



# KNOWLEDGE ORGANISER

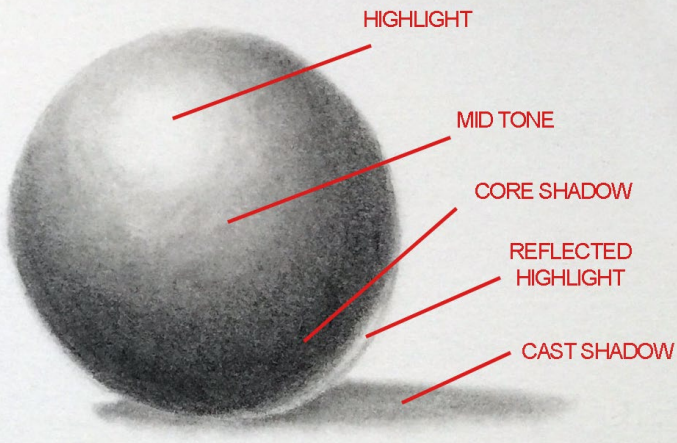
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NAME & FORM

YEAR 8  
AUTUMN TERM



<b>Art</b>	<b>3 – 4</b>
<b>Drama</b>	<b>5 – 5</b>
<b>Music</b>	<b>6 – 7</b>
<b>English</b>	<b>8 – 11</b>
<b>Geography</b>	<b>12 – 13</b>
<b>History</b>	<b>14 – 16</b>
<b>RE</b>	<b>17 – 18</b>
<b>Maths</b>	<b>19 – 25</b>
<b>Spanish</b>	<b>26 – 28</b>
<b>Science</b>	<b>29 – 37</b>
<b>Computer Science</b>	<b>38 – 42</b>
<b>Design Technology</b>	<b>43 – 47</b>
<b>Food Technology</b>	<b>48 - 52</b>
<b>Satchel:one Log In Guide</b>	<b>53 - 54</b>



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

Mark making- Blending- Rendering- Shadow- Highlight- Tone- Shape- Form- Line- Detail- Texture- Directional lines- Font- Accuracy- Proportion

## Observational drawings Year 8 Autumn term

Pencil shading gradient



WWW: A range of tones shown, and the shadow has been drawn.

EBI: Use directional lines to show the shape

20%-50%



WWW: The attention to detail is excellent and the font is accurate.

EBI: Apply more pressure to create darker tones

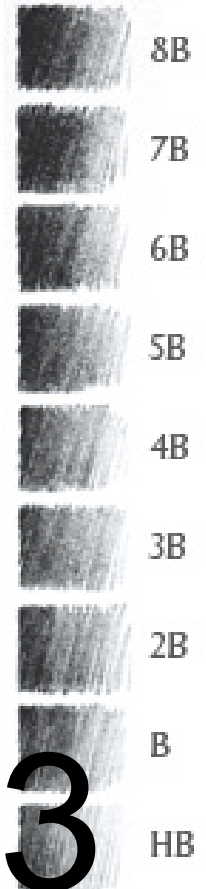
50%-80%



WWW: A highly accurate and proportionate study showing a range of tones.

EBI: The shading could be blended so there are no visible lines

80%-100%



## KEY WORDS AND MEANINGS:

Mark Making	Mark making describes the different lines, dots, marks, patterns, and textures we create in an artwork.
Rendering	Rendering is the process of creating the effects of light, shade and light source to achieve contrast in drawings.
Stippling	Overlapping lots of dots to create tone.
Directional lines	Lines that direct your eye around the drawn subject to emulate a 3D form.
Hatching	A shading technique which uses a series of thin, parallel lines that give the appearance of shadow in varying degrees.
Tone	How light or dark something is. Tones could refer to black, white and the grey tones in between. It could also refer to how light or dark a colour appears.
Shape	A flat, enclosed area of an artwork created through lines, textures, colours or an area enclosed by other shapes.
Form	Form refers to objects that are 3-Dimensional, or have length, width, and height.
Highlight	The lightest part or one of the lightest parts of a painting, drawing, etc.
Shadow	A dark area where light from a light source is blocked by an opaque object.

Colour code: BLUE= Tier 3 words

ORANGE= Tier 2 words

Look out for colour coding during lessons!

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# Drama Knowledge Organiser



## 'Crime & Punishment'

### Crime and Punishment

- The **perpetrator** of the crime is the name for the person who has committed a crime.
- The **victim** is the name for the person who has been harmed, injured or killed as a result of a crime.

### Drama Techniques!

A **flashback** takes the narrative of the Drama back in time.

A **flashforward** takes the narrative of the piece of Drama forward to the future. Both techniques can be used to create tension.

A **thought-track** is when a character speaks out loud to the audience about their thoughts and feelings.



### Performance Terminology

<b>Levels</b>	Using different heights or levels in a scene to create meaning. E.g. a low status character may sit on the floor.
<b>Proxemics</b>	Using the space between each character to create meaning.
<b>Gait</b>	The way the character moves. This could show their age or how they're feeling.
<b>Accent</b>	The way in which people from a specific country or area pronounce different words.
<b>Monologue</b>	A long speech said by only one actor.

## Keywords:

Learn the 10 spellings below:

- 1.) Perpetrator
- 2.) Victim
- 3.) Punishment
- 4.) Flashback
- 5.) Flashforward
- 6.) Levels
- 7.) Proxemics
- 8.) Gait
- 9.) Accent
- 10.) Monologue



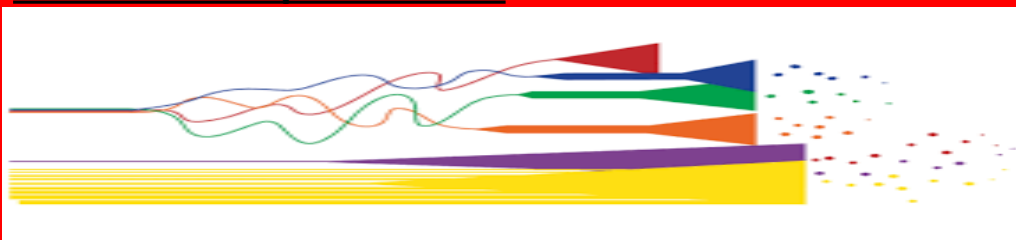




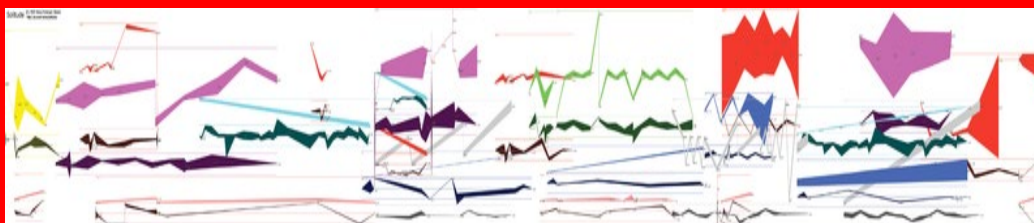
## KEY WORDS – test yourself! (definitions on the next page)

Soundscape	Graphic Score	Acoustic Environment	Musical Experimentation	Foley Technique
Pitch	Duration	Structure	Texture	Tone
				Dynamics
				Post-production

### What is a Graphic Score?



**Graphic notation** (or **graphic score**) is the representation of music through the use of visual symbols. Composers often rely on graphic notation in experimental music, where standard musical notation can be ineffective. Graphic notation relies heavily on the imagination to interpret the visual content. Because of this the pieces usually vary from performer to performer. Graphic notation can show effective use of **PITCH, DURATION, STRUCTURE, TEXTURE, TONE** and **DYNAMICS**.



### The Foley Method:

In filmmaking, **Foley** is the reproduction of everyday sound effects that are added to films, videos, and other media in post-production (after the film has been made) to enhance audio quality. These reproduced sounds, named after sound-effects artist Jack Foley, can be anything from the swishing of clothing and footsteps to squeaky doors and breaking glass. Foley sounds are used to enhance the auditory experience of the movie. Foley can also be used to cover up unwanted sounds captured on the set of a movie during filming, such as overflying airplanes or passing traffic.



### Interesting examples for you to look at:

Create a Live Soundscape to a Story (Mr McGee)

<https://vimeo.com/360684227>

The Magic of Making Sound -

[https://www.youtube.com/watch?v=UO3N\\_PRIgX0](https://www.youtube.com/watch?v=UO3N_PRIgX0)

Where the Sounds From the World's Favourite Movies Are Born

<https://www.youtube.com/watch?v=5GPeFDCZ1EE>

Kathy Berberian's 'Stripsody'

<https://www.youtube.com/watch?v=3dNVAhL46xM>

## Year 8 Autumn Term

### What is a Soundscape?

Soundscapes are when we use sound and **music** to create the atmosphere of a story being told. These sounds can be background noises, body/vocal percussion, electronic sound effects, or **musical** instruments that sound like what is happening (e.g. using a maraca or tapping on our teeth to sound like rain).



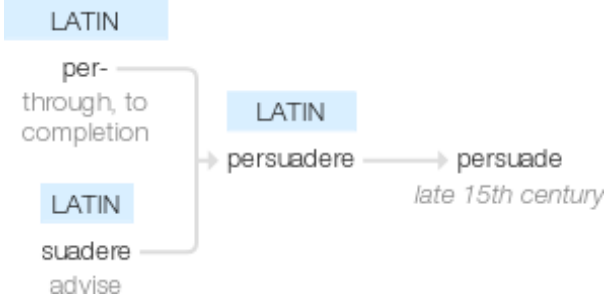
## KEY WORDS AND MEANINGS:

<b>Soundscape</b>	Music used to represent the impression of something (telling a story). This can be through the use of instruments, voice, electronic or natural sounds.
<b>Graphic Score</b>	A representation of sounds using symbols.
<b>Acoustic Environment</b>	An <b>acoustic environment</b> provides the framework of a sound picture e.g. the sounds of street life through an open window during the daytime or sounds of nature (birdsong, flowing water).
<b>Musical experimentation</b>	Trying several different combinations of sound before using the best version.
<b>Foley technique</b>	Using everyday objects to replicate sounds for film or radio – pioneered by Jack Foley.
<b>Pitch</b>	How high/low sounds are – changes can be sudden or gradual.
<b>Duration</b>	How long/ short sounds are.
<b>Structure</b>	How the music is organised from start to finish (e.g. verse-chorus song structure).
<b>Texture</b>	How many layers of sound are present (thick/ thin texture).
<b>Tone</b>	The sound quality – scratchy, smooth, mellow, thundering.
<b>Dynamics</b>	The volume – changes can be sudden or gradual.
<b>Post-production</b>	Something added to a film after it has been completed.





**Persuade**- To make somebody want to do something through reasoning/argument.



### Key features of Persuasive Writing:

**Ethos:** Our arguments should appeal to human ethics, i.e. they should depend on credibility and expertise as persuasive techniques.

*E.g. As an award-winning dentist, I see this problem a lot. So, I highly recommend using sensitive toothpaste.*

**Logos:** Our arguments should appeal to human logic, i.e. they should depend on facts and statistics to persuade the audience.

*E.g. People who eat a small bar of chocolate per day are 73% happier than those who don't. So, we should all eat chocolate every day!*

**Pathos:** Our arguments should appeal to human emotion, i.e. they should create an emotional response to an impassioned plea to convince the audience.

*E.g. If you don't adopt the puppy, he may never find a home and will be left alone!*

### Writing to Persuade

In this unit, we will be learning about how to persuade someone to agree with our point of view. As our end of unit assessment, we will be completing a persuasive writing piece which argues our own opinion on a topic we are given.

We should be aiming to not only include persuasive techniques, such as the DAFOREST techniques on the next page of your Knowledge Organiser, but also our usual techniques for effective creative writing such as: a range of punctuation, ambitious vocabulary, accurate and effective paragraphing and accurate spelling.

### Possible Persuasive Writing Sentence Starters:

*Firstly, it can be argued...*

*I firmly believe that...*

*It must be agreed...*

*Most people would agree that...*

*Only a fool would think that...*

*Secondly, it is true that...*

*A sensible idea would be to...*

*Doesn't everybody know that...?*

*The REAL truth is that...*

*Surely you would agree that...*

*Lastly, and most importantly...*

### WAGOLL- Wasps should be banned!

Join me to **banish wayward, wicked wasps** from our world! **Worthless wasps, with their stabbing stings, are aggressive, agonising and excruciating.**

**Who wants to feel their pernicious pain?**

In a recent study by Professor Benjamin E. Emms, it was revealed that **87% of people agreed with me that Wasps are the most egregious insects ever to have graced our planet. At least 3 in 5 people have had a harrowing experience with a wasp which caused them great sorrow and pain. Surely you don't want to see someone weeping due to wasps?**

So join me to **banish them now, banish them from here, banish them for eternity!**



# English Knowledge Organiser



## Word Classes

- Noun**- A person, place or thing, e.g. *class, teacher, canteen.*
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## Punctuation Reminder

- Commas ,**- Separate clauses or indicate a pause.
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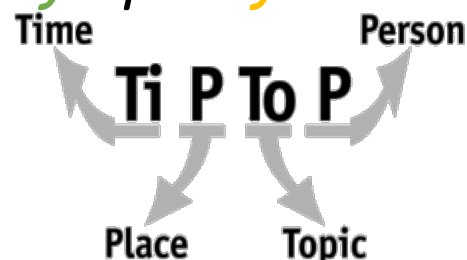
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- Simile**- A phrase comparing one thing to another, using *as* or *like*, e.g. *He was as stealthy as a ninja.*
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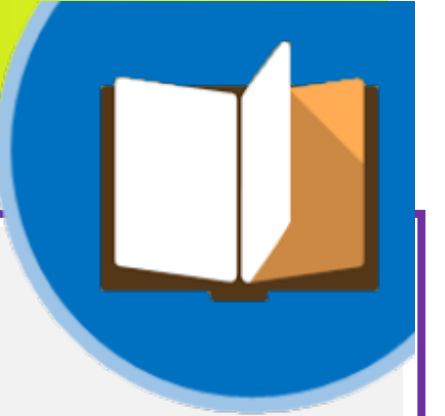
## Paragraphing Reminder



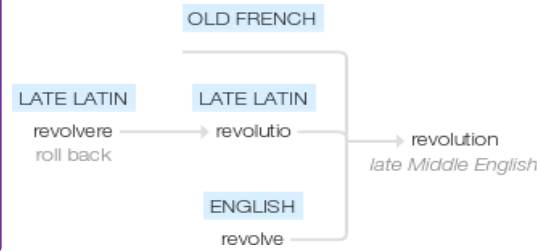
## Key Vocabulary- Persuasive Writing

- Opinion**- Your own personal view or judgement of something or someone.
- Perspective**- An attitude towards/way of looking at something; a point of view.
- Argue**- Give reasons/evidence in support of an idea or theory, with the aim of persuading others to share your view.
- Controversial**- Something which is disputed by different people.
- Non-Fiction**- Informative, persuasive or factual writing.





**Revolution-** a forcible overthrow of a government, in favour of a new system.



### QTA Sentence Starters:

**QUOTE:** Orwell presents... for example/this can be seen in ‘...’

A quote to support this is ‘...’

