KNOWLEDGE ORGANISER

£2

NAME & FORM

YEAR 8

SPRING TERM

What is Spy Fiction?

The spy thriller is a genre of literature that revolves around a storyline with secret agents and espionage. Part action-adventure and part thriller, spy stories often follow a government agent racing against the clock to thwart a big attack or uncover an enemy's plans in order to save lives—sometimes even the world.

Buzz Words!

See if you can try and include some of the following vocab in your writing; they're great examples of ambitious vocab!

Interrogating -

Menace -

Villainous -

Impenetrable -

Espionage -

Intelligence -

Detection -

Infiltrate -

Sabotage -

Language Devices (AKA Figurative Language)

Including figurative language in your writing enables your reader to visualise exactly what you want them to. It gets your reader to use their imagination to picture your story, like a movie in their mind!

Have a go at adding a suitable spy-fiction appropriate example for each of the following:

1. **Simile -** _____

2. **Alliteration -** _____

3. **Onomatopoeia -** _____

4. **Simple sentence (for effect!) -** _____

5. **Metaphor -** _____

*check the next page for the bank of definitions, in case you've forgotten what any of these are! ☺

Look   Cover   Write   Check   ✔

SPR1 Spelling Bee: 🐝

1. Secrecy
2. Surveillance
3. Investigator
4. Evidence
5. Protection
6. Control
7. Weapons
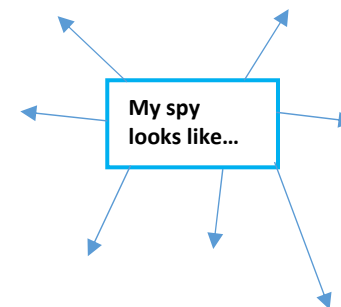8. Equipment
9. Suspicious
10. Authority

Practice 1: 🐝

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
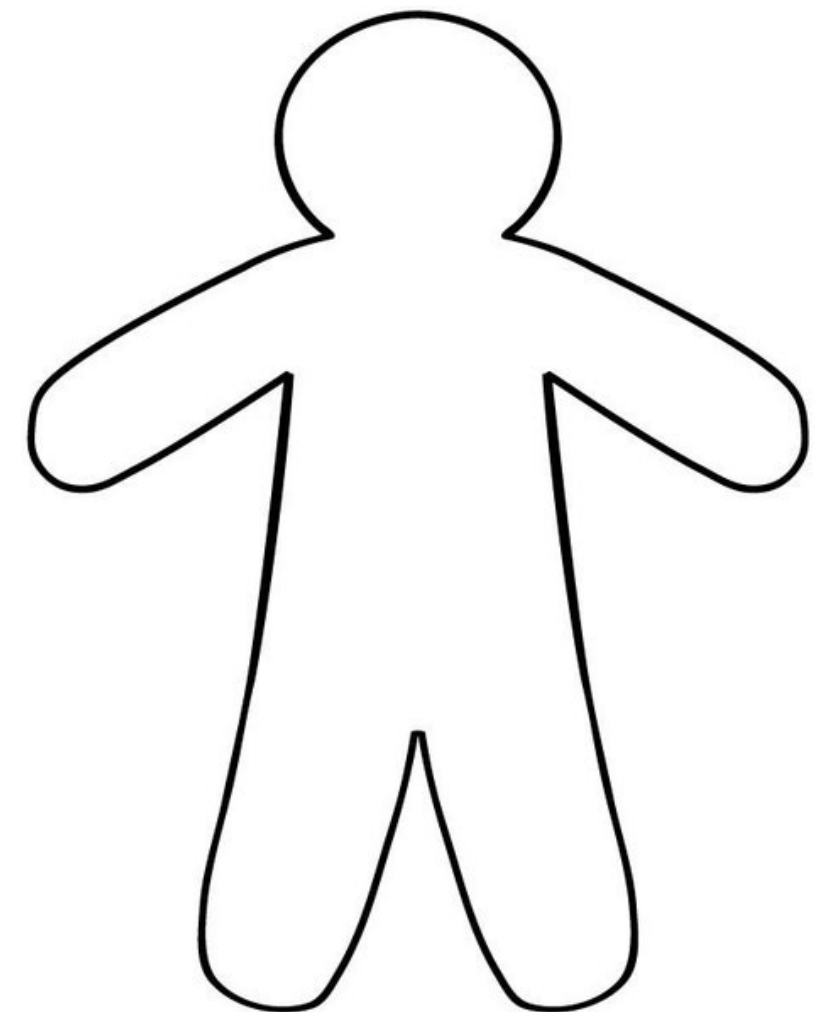10. _____

Practice 2: 🐝

1. _____
2. _____
3. _____
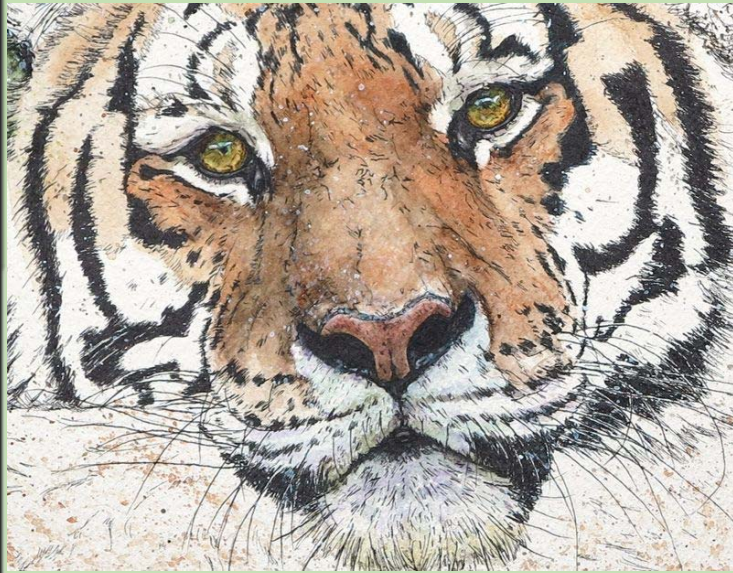4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

What descriptive words (adjectives) could you use to describe a spy? What do they look like? Do they have any stand-out, memorable features?

My spy looks like...

And how might they move? How can their movements help to build a picture of them?

Verbs & Adverbs

Watercolour endangered animals

Key features:

Appropriate colour- Texture- Detail- Layering- Fineliner- Highlights- Directional lines

Developing your style:
You need to build up layers of watercolour for a bolder effect.

KEY WORDS – test yourself! (definitions on the next page)

Gradient- Opaque- Transparent- Tone- Tint- Shade- Primary- Secondary- Tertiary- Layering- Bold- Application- Fine liner- Detail

Watercolour
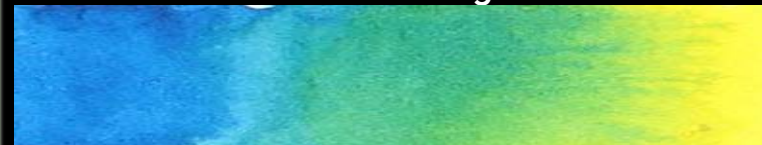### Year 8 Spring term

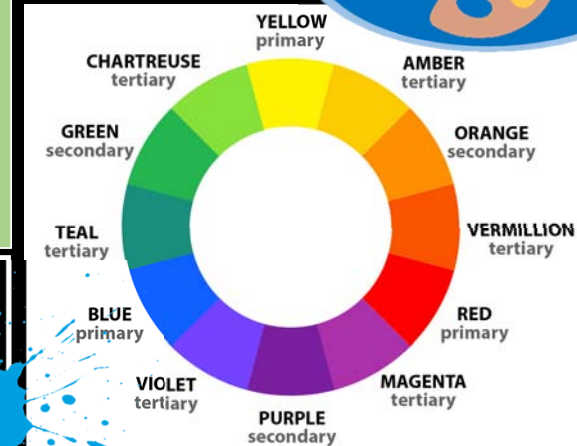### Watercolour techniques

Sponging

Colour to light gradient

Colour to colour gradient

Flat wash

Watercolour paint tips and tricks:

Watercolour looks very different when applied to dry paper than it does applied to wet paper.

To create transparent colour, use more water.

To create opaque colour, use less water and build up layers of paint.

Make sure each layer is fully dry before painting on top.

YELLOW primary
CHARTREUSE tertiary
AMBER tertiary
GREEN secondary
ORANGE secondary
TEAL tertiary
VERMILLION tertiary
BLUE primary
RED primary
VIOLET tertiary
MAGENTA tertiary
PURPLE secondary

KEY WORDS AND MEANINGS:

Opaque	A paint that is opaque will give a solid colour. In other words, you can't see through it.
Transparent	The quality of being able to see through (or partially see through) one or more layers in an artwork.
Flat wash	Brushing consecutive strokes of colour on a wet or dry surface to create a bold colour.
Gradient	Gradually blending from one colour to another colour or from dark to light.
Tertiary	These are made by combining equal parts of primary and secondary colours. E.g. Turquoise.
Primary	Primary colours include yellow, blue, and red. These are colours that can't be created by mixing of other colours.
Secondary	A colour formed by mixing two primary colours. For example, mixing red and yellow will give you orange.
Fine liner	An inky pen used for finer areas of detail. They are available with a range of nib sizes.
Detail	A distinctive feature of an object or scene which can be seen most clearly close up.
Bold	Bright, opaque and noticeable. Bold lines are often used to frame a specific area.

Colour code: BLUE= Tier 3 words   ORANGE= Tier 2 words   Look out for colour coding during lessons!

4

Devising from a Stimulus

Keywords explored in this topic

Devising - Creating a piece of theatre using our own ideas

Stimulus – Something that can be used to generate ideas when devising e.g. a poem, music, an image

Thought tracking - Sharing your inner thoughts and feeling with the audiences

Mime - Acting using only movement and imagination (no props)

Synchronised - Moving at the same time in the same way

Monologue – a long speech said by only one actor

Proxemics - The distance between two or more characters to show their relationship

How do we devise? BICS!

STRUCTURE
Create a story board to come up with your story

Highlight your key scenes and keep them in the piece

IMPROVISE
Don't just talk through – get up and just try out a scene

Try different genres. The scene could work better as a comedy or more serious

YES NO MAYBE

BRAINSTORM
Themes

What is your educational message?

Characters
How do you know each other?

Name /age

VILLAIN

Writing an effective peer evaluation:

WAGOLL: Tom's group used tableau effectively. I could see that Tom was using facial expressions such as wide eyes to portray how scared his character was. He projected his voice so that the audience could hear him. In order to improve, Tom should exaggerate his movements when miming.
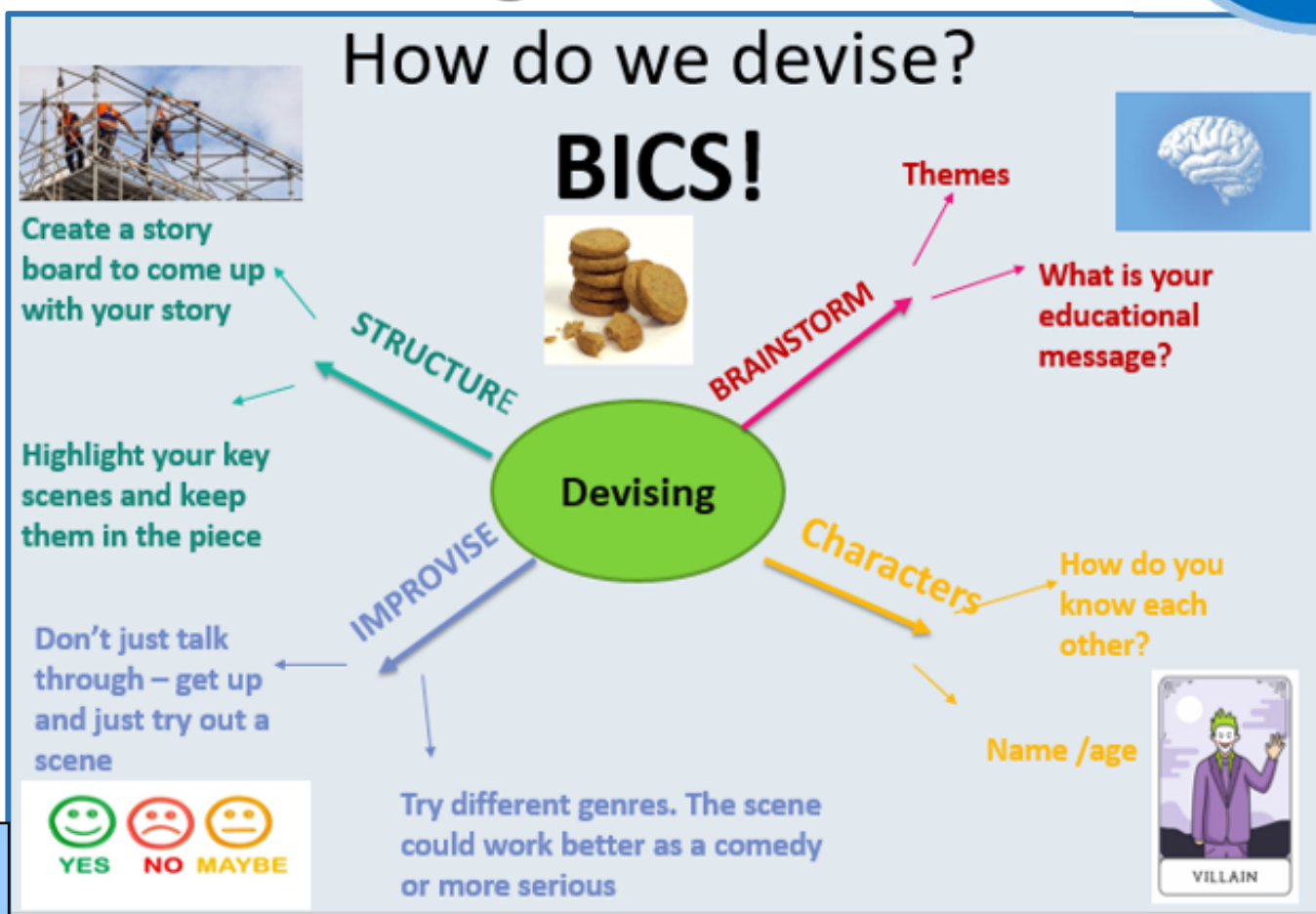
Keywords to recap and use

Pitch Pace Pause Tone Volume Accent Gesture Posture Facial Expressions Projection Diction Thought Track Multi-role Split Focus Audience

Evaluative words: successful improve effective captivating interesting focus

5

William Shakespeare (1564-1616) was a **British playwright and poet**. He is often considered to be the most talented writer of all time. His plays and poems are still studied and performed 400 years later! Shakespeare wrote **38 plays and 154 sonnets**. Shakespeare's plays generally fall into three categories: **comedies**, **tragedies** and **histories**.

Shakespeare lived in the 16th and 17th centuries, throughout the reigns of Queen Elizabeth I and King James I. Both watched his plays.

Some of his most famous plays include Romeo and Juliet, Macbeth, Hamlet and Much Ado about Nothing.

Some of the phrases that Shakespeare wrote have become a part of our everyday language.

Fun Fact: Shakespeare coined many new words and created "knock, knock" jokes

Iambic Pentameter	This is a poetic rhythm that Shakespeare wrote in. Each line has 10 syllables, of particular stresses. Plays at this time were basically extended poems, and so Shakespeare wrote poetically, thinking about rhythm and a lot of the time also rhyme. The main point is the lines weren't supposed to sound like everyday speech, they were supposed to sound fancy!
Histories	The plays of Shakespeare are generally divided into three categories: Histories, Tragedies and Comedies. The plays that we normally mean when we refer to the 'history' plays cover English history from the twelfth to the sixteenth centuries. Each play is named after, and focuses on, the reigning monarch of the period. We should never forget that they are works of imagination, based very loosely on historical figures. Shakespeare was a keen reader of history and was always looking for the dramatic impact of historical characters and events as he read.
Tragedies	The basic structure of a tragedy is: The main character is someone important; a prince or a king. He is someone we admire and respect, but he also has a 'tragic flaw' in his character which makes him contribute to his own destruction. The flaw is often part of his greatness but it also causes his downfall. The flaw causes the protagonist to make mistakes and mis-judgments. He begins to fall from his high level. He struggles to regain his position but fails and he comes crashing down. He eventually recognises his mistakes, but too late.
Comedies	Shakespearean comedies are full of fun, irony and dazzling wordplay. They are also full of disguises and mistaken identities with very complicated plots that are difficult to follow. Much of the comedy comes from characters making mistakes, and the ridiculous situations that arise from this.
Globe Theatre	The Globe Theatre was a theatre in London built in 1599 by Shakespeare's playing company . It was destroyed by fire in 1613, rebuilt in 1614 and closed in 1642 . It was a three-storey, open-air amphitheatre that could house up to 3,000 spectators. At the base of the stage, there was an area called the *pit*, where, for a penny, people would stand to watch the performance. Vertically around the yard were three levels of stadium-style seats , which were more expensive than standing room. Performers and audience members would have been very close, and be able to see each other clear as performances took place during the daytime.

Plot of Romeo and Juliet

Act 1
The Montagues and the Capulets are families involved in a bitter feud. Under penalty of death, the Prince of Verona orders the families to stop fighting.

Romeo, a Montague, is lovestruck. His cousin, Benvolio, and best friend, Mercutio plan to cheer him up by gatecrashing a party at the Capulet house.

Meanwhile, Lady Capulet plans for her daughter, Juliet, to marry Paris, a wealthy gentleman.

At the party, Romeo and Juliet meet and fall in love at first sight.

Act 2
After the party, Romeo sneaks back into the Capulet house and asks for her hand in marriage.

Friar Laurence agrees to marry the lovers in secret, hoping that it will end the feud.

Act 3
Tybalt, Juliet's cousin, is enraged that Romeo snuck into his family party. He tries to fight Romeo, who will not fight back. Mercutio dies defending his friend Romeo.

Having heard of the violence, the Prince banishes Romeo from Verona.

Capulet, in order to cheer his daughter up, arranges for her to marry Paris in two days' time.

Act 4
Friar Laurence hatches a plan for Juliet to take a sleeping potion and appear dead, so she can meet Romeo in the family crypt and run away together. Juliet takes the potion, and funeral plans are made.

Act 5
Romeo learns of Juliet's death, but not the secret plan. He fights his way back to Verona, buying poison on the way.

Romeo kills Paris in order to be the one lying next to Juliet's grave. He kills himself just as Juliet wakes up. She then uses Romeo's dagger to take her own life.

After the death of their children, the Montagues and Capulets end their feud.

THE MONTAGUES
Romeo
A lovesick teenager.
Benvolio
Romeo's cousin and all-round nice guy.
Mercutio
Romeo's fight-loving best friend
Lord and Lady Montague
Romeo's parents.

THE CAPULETS
Juliet
A teenager who won't be forced into love.
Tybalt
Juliet's fiery cousin
Nurse
Basically raised Juliet.
Lord and Lady Capulet
Juliet's pushy parents.

OTHERS
Friar Laurence
Tries to end the feud. Succeeds – at a price.
Prince Escalus
The lawmaker in Verona
Paris
A nice guy, but not Juliet's true love.

