



Knowledge Organiser
Summer Term
2023/24
Year 9





A Knowledge Rich Curriculum at Great Sankey High School

Research around memory suggests that if knowledge is studied once and not revisited or revised, it is not stored in the long-term memory. This means that after one lesson, or revising for one test, the knowledge will not be retained unless it is studied again. To ensure that knowledge is embedded in the long term memory it must be revisited frequently. Ensuring knowledge is embedded aids understanding, and in turn makes future learning more successful. To quote Daniel Willingham's learning theory,

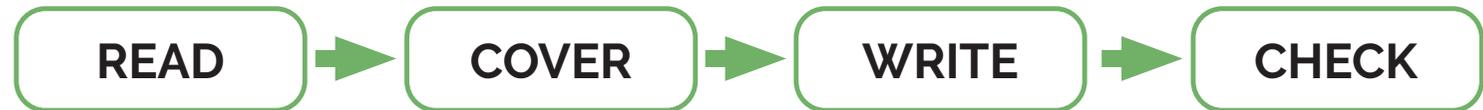
“Thinking well requires factual knowledge that is stored in our long-term memory”

As part of home learning, students should be revising what they have been taught recently but also content they were taught previously. Therefore, as part of our strategy to embed learning over time we have developed knowledge organisers across years 7, 8 and 9. These will provide key content and knowledge allowing students to pre-learn and re-learn, a vital part of processing all the information required to be successful. This knowledge will form the backbone of assessments in school.

How to use your knowledge organiser

Knowledge organisers will be used in subject lessons, homework activities and form time and therefore you need to bring your knowledge organiser to school every day.

Ensuring that knowledge is retained into your long-term memory and you are ready for tests takes work!



To encourage students to build good study habits, students will be assigned homework quizzes on a week A through Class Charts and Teams. Students will be expected to use revision strategies such as read, cover, write, check to learn key knowledge and will then complete the quizzes to demonstrate their learning. Completion of these quizzes is an essential homework activity and will be closely monitored by the pastoral team.

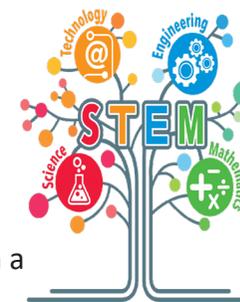
Other methods that you may wish to try at home are listed below:

- Create mind maps.
- Create flashcards.
- Get sticky with your learning: write out key points from the KO as you read over it on post-it notes.
- Write your own basic recall quizzing questions around the keywords, definitions and key facts that you need to know. Test yourself with these questions and then leave it overnight to answer them the next day.
- Write your own challenging questions using the following command words – explain, compare, evaluate. Then create a model answer for these questions.
- Put the key words from your KO into new sentences.
- Make mnemonics to remember the order of particular concepts.
- Draw a comic strip, storyboard or a timeline describing any series of events that have a chronological order.
- Write yourself or a partner some quiz questions. Quiz each other or swop your questions to see if you can answer each other's questions.
- Think about the big picture – why is knowing specific information important to you/other people/society/companies/science/technology? The more links that you can make, the more meaningful you make your learning and the more likely it is that you will remember it. Think about the big picture – are there any links in the content on your KO to anything that you have watched on TV, read about or heard in the news?
- Give yourself spelling tests.
- Definition tests.
- Draw diagrams of key processes or theories.
- Draw images and annotate/label them with extra information.
- Create fact files.
- Create flowcharts for descriptions or explanations that have a chronological order.
- Summarise in your own words each section.
- Get your parents/carers to test you.
- Pick out key words and write definitions.
- Pre-learning (read a section of your knowledge organiser prior to the lesson).
- Learn key quotes (if applicable). Consider what you may say about these quotes e.g. what the author is trying to make you think/feel, their choice of language, what can be inferred from it.
- Write a letter/blog/article to someone explaining a key idea or concept.
- Prepare to overcome any hurdles: write down any questions or any areas of the KO that you feel you need to speak to your teacher about.
- Use the guidance that may have been given with a specific KO to help you learn the information and use it.

***“Don't practise until
you get it right.
Practise until you
can't get it wrong.”***



Portable Knowledge in STEM at KS3



STEM stands for **Science**, **Technology**, **Engineering** and **Maths**, and it is important that you can see connections between each of these subjects. In the real world there are very few challenges that only require one set of skills. For example, you wouldn't be able to design a new app, video game or computer program without an understanding of all of the STEM concepts. This section of the knowledge organiser will show you how different STEM subjects have things in common, including examples of how you might use them, and how some things may actually appear slightly different from one subject to the next. As Geography is a Natural Science we can include that too.

EXAMPLE	SCIENCE	TECHNOLOGY & ENGINEERING	MATHS	GEOGRAPHY
Tally chart	Can be used to record the number of pupils in different height ranges in biology.	Can be used when choosing a final design choice from a selection of draft designs.	Can be used to record the number of pupils with different eye colours, or what their favourite colour, favourite animal or favourite subject is.	Can be used to used record the number of pedestrian or cars that pass a certain place.
Pie chart	Can be used to display the number of pupils with different eye colours in biology.	Can be used to display results of a tally chart.	Can be used to display the number of pupils who travel to school in different way.	Can be used to display the use of renewable and non-renewable energy resources.
Bar chart	Can be used to display the number of people with different blood groups in biology.	Can be used to display results of a tally chart.	Can be used to display the number of pupils with a different favourite sweet.	In geography the term histogram and bar chart are interchangeable and are used to display the percentage of forest lost in a range of countries for example.
Histogram	This is similar to a bar chart, but the bars touch each other and they represent continuous data that is grouped, for example number of pupils in different height ranges in biology.	x	Can be used to display number of pupils in different height ranges.	
Line graph	Can be used to display the time taken for salt to dissolve at different temperatures in chemistry.	Can be used to represent trend data during research pieces.	In maths, these are sometimes called scatter graphs or timeseries graphs. They can be used to display house prices or life expectancy.	Can be used to display temperatures of each month in different countries or rainfall in mm.
Line of best fit	In biology a line of best fit can be point to point, but in chemistry they are most often a straight line. In all 3 sciences they could be a curve depending on distribution of the points. For example: the extension of a spring in physics.	x	In maths, you might be asked to add a line of best fit to a scatter graph. It is always a straight line drawn with a ruler and can be used on graphs to show correlation between hours of revision and score in test or temperature and number of ice creams sold.	x

Portable Knowledge in STEM at KS3



Hopefully this section of the knowledge organiser will help you spot where things crossover from one STEM subject to another as you move from lesson to lesson. REMEMBER some things are exactly the same, some are very similar but might be called different things, and some things are different altogether!and don't forget STEM stands for **Science, Technology, Engineering and Maths**

EXAMPLE	SCIENCE	TECHNOLOGY & ENGINEERING	MATHS	GEOGRAPHY
Range	Range around a mean can be used with data for heart rate after exercise in Biology, amount of hydrogen gas produced in a chemical reaction in Chemistry and number of times a ball bounces in Physics.	x	Range around a mean can be used with data for heights, goals scored in a football match . In maths, this includes looking at a table for ungrouped and grouped data.	Range when looking at rainfall and temperature data for different locations. Used when using development indicators such as literacy rate, life expectancy etc.
Mean, Median and Mode	Mean, median and mode can be used to analyse any sets of data with a range of results.	x	Mean, median and mode can be used to analyse any sets of data with a range of results.	Mean, median and mode can be used to analyse any sets of data with a range of results.
Continuous data	This is where you have any value in your data. In science an example would be length.	x	This is where you have any value in your data. In maths an example would be length.	This is where you have any value in your data. An example would be mm of rainfall.
Discrete data	In science this is sometimes called discontinuous data. An example would be blood group or eye colour in Biology.	x	Sometimes called primary or secondary data. Examples include age, shoe size, result from rolling a dice or the number of pets people have.	x
Using co-ordinates	x	x	4 and 6 figure grid references are used when plotting in 4 quadrants and used in transformations.	Both 4 and 6 figure references are used across all topics in geography to locate places from a map.
Taking measurements that are accurate and precise	Accurate data is close to the true value and precise data gives similar results if you repeat the measurement. In science there are far too many examples to mention!	Used when marking out materials prior to cutting and quality during checking when manufacturing a component.	4 and 6 figure references used across all topics to locate places from a map.	Measurements and accuracy are very important when studying map skills, especially when looking at scale and distance.

Tier 2 Vocabulary

Year 9 Term 3		Definition	Contextual Sentence
1	furthermore	In addition; besides	Reading is a good way to increase your vocabulary and furthermore, it can also help you relax.
2	ignored	Refuses to take notice of or acknowledge; disregarded on purpose.	The book raises questions that cannot be ignored.
3	incentive	Something that motivates or encourages someone to do something.	Players receive a pay bonus for every game they win, as an added incentive.
4	incidence	The occurrence or frequency of a disease, crime, or other undesirable thing.	There is a high incidence of crime in the area.
5	incorporated	To include, combine or bring things together.	Butter and eggs are then incorporated into the mixture.
6	index	An alphabetical list of names/subjects with reference to the pages on which they are mentioned.	Check the index at the back of the book.
7	inhibition	Something that forbids or restricts you from doing something.	She laughed loudly and without inhibition.
8	initiatives	Strategies intended to resolve a difficulty or improve a situation; fresh approaches to something.	The school launched several new initiatives against bullying.
9	input	What is put/taken in or operated on, by a process or system.	The input of data to the system is very important.

10	instructions	Detailed information about how something should be done or operated.	Follow the instructions carefully in order to build the circuit.
11	intelligence	The ability to acquire and apply knowledge and skills.	She impressed us with her superior intelligence.
12	interval	A space of time or distance between events.	The play had an interval between the third and fourth act.
13	lecture	To impart information before an audience or class.	The lecture on biology will start at 2pm.
14	migration	Moving from one country or place to another; to change position or location.	During migration, geese may fly up to 600 miles per day.
15	minimum	The least or smallest amount possible or required.	Noise is kept to a minimum during exams.
16	ministry (2 definitions)	A government department headed by a minister. The work of a minister of religion.	He worked in the Ministry of Defence. A plaque in the church commemorates his ministry there.
17	motivation	A reason(s) for acting or behaving in a particular way; enthusiasm.	A place in the next round was all the motivation the players needed.
18	neutral	Not supporting or helping either side in a conflict, disagreement, etc.	The country remained neutral during World War 1.
19	nevertheless	In spite of.	She didn't win, but enjoyed the game nevertheless.
20	overseas	In or going to a foreign country, especially one across the sea.	He spent quite a lot of time working overseas.

21	preceding	Coming before something in order, position, or time; to go in front of	In the preceding year, a new monarch had taken the throne.
22	presumption	An idea that is taken to be true on the basis of probability.	In our legal system, the presumption is that you are innocent until proven guilty.
23	rational	Based on reason or logic.	There is a rational explanation for the strange noises.
24	recovery (2 definitions)	The return to a normal state of health, mind, or strength. The action of regaining possession or control of something stolen or lost.	He made a full recovery after injury. The museum is offering a reward for information leading to the recovery of the stolen painting.
25	revealed	Caused or allow something to be seen/known.	The winner of the competition will be revealed at the end of the month.
26	scope	The extent of the area/subject matter that something deals with	We widened the scope of our investigation.
27	subsidiary	Less important than but related to something.	The company is a subsidiary of a large, multinational corporation.
28	tapes	Narrow strips of material.	Tapes were used to mark out the area.
29	trace (2 definitions)	Find or discover by investigation. A mark or other indication of the existence or passing of something.	Police are trying to trace a white van seen in the area. Some traces of the Roman road can still be seen.
30	transformation	A marked change in form, nature or appearance.	A caterpillar's transformation into a butterfly has long fascinated humans.

31	transport	Take or carry people or goods from one place to another by means of a vehicle, aircraft or ship.	The government wants more people to use public transport instead of private cars.
32	underlying (2 definitions)	Lying beneath or below. To be the cause or basis of something.	The underlying rock is granite. Tests gave no indication of an underlying cause.
33	utility	The state of being useful, profitable, or beneficial.	Utility companies provide water, gas and electricity.
34	adaptation	Something that is adapted or changed in order to improve / make it better suited.	Being able to change colours is a biological adaptation of the chameleon.
35	adults	People who are fully grown or developed.	The film is suitable for both children and adults.
36	advocate	A person who publicly supports or recommends a particular cause or policy.	He is an advocate of living a healthy life and exercises every day.
37	aid	To help or support.	Good diagrams can aid revision.
38	channel	A length of water joining two larger areas of water, especially two seas.	The English Channel separates Dover and Calais.
39	chemical	Relating to chemistry; a substance, especially one which has been artificially prepared or purified.	Photosynthesis converts light energy from the sun into chemical energy for plants.

What is narrative writing?

A narrative is a story that shares a sequence of events, characters, and themes. It expresses experiences, ideas, and perspectives that should aspire to engage and inspire an audience. A narrative can spark emotion, encourage reflection, and convey meaning when done well.

Narrative features:

Language: Use descriptive and figurative language to create imagery in your story. Even when you are writing a narrative

Perspective: Narratives can be written from any perspective but are most commonly written in first or third person

Tense: If you change tense, make it perfectly clear to your reader what is happening. Analepsis (flashbacks) and prolepsis (flashforwards) can be used as part of your narrative.

Motifs

A motif is a recurring image or ideas in a text.

Motifs are repeated throughout the story. In fact, “motif” is a French word that translates to “pattern.” If you notice the same object, phrase, or symbol multiple times throughout the story, it’s probably a motif.

Motifs point to a larger theme or concept. Oftentimes, a motif will recur in similar situations throughout the story. It can also be used to generate a mood, create symbolism, and engage with readers.

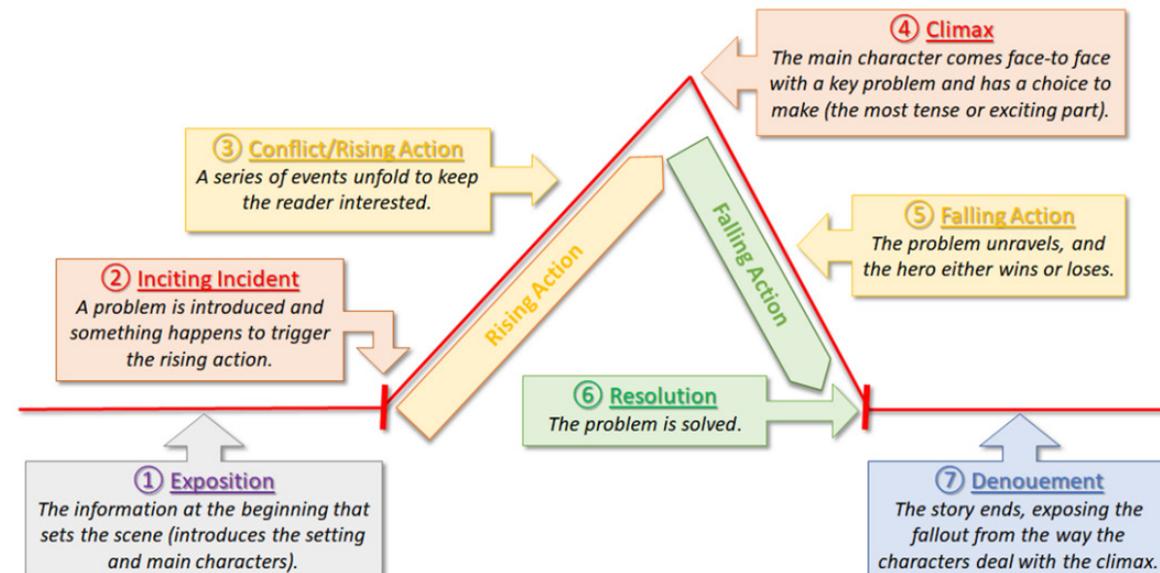
Motifs work by appearing during key moments throughout the story.

Description and the five senses

- Tactile (Touch): Think about texture, or how the surface of something you’re touching feels
- Auditory (hearing): Are you hearing a scrape, or a scratch? A wail or a sob? Consider the different descriptions that you can use for sound.
- Visual (sight): What can you see? What does it look like? How would you describe: colours, textures, movements?
- Gustatory (taste): Consider things like flavors and textures for example, what can you taste at the beach compared to what can you taste in a forest?
- Olfactory (smell): Think about what smells stand out for you and how everyday smells can add to description and add to emotions e.g. why do some smells appear unpleasant where as others are inviting.