**TECHNIQUE:** Through the use of ... the reader is able to...

Orwell uses the *(persuasive technique)* to...

**ANALYSIS:** This suggests/this shows...

*(A+)* It could also suggest that...

Particularly, the word \_\_\_\_\_ could highlight...

The reader may think/feel... because...

**AO3 (context)/THE WRITER:** Orwell used the character/idea/example to highlight...

Orwell was clearly trying to show that he felt...

Animal Farm is an allegory for... which...

### Key Characters:

Name	Picture	Character
<b>Old Major</b>		The oldest <b>pig</b> on the farm who inspires the animals to rebel. This character is based on <b>Karl Marx</b> and <b>Vladimir Lenin</b> .
<b>Napoleon</b>		A large violent <b>pig</b> who helps lead the rebellion and then seizes power. This character is based on <b>Joseph Stalin</b> .
<b>Snowball</b>		A clever <b>pig</b> who helps lead the rebellion and creates Animalism. A rival of Napoleon. This character is based on <b>Trotsky</b> .
<b>Squealer</b>		Napoleon's public speaker, this <b>pig</b> persuades other animals to support Napoleon, no matter how bad his rule is. He represents <b>the propaganda used during Stalin's rule of the Soviet Union</b> .
<b>Boxer</b>		A loyal and dedicated <b>carthorse</b> . He is the strongest worker among the animals. He represents <b>ordinary, hardworking Russian people (the proletariat)</b> .
<b>Clover</b>		A kind and caring <b>horse</b> who is close friends with Benjamin and Boxer. She also represents the <b>ordinary Russian people</b> .
<b>Benjamin</b>		A bitter, clever and sarcastic <b>donkey</b> who is good friends with Boxer. He represents the <b>very intelligent, professional people in Russia who did not push back against Communism or Stalin</b> .
<b>Mollie</b>		A spoiled white <b>pony</b> who only cares about pretty ribbons and sugar lumps. She represents the <b>comfortable middle-class people of Russia who were not willing to sacrifice their luxuries to fight back against Stalin and Communism</b> .
<b>Mr Jones</b>		The drunken, cruel <b>farmer</b> of Manor Farm. He is overthrown and kicked off the farm in the rebellion in Chapter 2. He is based on <b>Tsar Nicholas II</b> .
<b>Mr Pilkington &amp; Fredrick</b>		Neighbouring <b>farmers</b> who often change between allies and enemies throughout the story. They represent the <b>USA and Germany</b> .

### WAGOLL- How does Orwell present Squealer in Chapter 9?

Orwell presents Squealer in Chapter 9 as manipulative. This can be seen when he asks the animals “surely, they knew their beloved Leader, Comrade Napoleon, better than that?”. Through the use of rhetorical questions, Squealer is shown to manipulate the other animals and the reader is able to understand that he has been sent by Napoleon to convince them that he is a good leader and not a vicious dictator. This suggests that the other animals are being made to feel bad for ever questioning Napoleon because it makes them seem guilty and disloyal to their ‘comrade’, as if they are not working together for the good of the farm and to fight Jones. This then makes them more obedient; they don’t want to be accused of disloyalty in the future. Particularly, the adjective ‘beloved’ encourages them to think of Napoleon positively, reminding them of how they used to feel towards him when he was helping lead the rebellion. The reader may feel angry towards Squealer because the other animals are actually right and Napoleon is a cruel, evil dictator who has killed other animals, but Squealer is manipulating them, exploiting the fact that they are not intelligent enough to question him. Orwell has used this idea to make us feel anxious and sad for the animals as they are vulnerable and being manipulated, just like the Russian people were manipulated by Stalin and the government in the Russian Revolution, which Animal Farm was written as an allegory for in order to convey Orwell’s criticism of Communism.



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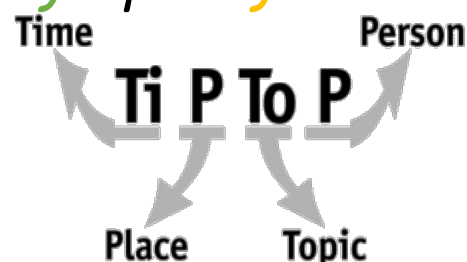
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## Paragraphing Reminder



## Key Vocabulary- Animal Farm

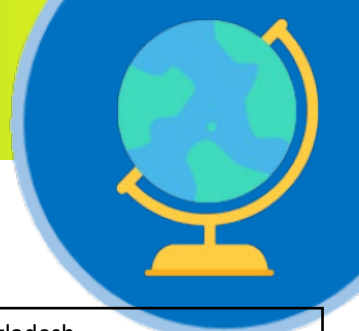
- Revolution**- a forcible overthrow of a government, in favour of a new system.
- Fable**- a short story, typically with animals as characters, conveying a moral.
- Anthropomorphism**- Making animals act like humans, e.g. talking and emoting.
- Allegory**- a story with a hidden meaning, typically a moral or political one.
- Dictator**- a ruler with total power over a country, usually one who has obtained control by force, violence or cruelty.







# Geography Knowledge Organiser: Topic 2 – Economic Activity and Globalisation



## Sectors of the Economy

**Primary Sector** – the collection of raw materials e.g. mining and farming.



**Secondary Sector** – the processing of manufactured goods e.g. oil refining, car manufacturing.



**Tertiary Sector** – the services sector e.g. medical care, retail, tourism.



**Quaternary Sector** – industries providing knowledge or information services e.g. consultancy, medical research.

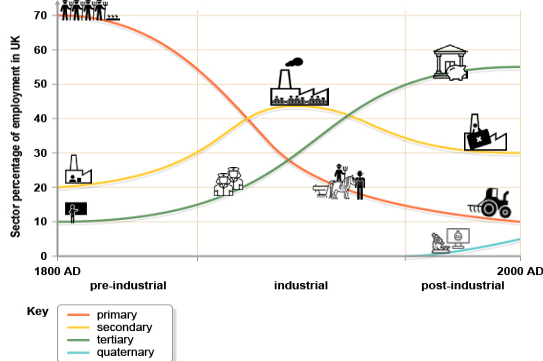


## Deindustrialisation

Deindustrialisation is the decline of manufacturing industries in a country. Many of our manufactured goods are made abroad in NEEs. This is because the labour costs are lower, which lowers costs. The use of machines means fewer people are needed to work in factories.



## Geographical Skill: Analysing Graphs



- Describe the overall trends shown in the graph.
- Include specific facts e.g. dates or amounts.
- Explain why these trends have happened over time.

## Case Study: Salford Quays

Manchester Docks was one of the world's biggest industrial ports. They were in operation from 1894, fuelling the secondary industries and cotton trade in the north west.



As secondary industries declined, so did the docks. They closed in 1982.

The growth of tertiary and quaternary industries led to their revival, and old buildings were demolished or regenerated into what is now Salford Quays and Media City, home to theatres, TV studios, shopping centres and museums.



## Industrial Accidents in Bangladesh

Bangladesh has a poor record of industrial accidents. In the past people have died due to factory fires with workers trapped inside, and factories collapsing while people worked. Thousands of people have died as a result of these incidents.

The main reasons they are so common in Bangladesh is due to:

- Corruption, where health and safety officials are 'paid-off' so as not to report any malpractice
- The rapid pace of industrialisation in Bangladesh, so factories are built quickly and are not secure enough.
- Lax enforcement as officials are not checking all buildings thoroughly enough due to lack of resources.

TNCs are quick to deny any wrong-doing, because they do not directly own the factories, but the products being made do go on to be sold by these big international companies.

## Year 8 Geography Key Literacy Skill: Writing to Explain

- Point - give the main argument you want to make e.g. 'topical storms have social impacts.'
- Evidence / example - give a fact or figure that supports the point you have made e.g. 'Typhoon Rai killed 407 people.'
- Explain - go into depth about why this is significant. Aim to give multiple reasons, or extend reasons further e.g. 'once people are dead, they are gone forever and it means families are left without loved ones, which is traumatising, especially when it has happened in such a painful way. It could mean young people are left without parents who may have been the main breadwinner, leading to no income for the family, putting a burden on young people to go out to work rather than attending school.'

## Key Terms

- deindustrialisation - a process of economic change caused by the reduction of manufacturing industries (factory work) in a country or region e.g. the main cause of deindustrialisation in the UK was the ability to make goods cheaper overseas.
- globalisation - The way in which the world has become more interconnected. It refers to how people communicate as well as world trade, international investment and the sharing of ideas e.g. globalisation has increased rapidly now that the internet is common on people's phones.
- TNC (transnational corporation) - a multinational company that is controlled in the home country but has operations (e.g. factories, offices, shops) in other countries of the world e.g. Nike is one of the largest TNCs in the world and is recognised globally.
- trade - the buying and selling of goods and services e.g. the UK trades with countries around the world, including the USA, India and EU countries.

## Transnational Corporations

TNCs are large companies that operate around the world. They may have head offices, factories and shops in countries all over the world. They are widely recognised and generate high profits.



### Positive impacts

- Create a lot of jobs when they open factories in NEEs.
- Increase a country's GNI, which can improve a country's overall development.

### Negative impacts

- Many of the jobs created are very low paid and workers suffer in poor working conditions.
- The companies take little responsibility for the environmental damage they create.



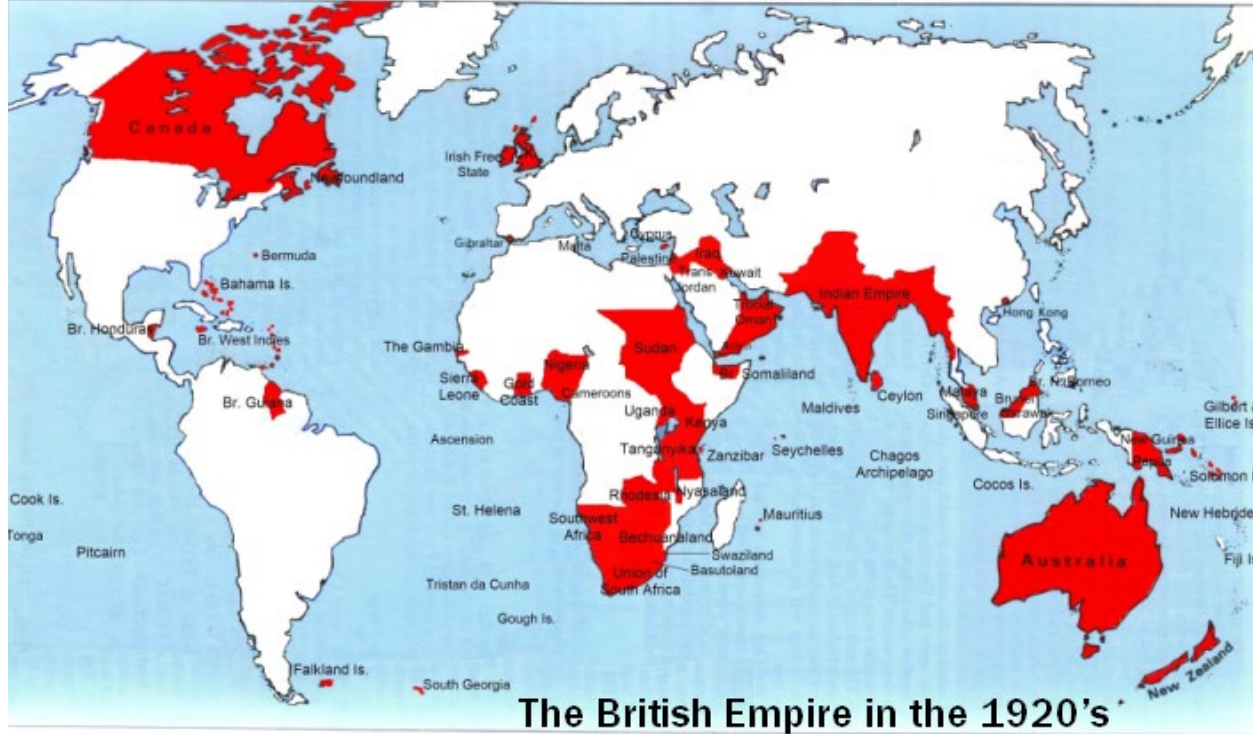
# History Knowledge Organiser



## Topic 1: The British Empire

### Why did the British want an empire:

- Take control of new resources (e.g. gold in Africa and South America, spices in Asia)
- Spread the Christian faith
- Compete with other empires (e.g. France, Spain)





The British Empire in the 1920's

### How did it benefit the British:

- New businesses made overseas.
- Thousands of jobs were created.
- New resources made Britain wealthy.
- Colonies in Africa and America allowed us to develop the slave trade which made Britain rich.
- Soldiers from the empire helped in wars (e.g. WW1).

### How did it change India:

Positive 	Negative 
<ul style="list-style-type: none"> <li>- The British invested around £400 million into India whilst they ruled.</li> <li>- British abolished sati (tradition where widows were burned alive).</li> <li>- Railways, roads and hospitals built in India.</li> </ul>	<ul style="list-style-type: none"> <li>- The <b>Amritsar Massacre</b> commanded by General Dyer led to hundreds of deaths.</li> <li>- Cash crops were grown which caused famine.</li> <li>- Religious groups were mistreated by British.</li> </ul>

### How did the British achieve such a large empire:

- It's army and navy overwhelmed the native population through new technology and clever tactics.
- Trade companies (such as the East India Company) were paid to explore and conquer new lands.
- Success in certain wars (e.g. Seven Years War) allowed us to take a lot of land in a short period of time.

### What countries were included in the British Empire:

A total of 70+ countries were in the empire at its height. Four examples include:

Australia (1770-1942)



Hong Kong (1842-1997)



India (1858-1947)



Canada (1867-1982)



### History Key words:

Colony – a country that belongs to another country

mutiny – a rebellion against authority

independence – being free to rule yourself



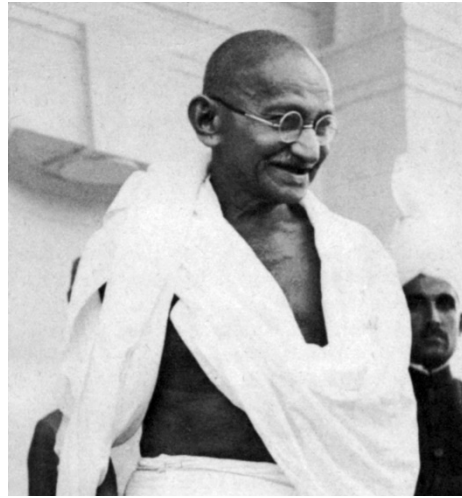
# History Knowledge Organiser



## Topic 1: The British Empire

### How did India achieve independence in 1947:

- Gandhi and other Indians protested peacefully for independence.
- Activities
- Indians had historically rebelled against British rule (e.g. Sepoy Mutiny).
- India had helped Britain win WW2.
- Controlling India became too costly for the British government.