Themes
ROLES
What makes a good lover? Parent? Priest?
AGE
Especially the old vs. young battle
AUTHORITY
How to use it and abuse it.
LOVE
Romantic, family, and friendships.

KEY WORDS:

Composer   Gustav Holst   Planet Suite   Movement   Orchestra
Dynamics   Tempo   Atmosphere   Tempo   Strings   Brass
Percussion   Woodwind   Contrast   Symphonic Suite   Synthesizer
Themes   Instrumentation   Texture   Structure   Crescendo

THE PLANET SUITE

- Composed by Gustav Holst
- English composer
- Time 1914 – 1916 (WW1)
- Symphony orchestra
- A suite of 7 movements (pieces)
- All based on Roman Gods/ Goddesses – planet names

Music and Space

Year 8 Spring Term

Other works we have studied:

Claire De Lune – Debussy
Piano solo, slow, romantic, moderately quiet. Represents the sad but lonely moonlight.

Ron's Theme – Jean Michelle Jarre
Contains electronically generated sounds to represent computers, a slow heartbeat, sad/ flat saxophone solo. Represents the crew of the Challenger shuttle who lost their lives when the rocket exploded on take-off.

Apollo 13 Theme – James Horner
Military sounds, solo trumpet, powerful brass and percussion, soaring strings. Represents the determination of the crew in a doomed space mission.

The Seven Movements:

MARS the Bringer of War – bold, lots of crescendos and loud dynamics, repeated rhythms (ostinato) using the whole orchestra. Frightening.

VENUS the Bringer of Peace – soft and gentle with quiet dynamics and mainly use of woodwind.

MERCURY the Winged Messenger – Fast tempo with short note values to signify flitting around.

JUPITER the Bringer of Jollity – four main themes used, quite varied as it's jolly BUT strong as Jupiter is also the KING of Roman Gods.

SATURN the Bringer of Old Age – Slow tempo, serious, long note values, mainly quiet with a contrasting middle section.

URANUS the Magician – Loud brass fanfare to start then short skip fell like a naughty cartoon character up to no good. Lots of contrasts of volume and instruments to represent the drama of a fantastic magic show!

NEPTUNE the Mystic – Long notes, slow tempo lots of woodwind and magical choir sounds. It feels like a soundtrack to walking though a misty, enchanted woodland.

KEY WORDS AND MEANINGS (Tier 2 words in ORANGE, Tier 3 words in BLUE)	
Percussion	A collection of instruments that you hit, scrape and shake in order to get a sound out of them e.g. tambourine, drum, glockenspiel
Orchestra	A group of instrumentalists, especially one combining string, woodwind, brass, and percussion sections
Instrumentation	The particular instruments used in a piece of music
Composer	A person who writes/ makes the music
Symphonic Suite	A collection of music, usually created for an orchestra
Crescendo	Gradually getting louder
Movement	One section (one piece of music) of a Symphonic Suite
Texture	The layering of sounds to make thin or thick texture
Themes	A short and simple tune repeated throughout a piece of music
Structure	The way that a piece of music is organised from start to finish e.g. intro/verse/chorus/outro

Key terms

Key terms	
Globalisation	that the world is becoming more interconnected by trade and culture.
TNC	Trans-national company. A company that works across different countries
HIC	Higher income country
LIC	Lower in come country
Interdependence	The need to rely on other countries/ businesses for something
Sustainable	The ability to meet todays needs, without damaging the environment for the future
Raw materials	Items that have not been processed, they are normally grown or dug out of the ground e.g. wood, metals
Manufacturing	The process of turning raw materials into something e.g. wood into a table
Infrastructure	The basic items needed for an area to operate smoothly e.g. roads, airports, pipes, internet
Ethically right	When something is morally right it is ethically right. It is good.
Slum	Highly populated, very poor area of a city. Normally houses are made from scrap material.

Positives (green) and negatives (red) for TNCs

New jobs are created for low-skilled workers	Employees in poorer countries may have to work longer hours and in poor conditions	Jobs in the poorer countries aren't secure (safe, always going to be there) – TNCs could decide to close the factory at any time!	Competition from TNCs with huge economies of scale (they produce a lot, therefore sell products cheaply) may force local companies out of business
Employees in poorer countries may be paid lower wages than employees in richer countries	Employees in poorer countries get more reliable income compared to traditional jobs like farming	TNCs spend money to improve the areas their factory is in e.g. better airport, roads (infrastructure)	Increased wealth in the host country may be spent on improving education, training and healthcare
New technology are bought to poorer countries	Most of the profits of the TNC go out of the country the factory is in	People learn new skills	Over time, local economies, traditions and languages may be lost.

Transport changes – trains, airplanes, cargo ships

Improved education

Communication technology – mobiles, internet, Zoom/Teams,

What has allowed industry to change?

Improvements in refrigeration (keeping food fresh and cool for longer)

Change in laws and trading

Outsourcing – putting parts of you business in another country because it's cheaper, more workers, different skills, space

10

Geography Knowledge Organiser – Globalisation B

Nike		Cadbury	
Positives	**Negatives**	**Positives**	**Negatives**
• Manufacturing in LICs has created new jobs for more than 1 million people. • Jobs helps the social and economic development of host countries, bringing new skills, technology and higher wages. • This ultimately improves living standards.	• profits are taken back the USA. Nike is worth £22 billion • Rubber for Nike's trainers comes from Malaysia and Indonesia and cotton comes form Turkey, India and the USA. Cotton workers in India earn just £65 per month. • 2013, 1,134 people tragically died during the collapse of an eight story "death trap", the Rana Plaza building in Dhaka, Bangladesh - home to factories previously used by TNCs, including Nike and H&M.	• Positive for the TNC is that Cadbury chocolate is manufactured in more than 15 overseas factories, located lower income countries, such as China, India and Brazil. This helps keep manufacturing and transportation costs down and increase profits. • Cadbury has tried to improve the quality of life of its cocoa farmers by investing in training, education and infrastructure.	• On average, cocoa farmers earn less than £1 per day. As a result, farmers often resort to the use of child labour to keep their prices competitive. • Up to 1.5 million children, as young as 5, work on cocoa farms in the Ivory Coast and Ghana. The work can be extremely difficult. Trafficked children are often abused by landowners and are rarely paid. • Cocoa industry is a huge boost to the West African economy, creating employment for 20 million people.

Impacts of palm oil

- 30% of Borneo's rainforests have vanished
- Deforestation – burning of large areas releases Co2
- Jobs are generally low paid. The money going to the TNC like Modelez / Cadbury
- Threatens the existence of indigenous rainforest tribes
- Job opportunities, 721, 000 new jobs for farmers in South Asia
- Efficient crop – if we used a different crop we might need MORE land

Positives (green) and negatives (red) of Shell in Nigeria

| **Shell gives money to Nigeria through taxes** on its oil that it sells. This is in the billions of pounds.	**Noise pollution** can be created from the heavy machinery.	**Employment (jobs)** for 65,000 workers in the oil plants. A further 250,000 people are employed in related industries (transport, maintenance etc.)
	Civil unrest (wars) in Nigeria – people disagree if TNCs like Shell are a good or bad thing.	
91% of Shell's contracts with other companies, are **deliberately given to local Nigerian** companies. Bringing lots of money and extra jobs in to Nigeria.	**Oil spills cause water pollution and damage soil.** Farmers and fishermen can't use the land or water. Fish are dead, soil is damaged.	**Burning oil pollutes the air with toxic fumes.** Terrorist groups damage the oil supply, in protest against "non-Nigerian" companies
The Nigerian government uses money to attract more businesses to Niger. The **money could be better spent on local Nigerian people and environment.**	Local people have **water sources polluted** – **impacting on people's health**. Many babies have been still born (dead), toxic fumes being breathed in lead to lung cancers.	**Shell has invested in the infrastructure around Nigeria.** There are some better roads, training and education services.
		Shell makes most of the profit (billions of pounds!) and that money **does not go to Nigeria.** It goers to Shell in the Netherlands.

11

Describe the locations of the coral reefs of the world.

Coral reefs are found in tropical areas. North and south of the equator.
An example of a coral reef is the Belize Barrier Reef. This is located off the south coast of Mexico, to the north east of the South American continent in the Pacific.

Great Barrier Reef

Belize Barrier Reef

Red Sea Reef
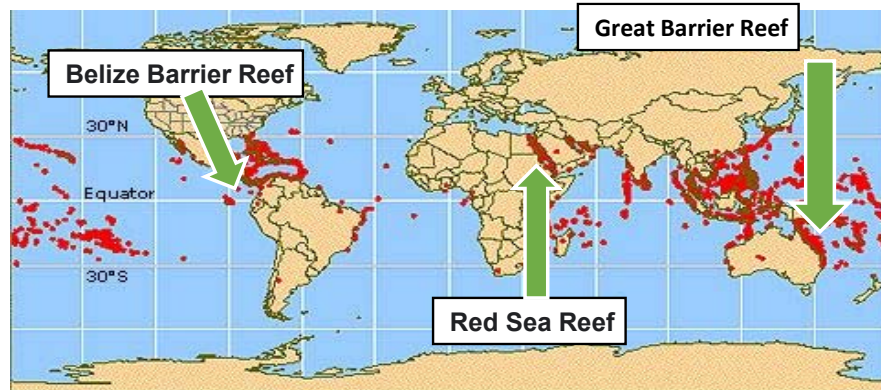
Importance of Coral reefs
- Protect the shoreline, minimizing wave impacts from storms.
- Provide habitats and shelter for 100s of organisms, this also helps ensure fish for commercial fishing
- Attract tourist/important for tourism (provides jobs and economical growth)
- Provide food for those who live close to the reef
- Many potential treatments for illness and disease

How to save coral reefs?
Stop sea level rise and climate change.
Recycle and dispose of rubnish properly.
Minimize use of fertilizers that get into the ocean.
Use environmentally-friendly modes of transportation/no boats over the reefs.
Be conscious when buying aquarium fish.
Tourists not to take any bits of coral home

Effects of oil spills

BP, 2010, in the sea of the Gulf of Mexico
1. Began 20 April 2010
2. Lots of jobs were created during May to help people out with insurance claims.
3. By 13th August, many dead animals: 4,080 birds, 525 sea turtles, 72 dolphins, and 1 crocodile.
4. 4.9 million barrels of crude oil had leaked
5. By late August, impact on tourism would cost $23 billion.

Shell's 2008 spill in the town of Bodo, Nigeria, Africa
1. The pipe breaking in 2008
2. Pipe break fixed but already lost 2,000 barrels of oil into the water . Leaked for 3 months (Dec to Feb)
3. 69,000 people living here now health at risk. Fish die and fishermen can't work. Water polluted for drinking and washing.
4. Shell blames vandalism and doesn't accept full responsibility in 2008
5. Shell accepts responsibility in 2018 and agrees to pay

Describe the Great Pacific garbage patch as shown in the graph. TEA.

TREND: *The graph shows that the Great Pacific Garbage Patch is located in the Northern Pacific off the west coast of North America / USA. It says there is 79, 000 tonnes of plastic floating in the sea here.*

EXAMPLE: *The thickest layer is 100 kg/km^2 (red) is in parts the central east of the patch. It then has a ring around this that is 10 kg/km^2 (orange). It then goes to 1 kg/km^2 (yellow) this is the largest section of the main patch. The biggest section that goes from the west coast of the USA and across the north of Hawaii is 0.1 kg/km^2 (light blue).*

ANNOMALY: *There is a bit of 0.1 kg/km^2 (light blue) thickness that goes up to the north east.*

Plastic all at sea
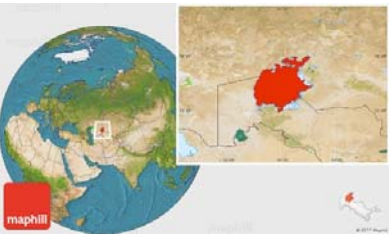79,000 tonnes of plastic is floating in one patch of the Pacific Ocean

Plastic build-up (kg/km^2) ■100 ■10 ■1 ■0.1 ■0.01
— Great Pacific Garbage Patch (GPGP)   Outer GPGP

CALIFORNIA

PACIFIC OCEAN

HAWAII
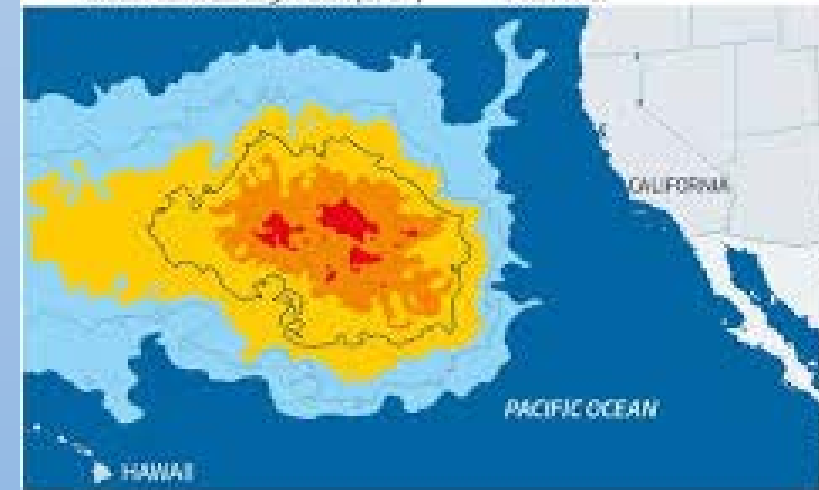
The Aral Sea is located in **west Asia**. On the boarder of **Uzbekistan and Kazakstan.** The "sea" is actually a fresh water inland lake.

Causes, effects and solutions to the Aral Sea Disaster

Aral Sea used to have an area of 26,300 sq miles and produce thousands of tons of fish for the local economy annually.

The Aral Sea began drying up when lots of dams and canals were built in the 1960s. On the Amu Darya and Syr Darya Rivers.

The water was used to irrigate cotton crops in Uzbekistan and Kazakhstan.

After the 1990s the top and bottom waters of the lake were not mixing well, which caused the salinity (salt) levels to be high.Allowing the water to evaporate *from the lake faster.*

1987, it dried up so much that instead of one lake, there were now two: the Large Aral (south) and the Small Aral (north).

Irrigation wasn't very efficient and a lot of water leaked or evaporated in the process, the system of canals, rivers. Meaning more water was needed.

Aral Sea produced about 20,000 to 40,000 tons of fish a year. This was reduced to a low of 1,000 tons of fish a year at the height of the crisis

Dried remnants of the lake contain not only salt and minerals but also pesticides like DDT that were once used in huge quantities by the Soviet Union

The ecosystems have collapsed, towns are abandoned, the fishing industry has basically stopped (jobs), people suffer diseases like lung cancer.

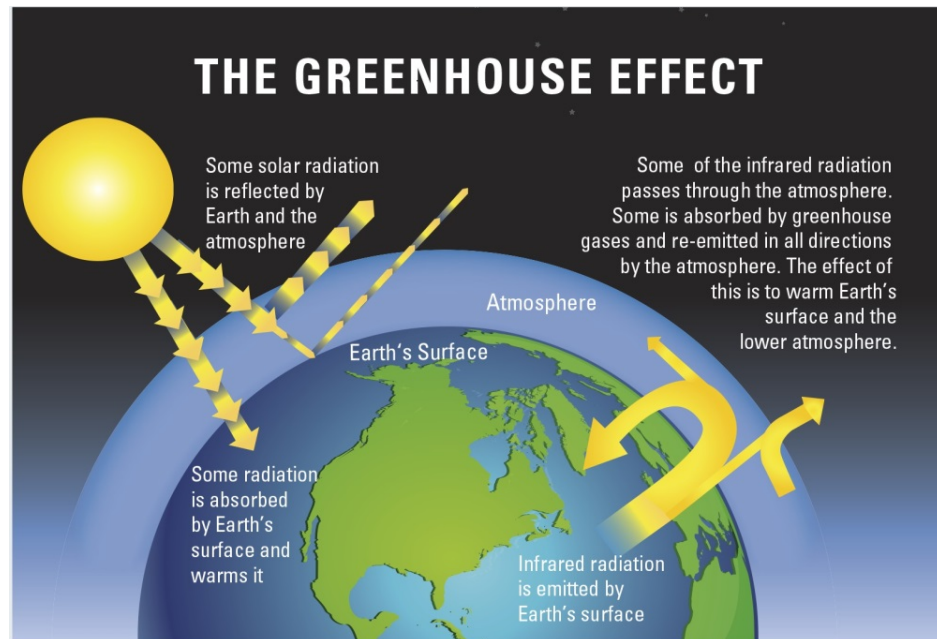Abandoned boats in the desert attract some tourists.

A fishery hatchery was build to grow fish eggs and release them – carp, fl*ou*nder and sturgeon fish. To help the lake produce 12,000 tons of fish a year.

In 2005 the Kok-Aral Dam was finished on the southern lake. The dam has helped the northern lake to grow. Before its construction, the lake was 62 miles away from Aralsk, a port city, but it started growing back, and in 2015 the sea was only 7.5 miles away from the port town.

2014, the eastern lake completely evaporated and disappeared, leaving behind the desert called Aralkum.
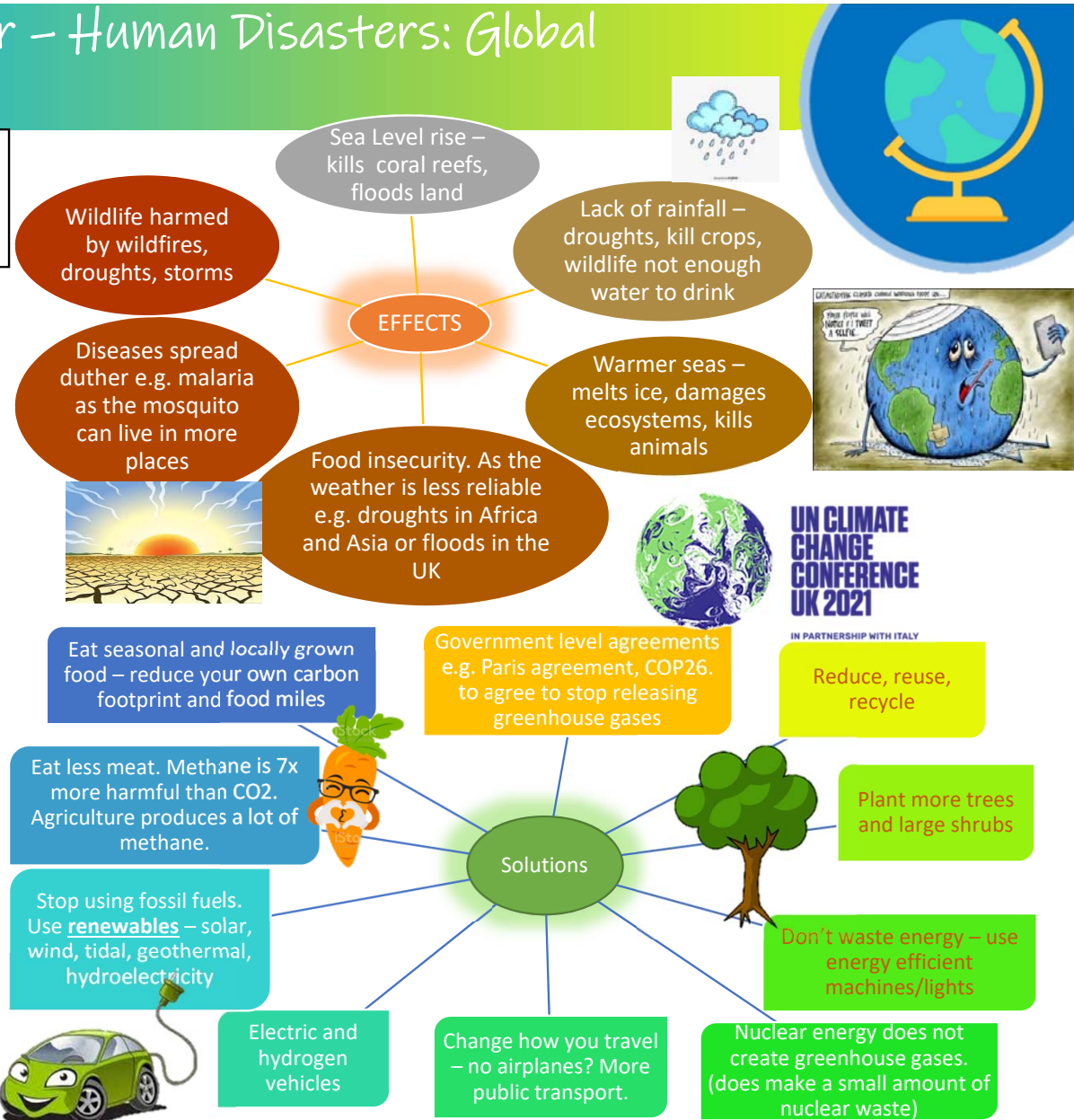
Global warming: the earth heating up because of the actions of humans burning fossil fuels and releasing greenhouse gases e.g. methane from farming and landfill
Climate change: the climates of the world changing and becoming less reliable owing to global warming.

