3
Green	IIII	4
Purple	II	2

Favourite Colour of Car

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

Averages

Mode	Most common

Mean	Sum of values / Number of values

Median	Middle value in ascending order

Average	Advantages	Disadvantages
Mean	Every value makes a difference	Affected by extreme values
Median	Not affected by extreme values	May not change if a data value changes
Mode	Easy to find. Not affected by extreme values. Can be non-numerical	There may not be one. There may be more than one.

Range

Range

Largest value – smallest value

Pie chart

1	Sum (add up) the frequency
2	360° ÷ frequency 360° ÷ 72 = 5
3	Multiply each category x5 to find sector size

Fish	Frequency	
Perch	10	x 5 = 50°
Bream	23	x 5 = 115°
Carp	39	x 5 = 195°
TOTAL	72	360°

360° ÷ 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

Positive Correlation   **Negative Correlation**   **No Correlation**
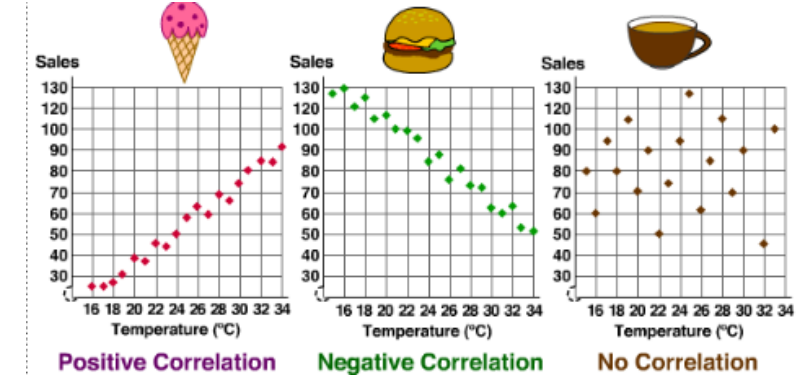
Hegarty Maths Skills Links

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

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Averages

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?

Bar Carts

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.
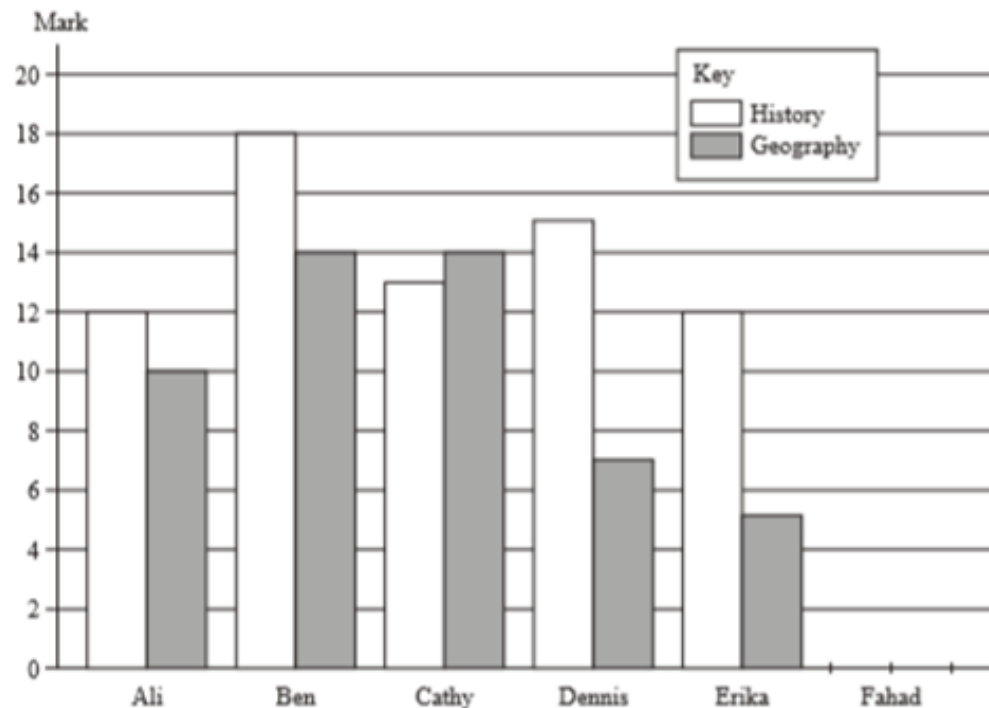
(a) How many marks did Ali get in his history test?

....

(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.