### How did Hong Kong become a crown colony under the British Empire?:

- Hong Kong founded as crown colony of the British Empire in 1842.
- Leased to Britain in 1898 for 99 years.
- Occupied by the Japanese Empire between 1941-1945
- Returned to Chinese rule 1997

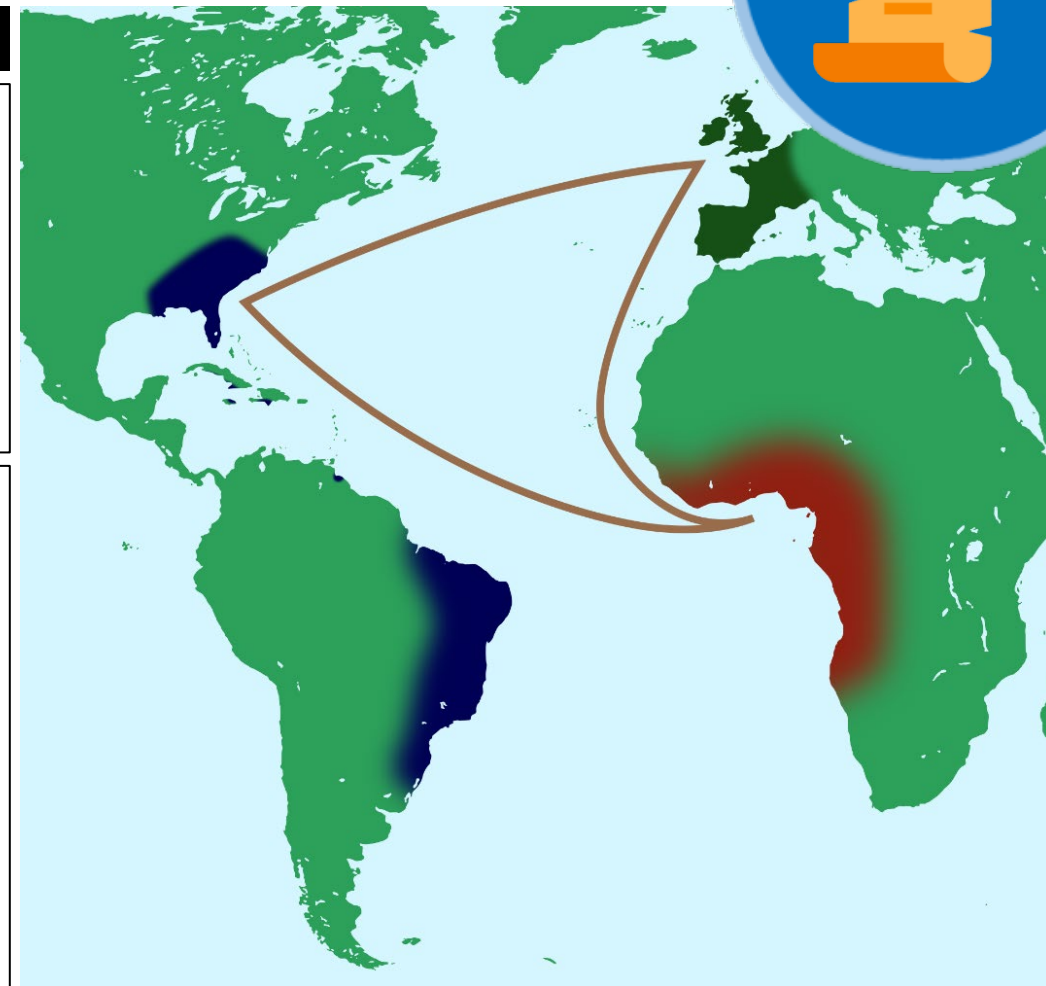
## Topic 2: Transatlantic Slavery

### What is slavery:

- Slavery is the act of using somebody to complete work without paying them a wage and they do not have their human rights
- Slavery began before the triangle trade. Egyptians and Romans used slaves.

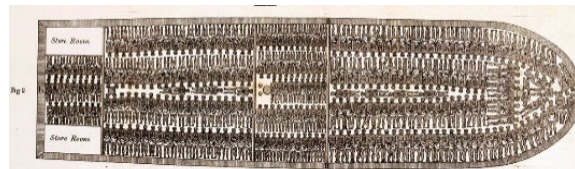
### What is the triangle trade:

- **EUROPE TO AFRICA:** Manufactured goods like textiles, rum and firearms were taken to be sold in Africa.
- **AFRICA TO AMERICAS:** African people were taken as slaves. This journey was called **the Middle Passage**.
- **AMERICAS TO EUROPE:** Farmed goods such as sugar, tobacco and cotton taken back to be used in factories etc.



### How did the Empire come to an end:

- Some countries fought for their independence and became their own nations (e.g. the British Thirteen Colonies became the USA).
- Countries who gave their service in the World Wars demanded the right to rule themselves.
- Countries protested for independence (e.g. Kenya, Nigeria, Gambia)

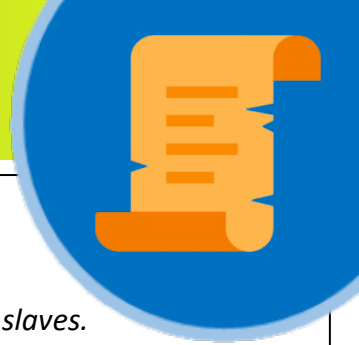


### What was life like on the Middle Passage:

- The journey took between 6-12 weeks to cross the Atlantic Ocean.
- Slaves remained tied down during the journey with limited space.
- Disease was incredibly common and they had to be thrown overboard.
- Some slaves would try to rebel and take over the slavers' ship.
- 10-15% of Africans did not survive the journey across the sea.



# History Knowledge Organiser



## Topic 2: Transatlantic Slavery

### What was Africa like before the Transatlantic Slave Trade:

- Rich African kingdoms such as Mali and Ghana existed before the arrival of white Europeans in Africa.
- Goods were traded between kingdoms such as gold, textiles and spices.
- Kingdoms had their own art and culture before the arrival of Europeans.
- Religion existed prior to colonisation. Islam and Christianity were worshipped alongside other religions that originated from Africa.
- Slavery did exist in Africa already as Africans captured in battle were sold to other African warlords.
- When European sailors arrived, warlords realized they could sell captive Africans to Europeans for more money and for firearms.

### What happened on arrival to the Americas:

- Africans were separated from their families and sold at auctions to slave owners. Slaves who did not sell were punished.
- Men were sold based on their strength and size for farm work.
- Women were sold to complete tasks either inside the house or in the plantation fields. Younger women were preferred to breed slaves.
- Children could also be sold and would not always go with their families.
- People looked out for rebellious slaves (Africans who had whip marks on them).

### What was life like on a plantation:

- Slaves could be expected to work from sunrise to sunset for their masters with zero breaks.
- Overseers watched over slaves and punished them for not working.
- Cotton, tobacco and sugar would be farmed all day.
- Slaves lived in small shelters close to the big house belonging to the master and the master's family.



### How did slavery end:

- Politicians in both Europe and the USA wanted to bring an end to slavery and campaigned for it to be abolished.
- Plantation owners found that slavery became less profitable in the 1800s as new machinery was available and it became expensive to stop slave rebellions.
- The American Civil War from 1861-65 was fought over the debate around slavery. Abraham Lincoln promised to free slaves after the war had been won by the Union side.
- Freed Africans still faced discrimination in the USA.



### How could slaves resist their masters:

- Passive resistance – working slow, pretending not to understand orders, singing songs, poisoning masters, stealing tools.
- Active resistance – murdering overseers or masters, arson of plantation property, running away to freedom in Northern states

### History Key words:

Plantation – a large farming estate where slaves worked

passive resistance – non-violently resisting authority

active resistance – using violence to challenge authority

# Religion and Ethics Knowledge Organiser



## Why is the belief in an afterlife important for some people?

Belief in an afterlife is important for both religious and non-religious people. Religiously, it brings **hope and meaning, providing comfort in difficult times** and reinforcing moral values.

For non-religious individuals, it symbolizes leaving a lasting impact, valuing relationships, and making the most of life. Overall, the belief in an **afterlife offers purpose, comfort, and motivation for living a fulfilling and ethical life.**



## Humanist belief about the afterlife

Humanists do not live their lives assuming an afterlife exists. **They prioritise living a meaningful and fulfilling life in the present rather than speculating about what happens after death.** Humanists will still honour people who have died by holding funerals but rather than having a service that speaks about the afterlife they will 'celebrate' the life of the person who has passed on.

## YEAR 8 - BIG QUESTION: IS DEATH THE END?

## What does resurrection mean?

Resurrection means to rise from the dead. The concept of resurrection holds deep meaning for both Christians and Muslims.

Christians believe that Jesus' resurrection demonstrates his victory over death. Some believe that they will have a **spiritual resurrection, where their souls will be reunited with God in Heaven.**

The belief in **bodily resurrection** is crucial in Islam as it represents the **Day of Judgment when all people will be held accountable for their actions.** Some Muslims believe that the soul and physical body will be reunited in the afterlife.



## Reincarnation

Dharmic faiths such as, Buddhism, Hinduism and Sikhism, believe in reincarnation, which means that after death, **the soul is reborn in a new body.** In Buddhism, this is influenced by a person's actions (karma), and the goal is to break free from the cycle (samsara) and **achieve spiritual liberation through becoming enlightened.**

In Sikhism, reincarnation is also believed, and the focus is on **connecting with the divine through devotion and selfless service to achieve Mukti** (liberation) and escape the cycle. The belief in reincarnation encourages people to lead good lives and strive for spiritual growth.



## Judgement: Heaven vs Hell

Abrahamic faiths such as Judaism, Christianity and Islam have beliefs about judgment, heaven, and hell. Judgment is when **God will judge a person's actions and decides whether they go to Heaven or Hell.**

**Heaven is a joyful and peaceful place** for those who lived well and sought a connection with the divine. **Hell is a place of punishment** and suffering for those who committed serious wrongdoings or rejected religious teachings.

These beliefs guide people to make good choices, live morally, and hope for a good afterlife.

## Other non-religious belief in the afterlife

Many non-religious people still believe in an afterlife. They **may believe in ghosts and that the existence of near death experiences** prove there is an afterlife. Near death experiences include **hearing voices, seeing light, seeing visions and feeling close to loved ones.** Non-religious people may believe there is an afterlife but that God does not exist.



# Religion and Ethics Knowledge Organiser



## The 4 Sights and the Life of Siddhartha:

Siddhartha, a **Prince living in luxury**, was sheltered by his father and unaware of the hardships faced by people outside the palace. Curiosity led him to venture beyond the walls, where he encountered four sights: **old age, illness, holy man, and death**. These experiences stirred compassion within him, prompting him to leave the palace and devote his life to easing the suffering of others.



## Enlightenment:

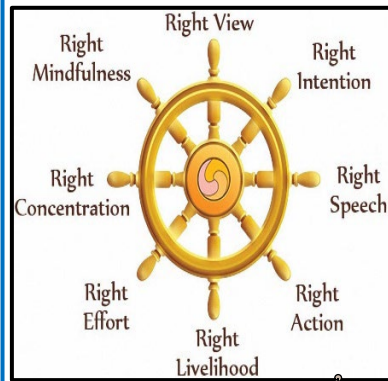
Siddhartha achieved enlightenment and **became the Buddha by meditating under a Bodhi tree** for 49 days. Enlightenment signifies understanding the **truth of existence and discovering how to live happily amidst suffering**. It requires people **to remove their desires for wealth and fame**. The Buddha taught that by following the **Eightfold Path**, individuals can live harmoniously, even in the face of aging, illness, and death. Buddhists believe that anyone has the potential to attain enlightenment, not just Siddhartha.



## Nirvana, Karma and the 5 precepts

Nirvana is the **state of ultimate liberation and peace** in Buddhism, free from suffering and the cycle of rebirth (samsara). **Karma means actions and our rebirth depends on how much good or bad karma** we acquire throughout our worldly life. Humans are considered the best life to be reborn into because we are the most intelligent and therefore able to feel compassion and do more good karma such as help those in need. **The cycle of Samsara only ends when enlightenment is achieved.**

## YEAR 8 BUDDHIST BELIEFS & PRACTICES



The 8 fold path



## Buddhist Practices: Lay people and Monks

Buddhist monks and lay people have different ways to practice Buddhism. **Monks lead a dedicated and disciplined life in monastic communities**, removing worldly attachments and following strict rules. They focus on meditation and studying scriptures.

Lay people, **incorporate Buddhist principles into their daily lives while balancing worldly responsibilities like jobs etc.** They practice mindfulness, follow moral guidelines, and engage in acts of kindness. Both paths offer opportunities for spiritual growth, but monks have a more intensive commitment to the teachings, while lay practitioners apply Buddhist values in their everyday experiences.

## Good moral behaviour and the 5 precepts

In order to achieve good Karma, Buddhists will follow the 'Five Precepts'. These are **moral guidelines to lead a virtuous life: abstaining from killing, stealing, engaging in sexual misconduct, lying, and consuming intoxicants**. Following these concepts promotes inner peace, ethical behaviour, and responsibility towards oneself and others.

## The 4 Noble Truths:

1. All is suffering
2. Your **desires** cause you to suffer
3. To stop suffering you must **stop wanting or desiring things**
4. To help you to stop wanting you must follow the **8 fold path**.



# 18



# Maths Knowledge Organiser



## FRACTIONS, DECIMALS, PERCENTAGES & RATIO

### Key Concept

FDP equivalence

F	D	P
$\frac{1}{100}$	0.01	1%
$\frac{1}{10}$	0.1	10%
$\frac{1}{5}$	0.2	20%
$\frac{1}{4}$	0.25	25%
$\frac{1}{2}$	0.5	50%
$\frac{3}{4}$	0.75	75%

### Key Words

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

**Ratio:** Relationship between two numbers.

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

**Equivalent:** Equal in value.

**Convert:** Change from one form to another.

Simplify 60 : 40 : 100

$$\div 10$$

6 : 4 : 10

$$\div 2$$

3 : 2 : 5

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

Share £45 in the ratio 2 : 7

$$45 \div 9 = 5$$

£10 : £35

2 : 7

5	5
5	5
=10	5
	5
	5
	5

=35

### Calculator

Find 32% of 54.60 =  $0.32 \times 54.60 = 17.472$

Year 8

### Tip

There is a % function on your calculator.

To find 25% of 14 on a calculator:

2, 5, SHIFT, (, ×, 1, 4, =

### Questions

- Simplify a) 45 : 63 b) 66 : 44 c) 320 : 440
- 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.



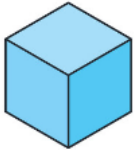
# Maths Knowledge Organiser

## 3D SHAPES



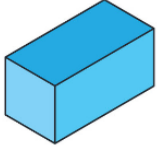
### Key Concept

Cube

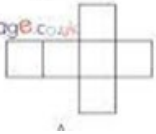
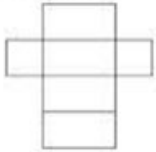


Faces – 6  
Edges – 12  
Vertices – 8

Cuboid



Faces – 6  
Edges – 12  
Vertices – 8



### Key Words

**Volume:** The amount of space that an object occupies.

**Net:** The net of a 3D shape is what it looks like if it is opened out flat. A net can be folded up to make a 3D shape.