THE GREENHOUSE EFFECT

Some solar radiation is reflected by Earth and the atmosphere

Some of the infrared radiation passes through the atmosphere. Some is absorbed by greenhouse gases and re-emitted in all directions by the atmosphere. The effect of this is to warm Earth's surface and the lower atmosphere.

Atmosphere

Earth's Surface

Some radiation is absorbed by Earth's surface and warms it

Infrared radiation is emitted by Earth's surface

What is the evidence that the world is warming?
- Glaciers across the globe have been shrinking away during the last century and the rate is getting faster e.g. The Rhône Glacier, Switzerland
- **Antarctica is melting.** The Müller Ice Shelf, has been shrinking recently after growing over a 400-year period. Scientists report that the temperature in Antarctica has increased by 5° C in winter over the past 50 years. The ice in the **Arctic** does not spread as far as it once did.
- The increasing fierceness of tropical weather, the increase in ocean temperatures, and rising sea levels are making trouble for low coastal countries like **Tuvalu, Haiti and the Maldives**
- Coastal areas are being flooded e.g. east coast **England, Netherlands, Bangladesh, Maldives**. Where will the people go? Who will pay to protect them?

EFFECTS

Sea Level rise – kills coral reefs, floods land

Wildlife harmed by wildfires, droughts, storms

Lack of rainfall – droughts, kill crops, wildlife not enough water to drink

Diseases spread duther e.g. malaria as the mosquito can live in more places

Warmer seas – melts ice, damages ecosystems, kills animals

Food insecurity. As the weather is less reliable e.g. droughts in Africa and Asia or floods in the UK

UN CLIMATE CHANGE CONFERENCE UK 2021
IN PARTNERSHIP WITH ITALY

Solutions

Eat seasonal and *locally grown* food – reduce your own carbon footprint and food miles

Government level agreements e.g. Paris agreement, COP26. to agree to stop releasing greenhouse gases

Reduce, reuse, recycle

Eat less meat. Methane is 7x more harmful than CO2. Agriculture produces a lot of methane.

Plant more trees and large shrubs

Stop using fossil fuels. Use **renewables** – solar, wind, tidal, geothermal, hydroelectricity

Don't waste energy – use energy efficient machines/lights

Electric and hydrogen vehicles

Change how you travel – no airplanes? More public transport.

Nuclear energy does not create greenhouse gases. (does make a small amount of nuclear waste)

History Knowledge Organiser

Manchester During the Industrial Revolution
➤ Capital of the industrial revolution.
➤ Richest town in England.
➤ Smoking mass of chimneys, factories, warehouses and canals.
➤ Cotton, cloth and other goods made Manchester very wealthy.
➤ High wages in factories and lots of jobs attracted many workers.
➤ Life was hard with conditions poor and risk of losing your employment.

How did Britain Change from 1750 – 1900?

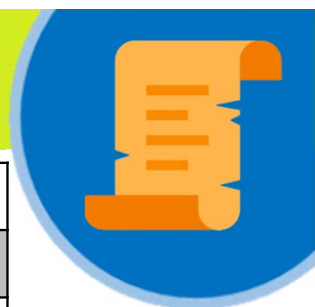|	1750	1900
Population	11 million.	42 million.
Travel	10 – 12 days to travel from Edinburgh to London.	45 hours to travel from Edinburgh to London.
Education	Most children did not go to school. Only 6 universities in Britain.	Compulsory for all 5 – 12 year old girls and boys.
Health and Medicine	Only simple operations were possible and little was known about disease.	Germs had been discovered and vaccines for diseases produced. Antiseptics and anaesthetics had made more complex operations possible.
The Vote	Only 5% of the population could vote.	Most men could vote but women could not.
Work	The most important work was farming and manufacturing was done in peoples homes.	The most important industries were coal, iron, steel and textiles. Most industry based in factories.

History Key Words:

Industrial Revolution - The name given to the time period between 1750 and 1900 where the way people lived, worked and produced goods changed dramatically.
Textiles - Cloth or goods produced by weaving or knitting.
Death rate - The number of deaths per 1000 people per year.
Manufacturing - Making something on a large scale using machinery.

Conditions of Industrial Towns
➤ Living conditions were extremely poor and people were crammed in houses together.
➤ This meant conditions were dirty and unhealthy.
➤ Diseases such as Cholera spread quickly through industrial towns.

Working Conditions for Children
➤ Very low wages.
➤ Extremely dangerous operating and maintaining heavy machinery and many children died working in factories.
➤ Harsh punishments.
➤ Hunger and thirst.

15

Chartists
➤ A charter is a list of demands or rights.
➤ The chartists of Britain wanted to created an enormous charter to make the government change.
➤ The chartists needed signatures for the government to listen.
➤ They got nearly 6 million in Britain.

Arguments Surrounding Electoral Reform

For Reform	Against Reform
➤ The government only looked after the rich. ➤ Women are equal to men. ➤ The Middle should vote as they could help make the country successful. ➤ There is too much bribery and corruption in government. ➤ Unfair representation.	➤ The economy will suffer. ➤ Only the wealthy should vote as they own the most land. ➤ There is no need to change as the British system has worked well for years.

History Key Words

Bribery – Offering or receiving an item of value to influence an action.
Borough – A village, town or city.
Corruption – Dishonest conduct by people in power.
Electoral system - The way in which people vote for the government.
Reform - Make changes in order to improve.
Representation – Acting or speaking on someone's behalf.

The Peterloo Massacre (Manchester 1819)
➤ Life in Manchester was hard.
➤ The working class wanted change.
➤ There was no member of parliament to represent the people of Manchester.
➤ A group of radical reformists organised a meeting in St. Peters Field, where one of the most famous radicals called Henry Hunt was going speak.
➤ Local Magistrates tried to use cavalry to arrest Henry Hunt and during the chaos 11 people died and many were injured.
➤ This went on to be called Peterloo, named after the recent victory against Napoleon at Waterloo.

Votes for Women
➤ By 1903 women had still not received the right to vote in Britain.
➤ A group of brave women formed the **Suffragette** movement.
➤ Emmeline Pankhurst led the suffragettes and her monument can still be seen today in Manchester.
➤ The suffragettes used various tactics to help gain support.
➤ These tactics included: heckling politicians, storming parliament, smashing windows, hunger strikes and bombing and arson campaigns.
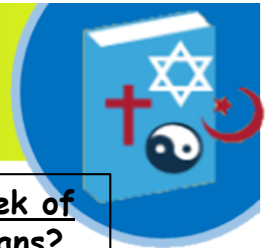
We want change!

16

Social and Religious Background 2000 years ago:

The Roman empire ruled Judea (now called Israel), which was the area where Jesus lived. Jesus was a Jew, living amongst Jewish people who hated the Romans for their violent rule over the Jews and for taxing the people.

The Pharisees were strict Jewish religious leaders. They interpreted the Jewish laws very extremely and people feared them because they might accuse you of blasphemy.
What is blasphemy? Insulting God or claiming to be God

The Jewish people were desperate for a Messiah to rescue them from the Romans and Pharisees. The Messiah was a Jewish belief in a saviour that would be sent by God to rescue them when they were persecuted. Christians are people who believe that Jesus was that Messiah. The Greek for Messiah is Christ, which means King or saviour.

Holy Week – Why is the last week of Jesus' life significant for Christians?

The Messianic Secret theory:

Theologians believe Jesus tried to keep his identity as the Messiah a secret. He never admitted or uttered the that he was the Messiah. He only suggested thorough his words and actions. Theologians theorise that this is so he could teach for longer and not get killed by the religious leaders for blasphemy.

Why is Jesus' Crucifixion and Resurrection so important for Christians?

- Jesus' death was a sacrifice. He was a **'sacrificial lamb',** showing his amazing courage
- Jewish scripture predicted the Messiah would die so he fulfilled the **prophecy**
- The resurrection shows that Jesus is the Messiah because he has the power to defeat death
- It also shows Christians that he is a **saviour** – if they believe in him and the resurrection they can also defeat death.
- The resurrection promises a spiritual **resurrection to Heaven.**

17
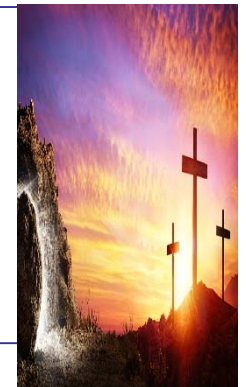
Healing on the Sabbath:
On this day, Jesus healed a man with a withered hand. He did this because he wanted to teach that you should help people in need. The Pharisees didn't like it because they thought Jesus was breaking the Jewish rule of *not working on the Sabbath,* the holy day. They accused him of blasphemy. Jesus was trying to teach that *God wants you to help people on every day and on any situation.* To ignore someone in need is the real sin.

Palm Sunday:
On this day Jesus rode into Jerusalem on a donkey. He did this because he knew that the Jewish scripture prophesied (predicted) that the Messiah would be *'humble and enter Jerusalem on a donkey'*. The crowd responded by tearing down and waving palm trees and waving their cloaks. This was a mark of respect as they believed Jesus was showing himself to be the Messiah.

Forgiving sins & healing the paralysed man:
On this day Jesus healed a man who was paralysed. He did it by telling the man *'your sins are forgiven'*. The Pharisees used to teach people that disabled people were being punished by God because of they had sinned. The Pharisees hated this because they believed only God could forgive sins. This means that they thought Jesus was committing blasphemy and claiming to be God. However, Christians believe Jesus was trying to teach that the disabled and ill don't have any sins and that they are not being punished by Good. Instead, *God wants them to be looked after and not ignored.*

Cleansing the Temple:
On this day Jesus went to the Jewish Temple and he turned over the tables of the market that was being run inside. He did this because he shouted, *'this should be a House of Prayer but you have made it a den of thieves'*. He thought the chief priests were **corrupt** and had defiled the Temple. The Chief Priests in the temple plotted to kill Jesus because they didn't want their power removed and they would have lost profits from the markets.

The Last Supper
Jesus and his **disciples** were celebrating the Jewish festival of the Passover. Would should have been a festival meal turned into something more **sombre.** Jesus announced that one of the disciples was going to **betray** him. He **then told Judas** to *'go and do what you have to do'*. This suggests he knew who the betrayer would be. An alternative suggestion is that is was an instructions – perhaps Jesus was choosing Judas so that he could sacrifice himself as predicted in scripture that the Messiah would die as a *'sacrificial lamb'.*

The Arrest and Trial:
Jesus was arrested without putting up a struggle, in the early hours of Friday morning. As he was being arrested he said to his disciples- *'He who lives by the sword will die by the sword'*. This suggests that he did not want the disciples to retaliate to save him in case they died too. Christians believe this shows he was willing to sacrifice himself. At his trial, he verbally admitted for the first time that he was the Messiah. He said: *'You will see me in heaven sitting on the right hand side of God'*. This suggested he was equal to God which the Chief Priest, Caiaphus, saw as the ultimate blasphemy and he sentenced him to death calling him an *'imposter!'.*

18
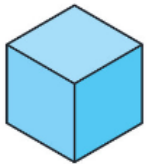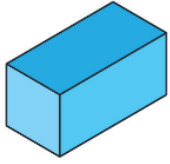
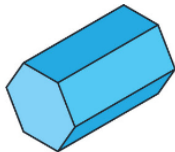# 3D SHAPES

Key Concept
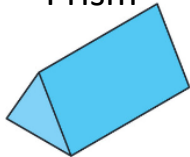
Cube

Faces – 6
Edges – 12
Vertices – 8

Cuboid

Faces – 6
Edges – 12
Vertices – 8

Hexagonal Prism

Faces – 8
Edges – 18
Vertices – 12

Triangular Prism

Faces – 5
Edges – 9
Vertices – 6

Year 8

Key Words

Volume: The amount of space that an object occupies.

The **surface area** of an object is the sum of the area of all of its faces. It is measured in units squared e.g. cm^2.

Cuboid: 3D shape with 6 square/rectangular faces.

Vertices: Angular points of shapes.

Face: A surface of a 3D shape.

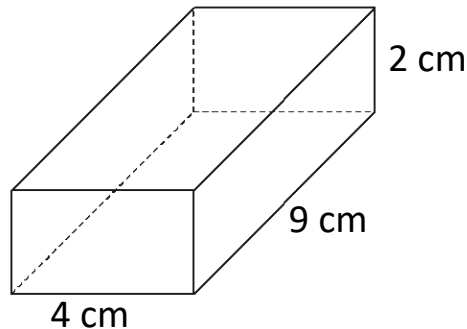**Edge:** A line which connects two faces on a 3D shape.

Tip
Remember the units are cubed for volume.

Formula
$Cuboid\ Volume = l \times w \times h$
$Prism\ Volume =$
$area\ of\ cross\ section \times length$

Examples

2 cm

9 cm

4 cm

$$Volume = 4 \times 9 \times 2$$
$$= 72cm^3$$

Surface area:
$Front = 4 \times 2 = 8$
$Back = 4 \times 2 = 8$
$Side\ 1 = 9 \times 2 = 18$
$Side\ 2 = 9 \times 2 = 18$
$Bottom = 4 \times 9 = 36$
$Top = 4 \times 9 = 36$
$Total = \mathbf{124cm^2}$

Questions
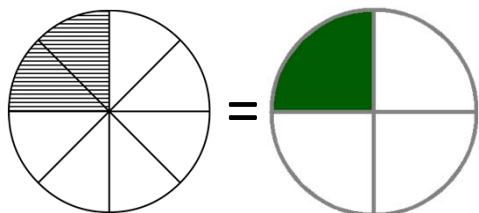Find the volume and surface area of the cuboid:

8 cm

40 cm

18 cm

19
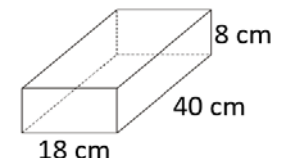
RATIO AND PROPORTION

Key Concept

2 parts → $2:6$ ← 6 parts

$$= 1:3$$

$$= \frac{1}{4}$$

Key Words

Ratio: Relationship between two numbers.

Part: This is the numeric value '1' of, would be equivalent to.

Simplify: Divide both parts of a ratio by the same number.

Equivalent: Equal in value.

Convert: Change from one form to another.

Examples

Simplify $60 : 40 : 100$

This could have been done in one step by dividing by 20.

$\div 10$

$6 : 4 : 10$

$\div 2$

$3 : 2 : 5$

Write 2: 5 in the form 1 : n

$2 : 5$

$\div 2$ $\div 2$

$1 : 2.5$

Share £45 in the ratio 2 : 7

$45 \div 9 = 5$

£10 : £35

$2 : 7$

5	5
5	5
=10	5
	5
	5
	5
	5
	=35

Joy and Martin share money in the ratio 2 : 5. Martin gets £18 more than Joy. How much do they each get?

$18 \div 3 = 6$

£12 : £30

$2 : 5$

6	6
6	6
	6
	6
	6
	6
=12	=30

Tip

Its often useful to write the letters above the ratio. This helps you keep the order the correct way round.

Year 8

Questions

1) Simplify a) 45 : 63   b) 66 : 44   c) 320 : 440
2) Write in the form 1 : n   a) 5 : 10   b) 4: 6   Share 64 in the ratio 3 : 5   4) Write the ratio 1 : 4 as a fraction.

ANSWERS: 1) a) 5 : 7 b) 3 : 2 c) 8 : 11   3) 24 : 40   2) a) 1 : 2   b) 1 : 1.5   4) $\frac{1}{5}$

SOLVING EQUATIONS

Key Concept

Inverse Operations

Operation	Inverse
$+$	$-$
$-$	$+$
$\times$	$\div$
$\div$	$\times$
x^2	$\sqrt{x}$

Year 8

Key Words

Unknown: A letter which represents a number we do not know the value of.
Terms: The numbers and letters in the expression or equation.
Inverse: The operation which will do the opposite.

Tip

Answers can be:
- Integers
- Decimals
- Fractions
- negatives

Examples

$x + 9 = 16$
$-9 \quad -9$
$x = 7$

$x - 12 = 20$
$+12 \quad +12$
$x = 32$

$\frac{x}{3} = 5$
$\times 3 \quad \times 3$
$x = 15$

$2x + 5 = 14$
$-5 \quad -5$
$2x = 9$
$\div 2 \quad \div 2$
$x = 4.5$

$\frac{x}{4} - 2 = 4$
$+2 \quad +2$
$\frac{x}{4} = 6$
$\times 4 \quad \times 4$
$x = 24$

$2(3x + 5) = -14$
expand
$6x + 10 = -14$
$-10 \quad -10$
$6x = -24$
$\div 6 \quad \div 6$
$x = -4$

$2x + 7 = 5x + 1$
$-2x$
(smallest x term)
$+7 = 3x + 1$
$-1 \quad -1$
$6 = 3x$
$\div 3 \quad \div 3$
$2 = x$

Questions

1) $x + 8 = 19$

2) $y - 25 = 15$

3) $2y = 82$

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

5) $\frac{p}{2} - 6 = 2$

6) $3(2x - 3) = 15$

7) $4x - 8 = 2x + 1$

ANSWERS: 1) x = 11, 2) y = 40, 3) y = 41, 4) t = 28, 5) p = 16, 6) x = 4, 7) x = 4.5

USING DATA

Key Concept

When drawing a pie chart, divide 360° by the total frequency. This will tell you how many degrees to use for the frequency of each category

If there are 40 people in a survey, then each person will be worth 360÷40=9° of the pie chart.