Pie charts

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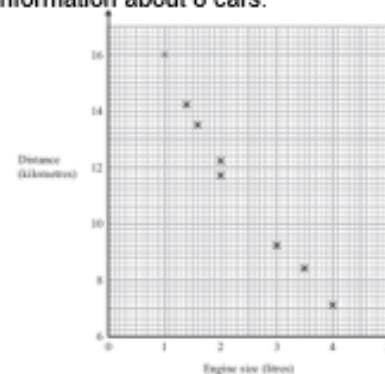

How did most of the students travel to school?

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.

Blues Music – Knowledge Organiser
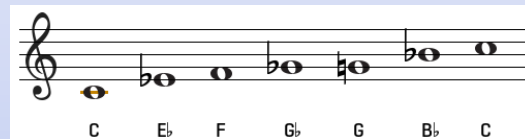
Historical Context:

The blues is the name given to a style of music created by **African-Americans** at the end of the **19th century**. Until the end of the 19th century, America was largely a rural community. In the early 20th century, large numbers of people started to move to industrial cities. After the Civil War and the emancipation of slaves, the blues spread, together with the people who sang and played it. Many former slaves moved from the cotton fields of the southern states to northern cities such as **Chicago** and **Detroit**, where the blues became highly popular. Blues lyrics often reflect the hardship and reality of everyday life and often follow an **AAB structure**. African influences such as **call & response** are also frequently heard in blues music.
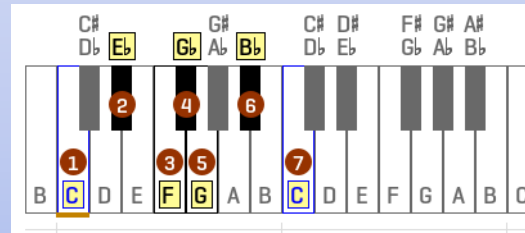
Keywords

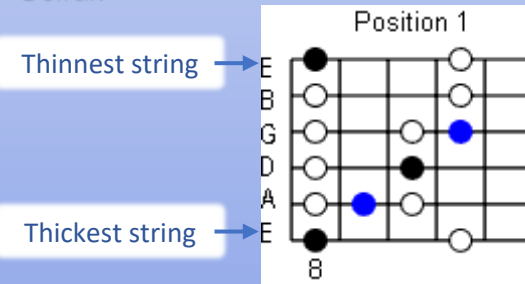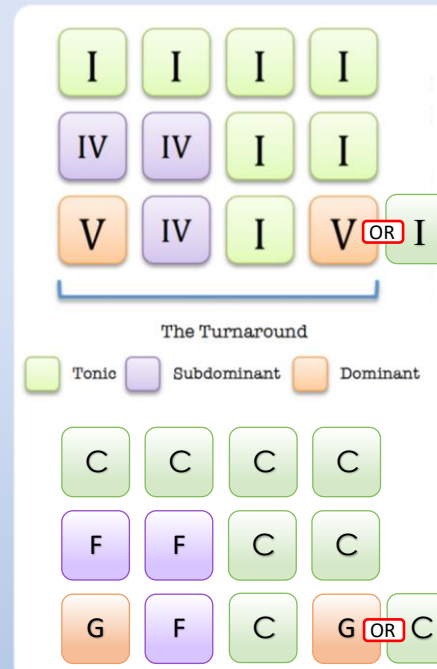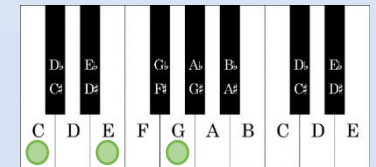| Keywords	
Chord	3 or more notes together
Primary chords	Chords: I, IV and V
12-bar Blues	A chord structure of 12 bars using the primary chords.
Walking bass	A bassline that moves by step ascending and descending the scale
Blues scale	A scale with a flattened 3rd, 5th and 7th.
Improvisation	Making something up on the spot
Seventh chord	A 4-note chord using notes 1, 3, 4 and 7.
Swung rhythm	A rhythm with a triplet feel, with the middle note removed.
Syncopation	Stressing the weaker beats
Vamp	A repeated, improvised accompaniment based around the chords

C Blues Scale:

Notation:

C   Eb   F   Gb   G   Bb   C

Keyboard:

Guitar:

Position 1

Thinnest string → E

Thickest string → E

12-bar Blues Chord Progression:

I	I	I	I
IV	IV	I	I
V	IV	I	V OR I

The Turnaround

Tonic   Subdominant   Dominant

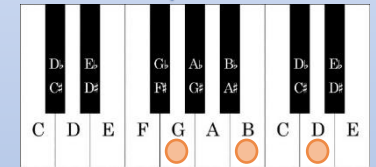| C | C | C | C |
| F | F | C | C |
| G | F | C | G OR C |

C major chord:
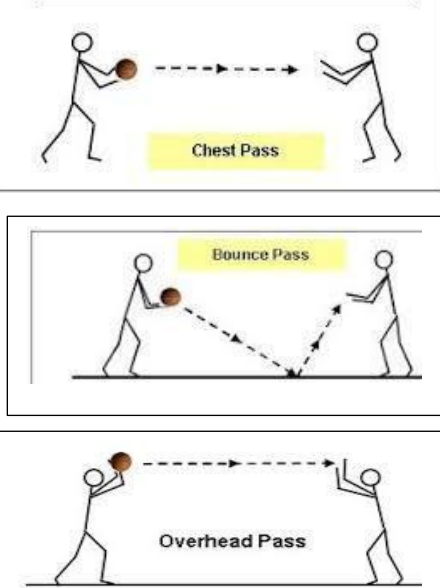

F major chord:
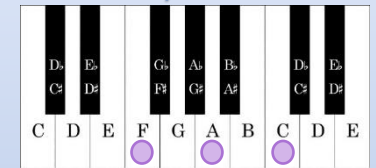
G major chord:

Walking Bassline:

Physical Education Department – Knowledge organiser – NETBALL year 7, 8 and 9

Skills and Techniques	Rules	Glossary	Pictures
Footwork: When you receive the ball from another player you will land with your feet using '1, 2' the first foot is your landing foot the second foot is your pivoting foot.	**Contact:** You can't touch or push any player during the game as it is a non-contact sport, this will result in a **penalty pass** or if they contact you whilst you are in the shooting circle, you will get a penalty shot.	Attack Defence Footwork Pass	Chest Pass
Pivoting: You may move around on a pivot by keeping foot number 1 on the floor, but not lifting it up, your foot number 2 can help you by moving around in a circle.	**Footwork:** If the player moves the landing foot or takes 3 steps with the ball, the other team gets a free pass.	Interception Marking Dodging Receive	Bounce Pass
Chest pass: This is a short and powerful pass, you have your hands in a W shape and push to extend your arms, you also step forward to give more power.	**Obstruction:** You must be 1 metre away from the player with the ball before your arms go up and over the ball. If your defender is obstructing you before you shoot, you get a penalty shot.	Obstruction Contact Pivoting	Overhead Pass
Shoulder pass: This is a long and powerful shot, you start with the ball in your strong hand next to your shoulder, you extend your arm and follow through with your body.	**3 Seconds:** You can only hold the ball for 3 seconds before you pass or shoot.	Shooting Repossession Signal	
Bounce pass: This is a pass which is low to the ground, you use the same position as a chest pass but aim in ¾ of the way between you and the person you are bouncing too.	**Centre Pass:** To start a game, and after a goal is scored you go back to the centre pass and players must receive the ball in the centre third.	Space Rebound Umpire	
Marking: You must be 1m away with your feet from the player, once you have this distance you put both of your arms up over the ball and go onto your tiptoes, when the ball is released you jump to attempt to intercept.	**Repossession:** If a players drops the ball or bounces the ball and picks it back up again the other team gets a free pass.	**Positions** GS GA	
Shooting: You have once hand underneath the ball and the other helping it to balance, you get your aim correct and then bend your knees and release the ball, flicking your wrists	**Offside:** If you go into a third that you are not allowed in or if any other player than GS GA GK GD go into the shooting circle the other team gets a **free pass**.	WA C WD GD GK	
Dodging: When you need to get free from your player you push off one foot and then turn your hips to change direction and run the other way.	**The Game:** Netball is played over 4 quarters.		Marking the ball Landing

Tactics

Blocking: This is where you face on and try and block a player. You have to have your hands by your side and if your opponent pushes/runs into you, it would be contact and you get a free pass. This is usually used around the circle. E.G, the defending C will block out the GA, which assists the GD

Dodging tactics: always signal when you want to receive the ball.
Feint Dodge: This is where you trick your player into thinking you are going to run into a certain space by dropping your shoulder but then change your direction and get free for the pass.
Drive/Sprint Dodge: Start on your toes and sprint into a space to receive the ball.
Roll Off: Step to one side to draw the defender, pivot on that foot, make a quick half turn with your back towards the defender and sprint in the opposite direction.
Double feint dodge: Drop your shoulder one way and then the other and then sprint into the space in the opposite direction.

