



Knowledge Organiser
Autumn Term
2023/24
Year 11

Name: _____

Form: _____



Contents

- 6. Tier 2 Vocabulary
- 8. English
- 17. Maths
- 22. Biology
- 26. Chemistry
- 42. Physics
- 46. History
- 50. Geography
- 54. Spanish
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- 62. German

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,

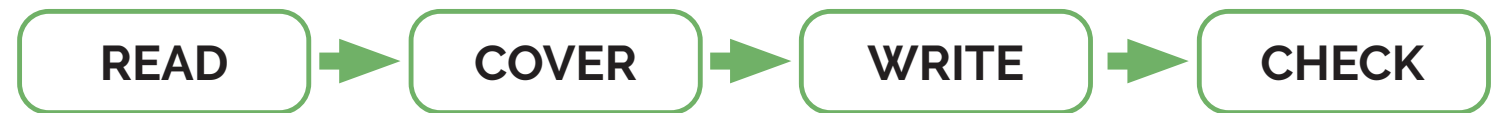
“Thinking well requires factual knowledge that is stored in our long-term memory”

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 -11. 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 the Google Classroom. 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 swap 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 KS4



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 (usually labelled frequency) with different eye colours or what their favourite subject is.	Can be used to record the number of people visiting honeypot sites when studying tourism such as visitor numbers in Jamaica over a 5 year period.
Pie chart	Can be used to display the % of different hydrocarbons in crude oil or % of different gases in the atmosphere in chemistry.	Can be used to display results of a tally chart.	Can be used to display the proportion or % of pupils who travel to school in different way.	Can be used to record the amount of people working in different job sectors over time in the UK in comparison to other countries.
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 data such as the percentage of forest lost in a range of countries.
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.	Can be used to display research data. Can also be used to represent time on a "Gant" chart.	In maths this can be used to show the distribution of a data set such as the ages within a population. In most cases, a histogram has different class widths meaning the area of each bar is the frequency for it.	A range of different bar charts and histograms are used when writing up fieldwork.
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 and/or the trend in a data set over time.	Can be used when studying climate graphs. Line graphs are also used when analysing climate data over a period of time.
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. In GCSE Statistics, we use correlation coefficients and linear regression equations to analyse this in detail.	In geography lines of best fit are used to look for negative and positive correlations when comparing data usually in physical geography modules. It is always a straight line drawn with a ruler through as many points as possible.

Portable Knowledge in STEM at KS4



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	The range is a measure of the spread of a data set. It can be used to compare data, with a smaller range meaning it is more consistent such as comparing times athletes run 100m over 10 races.	Range is used in the geographical skills section of course. Range can be used when looking at rainfall and temperature data for different locations or 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 in conjunction with the range.	Mean, median and mode are used in the geographical skills section of the course and can be used to analyse any sets of data with a range of results.
Continuous data	These are data values that can take any value and are grouped/rounded. In biology an example would be bubbles of oxygen produced during photosynthesis.	x	These are data values that can take any value and are grouped/rounded. Data could be length, time, capacity or mass.	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	These are specific data values and can be quantitative (numerical) and qualitative (word or category). Examples include type of colour, the result from rolling a dice or the number of pets people have.	Discrete data in geography includes both primary and secondary data. Fieldwork data could include rock sample sizes and how they change from the source to the mouth of a river.
Using co-ordinates	x	Used by a CNC machine to position the cutter when machining a piece of material. Marking out a series of holes from dimensions on a drawing.	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.	Being able to read a variety of scales is a key skill for plotting and drawing graphs or measuring angles and lines. It is important in constructions and scale drawings to be within 0.1 cm or 1°	Measurements and accuracy are really important when studying map skills, especially when looking at scale and distance.

Year 11 Term 1		Definition Sentence	Contextual Sentence
1	coincide	Happen at the same time.	The show will coincide with the launch of her new book.
2	commenced	Started, began	The day commenced with a welcome from the head teacher.
3	incompatible	Unsuitable to be or to use together	New computer software is often incompatible with older computers.
4	concurrent	Existing, happening, or done at the same time.	The games are concurrent, so I can't watch both today.
5	confined	Restricted in area or volume; cramped.	The soldiers were confined to barracks.
6	controversy	Prolonged public disagreement or heated discussion.	The design of the building has caused controversy.
7	conversely	In a contrasting or opposite way.	You can add the water to the powder, or, conversely, the powder to the water.
8	device	Something made for a particular purpose, especially a piece of mechanical / electronic equipment.	Smartphones and other electronic devices must not be used.
9	devoted	Very loving or loyal.	She was a devoted fan of the band.
10	diminished	Made smaller or less.	The lack of rainfall quickly diminished the water supply.