Key Words

Qualitative Data non-numerical data

Quantitative Data numerical data

Continuous Data data that can take any numerical value within a given range.

Discrete Data data that can take only specific values within a given range.

Examples

These are the journey times, in minutes, for a group of railway travellers

25, 37, 12, 32, 28, 17, 20, 43, 15, 34, 45, 22, 19, 36, 44 , 17

1. Construct a grouped frequency table to represent the data
2. What is the modal class?

Time, T (minutes)	Frequency
10 < T ≤ 20	6
20 < T ≤ 30	3
30 < T ≤ 40	3
40 < T ≤ 50	4

The modal class is 10 < T ≤ 20 as it has the highest frequency

Tip

Remember to label the category that each sector in the pie chart represents.

Year 8

Questions

These are the heights (in metres) of 20 people.

1.65, 1.53, 1.71, 1.72, 1.48, 1.74, 1.56, 1.55, 1.80, 1.85, 1.58, 1.61, 1.82, 1.67, 1.47, 1.76, 1.79, 1.66, 1.68, 1.73

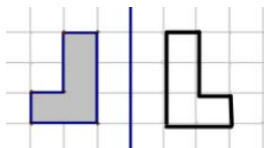Construct a grouped frequency table and use it to find the modal class
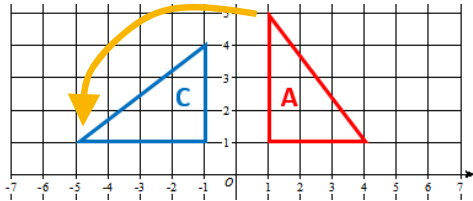
22

TRANSFORMATIONS

Key Concept

Reflection
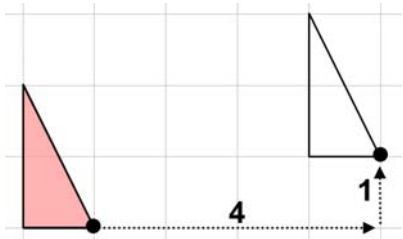
Rotation

Translation

Year 8

Key Words

Co-ordinate: A pair of numbers which describe the position on a grid.

Transformation: This means the shape has 'changed'.

Reflection: This means a shape has been flipped.

Rotation: This means a shape has been turned.

Translation: This means a *movement* of the shape.

Tip

- Use **tracing paper** to avoid mistakes.
- When describing transformations, look at how many marks are available and see if you have put enough to get the marks.

Examples

a) Reflect A in the x-axis, label it B.

b) Rotate A 90°, anti-clockwise about (0,0), label it C.

c) Translate A in the vector $\begin{pmatrix} -7 \\ -6 \end{pmatrix}$, label it D.
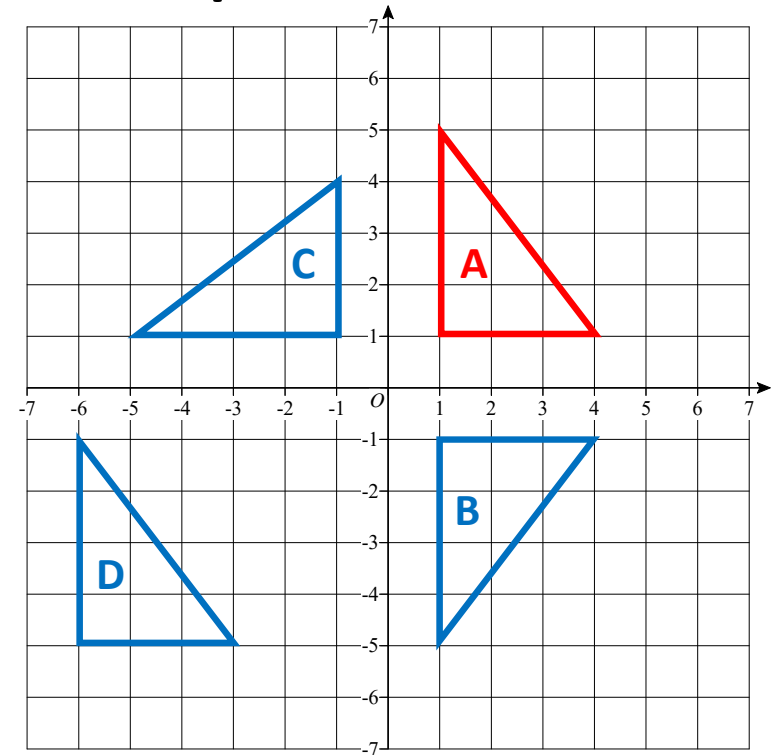
Questions

Draw a grid like the one above.

Plot a triangle with vertices (6,2), (3, 2) and (4, 5).

a) Reflect the triangle in the y-axis. b) Translate the triangle $\begin{pmatrix} -3 \\ -4 \end{pmatrix}$

23

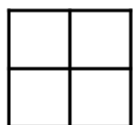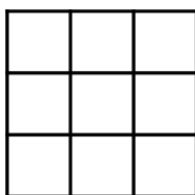# WORKING WITH NUMBERS

Key Concept

Square numbers

1^2
$1 \times 1 = 1$

2^2
$2 \times 2 = 4$

3^2
$3 \times 3 = 9$

Cube numbers

1^3
$1 \times 1 \times 1$
1

2^3
$2 \times 2 \times 2$
8

3^3
$3 \times 3 \times 3$
27
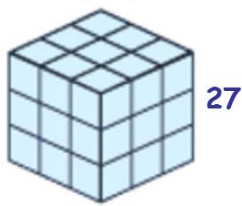
Key Words

Square: A square number is the result of multiplying a number by itself.

Cube: A cube number is the result of multiplying a number by itself twice.

Root: A root is the reverse of a power.

Integer: whole number

Tip

We use standard form to write a very large or a very small number in scientific form.

Year 8

Examples

What is 2^4 ?

$2 \times 2 \times 2 \times 2 = 16$

What is $\sqrt{64}$?

$8^2 = 64$, so $\sqrt{64} = \pm 8$

Multiplying/Dividing by powers of 10

3.4 x 100

100	10	1	$\frac{1}{10}$
		3	4
3	4	0	

Write the following in **standard form**:

1) $3000 = 3 \times 10^3$

2) $4580000 = 4.58 \times 10^6$

Questions

1) a) 2^5 b) 3^3 c) 1^{17} d) $\sqrt{81}$ e) $\sqrt{16}$ f) $\sqrt[3]{64}$

2) Write the following in standard form: (a) 74 000   (b) 1 042 000

PERCENTAGE CHANGES

Key Concept

Multipliers

Find 15%	× 0.15
Increase by 15%	× 1.15
Decrease by 15%	× 0.85

For **reverse percentage** problems you can divide by the multiplier to find the original amount.

Key Words

Percentage: Is a proportion that shows a number as parts per hundred.

Fraction: A fraction is made up of a numerator (top) and a denominator (bottom).

Multiplier: A quantity by which a given number is to be multiplied.

Examples

Find **32%** of 54.60 = **0.32** × 54.60 = 17.472

Percentage Change:

Increase 45 by **12%**

$Value \times (1 + percentage\ as\ a\ decimal)$

$= 45 \times (1 + 0.12)$

$= 45 \times \mathbf{1.12} = 50.4$

A dress is reduced in price by 35% from £80. What is it's **new price**?

$Value \times (1 - percentage\ as\ a\ decimal)$

$= 80 \times (1 - 0.35)$

$= £52$

Year 8

Tip

There is a % function on your calculator.

To find 25% of 14 on a calculator:

2, 5, SHIFT, (, ×, 1, 4, =

Questions

1) a) 35% of 140   b) 21% of 360   c) Increase 60 by 15%

2) Write the following as a decimal multiplier: a) 45%   b) 3% c) 2.7%

3a) Decrease £500 by 6% b) Increase 65g by 24% c) Increase 70m by 8.5%

ANSWERS: 1) a) 49   b) 75.6   c) 69 2a) 0.45 b) 0.03 c) 0.027 4a) £470 b) 80.6g c) 75.95m

Present tense: regular verbs

PRESENT	-er verbs	-ir verbs	-re verbs
je / j'	jou-e	-is	-s
tu	jou-es	-is	-s
Il/elle/on	jou-e	-it	-
Nous	jou-ons	-issons	-ons
Vous (pl)	jou-ez	-issez	-ez
Ils or elles	jou-ent	-issent	-ent

KEY IRREGULAR VERBS in the present

FAIRE [to do]	ÊTRE [to be]	AVOIR [to have]
Je fais	Je suis	J'ai
Tu fais	Tu es	Tu as
Il/ elle/ on fait	Il/elle/on est	Il/elle/ on a
Nous faisons	Nous sommes	Nous avons
Vous faites	Vous êtes	Vous avez
Ils / elles font	Ils / elles sont	Ils/ elles ont

Opinions & Pronouns

Ce que j'aime **LE PLUS** c'est … [What I like **the most** is…]
Ce qui **ME PLAÎT** c'est … [What **I enjoy** is…]

J'aime [bien] …

J'adore …
Je préfère …
Mon sport préféré est …
… (ça) m'amuse.

Je n'aime pas (**du tout**)
… I don't like (**at all**)
Je déteste …
Je ne supporte pas…
J'ai horreur de
… (ça) m'éneve.
… (ça) m'ennuie.

Frequency words & Connectives

quelquefois sometimes
souvent often
cependant however
tout le temps all the time
de temps en temps from time to time
tous les soirs every night
une fois par semaine once a week
deux fois par semaine twice a week

parce que/ car because
tous les jours every day
de plus furthermore
mais but
et and
ou or

Complexity

a) **Quand** il fait beau …. **When** it's nice weather …
b) **Quand** il (**ne**) pleut (**pas**) **When** it (**doesn't**) rain(s)

1. ne….pas — not
2. ne….jamais — never
3. ne… plus — no more / no longer
4. qui est / qui sont — which is / which are

Adjectives

C'EST … = IT IS … CE N'EST PAS… =
1. act**if**/ active = active
2. amusant [**e**] = fun
3. barbant [**e**] = boring/ tedious
4. drôle = funny
5. énervant [**e**] = annoying
6. ennuy**eux** / ennuy**euse** = boring
7. excitant [e] = exciting
8. danger**eux**/ danger**euse** = dangerous
9. difficile = difficult
10. facile = easy
11. génial [**e**] = great
12. intéressant [**e**] = interesting
13. nul / nul**le** = rubbish
14. passionnant [**e**] = exciting
15. relaxant [**e**] = relaxing
16. violent [**e**] = violent

QUANTIFIERS

assez = quite
plutôt = rather
très = very
tellement = so
trop = to
vraiment = really

KEY QUESTIONS

1 **[Est-ce que] tu es sportif/ sportive?** *Are you sporty?*
2. **Qu'est-ce que tu fais?** *What do you do?*
2. **Qu'est-ce que tu aimes faire?** *What do you like to do?*
3. **Quand?** *When?*
4. **Qu'est-ce qu'ils font?** *What do they do?*

TOPIC VOCABULARY TRANSLATED

En été / En hiver	in summer / in winter
Au printemps / en automne	in spring / in summer
Quand il fait beau / chaud	When it's good / hot weather
Quand il fait mauvais / froid	When it's bad / cold weather
Quand il pleut / il neige	When it rains / snows
Il y a du soleil	it is sunny
Il y a du vent	it is windy
Il y a des nuages	it is cloudy
Il y a de l'orage	it is stormy
Le temps est variable	the weather is changeable

Quand? ● When?

Le sport — *Sport*

Je joue … — *I play …*

au billard — *billiards/snooker*
au tennis de table/au ping-pong — *table tennis*
à la pétanque/aux boules — *boules*

Tu es sportif/sportive? — *Are you sporty?*

1. Je suis (assez) sportif/sportive. — *I'm (quite) sporty.*
2. Je ne suis pas (très) sportif/sportive. — *I'm not (very) sporty.*
3. Mon sportif/Ma sportive préféré(e) est … — *My favourite sportsman/sportswoman is …*

USEFUL infinitives verbs

*envoyer = to sent
*faire = to do
jouer = to play
retrouver = to meet
traîner = to hang out

Qu'est-ce que tu fais? — *What do you do?*

Je fais du parkour. — *I do parkour.*
Je fais du patin à glace. — *I go ice-skating.*
Je fais du vélo. — *I go cycling.*
Je fais de la natation. — *I go swimming.*
Je fais de l'équitation. — *I go horse-riding.*
Je fais des promenades. — *I go for walks.*

Les mots essentiels ● High-frequency words

sur	on
en (été)	in (summer)
quand	when
tout/toute/tous/toutes	all
par (deux fois par semaine)	per (twice a week)
d'habitude	usually
d'abord	first of all
ensuite	then/next
puis	then/next

Qu'est-ce que tu aimes faire? ● What do you like doing?

le soir/le weekend	in the evenings/ at the weekends
le samedi matin/ après-midi/soir	on Saturday mornings/ afternoons/evenings
J'aime …	I like …
… retrouver mes amis en ville.	… meeting my friends in town.
… regarder la télévision (la télé).	… watching TV.
… jouer sur ma PlayStation.	… playing on my PlayStation.
… écouter de la musique.	… listening to music.
… faire les magasins.	… going shopping.
… faire du sport.	… doing sport.
… jouer au football.	… playing football.
… traîner avec mes copains.	… hanging out with my mates.
… téléphoner à mes copines.	… phoning my mates.

27

Present tense: regular verbs

PRESENT	-er verbs	-ir verbs	-re verbs
je / j'	habit-e	-is	-s
tu	habit-es	-is	-s
Il/elle/on	habit-e	-it	-
Nous	habit-ons	-issons	-ons
Vous (pl)	habit-ez	-issez	-ez
Ils or elles	habit-ent	-issent	-ent

KEY IRREGULAR VERBS in the present

FAIRE [to do]	ÊTRE [to be]	AVOIR [to have]
Je fais	Je suis	J'ai
Tu fais	Tu es	Tu as
Il/ elle/ on fait	Il/elle/on est	Il/elle/ on a
Nous faisons	Nous sommes	Nous avons
Vous faites	Vous êtes	Vous avez
Ils / elles font	Ils / elles sont	Ils/ elles ont

Opinions & Pronouns

Ce que j'aime **LE PLUS** c'est … [What I like **the most** is…]

Ce qui **ME PLAÎT** c'est … [What **I enjoy** is…]

J'aime [bien] …

Je préfère …

Je n'aime pas **du tout**

Je ne supporte pas…

J'ai horreur de

… (ça) m'amuse

.. (ça) m'intéresse

… (ça) m'énerve.

… (ça) m'ennuie.

Frequency words & Connectives

quelquefois sometimes   parce que/ car because

souvent often   cependant however

tous les jours every day   de plus   furthermore

tout le temps all the time   mais but   ou or

Premièrement…deuxièmement   firstly…secondly…

(et) en fin (and) finally

Complexity

1. ne….pas   not
2. ne… plus   no more / no longer
3. Il y a / il n'y a pas DE   there is / are / isn't / aren't
**TIF - il y avait – there were   (neg = il n'y avait pas de)
**TIF - c'était…=it was   (neg = ce n'était pas)
4. qui est / qui sont   which is / which are

Expressions of frequency

(adverbs)	
d'habitude	usually
normalement	normally
quelquefois	sometimes
tous les weekends	every weekend

Adjectives

C'EST … = IT IS …   CE N'EST PAS… = IT IS NOT…

1. beau / belle = beautiful
2. joli [e] = pretty
3. laid [e] = ugly
4. intéressant [e] = interesting
5. grand [e] / petit [e] = big / small
6. Ennuyeux [euse] = boring
7. excitant [e] = exciting
8. dangereux [euse] = dangerous
9. nul [le] = rubbish
10. énorme = enormous
11. génial [e] = great
12. mystérieux / euse = mysterious
13. nouveau [elle] = new
14. vieux / *vielle = old
15. touristique = touristic
16. historique = historical

QUANTIFIERS

un peu = a bit   tellement = so

plutôt = rather   trop = too

assez /très   = quite/very   vraiment = really

KEY QUESTIONS

1 **Où habites-tu?**   *Where do you live?*

2. **Qu'est-ce qu'il y a?**   *What is there?*

2. **Où est?**   *Where is?*

4. **Où sont?**   *Where are?*

5. **Tu aimes..? Aimes-tu..?** *Do you like..?*

28

TOPIC VOCABULARY TRANSLATED

Là où j'habite • Where I live

Qu'est-ce qu'il y a ... ?	What is there ... ?
Il y a ...	There is ...
un café	a café
un centre commercial	a shopping centre
un centre de loisirs	a leisure centre
un château	a castle
un cinéma	a cinema
une église	a church
un hôtel	a hotel
un marché	a market
un parc	a park
un restaurant	a restaurant
un stade	a stadium
une patinoire	an ice rink
une piscine	a swimming pool
des magasins	shops
des musées	museums
Il n'y a pas de ...	There isn't a ... / There are no ...

Les opinions • Opinions

Tu aimes ta ville/ ton village?	Do you like your town/ village?
Je pense que ...	I think that ...
À mon avis, ...	In my view ...
C'est ...	It's ...
vraiment nul	really rubbish
trop petit	too small
J'aime ça.	I like that.
J'adore ça.	I love that.
Tu es d'accord?	Do you agree?
Oui, je suis d'accord.	Yes, I agree.
Non, je ne suis pas d'accord.	No, I disagree.

Les attractions • Attractions

le bateau pirate	the pirate ship
le manège	the merry-go-round
le Cheval de Troie	the Trojan horse
le petit train	the little train
le toboggan géant	the giant slide
le trampoline magique	the magic trampoline
la grotte mystérieuse	the mysterious grotto
la rivière enchantée	the enchanted river
la soucoupe volante	the flying saucer
l'hôtel	the hotel
les autos tamponneuses	the dodgems
les chaises volantes	the flying chairs

USEFUL infinitives verbs

*avoir = to have
*être = to be
*faire = to do
*prendre = to take

tourner = to turn
continuer = to continue
chercher = to look for

Les directions • Directions

Pardon ...	Excuse me ...
Où est ... ?	Where is ... ?
Où sont ... ?	Where are ... ?
C'est ...	It's ...
à gauche	left
à droite	right
tout droit	straight on
au carrefour	at the crossroads
entre	between
derrière	behind
devant	in front of

Asking for places & tu or vous?

Où est...	l'hôtel? le restaurant? le petit train? la rivière enchantée? le montage russe? le bateau pirate?	
Où sont...	les autos tamponneuses? les chaises volantes?	
C'est à gauche C'est à droite C'est tout droit C'est au carrefour C'est entre C'est devant C'est derrière	**Tu tournes** **Tu vas** **Tu continues** **Vouz tournez** **Vous allez** **Vous continuez**	à gauche à droite tout droit entre derrière devant
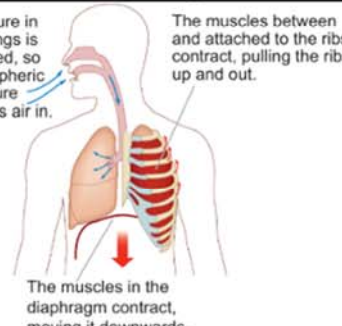
8C Breathing and Respiration

1. Aerobic Respiration

Robert Boyle	(1627-1691) placed a burning candle in a jar and sucked out all the air- the candle went out. Repeated with a mouse and the mouse died.
Joh Mayow	(1641-1679) did experiments to discover that only a certain part of the air was needed to keep candle burning and mouse alive.
Joseph Priestly & Antoine Lavoisier	(1733-1804) (1743-1794) Showed that oxygen was the part of air needed for the candle to burn and mouse to live- makes up 21% of air.
Aerobic Respiration	Using oxygen to release energy from glucose.