Attacking: Gain the front position on a defender. Move in front of the defender to gain an advantage. Receive the ball on ball side

Defending- 3 steps - mark the player, mark the ball and mark the space Limit available options for the ball carrier.

Umpire decisions:
Penalty pass - Awarded to the opposing team for any penalty incurred involving obstruction or contact**.** The offending player must stand to the side of the opposing player and is not allowed to move until the ball has been released.

Free pass - If a player breaks a minor rule such as footwork, offside, the opposition is awarded a free pass, which is a pass taken from the same spot where the rule was broken.

Scoring systems and positions

To score a point the GA or GS must shoot the ball into the net and it must travel all the way through the net. You get 1 point for each goal. They must be wholly inside the goal circle to shoot. If the shooter does not hit the rim of the net/post with the ball and the shooter catches the ball after shooting, this is repossession and the ball goes to the other side.

Position	Role
Goal Shooter (marks GK)	To score goals and to work in and around the circle with the GA. Allowed in the shooting third.
Goal Attack (marks GD)	To feed and work with GS and to score goals. Allowed in the shooting and centre third.
Wing Attack (marks WD)	To feed the circle players giving them shooting opportunities. Allowed in the centre and shooting third but not the circle.
Centre (marks C)	To take the centre pass and to link the defence and the attack. Allowed everywhere except the 2 semi circles.
Wing Defence (marks WD)	To look for interceptions and prevent the WA from feeding the circle. Allowed in the centre and defending third but not the circle
Goal Defence (marks GD)	To win the ball and reduce the effectiveness of the GA. Allowed in the defending third and centre third
Goal Keeper (marks GS)	To work with the GD and to prevent the GA/GS from scoring goals. Defending third only.
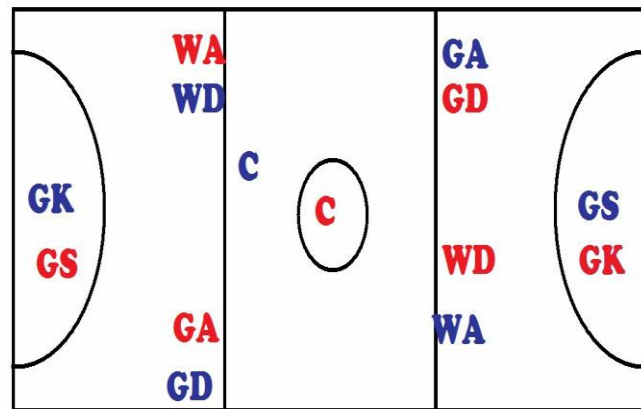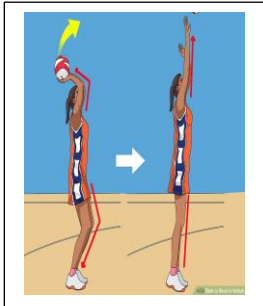
Shooting position

= Blue Team.
= Red Team.

Key Skills/Techniques

Dribbling

Dribbling allows you to move the ball around the field without losing possession.

Keep the ball close to your feet at all times, when running with it.

Use the inside of your foot to control the ball when moving.

Don't look down when running with the ball. Keep your head up.

Passing

Non-kicking foot is closest to the ball.

Kicking foot needs to be at a right angle to the ball.

Body need to be over the ball.

Eyes focused upon the ball and arms are to be used for balance.

Shooting

Non kicking foot needs to be next to the ball and players needs to keep their body balanced with their head slightly over the ball.

Contact the ball either with the side of the foot (placement of ball) top of the foot (to generate power).

Both legs need to be fixed but when striking the ball, kicking foot needs to be fully extended on the follow-through.

For accuracy, aim to shoot between the goal keeper and the posts

Heading
The forehead is used to contact the ball. Eye must be focused on the ball. Meet the ball with your head by moving your feet or jumping to gain the extra height advantage and power. Do not wait for the ball to hit your forehead.

Chest
– Used when the ball is played in the air, to bring it down onto the floor. Player needs to align himself with the ball. Roll their shoulders back to generate a greater surface for the ball to contact with. Chest needs to be slightly curved, to cushion the ball. Bend your knees to take the impact of the ball and then allow the ball to roll down your leg to your kicking foot.