Narrative perspective

- 1st person perspective: written as if the narrator is a character, observing or taking part in the story
- 2nd person perspective: written as if the narrator is talking directly to the reader
- 3rd person perspective: written as if the narrator is talking about the characters and events, but not necessarily a character in them.
- Limited narrator: A narrator aligned to a specific character, knowing nothing outside of that character’s thoughts and interactions with the world and story.
- Omniscient narrator: A narrator who is god-like, able to move from place to place and character to character, realigning the reader to any perspective they wish to share.



Language features	
Metaphor	Describing something by saying it is something else, e.g. 'he was a lion in battle' might show a soldier as fierce or brave.
Extended Metaphor	Using the same metaphorical theme throughout the text, e.g. describing a sports match as a war battle.
Simile	Describing something by saying it is like something else using like or as, e.g. 'her smile shone like the sun' would suggest a bright smile and a happy mood.
Personification	The attribution of human characteristics to something non-human, e.g. 'the angry sea grabbed and threw the boat across the choppy waters' would show rough and dangerous weather.
Alliteration	When two or more words that start with the same sound are repeated in a phrase or sentence. e.g. 'softly spoken, towering trees'
Oxymoron	A figure of speech that combines contradictory words with opposite meanings 'bittersweet', 'old news' or 'beautiful monster'. The contrast showing how things can be contradictory.
Juxtaposition	When words or ideas near to each other in a sentence, paragraph or text have contrasting meanings.
Noun	Words for people, places, things, e.g. 'the muddy dog jumped eagerly onto the table'.
Adjective	Words that describe nouns, e.g. 'the muddy dog jumped eagerly onto the table'.
Verb	Words for action, e.g. 'the muddy dog jumped eagerly onto the table'.
Adverb	Words that describe verbs or adjectives, e.g. 'the muddy dog jumped eagerly onto the table'.
Preposition	Words that indicate place or time and how words in a sentence relate to each other, e.g. 'the muddy dog jumped eagerly onto the table'.
Semantic & Lexical Fields	A semantic field is a group of words with similar meanings or connotations in a text, e.g. in the semantic field of ghostly, you might have 'fear', 'shiver', 'eerie', 'pale', etc. However a lexical field is a group of words that relate to the same topic, e.g. in a lexical field of the supernatural, you might have 'ghost', 'vampire', 'graveyard', 'abandoned house', 'spirit', 'bats', 'moonlight', etc.
Structural Features	
Sentence Functions	Declarative: stating information, e.g. 'I am taking the dog for a walk.' Interrogative: asking questions, e.g. 'Are you taking the dog for a walk?' Exclamatory: emotionally stated information, often ending with an exclamation mark, e.g. 'This dog needs a walk NOW!' Imperative: an order or command, e.g. 'You will take the dog for a walk.'
Sentence types: - complex - compound - simple	Complex: containing a main (makes sense on its own) and a subordinate (must be linked to another) clause. E.g. 'If you're going for a walk then remember to take some water.' Compound: two or more main clauses linked by a conjunction (a 'joining' word, e.g. 'and'). E.g. 'We went for a walk and enjoyed the fresh air.' Simple: one main clause (makes sense on its own). E.g. 'We went for a walk.'
Repetition	When words are repeated in any way within a text. E.g. 'Everyone lived in the same small brick houses, on the same kind of long and narrow streets, all leading to the same tall factory chimneys in one direction and the same dark and brooding moors on the other.'
Listing	When items are noted one after the other. E.g. 'The cold, dark and brooding moors.'
Anaphora	(A type of repetition) When a series of sentences begin in the same way. E.g. Martin Luther King's 'I have a dream' speech had many lines beginning with the phrase 'I have a dream'.
Setting	The time and place in which the story takes place. Can include things like the weather, the historical period, the social structures and any other details about the surroundings. The settings create a backdrop to the story and help create mood and atmosphere. E.g. 'As I looked up at the cold, dark and brooding moors I saw a flash of lightning followed by the deep roar of thunder and raindrops began to fall like bullets from the sky...'
Plot	The events and the organisation and sequencing of them that make up the story. E.g. in the nursery rhyme 'Humpty Dumpty', he first sits on the wall, then he falls off, then all the King's horses and men arrive, but cannot put him back together again. The events and the order of them are each important.
Theme	An underlying message or meaning conveyed by the story. E.g, the story might tell us something about love, conflict, betrayal, friendship, bravery, loyalty, all of these things or something completely different. Stories generally have several linked themes.

Julius Caesar

William Shakespeare

Context

In 'Julius Caesar', Shakespeare explores the key moments of transition in the history of Rome. For over a thousand years, the Romans had ruled the greatest empire the world had ever seen. Even after its decline, and ultimate fall, the Western world used Rome as a model of excellence.

By the end of the Roman Civil War in 45BC, Caesar had been appointed 'Imperator' which meant Roman leader for the rest of his life. Caesar used his power to carry out much-needed reform, relieving debt, enlarging the senate, building the Forum Julium and revising the calendar.

The play is set in 44BC, when threats to the existence of the Roman Empire were common and there was a lot of political infighting in Rome. Some feared that Julius Caesar's rule would lead to the enslavement of Romans, and so a group of conspirators came together and assassinated him. Caesar was assassinated on the 15th March, also known as the Ides of March. The play covers the events before and immediately after the assassination of Caesar.

Shakespeare may have been drawing parallels between Rome's shift from a republic to an imperial power and the power shift in England towards the monarchy. As Elizabeth I had no heirs, many feared her death would plunge the country into chaos. Censorship meant it would be dangerous to comment on this in 1599, when the play was first performed, but Shakespeare was able to do so through Julius Caesar.

Aristotle and The Art of Rhetoric

With the emergence of democracy in the city-state of Athens, public speaking became an essential skill for politicians and ordinary people. In response, Aristotle outlined 'The Art of Rhetoric': pathos, ethos and logos. Suddenly the art of persuasion was at the heart of government. If you could learn the art of Rhetoric, you could hold enormous power and influence.

Key Ideas

- Public vs Private Self
- Fate vs Freewill
- Misinformation and Misreading
- Dictatorship and Power
- Ambition

Characters in Shakespeare's Julius Caesar

- Caesar- Dictator who ignores the soothsayer's and his wife's warnings
- Cassius – Conspirator influencing others to plot Caesar's assassination
- Brutus – Conspirator influenced by honour and Roman republicanism
- Antony- Caesar's general who incites the mob against the plotters
- Decius – Conspirator who convinces Caesar to come to the Capitol
- Calpurnia – Caesar's loyal wife who dreams of his murder and warns him.
- Portia – Brutus' wife. She wants her husband to confide in her/
- Casca – Conspirator who strikes the first blow in Caesar's murder
- Cinna – Conspirator who announces Caesar's assassination



Keyword	Definition	Contextual sentence
Dictator	A ruler with total power over a country, typically one who has obtained control by force.	Caesar ruled as a dictator.
Empire	A group of nations or peoples ruled over by an emperor, empress or other powerful sovereign/ government.	The Roman Empire covered mainland Europe and England.
Alliance	A relationship based on similarity of interests, nature or qualities	They formed an alliance to overthrow Caesar.
Civil War	A war between citizens of the same country	The signed a peace treaty to end Rome's civil war.
Republic	a state in which supreme power is held by the people and their elected representatives, and which has an elected or nominated president rather than a monarch.	The Roman Empire was a republic.
Liberty	the state of being free within society from oppressive restrictions imposed by authority on one's way of life, behaviour, or political views; not imprisoned or enslaved.	Individuals should enjoy the liberty to pursue their own preferences.
Ambition	a strong desire to do or achieve something.	His ambition was to rule the Roman Empire.
Conflict	a serious disagreement or argument, typically a protracted one.	There was a conflict between three different individuals who wanted to rule.
Oath	a solemn promise, often invoking a divine witness, regarding one's future action or behaviour.	They took an oath of allegiance to the Emperor
Quarrel	a heated argument or disagreement, typically about a trivial issue and between people who are usually on good term.	I have no quarrel with you!
Conspirators	Someone who conspires; plots	A group of conspirators assassinated Julius Caesar
Regicide	Killing a monarch, usually a king	He committed regicide.
Tyrannicide	Killing a tyrant	They needed to commit tyrannicide to bring order back to the Republic.
Hamartia	A fatal flaw leading to the downfall of a tragic hero or heroine.	His hamartia was his ambition.
Hubris	Excessive pride or self-confidence	He suffered from hubris in his own ability to rule.
Peripeteia	(Greek: "reversal") the turning point in a drama after which the plot moves steadily to its denouement	
Anagnorisis	(Greek: "recognition"), in a literary work, the startling discovery that produces a change from ignorance to knowledge	
Catharsis	The process of releasing, and thereby providing relief from, strong or repressed emotions.	
Tragic Hero	A character, usually of noble birth, with heroic qualities who makes a judgement or error that inevitably leads to their destruction.	
Tragic Decorum	The idea that plays in the tragic genre should follow specific rules	
Rhetoric	The art of effective or persuasive speaking or writing	
Patriarchy	A system of society or government in which men hold the power.	
Protagonist	The main character is a literary work.	
Dramatic Irony	a literary technique, originally used in Greek tragedy, by which the full significance of a character's words or actions is clear to the audience or reader although unknown to the character.	
Tragedy	Tragedy is a genre of story in which a hero is brought down by his/her own flaws, usually by ordinary human flaws – flaws like greed, over-ambition, or even an excess of love, honour, or loyalty.	

 Year 9 Mathematics Knowledge Organiser	Topic	Key terms – use www.amathsdictionaryforkids.com to help	
	Algebra	Expression	Numbers, symbols and operators (such as + and x) grouped together that show the value of something.
	Manipulation and Solving	Expanding brackets	"Expanding" means removing the () ... but we have to do it the right way!
		Simplify	In general, it is simpler when it is easier to use .
		Factorise	Finding what to multiply to get an expression.'
			3(4x + 9y + 5z) is an expression .
			Expand the expression (x + 5) ²
			Simplify 7x + 4y + 2x – 3y
			Factorise x ² + 8x – 20

Expanding Brackets

To expand brackets: multiply everything in the bracket by the term outside the bracket

Single Bracket Expansion

$$\begin{array}{l} \text{Expanding} \\ 2(g + 4) \\ = 2g + 8 \end{array}$$

$$\begin{array}{l} \text{Expanding} \\ 5n(n + 3) \\ = 5n^2 + 15n \end{array}$$

2 Single Brackets → Expand then Simplify

$$\begin{array}{l} 5(x + 3) + 6(x - 4) \\ 5x + 15 + 6x - 24 \\ = 11x - 9 \end{array}$$

Double Bracket Expansion

$$\begin{array}{l} (x + 7)(x - 4) \\ x^2 - 4x + 7x - 28 \\ = x^2 + 3x - 28 \end{array}$$

How you expand it out is your call - Crab's Claw, FOIL, ... the choice is yours

Factorising

Factorising is the opposite of expanding. You need to identify factors that the terms share... it could be a **number (HCF)**, a **letter** or **both!**

$$\begin{array}{l} 5x + 15 = 5(x + 3) \\ 10x - 12 = 2(5x - 6) \\ 10xy + 15y = 5y(2x + 3) \\ 8x^2y + 4xy^2 = 4xy(2x + y) \end{array}$$

Quadratics

A quadratic is a 3-part equation that is equal to zero and has 2 roots.

Factorise $x^2 + 7x - 18$

Find 2 numbers that **x to -18** and **+ to 7**
2 numbers are 9 and -2

Answer $(x + 9)(x - 2)$

To solve, we equate the brackets to zero.

$$\begin{array}{l} (x + 9)(x - 2) = 0 \\ x + 9 = 0 \quad x = -9 \\ x - 2 = 0 \quad x = +2 \end{array}$$

Inequalities

Inequalities follow the same rules as equations (with one exception see second example!)

As when solving equations, you need to get the unknown on its own on one side of the inequality.

$$\begin{array}{l} 2x - 5 \geq 7 \\ +5 \quad +5 \\ 2x \geq 12 \\ \div 2 \quad \div 2 \\ x \geq 6 \end{array}$$

The exception to the normal rules comes when you divide by a negative number. When you divide by a negative you reverse the symbol

Add or subtract to isolate the variable term. Multiply or divide to solve for the variable. If **multiply or divide** by a **negative number** then **reverse the inequality symbol**.

$$\begin{array}{l} -3x + 5 \leq -16 \\ -5 \quad -5 \quad \text{Subtract} \\ -3x \leq -21 \\ \frac{-3x}{-3} \geq \frac{-21}{-3} \quad \text{Divide by -3, reverse inequality} \\ x \geq 7 \end{array}$$

Averages and Spread

Hey diddle diddle, the **median's** the **middle**
 You **add then divide** for the **mean**
 The **mode** is the one you see the **most**
 And the **range** is the **difference** between
 Yeah!

Median

Find the median of
 6, 4, 3, 6, 7, 11, 9, 15

Put the numbers in order, smallest first

3 4 6 **6** 7 9 11 15

There are two numbers in the middle, 6 and 7 - find halfway between them

$(6 + 7) \div 2 = 6.5$
 So 6.5 is the **median**

Mean

Find the mean of
 8, 6, 2, 3, 11, 12, 0

Find the sum of the numbers.

Total = 42

There are 7 items in the data set (the numbers) so we will divide by 7.

$42 \div 7 = 6$
 So 6 is the **mean**

Mode

Find the mode of
 1, 3, 6, 4, 3, 2, 7, 8, 10

Find the number that appears the most (Putting them in order can help).

3 appears the most (twice) so **3 is the mode**

Range

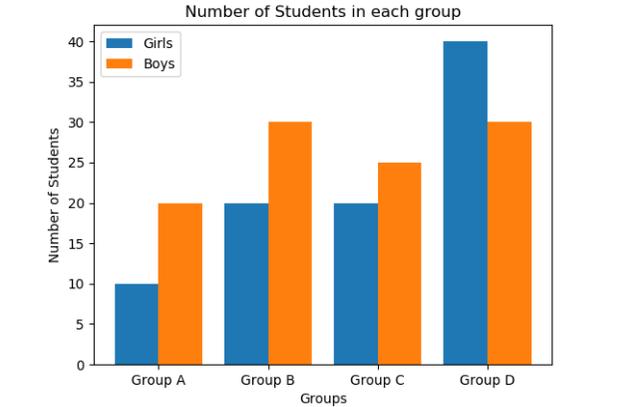
Find the range of
 2.6, 3.7, 2.1, 8.4, 2.9, 3.6

Find the Highest and Lowest numbers and calculate
Highest - Lowest

Highest = 8.4 Lowest = 2.1
Range = 8.4 - 2.1 = 6.3

Bar Chart

A **Bar Graph** (also called Bar Chart) is a graphical display of data using bars of different heights.



The Bar Chart Checklist

- A title** explaining what the bar chart means.
- Labels** that tell you what each bar means. This could be a key or just a label underneath the line that runs along the bottom of the bar graph (the **horizontal axis**).
- The line going up the left-hand side of the bar graph (the **vertical axis**) must have **numbers at equal intervals** (a scale). This tells you how big the bars are so that your reader can read the data.

Two-Way Tables aka Carroll Diagrams

Two-way tables are used to study the relationship between categorical variables. They are also known as **Carroll Diagrams** and are named after **Lewis Carroll** (who wrote Alice's Adventures in Wonderland)

Dominant Hand
 Sample: 20 toddlers, 20 18 year olds.

	Left	Right	Totals
2 years	9	11	20
18 years	15	5	20
Totals	20	20	40

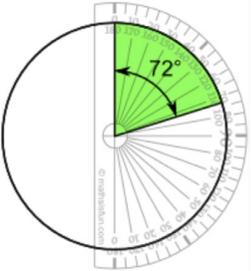
Pie Chart

A **Pie Chart** is a graph using a divided circle where each section represents a percentage of the total. Each section represents a percentage (or a proportion) of the total

The Pie Chart Checklist

Remember that there are 360° in a circle so each group in the pie chart will be a proportion of 360°.

- Draw a circle and mark the centre of the circle
- Draw a radius from the centre of the circle vertically upwards
- Then use your protractor to measure the degrees of each sector.
- Finish up by colouring each sector and giving it a label like "Comedy: 4 (20%)" etc.
- And don't forget a title!



Scatter Diagrams

A **scatter diagram** is a diagram where points are plotted to show the relationship (correlation) between two variables.