Aerobic Respiration Word Equation

glucose + oxygen → carbon dioxide + water

Combustion	The word equation for combustion (burning) of glucose is the same as above but occurs in a different way.
Reactants	The starting substances- written on left of word equation.
Products	The new substances made- written on right of word equation.

2. Gas Exchange System

Breathing	Muscle movement allowing the lungs to expand/contract.
Ventilation	Movement of air into / out of the lungs.

Diaphragm	Organ below the lungs that contracts / relaxes changing the size of the lungs.
Inhalation breathing in	Pressure in the lungs is reduced, so atmospheric pressure pushes air in. The muscles between and attached to the ribs contract, pulling the ribs up and out. The muscles in the diaphragm contract, moving it downwards.
Mucus	Sticky liquid that traps dirt, dust and microorganisms.
Cilia	Tiny hairs on cells that sweep mucus from the lungs into the gullet to be swallowed.
Gas Exchange	The swapping of gases between the lungs and the blood.
Diffusion	Movement of particles from a high concentration to low.
Alveoli	Little pockets on the lungs.
Adaptations of Alveoli	They increase the surface area for faster diffusion. The walls are one cell thick for faster diffusion.

3. Getting Oxygen

Red Blood Cells	Take in oxygen when it gets into the blood.
Haemoglobin	Where the oxygen binds to in red blood cells.
Arteries	Blood vessels that carry blood from the heart to the body.
Capillaries	Tiny blood vessels that the arteries divide into. oxygen leaves red blood cells here and dissolves into the plasma.

|	
Plasma	Liquid part of the blood that leaks out of the capillaries into the tissue fluid.
Tissue Fluid	Carries the oxygen to the cells.
Veins	Carry blood back towards the heart.
Exercise	Your muscles must release more energy so need more oxygen and glucose- your breathing and heart rates increase.
Frostbite	Blood vessels in skin narrow to avoid heat loss and less blood reaches cell. If the cells die this causes frostbite.
Heart Attack	Fatty substances build up inside blood vessels reducing blood flow causing cells to die.
Carbon Monoxide	Poisonous gas found in cigarette smoke- sticks to haemoglobin so red blood cells carry less oxygen.
Tar	In tobacco smoke- irritates alveoli and causes them to break apart leading to emphysema.
Asthma	Tiny tubes in lungs become narrow and fill with mucus meaning less air gets into and out of the lungs.

4. Comparing Gas Exchange

Limewater	Turns cloudy in the presence of carbon dioxide.
Hydrogen Carbonate Indicator	Turns from pink to yellow as carbon dioxide increases and the pH drops.
Gills	Water flows over feathery strands where oxygen diffuses into the blood and carbon dioxide out.

Stomata	Tiny holes in leaves that allow gas exchange.

5. Anaerobic Respiration

Anaerobic Respiration	Respiration that occurs in the cytoplasm of cells when oxygen isn't present during strenuous exercise.

Anaerobic Respiration Word Equation
Glucose → lactic acid

|	
Energy	Anaerobic respiration releases less energy than aerobic.
Anaerobic Advantages	Allows for a quick, sudden burst of energy.
After Strenuous Exercise	Lactic acid enters the blood, is carried to the liver and converted back to glucose.
EPOC	Excess post-exercise oxygen consumption (or oxygen debt). Extra oxygen is needed after strenuous exercise to replace lost oxygen from blood / muscles and convert lactic acid to glucose.

Effect of exercise on oxygen demand
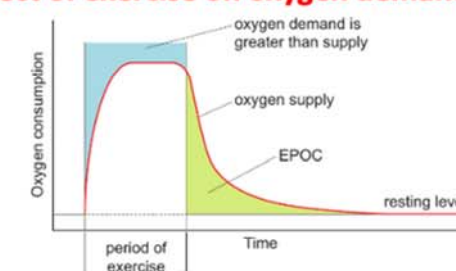
Work through memorising the information – highlight each definition once you know it. When you have completed your highlighting completed the gap fill and activities on the second sheet to support your retrieval practice.
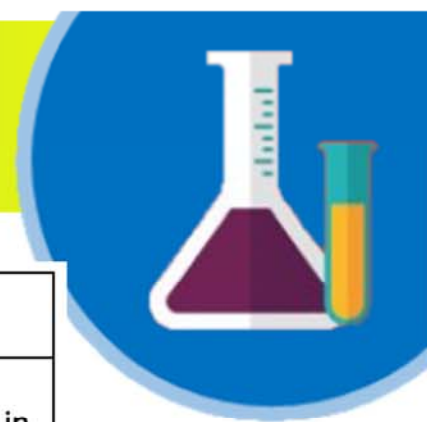
8D Unicellular Organisms

1. Unicellular or Multicellular

Cells	The basic unit of life. All organisms are made up of cells.
Unicellular	An organism made up of one cell.
Microorganisms	Organisms that are so small they can only be seen with a microscope.
Multicellular	An organisms made of many cells.
Diffusion	When particles spread to fill the area that they are in.
Kingdoms	All living organisms can be grouped into one of the five kingdoms.
Prokaryotes	Unicellular organisms that do not have a nucleus.
Protoctists	Mainly unicellular organisms. All have a nucleus.
Fungi	Mainly multicellular organisms that do not make their own food and have a nucleus.
Plants	Multicellular organisms that have a nucleus and make their own food.
Animals	Multicellular organisms that have a nucleus, do not make their own food and do not have a cell wall.
Bacteria	A type of microorganisms in the prokaryote kingdom.

Viruses	Not classed as living organisms because they cannot live without being inside a host.

2. Microscopic Fungi

Asexual Reproduction	Producing new organisms from one parent only.
Budding	Type of asexual reproduction used by fungi in which a small new cell grows out from a parent cell.
Aerobic Respiration	Glucose + oxygen → carbon dioxide + water
Anaerobic Respiration	A type of respiration which does not require oxygen.
Fermentation	The anaerobic respiration of microorganisms. Glucose → carbon dioxide + water
Population	The number of a certain organism found in a certain area.
Limiting Factor	Something that stops a population growing.

3. Bacteria

Lactic Acid	Produced by the anaerobic respiration of bacteria. Glucose → lactic acid
Enzymes	A substance that can speed up some processes in living organisms.
Binary Fission	Type of asexual reproduction used by bacteria in which a cell splits into two.
Chromosome	A long molecule that contains instructions for organisms and their cells.
Flagella	A tail-like structure that rotates, allowing a unicellular organism to move.

Statement Key	A series of descriptive statements used to work out what something is.

4. Protoctists

Algae	A type of protoctist that uses photosynthesis.
Photosynthesis	Carbon dioxide + water → glucose + oxygen
Chloroplast	Found in plant and some protoctist cells- the site of food production through photosynthesis.
Chlorophyll	The green substance inside chloroplasts that absorbs light.
Producers	Organisms that are able to make their own food- always the start of a food chain.
Food Chains	A way of showing what eats what in an ecosystem.
Energy Transfer	Represented by an arrow on a food chain diagram.
Pyramids of Numbers	A way of showing the numbers of different organisms in a food chain.
Poison	Can build up and become more concentrated as you move along a food chain.

5. Decomposers & Carbon

Ecosystem	All the physical environmental factors and all the organisms that are found in a habitat.
Decomposers	Organisms that feed on dead organisms or animal waste which allows substances to be recycled.
Decay	The breakdown of dead organisms or animal waste.

Soluble	A substance that can dissolved in a liquid.
Carbon Cycle	Shows how carbon compounds are recycled in an ecosystem.
Combustion	Burning fuels and releasing carbon dioxide into the air.
Feeding	Transfers carbon compounds stored in plants to the animals eating them.
Carbohydrates	A nutrient used as the main source of energy.
Proteins	A nutrient used for growth and repair.
Fats	A nutrient used for storing energy and as a thermal insulator.

Work through memorising the information – highlight each definition once you know it. When you have completed your highlighting completed the gap fill and activities on the second sheet to support your retrieval practice.

8E Combustion

1. Burning Fuels

Fuel	A chemical substance from which stored energy can be transferred usefully to make things happen.
Fuel Cell	Used in hydrogen-powered vehicles, releasing energy from hydrogen.

Fuel Cell Word Equation
Hydrogen + oxygen → water

Reactants	The starting substances- on left of word equation.
Products	The new substances made- on right of word equation.
Combustion	Burning, usually in air. The reaction gives out energy which is transferred to the surroundings by heating or light.
Fossil Fuels	Fuels formed from living organisms that died millions of years ago- *petrol, diesel*
Hydrocarbons	Only contain carbon and hydrogen atoms- *petrol, diesel*
Combustion of Hydrocarbons	The carbon and hydrogen atoms react with oxygen. The carbon reacts to form carbon dioxide.
Carbon Dioxide	Carbon dioxide will turn limewater cloudy.

2. Oxidation

Oxidation	Reacting with oxygen.
Oxide	Compound formed by oxidation.
Metal Oxides	Formed when metals react with oxygen. *metal + oxygen → metal oxide*

Conservation of Mass	Mass is never gained or lost in a chemical reaction. The atoms in reactants just rearrange to form the products, no new atoms are made and none disappear.
Heating Zinc in Air	Forms a white powder zinc oxide. The mass will appear to increase because the zinc has combined with the oxygen in air.
Gas Products	If the product is a gas it may escape and make it seem like the mass has decreased.
Phlogiston	A substance scientists used to think explained why things burned that was then proven not to exist.

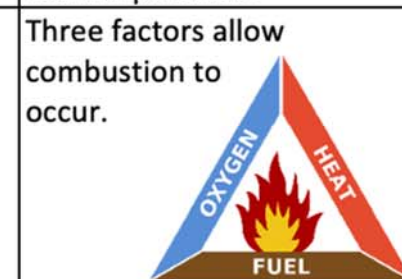### 3. Fire Safety

Exothermic	A reaction that releases energy that we can feel as heat- *combustion*
Thermometer	Used to measure a change in the temperature.
Fire Triangle	Three factors allow combustion to occur.
Putting Out a Fire	You must remove at least one of the three factors.
	Explosive Heating may cause an explosion.
	Flammable These substances catch fire easily.
	Oxidising These substances release oxygen.

Fire Extinguishers	Work by cooling a fire or stopping oxygen getting to the fuel.
Oil Fire	Water will sink through the oil and turn to steam making the fire spread out. Use foam or a fire blanket to keep oxygen away.
Electrical Fire	Water conducts electricity so you may get a serious shock. Turn off the electricity and use a powder or carbon dioxide extinguisher.

4. Air Pollution

Complete Combustion	Carbon burns in plenty of air only forming carbon dioxide.
Incomplete Combustion	Not enough oxygen for all the carbon to react with.
Products of Incomplete Combustion	• carbon dioxide- linked to global warming • carbon monoxide- poisonous gas • soot- damage lungs and trigger asthma
Impurities	Small amounts of other substances in fuels.
Sulfur Dioxide	Formed when hydrocarbons have a sulfur impurity.
Nitrogen Oxide	Formed by high engine temperatures causing nitrogen and oxygen in air to react.
Pollutants	Something that can harm living things and damage the environment.
Catalytic Converter	Found in cars to react carbon monoxide with more oxygen forming carbon dioxide. Also breaks down nitrogen oxides.

Acid Rain	Sulfur dioxide and nitrogen oxides rise into the air and dissolve in water vapour. The rain is now more acidic.
Controlling Acid Rain	Neutralisation reactions used to remove acidic gases from chimney smoke. Acidic soil /water can be neutralised by adding calcium carbonate.

5. Global Warming

Greenhouse Gases	Trap energy from the Sun in the atmosphere *e.g. carbon dioxide*
Greenhouse Effect	Energy trapped by greenhouse gases is transferred back to the Earth's surface causing it to warm up.
Earth's Temperature Over Time	The temperature of the Earth has fluctuated over time it is rising rapidly now though.
Global Warming	Increase in global temperature due to more greenhouse gases in the air and the greenhouse effect.
Climate Change	Resulting from global warming- changes to weather patterns, more storms, flood, droughts, etc.
Evidence	There is now lots of evidence for global warming. average temperatures are increasing and ice caps are melting.

Work through memorising the information – highlight each definition once you know it. When you have completed your highlighting completed the gap fill and activities on the second sheet to support your retrieval practice.

8G Metals and Their Uses

1. Metal Properties

Physical Properties	The properties that describe a substance on its own. *(colour, strength, density, etc.)*
Chemical Properties	How a substance reacts with other substances.
Properties of Metals	High melting points, strong, flexible, malleable, shiny, good conductors.
Copper	Used in electrical circuits because it is a good conductor of electricity and unreactive. Used in water pipes because it is unreactive, non-poisonous and malleable.
Aluminium	Used in window frames because it is strong and light.
Metals & Oxygen	Most metals react with oxygen. metal + oxygen → metal oxide *e.g. zinc + oxygen → zinc oxide*
Metals & Halogens	Metals react with halogens and other non-metals. *e.g. zinc + fluorine → zinc fluoride*
Catalysts	Speed up chemical reactions without being permanently changed themselves.
Catalytic Converter	Found in cars to help convert dangerous gases into harmless ones- often contain platinum, palladium and rhodium.

2. Corrosion

Corrosion	Any reaction with oxygen at the surface of a metal.
Rusting	The corrosion of iron.

Word Equation for Corrosion of Titanium
titanium + oxygen → titanium oxide

Symbol Equation for Corrosion of Titanium
$Ti + O_2 \rightarrow TiO_2$

Formula	Used to represent the products and reactants in a symbol equation.
Ratio	Comparison of the proportion of two quantities *e.g. in TiO_2 there are two oxygen atoms for every titanium- the ratio is 1:2*
Rusting of Iron	More complex than general corrosion- requires water as well.

Rusting of Iron Word Equation
Iron + oxygen + water → iron hydroxide

Preventing Rust	Use a barrier such as paint/plastic/oil to keep away air/water

3. Metals and Water

Reactivity of Metals

Reactivity	How quickly / vigorously something reacts.
Reactivity Series	A list of metals in the order of their reactivity.

Metals & Water	Metals produce metal hydroxides and hydrogen when reacting with water. *(sodium + water → sodium hydroxide + hydrogen)*

4. Metals and Acids

Potassium - Lithium	React explosively with dilute acids.
Calcium - Zinc	React very quickly with dilute acids.
Iron - Lead	React slowly with dilute acids.
Copper - Platinum	Do not appear to react with dilute acids at all.
Effervescence	The production of a gas. Occurs when metals react with an acid.
Metals & Acids	Metals react with acids to form hydrogen and a salt.

Metals & Acids Word Equation
metal + acid → salt + hydrogen
e.g. magnesium + sulfuric acid → magnesium sulfate + hydrogen

Naming Salts	The first word in the salt is the metal the second depends on the acid used.
Hydrochloric Acid	HCl – forms salts ending in chloride
Sulfuric Acid	H_2SO_4 – forms salts ending in sulfate
Nitric Acid	HNO_3 – forms salts ending in nitrate
Obtaining Salts	Mix the acid and the metal. Filter the solution to remove any excess metal. Heat the solution to evaporate water leaving just the solid salt.

5. Pure Metals and Alloys

Pure	Substance made up of one type of atom.

Alloys	Mixtures of metals.
Solder	Lead mixed with tin- lower melting point than lead used for fixing pipes / electrical equipment.
Duralumin	Aluminium mixed with copper and magnesium making it lighter and stronger. Used in aircraft.
Stainless Steel	Iron mixed with carbon, chromium and nickel making it stronger and more resistant to corrosion. Used in cutlery.

Explaining How Alloys Are Strong

Melting / Boiling Points	Melting and boiling points for pure substances are fixed and occur at precise temperatures. Alloys melt and boil over a range of temperatures.

Work through memorising the information – highlight each definition once you know it. When you have completed your highlighting completed the gap fill and activities on the second sheet to support your retrieval practice.

8J Light

1. Light on the move

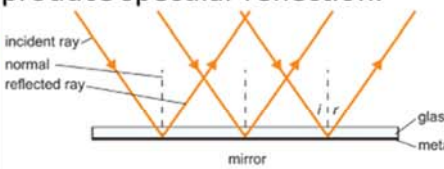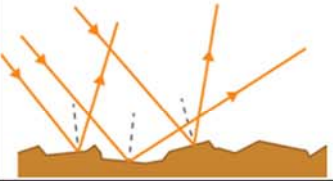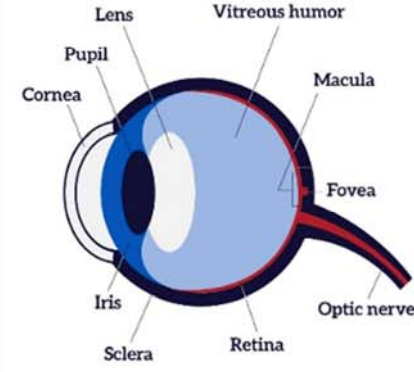|	
Vacuum	A completely empty space, containing no particles.
Matter	All things are made of matter. There are three states of matter: solid, liquid, gas.
Longitudinal wave	A wave where the particles vibrate in the same direction as the wave is travelling. **longitudinal**
Transverse wave	A wave where the vibrations are at right angles to the direction the wave is travelling. **transverse**
Ray	A narrow beam of light, or an arrow on a diagram representing the path of light and the direction in which it is travelling.
Transparent	A material that light can travel through without scattering. (Note: transparent substances may be coloured or colourless.)
Transmit	To pass through a substance.
Reflect	To bounce off a surface instead of passing through it or being absorbed.
Absorb	'To soak up' or 'to take in'.
Translucent	Material that lets light through but scatters it. You cannot see things clearly through translucent materials.

Opaque	Material that does not let light through. It is not possible to see through an opaque substance.
Scattered	Scattering occurs when light or other energy waves pass through an imperfect medium (such as air filled with particles of some sort) and are deflected from a straight path.
Reflected ray	A ray of light bouncing off a mirror.
Source	Where a sound wave or other wave begins.
Image	A picture that forms in a mirror or on a screen, or is made by a lens. You see an image when looking down a microscope.
Pinhole camera	A piece of apparatus that forms an image of an object on a screen when light rays travel through a tiny hole in the front
Shadow	A place where light cannot get to, because an opaque object is blocking the light.

2. Reflection

Plane mirror	A smooth, flat mirror.
Ray box	A piece of equipment that produces a narrow beam of light.
Ray tracing	A method of investigating what happens to light by marking the path of a light ray.
Ray diagram	A diagram that represents the path of light using arrows.
Normal	An imaginary line at right angles to the surface of a mirror or other object where a ray of light hits it.

Incident ray	A ray of light going towards the mirror or other object.
Reflected ray	A ray of light bouncing off a mirror.
Angle of incidence	The angle between an incoming light ray and the normal.
Angle of reflection	The angle between the normal and the ray of light leaving a mirror.
Specular reflection	When light is reflected evenly, so that all reflected light goes off in the same direction. Mirrors produce specular reflection.
Diffuse reflection	Reflection from a rough surface, where the reflected light is scattered in all directions.
Law of reflection	The angle of incidence is equal to the angle of reflection.