Rules/Tactics

Rules

Game is started with a **kickoff** or restarting it after a goal is scored. It is taken at the centre part of the soccer field. During a kickoff, both teams must be on their own halves and only the kicker and the receiver can be inside the centre circle.

The game has 11 players on the pitch, consisting of a goal keeper, defenders, midfielders and strikers. A referee and 2 linesmen, officiate the game. If the ball is played outside of the pitch lines, the possession is given to the opposing team. If it goes out the side of the pitch, a throw in is awarded. If it is kicked behind the A corner kick is awarded **when the whole of the ball passes over the goal line**, either on the ground or in the air, having last touched a player of the defending team. If the attacking team hit the ball behind the goal line a goal kick is awarded.

If a foul is committed a free kick or penalty is issued, depending on the incident.

To score a goal the ball must cross the opposition's goal line.

The team with the most amount of goals at the end of the game will win the game.

Tactics

Vary the passes that you make

Play to your opponents weaknesses (if they are dominantly using their left foot, then play the balls on their right).
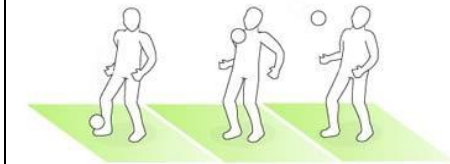
Move opponents around he pitch to tire them out.

Vary the pace and direction of passes.

Glossary

Throw in   Attack   Defend   Dribbling   Foul

Off side   Referee   Volley   Accuracy   Penalty   Pass   Formation   Goal   Ball   Posts

Free kick   Striker   Midfielder   Header   Tackle   Passing   communication   Formation   Corner kick

Pictures

Volley – The volley involves striking a ball that is still in the air. Focus eyes upon the ball. Arms out for balance. Keep eyes focused on the ball as you get into the line of flight. Head still. Non kicking foot on the floor and lead with the kicking leg forward.

Turning with the ball

Cruyff - Great skill for losing your opponent.
Named after the brilliant Dutchman Johan Cruyff.
Shape as if to pass or cross but then drag the ball behind your standing leg with the inside of foot. Turn your shoulders and your hips so that you are back in line with the ball and then race away.

Step over – Skill for sending an opponent in the opposite direction.
Lift your foot over the top of ball to use a 'step over' and this should immediately create you time and space. Then hook the ball away with the outside of the foot and race away.

Inside Hook - You need to keep your body between the ball and your opponent.
Reach round the outside of the ball with your foot so that you can change its direction. Bend your knees so that you can transfer your weight quickly and turn your hips to change your own direction. Then get a positive first touch on the ball that puts it into an area that is comfortable for you to move on to and accelerate away from your opponent .

Outside Hook – This tricks your opponent
Use the outside of the foot to hook the ball back in the direction that you are going to go.

Drag Back - The drag back is a great turn to use when you haven't got a lot of space to work.
Place one foot on top of the ball and staying in contact with it throughout, roll it back and move off in the opposite direction.

Team formation
4-4-2 (4 defenders, 4 midfielders and 2 strikers) a traditional team set up
5-4-1 (5 defenders, 4 midfielders and 1 striker) A more defensive set up.
3-5-1-1 (3 defenders, 5 midfielders, and 2 strikers one in front of each other). A more attacking set up.

Counter attacking – The team withdraws players into their own half but ensuring that one or two players are committed to the attack

Direct long ball football – Often used to deride 'boring' teams, the long-ball style of play is genuine route one football. Rather than spending time on the ball picking up the pass, exploiting small gaps in the opposition's defence or utilising the flanks, the long-ball is employed as an opportunistic method of attack.

Wide/Wing plays – The ball is played to the wings. By spreading the ball wide, you allow a different angle of attack and offer a number of opportunities for the winger; take on the fullback and drag central defenders out of position, cut inside and drive forward at an angle, or whip in a cross from deep for the strikers to attack.

Off side - An attacking player is flagged offside by the assistant referee if there is only one defending player between the player and the goal line at the time the ball is struck. The player should be in active play if the offside offense is to be called.