Positive Correlation
 A positive trend - as one set of values increases, the other set increases.
 For example, as the temperature went up ice cream sales went up.

Negative Correlation
 A negative trend - as one set of values increases, the other set decreases.
 For example, as the temperature went up hamburger sales went down.

No Correlation
 No trend - the points are scattered randomly with no visible pattern.
 For example, as the temperature went up there was no apparent effect on coffee sales.

From here we could draw a line of best fit



Year 9 Mathematics Knowledge Organiser

Topic

Pythagoras,
Trigonometry,
Quadratics ext

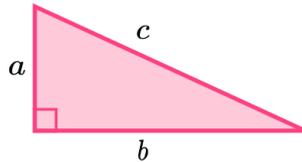
What is the etymology of the word hypotenuse?

The hypotenuse is the side of a right triangle that's opposite the 90-degree angle. It's a term specific to math, specifically geometry. Hypotenuse comes from the Greek word *hypoteinousa* which means "stretching under." The hypotenuse "stretches under" the right angle of a triangle, which has an angle of 90 degrees.

Pythagoras' Theorem

Pythagoras theorem states that the square of the longest side of a right-angled triangle (called the hypotenuse) is equal to the sum of the squares of the other two sides.

Pythagoras' Theorem is $a^2 + b^2 = c^2$



Side c is known as the **hypotenuse**, which is the longest side of a right-angled triangle and is opposite the right angle.

Side a and **side b** are known as the **adjacent** sides because they are adjacent (next to) the right angle.

If we know any **two sides** of a **right angled triangle**, we can use Pythagoras theorem to work out the length of the **third side**.

We can only use Pythagoras theorem with **right-angled triangles**.

How to use Pythagoras' theorem

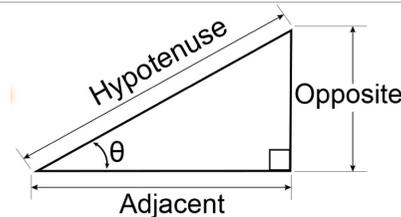
To use Pythagoras theorem:

1. **Label** the sides of the triangle.
2. Write down the **formula** and **apply** the numbers.
3. **Work out** the answer.

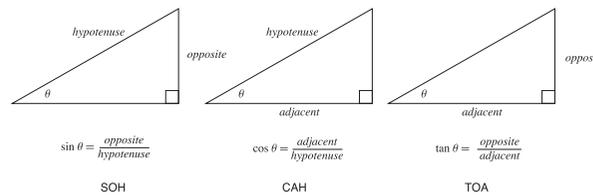
Trigonometry

Trigonometry is a branch of mathematics that studies relationships between side lengths and angles of triangles.

Right-angled Triangles

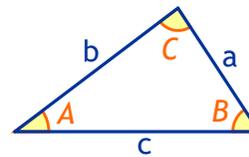


The Trigonometrical Functions



All Triangles

In any triangle ABC where a , b and c are the length of the sides:



The Sine and Cosine Rules

$$\text{sine rule: } \frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\text{cosine rule: } a^2 = b^2 + c^2 - 2bc \cos A$$

Algebra

Quadratic Formula

The **quadratic formula** is a formula that provides the solutions to quadratic equations.

The solution of a quadratic equation of the form $ax^2 + bx + c = 0$ where $a \neq 0$ is

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

You must memorise this!

The \pm in front of the square root means 'plus or minus'

Quadratic equations normally have two solutions, so we need to use the formula twice, once with a + and once with a -.

$$x = \frac{-b + \sqrt{b^2 - 4ac}}{2a}, \quad x = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

The solutions to quadratic equations could involve fractions, decimals or integers.

Getting the quadratic equation ready to use

In order to solve a quadratic equation by using the quadratic formula, it is a good idea to simplify it and make sure it is in the form of the general quadratic equation.

$$ax^2 + bx + c = 0$$

We must ensure **the quadratic equation is equal to 0**, rearranging it if necessary.



Year 9 Mathematics Knowledge Organiser

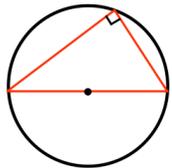
Topic
Summer:
Circle Theorems
and Bearings

Origins and usage of the word 'tangent'

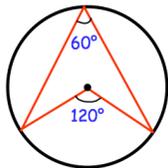
- Tangent is the Latin word for touching (hence it is the line that touches a circle at one point).
- The phrase "going off at a tangent" links to the circle theorem - as the radius is at right angles to the tangent, "going off at a tangent" means to start talking about something that is only slightly or indirectly related to the original subject.

Circle Theorems

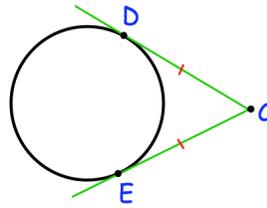
Circles have different angle properties described by different circle theorems. **Circle theorems** are used in geometric proofs and to calculate angles.



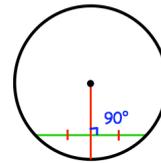
The angle in a semi-circle is 90°



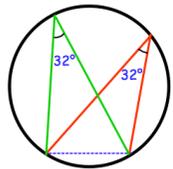
The angle at the circumference is half the angle at the centre



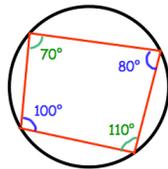
The tangents to a circle from the same point will be equal length



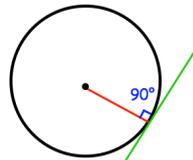
The radius through the midpoint of a chord will bisect the chord at 90°



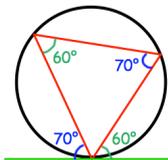
The angles in the same segment from a common chord are equal



The opposite angles in a cyclic quadrilateral always add to 180°



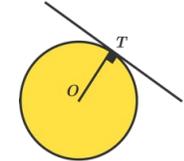
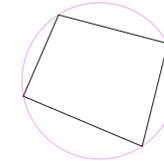
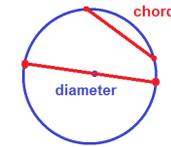
The angle between a radius and a tangent is 90°



Alternate segment theorem
The angle between the chord and the tangent is equal to opposite angle inside the triangle.

Some examples of circles in real life are **camera lenses, pizzas, tyres, Ferris wheels, rings, steering wheels, cakes, pies, buttons and a satellite's orbit around the Earth**. Circles are simply closed curves equidistant from a fixed centre. Circles are special ellipses that have a single constant radius around a centre.

Chord	Cyclic Quadrilateral	Tangent at a point	Bisect	Equidistant
A line segment connecting two points on a curve (or circle)	A quadrilateral whose vertices all lie on a single circle	The straight line that just touches the curve at that point	Dividing a line, shape or angle into 2 exactly equal parts	A point which is at the same distance from two given points



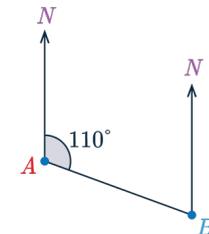
Bearings

Bearings are angles used in navigation. They are based on moving clockwise from due north.

A bearing is **the angle in degrees measured clockwise from North**

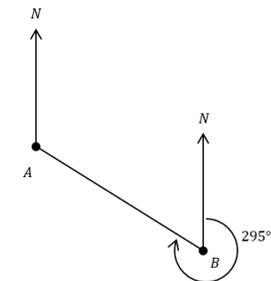
Bearings are usually given as a three-figure bearing. For example, 30° clockwise from north is usually written as 030° .

In the diagram below the bearing of **B from A** is 110°



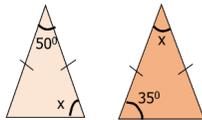
Example

In this diagram the bearing of **A from B** is 295°



How to calculate bearings

Mathematics Command Words – Tier 2 Vocabulary

Assess	Calculate	Compare...and/to/with	Convert	Draw
Make a judgement or decision based on the information you have.	Work out, showing your method where necessary.	Work out or identify the values required and say which is smaller/larger, etc.	Change a value from one numerical form to another or a measure from one unit to another.	Give an accurate depiction of a graph, map, diagram, etc.
Example Application	Example Application	Example Application	Example Application	Example Application
Assess the statements below and decide whether they are true or false	Calculate the missing angles in this diagram...	Compare the following calculations and say which is larger. 23% of 50 or 60% of 20	Convert 0.74 into a fraction in its simplest form.	Draw the graph of $y = x^2$ or values of x from -2 to 2
Estimate	Explain	Find	Give a reason why...	Is this correct?
After rounding given values, give an approximate answer to a calculation or measurement.	Give reasons or examples of why or how.	Figure out or work out the answer or missing piece of information	Show a calculation and/or written evidence to support the given statement.	Give an argument, with reasons, whether the statement is correct or not.
Example Application	Example Application	Example Application	Example Application	Example Application
Estimate the answer to $\begin{array}{r} 8.62 + 22.1 \\ \hline 5.23 \end{array}$ giving your answer to 1 significant figure.	Use the table to explain how you can tell the conversions cannot all be exact..	Find a fraction that is greater than 0.3 but less than 0.4.	Assess the statements below and decide whether they are true or false	Jamal writes the following calculation $\frac{3}{7} - \frac{2}{5} = \frac{15}{35} - \frac{14}{35} = \frac{1}{35}$ Is he correct?
Measure	One has been done for you	Show working to support your answer	Work out	You may use... to help you
Use a ruler to measure a length or a protractor to measure an angle.	The given example shows the format in which the rest of the answers are required.	If you have made a decision, give a calculation (and wording where it helps) that shows why you made it.	One or more calculations will usually be necessary.	A diagram or table has been given that may be helpful in organising your working, but you do not have to use it.
Example Application	Example Application	Example Application	Example Application	Example Application
Measure the angle ABC correct to the nearest degree	The properties of the quadrilaterals are placed into a table. Complete the table. The first one has been done for you	Anya says the answer is _ Deion says the answer is _ . Who is correct? Show working to support your answer	Work out three-quarters of one-fifth of 100	Find the angle x ,  you may use the diagram to help you, including writing on the diagram if needed.



1) The blood

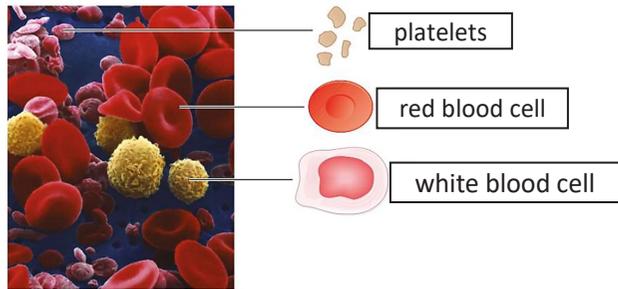


Figure 4 Red blood cells, white blood cells, and platelets are suspended in the blood plasma

Key points

- The blood, blood vessels, and heart make up the human circulatory system which transports substances to and from the body cells.
- Plasma has blood cells suspended in it and transports proteins and other chemicals around the body.
- Your red blood cells contain haemoglobin that binds to oxygen to transport it from the lungs to the tissues.
- White blood cells help to protect the body against infection.
- Platelets are cell fragments that start the clotting process at wound sites.

5) Breathing and gas exchange

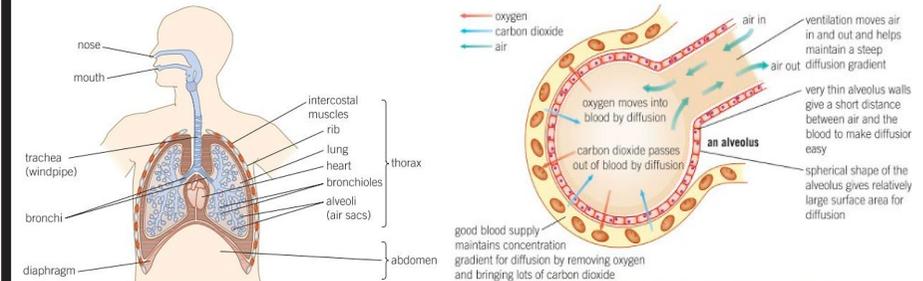


Figure 3 The alveoli are adapted so that gas exchange can take place as efficiently as possible in the lungs

2) The blood vessels

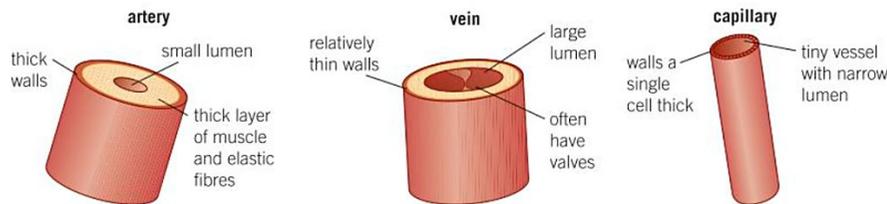


Figure 1 The three main types of blood vessels

6) Breathing and gas exchange

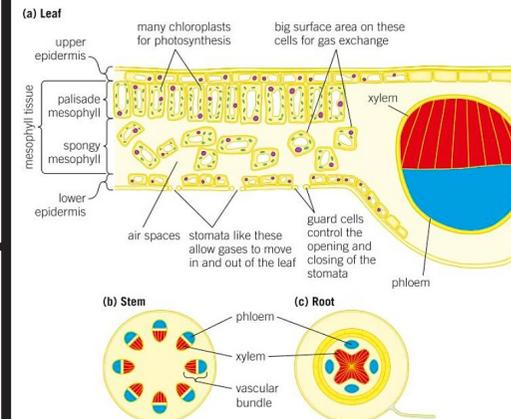


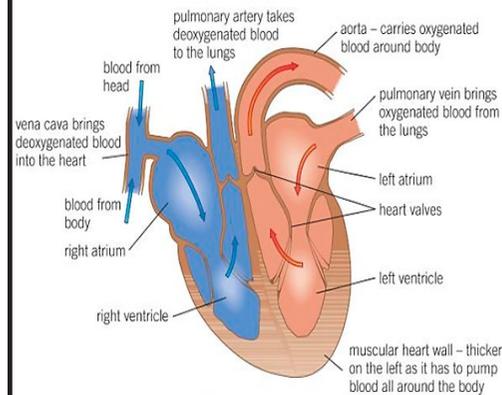
Figure 3 Plants have specific tissues to carry out particular functions. They are arranged in organs such as the: a leaf, b stem, and c roots.

7) Transport systems in plants

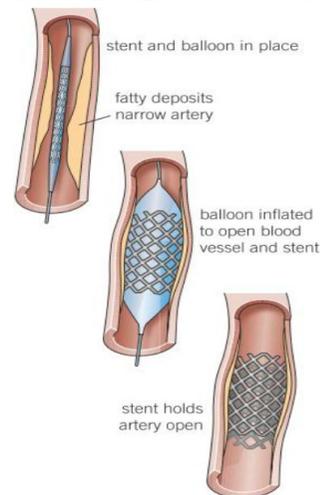
Key points

- Plants have separate transport systems.
- Xylem tissue transports water and mineral ions from the roots to the stems and leaves.
- Phloem tissue transports dissolved sugars from the leaves to the rest of the plant, including the growing regions and storage organs.

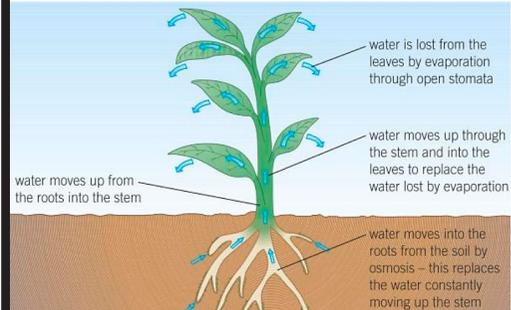
3) The Heart



4) Helping the Heart



8) Evaporation and transpiration



9) Factors affecting transpiration

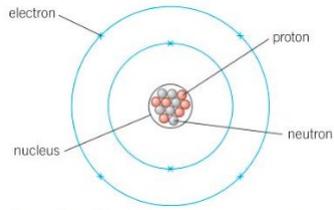
Key points

- Factors that increase the rate of photosynthesis or increase stomatal opening will increase the rate of transpiration. These factors include temperature, humidity, air flow, and light intensity.
- Transpiration is more rapid in hot, dry, windy, or bright conditions.