11	distorted	Pulled or twisted out of shape; giving a misleading/false account or impression.	His face was distorted by rage.
12	duration	The time during which something continues.	You can rent a locker for the duration of the term.
13	erosion	The action or process of eroding (being removed/rubbed away)	The area suffers badly from coastal erosion.
14	ethical	Morally good or correct.	The use of animals in scientific tests raises some difficult ethical questions.
15	format	The way in which something is arranged or set out.	Your reports should be in a standard format - introduction, main body and conclusion.
16	founded	To establish or originate.	York was founded by the Romans in 71 AD.
17	inherent	Existing in something as a permanent, essential, or characteristic attribute; in-built.	Rock climbing has its inherent dangers.
18	insights	An accurate and deep understanding.	The project gives scientists new insights into global warming.
19	integral	Essential to make something complete.	PE is an integral part of the curriculum.
20	intermediate	Coming between two things in time / place / level.	The club holds coaching sessions for beginners and intermediate players on Friday evenings.

Tier 2 Vocabulary

21	manual	Relating to or done with the hands. A book giving instructions or information.	Robots are taking over manual jobs in many industries. The computer comes with a helpful manual.
22	mature	Become fully grown or developed.	He's not mature enough to be given too much responsibility.
23	mediation	Intervention in a dispute in order to resolve it.	The conflict ended through the mediation of the United Nations.
24	medium	Something in a middle position. A means of effecting or conveying something	Cook the sauce over a medium heat until it thickens. Cinema is a medium of mass entertainment.
25	military	Relating to/characteristic of soldiers or armed forces.	There was a build-up of military activity along the border.
26	minimal	Of a minimum amount, quantity, or degree	The castle suffered minimal damage.
27	mutual	Having the same feelings one for the other ; shared in common	I don't like her, and I think the feeling is mutual .
28	norms	Something that is usual, typical, or standard.	It is important to understand the norms of behaviour.
29	overlap	Extend over so as to partly cover; cover part of the same area.	You will need to overlap the pieces of wood slightly.
30	passive	Accepting/allowing something, without responding.	She had a passive expression on her face, as if she didn't care what happened.

31	portion	A part of something	He took the biggest portion of cake.
32	preliminary	Coming before or done in preparation for something more important.	A preliminary study suggested that the product would be popular.
33	protocol	A detailed plan / set of procedures on how something must be done.	They were familiar with the protocol of royal visits.
34	qualitative	Relating to the quality of something rather than its quantity.	Qualitative analysis shows that water is made up of hydrogen and oxygen.
35	refine	Make minor changes so as to improve	You can refine your skills at college.
36	relaxed	Free from tension and anxiety ; to make a rule/ restriction less strict.	School relaxed the ban on phones for a trial period.
37	restraints	Measures that keep someone/something under control.	The government imposed export restraints on some products.
38	revolution	Overthrow a government/ social order, by force, in favour of a new system; a sudden, radical, or complete change. To move round in a circle.	The army officers led a revolution against the king. The earth makes a yearly revolution around the sun.
39	rigid	Unable to bend/be forced out of shape; not flexible.	We must stick to a rigid schedule in order to get the work done.
40	route	A line of travel; a travelled way	It was the main route north.
41	scenario	A predicted sequence or development of events.	The worst-case scenario would be for the factory to be closed.