**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.

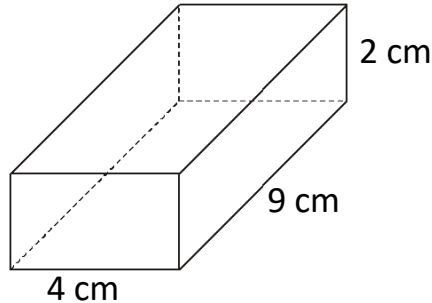
### Tip

Remember the units are cubed for volume.

### Formula

$$\text{Cuboid Volume} = l \times w \times h$$

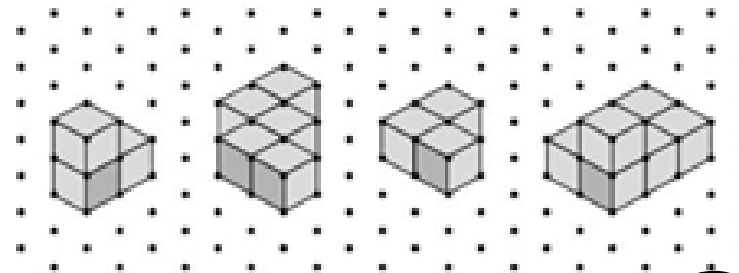
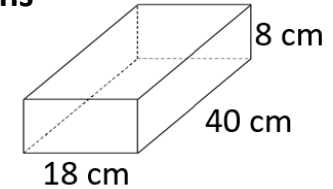
### Examples



$$\begin{aligned} \text{Volume} &= 4 \times 9 \times 2 \\ &= 72\text{cm}^3 \end{aligned}$$

### Questions

Find the volume of the cuboid:



Try drawing these on isometric paper

Year 8

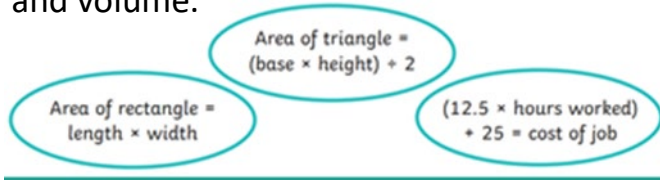
# Maths Knowledge Organiser

## FORMULAE AND NTH TERM



### Key Concepts

A formula is a special type of equation that shows the relationship between different substituted variables. Formulas are often used in geometry to find area and volume.



To find the  $n^{\text{th}}$  term of a linear sequence we can use  $Din0$ :

1<sup>st</sup> 2<sup>nd</sup> 3<sup>rd</sup> 4<sup>th</sup> 5<sup>th</sup>  
 5, 7, 9, 11, 13, 15, ...  
 2 2 2 2

Difference is 2  
n  
0

2n  
 2n+5



### Key Words

#### Substitution:

Replacing letters with numbers

**Term:** The numbers in a sequence

**Linear Sequence:** A sequence which goes up or down by the same amount

**nth term:** rule for finding a term in a sequence

**Coefficient:** The value of a letter, e.g. in  $4a$  the coefficient of  $a$  is 4

### EXAMPLES

$$P = 4m - 5$$

Work out the value of  $P$  when  $m = 7$

$$P = 4 \times 7 - 5$$

$$P = 28 - 5 = 23$$

Find the  $n^{\text{th}}$  term of the sequence 3, 8, 13, 18, 23

3, 8, 13, 18, 23,

Difference is 5

n 5n

0 5n + 3

# Year 8

### Tip

If a sequence is decreasing the  $n^{\text{th}}$  term will have a negative coefficient of  $n$

### Questions

- $T = 5m - 7$  find the value of  $T$  if (a)  $m = 3$  (b)  $m = -3$
- Find the  $n^{\text{th}}$  term of (a) 4, 7, 10, 13, 16  
(b) 6, 14, 22, 30, 38



# Maths Knowledge Organiser

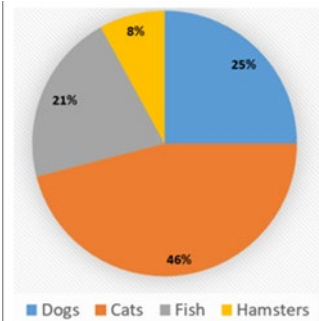
## PIE CHARTS



### Key Concepts

#### Pie Chart

- Divided into sectors which shows the relative size of the data.
- Needs a key or labels to clearly show what each sector represents.
- Sectors calculated using parts of  $360^\circ$ .



### Key Words

#### Discrete Data:

Information that can only take certain values

**Frequency:** The number of times something happens

**Proportion:** The relative size of something compared to a whole

**Protractor:** Used to accurately draw and measure angles

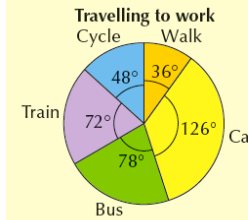
This is a circle divided into **sectors**. Each sector represents a set of data. Pie charts are excellent for displaying the most / least popular type of something.

Draw a pie chart to represent the data showing how a group of people travel to work.

Set the data out in a frequency table and write the calculations in it.

Now draw the pie chart.

When drawing a pie chart, draw the smallest angle first and try to make the largest angle the last one you draw, then any cumulative error in drawing will not be so noticeable.



Sector (type of travel)	Frequency	Calculation	Angle
Walk	24	$\frac{24}{240} \times 360^\circ = 36^\circ$	$36^\circ$
Car	84	$\frac{84}{240} \times 360^\circ = 126^\circ$	$126^\circ$
Bus	52	$\frac{52}{240} \times 360^\circ = 78^\circ$	$78^\circ$
Train	48	$\frac{48}{240} \times 360^\circ = 72^\circ$	$72^\circ$
Cycle	32	$\frac{32}{240} \times 360^\circ = 48^\circ$	$48^\circ$
Total	240		$360^\circ$

Year 8

### Tip

Check that your calculated angles add up to  $360^\circ$

### Questions:

The table gives information about the dogs in a village

Draw an accurate pie chart to show this information.

Breed	Frequency
Spaniel	11
Poodle	7
Greyhound	4
Jack Russe	14

22



# Maths Knowledge Organiser



## AREA OF COMPOUND SHAPES & TRAPEZIUMS

### Key Concepts

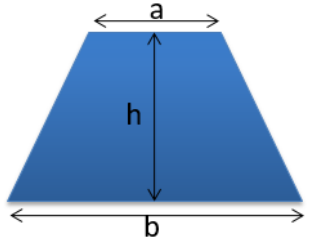


Rectangle

$$A = l \times w$$

Trapezium

$$\text{Area} = \frac{a+b}{2} \times h$$



or

$$\text{Area} = \frac{1}{2}(a+b)h$$

### Key Words

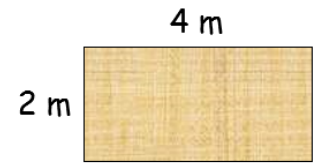
**Perimeter:** The distance around the outside of the shape.

**Area:** The amount of square units that fit inside the shape.

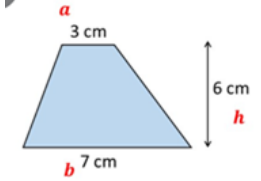
**Dimensions:** The lengths which give the size of the shape.

**Shapes:** Rectangle, Triangle, Parallelogram, Trapezium, Kite.

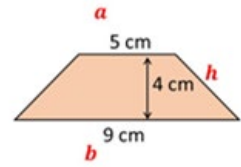
### Examples



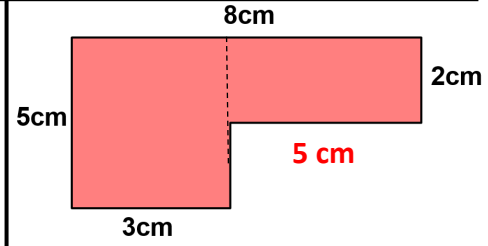
$$\text{Area} = 2 \times 4 = 8m^2$$



$$\frac{3+7}{2} \times 6 = 30 \text{ cm}^2$$



$$\frac{5+9}{2} \times 4 = 28 \text{ cm}^2$$



$$\text{Area} = (5 \times 3) + (2 \times 5) = 25 \text{ cm}^2$$

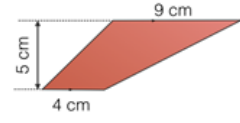
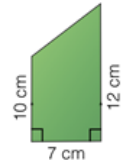
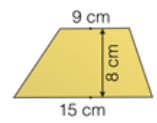
# Year 8

### Tip

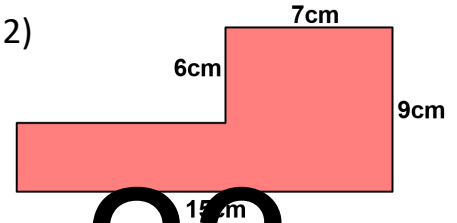
You can work out the area of a trapezium by splitting into a rectangle and triangle(s) but it is quicker to use the formula

1)

Find the area of each of the following trapeziums:



2)





# Maths Knowledge Organiser



## ADDING AND SUBTRACTING FRACTIONS

### Key Concepts

To add and subtract fractions the denominators must be the same. Use common denominators and equivalent fractions to convert them

**Converting from a mixed number into an improper fraction:**

$$2 \frac{3}{5} = \frac{(2 \times 5) + 3}{5} = \frac{13}{5}$$

### Key Words

**Improper fraction:** when the numerator is larger than the denominator e.g.  $\frac{20}{12}$

**Mixed Number:** a whole number and a fraction e.g.  $2 \frac{1}{4}$

**Numerator:** top numbers

**Denominator:** bottom number

**Convert:** change

### Examples

$$+ \quad \frac{3}{5} + \frac{2}{7}$$

$$- \quad \frac{3}{5} - \frac{2}{7}$$

Make the denominators the same

$$\begin{array}{r} \frac{3}{5} + \frac{2}{7} \\ \times 7 \quad \times 5 \\ \hline \frac{21}{35} + \frac{10}{35} = \frac{31}{35} \end{array}$$

$$\begin{array}{r} \frac{3}{5} - \frac{2}{7} \\ \times 7 \quad \times 5 \\ \hline \frac{21}{35} - \frac{10}{35} = \frac{11}{35} \end{array}$$

$$1 \frac{2}{3} + 2 \frac{1}{4}$$

$$= \frac{5}{3} + \frac{9}{4}$$

$$= \frac{20}{12} + \frac{27}{12}$$

$$= \frac{47}{12}$$

$$= 3 \frac{11}{12}$$

Convert into an improper fraction



Find a common denominator



Convert back into a mixed number



$$2 \frac{2}{3} - 1 \frac{1}{4}$$

$$= \frac{8}{3} - \frac{5}{4}$$

$$= \frac{32}{12} - \frac{15}{12}$$

$$= \frac{17}{12}$$

$$= 1 \frac{5}{12}$$

## Year 8

1)  $\frac{3}{5} + \frac{4}{15}$

2)  $\frac{2}{7} + \frac{5}{8}$

3)  $\frac{7}{9} - \frac{2}{5}$

Calculate:

4)  $1 \frac{2}{3} + 2 \frac{3}{4}$

5)  $3 \frac{3}{4} - 1 \frac{1}{3}$

# Maths Knowledge Organiser

## SOLVING EQUATIONS



### Key Concept

#### Inverse Operations

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

### 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

$x + 9 = 16$ $-9 \quad -9$ $x = 7$	$x - 12 = 20$ $+12 \quad +12$ $x = 32$	$\frac{x}{3} = 5$ $\times 3 \quad \times 3$ $x = 15$	$2x + 5 = 14$ $-5 \quad -5$ $2x = 9$ $\div 2 \quad \div 2$ $x = 4.5$
--	--	--	--

$\frac{x}{4} - 2 = 4$ $+2 \quad +2$ $\frac{x}{4} = 6$ $\times 4 \quad \times 4$ $x = 24$	$2(3x + 5) = -14$ <b>expand</b> $6x + 10 = -14$ $-10 \quad -10$ $6x = -24$ $\div 6 \quad \div 6$ $x = -4$	$2x + 7 = 5x + 1$ $-2x$ <b>(smallest x term)</b> $+7 = 3x + 1$ $-1 \quad -1$ $6 = 3x$ $\div 3 \quad \div 3$ $2 = x$
--	---	--

Year 8

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



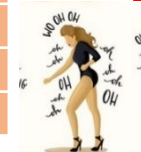


## Tenses (& key verbs)



Son= they are  
Hay - there is  
Es - is  
Tiene - has

### Regular verbs – present tense endings

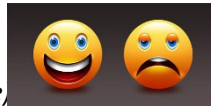


	-ar verbs	-er verbs	-ir verbs
I	-o	-o	-o
you	-as	-es	-es
he/she/it	-a	-e	-e
we	-amos	-emos	-imos
you (pl)	-áis	-éis	-ís
they	-an	-en	-en

### FUTURE Saying what you are going to do

IR – to go		INFINITIVE (-ar -er -ir endings)
Voy	a	Ir
vas		visitar
va		jugar
va		nadar
vamos		
vais		comer
van		Ver
Van		

## Opinions & Pronouns



Me chifla (*pleases me*)      Me enfada (*angers me*)  
 Me impresiona (*impresses me*)      Me repugna (*angers me*)  
 Me fascina (*fascinates me*)      Me irrita (*repulses me*)  
 Me interesa (*interests me*)      Me aburre (*bore me*)

## Connectives



También / además      also/furthermore  
 Pero / sin embargo      but / however  
 que      which  
 Donde      where  
 Porque / dado que      because/ given that  
 Aunque      although  
 Así que / por eso      there fore /so

## Complexity

Tengo que+ inf      - I have to....  
 Tengo que vivir en      - I have to live in  
 Tengo que compartir con      - I have to share with  
  
 No tiene....TAMPOCO tiene... =  
 It doesn't have..... neither does it have.....