3. Refraction

Refraction	The change in direction when light goes from one transparent material to another.
Interface	The boundary between two materials.
Lens	A curved piece of glass or other transparent material that can change the direction of rays of light.
Converging lens	A lens that makes rays of light come together.
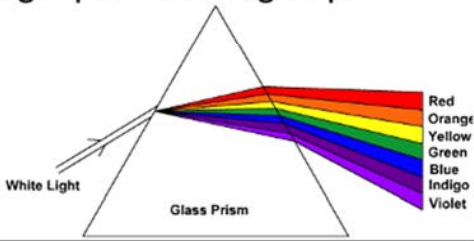
Angle of refraction	The angle between the normal and a ray of light that has been refracted.
Focal point	The place where parallel rays of light are brought together by a converging lens.
Focal length	The distance between the centre of the lens and the focal point.

4. Cameras and eyes

Digital camera	A camera that uses electronics to record an image.
Sensor	An instrument that detects something. In a digital camera, the sensors detect light and change it to electrical signals.
Memory card	Part of a digital camera that stores the images.
Aperture	A hole in a camera that controls how much light goes to the sensor.
Shutter	A device that shields and protects the sensor in a digital camera. It opens when the picture is taken.
Human eye	
Retina	The part at the back of the eye that changes energy transferred by light into nerve impulses.
Pupil	The hole in the front of the eye that light can pass through.

Rod cell	A cell in the retina that detects low levels of light. It cannot detect different colours.
Cone cell	A cell in the retina that detects different colours of light.
Cornea	The transparent front part of the eye, which covers the iris and pupil.
Iris	The coloured part of the eye.
Optic nerve	The nerve that takes impulses from the retina to the brain.
Primary colour	One of three colours that are detected by the cone cells in our eyes. The primary colours are red, green and blue.
Secondary colour	A colour made when two primary colours mix. The secondary colours are magenta, cyan and yellow.

Filter (physics)	Something that only lets certain colours through and absorbs the rest.

5. Colour	
White light	Normal daylight, or the light from light bulbs, is white light.
Frequency	The number of vibrations (or the number of waves) per second. Different frequencies of light have different colours.
Spectrum	The seven colours that make up white light.
Dispersion	The separating of the colours in light, for example when white light passes through a prism.
Prism	A block of clear, colourless glass or plastic. Usually triangular.

8L Earth and Space

1. Gathering the Evidence
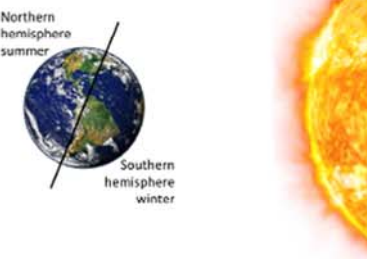
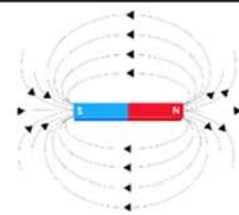|	
Astronomer	A scientist that studies space.
Early Astronomers	Could only use their eyes to make observations.
Ptolemy	Egyptian astronomer (*90-168*) Proposed a model with the Earth in the centre and the Moon, Sun and planets orbiting the Earth.
Nicolaus Copernicus	Polish astronomer (*1473-1543*) Suggested the Earth and other planets move in circles around (orbit) the Sun.
Reaction to Copernicus' Model	It was not accepted straight away. However observation made by Galileo using one of the first telescopes provided more evidence to support it.
Johannes Kepler	German astronomer (*1571-1630*) Proposed the model used today. The Sun is at the centre with the planets moving around in elliptical orbits. Moons orbit planets.

The Model of the Solar System

Phases of the Moon	The Moon appears different shapes at different times due to its position relative to the Earth and Sun.
Spacecraft	Allowed scientists to investigate space more by collecting samples and taking readings on other planets.

2. Seasons

Summer	Longer days than nights, Sun high in the sky.
Winter	Longer nights than days, Sun not very high in the sky.
Cause of Seasons	Due to the tilt of the Earth's axis by 23.5°.
Causing Summer	When the northern hemisphere is tilted towards the Sun it is summer in the UK.
Causing Winter	When the northern hemisphere is tilted away from the Sun it is winter in the UK.
Causing Seasons Diagram	
Summer Sun	Because the Sun is higher in the sky in summer the heat is more concentrated, making it feel warmer

3. Magnetic Earth

Compass	A magnet that points north.
North-Seeking pole	The end of a bar magnet that points north- shortened to north pole.
South-Seeking pole	The end of a bar magnet that points south- shortened to south pole.
Attract	When two magnets are pulled together. Opposite poles will attract each other.
Repel	When two magnets are pushed apart. The same poles will repel each other.
Magnetic Field	The area around a magnet where it has an effect. Can be found using iron filings or a small compass.
Magnetic Field Diagram	
Magnetic Field Strength	Strongest closest to each pole, the field gets weaker as you get further from the magnet.
Magnetic Field Direction	The direction of a magnetic field is always from the north pole towards the south pole.

4. Gravity in Space

Gravity	Force exerted by all objects with mass trying to pull other objects towards it.
Bigger Mass	The bigger the mass of an object, the stronger the force it exerts.
Weight	The force of gravity pulling on you. *Measured in Newtons (N)*
Gravitational Field	The space around the Earth where gravity attracts things.
Gravitational Field Strength (*g*)	At the surface of the Earth it is about 10 newtons per kilogram (N/kg).
Weight Formula	Weight = mass x g

Gravity and Orbits	The force of gravity keeps the Earth in its orbit of the Sun.
Satellite	Anything that orbits a planet.
Natural Satellite	Moons are examples of natural satellites.
Artificial Satellite	Can be put into orbit around Earth for photographing / transmitting TV programs etc

5. Beyond the Solar System

|	
Constellation	Pattern of stars
Stars	Huge balls of gas that give out large amounts of energy. The Sun is a star.
Stars At Night	Appear less bright than the Sun because they are further away.
Galaxies	Large groups of stars.
Milky Way	The galaxy our Sun is in.
Universe	Made up by all of the millions of galaxies.
Light Year	Measurement of distance- the distance travelled by light in 1 year. Approximately ten million million kilometres.
Proxima Centauri	Nearest star to the Sun, about 4.22 light years away.

Work through memorising the information – highlight each definition once you know it. When you have completed your highlighting completed the gap fill and activities on the second sheet to support your retrieval practice.

Computer Science Knowledge Organiser

COMPUTING SYSTEMS

Modern computer systems receive an input, process that data and then produce an output. The data can be sored in memory. They are designed to automate any process by a program. To execute programs that operate on data.

Computing systems need a **processor**, **memory**, and **storage**. Modern systems also rely heavily on **communication** between them.

MEMORY vs STORAGE
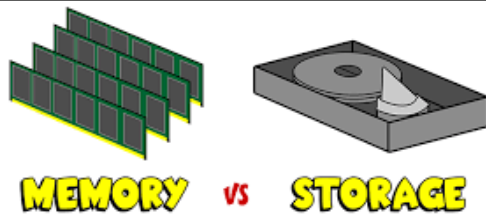
Communication Computing systems exchange information and form networks
Programs and **data** are transferred between computing systems, when required.

"AI has by now succeeded in doing essentially everything that requires 'thinking' but has failed to do most of what people and animals do 'without thinking' – that, somehow, is much harder!"
Donald Knuth, author of *The Art of Computer Programming, in 1981*
Programming computers to learn from experience

The processor (CPU)the component that **executes** program instructions.

An instruction may:

- Perform arithmetic or logic operations on data

- Perform input/output of data

- Control program flow

The **storage** (secondary memory) is the set of components that **stores** programs and data.
Storage is **persistent**: it retains its contents when the power is off.

Main memory is referred to as RAM. The main component that **stores** the programs and data **currently in use**.

Memory is **volatile**: its contents are lost when the power is off.

Logical operations operate on statements that are **true** or **false**. There are three basic logical operations. AND OR NOT
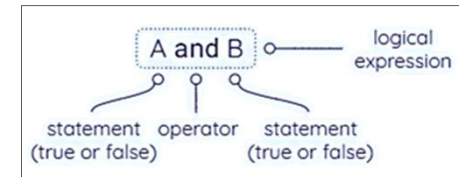
Logical expressions — **logic circuits** can be represented using diagrams

Logical operations — **logic gates** can be represented using symbols

FREE or OPEN software is where creators of a program can choose to provide access to its **source code**. This means that anyone can 'see inside' the program to understand how it works, check for errors, suggest improvements, and 'remix' it. Whilst still acknowledging the source.
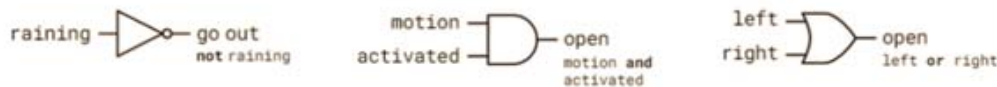
Binary

Key Words	
Bit (b)	The smallest unit of data. 0 or 1.
Nibble (N)	4 bits
Byte (B)	8 bits (note the difference between b and B)
Kilobyte (KB)	1000 bytes. Note KB is different from Kb.
Megabyte (MB)	1000 KB
Gigabyte (GB)	1000 MB
Terabyte (TB)	1000 GB
Petabyte (PB)	1000 MB
Binary number	A number system that contains two symbols, 0 and 1. Also known as base 2
Base 2 number system	A number system where there are only 2 digits to select from.
data	Units of information. In computing there can be different data types, including integers, characters and Boolean. Data is often acted on by instructions.
Denary (also known as decimal)	The number system you use. It contains 10 unique digits 0 to 9. Also known as decimal or base 10
Multiplier (also known as place value)	The value of the place, or position, of a digit in a number

Multipliers	128	64	32	16	8	4	2	1
Example binary number	0	0	0	1	0	1	1	1
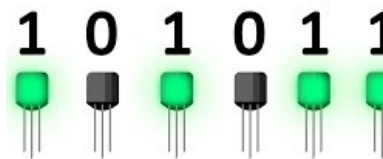
Representing information with sequences of symbols, is necessary for storing, exchanging and processing information. Information in computers must be represented in a form convenient for processing.

Humans have invented lots of different ways to code information using different sounds, symbols or even lights!

Computers represent all data, including numbers, letters, symbols, images, videos and sounds using binary numbers. All binary numbers are made up of the digits) and 1.

0s and 1s are called binary digits, or bits. All characters are represented using sequences of bits.

Computers only use the two symbols 0 and 1 because all computers are built out of electrical switched which can only be on (1) or off (0).

Multipliers or weights are the amount each digit in a sequence is worth e.g the number 30 contains three 10s and zero 1s . 10 and 1 are the multipliers or weights. Binary numbers use different multipliers or weights

To convert from binary to decimal (also known as denary) multiply each binary digit with its multiplier, then add up the products to work out the decimal number. For example in the binary number above 1 x 16 =16 4 x1 = 4 1x2 = 2 and 1x1 = 1 and 16 + 4 + 2 + 1 = 23
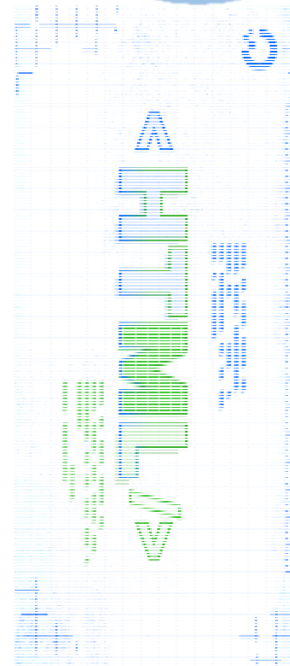
HTML

Key Words	
World Wide Web	Collection of webpages connected together by hyperlinks, using the Internet (Usually shortened to WWW)
Internet	A global network of computers all connected together
Webpage	A hypertext document connected to the world wide web
Website	A collection of webpages with information on a particular subject
Web browser	The software which displays a webpage or website on a computer
Uniform Resource Locator (URL)	An address that identifies a particular file or webpage on the internet
HTML	Hyper Text Mark-up Language – describes and defines the content of a webpage
Web script	A type of computer programming language used to add dynamic features to a webpages
Multimedia	Content that uses a combination of different types of media – for example, text, audio, images
Hyperlink	A link from a hypertext document to another location, activated by clicking on a highlighted word or image
Hotspot	An area on a computer screen which can be clicked to activate a function, especially an image or piece of text acting as a hyperlink
Navigation	The elements of a website that allows the user to move around the website. This is usually in the form of a menu or hyperlinked text or buttons
JPG	The main file type used for mages on the world wide web – uses lossy compression
PNG	Another type of image file used on the world wide web – supports transparency and uses lossless compression

Definitions: What does it do?	
<html>	Root of a HTML document
<body>	Contents of the page
<head>	Information about a page
<title>	Table title/defines title
<h1>,<h2>,<h3>	Headings
<p>	Paragraph
<img>	Image
<a>	Anchor (used in hyperlinks with href)
,	Order/unordered list
	List item
<table>	Creates and defines table
<tr>	Table row
<td>	Table data
<strong>	Bold
 	Linebreak
<div>	Divider
<!-- -->	Comment

```
<!DOCTYPE html>
<html>
<head>
<title>My First Webpage</title>
</head>
<body>
<h1>My First Heading</h1>
<p>My first paragraph.</p>
</body>
</html>
```

My First Web

My First Heading

My first paragraph.

edublocks

PYTHON PROGRAMMING

Python is a **text** based **programming language**. That can be used to create programs, games, applications and much more!

A **program** is a set of precise instructions, expressed in a **programming language**.
Translating the programming language is necessary for a machine to be able to **execute** the instructions.

To execute a Python program, you need a **Python interpreter**.

This is a program that translates and executes your Python program.

A list is where values can be stored. This is a comma-separated list of values (items) in square brackets.
```
flavours = ["strawberry", "chocolate", "mint",
"cherry","raspberry"]
```

This is an data structure organised in a structure, each item has its own index indicating its position in the list.
NOTE: List item numbering starts from 0—zero based system

When this code is executed
print (flavours[2])
Mint will be output as it is looking in the list flavours and selecting index position 2 to output

Arithmetic operators + addition, - difference, * multiplication, / division, // integer division
% remainder of integer division, ** exponentiation (to the power of)

Useful snippets of code	
list.append(item)	Add an item to the end of a list
list.insert,index.item)	Inserts an item to a given index
list.pop(index)	Remove item at given index and return it
list.remove(item)	Remove the first item from the list with a particular value
list.index(item)	Search for the index of an item
list.count(item)	List the occurrences of the item
list.reverse()	Reverse the list
list.sort()	Sort the list

Use an structure , a (**while**) when the program needs to **repeat** actions, while a **condition** is satisfied.

for loops are convenient for **iterating** over any sequence of elements

Walk through the program keeping track of what is happening to lists and variables as the loops are executed.

MOBILE APP DEVELOPMENT

Key Words	
abstraction	Identify the important aspects to start with
algorithm	Precise sequence of instructions
Application (app)	Software designed to run on a mobile device
Computational thinking	Solving problems with or without a computer
debugging	Looking at where a program might have errors or can be improved
blocks	Scratch bricks that we can use to code algorithms
decomposition	Breaking down a problem into smaller parts
execute	A computer precisely runs through the instructions
GUI	Graphical User Interface
iteration	Doing the same thing more than once
selection	Making choices
sequence	Running instructions in order
variable	Data being stored by the computer

Sequence, **selection** and **iteration** are all processes. In order for computers to perform tasks there is more that is needed. For example a computer will take an **input** (this might be automatic or via human input) which the computer will then **process** and the **output** will be visible on the computer monitor.

A mobile application, most commonly called an app, is a type of application software designed to run on a mobile device, such as a smartphone or tablet computer.

App Lab is a block or text based programming language. This allows creation and sharing of apps.

The point of an app is to connect and interact with users.
App creators tend to have an idea, a problem or a task that they want to develop user an app. These can be huge or relatively small ideas.
Decomposing the problem helps us make the task less daunting and more achievable. This involves breaking down the task into smaller more manageable parts to start with.

Most computers have an environment with tiles, icons and/or menus. These allow users to interact.
This type of interface is called the **graphical user interface (GUI)** because the user interacts with images through a mouse, keyboard or touchscreen. The GUI needs careful design consideration so that the user experience is a positive one so they want to continue to use it.

Making sure the app is successful and actually does what it was intended to do is important.
Setting **success criteria** should be determined at the start of the project and can be revisited frequently.
The success criteria should be clear and easy to follow.

Evaluating and **debugging** allow for judging the quality of the app and enables errors to be corrected and improvements to be made.

Mechanical Properties

Tensile Strength	Material's resistance to the tension caused by pulling force.
Compressive Strength	Material's resistance to a crushing or squeezing force.
Shear Strength	Material's resistance to two parallel forces acting in opposite directions.
Torsional Strength	Material's resistance to a twisting force.

Compression   Tension   Torsion   Shear

Strength	The ability of a material to resist a force applied.
Hardness	The resistance of a material to scratching and wear.
Toughness	The ability of a material to not break when a force is suddenly applied.
Malleability	The ease with which the shape of a material can be changed without the material breaking.

Physical Properties

Density	The mass of a material per unit volume.
Electrical Conductivity	The ability of electricity to pass through a material.
Absorbency	The ability of a material to draw in moisture.

Design Specification – Key Questions

A	Aesthetics	What shape should the product be? What colour should be product be? What texture should the surface have?
C	Cost	What should the cost of the product be?
C	Consumer	Who is the client or the user of the product? What features of other similar products should it have? Does the client have any specific needs or wants for the product?
E	Environment	Should the product be made from recycled materials? How should the product be packaged? How will the product be disposed of when it is no longer needed?
S	Safety	What safety risks have to be considered? What safety standards must the product meet?
S	Size	How long, wide and tall should the product be? How much should the product weigh?
F	Function	What will the product be used for? How will it work? How should it be tested?
M	Materials and Manufacturing	What materials should the product be made from? Are there any limits on the sizes of the available materials? How many products need to be made? Which processes should be used to make the product?

42

Ergonomics and Anthropometrics

Anthropometrics is the practice of taking measurements of the human body and provides categorised data that can be used by designers. Anthropometrics help designers collect useful data, eg head circumferences when designing a safety helmet. In this example, as there is a large variation in size, the designer would need to build some adjustment into the safety helmet design.

Ergonomics can incorporate the use of **anthropometric data** when designing products to improve the user experience. If a designer doesn't use anthropometric data during the design process, it can lead to a poor user experience that causes discomfort, pain and potential injury. **Ergonomics** is a consideration that leads to a product being designed in a way to make it easy to use. Size, weight, shape, position of buttons and controls are all aspects that contribute to it being ergonomically designed.

How can we reduce our impact on the environment?