Plot		Characters		Vocabulary	Context												
Act 1	The Birling family celebrate their daughter Sheila's engagement. Inspector Goole arrives to investigate the death of a young woman named Eva Smith who has taken her own life. Mr Birling fired Eva Smith from his factory because she wanted higher wages. Sheila Birling used her influence to have Eva Smith sacked from Milward's. The Inspector informs the family Eva Smith changed her name to Daisy Renton. Sheila notices immediately that her fiancé, Gerald Croft, reacts to the name.	Mr. Arthur Birling	The head of a middle-class family and a prosperous business owner. He is selfish, boastful and self-important. He puts profit above people. He aspires to a knighthood. He is unchanged by the events of the evening and believes he has been hoaxed.	Act Narrative Dramatic Irony Characterisation Hyperbole Metaphor Stage Directions	Priestley served in the army during WW1 1914-1918 and wrote 'An Inspector Calls' in the winter of 1944-1945 as the "world was suffering" at the end of WW2.												
Act 2	Gerald admits he had an affair with Eva/Daisy. He offered her a place to stay and gave her money. Sheila breaks off her engagement to Gerald. Mrs Birling eventually admits she used her influence to make sure Eva was refused help from a charity. Mrs Birling blames the father of Eva's unborn child and wants to see him made an example of.	Mrs. Sybil Birling	She is a cold, unsympathetic woman who lacks compassion. She supports her husband, believes her actions are completely justified and refuses to help Eva Smith. She is prejudiced towards "women of that class". She is unchanged at the end of the play.	Simile Symbolism Foreshadowing Interrogative Tone Exclamatory Tone Satire Allegory Listing Naturalistic Dialogue Genre	The play is set in 1912 and exposes the "rotteness behind the façade" of the families like the Birlings. The play is a social criticism of "middle-class prosperity and apparent respectability".												
Act 3	Eric Birling is the father of Eva's child. He gave her money stolen from his father's business and offered to marry her, but she refused both. The Inspector's final speech warns people to care for everyone or they will be taught to in a painful way. In a final plot twist the family question whether the Inspector was real. The younger and older generation react differently when reflecting on their actions. Sheila and Eric change and show regret, their parents do not, and events repeat themselves.	Inspector Goole	The Inspector highlights the importance of social responsibility and community. His role helps structure the play "one line of enquiry at a time". He explores how each character contributed to Eva Smith's death. He warns the characters and the audience of the consequences of their actions.	Structure and Form	Priestley exposes the irony of 1912 attitudes. The dramatic irony of Mr. Birling's claims: "there isn't a chance of war" and that the Titanic is "absolutely unsinkable" reflect his ignorance and pre-war complacency. Birling's speech at the beginning of the play also dismisses the idea of community "as if we were all mixed up together like bees in a hive". The idea that "a man has to make his own way" is interrupted by the Inspector's arrival to counter this message.												
Themes		Sheila Birling	She is initially "very pleased with life and rather excited". She is shocked by the way Eva has been treated. She becomes more independent as the play progresses. She breaks off her engagement to Gerald. She is incredibly sorry for her behaviour.	Written in three Acts. Each act ends with on cliff hanger. The play is cyclical in nature, with the last Act directly linking to the events of the first. By the end of the play Sheila and Eric have learned important lessons and are ashamed of their previous behaviour. Mr and Mrs Birling believe their actions were right and justified.	The Inspector's final warning would resonate with the audience who had lived through two world wars. Priestley highlights the way Europe moved towards the 'fire and blood and anguish' of the 1914-1918 War because society did not appreciate that "We are members of one body" responsible for each other.												
<table border="1"> <tr> <td>Class</td> <td>Consequence</td> <td>Remorse</td> </tr> <tr> <td>Prejudice</td> <td>Family</td> <td>Responsibility</td> </tr> <tr> <td>Capitalism</td> <td>Injustice</td> <td>Redemption</td> </tr> <tr> <td>Socialism</td> <td>Supernatural</td> <td>Hypocrisy</td> </tr> </table>		Class	Consequence	Remorse	Prejudice	Family	Responsibility	Capitalism	Injustice	Redemption	Socialism	Supernatural	Hypocrisy	Gerald Croft	The upper-class son of Lord and Lady Croft. He claims he was kept away from Sheila due to business while he was having an affair with Daisy/Eva. He sides with Mr. and Mrs. Birling at the end of the play in claiming the Inspector was a hoax.		The concept of "Time" inspired this and other works by Priestley. 'An Inspector Calls' allows the characters to examine the consequences of their actions. They are given an opportunity to change and act differently to break this cycle. The final climax of the play shows that lessons have not been learned just as they were not from WW1 and repeated in WW2.
Class	Consequence	Remorse															
Prejudice	Family	Responsibility															
Capitalism	Injustice	Redemption															
Socialism	Supernatural	Hypocrisy															
Assessment Objectives		Eric Birling	He is young, drinks heavily and works for the family business. He threatens to "make a row" when he goes home with Eva. He steals money to support pregnant Eva and offers to marry her. He is ashamed of himself and his parents' actions at the end of the play.		Tips												
AO1	Read, understand and respond to texts. Students should be able to: • use textual references, and quotations, to support and illustrate interpretations. • maintain a critical style and develop an informed personal response.	Eva Smith/ Daisy Renton	Eva Smith represents ordinary working-class women. She has no one to turn to when unemployed and pregnant. She highlights the need for the Welfare State established after WW2.		<ul style="list-style-type: none"> Support points with reference to characters and events and refer back to the question set. The provided extract can be useful for language analysis (AO2). 												
AO2	Analyse the language, form and structure used by a writer to create meanings and effects, using relevant subject terminology where appropriate.																
AO3	5 marks are allocated for accuracy in spelling, punctuation and the use of vocabulary and sentence structures in Section A.																