Year 9 Biology: Organising Animals and Plants Key Vocabulary

Key Word	Definition	Contextualised Sentence
Aorta	The artery that leaves the heart from the left ventricle and carries oxygenated blood to the body.	Oxygenated blood is supplied from the heart to the body mainly through the aorta .
Arteries	Blood vessels that carry blood away from the heart. They usually carry oxygenated blood and have a pulse.	High blood pressure can often be caused from fatty plaque building up in the arteries .
Atria	The upper chambers of the heart.	The atria have valves within them to prevent blood backflowing in the heart.
Capillaries	The smallest blood vessels. They run between individual cells and have a wall that is only one cell thick.	Arteries and veins are linked together thanks to a network of capillaries .
Coronary arteries	The blood vessels that supply oxygenated blood to the heart muscle.	Fatty plaque building up in the coronary arteries can often lead to heart attacks.
Double circulatory system	The circulation of blood from the heart to the lungs is separate from the circulation of blood from the heart to the rest of the body.	The circulatory system of the human body is described as a double circulatory system as there are two separate circulations within the human body.
Epidermal	The name given to cells that make up the epidermis or outer layer of an organism.	The epidermal layer of the leaf often secrete waxy substances that prevent water loss.
Guard cells	Surround the stomata in the leaves of plants and control their opening and closing.	The guard cells control how often the stomata of the leaf open and close.
Haemoglobin	The red pigment that carries oxygen around the body in the red blood cells.	Carbon monoxide, which enters the blood when a person smokes tobacco, makes a person feel breathless as it occupies the Haemoglobin of the red blood cells.
Palisade mesophyll	The upper layer of the mesophyll tissue in plant leaves made up of closely packed cells that contain many chloroplasts for photosynthesis.	The palisade mesophyll layer is located near the top of the leaf to maximise sunlight absorption for photosynthesis.
Phloem	The living transport tissue in plants that carries dissolved food (sugars) around the plant.	The glucose produced from photosynthesis is transported around the plant by the phloem .
Plasma	The clear yellow-liquid part of the blood that carries dissolved substances and blood cells around the body.	The nutrients absorbed from food during digestion are transported around the body in the plasma of the blood.
Platelets	Fragments of cells in the blood that play a vital role in the clotting mechanism of the blood.	When there is an open wound, platelets help the blood to clot and form a clot.
Pulmonary artery	The large blood vessel that takes deoxygenated blood from the right ventricle of the heart to the lungs.	The pulmonary artery carries blood towards the lungs so that it can be replenished with oxygen.
Pulmonary vein	The large blood vessel that carries oxygenated blood from the lungs back to the left atrium of the heart.	The pulmonary vein carries oxygenated blood from the lungs to the heart so it can be pumped around the body.
Red blood cells	Biconcave cells that contain the red pigment haemoglobin and carry oxygen around the body in the blood.	Red blood cells are highly specialised cells that are well adapted to carry oxygen around the body.
Spongy mesophyll	The lower layer of mesophyll tissue in plant leaves that contains some chloroplasts and many large air spaces to give a big surface area for the exchange of gases.	The spongy mesophyll is named due to its sponge-like property of containing air spaces.
Statins	Drugs used to lower blood cholesterol levels and improve the balance of high- to low-density lipoproteins in the blood.	Doctors often prescribe statins to people with high cholesterol.
Stent	A metal mesh placed in a blocked or partially blocked artery. They are used to open up the blood vessel by the inflation of a tiny balloon.	Surgeons may operate on a person with coronary heart disease and fit them with a stent to attempt to widen the coronary arteries.
Translocation	The movement of sugars from the leaves to the rest of the plant through the phloem.	Glucose produced from photosynthesis is transported around the plant by translocation .
Transpiration	The loss of water vapour from the leaves of plants through the stomata when they are opened to allow gas exchange for photosynthesis. It involves evaporation from the surface of the cells and diffusion through the stomata.	A hot, dry, windy day provides conditions for high levels of transpiration to occur.
Veins	Blood vessels that carry blood towards the heart. They usually carry deoxygenated blood and have valves to prevent the backflow of blood.	Veins contain valves to ensure that blood flows in the right direction.
Vena cava	The large vein that brings deoxygenated blood from the body into the heart.	The largest vein in the human body is the vena cava .
Ventricles	Chambers of the heart that contract to force blood out of the heart.	The ventricles are the bottom chambers of the heart.
Xylem	The non-living transport tissue in plants that transports water from the roots to the leaves and shoots.	Water and dissolved minerals are transported from the roots to the rest of the plant by the xylem .

Year 9 Atomic Structure & The Periodic Table



Atomic structure

Atoms contain sub-atomic particles. **protons**, **neutrons** and **Electrons**. **Protons** and **neutrons** are found in the centre of the atom, called its **nucleus** and **electrons** are found in **energy shells** around the **nucleus**. This **nucleus** is not the same as what is found in plant cells.

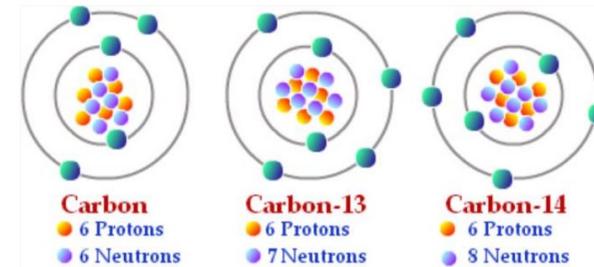
Sub-atomic Particle	Mass	Charge
Proton	1	+
Neutron	1	No charge
Electron	1/2000	-

Atomic number

All the atoms of a particular element have the same number of **protons**. For example, Na has eleven **protons** in its **nucleus**. The number of **protons** in each atom is called its **atomic number**.

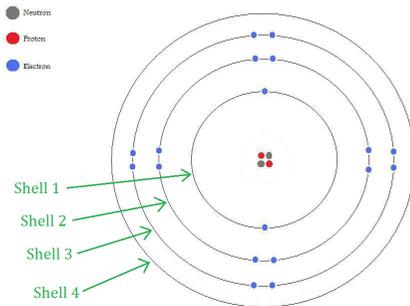
Isotopes

Atoms of the same element with the same number of protons but with different numbers of neutrons are called **ISOTOPES** e.g.

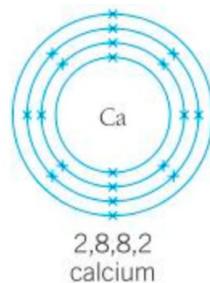


Electron Structure

The electrons in an atom are arranged in energy shells (levels). The lowest energy level (the 1st shell) can hold up to a maximum of 2 electrons, the next energy level (2nd shell) can hold a maximum of 8 electrons and so on. You need to be able to draw the atoms from Hydrogen to calcium.



Calcium has the structure of 2,8,8,2



Discovering Chemicals

During the 19th century, chemists were finding new **elements** almost every year. They were also trying to find patterns in the behaviour (**properties**) of the **elements**. This would allow them to organise the **elements** and understand more about chemistry.

Scientist	Contribution
Dalton 1808	Arranged elements in order of atomic weight, but there were only a few elements that had been discovered at this time.
Newlands 1864	Noticed every 8 th element had repeating properties, but pattern broke down in a number of places. Newlands called it the "Law of octaves"
Mendeleev v 1869	Arranged in order of weight AND properties but LEFT SPACES for undiscovered elements.
Modern Periodic Table	Currently the Periodic Table is arranged in Atomic number order (the number of protons it has).

Electron Configuration and the Periodic table

The chemical **elements** are placed in order of their atomic number (**proton** number) in the periodic table. This arranges the **elements** so that they line up in groups (vertical columns) with similar **properties**. There are 8 main groups in the periodic table.

1	2	3	4	5	6	7	0										
1 H hydrogen 1							4 He helium 2										
7 Li lithium 3	9 Be beryllium 4	11 B boron 5	12 C carbon 6	14 N nitrogen 7	16 O oxygen 8	19 F fluorine 9	20 Ne neon 10										
23 Na sodium 11	24 Mg magnesium 12	27 Al aluminium 13	28 Si silicon 14	31 P phosphorus 15	32 S sulphur 16	35.5 Cl chlorine 17	40 Ar argon 18										
39 K potassium 19	40 Ca calcium 20	45 Sc scandium 21	48 Ti titanium 22	51 V vanadium 23	52 Cr chromium 24	55 Mn manganese 25	56 Fe iron 26	59 Co cobalt 27	59 Ni nickel 28	63.5 Cu copper 29	65 Zn zinc 30	70 Ga gallium 31	73 Ge germanium 32	75 As arsenic 33	79 Se selenium 34	80 Br bromine 35	84 Kr krypton 36
85 Rb rubidium 37	88 Sr strontium 38	89 Y yttrium 39	91 Zr zirconium 40	93 Nb niobium 41	96 Mo molybdenum 42	[97] Tc technetium 43	101 Ru ruthenium 44	103 Rh rhodium 45	106 Pd palladium 46	108 Ag silver 47	112 Cd cadmium 48	115 In indium 49	119 Sn tin 50	122 Sb antimony 51	128 Te tellurium 52	131 I iodine 53	137 Xe xenon 54
133 Cs caesium 55	137 Ba barium 56	139 La* lanthanum 57	178 Hf hafnium 72	181 Ta tantalum 73	184 W tungsten 74	186 Re rhenium 75	190 Os osmium 76	192 Ir iridium 77	195 Pt platinum 78	197 Au gold 79	201 Hg mercury 80	204 Tl thallium 81	207 Pb lead 82	209 Bi bismuth 83	[209] Po polonium 84	[210] At astatine 85	[222] Rn radon 86
[223] Fr francium 87	[226] Ra radium 88	[227] Ac* actinium 89	[267] Rf rutherfordium 104	[270] Db dubnium 105	[269] Sg seaborgium 106	[270] Bh bohrium 107	[270] Hs hassium 108	[278] Ds darmstadtium 109	[281] Rg roentgenium 110	[285] Cn copernicium 111	[285] Nh nihonium 112	[286] Fl flerovium 113	[289] Mc moscovium 114	[289] Lv livermorium 115	[293] Ts tennessine 116	[294] Og oganeson 117	[294] Og oganeson 118

The periodic table gives an important summary of the electronic structures of all the **elements**.

Elements in the same group of the periodic table react in similar ways because their **atoms** have the same number of **electrons** in the highest occupied energy levels (that's the outer shell).

What is Crude Oil?

Crude oil is a finite resource that is formed from dead plant and animal that have been buried under the sea floor. Over time layers of silt and sand built up on it, causing the carbon-based organisms to break down under the heat and pressure.

What is crude oil made up of?

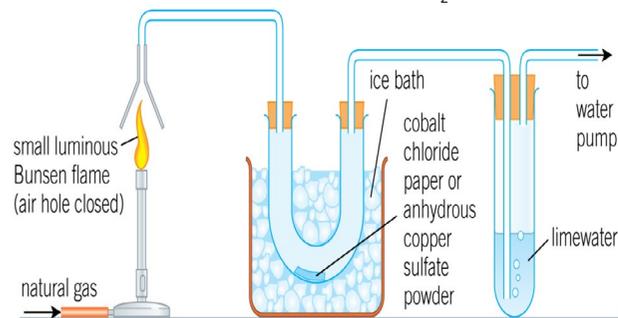
Crude oil is a mixture of different length hydrocarbons from the **alkane** family. A **hydrocarbon** is a compound that is made up of only carbon and hydrogen atoms. Crude oil is fairly useless when its first taken out of the ground, however, once the mixture is separated into its different substances, known as fractions, they become useful.



Burning Fuels

The test for **carbon dioxide** is bubbling the gas through **limewater**; if there is **CO₂** present, then the **limewater** turns cloudy.

The test for **H₂O** and **CO₂** (the products of combustion) is using the equipment below. It uses **cobalt blue paper** to test for water and **limewater** to test for **CO₂**

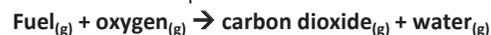


What is combustion?

Combustion is a chemical reaction between fuel and oxygen. Depending on how much oxygen there is depends on the products it produces.

Complete Combustion

If there is plenty of oxygen, then it produces carbon dioxide and water. You can write this as a word equation



Carbon dioxide increases global warming.

Incomplete Combustion

If there is a lack of oxygen, then it will produce carbon monoxide + water + carbon particulates.



Carbon monoxide is toxic to humans. Carbon particulates cause global dimming and respiratory issues.

Evidence of greenhouse gases

Over the last 200 years, there is an increase in the volume of **CO₂** produced. This is mainly due to the advances in technology and the use of fossil fuels. **CO₂** has been locked-up in fossil fuels for millions of years, but as we burn it, it releases **CO₂**.

Methane gets into our atmosphere from **swamps** and **rice fields**. Methane is also produced from **grazing cattle** and from **decomposing waste** (poop).

Landfill sites are another source that produces methane, from the **rotting food waste**. This has increased over the years due to the population increasing.

Scientists use "hard" evidence to link the levels of **CO₂** with the climate and any changes. One source of evidence is the ice cores from Greenland, which have trapped gases over time. These can be dated and analysed for changes.

But remember it is difficult to predict with complete certainty the effects on the climate due to greenhouse gases, however, the evidence is showing trends which can be used to suggest the future effects.

Greenhouse Gases: how it warms the Earth

1. UV radiation from the Sun reaches Earth
2. Some Infra-Red re-radiated back into space
3. A portion doesn't reach space and is **absorbed** by greenhouse gases.
4. These gases re-radiate the Infra-Red radiation back to Earth.
5. This warms the Earth's surface.

Meet the greenhouse gases?

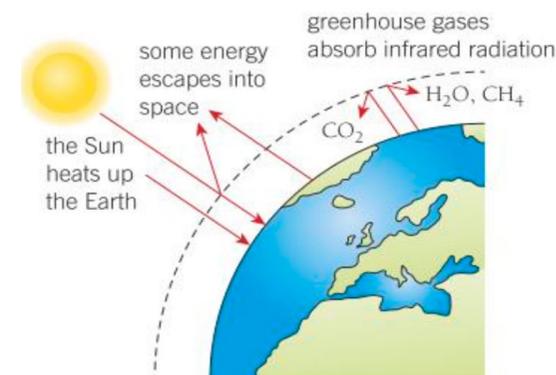
Greenhouse gases is a term used for a group of gases that absorb energy radiated by their surface.

The main greenhouse gases are:

- **Carbon dioxide (CO₂)**
- **Methane (CH₄)**
- **Water Vapour (H₂O)**

Others can include (extra info)

- Chlorofluorocarbons (CFCs)
- Nitrous oxides (NOx)



Sustainability

Sustainability is about **meeting the needs of current society, without endangering the ability of future generations to meet their needs.**

Finite resources are resources that are being used up faster than they can be replaced, so if you can carry on using them, they will run out. Fossil fuels (coal, oil and natural gas) and limestone are examples of **finite** resources.

Renewable resources are resources that can be replaced at the same rate at which that is used up. Crops, wool, silk, rubber and wood are all examples of **renewable** resources.

State	Flow ?	Fixed shape ?	Fixed volume ?	Density	Particle energy	Forces between particles
Solid	No	Yes	Yes	High	Low	High
Liquid	Yes	No	Yes	Med	Med	Med
Gas	Yes	No	No	Low	High	Low

Gas Pressure and Temperature

Increase temperature - increase KE of particles. More collisions with greater force, therefore increased pressure

Change of state

- The freezing point of a substance is the same temperature as the **melting** point.
- The energy transferred to a substance as it changes state is called its **latent** heat.
- The energy stored by particles in a substance is its **internal** energy.
- This energy is sum of the **kinetic** energy of particles and their **potential** energy.
- The specific latent heat of fusion is the energy needed to change **1kg** of a substance from **solid** to **liquid** at its **melting point** (without a change in temperature).
- The specific latent heat of vaporisation of a substance is the energy needed to change **1kg** from **liquid** to **vapour**, at its **boiling point** (without a change in temperature).

Density

Density of a substance is defined as its mass per unit volume.