## Adjectives

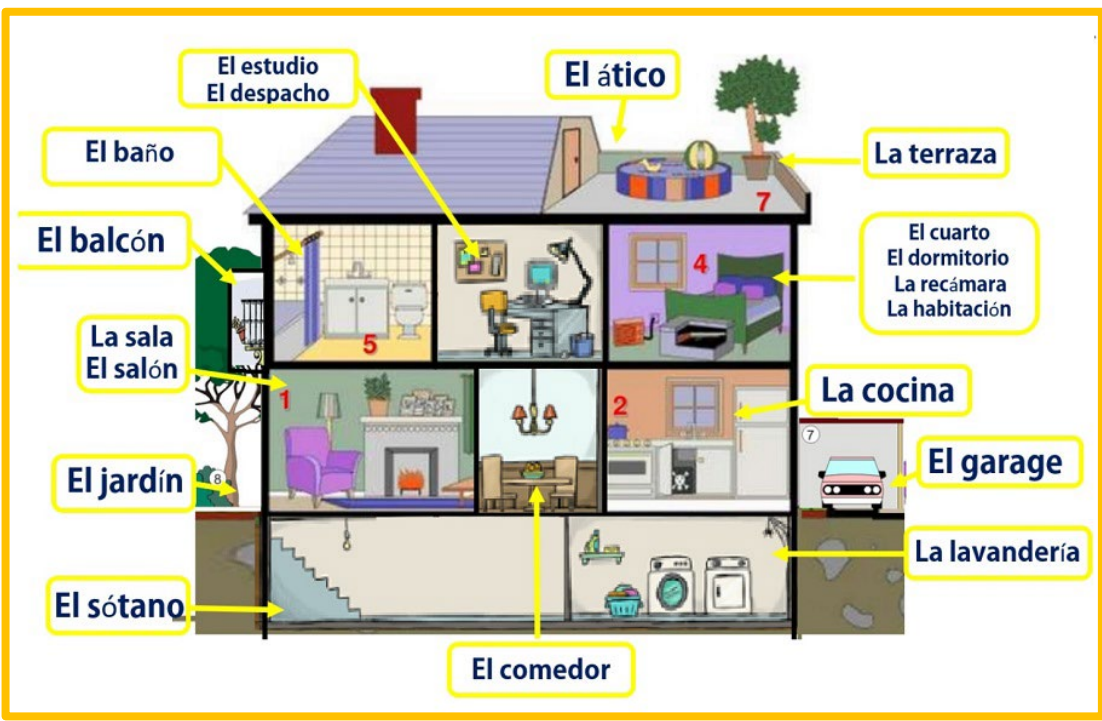
Acogedor(a)	Cosy
Adosado/a	Semi-detached
Reformado/a	Renovated
antiguo/a	old
viejo/a	old
moderno/a	modern
nuevo/a	new
bonito/a	pretty
feo/a	ugly
cómodo/a	comfortable
incómodo	uncomfortable
ordenado/a	tidy
desordenado/a	untidy
limpio/a	clean
sucio/a	dirty

Vivo en un piso nuevo  
 La cocina es limpia pero  
 los baños son pequeños









### PREPOSICIONES DE LUGAR

¿DÓNDE ESTÁ EL MONTO?

encima de	debajo de	a la derecha de
a la izquierda de	entre	al lado
adentro de	enfrente de	detrás de

Más palabras

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

LA PUERTA 	EL ARMARIO 	LA ESTANTERÍA 	LA VENTANA 
			LAS CORTINAS 
EL ESCRITORIO 	EL ORDENADOR 	EL COJÍN 	LA CAMA 
			LA ALMOHADA 
			LAS SÁBANAS 
			EL EDREDÓN 
LA LÁMPARA 	EL ESPEJO 	EL CUADRO 	
LA MESILLA DE NOCHE 			

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WAGOLL

T O P C A T

Vivo en una casa adosada y renovada. Mi casa es pequeña que me molesta.

Vivo con mi familia en las afueras de la ciudad de Manchester. Mi barrio es residencial. Sin embargo mi amigo vive en el campo que me aburre.

Me gusta mi casa porque ES bonita y también ES bastante moderna. Además mi barrio ES limpio y tranquilo y TIENE un parque grande.

En el futuro voy a vivir en el centro de una ciudad grande porque será muy divertido. Voy a vivir en un piso increíblemente nuevo que será fantástico.

## 8F The Periodic Table

### 1. Dalton's Atomic Model

<b>Matter</b>	All things are made of matter.
<b>John Dalton</b>	(1766-1844) An English chemist.
<b>Dalton's Atomic Theory</b>	<ul style="list-style-type: none"> <li>all matter is made up of atoms.</li> <li>atoms in an element are identical. Each element has its own type of atom.</li> <li>atoms cannot be destroyed or created.</li> <li>In compounds each atom is always joined to a fixed number of other atoms.</li> <li>atoms rearrange during chemical reactions to form new substances.</li> </ul>
<b>Atoms</b>	Small particles that all matter is made up of.
<b>Element</b>	A substance made up of one kind of atom.
<b>Compound</b>	Contains atoms of two or more different elements chemically joined together.
<b>Physical Properties</b>	The properties that describe a substance on its own. (colour, strength, density, etc.)
<b>Physical Changes</b>	A change in which no new substances are formed.
<b>Symbols</b>	Letters used to represent the elements. <i>e.g. C represents Carbon</i>

### 2. Chemical Properties

<b>Chemical Properties</b>	How a substance reacts with other substances.
<b>Hypothesis</b>	An idea about how something works that can be tested using experiments.

<b>Prediction</b>	What you think will happen in experiment and why.
<b>Conserving Mass</b>	The mass of the products of a reaction will be the same as the mass of the reactants.
<b>Chemical Formulae</b>	The combination of symbols and numbers that shows how many atoms of different element are in a particular molecule. <i>e.g. water is H<sub>2</sub>O</i>
<b>Ratio</b>	Comparison of the proportion of two quantities <i>e.g. in water there are 2 hydrogens for every oxygen, the ratio is 2:1</i>

### 3. Mendeleev's Table

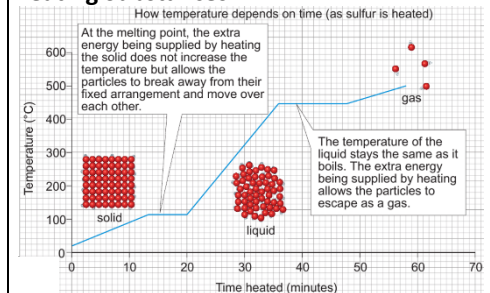
<b>Johann Döbereiner</b>	(1780-1849) German chemist who highlighted some groups of 3 elements had similar physical / chemical properties.
<b>John Newlands</b>	(1837-1898) English chemist who ordered elements by the mass of atoms and noticed every 8 <sup>th</sup> element has similar properties.
<b>Dmitri Mendeleev</b>	(1834-1907) Russian chemist who published the first periodic table by ordering elements by increasing masses of their atoms forming groups of similar properties.
<b>Gaps</b>	Mendeleev left gaps in his table for undiscovered elements and predicted their properties.
<b>Group</b>	A vertical column in the Periodic Table- contains elements with similar properties.

<b>Alkali Metals</b>	Group 1 Very reactive metals, they even react with water.
<b>Halogens</b>	Group 7 React with most metals to form solid compounds.
<b>Noble Gases</b>	Group 0 Unreactive gases

### 4. Physical Trends

<b>Melting Point</b>	When a substance changes from a solid into a liquid
<b>Boiling Point</b>	When a substance changes from a liquid into a gas.
<b>Freezing Point</b>	When a substance changes from a liquid into a solid- the same as the melting point.

#### Heating Substances



<b>Periods</b>	The horizontal rows in the Periodic table.
<b>Transition Metals</b>	Block of elements in the middle of the Periodic table- separates the eight main groups.
<b>Metal Properties</b>	High melting points, strong, flexible, malleable, shiny, good conductors.
<b>Non-Metal Properties</b>	Low melting points, brittle, dull, poor conductors.

### 5. Chemical Trends

<b>Alkali Metals &amp; Water</b>	Alkali metals produce metal hydroxides and hydrogen when reacting with water. <i>(sodium + water → sodium hydroxide + hydrogen)</i>
<b>Alkali Metals &amp; Oxygen</b>	Alkali metals produce metal oxides when reacting with oxygen. <i>(lithium + oxygen → lithium oxide)</i>
<b>Reactivity</b>	How quickly / vigorously something reacts.
<b>Alkali Metal Reactivity</b>	As you move down the group the reactivity increases.
<b>Oxides</b>	Formed when elements react with oxygen.
<b>Oxide Trends</b>	When we dissolve oxides in water there is a trend in their pH. Further to the left of the Periodic table oxides formed are more alkaline. Further to the right they are more acidic.

*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.*



## 8K Energy Transfers

### 1. Temperature Changes

<b>Temperature</b>	How hot or cold an object is. <i>Measured in degrees Celsius (°C)</i>
<b>Internal / Thermal Energy</b>	The energy stored in the movement of particles. <i>Measured in Joules (J)</i>
<b>Factors Affecting Amount of Internal Energy Stored</b>	<ul style="list-style-type: none"> <li>• temperature</li> <li>• material</li> <li>• mass</li> </ul>
<b>Energy Transfer</b>	Always from a hotter object to a cooler one.
<b>Evaporation</b>	When a liquid turns into a gas. A way of transferring energy.
<b>Cooling by Evaporation</b>	The fastest moving particles escape a liquid to form a gas. The particles left are storing less energy so the temperature of the remaining liquid is lower.

### 2. Transferring Energy

<b>Transferring Energy</b>	Energy can be transferred by heating via evaporation, conduction, convection and radiation.
<b>Radiation</b>	A way of transferring Energy by heating through waves (it does not need a medium).
<b>Emitting Radiation</b>	All things give out (emit) infrared radiation, the hotter it is the more it emits.

<b>Thermal Images</b>	Instruments that measure infrared radiation and convert into maps of temperatures.
<b>Conduction</b>	When a solid is heated the particles vibrate more and these vibrations are passed through the solid transferring energy.
<b>Thermal Conductors</b>	Energy is transferred easily through them- metals.
<b>Thermal Insulators</b>	Energy is not transferred through them easily- wood / plastic.
<b>Convection</b>	In fluids (liquids and gases) when part of it is heated it become less dense and rises. Cooler fluid moves in to take its place and a convection current forms.
<b>Convection Diagram</b> 	

### 3. Controlling Transfers

<b>Cold Climates</b>	Houses are kept warm by burning fuel for heating and insulating houses to keep warmth inside.
<b>Good Insulators</b>	Brick, wood, carpet, feathers, wool.
<b>Air</b>	A very poor conductor because the particles are far apart
<b>Hot Climates</b>	Houses are kept cool by painting them white (light and shiny surfaces reflect infrared radiation).

<b>Solar Panels</b>	Painted black because dark colours absorb and emit infrared radiation well.
<b>Vacuum Flask</b>	Designed to reduce energy transfers and keep contents hot: <ul style="list-style-type: none"> <li>• Plastic stopper to stop convection (and it is an insulator).</li> <li>• Glass walls with silver coating reflect radiation back in.</li> <li>• Vacuum between walls so no conduction or convection can occur.</li> </ul>

### 4. Power and Efficiency

<b>Power</b>	The amount of energy transferred by an appliance per second.
<b>Watts (W)</b>	The units for measuring power. 1000W = 1kW (kilowatt)
<b>Power Ratings</b>	Tell us how much energy an appliance transfers.
<b>Efficiency</b>	The amount of useful energy transferred by a device compared with the amount of energy supplied to it.
<b>Sankey Diagram</b>	A diagram that represents energy transfers.
<b>Sankey Diagram Example</b> 	
<b>Efficiency Formula</b> $\text{efficiency} = \frac{\text{useful energy transferred}}{\text{total energy supplied}} \times 100\%$	

### 5. Paying for Energy

<b>Kilowatt-hour (kWh)</b>	The amount of energy transferred in 1 hour by an appliance. Used by energy companies to measure energy use.
<b>Energy Use Formula</b> $\text{energy use (kWh)} = \text{power rating (kW)} \times \text{time (hours)}$	
<b>Saving Money on Electricity / Gas Bills</b>	Not using as much energy will save money. Insulating houses and using more efficient appliances will help with this.
<b>Payback Time</b>	How long it will take you to save the money that an efficiency measure costs.
<b>Payback Time Formula</b>	$\text{payback time} = \frac{\text{cost of change}}{\text{saving per year}}$

*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.*

## 8K Energy Transfers

### 1. Temperature Changes – complete the gaps

<b>T</b> .....	How hot or cold an object is. <i>Measured in degrees Celsius (°C)</i>
<b>I</b> ..... / <b>Thermal Energy</b>	The energy stored in the movement of particles. <i>Measured in Joules (J)</i>
<b>Factors Affecting Amount of Internal Energy Stored</b>	
<b>E</b> ..... <b>T</b> .....	Always from a hotter object to a cooler one.
<b>E</b> .....	When a liquid turns into a gas. A way of transferring energy.
<b>C</b> ..... <b>by Evaporation</b>	The fastest moving particles escape a liquid to form a gas. The particles left are storing less energy so the temperature of the remaining liquid is lower.

### 2. Transferring Energy

<b>Transferring Energy</b>	
<b>Radiation</b>	
<b>E</b> ..... <b>Radiation</b>	All things give out (emit) infrared radiation, the hotter it is the more it emits.

<b>Thermal I</b> .....	Instruments that measure infrared radiation and convert into maps of temperatures.
<b>C</b> .....	When a solid is heated the particles vibrate more and these vibrations are passed through the solid transferring energy.
<b>Thermal C</b> .....	Energy is transferred easily through them- metals.
<b>Thermal I</b> .....	Energy is not transferred through them easily- wood / plastic.
<b>C</b> .....	In fluids (liquids and gases) when part of it is heated it become less dense and rises. Cooler fluid moves in to take its place and a convection current forms.
<b>Convection Diagram – complete a diagram</b>	

### 3. Controlling Transfers

<b>Cold C</b> .....	Houses are kept warm by burning fuel for heating and insulating houses to keep warmth inside.
<b>Good Insulators</b>	
<b>Air</b>	
<b>Hot C</b> .....	Houses are kept cool by painting them white (light and shiny surfaces reflect infrared radiation).

<b>S</b> ..... <b>P</b> .....	Painted black because dark colours absorb and emit infrared radiation well.
<b>V</b> ..... <b>Flask</b>	Designed to reduce energy transfers and keep contents hot: <ul style="list-style-type: none"> <li>• Plastic stopper to stop convection (and it is an insulator).</li> <li>• Glass walls with silver coating reflect radiation back in.</li> <li>• Vacuum between walls so no conduction or convection can occur.</li> </ul>

### 4. Power and Efficiency

<b>Power</b>	
<b>W</b> .....	The units for measuring power. 1000W = 1kW (kilowatt)
<b>Power Ratings</b>	
<b>E</b> .....	The amount of useful energy transferred by a device compared with the amount of energy supplied to it.
<b>S</b> ..... <b>D</b> .....	A diagram that represents energy transfers.
<b>Sankey Diagram Example – complete a diagram</b>	
<b>Efficiency Formula</b>	




### 5. Paying for Energy

<b>Kilowatt-hour (kWh)</b>	The amount of energy transferred in 1 hour by an appliance. Used by energy companies to measure energy use.
<b>Energy Use Formula</b>	
<b>Saving Money on Electricity / Gas Bills</b>	Not using as much energy will save money. Insulating houses and using more efficient appliances will help with this.
<b>P</b> ..... <b>Time</b>	How long it will take you to save the money that an efficiency measure costs.
<b>Payback Time Formula</b>	



## 81 Fluids

### 1. The Particle Model

<b>States of Matter</b>	The three forms that a substance can be in; solid, liquid or gas.
<b>Solid Properties</b>	Do not flow, fixed shape, fixed volume, cannot be compressed
<b>Liquid Properties</b>	Can flow, no fixed shape, fixed volume, cannot be compressed
<b>Gas Properties</b>	Can flow, no fixed shape, no fixed volume, can be compressed
<b>Particle Theory</b>	Used to explain the different properties and observations of solids, liquids and gases.
<b>Solid Particle Properties</b>	Fixed arrangement of particles held closely together that cannot move over each other but vibrate. 
<b>Liquid Particle Properties</b>	Held closely together but not in a fixed arrangement and can move over each other. 
<b>Gas Particle Properties</b>	Far apart from each other and free to move about in all directions. 
<b>Diffusion</b>	The movement of particles spreading out and mixing with each other without anything moving them.