An Inspector Calls

You are advised to spend about 45 minutes on this question.

You should use the extract below and your knowledge of the whole play to answer the question.

Write about the theme of responsibility in *An Inspector Calls* and how it is presented at different points in the play.

In your response you should:

- refer to the extract and the play as a whole
- show your understanding of characters and events in the play. [40]

5 of the question's marks are allocated for accuracy in spelling, punctuation and the use of vocabulary and sentence structure.

INSPECTOR *(taking charge, masterfully)* Stop! They are suddenly quiet, staring at him. And be quiet for a moment and listen to me. I don't think to know any more. Neither do you. The girl killed herself - and died a horrible death. But each of you helped to kill her. Remember that. Never forget it. *(He looks from one to the other of them carefully.)* But I don't think you ever will. Remember what you did —

ERIC *(unhappily)* My God — I'm not likely to forget.

INSPECTOR Just used her for the end of a stupid drunken evening, as if she was an animal, a thing, not a person. No you won't forget. *(He looks at SHEILA.)*

SHEILA *(bitterly)* I know. I had her turned out of a job. I started it.

INSPECTOR You helped — but didn't start it *(Rather savagely, to BIRLING.)* You started it. She wanted twenty-five shillings a week instead of twenty-two and sixpence. You made her pay a heavy price for that. And now she'll make you pay a heavier price still.

BIRLING *(unhappily)* Look, Inspector — I'd give thousands - yes, thousands —

INSPECTOR You're offering the money at the wrong time, Mr Birling. *(He makes a move as if concluding the session, possibly shutting you notebook, etc. Then surveys them sardonically.)* No, I don't think any of you will forget. Nor that young man, Croft, though he at least had some affection for her and made her happy for a time. Well, Eva Smith's gone. You can't do her any more harm. And you can't do any good now, either. You can't even say 'I'm sorry, Eva Smith.'

SHEILA *(who is crying quietly)* That's the worst of it.

INSPECTOR But just remember this. One Eva Smith has gone — but there are millions and millions and millions of Eva Smiths and John Smiths still left with us, with their lives, their hopes and fears, their suffering and chance of happiness, all intertwined with our lives, and what we think and say and do. We don't live alone. We are members of one body. We are responsible for each other. And I tell you that if the time will soon come when, men will not learn that lesson, then they will be taught it in fire and blood and anguish. Good night. *He walks straight out, leaving them staring, subdued and wondering.*

Exemplar response

Responsibility is central to 'An Inspector Calls' because the play revolves around the death of a young woman, Eva Smith, and to what extent the Birling family and Gerald Croft are responsible for this. Priestley also emphasizes the tragic consequences of the Birling's actions because "we are responsible for each other" and yet Eva Smith became so desperate she took her own life. The play is set in 1912 and exposes the "rottenness behind the façade" of the families like the Birlings. The play is a criticism of "middle-class prosperity and apparent respectability".

We first encounter the theme of responsibility directly when Mr. Birling gives a speech to his family as they celebrate his daughter's engagement. Mr. Birling states that a man "has to look after himself" and dismisses ideas of community as "nonsense" encouraged by "cranks". It is at this point that Inspector Goole arrives to challenge Mr. Birling's ideas and investigate Eva Smith's death.

As the first Act continues Priestley presents the lack of responsibility evident in capitalist values as Mr. Birling claims it is his responsibility to keep profits high and labour costs down. He is also keen to ensure his daughter's marriage to Gerald Croft in order to secure a merger for his business and avoid any potential scandal. He is, however, reminded by the Inspector that public men "have responsibilities as well as privileges". Sheila's sense of responsibility is clear in her guilt for turning Eva "out of a job" is in direct contrast to her father's lack of responsibility and capitalist solution stuttering an offer of "thousands" to end the matter.