Density, $\rho = \frac{\text{mass, } m \text{ (kilograms, kg)}}{\text{volume, } V \text{ (metres}^3, \text{ m}^3\text{)}}$

Density (Required Practical)

1 Measure mass (m)

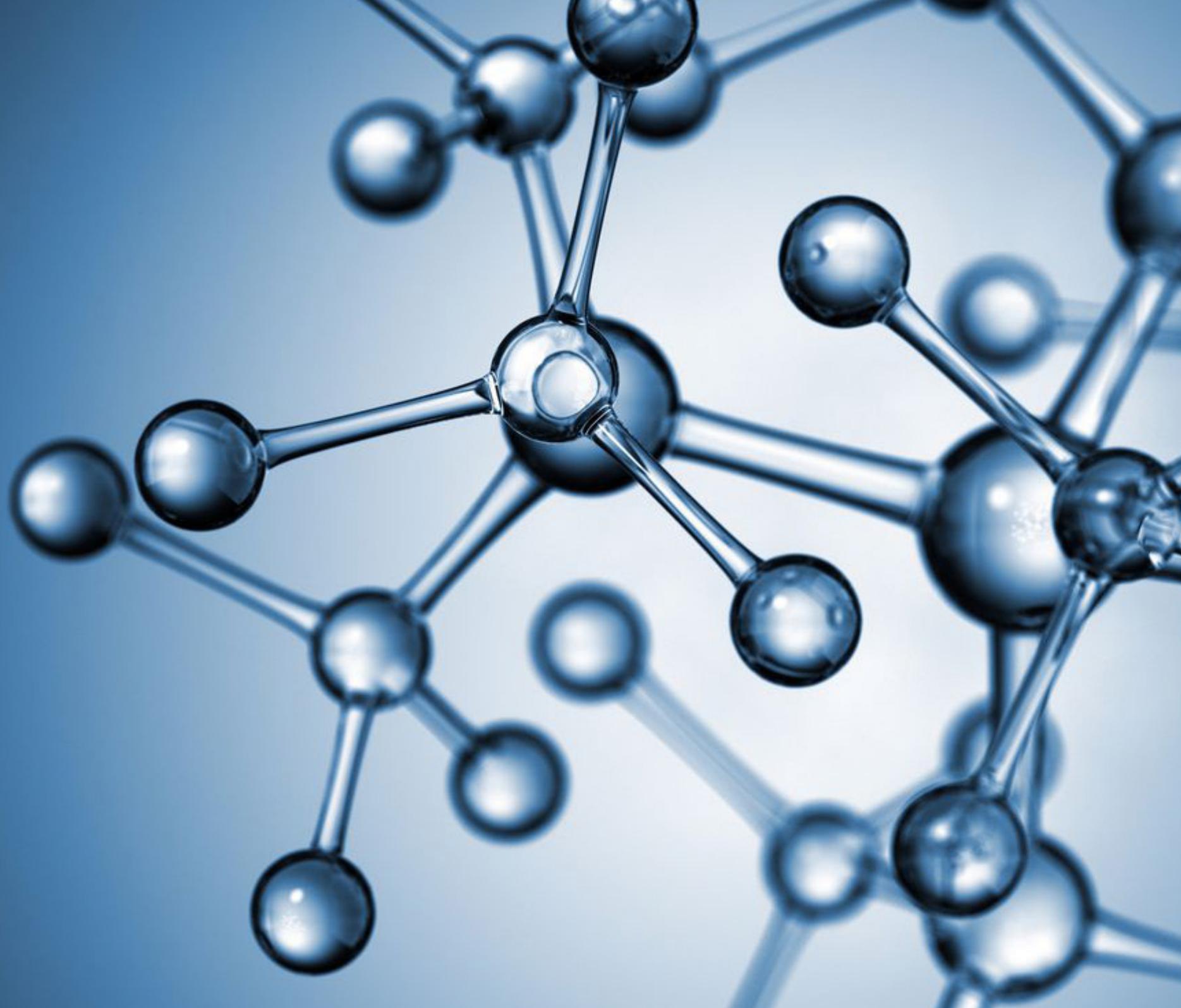
2 Submerge object in water

3 Measure volume of water displaced (V)

4 Calculate density (ρ)

$\rho = \frac{m}{V}$

Key Vocabulary	Definition	Contextual Sentence
Density	The mass per unit volume of an object, measured in kg/m ³ or g/cm ³ .	Ice floats in water due to having a lower density.
Eureka can	A piece of equipment used to measure the volume of an irregular object through water displacement.	The student lowered the rock on a string into the eureka can to find its volume.
Internal energy	the energy of the particles of a substance due to their individual motion and positions .	The internal energy of the substance increased as it was heated.
latent heat	the energy transferred to or from a substance when it changes its state .	The unit of latent heat is J/Kg.
pressure	force per unit cross-sectional area for a force acting on a surface at right angles to the surface. The unit of pressure is the pascal (Pa) or newton per square metre (N/m ²).	The pressure of the gas increased when it was heated.



Religious Studies
Year 9 Knowledge Organiser
Summer Term



Half Term Two

What are alternative religions?

1. Who are Scientologists and what do they believe?
2. Who are the Amish and what do they believe?
3. Who are Jehovah's Witnesses and what do they believe?
4. Who are Rastafarians and what do they believe?
5. What are the key beliefs in Jediism?
6. Assessment

Religious Group	
Scientologists	Started in May 1952 by L. Ron. Hubbard.
Amish	Founder Jakob Ammann in 1693.
Jehovah's Witnesses	Founder Charles Taze Russell in 1870s.
Rastafarians	Begins in 1930s following a prophecy by Marcus Garvey.
Jediism	Daniel Jones leader of the Church of Jediism in the UK.

1. Who are Scientologists and what do they believe?

Scientology is a set of beliefs and practices that were created by L. Ron Hubbard who was known as a science fiction writer. It began in 1952 as a development of his self-help system, **Dianetics**. Hubbard said that Scientology was a religion, and in 1953 it was incorporated as the Church of Scientology in New Jersey, USA.

Scientologists believe that people are immortal and spiritual beings called **thetans** who have forgotten their true nature and are trapped on earth in a human body. Scientologists believe that each thetan has lived numerous past lives, both on earth in our physical bodies, and on other planets. Scientologists also believe that by undergoing a series of classes and teachings (called **auditing** by the Church), people can free themselves of their human form and reclaim their true selves. By taking all of the classes the Church of Scientology offers, Scientologists believe that you can reclaim his true thetan form, become closer to God (or the Supreme Being) and unlock abilities to control life, matter, energy, space, and time that have been repressed by being in a human form.

2. Who are the Amish and what do they believe?

The Amish are Christians. They believe salvation comes through living a loving life in a pure community of believers who live in **separation from the world** and by receiving forgiveness from Jesus. The Amish believe that they should farm as stewards of God's creation, and that this is a spiritual activity. The Amish are known for **simple living, plain dress, and reluctance to adopt to many conveniences of modern technology**. The Amish own horse-drawn buggies, not cars. They have no telephones or electricity in their houses as most Amish people believe these technologies would join them to the world through their wires. Also, phones and electricity bring distractions e.g., TV, internet, music, and computer games etc. The Amish **worship in their houses on Sundays**. Different households take it in turns to have the worship service. Communion services are held twice a year.



3. Who are Jehovah's Witnesses and what do they believe?

Jehovah's Witnesses base their lives and beliefs on the Church and the words of the **Bible**. Jehovah's Witnesses believe the Bible was inspired by God and is historically accurate. Jehovah's Witnesses test any idea or teaching against the Bible. The denomination was founded in the USA at the end of the 19th century by **Charles Taze Russell**. There are about 6.9 million Jehovah's Witnesses in 235 countries in the world, including 1 million in the USA and 130,000 in the UK.

Jehovah's Witnesses are probably best known for their door-to-door evangelical work; **witnessing** from house to house, offering Bible literature and converting people to what they consider to be the true faith. Jehovah's witnesses do not believe Jesus Christ died on a cross but instead a stake. They do not celebrate Christmas or Easter as they believe the festivals have pagan customs.

4. Who are Rastafarians and what do they believe?

Rastafarianism is a young, **Africa-centred religion** which developed in Jamaica, in the 1930s following a prophecy made by **Marcus Garvey**. Garvey preached *'Look to Africa where a black king shall be crowned, he shall be your Redeemer.'* This statement became the foundation of the Rastafarian movement. The prophecy was followed by the coronation of **Haile Selassie I** as King of Ethiopia in 1930. Rastafarians believe Haile Selassie is God, and that he will return to Africa to free members of the black community who are living in exile as the result of colonisation and the slave trade.

Rastafarians believe reincarnation follows death and that life is eternal. Rastafarians are forbidden to cut their hair; instead, they grow it and twist it into dreadlocks. Rastafarians eat clean and natural produce, such as fruit and vegetables. Rastafarians try to refrain from the consumption of meat, especially pork and do not drink alcohol.



5. What are the key beliefs in Jediism?

In the 2001 census 390,127 people identified themselves as part of the Jedi faith. In the 2011 census this fell to 176,632 people. The Jedi Church believes in the **Force**, a specific energy that flows through all things and binds the universe together. They also believe that humans can tap into or shape the Force to unlock greater potential. Many Jedi also view themselves as **guardians of truth**, knowledge, and justice, and actively promote such ideals. It is based on the philosophical and spiritual ideas of the **Jedi** as shown in **Star Wars** films. While these films are fictional, their creator, George Lucas, researched a variety of religious ideas e.g., Buddhism during their creation. Followers agree that the movies are fiction but recognise religious truths in them, specifically those referring to the Jedi and the Force.



Key words	Definition	Contextual Sentence
Community	A group of people living in the same place or having a particular characteristic in common	We are all part of the Great Sankey High School <u>community.</u>
Salvation	To be saved by God and have the chance to go to heaven.	The Amish believe that <u>salvation</u> comes through living a loving life.
Values	Principles considered most important.	The Amish have traditional <u>values.</u>
Separation	To divide yourself from something else.	The Amish live in <u>separation</u> from the world.
Self sufficient	To be dependent solely on yourself.	Many Amish are farmers in order that they can live a <u>self-sufficient</u> life.
Tradition	The process of handing down a culture's beliefs, customs and more from one generation to the next.	The Amish faith is built heavily on <u>tradition.</u>
Dianetics	A set of ideas and practices to help the relationship between the body and mind.	L. Ron Hubbard is responsible for the self- help system <u>dianetics.</u>
Thetans	The immortal and spiritual part of human beings.	Scientists believe each <u>thetan</u> has lived many previous lives.
Auditing	A process by which scientologists can get rid of any present past negative situations.	<u>Auditing</u> allows scientologists to reclaim their true self.
Witnessing	To share the Christian faith with other.	<u>Witnessing</u> allows Jehovah's Witnesses to share their faith with others.
Trinity	The belief that God is 3 in 1.	Jehovah's Witnesses reject the belief in the <u>Trinity.</u>
Jah	The term used by Rastafarians for God.	Rastafarians believe they were tested by <u>Jah</u> through slavery.
The Force	A specific energy that flows through all things and binds the universe together.	Jediism is based on the belief in <u>The Force.</u>

Religious Studies
Year 9 Knowledge Organiser
Summer Half Term 2



Are humans equal?

1. What is a multi-cultural society?
2. How do religions work for social justice and human rights?
3. What is prejudice and discrimination?
4. What is religious freedom?
5. How do religions help those in need?

1. What is a multicultural society?

Multi-culturalism is a word that describes a society where many different cultures live together. Multi-culturalism allows differences in customs, religious beliefs and opinions in an area or country. Britain as a multi-cultural society began after WW2. People came to Britain because of encouragement from the UK government. As technology and the ability to travel increased, this led to an increase in immigration and people being able to live and work in other countries.

Positive of a multi-cultural society

1. Life is more varied and interesting. A multi-cultural society brings variety in food, music, dress etc.
2. There are increased opportunities to learn about other people's culture which helps to reduce discrimination.

Issues to overcome in a multi-cultural society

1. There can be prejudice and discrimination towards different ethnic groups
2. There can be communication problems because of language barriers.



2. How do religions work for social justice and human rights?

Many different groups, both religious and non-religious strive for social justice to help promote fairness in the world.

Christians help by:

- Following the teachings of Jesus to "Love your neighbour." This means they try to improve lives of the less fortunate in society by giving to charity and campaigning for equal rights.

Muslims try to help by:

- Giving Zakah which is giving 2.5% of their savings annually to charity. Many Muslims also become involved in social and community projects such as working with the homeless and poor.

The declaration of Human Rights also helps promote equality and fairness it states that:

"All human beings are born free and equal in dignity and rights. They are endowed with reason and conscience and should act towards one another in a spirit of brotherhood"

3. What is prejudice and discrimination?

All religions teach against prejudice and discrimination, Christians would use the teaching of St Paul ***“There is neither Jew nor Gentile (non Jew), neither slave nor free, nor is there male or female for you are all one in Christ”***. This shows that everyone should be treated fairly and given a chance. In Islam, Muslims would use the teaching of ***“People are as equal as the teeth of a comb”*** in the Hadith to show that prejudice and discrimination are both wrong.

4. What is religious freedom?

Religious Freedom is an expression used that refers to allowing people to freely practice their religion without any issues and discrimination. In some countries it has been made illegal to wear religious items or symbols to the workplace. Many see this as a violation of the Universal Declaration of Human Rights.

Religious groups would allow religious freedom, even if it means that the other person is not follow the same religion as them. This is because in Christianity the Bible says “If it is possible, as far as it depends on you, live at peace with everyone.” Romans 12:18, showing that they should live in peace with other religious groups.

5. How do religions help those in need?

Charity is an important duty for many religious people. Both Christians and Muslims believe that wealth is a gift from God and should be used responsibly.

Muslims believe the value of money is only in the good that it can do, especially helping the poor. Therefore, Muslims are expected to give **2.5% of their savings** to help those in need. An important Muslim charity is **Muslim Aid**.

For **Christians**, the Bible teaches against **greed and selfishness** e.g. **the Parable of the Rich Man and Lazarus**. This has led Christians to form charities such as **Christian Aid and Cafod**.



Key Term	Definition	Contextual sentence
Multi-culturalism	A society where many different cultures live together.	<i>Multi-culturalism</i> brings many benefits to a society.
Multi-faith	A multi-faith society is one where many different religions live together.	The UK is a <i>multi-faith</i> country.
Ethnic minority	A group within a community which has different national or cultural traditions from the main population.	There are different groups of <i>ethnic minorities</i> in the UK.
Social Justice	Social Justice is ensuring that society treats people fairly no matter if they are poor or rich and protect people's Human Rights.	Many religious groups fight for <i>social justice</i> .
Human Rights	A right which is believed to belong to every person. Human rights are moral principles or norms for certain standards of human behaviour and are regularly protected in municipal and international law.	The declaration of <i>Human Rights</i> helps to protect human life and how people are treated.
Prejudice	Is a preconceived opinion that is not based on reason or experience.	People can suffer <i>prejudice</i> because of their religion, race, gender, or sexuality.
Discrimination	Unjust or prejudicial treatment of different categories of people, especially on the grounds of race, age, sex, or disability.	Treating people differently because of their gender or race is <i>discrimination</i> .
Religious Freedom	A principle that supports freedom of an individual or a community, in public or private, to manifest religion or belief in teaching, practice, worship and observance.	<i>Religious freedom</i> is an important part of the declaration of Human Rights
Marginalised	To treat a person or group as insignificant.	By removing religion from the public space, we <i>marginalise</i> it.
Inter-faith relations	The positive interaction of different religions.	Positive <i>inter-faith relations</i> can give a boost to charity work.
Ecumenical	Promoting unity across the Christian Churches.	He was a member of an <i>ecumenical</i> committee.
Islamophobia	Islamophobia is dislike, prejudice and discrimination against Muslims and Islam.	The government must work hard to tackle <i>Islamophobia</i> .
Altruism	Selfless concern for the well-being of others.	Some people work with the vulnerable out of <i>altruism</i> .
Influential	Having an impact or shaping how people act or how things occur.	His work was <i>influential</i> in Christian theology.



Year 9 History Summer Term- The Holocaust

The word "Holocaust," from the Greek words "holos" (whole) and "kaustos" (burned), was historically used to describe a sacrificial offering burned on an altar. Since 1945, the word has taken on a new and horrible meaning: the ideological and systematic state-sponsored prosecution and mass murder of millions of European Jews (as well as millions of others, including Gypsies, the disabled and homosexuals) by the German Nazis between 1933 and 1945.