<b>Brownian Motion</b>	An erratic movement of small specks of matter caused by being hit by the moving particles that make up liquids or gases.
<b>Expanding</b>	Materials expand when heated because the particles vibrate more, taking up more space.
<b>Contract</b>	Materials contract when cooled because the particles vibrate less and take up less space.
<b>Density</b>	The mass of a certain volume of a material. $\text{density} = \frac{\text{mass}}{\text{volume}}$

### 2. Changing State

<b>Changes of State</b>	Changing from one state of matter to another. Physical changes because no new chemicals are made.
<b>Melting</b>	Turning from a solid to a liquid- occurs at melting point
<b>Freezing</b>	Turning from a liquid to a solid- occurs at freezing point
<b>Condensing</b>	Turning from a gas into a liquid.
<b>Sublimation</b>	Turning from a solid to a gas.
<b>Evaporation</b>	Turning from a liquid into a gas. Can occur at the surface of a liquid at any temperature.
<b>Boiling</b>	When evaporation occurs within a liquid- occurs at the boiling point
<b>Pure</b>	A substance made up of a single type of atom or compound.
<b>Pure Substances Changing State</b>	Occurs at a set temperature. The temperature stays constant when changing state as bonds are broken or made.

<b>Mixtures Changing State</b>	Occurs over a range of temperatures as it contains substances with different melting/boiling points.
<b>Water</b>	Contracts as it is cooled up until 4°C and then it expands slightly. Ice takes up more space than water and is less dense

### 3. Pressure in Fluids

<b>Fluids</b>	Liquids and Gases
<b>Pressure</b>	The force of particles hitting things- comes from all directions in gases and liquids.
<b>Pressure Units</b>	<b>Pascals (Pa)</b> One pascal is the a force of one newton on every square metre.
<b>Atmospheric Pressure</b>	The pressure of the air- 100,000 Pa
<b>Tyres</b>	Contain air under high pressure because they are pumped with extra air causing more particles to hit the inside walls.
<b>Temperature</b>	Pressure in fluids increases as you increase temperature because particles move faster and hit the walls of the container harder.
<b>Volume</b>	If you compress a gas into a smaller volume the pressure increases because the particles hit the walls more.
<b>Pressure From Above</b>	As you go down the ocean there is more water above you so pressure increases. As you go up a mountain there is less air above you so pressure decreases.

### 4. Floating and Sinking

<b>Upthrust</b>	The force of water pushing upwards.
<b>Weight</b>	The amount of force with which gravity pulls on a mass.
<b>Water</b>	The density of water is 1 g/cm <sup>3</sup>
<b>Floating</b>	If something has a density less than water it will float in water.
<b>Sinking</b>	If something has a density greater than water it will sink in water.
<b>Air</b>	The density of air at sea level is around 0.001 g/cm <sup>3</sup>
<b>Hot Air Balloons</b>	Fly because the overall density of the balloon is less than the air around it.



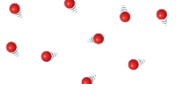
### 5. Drag

<b>Drag</b>	A resistance force acting on an object to slow it down.
<b>Water Resistance</b>	Type of drag that occurs in water.
<b>Air Resistance</b>	Type of drag that occurs in air.
<b>Friction</b>	Partly causes the drag on a moving object.
<b>Streamlined</b>	Smooth shape to reduce air / water resistance.
<b>Speed</b>	The faster an object is moving, the greater the drag.
<b>Balanced Forces</b>	Equal forces acting in opposite directions.
<b>Engine</b>	Forward force of an engine needs to balance the drag.

*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.*

## 8I Fluids

### 1. The Particle Model – complete the gaps

<b>S..... of M.....</b>	The three forms that a substance can be in; solid, liquid or gas.
<b>Solid Properties</b>	
<b>Liquid Properties</b>	
<b>Gas Properties</b>	
<b>Particle Theory</b>	Used to explain the different properties and observations of solids, liquids and gases.
<b>S..... Particle Properties</b>	Fixed arrangement of particles held closely together that cannot move over each other but vibrate. 
<b>L..... Particle Properties</b>	Held closely together but not in a fixed arrangement and can move over each other. 
<b>G..... Particle Properties</b>	Far apart from each other and free to move about in all directions. 

<b>D.....</b>	The movement of particles spreading out and mixing with each other without anything moving them.
<b>B..... Motion</b>	An erratic movement of small specks of matter caused by being hit by the moving particles that make up liquids or gases.
<b>Expanding</b>	
<b>Contract</b>	Materials contract when cooled because the particles vibrate less and take up less space.
<b>D.....</b>	

### 2. Changing State

<b>Changes of S.....</b>	Changing from one state of matter to another. Physical changes because no new chemicals are made.
<b>M.....</b>	Turning from a solid to a liquid- occurs at melting point
<b>F.....</b>	Turning from a liquid to a solid- occurs at freezing point
<b>C.....</b>	Turning from a gas into a liquid.
<b>S.....</b>	Turning from a solid to a gas.
<b>E.....</b>	Turning from a liquid into a gas. Can occur at the surface of a liquid at any temperature.
<b>B.....</b>	When evaporation occurs within a liquid- occurs at the boiling point
<b>P.....</b>	A substance made up of a single type of atom or compound.

<b>P..... Substances Changing State</b>	Occurs at a set temperature. The temperature stays constant when changing state as bonds are broken or made.
<b>M..... Changing State</b>	Occurs over a range of temperatures as it contains substances with different melting/boiling points.
<b>W.....</b>	Contracts as it is cooled up until 4°C and then it expands slightly. Ice takes up more space than water and is less dense

### 3. Pressure in Fluids

<b>Fluids</b>	
<b>P.....</b>	The force of particles hitting things- comes from all directions in gases and liquids.
<b>Pressure Units</b>	
<b>Atmospheric Pressure</b>	The pressure of the air- 100,000 Pa
<b>T.....</b>	Contain air under high pressure because they are pumped with extra air causing more particles to hit the inside walls.
<b>T.....</b>	Pressure in fluids increases as you increase temperature because particles move faster and hit the walls of the container harder.
<b>V.....</b>	If you compress a gas into a smaller volume the pressure increases because the particles hit the walls more.

<b>Pressure From Above</b>	As you go down the ocean there is more water above you so pressure increases. As you go up a mountain there is less air above you so pressure decreases.
----------------------------	--

### 4. Floating and Sinking

<b>Up.....</b>	The force of water pushing upwards.
<b>W.....</b>	The amount of force with which gravity pulls on a mass.
<b>W.....</b>	The density of water is 1 g/cm <sup>3</sup>
<b>F.....</b>	If something has a density less than water it will float in water.
<b>S.....</b>	If something has a density greater than water it will sink in water.
<b>A.....</b>	The density of air at sea level is around 0.001 g/cm <sup>3</sup>
<b>Hot Air B.....</b>	Fly because the overall density of the balloon is less than the air around it.

### 5. Drag

<b>Drag</b>	
<b>Water Resistance</b>	
<b>Air Resistance</b>	
<b>Friction</b>	
<b>Streamlined</b>	
<b>Speed</b>	
<b>Balanced Forces</b>	
<b>Engine</b>	



## 8C Breathing and Respiration

### 1. Aerobic Respiration

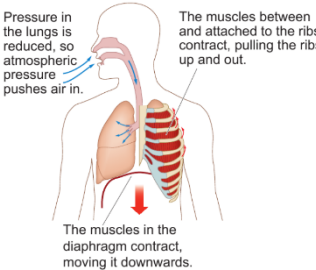
<b>Robert Boyle</b>	(1627-1691) placed a burning candle in a jar and sucked out all the air- the candle went out. Repeated with a mouse and the mouse died.
<b>John Mayow</b>	(1641-1679) did experiments to discover that only a certain part of the air was needed to keep candle burning and mouse alive.
<b>Joseph Priestley &amp; Antoine Lavoisier</b>	(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.
<b>Aerobic Respiration</b>	Using oxygen to release energy from glucose.

**Aerobic Respiration Word Equation**  
glucose + oxygen → carbon dioxide + water

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

### 2. Gas Exchange System

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

<b>Diaphragm</b>	Organ below the lungs that contracts / relaxes changing the size of the lungs.
<b>Inhalation breathing in</b>	
<b>Mucus</b>	Sticky liquid that traps dirt, dust and microorganisms.
<b>Cilia</b>	Tiny hairs on cells that sweep mucus from the lungs into the gullet to be swallowed.
<b>Gas Exchange</b>	The swapping of gases between the lungs and the blood.
<b>Diffusion</b>	Movement of particles from a high concentration to low.
<b>Alveoli</b>	Little pockets on the lungs.
<b>Adaptations of Alveoli</b>	They increase the surface area for faster diffusion. The walls are one cell thick for faster diffusion.

### 3. Getting Oxygen

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

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

### 4. Comparing Gas Exchange

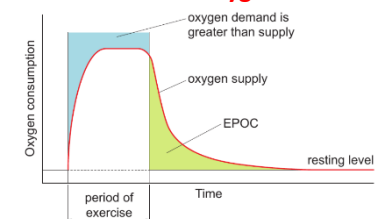
<b>Limewater</b>	Turns cloudy in the presence of carbon dioxide.
<b>Hydrogen Carbonate Indicator</b>	Turns from pink to yellow as carbon dioxide increases and the pH drops.
<b>Gills</b>	Water flows over feathery strands where oxygen diffuses into the blood and carbon dioxide out.

<b>Stomata</b>	Tiny holes in leaves that allow gas exchange.
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### 5. Anaerobic Respiration

<b>Anaerobic Respiration</b>	Respiration that occurs in the cytoplasm of cells when oxygen isn't present during strenuous exercise.
<b>Anaerobic Respiration Word Equation</b> Glucose → lactic acid	
<b>Energy</b>	Anaerobic respiration releases less energy than aerobic.
<b>Anaerobic Advantages</b>	Allows for a quick, sudden burst of energy.
<b>After Strenuous Exercise</b>	Lactic acid enters the blood, is carried to the liver and converted back to glucose.
<b>EPOC</b>	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.*

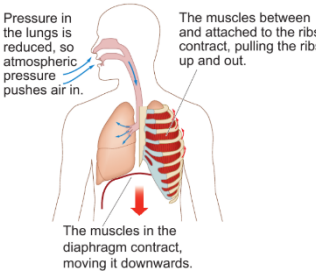
## 8C Breathing and Respiration

### 1. Aerobic Respiration – complete the gaps

<b>R.....</b> <b>B.....</b>	(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.
<b>Joh M.....</b>	(1641-1679) did experiments to discover that only a certain part of the air was needed to keep candle burning and mouse alive.
<b>Joseph Priestly &amp; Antoine Lavoisier</b>	(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.
<b>Aerobic R.....</b>	Using oxygen to release energy from glucose.
<b>Aerobic Respiration Word Equation</b>	
<b>C.....</b>	The word equation for combustion (burning) of glucose is the same as above but occurs in a different way.
<b>R.....</b>	The starting substances- written on left of word equation.
<b>P.....</b>	The new substances made- written on right of word equation.

### 2. Gas Exchange System

<b>Breathing</b>	
<b>Ventilation</b>	

<b>D.....</b>	Organ below the lungs that contracts / relaxes changing the size of the lungs.
<b>I..... breathing in</b>	Pressure in the lungs is reduced, so atmospheric pressure pushes air in. 
<b>Mucus</b>	
<b>C.....</b>	Tiny hairs on cells that sweep mucus from the lungs into the gullet to be swallowed.
<b>G..... E.....</b>	The swapping of gases between the lungs and the blood.
<b>D.....</b>	Movement of particles from a high concentration to low.
<b>A.....</b>	Little pockets on the lungs.
<b>Adaptations of Alveoli</b>	

### 3. Getting Oxygen

	Take in oxygen when it gets into the blood.
<b>H.....</b>	Where the oxygen binds to in red blood cells.
<b>A.....</b>	Blood vessels that carry blood from the heart to the body.
<b>C.....</b>	Tiny blood vessels that the arteries divide into. oxygen leaves red blood cells here and dissolves into the plasma.

<b>P.....</b>	Liquid part of the blood that leaks out of the capillaries into the tissue fluid.
<b>Tissue F.....</b>	Carries the oxygen to the cells.
<b>V.....</b>	Carry blood back towards the heart.
<b>E.....</b>	Your muscles must release more energy so need more oxygen and glucose- your breathing and heart rates increase.
<b>F.....</b>	Blood vessels in skin narrow to avoid heat loss and less blood reaches cell. If the cells die this causes frostbite.
<b>H.....A.....</b>	Fatty substances build up inside blood vessels reducing blood flow causing cells to die.
<b>Carbon Monoxide</b>	
<b>T.....</b>	In tobacco smoke- irritates alveoli and causes them to break apart leading to emphysema.
<b>A.....</b>	Tiny tubes in lungs become narrow and fill with mucus meaning less air gets into and out of the lungs.

### 4. Comparing Gas Exchange

<b>L</b>	Turns cloudy in the presence of carbon dioxide.
<b>Hydrogen Carbonate I.....</b>	Turns from pink to yellow as carbon dioxide increases and the pH drops.
<b>G.....</b>	Water flows over feathery strands where oxygen diffuses into the blood and carbon dioxide out.

<b>S.....</b>	Tiny holes in leaves that allow gas exchange.
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### 5. Anaerobic Respiration

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<b>Anaerobic Respiration Word Equation</b>	
<b>E.....</b>	Anaerobic respiration releases less energy than aerobic.
<b>Anaerobic Advantages</b>	
<b>After Strenuous Exercise</b>	Lactic acid enters the blood, is carried to the liver and converted back to glucose.
<b>E.....</b>	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.
<b>Effect of exercise on oxygen demand</b> <b>Complete a diagram</b>	



## 8D Unicellular Organisms

### 1. Unicellular or Multicellular

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

<b>Viruses</b>	Not classed as living organisms because they cannot live without being inside a host.
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### 2. Microscopic Fungi

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

### 3. Bacteria

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

<b>Statement Key</b>	A series of descriptive statements used to work out what something is.
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### 4. Protoctists

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

### 5. Decomposers & Carbon

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

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

## 8D Unicellular Organisms

### 1. Unicellular or Multicellular – fill in the gaps

<b>C</b> .....	The basic unit of life. All organisms are made up of cells.
<b>U</b> .....	An organism made up of one cell.
<b>M</b> .....	Organisms that are so small they can only be seen with a microscope.
<b>M</b> .....	An organisms made of many cells.
<b>D</b> .....	When particles spread to fill the area that they are in.
<b>K</b> .....	All living organisms can be grouped into one of the five kingdoms.
<b>P</b> .....	Unicellular organisms that do not have a nucleus.
<b>P</b> .....	Mainly unicellular organisms. All have a nucleus.
<b>F</b> .....	Mainly multicellular organisms that do not make their own food and have a nucleus.
<b>P</b> .....	Multicellular organisms that have a nucleus and make their own food.
<b>A</b> .....	Multicellular organisms that have a nucleus, do not make their own food and do not have a cell wall.
<b>B</b> .....	A type of microorganisms in the prokaryote kingdom.
<b>V</b> .....	Not classed as living organisms because they cannot live without being inside a host.