Throw in - A method of restarting play during the game, when the ball has exited the side of the field of play. Throw in is taken from where it went out. At the moment of delivering the ball, the thrower must face the field of play. The thrower must have part of each foot on the touchline or on the ground outside the touchline, and use both hands to deliver the ball from behind and over the head.
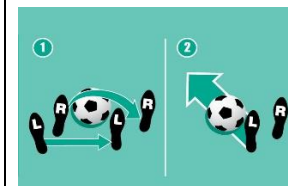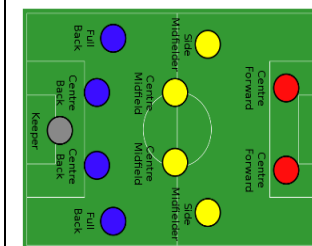
Cruyff Turn **Inside Hook**

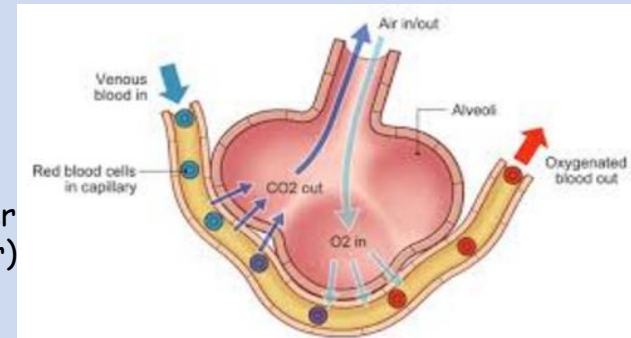**Step over** **Free Kick**

4-4-2 example **Throw in**

Key Words!

Breathing (ventilation): The movement of air in (inhaling) and out (exhaling) of the lungs.
Trachea (windpipe): Carries air from the mouth and nose to the lungs.
Bronchi: Two tubes which carry air to the lungs.
Bronchioles: Small tubes in the lung.
Alveoli: Small air sacs found at the end of each bronchiole.
Ribs: Bones which surround the lungs to form the ribcage.
Diaphragm: A sheet of muscle found underneath the lungs.
Lung volume: Measure of the amount of air breathed in or out
Respiration: A chemical reaction which occurs inside all cells to release ENERGY from food substances such as GLUCOSE.
Circulatory system: Transports substances around the body.
Respiratory system: Replaces oxygen and removes carbon dioxide from blood.

Respiratory System

Air enters your body through your mouth and nose.
↓
Air moves down the **trachea** (windpipe) – a large tube.
↓
Air moves down a **bronchus** – a smaller tube.
↓
Air moves through a **bronchiole** – a tiny tube.
↓
Air moves into an **alveolus** – an air sac.
↓
Oxygen then diffuses into the blood.

When we breathe in we inhale to take in oxygen. The oxygen is used in **respiration** to transfer energy. When we breathe out we exhale carbon dioxide and water, the waste products of **respiration.**

Inhaled air contains more oxygen compared to air breathed out. Air we breathe out contains more carbon dioxide than air breathed in.

Lung Volume

Breathing and respiration are NOT the same! Breathing is a MECHANICAL process while respiration is CHEMICAL.

Lung Volume can be measured by blowing into an inverted measuring cylinder/bottle. The volume of water displaced is equal to how much air your lungs can hold.
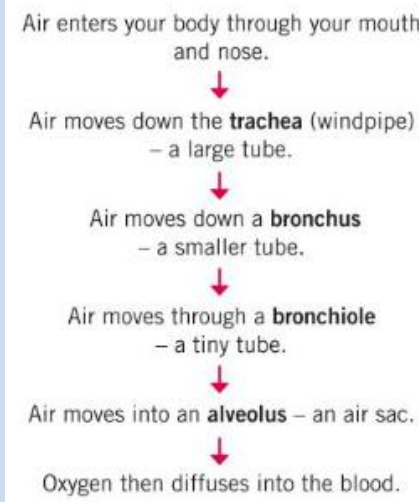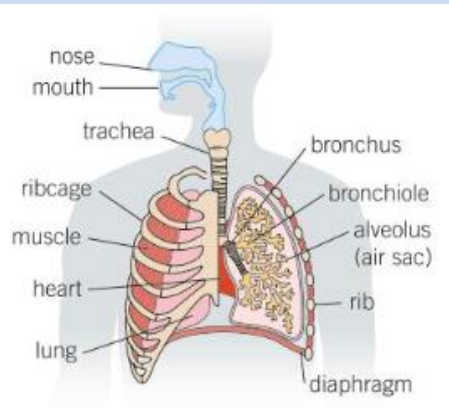
Gas Exchange

During gas exchange **oxygen** passes into the **blood** from the **alveoli** and **carbon dioxide (**a waste product of respiration) passes from the **blood** into the **alveoli** to be exhaled. Gas exchange occurs by the process of **diffusion**.