Jewish Persecution

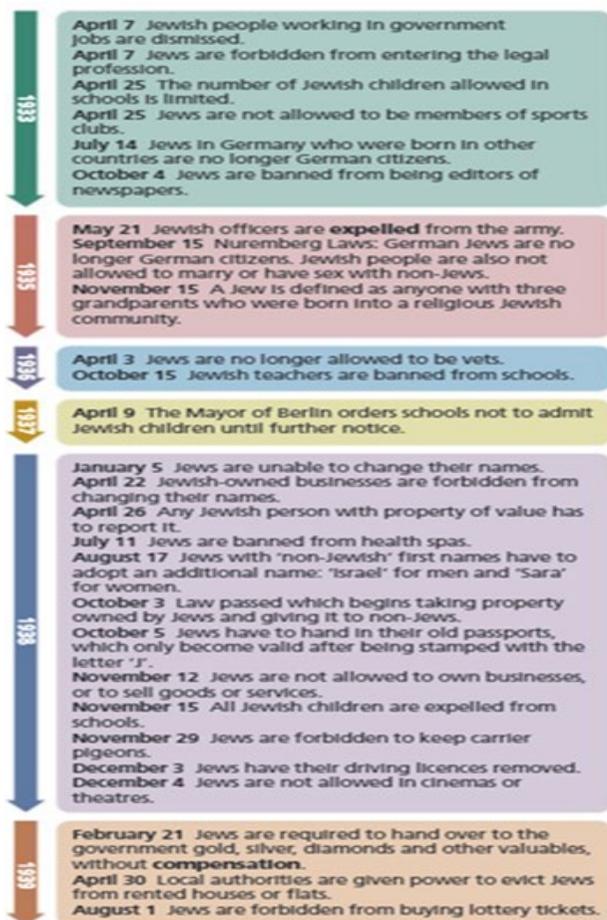


Figure 3.2 A selection of anti-Jewish laws passed, 1933–39.

Genocide

1940	In many towns, Jewish people were forced to leave their homes and go to live in Jewish areas, or 'ghettos', where they were forbidden to earn a wage. Many starved to death.
1941	All Jewish people were forced to wear a yellow Star of David.
1941	In eastern Europe, Nazi Einsatzgruppen rounded up and murdered over a million Jewish people.
	Wannsee Conference: In January, the decision was taken for a 'Final Solution to the Jewish Problem' – to exterminate all the Jewish people in Europe. Camps were built at places such as Auschwitz and Jewish people were rounded up and sent there to be gassed. Jewish prisoners were organised into Sonderkommando units to burn the bodies in the crematoria. Others were worked to death in labour camps to help the war effort.
1942	
Winter 1944–1945	The 'Death Marches'. As the Russians advanced, the SS guards marched the Jewish people to concentration camps in the west. Many Jewish people died on the marches. Many were killed because they could not keep up. When they reached camps such as Bergen-Belsen in West Germany, they were crammed in in such numbers that they died of starvation or disease.

- At the end of 1941, Hitler demanded an "aggressive policy" to rid Germany of the Jews. On 20 January 1942, Reinhard Heydrich, the Head of the **Sicherheitsdienst (SD)**, held a conference to discuss what the new policy should be. At this meeting, it was agreed that Jews would be brought to Poland, where those fit enough would be worked to death and the rest exterminated.
- This led to the horror of the Nazi death camps, six of which were built specifically to murder those brought to them. The biggest camp was **Auschwitz-Birkenau**, where 2.5 million Jews were murdered.
- Jews arrived at the camps on trains, where they were separated into two groups: those fit to work and those to be killed immediately – usually women, children and the elderly.
- The latter group was ushered into what they thought were showers, where they were gassed. It took up to 30 minutes for victims to die. Their bodies were then burnt in ovens.
- Altogether, it is thought around six million Jews were murdered, as well as several million other victims, including **Sinti** and **Roma**, homosexuals, Soviet prisoners of war, **Jehovah's Witnesses** and other 'undesirables'.

Key Word	Definition
annihilation	Complete destruction
anti-Semitism	Hostility or prejudice against Jews.
exterminate	To destroy something completely
genocide	The attempt to kill or destroy national, ethnical, racial or religious groups.
ghetto	A poor part of a city that is usually occupied by a minority group, sometimes purpose built.
persecution	To ill-treat people for their religious or political beliefs.

Some of the most startling images from the persecution are from the horrors of Auschwitz Birkenau. They show the true scale of the Holocaust. The four stages below are how they treated the Jews from their arrival to the gas chambers.



Stage 1

Trains arrive from all over Europe



Stage 2

The selection process



Stage 3

Fit, healthy and strong prisoners taken to be washed and uniformed



Stage 4

Weak and elderly told they are going to be 'showered'.



Year 9 History Summer Term- WW2

Events up to the start
of WW2



1933, Hitler told his military chiefs to start building up the army, navy and air force in secret.

1936, Hitler broke the rules again by sending his soldiers into the Rhineland area of Germany

1938, German troops marched into Austria, the country of Hitler's birth. This was known as Anschluss.

September 1938, Britain and France allow Germany to take the Sudetenland in Czechoslovakia – they are following a policy of appeasement.

March 1939, Hitler takes the rest of Czechoslovakia.

1 September 1939, German troops invaded Poland.

Two days later, on 3 September 1939, Britain declared war on Germany.

Main features of WW2

1939

- Hitler invades Poland on 1 September. Britain and France declare war on Germany two days later.

1940

- Rationing starts in the UK.
- German 'Blitzkrieg' overwhelms Belgium, Holland and France.
- Churchill becomes Prime Minister of Britain.
- British Expeditionary Force evacuated from Dunkirk.
- British victory in Battle of Britain forces Hitler to postpone invasion plans.

1941

- Hitler begins Operation Barbarossa - the invasion of Russia.
- The Blitz continues against Britain's major cities.
- Allies take Tobruk in North Africa, and resist German attacks.
- Japan attacks Pearl Harbor, and the US enters the war.

1942

- Germany suffers setbacks at Stalingrad and El Alamein.
- Singapore falls to the Japanese in February - around 25,000 prisoners taken.
- American naval victory at Battle of Midway, in June, marks turning point in Pacific War.
- Mass murder of Jewish people at Auschwitz begins.



1945

- Auschwitz liberated by Soviet troops.
- Russians reach Berlin: Hitler commits suicide and Germany surrenders on 7 May.
- Truman becomes President of the US on Roosevelt's death, and Attlee replaces Churchill.
- After atomic bombs are dropped on Hiroshima and Nagasaki, Japan surrenders on 14 August

1944

- Allies land at Anzio and bomb monastery at Monte Cassino.
- Soviet offensive gathers pace in Eastern Europe.
- D Day: The Allied invasion of France. Paris is liberated in August.
- Guam liberated by the US Okinawa, and Iwo Jima bombed.

1943

- Surrender at Stalingrad marks Germany's first major defeat.
- Allied victory in North Africa enables invasion of Italy to be launched.
- Italy surrenders, but Germany takes over the battle.
- British and Indian forces fight Japanese in Burma.

During World War II (1939-1945), the Battle of Normandy, which lasted from June 1944 to August 1944, resulted in the Allied liberation of Western Europe from Nazi Germany's control. Codenamed Operation Overlord, the battle began on June 6, 1944, also known as D-Day, when 156,000 American, British and Canadian forces landed on five beaches along a 50-mile stretch of the heavily fortified coast of France's Normandy region. The invasion required extensive planning. Prior to D-Day, the Allies conducted a large-scale deception campaign designed to mislead the Germans about the intended invasion target. By late August 1944, all of northern France had been liberated, and by the following spring the Allies had defeated the Germans. The Normandy landings have been called the beginning of the end of war in Europe.



The atomic bomb, and nuclear bombs, are powerful weapons that use nuclear reactions as their source of explosive energy. Scientists first developed nuclear weapons technology during World War II. Atomic bombs have been used only twice in war—both times by the United States against Japan at the end of World War II, in Hiroshima and Nagasaki. A period of nuclear proliferation followed that war, and during the Cold War, the United States and the Soviet Union vied for supremacy in a global nuclear arms race.

Key features to the end of WW2

D-Day Landings

Atomic Bomb

Life at home

Evacuation

The Homefront WW2



In 1938, the government began to build warships and increase its armaments. The government expected the war to disrupt and threaten the lives of civilians at home. This happened in different ways, from cutting down railings to be melted down and used in munitions factories, to rationing and evacuation. Between 1938 and 1939, the government thought of the possible dangers and difficulties the Home Front would face during war, and started to take precautions. People were encouraged to plant vegetables on spare land to supplement rationing. People were also recruited into essential positions such as Air Raid Wardens and the Home Guard. The government educated people on what to do in situations such as an air raid, or a gas attack, on how to make rations stretch.

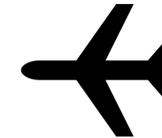
Evacuation means leaving a place. During the Second World War, many children living in big cities and towns were moved temporarily to places considered safer, usually the countryside. The British evacuation began on Friday 1 September 1939. It was called 'Operation Pied Piper'. Between 1939 - 1945 there were three major evacuations in preparation of the German Luftwaffe bombing Britain. The first official evacuations began on September 1 1939, two days before the declaration of war. By January 1940 almost 60% had returned home. A second evacuation effort was started after the Germans had taken over most of France. From June 13 to June 18, 1940, around 100,000 children were evacuated (in many cases re-evacuated).

Year 9 History
Summer Term- WW2

Dunkirk is a small town on the coast of France that was the scene of a massive military campaign during World War II. During the Battle of Dunkirk from May 26 to June 4, 1940, some 338,000 British Expeditionary Force (BEF) and other Allied troops were evacuated from Dunkirk to England as German forces closed in on them. The massive operation, involving hundreds of naval and civilian vessels, became known as the "Miracle of Dunkirk" and served as a turning point for the Allied war effort.



The Battle of Stalingrad was a military campaign between Russia and Nazi Germany and the Axis powers. From August 1942 through February 1943, more than two million troops fought in close quarters – and nearly two million people were killed or injured in the fighting, including tens of thousands of Russian civilians. But the Battle of Stalingrad (one of Russia's important industrial cities) ultimately turned the tide of World War II in favour of the Allied forces.



The Battle of Britain was between Britain's Royal Air Force (RAF) and the Luftwaffe, Nazi Germany's air force, and was the first battle in history fought solely in the air. From July 10 through October 31, 1940, pilots and support crews on both sides took to the skies and battled for control of airspace over Britain, Germany and the English Channel. The powerful, combat-experienced Luftwaffe hoped to conquer Britain easily, but the RAF proved a formidable enemy.

Dunkirk

The Battle of Britain

Stalingrad

The Blitz

The Blitz was Nazi Germany's sustained aerial bombing campaign against Britain in World War Two. The raids killed 43,000 civilians and lasted for eight months, petering out when Hitler began to focus on his plans for Russian invasion in May 1941.



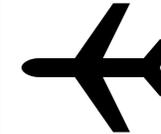
During World War II (1939-1945), the Battle of Normandy, which lasted from June 1944 to August 1944, resulted in the Allied liberation of Western Europe from Nazi Germany's control. Codenamed Operation Overlord, the battle began on June 6, 1944, also known as D-Day, when 156,000 American, British and Canadian forces landed on five beaches along a 50-mile stretch of the heavily fortified coast of France's Normandy region. The invasion required extensive planning. Prior to D-Day, the Allies conducted a large-scale deception campaign designed to mislead the Germans about the intended invasion target. By late August 1944, all of northern France had been liberated, and by the following spring the Allies had defeated the Germans. The Normandy landings have been called the beginning of the end of war in Europe.



Year 9 History Summer Term- WW2

The atomic bomb, and nuclear bombs, are powerful weapons that use nuclear reactions as their source of explosive energy. Scientists first developed nuclear weapons technology during World War II. Atomic bombs have been used only twice in war—both times by the United States against Japan at the end of World War II, in Hiroshima and Nagasaki. A period of nuclear proliferation followed that war, and during the Cold War, the United States and the Soviet Union vied for supremacy in a global nuclear arms race.

Dunkirk is a small town on the coast of France that was the scene of a massive military campaign during World War II. During the Battle of Dunkirk from May 26 to June 4, 1940, some 338,000 British Expeditionary Force (BEF) and other Allied troops were evacuated from Dunkirk to England as German forces closed in on them. The massive operation, involving hundreds of naval and civilian vessels, became known as the "Miracle of Dunkirk" and served as a turning point for the Allied war effort.



The Battle of Britain was between Britain's Royal Air Force (RAF) and the Luftwaffe, Nazi Germany's air force, and was the first battle in history fought solely in the air. From July 10 through October 31, 1940, pilots and support crews on both sides took to the skies and battled for control of airspace over Britain, Germany and the English Channel. The powerful, combat-experienced Luftwaffe hoped to conquer Britain easily, but the RAF proved a formidable enemy.



Key features to the end of WW2

D-Day Landings

Atomic Bomb

Life at home

Evacuation

The Homefront WW2



Evacuation means leaving a place. During the Second World War, many children living in big cities and towns were moved temporarily to places considered safer, usually the countryside. The British evacuation began on Friday 1 September 1939. It was called 'Operation Pied Piper'. Between 1939 - 1945 there were three major evacuations in preparation of the German Luftwaffe bombing Britain. The first official evacuations began on September 1 1939, two days before the declaration of war. By January 1940 almost 60% had returned home. A second evacuation effort was started after the Germans had taken over most of France. From June 13 to June 18, 1940, around 100,000 children were evacuated (in many cases re-evacuated).



In 1938, the government began to build warships and increase its armaments. The government expected the war to disrupt and threaten the lives of civilians at home. This happened in different ways, from cutting down railings to be melted down and used in munitions factories, to rationing and evacuation. Between 1938 and 1939, the government thought of the possible dangers and difficulties the Home Front would face during war, and started to take precautions. People were encouraged to plant vegetables on spare land to supplement rationing. People were also recruited into essential positions such as Air Raid Wardens and the Home Guard. The government educated people on what to do in situations such as an air raid, or a gas attack, on how to make rations stretch.

Pearl Harbor is a U.S. naval base near Honolulu, Hawaii, that was the scene of a devastating surprise attack by Japanese forces on December 7, 1941. It was this event that brought the USA in WW2 and started the Pacific war. Tensions between Japan and the USA rose to such an extent that atomic bombs were dropped on the Japanese cities of Hiroshima and Nagasaki in August 1945.

Dunkirk

The Battle of Britain

Pearl Harbour

The Blitz



Year 9 History Summer Term- Into the modern world

As the war ended an election was held to see who would run the country next. The new Labour government promised to rebuild Britain post war and create a welfare state. Britain as a country started to change dramatically over the next few decades under both Conservative and Labour governments. Slums were torn down and rebuilt, and technology started to become more important in everyday life. People from commonwealth countries started to move to Britain 'the mother country' leading to the multicultural society that we know today.

The welfare state

The war highlighted all sorts of problems that people in Britain were facing at that time. There had been shock at the filthy, underfed children evacuated to the countryside. Wounded soldiers needed free medical care. People felt that the sacrifices made in the war should mean a better future.

Sir William Beveridge was asked to investigate ways the country might help the vulnerable (sick, elderly, unemployed, low paid workers). He published the Beveridge report in 1942. It suggested that the government take control of social security from cradle to grave. He suggested that pensions, financial help for parents and free medical care be paid for through taxes and National insurance contributions.

Several changes took place from 1945:

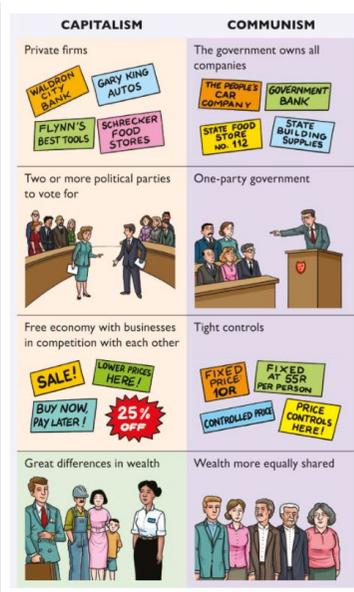
- A National Health Service (NHS) was set up to provide healthcare for everyone.
- A weekly family allowance payment was introduced to help with childcare costs.
- The very poor received financial help or benefits.
- Pensions for the elderly and disabled were increased.
- Several new towns were built.



The Cold War

The USA and the USSR were the most powerful countries in the world and became known as superpowers. They had skilled populations, large armed forces and reserves of raw materials like coal, iron and oil. The two countries organised themselves in different ways. The USSR was communist, the USA was capitalist.