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<b>Chlorophyll</b>	
<b>Producers</b>	Organisms that are able to make their own food- always the start of a food chain.
<b>Food Chains</b>	Try to draw an example
<b>Energy Transfer</b>	Represented by an arrow on a food chain diagram.
<b>Pyramids of Numbers</b>	A way of showing the numbers of different organisms in a food chain.
<b>Poison</b>	

### 5. Decomposers & Carbon

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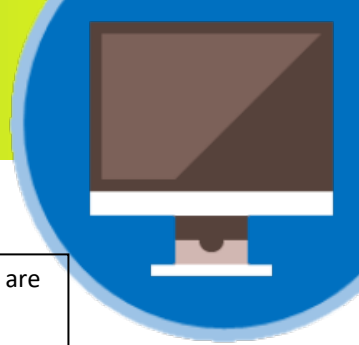
<b>Soluble</b>	A substance that can dissolved in a liquid.
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<b>Fats</b>	A nutrient used for storing energy and as a thermal insulator.

Summarise section 5 as a mini mind map





# Computer Science Knowledge Organiser



## COMPUTING SYSTEMS

Modern computer systems receive an input, process that data and then produce an output. The data can be stored 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.

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

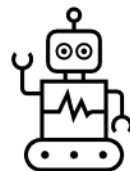
**Communication** Computing systems exchange information and form networks  
**Programs and data** are transferred between computing systems, when required.

### Artificial Intelligence (AI)

"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



### Machine Learning



### Hardware Components

#### CPU – Central Processing Unit

It is known as the 'brains of the computer' that processes program instructions

An instruction may:

- Perform arithmetic or logic operations on data
- Perform input/output of data
- Control program flow



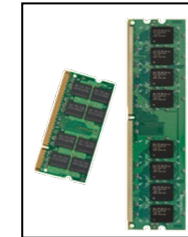
The **storage** (secondary memory) is the set of components that **stores** programs and data.

Storage is **persistent**: it retains its contents when the power is off.

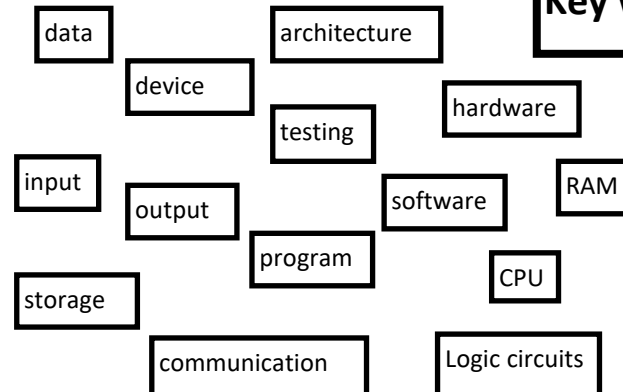


Volatile (RAM) - Only stores information to run programs when computer is on

Non-volatile (ROM) - retains data even when the computer is switched off

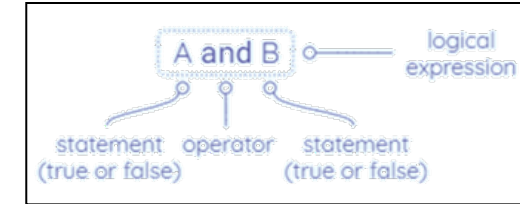


### Key words



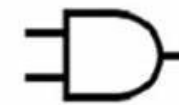
### Logical Operators

**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



AND



OR



NOT

### Operating Systems

All hardware needs an operating system. It is responsible for managing the hardware and providing an environment for programs to run in.

It manages: Files, Hardware, software, memory

Examples: IOS, Windows, Android, MacOS, Linux

# Computer Science Knowledge Organiser



## Binary – Data Representation

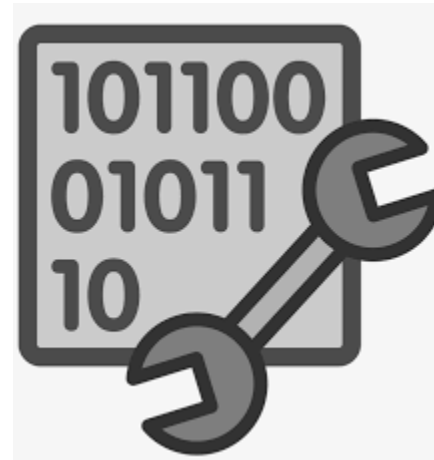
Key Words	
Binary number	A number system that contains two symbols, 0 and 1. Also known as base 2
Base 2	A number system where there are only 2 digits to select from. 0 – 1 as this is all binary can understand.
data	Units of information. In computing there can be different data types, including integers, 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
Base 10	The number systems that we/humans use. Numbers 0-9 as it can make any number combination from that.



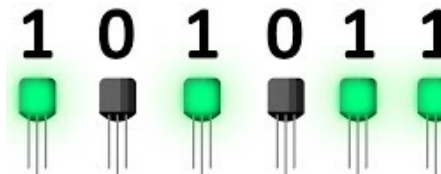
Binary Rules	Carry
$0 + 0 = 0$	0
$0 + 1 = 1$	0
$1 + 0 = 1$	0
$1 + 1 = 0$	1

Conversion table	128	64	32	16	8	4	2	1
Example binary number	0	0	0	1	0	1	1	1

0 → OFF  
1 → ON



## Binary!



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 0 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 switches which can only be on (1) or off (0).

### ASCII – American Standard Code for Information Interchange

ASCII is a character set that uses numeric codes to represent characters. These include upper and lowercase English letters, numbers, and punctuation symbols.

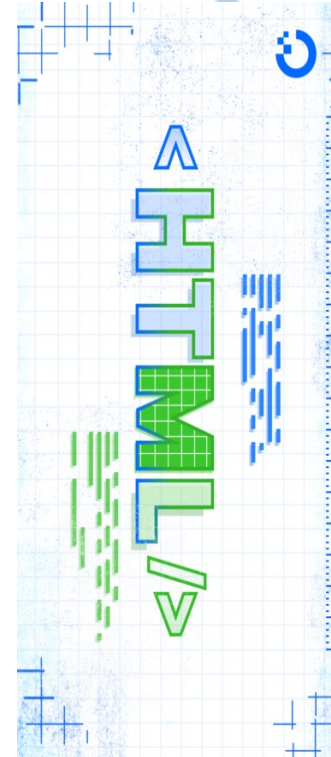
Example: a capital "T" is represented by 84, or 01010100 in binary.