To maximise the efficiency of gas exchange, the alveoli have several adaptations.
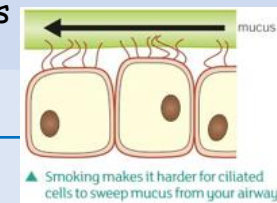1. Large surface area .
2. The membranes of the alveolus and capillaries are only one cell thick (shorter diffusion distance, gases diffuse quicker)
3. They are moist, encouraging gas molecules to easily dissolve.
4. Good blood supply (maintains concentration gradient)
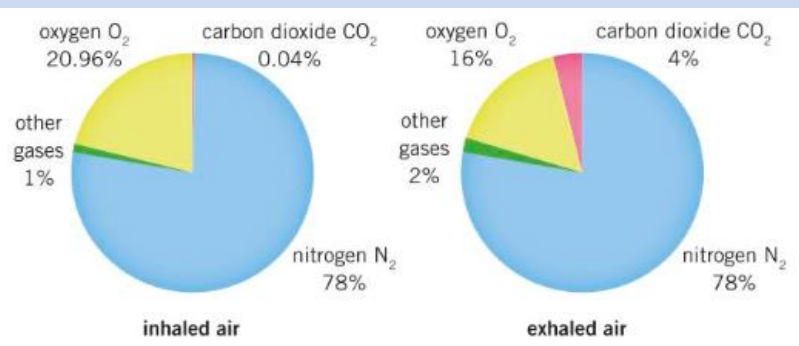

Factors that affect gas exchange

Smoking
• Causes cancer
• Damages the cilia so they can't remove mucus properly, (increased infections)
• Chemicals break down and reduce the number of alveoli (reduces surface area- **emphysema**)

Tar	contains chemicals which cause cancer.
Nicotine	Stimulant drug which makes the heart beat faster, also addictive.
Carbon Monoxide	reduces the amount of oxygen the red blood cells can carry

Asthma
• narrows the small airways (bronchioles) that carry air in and out of the lungs.
• airways can become inflamed, swollen and constricted (or narrowed) and excess mucus is produced

Respiration

Respiration is not breathing. That is called . Respiration is a chemical reaction which occurs in every one of the cells in the human body. It releases energy stored in glucose and without it, these cells would die.

Glucose and oxygen are taken in and converted to carbon dioxide, water and energy. This energy is important for growth, movement and keeping warm.

Circulatory System

Your circulatory system is made up of three parts: the heart, blood vessels and the blood itself.
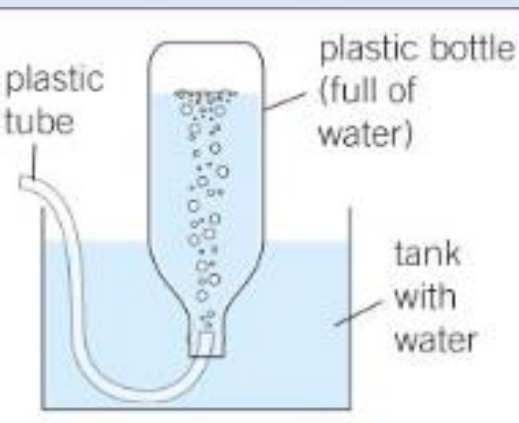

Your heart keeps all the blood in your circulatory system flowing. The blood travels through a network of blood vessels to everywhere in your body. It carries useful materials like oxygen, water and nutrients and removes waste products like carbon dioxide.

Key Words!

Work: The transfer of energy when a force moves an object, in joules.
Lever: A type of machine which is a rigid bar that pivots about a point.
Input force: The force you apply to a machine.
Output force: The force that is applied to the object moved by the machine.
Displacement: The distance an object moves from its original position.
Deformation: When an elastic object is stretched or squashed, which requires work.
Thermal conductor: Material that allows heat to move quickly through it.
Thermal insulator: Material that only allows heat to travel slowly through it.
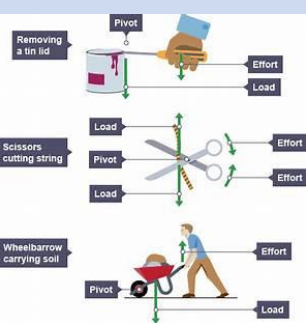**Temperature:** A measure of the motion and energy of the particles.
Thermal energy: The quantity of energy stored in a substance due to the vibration of its particles.
Conduction: Transfer of thermal energy by the vibration of particles.
Convection: Transfer of thermal energy when particles in a heated fluid rise.
Radiation: Transfer of thermal energy as a wave.