Use **renewable** materials rather than non-renewable means these can be replenished.
If non-renewable materials are used such as plastic (oil) **carbon emissions** are given off resulting in global warming.
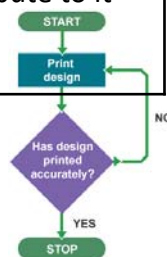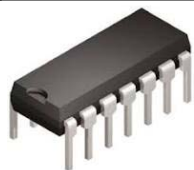Choosing **biodegradable** materials means they will break down naturally when the product comes to the end of its life. Non-biodegradable materials that have not been recycled will end up in the landfill or the sea damaging animals and habitats.
Apply the **6Rs** to ensure minimal impact on the planet.

Microcontrollers are programmable components that acts like a small computer within a single integrated circuit.

Peripheral Interface Controller **PIC** is a commonly used microcontroller

Flowchart program is a set of instructions laid out using flowchart symbols that tells a microcontroller what to do.

Advantages And Disadvantages Of Using Plastics

- Plastics are made from a **non-renewable** resources which cannot be replaced.
- Plastics are **non-biodegradable** and will not decay if disposed of in landfills or the the sea causing damage to animals and habitats.
- Not all plastics can be recycled.

+ Plastics are **strong** and **durable.**
+ Plastics come in a range of sizes and colours.
+ Plastics can be easily shaped.
+ Plastics are **insulators** and are **waterproof.**

The **Green Dot** does not necessarily mean that the packaging is recyclable, will be recycled or has been recycled.

The **Mobius Loop**. This indicates that an object is capable of being recycled, not that the object has been recycled or will be accepted in all recycling collection systems.

Age warning logo
This indicates the product is not suitable for under 3 year olds.

43

Design & Technology Knowledge Organiser

3

Tools and Equipment	Name	• Use / • Safety point
	Coping Saw	To cut wood **Safety Rules when using it** Work should be clamped in a vice
	Half Round File	Smoothing wood or Styrofoam **Safety** Work should be clamped in a vice
	Vice	Used to hold work in place **Safety** Allows work to be safely clamped while being cut or smoothed
	Pillar Drill	Used to drill holes in wood or plastic **Safety** You must wear goggles, an apron, tie your hair back, have the guard down and worked clamped securely

Computer Aided Design
Computer Aided Manufacture

CAD	This is using computer software to draw and model a product. **Examples:** 2D Design, Photoshop, Macromedia Fireworks and Sketch Up **Advantages:** • Designs can be shared electronically • Accurate • Designs can be easily edited **Disadvantages:** • Software and training can be expensive • Security issues
CAM	This is using computer software to control machine tools to make products. **Examples:** Laser Cutter, 3D printer **Advantages:** • Faster • Complicated shapes are easily produced • Exact copied are easily made • Machines can run 24/7 **Disadvantages:** • High initial set up costs as CAM machines are expensive

44

Most polymers are synthetic. This means they are man-made. They are usually made from crude oil which can be obtained by drilling underground or under sea level. Crude oil is a non-renewable resource- this means that it is not replaced as it is used.

Thermoplastic polymers can be reshaped when heated. They can also be recycled.

Thermosetting polymers cannot change shape when reheated and cannot be recycled. They have extra links between the individual chains of polymer. These links stop the chains being able to move, meaning that thermosetting polymers are typically stronger and more rigid than thermoplastics polymers.

Vacuum Forming is a process that uses heat and air pressure to shape a thermoplastic. It can be used to manufacture **blister packaging.**

SEQUENCE DRAWING - VACUUM FORMING

1. A SUITABLE MOULD / FORMER IS CAREFULLY MANUFACTURED
2. THE MOULD IS PLACED IN THE VACUUM FORMER
3. PLASTIC SHEET IS PLACED ABOVE THE MOULD AND CLAMPED SECURELY
4. THE ELECTRIC HEATER IS TURNED ON TO WARM THE PLASTIC SHEET.
5. THE PLASTIC BECOMES FLEXIBLE WHEN HEATED
6. THE AIR IS PUMPED OUT OF THE AREA BELOW THE PLASTIC AND MOULD.

Thermoplastic Polymers

Type	Properties	Uses
HDPE *High Density Polyethylene*	Strong and stiff	Pipes, buckets, bowls
PET *Polyethylene Terephthalate*	High strength and good toughness. Heat resistant	Drinks bottles and food packaging
HIPS *High Impact Polystyrene*	Reasonable strength and good toughness	Packaging
Acrylic	Can be transparent Hard wearing and tough	Plastic windows, bath tubs

Thermosetting Polymers

Type	Properties	Uses
Epoxy Resin	High strength, stiff and brittle Excellent temperature resistance	Printed circuit boards, cast electrical insulators
Melamine Formaldehyde	Strong, stiff and hard Resistant to many chemicals and stains	Laminate coverings for kitchen worktops
Urea Formaldehyde	Good strength, rigid and hard Warm to the touch	Plugs and plug sockets

Metal sources

Ores are naturally occurring rocks that contain metal or metal compounds in sufficient amounts to make it worthwhile extracting them.

Iron ore is used to make iron and steel. Copper is easily extracted, but ores rich in copper are becoming more difficult to find.

Metals are grouped into the following categories or classifications:
•**ferrous** - contain iron, rust easily and are magnetic, eg iron and steel
•**non-ferrous** - do not contain iron, do not rust and are not magnetic, eg copper and aluminium
•**alloys** - a mixture of more than one metal, eg bronze or brass.

Environmental impact

When considering the ecological and social implications of using metal, its non-renewable nature is the main concern. Metal cannot be grown and is a finite resource - there is only a certain amount within the Earth's crust.

Steel is made in huge and exceedingly hot cauldrons. Its production uses a lot of energy and contributes approximately 5 per cent of the world's greenhouse gas emissions.

Ferrous metals

	Strength and weaknesses (properties).	Uses
Cast iron	Cheap to produce, easy to cast, is rigid, has high compressive strength, machines and absorbs vibrations well, has low tensile strength, it is brittle and cannot be forged	Pans, brake discs, large castings
High-carbon steel (tool steel)	Hard but brittle, less malleable than mild steel, good electrical and thermal conductivity	Taps and tools, eg screwdrivers and chisels
Low-carbon steel (mild steel)	Ductile and tough, easy to form, braze and weld, good electrical and thermal conductivity but poor resistance to corrosion	Nuts, bolts, screws, bike frames and car bodies

Non Ferrous metals

	Strength and weaknesses (properties).	Uses
Aluminium	Light in weight and malleable but strong, a good conductor of heat and corrosion resistant	Drink cans, saucepans, bike frames
Copper	An excellent electrical conductor of heat and electricity, extremely malleable and can be polished, oxidises to a green colour	Plumbing fittings and electrical wires, professional chef's saucepans
Silver	A precious metal that is soft and malleable when heated, highly resistant to corrosion and an excellent electrical conductor of heat	Jewellery

8 Tips for Eating Well

To grow and be healthy we need to eat a variety of foods. We should choose more of some and less of others:

1. **Base your meals on starchy foods**

2. **Eat lots of fruit and vegetables**

3. **Eat more fish:** Including 1 portion of oily fish / week

4. **Cut down on saturated fat and sugar**

5. **Try to eat less salt:** no more than 6g a day for adults

6. **Get active and try to be a healthy weight**

7. **Drink plenty of water**

8. **Don't skip breakfast**

Eatwell Guide

Check the label on packaged foods

Use the Eatwell Guide to help you get a balance of healthier and more sustainable food. It shows how much of what you eat overall should come from each food group.

- 40%
- 38%
- 12%
- 8%
- 1%

Danger zone: because microorganisms multiply quickly at this temperature 5◦C to 63◦C

Fridge :0◦C to 4◦C

Freezer:
 -18◦C to -23◦C

Microorganisms are dormant below 5◦C.

Above 63◦C they are killed.
Reheat foods :75◦C

COOKING ZONE 100 °C
75 °C
63 °C
DANGER ZONE 37 °C
8 °C
5 °C
COLD ZONE -18 °C

Key Words

Microorganisms- Mould, Yeast. Bacteria
Fermentation-Yeast+FATTOM= Carbon dioxide and Alcohol
Pathogens: Bad bacteria
Salmonella-raw meat, poultry, eggs, unpasteurized milk
Listeria- Soft cheeses, ready meals, pates , deli meats
Campylobacter-raw meats, unpasteurised milk and contaminated water

The Purpose of Basic Baking Ingredients from the spruce

Functional and chemical properties of ingredients in cake and bread making

Cupcakes	
Self raising flour	Make the cake rise, Structure, dextrinises –add colour
Caster sugar	Sweetness, aeration
Margarine	Makes the cake moist, aeration
Egg	Binds mixture

Bread	
Strong flour	Structure, Gluten stretches helps bread rise and sets shape
Yeast	Produce CO2 when all conditions provided so makes bread rise.
Water	Binds ingredients, provides moisture for yeast.

metal atom

Why food is cooked:

1. To make it safe to eat
2. To improve the shelf life
3. To develop flavour
4. To improve texture
5. To give variety

Methods of heat transfer

Convection - when the environment (air, water or oil) is heated up.
e.g. - baking a cake
- boiling an egg

Conduction - when heat is transferred directly.
e.g. - frying an egg

Radiation - when heat radiates
e.g. - toast

Effect of cooking on protein

Protein denaturation: the process of altering a protein's molecular characteristics or properties

Proteins: Coagulation The process of turning a liquid into a solid

Example: Egg

Fruit & vegetables

- 5 portions a day.
- 1 portion is a handful or 80g.
- Eat a balance of fruit and vegetables.
- Fruit and vegetables should make up at least 1/3 of each meal.
- It doesn't matter how you eat them: fresh, frozen, tinned, dried or in a juice format.

Protein-rich, non-dairy foods / Dairy and alternatives

1/3 of your meals should be made up from any combination of the following:

- dairy foods
- animal protein foods
- peas and beans
- dairy and meat alternatives.

The Eatwell Guide

Starchy foods:

- Choose wholegrain or high fibre verisons.
- Each meal should be bsed on at least 1/3of starchy carbohydrates.
- Starchy carbohydrates include: pasta, rice, potatoes, bread, breakfast cereals.

Water

Don't forget to drink water to prevent dehydration.

Sugar

Eat sugary / sweet foods in small quantities and less often.

Oils and spreads

Although important we should eat these sparingly and use low fat options.

Nutrient	Functions	Sources
Protein	Growth – known as the body's building blocks.	Animal products – meat, fish, dairy; plants – lentils, nuts, seeds
Carbohydrates	Source of energy. Divided into: simple carbohydrates – sugars and complex carbohydrates – starches and dietary fibre. Starches provide slow releasing energy and add bulk	complex – bread, pasta, rice, potatoes (chose wholemeal versions for fibre and potato with the skin
Fats	Source of energy. Four types: monounsaturated, polyunsaturated (omega 3 and 6), saturated and trans fats. Fats are stored under the skin and are essential for health. Too much fat can cause health problems	Monounsaturated – olive oil, avocados; polyunsaturated – oily fish, nuts, sunflower oil, soya beans; saturated – full-fat dairy, fatty meats; and trans fats – many snack foods
Vitamin	Essential for many processes, eg bone growth, metabolic rate, immune system, vision, nervous system. Need small amounts only.	A – dairy, oily fish, yellow fruit; B – vegetables, wholegrain cereals; C – citrus fruit, broccoli, sprouts; D – oily fish, eggs, fortified cereals
Minerals- Calcium	Essential for many processes, eg bone growth/strength, nervous system, red blood cells, immune system. Need small amounts only	Calcium – milk, canned fish, broccoli; iron – watercress, brown rice, meat; zinc – shellfish, cheese, wheatgerm; potassium – fruit, pulses, white meat

Conditions for Microorganism growth (FATTOM)

Yeast, Mould, Bacteria (Bad bacteria are known as Pathogens

F		**F**ood-Food provides energy and nutrients for bacteria to grow. High risk foods particularly protein foods such as chicken and dairy products are rich in nutrients and moisture and so promote bacterial growth.
A		**A**cid-Most bacteria reproduce best at a neutral pH level of 7. Acidic foods with a pH below 7, or alkaline foods with a pH above 7, may stop or slow down the rate of bacterial growth.
T		**T**ime- If provided with the optimum conditions for growth, bacteria can multiply to millions over a small period of time via binary fission. This is when a bacterium divides in two every 20 minutes.
T		**T**emperature-Bacteria need warmth to grow. The temperature a food is stored, prepared and cooked at is crucial. If this is not followed correctly then the food will not be safe to eat. The optimum temperature range for bacterial growth is between 5-63°C. This is known as the **danger zone** as it is dangerous for some foods to be in this temperature range for prolonged periods of time.
O		**Ox**ygen-Microorganisms that that require oxygen to grow are called aerobic such as most yeast.
M		**M**oisture-Bacteria need moisture in order to grow. This is why they grow on foods with high moisture content such as chicken. Foods that are dehydrated or freeze-dried can be stored for much longer as the moisture has been removed.

Some Pathogens that causes Food Poisoning:
*Campylobacter-Raw or undercooked meat, particularly raw poultry
Unpasteurised milk
Untreated water.
*E. coli-Raw or undercooked meat and poultry or related products (eg gravy)
Raw seafood products
Unpasteurised milk or products made from it (eg cheese)
Contaminated water
*Listeria-Unpasteurised milk or products made from it
Soft cheeses (eg camembert, brie)
Ready-to-eat foods (eg pre-packed sandwiches, pâté, deli meats)
Unwashed vegetables contaminated with soil
*Staphylococcus aureus-humans carry this in their nose and throat and can be transmitted by coughing or sneezing. Ready-to-eat foods that are hand-made (eg sandwiches)
Cooked meats, Unpasteurised milk and related products.
*Salmonella-raw or undercooked poultry and meat, eggs and unpasteurised milk

Art – Tier 2 and Tier 3 language

Type		Keyword	Definition
SPRING 1: ART: Endangered animals	Tier 2 language	Primary	Primary colours include yellow, blue, and red. These are colours that can't be created by mixing of other colours.
		Secondary	A colour formed by mixing two primary colours. For example, mixing red and yellow will give you orange.
		Fine liner	An inky pen used for finer areas of detail. They are available with a range of nib sizes.
		Detail	A distinctive feature of an object or scene which can be seen most clearly close up.
		Bold	Bright, opaque and noticeable. Bold lines are often used to frame a specific area.
	Tier 3 language	Opaque	A paint that is opaque will give a solid colour. In other words, you can't see through it.
		Transparent	The quality of being able to see through (or partially see through) one or more layers in an artwork.
		Flat wash	Brushing consecutive strokes of colour on a wet or dry surface to create a bold colour.
		Gradient	Gradually blending from one colour to another colour or from dark to light.
		Tertiary	These are made by combining equal parts of primary and secondary colours. E.g. Turquoise.

Colour code: BLUE= Tier 3 words   ORANGE= Tier 2 words   Look out for colour coding during lessons!

52

Computer Science – Tier 2 and Tier 3 language

Type		Keyword	Definition
SPRING 1: COMPUTER SCIENCE: Computer Systems	Tier 2 language	Communication	Computing systems exchange information and form networks. Modern systems rely heavily on communication.
		Storage	Stores programs and files long term, even when they are not in use. Devices such as hard drives, USB memory sticks or SD cards
		Memory	A device or system that is used to store information for immediate use.
		Input/output	Input device sends information to a computer system for processing, and an output device reproduces or displays the results of that processing.
		Process	A set of instructions currently being processed by the computer processor.
	Tier 3 language	Logical expressions	Logic circuits can be represented using diagrams.
		Logical Operations	Operate on statements that are true or false. Logic gates can be represented using symbols.
		Volatile	Used to store computer programs and data that CPU needs in real time and is erased once computer is switched off
		Non-Volatile	Retains data even if there is a break in the power supply.
		Logic gates	A collection of powered and unpowered circuits and transistors. Includes AND, OR, NOT gates.

Type		Keyword	Definition
SPRING 2: COMPUTER SCIENCE: Data Representation	Tier 2 language	Data	Units of information. In computing there can be different data types. Data is often acted on by instructions.
		Decimal	Another word for Denary.
		Pixels	Pixels are combined to form a complete image, video, text, or any visible thing on a computer display.
		Represents	To represent an idea or quality means to be a symbol or an expression of that idea.
		Samples	A sample is a digital representation of an analogue signal.
	Tier 3 language	Binary	A number system that contains two symbols, 0 and 1. Also known as base 2.
		Denary	The number system we use. It contains 10 unique digits 0 to 9. Also know as decimal or base 10.
		Bit	The smallest unit of data. 0 or 1.
		Nibble	4 bits.
		Byte	8 bits.

Computer Science - Tier 2 and Tier 3 language

Type		Keyword	Definition
SPRING 1: COMPUTER SCIENCE: Building a website	Tier 2 language	Multimedia	Content that uses a combination of different types of media – text, audio, images.
		Website	A collection of webpages with information on a particular subject.
		Webpage	A hypertext document connected to the world wide web.
		Navigation	The elements of a website that allows the user to move around the website.
		JPG/PNG	JPG – main file used for images on WWW. PNG – another image file used on WWW.
	Tier 3 language	Hyper text mark-up language (HTML)	Describes and defines the content of a webpage.
		Uniform resource locator (URL)	An address that identifies a particular file or webpage on the internet.
		Hyperlink	A link from a hypertext document to another location, activated by clicking on a highlighted word or image.
		Hotspot	An area on a computer screen which can be clicked to activate a function, especially an image or piece of text acting as a hyperlink.
		Web script	A type of computer programming language used to add dynamic features to a webpages.

Type		Keyword	Definition
SPRING 2: COMPUTER SCIENCE: Python	Tier 2 language	Program	A detailed plan or procedure for solving a problem with a computer.
		Coding	How we communicate with computers.
		Errors	Problems occurring in a piece of code.
		Input	Computer hardware equipment used to provide data and control signals to a computer.
		Data	Facts and figures in their raw form.
	Tier 3 language	Variable	A memory location within a computer program where values are stored.
		Syntax	Errors/mistakes made in the piece of code.
		Iteration	Repeating steps, or instructions , over and over again.
		While loop	When the program needs to repeat actions, while a condition is satisfied.
		Condition	Statements that are created by the programmer which evaluates actions in the program.

Design & Technology - Tier 2 and Tier 3 language

Type		Keyword	Definition
SPRING 1: D & T	Tier 2 language	Polymers	Plastics are a type of polymer composed of chains of polymers which can be partially organic or fully synthetic.
		Conductivity	The ability of electricity to pass through a material.
		Absorbency	The ability of a material to draw in moisture
		Malleability	The ease with which the shape of a material can be changed without the material breaking.
		Density	The mass of a material per unit volume.
	Tier 3 language	Ergonomics	The consideration that leads to a product being designed in a way to make it easy to use. Size, weight, shape, position of buttons and controls are all aspects that contribute to it being ergonomically designed.
		Anthropometrics	The practice of taking measurements of the human body and provides categorised data that can be used by designers.
		Microcontrollers	Microcontrollers are programmable components that acts like a small computer within a single integrated circuit.
		Thermoplastic	A type plastic that can be reshaped when heated. They can also be recycled.
		Thermosetting	A type of plastic that cannot change shape when reheated and cannot be recycled.