Tension between the USA and the USSR had been building for a long time. At this time, the USA and its allies in Europe were known as the West. The USSR and its allies were known as the East. What to do with Europe after the war caused disagreements. Britain and the USA wanted European countries to recover quickly so they could trade. Stalin (leader of the USSR) wanted Germany weak to create a buffer of countries that he controlled between the USSR and Germany. Despite attempts to reach an agreement Europe became divided by what Winston Churchill called an Iron Curtain. The countries to the west were capitalist with a close relationship to the USA. Countries to the east were communist influenced by the USSR. In 1947 US President Harry Truman offered money to European countries to repair war damage. It was called the Marshall plan after the General who launched it in 1948. Truman hoped this would strengthen Europe for trade, he also thought people would be less likely to support communism if they had jobs. The USA gave \$17 billion to 16 countries including Britain. Stalin banned countries in the East from taking money and he thought it was a US plot to get more support in Europe.



The decline of the British empire

World war two bankrupted Britain. There was more debt than ever and Britain was no longer as important on the world stage. Several of Britain's colonies, such as Canada, had been running their own affairs for years. These countries helped Britain during the war and by the end of it, many other colonies wanted the right to rule themselves. Britain no longer had the military strength to hold on to them and needed to focus on rebuilding. There were several reasons why there was calls for independence:

- The Africans and Indians who had fought for Britain felt they were fighting to defend freedom, but were frustrated that their own countries were not free.
- Ideas about democracy, freedom and nationalism spread around the world in the 1800s. Many people in colonies began to demand independence.
- Researchers and historians showed how important the cultures and achievements of Africa and Asia had been. Many wanted to celebrate their own traditions.

After the Second World War, the British Empire declined rapidly. One of the first colonies to gain independence was India, followed by other colonies, including many in Africa.

Migration to Britain

Large groups of immigrants came to Britain after WW2. Some were refugees from Europe. Their homes and livelihoods had been destroyed, they were looking for new opportunities in Britain. Other migrants came from the British Empire to find work and a better life. The government encouraged/welcomed them as there was a shortage of workers. Workers were needed in building, transport, healthcare etc. Many from the Caribbean came on the Empire Windrush.

Where?	Why did they come?
Europe	Around 200,000 Jews has fled persecution and settled in Britain. When fighting started in 1939 thousands of Polish people sought safety in Britain. By 1950 Hungarians, Ukrainians, Estonians, Latvians and Lithuanians who had fled the USSR had settled in Britain.
Ireland	Famine in Ireland meant that there was already Irish people living in Britain. After WW2 a new period of immigration increased the number.
Caribbean Islands	Around 15,000 West Indians settled in Britain after WW1. During WW2 thousands moved to help Britain with the war. From the late 1940s to 70s more immigrants were encouraged to come to Britain due to a shortage of workers.
West Africa	The countries made a large contribution to WW2. Many West Africans moved to Britain to find jobs.
Far East	Moved during the 1950s and 60s. Most came from the British colony of Hong Kong. In 1997 Hong Kong stopped being a British colony.

The Berlin airlift

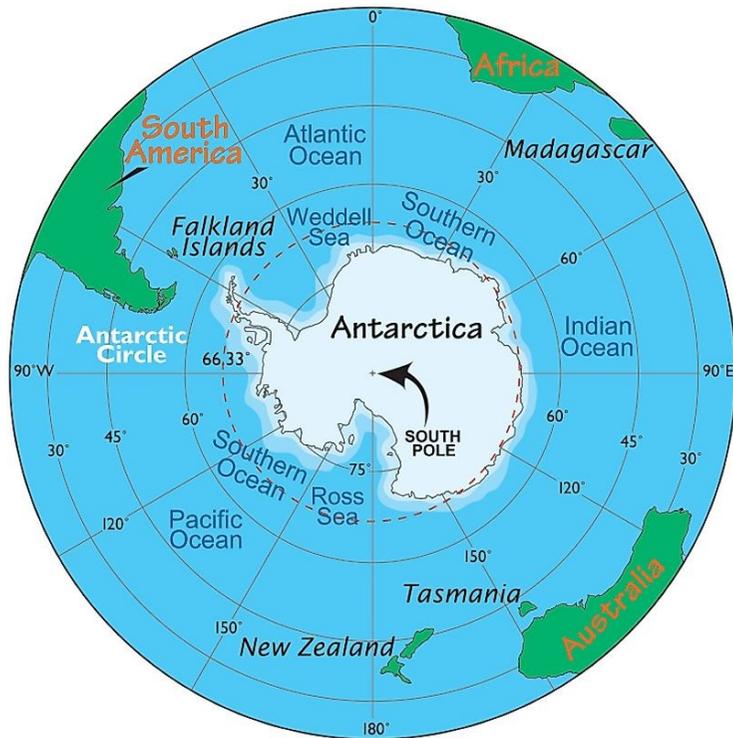
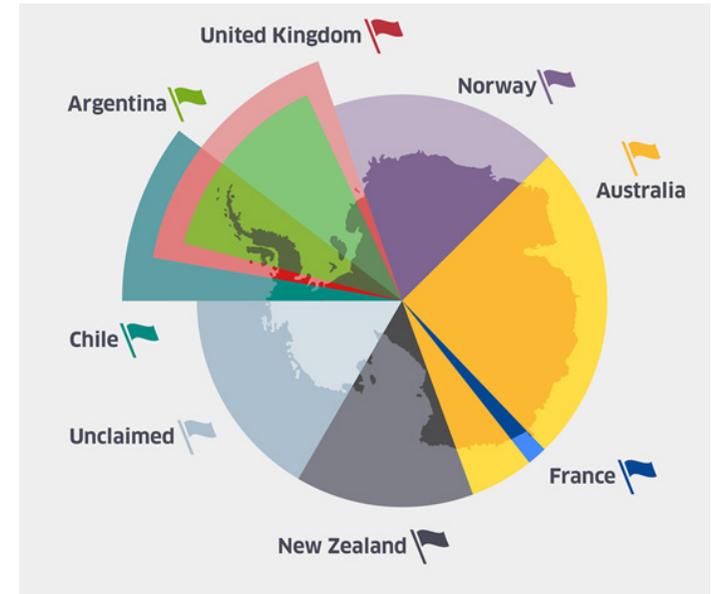
At the end of the war, Germany was split into four zones, each controlled by the winning countries – USA, Britain, France and the USSR. Berlin was also split into four, Berlin was in the Soviet area of Germany. In 1948 France, Britain and the USA untied their zones. This angered the USSR because they were not told about the plans. In June 1948, the USSR cut off all road and rail links between the allied area of Berlin and West Germany. The wanted France, Britain and the USA to withdraw from their area in Berlin. This was called the Berlin Blockade. The allies couldn't leave 2 million people to starve. They couldn't march troops into the area as this would mean war. They supplied West Berlin by air and hoped the Russians didn't shoot them down. The Americans and Britain organised a round the clock airlift of essential supplies such as food, fuel and medicine. In 11 months a total of 274,000 flights delivered an average of 400 tons of supplies a day. Stalin had expected the West to give up, he realised this wouldn't happen and the blockade ended in early May 1949.



The Antarctic Treaty

The primary purpose of the Antarctic Treaty is to ensure "in the interests of all mankind that Antarctica shall continue forever to be used exclusively for peaceful purposes and shall not become the scene or object of international discord."
Some of the rules include:

1. No military use
2. Freedom of scientific investigation
3. Free exchange of scientific plans and data
4. Any territorial claims put on hold
5. Nuclear free zone
6. Applies to land but not seas
7. All stations open to inspection by other nations



Map of Antarctica

Short wings reduced to flippers for "flying" underwater

Short sharp beak for catching fish and krill, pecking at neighbours and attacking nosy scientists and tourists

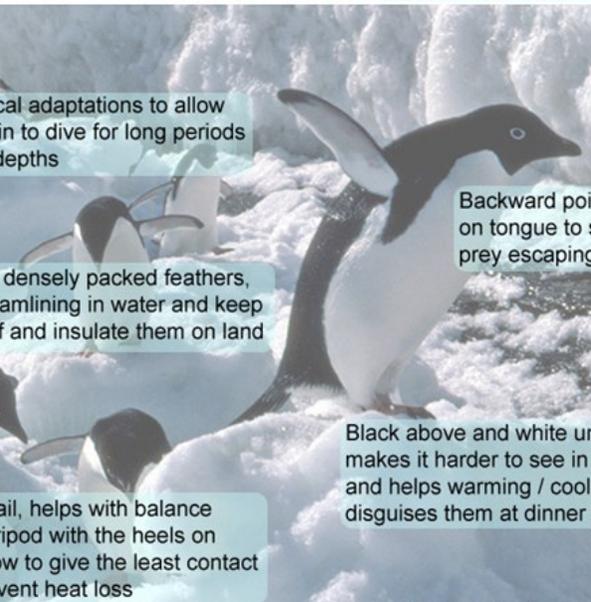
Physiological adaptations to allow the penguin to dive for long periods and great depths

Backward pointing barbs on tongue to stop slippery prey escaping

Short, very densely packed feathers, help in streamlining in water and keep the wind off and insulate them on land

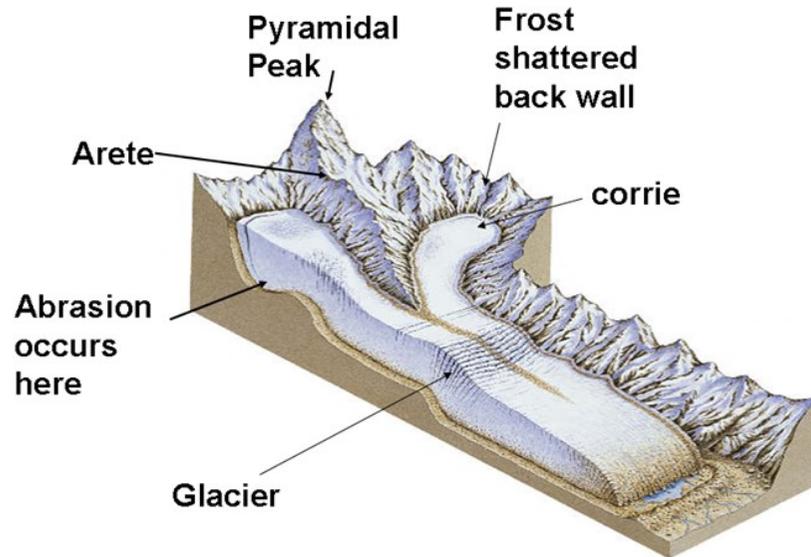
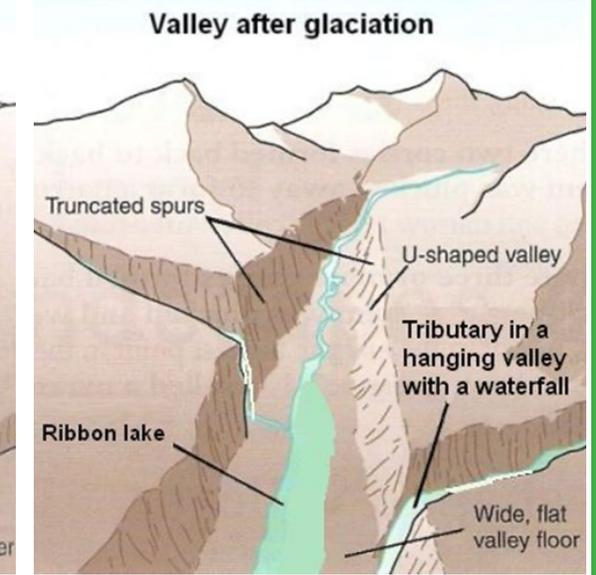
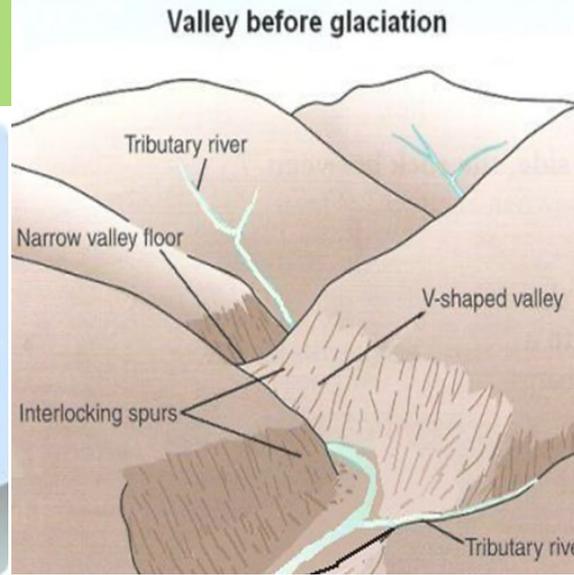
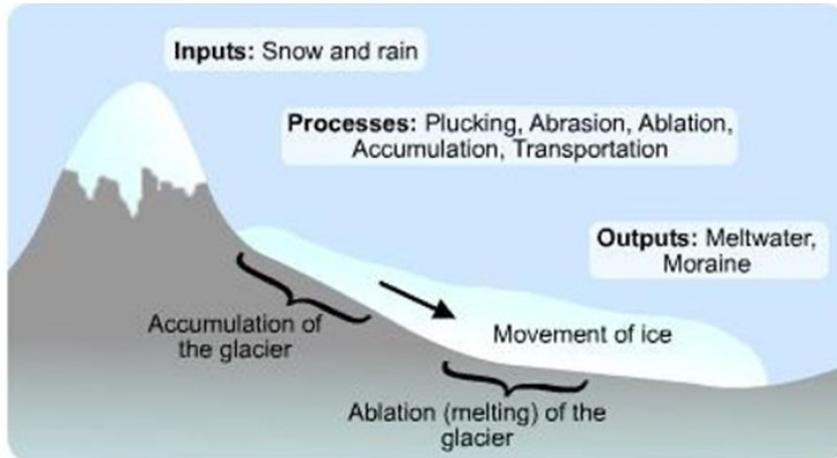
Black above and white underneath makes it harder to see in the sea and helps warming / cooling on land, disguises them at dinner parties

Short stiff tail, helps with balance forming a tripod with the heels on ice and snow to give the least contact area to prevent heat loss



Animal adaptations in Antarctica

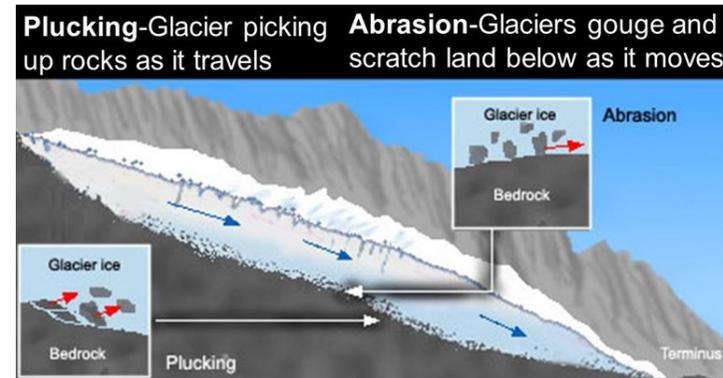
Glacial Landforms



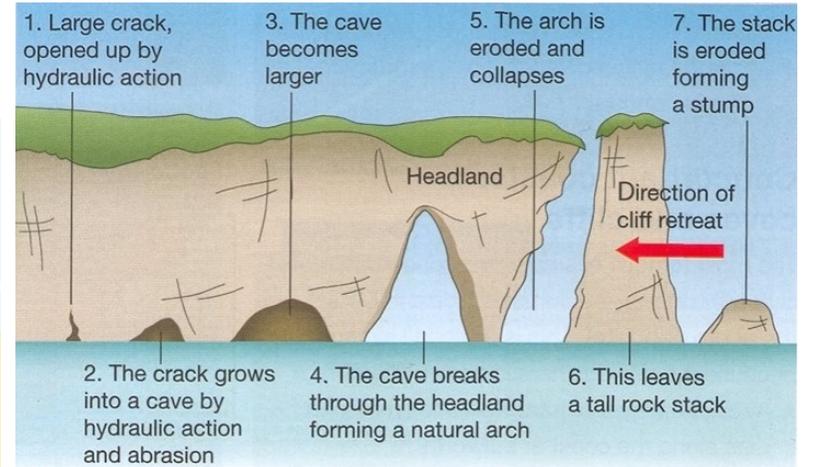
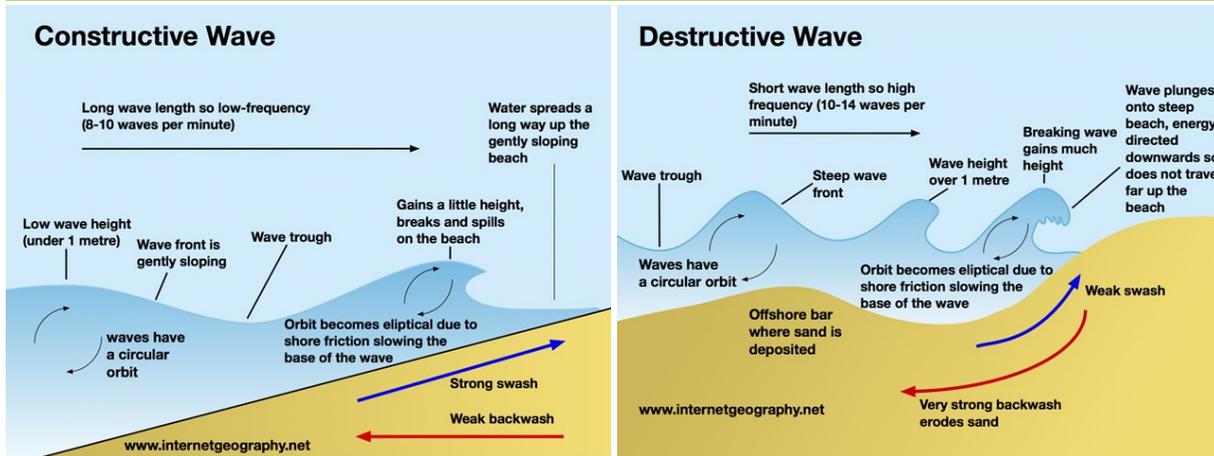
Freeze Thaw Weathering

Water enters cracks in the rock. Temperatures fall at night, causing water to freeze. When water turns to ice it expands by 10%. This puts pressure on the rock, prising the crack apart. The ice melts, water seeps deeper into the crack and freezes again. Over a period of time large blocks of rock can be shattered by repeated freeze-thaw weathering.