Work done

When a **force** causes a body to move, work is being done on the object by the force. Work is the measure of energy transfer when a force (*F*) moves an object through a distance (*d*). It can be calculated using the following formula:

Work done (J) = force (N) x distance moved (m)

So when work is done, **energy** has been transferred from one energy store to another, and so:

energy transferred = work done

Simple Machines

Simple machines give a bigger force but with a smaller movement
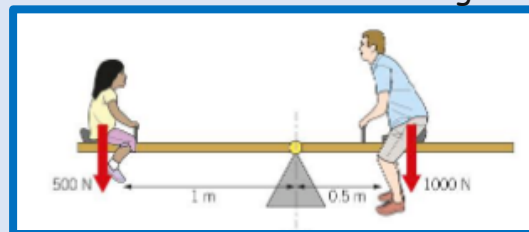
The wheelbarrow is a simple machine with the load near the pivot (the wheel) and the effort on the handles far from the pivot. When you lift the wheelbarrow, the handles move through a bigger distance than the load does.

If you multiply the force by the distance travelled, you get the same value for the effort and for the load.

Moments

A moment is the turning effect of a force. Forces that create a moment act around a point called the pivot. The pivot is the point around which the object can rotate or turn. On a seesaw the pivot is the point in the middle.

When you push open a door, you apply a force to the edge of the door furthest from the hinges. This force has a turning effect on the door - a moment which causes the door to rotate around the hinges - the *pivot* - and the door opens
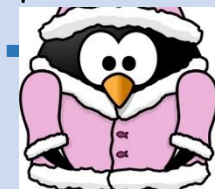
Force x distance right (1000N x 0.5m = 500Nm)
Force x distance left (500N x 1m = 500Nm)
The forces are equal, so the see-saw is balanced

Conduction

Heat energy can move through a substance by *conduction*. Metals are good conductors of heat but non-metals and gases are usually poor conductors of heat. Poor conductors of heat are called insulators. Heat energy is conducted from the hot end of an object to the cold end.
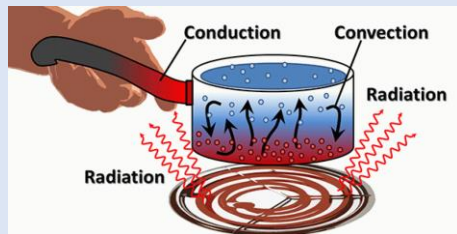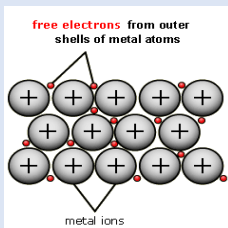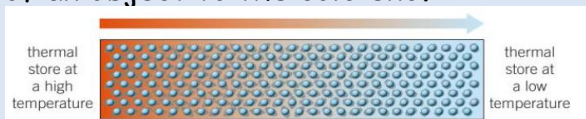
Metals are made of atoms which have free electrons, free electrons can move throughout the whole metal. If they are heated the free electrons move quickly transferring the heat energy quickly through the metal.

Insulation

Insulators are materials that do not allow thermal energy to be easily passed through. They are inefficient at transferring heat energy. These are typically non- metals. The particles vibrate **more** when they are heated. They bump into the particle next to them passing on the kinetic energy. This is done slowly.
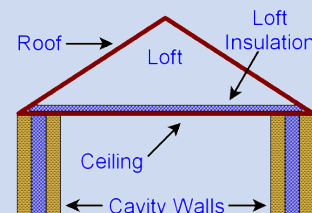
Houses can be adapted to include insulation features which reduces energy wastage and therefore cost.

Radiation

Heat can be transferred by **infrared** radiation. Unlike **conduction** and **convection** - which need particles - infrared radiation is a type of **electromagnetic radiation** that involves waves.

Because no particles are involved, radiation can even work through the **vacuum** of space. This is why we can still feel the heat of the Sun even though it is 150 million kilometres from the Earth.

Surface	Absorption	Emission
Dull, matt or rough, dark coloured	Good	Good
Shiny, light coloured	Poor	Poor

Convection

When you heat soup in a pan it all heats up, not just the layer in contact with the bottom of the saucepan.
- Soup at the bottom gets hotter so particles move faster.
- Hotter particles mover further apart, becoming less dense.
- Hotter soup rises and cooler, denser soup sinks.