Type		Keyword	Definition
SPRING 2: D & T	Tier 2 language	Context	The wider sociocultural, organisational and economic settings of a design problem.
		Evaluation	Where a designer reflects on the design of a product, looks at what went well during testing and identifies ways that a product could be improved.
		Sustainability	The level to which resources can be used without them becoming unavailable in the future.
		Ecological	Ecological footprint is the impact of human activities measured in terms of the area of biologically productive land and water required to produce the goods consumed and to assimilate the wastes generated.
	Tier 3 language	Polyethylene	Polyethylene or polythene is the most common plastic in use today. It is a polymer, primarily used for packaging.
		Polystyrene	Polystyrene is a synthetic aromatic hydrocarbon polymer made from the monomer known as styrene. Polystyrene can be solid or foamed.
		Biopolymer	Biopolymers are natural polymers produced by the cells of living organisms.

55

Drama - Tier 2 and Tier 3 language

	Type	Keyword	Definition
SPRING 1: DRAMA: Shakespeare	Tier 2 language	Status	How powerful a character is e.g. a king has a higher status than his subjects
		Pitch	How high or low an actors voice is
		Pace	How fast or slow and actor speaks
		Levels	How high or low a character is onstage to convey their status
		Gesture	How we communicate through the use of our hands and arms
	Tier 3 language	Iambic Pentameter	The beat used in some of Shakespeare's famous lines e.g. da-DUM da-DUM da-DUM da-DUM da-DUM
		Explorative Strategies	Techniques used to create a piece of drama
		Tableau	A frozen image that tells a story
		Thought tracking	Sharing your inner thoughts and feeling with the audiences
		Physicality	The way in which we use our body to portray a character

	Type	Keyword	Definition
SPRING 2: DRAMA: Devising from a Stimulus	Tier 2 language	Devising	Creating a piece of theatre using our own ideas
		Stimulus	The thing that gives you ideas when devising e.g. an image, a poem, a piece of music
		Slow Motion	Exaggerated movement at a slow pace
		Vocal Projection	Speaking loudly enough for the audience to be able to hear you
		Synchronisation	Moving at the same time in the same way
		Evaluation	Identifying the most and least effective aspects of a performance
	Tier 3 language	Ensemble	A group of actors working together to create a performance
		Multi-role	When an actor plays more than one character in a performance
		Monologue	A long speech said by only one actor
		Proxemics	The distance between two or more characters to show their relationship

English - Tier 2 and Tier 3 language

Type		Keyword	Definition
SPRING 1: ENGLISH	Tier 2 language	Menace	A threat
		Furtive	A sly or secretive action
		Ruthless	Cold-blooded way
		Megalomaniac	Somebody who is power-hungry and treats people horribly.
		Interrogating	Interviewing somebody by asking lots of questions
	Tier 3 language	Narrative Viewpoint	The point of view that a story is told from: First person (I), Third person (He, she, they)
		Minor Sentence	A sentence that does not contain all of the necessary elements to be grammatically correct 'Stop!', 'No, don't!'
		Exposition	The beginning of a story
		Resolution	The ending of a story
		Noun Phrases	A section of a sentence that contains a noun and its modifiers such as adjectives and determiners

Type		Keyword	Definition
SPRING 2: ENGLISH	Tier 2 language	Banished	Removed from a place forcefully/sent away.
		Conveyed	A synonym for presents or shows. For example 'the writer *conveyed* the idea that the character felt angry by the use of…'
		Implies	A synonym for suggests or means. For example 'the verb 'crept' *implies* the character was…'
		Interpretation	An understanding or explanation. For example 'One interpretation might be that the character is angry here.'
		Theme	A subject or running idea throughout a text. For example, the theme of love within 'Romeo & Juliet'.
	Tier 3 language	Prologue	A small segment of text to provide an overview of a play/plot, which is given to the reader/audience at the start.
		Figurative Language	Another term used for language devices. The name given to the category of devices that includes: simile, metaphor, repetition…
		Colloquial	Means slag or informal.
		Connotations	Means associations. You might say that *connotations* of the word red include: love, anger, blood, romance etc.
		QTA	The acronym for the way we construct our reading responses – Quote Technique Analysis

Food Technology - Tier 2 and Tier 3 language

SPRING 1: FOOD TECHNOLOGY: Microorganisms

Type	Keyword	Definition
Tier 2 language	Microorganism	A microscopic organism, especially a bacterium, virus, or fungus.
	Pathogens	Microorganism (eg bacteria, virus) that can cause disease
	Bacteria	A group of single-celled organisms with a cell wall but no organelles (structure in a cell with a specific function
	Nausea	A feeling of sickness with an inclination to vomit.
	Deterioration	The process of becoming progressively worse
Tier 3 language	Salmonella	A bacteria that occurs mainly in the gut, especially linked to poultry and eggs causing food poisoning.
	Campylobacter	This foodborne illness starts after someone eats or drinks something that has Campylobacter bacteria the bacteria linked to meat and poultry.
	The enzyme Rennet	Rennet, an enzyme found in a calf's stomach, is added to milk, causing the milk protein casein to coagulate into a semisolid substance called curd used for making cheese.
	Fermentation of yeast	The process by which yeast produces carbon dioxide and alcohol when it has all the right conditions.
	Critical temperature zone	Temperature range of 5-63°C in which harmful microorganisms can grow and which must be avoided as much as possible during food-storage

SPRING 2: FOOD TECHNOLOGY: Nutrients

Type	Keyword	Definition
Tier 2 language	Essential	Extremely important.
	Nutrition	The process of providing or obtaining the food necessary for health and growth.
	Carotene	An orange or red plant pigment.
	Function	The purpose of something.
	Deficiency	A lack or shortage of something such as calcium.
Tier 3 language	Macro/Micro-Nutrients	Macro large amounts/Micro small amounts: nourishing substance required for maintaining growth and good health in living things
	Osteoporosis	A health condition that weakens bones, making them fragile and more likely to break. (A lack of calcium and vitamin D)
	Soluble	(of a substance) such as some vitamins which are able to be dissolved, especially in water
	Fortification	The process of adding nutrients to food
	Omega 3	polyunsaturated fatty acid with its final double-bond 3 carbon atoms away from the end of the carbon chain

Food Technology - Tier 2 and Tier 3 language

Type		Keyword	Definition
SPRING 1: FOOD TECHNOLOGY: Microorganisms	Tier 2 language	Structure	construct or arrange according to a plan
		Coagulate	change to a solid or semi-solid state.
		Convection	The movement caused within a fluid by the tendency of hotter and therefore less dense material to rise, and colder, denser material to sink under the influence of gravity, which consequently results in transfer of heat
		Conduction	The process by which heat energy is transmitted through collisions between neighbouring atoms or molecules.
		Radiation	Energy that comes from a source and travels through space and may be able to penetrate various materials.
	Tier 3 language	Dextrinization	Occurs when starch is toasted or cooked by dry heat. It is a result of starch breakdown by dry heat to form dextrin.
		Gluten in food	Refers to the proteins in cereal grains, such as wheat, barley and rye.
		Emulsifying agent	Is a food item such as egg yolk used in mayonnaise performs the function of allowing the fat such as oils to be dispersed into a water based liquid to stop the fat from separating.
		Protein Denaturation	When its normal shape gets unravelled because some of the hydrogen bonds are broken. Weak hydrogen bonds break when too much heat is applied or when they are exposed to an acid (like citric acid from lemon juice).
		Elasticity of flour	Wheat and other related grains (including barley and rye) contain a mixture of two proteins glutenin and gliadin which when combined forms gluten to make some doughs very stretchy (e.g. Strong bread flour has a high elasticity so will stretch more than cake flour.

59

Geography - Tier 2 and Tier 3 language

Type		Keyword	Definition
SPRING 1: GEOGRAPHY: Globalisation	Tier 2 language	Interdependence	The ability for countries/companies to rely on each other for products or materials
		Import	Something that is bought into the country for money
		Export	Something that is sold into the country for money
		Raw-material	Something that is natural and in its unprocessed form. E.g. wood before it is made into paper or furniture or diamonds/gold nuggets before they are made into jewellery
		Manufacturing	The process of turning the raw materials into the final product e.g. a paper mill will turn wood in to paper. Car factory will assemble car parts into a car.
	Tier 3 language	Globalisation	The process of the world becoming more interconnected e.g. via people moving, communication, imports and exports.
		Infrastructure	The structures needed for society to function e.g. roads, cables for phones, pipes, buildings
		Biodiversity	The mix and amount of plants and animals living in an area. The rainforest has a high biodiversity.
		Trans-national company	A company that works over many different countries e.g. A head quarters in the UK, call centre in India, factory in China, shops in USA
		Sustainability	Something that meets the needs of the present people, without damaging the environment for the future generations

Type		Keyword	Definition
SPRING 2: GEOGRAPHY: Human Disaster	Tier 2 language	Disaster	A catastrophic event
		Human-made	Something that is caused by people, it is not natural
		Oil (oil rig and oil spill)	A raw material (see above) that is pumped up from under ground. (Oil is then used to make other products like petrol and plastics)
		Global warming	The process of the earth getting warmer as heat is trapped in the atmosphere by greenhouse gases (see below)
		Climate change	The process of the world's climate (average weather) changing owing to global warming. E.g. the UK is experiencing drier summers than normal
	Tier 3 language	Pesticides	A chemical used to kill insects (pests) on plants
		Green house gases	Gasses trap heat into the earth's atmosphere
		Methane	A greenhouse gas that is produced from landfill sites and agriculture. It is seven times worse that carbon dioxide (it traps in 7x more heat into the earth!)
		Delta	a wetland area, where the land meets the sea, its made as the river has deposited material (rocks, soil) there over many years.
		Atolls	a ring-shaped coral reef. An atoll surrounds a body of water called a lagoon.

History - Tier 2 and Tier 3 language

Type		Keyword	Definition
SPRING 1: HISTORY: Industrial Revolution	Tier 2 language	Summarise	Give a brief statement of the main points of something.
		Significant	Important of attention.
		Conditions	The circumstances or factors affecting the way in which people live or work.
		Exaggerating	Represent something as being larger, better or worse than it really is.
		Extract	Remove or take out.
	Tier 3 language	Industrial Revolution	The name given to the time period between 1750 and 1900 where the way people lived, worked and produced goods changed dramatically.
		Overseer	A person who supervises others, especially workers.
		Victorian Britain	The Period of Queen Victoria's reign.
		Cholera	An infectious and often fatal bacterial disease of the small intestine.
		Campaign	An organised course of action to achieve a goal.

Type		Keyword	Definition
SPRING 2: HISTORY	Tier 2 language	Dissatisfied	Not content or happy with something.
		Reform	Make changes in order to improve it.
		Radical	A person who advocates political or social change.
		Climax	The most important part of something.
		Reluctant	Unwilling and hesitant.
	Tier 3 language	Electoral	Relating to electors or elections.
		Patriotic	Expressing support for a country or nation.
		Suffragette	A woman seeking the right to vote through organised protest.
		Massacre	A brutal slaughter of many people.
		Yeomanry	A volunteer cavalry force.

Maths - Tier 2 and Tier 3 language

Type		Keyword	Definition
SPRING 1: MATHS	Tier 2 language	Frequency	How often something happens.
		Calculate	Work out mathematically.
		Solve	To find a solution.
		Substitute	Putting values where the letters are.
		Equivalent	Of equal value.
	Tier 3 language	Proportion	The mathematical comparison between two numbers.
		Coefficient	An integer that is multiplied with the variable.
		Inverse	The opposite of another operation.
		Vertex	The vertices of a solid figure are points where the edges connect and create a corner
		Bar model	A pictorial representation of a problem or concept where bars or boxes are used to represent the known and unknown quantities.

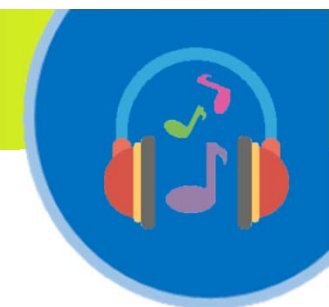| Type		Keyword	Definition
SPRING 2: MATHS	Tier 2 language	Transformation	A general term for four specific ways to manipulate the shape and/or position of a point, a line, or geometric figure.
		Rounding	The process of putting a number up or down to the nearest whole number or the nearest hundred, thousand, etc
		Reverse	Work backwards.
		Root	A square root of a number is a value that, when multiplied by itself, gives the number. Example: $4 \times 4 = 16$, so a square root of 16 is 4.
		Angle	The amount of turn between two lines around their common point (the vertex).
	Tier 3 language	Integer	A whole number.
		Indices	An index, or power, is the small floating number that appears after a number or letter. Indices show how many times a number or letter has been multiplied by itself.
		Multiplier	The number that you are multiplying by (often used for percentages).
		Significant figure	The number of digits that are meaningful: they have an accuracy matching our measurements, or are simply all we need.
		Standard form	A way of representing very big or very small numbers using powers of 10.

MFL - Tier 2 and Tier 3 language

Type		Keyword	Definition
SPRING : MFL	Tier 2 language	Present Tense	a tense expressing an action that is currently going on or habitually performed
		Conjugation	the variation of the form of a verb in a language to show the tense, number, and person doing the action.
		Adjectival agreement	the adjective 'agrees' with the noun it's describing in gender and number.
		Intensifier / quantifier	to give force or emphasis, for example *really* in *my feet are really cold*.
		Metacognition	awareness and understanding of one's own thought processes.
	Tier 3 language	SHET (Sp)	**S**on – (they) are **H**ay - (there is/ there are) **E**s ((it) is **T**iene) (it) has)
		IESAO (Fr)	**i**l y a - there is **E**st -is **S**ont -(They) are **A** - (he/she/it) has **O**nt – (they) have
		WWWWW	**W**ho **W**hat **W**here **W**hen **W**hy
		AVOW	**A**djective **V**erb **O**rder of **W**ords
		TOPCAT	**T**enses **O**pinions **P**ronoun phrases **C**onnectives **A**djectives **T**ranslate

Type		Keyword	Definition
SUMMER: MFL	Tier 2 language	Future tense	a tense expressing an action that has not yet happened or a state that does not yet exist.
		conjugation	the variation of the form of a verb in a language to show the tense, number, and person doing the action.
		Adjectival agreement	the adjective 'agrees' with the noun it's describing in gender and number.
		Subject pronoun / direct pronoun	a **subject pronoun** is a personal pronoun that is used as the subject of a verb. **Direct object pronouns** stand in for nouns when it is clear who or what is being talked about, and save having to repeat the noun.
		adverb	An adverb is a word or an expression that modifies a verb, adjective, another adverb, determiner, clause, preposition, or sentence
	Tier 3 language	SHET (Sp)	**S**on – (they) are **H**ay - (there is/ there are) **E**s ((it) is **T**iene) (it) has)
		IESAO (Fr)	**i**l y a - there is **E**st -is **S**ont -(They) are **A** - (he/she/it) has **O**nt – (they) have
		WWWWW	**W**ho **W**hat **W**here **W**hen **W**hy
		AVOW	**A**djective **V**erb **O**rder of **W**ords
		PALM	**P**eople **A**ction **L**ocation **M**ood

63

Music - Tier 2 and Tier 3 language

Type	Keyword	Definition
Tier 2 language	Movement	One section (one piece of music) of a Symphonic Suite
	Texture	The layering of sounds to make thin or thick texture
	Themes	A short and simple tune repeated throughout a piece of music
	Structure	The way that a piece of music is organised from start to finish e.g. intro/verse/chorus/outro
Tier 3 language	Percussion	A collection of instruments that you hit, scrape and shake in order to get a sound out of them e.g. tambourine, drum, glockenspiel
	Orchestra	A group of instrumentalists, especially one combining string, woodwind, brass, and percussion sections
	Instrumentation	The particular instruments used in a piece of music
	Composer	A person who writes/ makes the music
	Symphonic Suite	A collection of music, usually created for an orchestra
	Crescendo	Gradually getting louder

Colour code: BLUE= Tier 3 words   ORANGE= Tier 2 words   Look out for colour coding during lessons!

64

Religion and Ethics - Tier 2 and Tier 3 language

Type		Keyword	Definition
SPRING 1: RE	Tier 2 language	Humble	To be shy and quiet and not show off
		Corrupt	To abuse power
		Defile	To damage and disrespect an object
		Scripture	Books which contain holy writings dedicated to God
		Persecute	To hurt or kill someone because of their identity who the group they belong to
	Tier 3 language	Messiah/Christ	King or Saviour. Messiah is the Hebrew. Christ is Greek.
		Blasphemy	To claim to be God or insult God. A religious crime
		Pharisee	Jewish leaders who ruled at the time of Jesus 2000 years ago
		Disciple	Jesus' 12 recruits who helped him spread his message
		Prophecy/Prophesied	A religious prediction of the future and written down in holy books (scripture)/ to predict the future

Type		Keyword	Definition
SPRING 2: RE	Tier 2 language	Sombre	A sad feeling or mood
		Sacrificial	To give something up that is important to you
		Imposter	Someone who is pretending to be who they say they are
		Betray	To hand someone over to the authorities who you have been friends with
		Retaliate	To fight back or to get revenge
	Tier 3 language	Messianic Secret	The Christian theory that Jesus kept his identity as the Messiah a secret and only showed it through actions.
		Crucifixion	Method of execution of Jesus. He was nailed to a cross shape through his hands and feet and left to die
		Resurrection	The Christian belief that Jesus rose from the dead
		Saviour	To save. Christians believe Jesus saved humans so they can resurrect to Heaven
		Heaven	A reward for people when they die. An existence where there is no suffering and where the human soul goes to upon death

Science - Tier 2 and Tier 3 language

	Type	Keyword	Definition
SPRING 1: SCIENCE: Topic Respiration, Combustion, Unicellular organisms	Tier 2 language	Diffusion	Movement of particles from a high concentration to a low concentration
		Respiration	Chemical reaction that takes place in the mitochondria; glucose + oxygen → carbon dioxide + water + energy
		Population	The number of a certain organism found in a certain area
		Cells	The fundamental unit of life. All organisms are made up of cells
		Fuel	A chemical substance from which stored energy can be transferred usefully to make things happen.
	Tier 3 language	Anaerobic Respiration	Chemical reaction that takes place in the cytoplasm in the absence of oxygen; glucose → Lactic acid + (less) energy
		Stomata	Tiny holes in a leaf that allow gas exchange
		Prokaryotes	Unicellular organisms that have no nucleus in their cells
		Fermentation	Anaerobic respiration in microorganisms; Glucose → carbon dioxide + water
		Exothermic	Reactions that release energy to the surroundings (make the surroundings hotter)

	Type	Keyword	Definition
SPRING 2: SCIENCE: Metals and their Uses, Light, Earth and Space	Tier 2 language	Corrosion	The reaction at a metal's surface with oxygen.
		Malleable	Able to be hammered or pressed into shape without breaking or cracking. Metals are malleable.
		Source	Where a sound wave or other wave begins
		Translucent	A material that lets light through but scatters it. You cannot see things clearly through translucent materials.
		Weight	The force acting on an object due to gravity. Weight (kg) = mass (N) x gravitational field strength (N/kg).
	Tier 3 language	Oxidation	Reactions in which an element combines with oxygen.
		Catalyst	A substance that increases the rate of a chemical reaction without being used up in the process.
		Dispersion	The separation of white light into colours of the light spectrum.
		Cornea	The clearly outer layer at the front of the eye, which helps your eye focus light.
		Eclipse	The total or partial obscuring of an object in space.