Glacial Transportation Processes



Types of Waves



Cave, arch, stack and stump

Type	Definition	Advantages	Disadvantages
Beach Nourishment	The beach is made wider by using sand and shingle.	Increases the distance a wave has to travel, thus slowing it down and preventing erosion.	Sand and shingle need to be sourced from somewhere else - usually by dredging. Requires a lot of maintenance and can be costly.
Managed Retreat	Certain areas of the coast are allowed to erode and flood naturally due to their low value	Natural eroded material encourages the development of beaches and salt marshes. Is low cost.	Required to compensate people who lose buildings and farmland
Beach Stabilization	Planting dead trees in the sand to stabilize the beach	Widens the beach therefore slowing down waves and preventing erosion	Similarly to beach nourishment trees need to be sourced and requires maintenance.
Dune Regeneration	Creating new sand dunes or restoring existing dunes	Dunes act as a barrier and absorb wave energy reducing erosion and protecting against flooding	Dunes are a barrier to beach access and creating new dunes results in land loss
Afforestation of Coastal Dunes	A way to stabilize dunes by planting trees	By stabilizing the dunes this minimizes sand drift and erosion	If non-native trees are planted this impacts the nutrient deposition of the soil

Strategy - Hard	Description	Advantages	Disadvantages
Sea Walls	A wall or embankment erected to prevent the sea from encroaching on or eroding on an area of land.	-Effective, long-term solution -Protects areas of human habitation	-Maintenance required -High construction cost
Groins	A structure that interrupts water flow and limits the movement of sediment.	-Avoids having beaches washed away by long shore drift -Prevents erosion and ice-jamming in rivers	-Makes shorelines look unnatural/unattractive
Revetments	Sloping structures placed on banks or cliffs in such a way as to absorb the energy of incoming water.	-Preserves existing uses of shoreline -Prevents damage during flood periods/heavy seasonal rains	-Could be a barrier to different organisms -May be a hazard to people
Rock Armor (Rip rap)	Rock or other material used to armor shorelines and other structures against scour, ice, or erosion.	-Can be used on any waterway or water containment -Absorbs and deflects energy of waves	-Unattractive -Constantly needs maintenance

Hard vs Soft Engineering Strategies

Glaciation and Coasts Tier 3 Vocabulary

Key Vocabulary	Definition	Contextual Sentence
Erosion	The wearing away and removal of material by a moving force, such as a breaking wave.	There are 4 types of erosion processes; hydraulic action, abrasion, attrition and solution.
Gabion	Steel wire mesh filled with boulders used in coastal defences.	Gabions can protect cliffs from erosion.
Glacier	A sheet of ice that moves slowly down a river valley under the influence of gravity.	Glaciers are often described as a river of ice.
Glacial episode	A colder period of time with ice expansion.	Glacial episodes often last approximately 100,000 years.
Glacial trough	A river valley widened and deepened by the erosive action of glaciers.	A glacial trough becomes U shaped instead of the normal V shape of a river valley.
Groyne	A wooden barrier built out into the sea to stop the longshore drift of sand and shingle.	Groynes are used to build beaches to protect against cliff erosion.
Hard engineering	The use of man made structures to defend land against natural erosion processes.	Many people are against hard engineering strategies as they do not fit in with the natural environment.
Hydraulic Action	The process by which breaking waves compress pockets of air in cracks in a cliff.	The pressure built up by hydraulic action can cause cracks to widen, breaking off rock.
Moraine	Frost shattered rock debris and material eroded from the valley floor and sides.	Moraine is transported and deposited by glaciers.
Rock armour	Large boulders dumped on the beach as part of the coastal defences.	Rock armour is an example of a hard engineering strategy.
Sea Wall	A concrete wall which aims to prevent erosion of the coast by providing a barrier which reflects wave energy.	A sea wall costs between £5,000 to £10,000 per metre.
Stack	An isolated pillar of rock left when the top of an arch has collapsed.	Over time further erosion reduces the stack to a smaller stump.
Thermal expansion	When the sea expands and becomes larger as a result of increased temperature.	Thermal expansion relates to the change in the size of material due to temperature.



Spanish: Knowledge Organiser Year 9 Term 3

Unit 5: School, school subjects and school life

3.1 Las asignaturas- *School subjects*

estudio	I study
el inglés	English
las matemáticas	Maths
la historia	history
la geografía	geography
las ciencias	Sciences
la biología	biology
la química	chemistry
la física	physics
la educación física	PE
el teatro	drama
el dibujo	art
la tecnología	DT
la informática	IT
la cocina	food tech
la sociología	sociology
la psicología	psychology

3.2 Las opiniones - *Opinions*

prefiero	I prefer
me encanta	I love
me gusta	I like
no me gusta	I don't like
odio	I hate
Se me da(n) bien	I'm good at...
porque/ dado que	because
es/ son	It is/ they are
fácil(es)	easy
difícil(es)	difficult
interesante(s)	interesting
aburrido (a,os,as)	boring
divertido (a,os,as)	fun
creativo (a,os,as)	creative
práctico (a,os,as)	practical
útil (es)	useful
inútil (es)	useless
entretenido(a,os,as)	entertaining
estoy flojo/a en	I'm not good at..
voy bien en	I'm doing ok in..
creo que	It think

3.3 El instituto *High school*

la biblioteca	the library
las taquillas	the lockers
los laboratorios	the labs
el gimnasio	the gym
las aulas	the classrooms
los vestuarios	the changing-rooms
el salón de actos	the arts theatre
la sala de profesores	the staffroom
el despacho del director	the headteacher's office
el comedor	the dining-room
la cafetería	the cafeteria
es mixto	it's mixed
es masculino	it's all boys
es femenino	it's all girls
el campo de fútbol	football pitch
la cancha de tenis	tennis court
la pista de atletismo	athletics track
hay	there is/are
no hay	there isn't/ aren't

3.4 Aspectos positivos y negativos

positive and negative aspects

Lo bueno es que hay	the good thing is there is/are
Lo malo es que hay	the bad thing is there is/are
Lo bueno es que no hay	the good thing is there isn't/aren't
Lo malo es que no hay	the bad thing is there isn't/aren't
Había	there used to be
Tenía	it used to have

Gramática: making adjectives agree

Llevo una falda negra.

LLevamos zapatos negros.

La corbata tiene rayas rojas/ moradas.

3.5 El uniforme *uniform*

Llevo	I wear
Llevamos	We wear
Tengo que llevar	I have to wear
una falda	a skirt
un pantalón	trousers
una chaqueta	a jacket
una camisa	a shirt
una corbata	a tie
unos calcetines	socks
unos zapatos	shoes
un jersey	a jumper
con rayas	striped
negro	black
blanco	white
gris	grey
rojo	red
naranja	orange
azul	blue

Unit of work 5: Key language in context

Saying what you study at School:	En el instituto estudio inglés, matemáticas y ciencias.	In high school, I study English, maths and science.
	Estudio las tres ciencias: biología, química y física.	I study the three sciences: biology, chemistry and physics.
Giving opinions about school subjects.	Me gusta la historia.	I like history.
	Me encanta el español.	I love Spanish.
	No me gustan las matemáticas.	I don't like maths.
	Me gustan la informática y la tecnología.	I like IT and DT.
	Prefiero la música.	I prefer music.
Giving reasons for opinions:	Me encanta el español porque es útil.	I love Spanish because it is useful.
	No me gustan las matemáticas porque son difíciles.	I don't like maths because it's (they are) difficult.
	Prefiero el dibujo porque es creativo.	I prefer art because it's creative.
Extending opinions about School:	Voy bien en educación física.	I'm doing well in PE.
	Voy mal en geografía.	I'm not doing well in geography.
	Se me dan bien las ciencias.	I'm good at science. (the sciences)
	Estoy flojo/a en dibujo.	I'm bad at art.
Saying what facilities, the school has or hasn't got:	Hay muchas aulas y laboratorios.	There are many classrooms and labs.
	Hay un campo de fútbol, canchas de tenis y una pista de atletismo.	There is football pitch, tennis courts and an athletics track.
	No hay piscina.	There is no pool.
Expressing opinions about the facilities:	Lo bueno es que hay laboratorios modernos.	The good thing is there are modern labs.
	Lo malo es que la cantina es pequeña.	The bad thing is the canteen is small.
	Me gustaría tener un McDonalds en el insti.	I would like to have a McDonalds in school.
Talking about school uniform:	Tengo que llevar uniforme.	I have to wear a uniform.
	Llevo una chaqueta negra, un pantalón negro y una camisa blanca.	I wear a black blazer, black trousers and a white shirt.
	Llevamos zapatos negros.	We wear black shoes.

French: Knowledge Organiser Year 9

Unit 5: Food and eating out

5.1 Qu'est-ce que tu aimes manger?

de l'agneau (m)	lamb
du bifteck	beef steak
des biscuits	biscuits
du bœuf	beef
des champignons	mushrooms
des chips	crisps
des crêpes	pancakes
de l'eau	water
des frites	chips
des haricots verts	green beans
du jambon	ham
du lait	milk
des légumes	vegetables
des nouilles (f)	noodles
de la nourriture	food
des œufs	eggs
des pâtes	pasta
une pomme	an apple
des pommes de terre	potatoes
du porc	pork
du poulet	chicken
du riz	rice
de la viande	meat
du yaourt	yoghurt

5.2 Les quantités

Un kilo de	a kilo of
Une bouteille de	a bottle of
Un litre de	a litre of
Un paquet de	a packet of
Beaucoup de	lots of
200 grammes de	200g of
Un pot de	a pot of
Une tranche de	a slice of
Une tablette de	a bar of
Un morceau de	a piece of
Une boîte de	a box of
Une cuillère de	a spoonful of

5.3 Les numéros 1-100

<i>dix</i>	10
<i>vingt</i>	20
<i>trente</i>	30
<i>quarante</i>	40
<i>cinquante</i>	50
<i>soixante</i>	60
<i>soixante-dix</i>	70
<i>quatre-vingts</i>	80
<i>quatre-vingts-dix</i>	90
<i>cent</i>	100

5.4 Les repas

<i>le matin</i>	<i>in the morning</i>
<i>au petit-déjeuner</i>	<i>for breakfast</i>
<i>à midi</i>	<i>at midday</i>
<i>au déjeuner</i>	<i>for lunch</i>
<i>le soir</i>	<i>in the evening</i>
<i>au dîner</i>	<i>for dinner</i>
<i>mon repas préféré</i>	<i>my favourite meal</i>

5.5 Les opinions

J'aime	I like
Je n'aime pas	I don't like
Je déteste	I hate
J'adore	I love
car / parce que	because
c'est	it is
goûteux	tasty
délicieux	delicious
aigre	sour
sucré	sweet/sugary
épicé	spicy
salé	salty
savoureux	tasty
dégoûtant	disgusting
immangeable	inedible
nul	rubbish

5.6 Les cuisines

J'aime la cuisine...	I like ... cuisine
espagnole	Spanish
indienne	Indian
marocaine	Moroccan
des Caraïbes	Caribbean
mexicaine	Mexican
italienne	Italian
grecque	Greek
chinoise	Chinese
végétarienne	vegetarian
française	French

5.5 Au restaurant

le restaurant	the restaurant
le fast-food	the fast-food restaurant
la pizzeria	the pizzeria
la crêperie	the pancake restaurant
la glacerie	the ice cream parlour
Vous désirez ?	What would you like ?
Je voudrais...	I would like
C'est tout ?	Is that all ?
Quel parfum ?	What flavour ?
Combien de boules ?	How many scoops ?
C'est combien ?	How much is it ?

Comme boisson ?	And to drink ?
un cornet	a cone
un pot	a pot
un plat régional	a regional dish
une spécialité	a speciality
L'entrée	starter
Le plat principal	main meal
Le dessert	dessert / pudding
L'addition	the bill
La serveur	waiter
La serveuse	waitress

Discussing food and drinks / restaurants and meals:	Je mange du poulet et des légumes	I eat chicken and vegetables.
	Je bois de l'eau tous les jours	I drink water every day.
	Il faut acheter un paquet de chips et une bouteille de coca	I must buy a packet of crisps and a bottle of coke.
	Il faut quatre-vingt-dix grammes de riz	You need 90 grams of rice.
	Le matin, au petit-déjeuner je mange des céréales avec du lait	In the morning, for breakfast I eat cereal with milk.
	Mon repas préféré c'est le dîner car je prends un dessert	My favourite meal is dinner because I have dessert.
	Je déteste le porc car c'est dégoûtant, mais j'adore le fromage car c'est délicieux	I hate pork because it is disgusting, but I love cheese because it's delicious.
	Je préfère la cuisine mexicaine car c'est épicée	I prefer Mexican food because it's spicy.
	Je voudrais une boule de glace au chocolat	I would like one scoop of chocolate ice cream.
Je voudrais une pizza comme plat principal	I would like a pizza for my main course.	

Unit 6: C'est quoi, la France?

6.1 La France et la Grande Bretagne

En France/Grande-Bretagne...	In France/Britain
On a une monarchie	we have a monarchy
On a un président	we have a president
On utilise la livre sterline/l'euro	we use the pound/euro
On roule à gauche/droite	we drive on the left/right
On porte un uniforme à l'école	we wear a uniform at school
Il y a des rideaux/volets au fenêtrés	there are curtains/shutters at windows
il y a le tournoi de tennis de...	there is the ... tennis tournament
les gendarmes portent un képi	the police wear a cap
c'est une île	it's an island

6.3 Les BD

C'est un personnage...	it's a ... character
Qui est...	who is
Jaloux	jealous
Paresseux	lazy
Amoureux	romantic
Intelligent	intelligent
Gourmand	greedy
Nul	rubbish
Populaire	popular
Tenace	determined
Bête	stupid

6.2 Les français célèbres

Il est/elle est	he/she is
auteur	an author
couturier/couturière	a fashion designer
écrivain	a writer
homme/femme politique	a politician
ingénieur	an engineer
physicien/physicienne	a physicist
scientifique	a scientist
il/elle est né(e) en...	he/she was born in...
il/elle est mort(e) en...	he/she died in...
il/elle a écrit	he/she wrote
il/elle a inventé	he/she invented
il/elle a travaillé	he/she worked
il/elle a créé	he/she created
il/elle a dessiné	he/she designed
il/elle a fait	he/she made
il/elle a construit	he/she built

CREMERIE RESTAURANT POLIDOR



Liqueurs

Le Polidor
Semainier
TRAIT MAISON

Lundi:	Boeuf persis	11€
Mardi:	Roche parmentier	12€
Mercredi:	Pigeon à la mode de Cœur	12€
Jeudi:	Tourtière d'Andréproux-sauté	12€
Vendredi:	Roche parmentier	11€
Samedi:	Pigeon à la mode de Cœur	12€
Dimanche:	Pigeon à la mode de Cœur	12€

Vins Fins