# Computer Science Knowledge Organiser

## 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)
<ol>,<ul>	Order/unordered list
<li>	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>
```

→



# Computer Science Knowledge Organiser

## Year 8 Intro to Python

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 **selection** statement allows a computer to **evaluate** whether an **expression** is 'true' or 'false' and then perform an action depending on the outcome.

### Arithmetic operators

+ addition  
- difference  
\* multiplication  
/ division  
// integer division

### Key terms

selection

algorithm

iteration

sequence

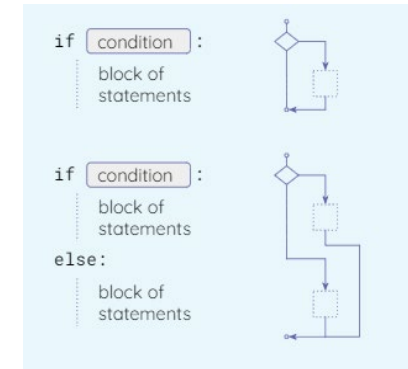
logical operators

input

variable

Arithmetic

output



You can use multiple branches using if, elif and else

Python helps by telling the programmer where the error is. So if you see red error text—read it first.

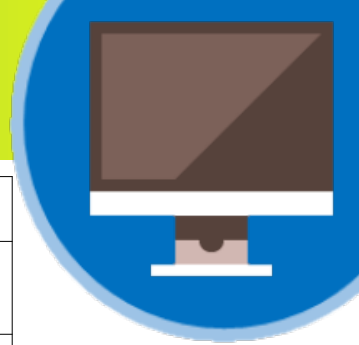
Keywords	
Variable	Stores a value/data – Can be changed during the program
Float (FLOAT)	Decimal point
Integer (INT)	Whole number
Boolean (BOOL)	True or False
String (STR)	Letters, numbers, symbols inside speech marks
Data types	The different data that can be stored in a variable
Sequence	A set of instructions or rules that an algorithm uses have to be in the right order.
Syntax Error	A syntax error is a mistake in your Python program that prevents it from running (executing). Syntax errors are like spelling/grammar errors or logic error

### Some common syntax errors in selection

- use if and else—no capitals
- A colon : is always required after the condition and after else.
- Use **indentation** to indicate which statements 'belong' to the if block and the else block.
- The == operator checks for equality.
- A single = is only used in assignments

### Syntax Errors

All programming languages have rules for **syntax**, i.e. how statements can be assembled. Programs written in a programming language must follow its syntax. Programs with **syntax errors** cannot be translated and executed.



python™

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# Computer Science Knowledge Organiser

YEAR 8

MOBILE APP



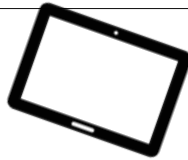
Key Words	
abstraction	Identify the important aspects to start with
algorithm	Precise sequence of instructions
Application (app)	Software designed to run on a mobile device
Computational thinking	Solving problems with or without a computer
debugging	Looking at where a program might have errors or can 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.

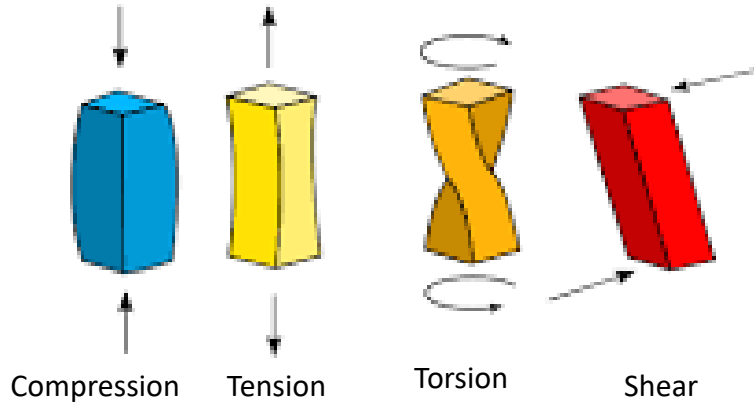
**Evaluating** and **debugging** allow for judging the quality of the app and enables errors to be corrected and improvements to be made.



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## Mechanical Properties

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



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

## Physical Properties

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

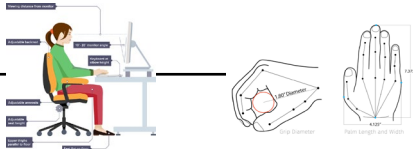
## Design Specification – Key Questions

<b>A</b>	<b>Aesthetics</b>	What shape should the product be? What colour should the product be? What texture should the surface have?
<b>C</b>	<b>Cost</b>	What should the cost of the product be?
<b>C</b>	<b>Consumer</b>	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?
<b>E</b>	<b>Environment</b>	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?
<b>S</b>	<b>Safety</b>	What safety risks have to be considered? What safety standards must the product meet?
<b>S</b>	<b>Size</b>	How long, wide and tall should the product be? How much should the product weigh?
<b>F</b>	<b>Function</b>	What will the product be used for? How will it work? How should it be tested?
<b>M</b>	<b>Materials and Manufacturing</b>	What materials should the product be made from? Are there any limits on the types of materials available? How many products need to be made? Which processes should be used to make the product?

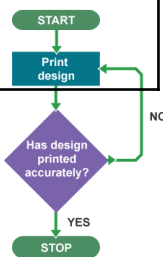


## Ergonomics and Anthropometrics

**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

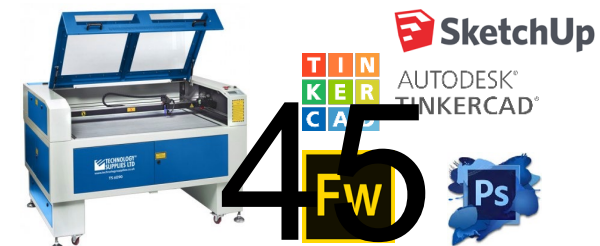
This indicates the product is not suitable for under 3 year olds.



Tools and Equipment	Name	<ul style="list-style-type: none"> <li>• Use</li> <li>• Safety point</li> </ul>
	Coping Saw	To cut wood <b>Safety Rules when using it</b> Work should be clamped in a vice
	Half Round File	Smoothing wood or Styrofoam <b>Safety</b> Work should be clamped in a vice
	Vice	Used to hold work in place <b>Safety</b> Allows work to be safely clamped while being cut or smoothed
	Pillar Drill	Used to drill holes in wood or plastic <b>Safety</b> You must wear goggles, an apron, tie your hair back, have the guard down and worked clamped securely

## Computer Aided Design Computer Aided Manufacture

<b>CAD</b>	This is using computer software to draw and model a product. <b>Examples:</b> 2D Design, Photoshop, Macromedia Fireworks and Sketch Up <b>Advantages:</b> <ul style="list-style-type: none"> <li>• Designs can be shared electronically</li> <li>• Accurate</li> <li>• Designs can be easily edited</li> </ul> <b>Disadvantages:</b> <ul style="list-style-type: none"> <li>• Software and training can be expensive</li> <li>• Security issues</li> </ul>
<b>CAM</b>	This is using computer software to control machine tools to make products. <b>Examples:</b> Laser Cutter, 3D printer <b>Advantages:</b> <ul style="list-style-type: none"> <li>• Faster</li> <li>• Complicated shapes are easily produced</li> <li>• Exact copied are easily made</li> <li>• Machines can run 24/7</li> </ul> <b>Disadvantages:</b> <ul style="list-style-type: none"> <li>• High initial set up costs as CAM machines are expensive</li> </ul>

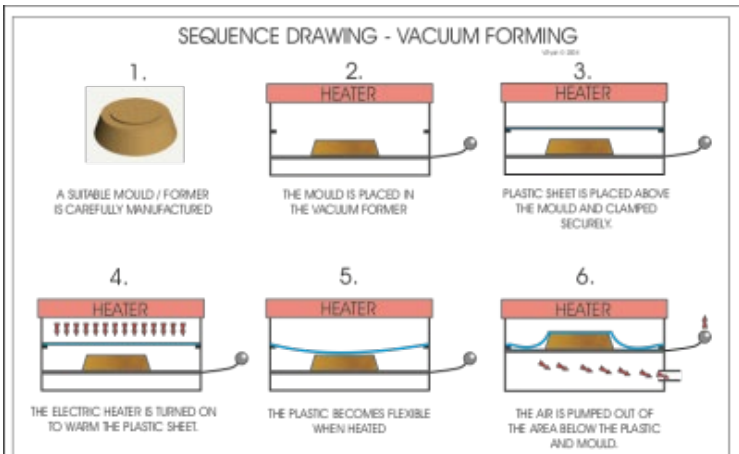


Most polymers are synthetic. This means they are man-made. They are usually made from crude oil which can be obtained by drilling underground or under sea level. Crude oil is a non-renewable resource- this means that it is not replaced as it is used.

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

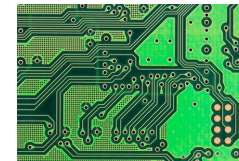
**Thermosetting polymers** cannot change shape when reheated and cannot be recycled. They have extra links between the individual chains of polymer. These links stop the chains being able to move, meaning that thermosetting polymers are typically stronger and more rigid than thermoplastics polymers.

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



## Thermoplastic Polymers

Type	Properties	Uses
<b>HDPE</b> <i>High Density Polyethylene</i>	Strong and stiff	Pipes, buckets, bowls
<b>PET</b> <i>Polyethylene Terephthalate</i>	High strength and good toughness. Heat resistant	Drinks bottles and food packaging
<b>HIPS</b> <i>High Impact Polystyrene</i>	Reasonable strength and good toughness	Packaging
<b>Acrylic</b>	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

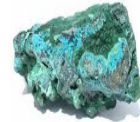


## Metal sources

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
<b>Cast iron</b>	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
<b>High-carbon steel (tool steel)</b>	Hard but brittle, less malleable than mild steel, good electrical and thermal conductivity	Taps and tools, eg screwdrivers and chisels
<b>Low-carbon steel (mild steel)</b>	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
<b>Aluminium</b>	Light in weight and malleable but strong, a good conductor of heat and corrosion resistant	Drink cans, saucepans, bike frames
<b>Copper</b>	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
<b>Silver</b>	A precious metal that is soft and malleable when heated, highly resistant to corrosion and an excellent electrical conductor of heat	Jewellery

# Food Technology Knowledge Organiser



## 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



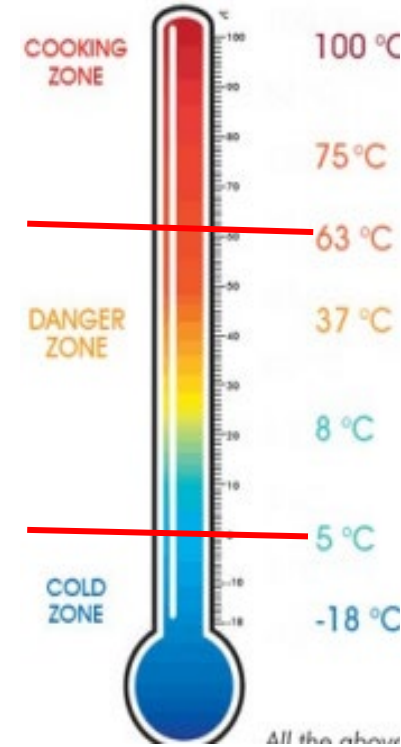
### 6. Get active and try to be a healthy weight



### 7. Drink plenty of water



### 8. Don't skip breakfast



**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

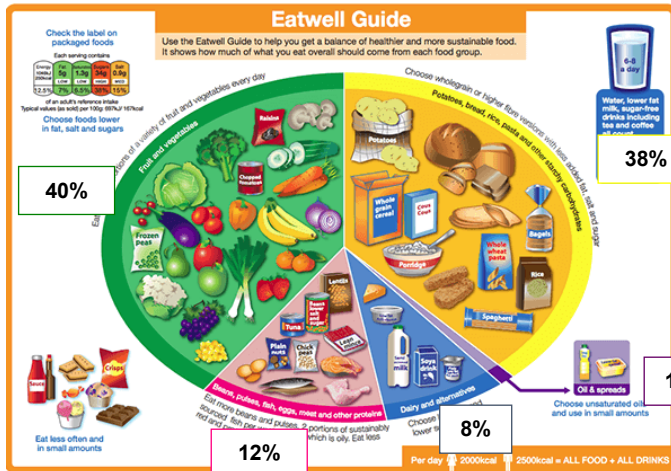
Microorganisms are dormant below 5°C.

Above 63°C they are killed.

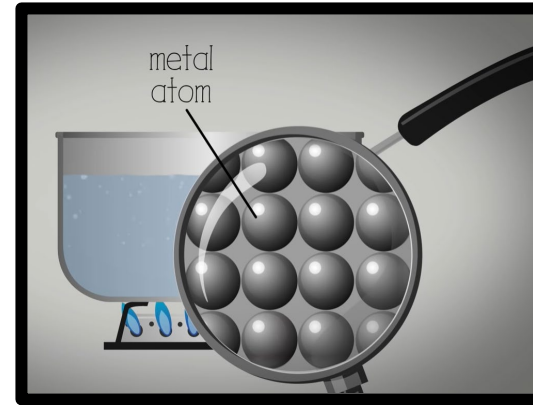
Reheat foods :75°C

## 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



# Food Technology Knowledge Organiser



## 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.



### Why food is cooked:

- To make it safe to eat
- To improve the shelf life
- To develop flavour
- To improve texture
- 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

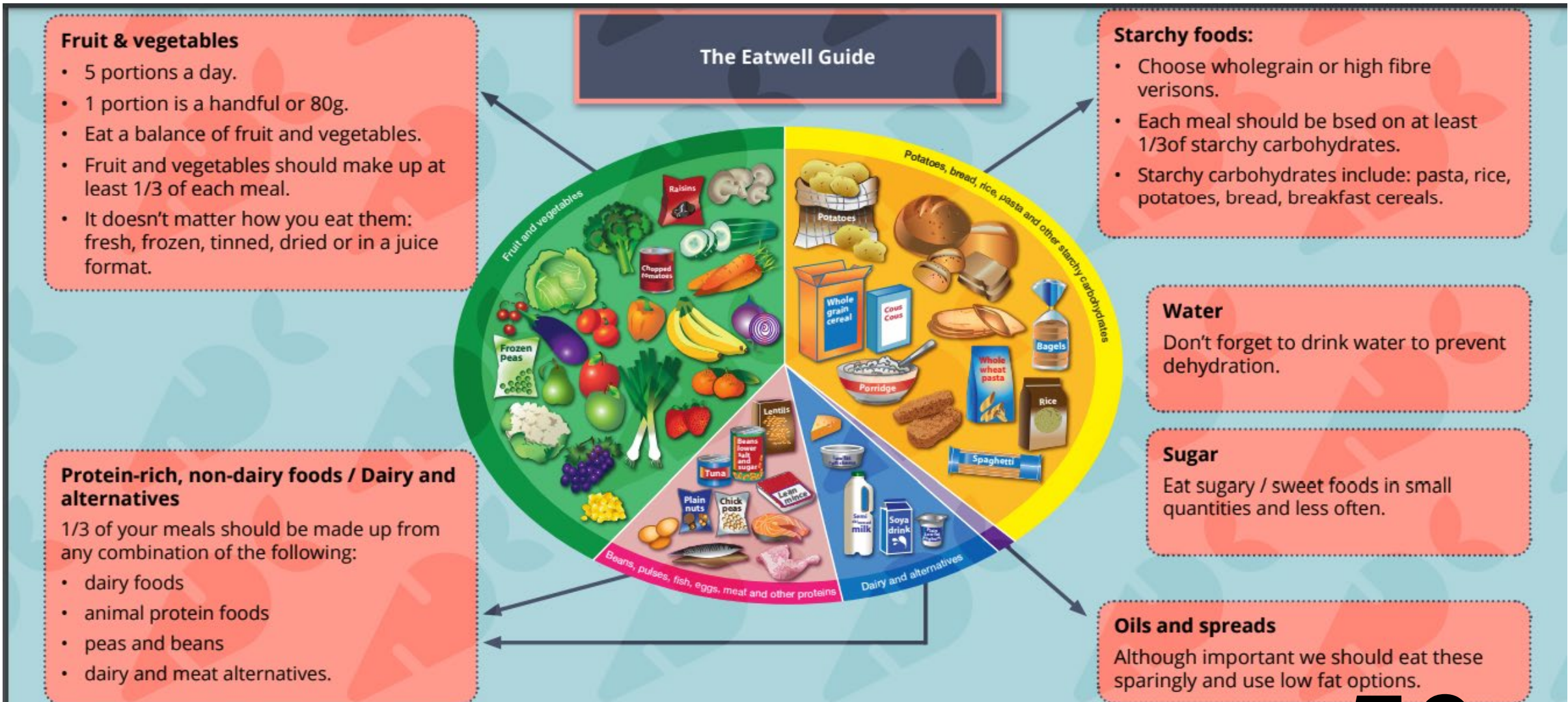
## Effect of cooking on protein

**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

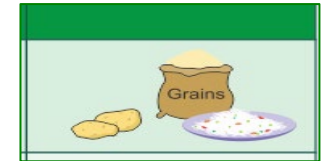




# Food Technology Knowledge Organiser




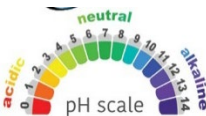

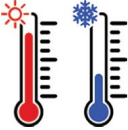


Nutrient	Functions	Sources
<b>Protein</b>	<p>Growth – known as the body's building blocks.</p> <ul style="list-style-type: none"> <li>*for growth, in particular during pregnancy and adolescence</li> <li>*to repair body cells and tissues, including recovery after illness or injury</li> <li>*to produce enzymes needed for digestion</li> <li>*to produce hormones that control body functions</li> </ul> <p>protein provides a secondary source of energy</p>	<p>Animal products – meat, fish, dairy; plants – lentils, nuts, seeds</p>
<b>Carbohydrates</b>	<p>Source of energy. Divided into: simple carbohydrates – sugars and complex carbohydrates – starches and dietary fibre. Starches provide slow releasing energy and add bulk</p>	<p>complex – bread, pasta, rice, potatoes (chose wholemeal versions for fibre and potato with the skin)</p>
<b>Fats</b>	<p>Source of energy, insulation and Helping your body absorb fat-soluble vitamins (A, D, E, and K)</p> <p>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</p>	<p>Monounsaturated – olive oil, avocados; polyunsaturated – oily fish, nuts, sunflower oil, soya beans; saturated – full-fat dairy, fatty meats; and trans fats – many snack foods</p>
<b>Vitamin A, D &amp; C</b>	<p><b>A</b> for healthy eyes, skin and immune system</p> <p><b>D</b> The main function of vitamin D is to help the body absorb calcium for strong teeth and bones</p> <p><b>C</b>-helps heal wounds and prevents scurvy. Helps absorb iron</p>	<p>A – dairy, oily fish, yellow fruit; D – oily fish, eggs, fortified cereals C – citrus fruit, broccoli, sprouts, berries, kiwi</p>
<b>Minerals- Calcium</b>	<p>Essential for many processes, eg bone growth/strength, nervous system, red blood cells, immune system. Need small amounts only</p>	<p>Calcium – milk, canned fish, broccoli; iron – watercress, brown rice, meat; zinc – shellfish, cheese, wheatgerm; potassium – fruit, pulses, white meat</p>



# Food Technology Knowledge Organiser




## Conditions for Microorganism growth (FATTOM)

<p><b>F</b></p> 	<p><b>Food</b>-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.</p>
<p><b>F</b></p> 	<p><b>Acid</b>-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.</p>
<p><b>A</b></p> 	<p><b>Time</b>- 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.</p>
<p><b>T</b></p> 	<p><b>Temperature</b>-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 <b>danger zone</b> as it is dangerous for some foods to be in this temperature range for prolonged periods of time.</p>
<p><b>T</b></p> 	<p><b>Oxygen</b>-Microorganisms that that require oxygen to grow are called aerobic such as most yeast.</p>
<p><b>O</b></p>  <p><b>M</b></p>	<p><b>Moisture</b>-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.</p>

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

### 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



# Satchel:one log in guide



satchel:  
one

How to Log into satchel:one

1. At the Log in Screen, Click 'Sign in with Office 365'

Login [Forgot password?](#)

Staff Parent Student

Sale High School

Enter email address or username

Enter password

Log in

Or log in with:

Sign in with Office 365

Sign in with Google

Sign in with RM Unity

Sign in to your account - Profile 1 - Microsoft Edge

https://login.microsoftonline.com/common/oauth2/authorize?re...

Microsoft

Sign in

No account? [Create one!](#)

Can't access your account?

Next

Sign-in options

Terms of use Privacy & cookies

2. Type in your school email address.

Your School Email Address is made up from the year you started Highschool,

Year Started	School Year
23	7
22	8
21	9
20	10
19	11

Follow this with your first initial, second name, and the school domain address (@salehighschool.org.uk)

e.g: 21BDrake@salehighschool.org.uk

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# Satchel:one log in guide



satchel:  
one

3. Enter your password.  
This is a six digit number.  
(Your teachers can give you)



← 21BDrake@salehighschool.org.uk

Enter password

Password

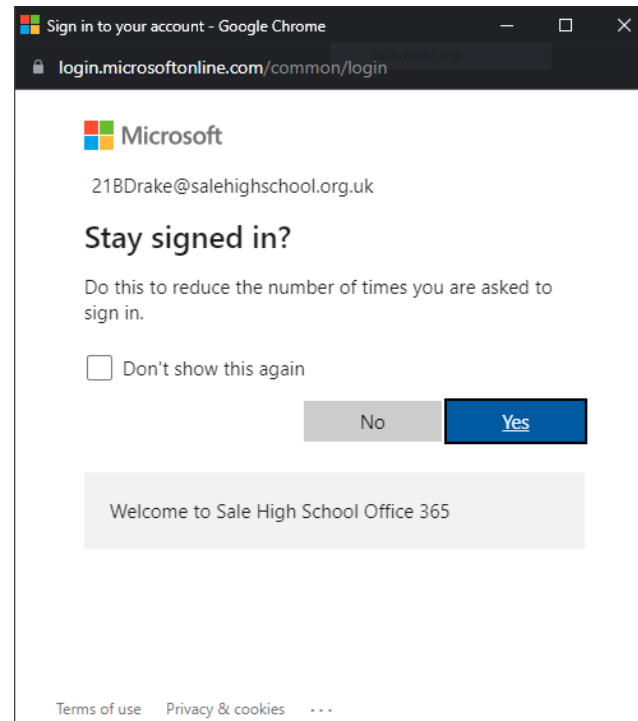
[Forgot my password](#)

Sign in

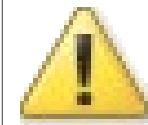
Welcome to Sale High School Office 365

4. Finally, Office 365 asks about signing in.

Yes can be pressed if your log in is from your phone or own computer.



Logging into Satchel:one in this way is the same on all devices:  
PC, Laptop, Tablet, iPad, and Phone.



**PLEASE BE PATIENT!**

If you are on a mobile device (phone or tablet) Satchel often 'snaps' back to the original log in screen. Wait for a few seconds and the system will change to your logged in account.

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