Priestley highlights the lack of responsibility for others as the Inspector reveals how Gerald tries to avoid responsibility for his affair with Eva at first denying he knew her. The theme is highlighted most cruelly in Act 2 by Mrs. Birling who admits her prejudice against "girls of that class. Mrs. Birling is reminded "masterfully" by the Inspector that she used her position and influence to deny an unemployed, pregnant Eva "even the pitiable little bit of organized charity". Mrs. Birling's refusal to accept any responsibility also leads to the dramatic irony of her demand to hold the "father" responsible and make an "example" of him.

In Act 3 the theme builds to its peak. The Inspector's exclamative "Stop!" brings a distinct focus to the key message on this theme as the focus of responsibility shifts from the Birling family to a general message to society. Priestley uses the Inspector as a mouthpiece for a more Socialist reminder that all our lives are "intertwined". Priestley emphasizes the number of working class, ordinary people in need of support from the more advantaged in society by repeating the enormous number "millions and millions and millions of Eva Smiths and John Smiths". The Inspector's speech warns of "fire and blood and anguish" if society does not take responsibility for "each other".

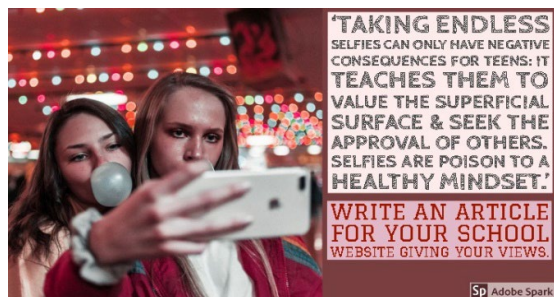
Overall, the younger generation take responsibility for their actions, learn the Inspector's lesson and provide hope for the future. The older generation however refuse to acknowledge their responsibilities or adapt which results in the final plot twist where events repeat themselves.

Commentary

The opening sentence shows a clear focus on the question and addresses the theme of responsibility. The candidate brings in relevant points and discusses Priestley's purpose in writing the play. The second paragraph keeps the focus firmly on the theme in the play. The response makes some clear AO2 points about technique – e.g. dramatic irony. The candidate also uses the extract. There are appropriate direct references from the extract and other parts of the text, used to support the candidate's astute points. Overall this response shows assured understanding of the demands of the task and covers all the Assessment Objectives in a sustained, integrated way.

Writer's Viewpoints and Perspectives (GCSE English Language Paper 2 Section B – AQA)

Example question:



Statement of opinion, linked to the Sources in Section A. start by drawing an agree/disagree table to generate ideas.

Instructions for which Genre, Audience and Purpose to use

24 marks for content and organisation; 16 marks for technical accuracy (40 marks)

Structuring your writing

Beginnings	Imagine this:....	-Use descriptive language techniques -Juxtapose two views on the same topic -e.g. <i>Imagine this: a world in which social media has ruined young people's mental health due to emphasis on body image.... Now imagine this: a world in which social media boosts mental health because it helps people connect...</i>
	Now imagine this:....	
	One word + amplification	-e.g. <i>Social media. What comes to mind when you hear these words? Well, to many people social media conjures up images of... and...</i>
Middles	Anecdote	-Use descriptive language techniques -Use a personal story to engage your reader -e.g. <i>Josie joined Instagram when she was 14, three years after she started endlessly pestering her parents to get an account. But after just one week, it all went wrong...</i>
	XXOX	X = agree, O = show the other side of the argument (then demolish it)
Endings	Develop your points	Use descriptive language and detailed anecdotes to expand on your ideas <i>e.g. Remember the world we imagined...</i>
	Circular structure: return to the start	Return to the character you described in your opening anecdote. How have they changed? What might they have learned? How has your perspective on this character's situation changed?
	Use collective language and a call to action	<i>e.g. Let's join together in a call to improve social media. Our voices need to be heard so that the technological giants which increasingly control our online interactions will change for the better...</i>
	Offer a solution	e.g. In order to see an improvement in this, we need to...

GAP the question:

Genre	Newspaper article	Include a headline Broadsheet – serious, academic, factual Tabloid – less serious, humorous, focussed more on personal stories and experiences
	Speech	Address the audience directly Use inclusive pronouns (we, us, our) Use anecdotes which the audience will relate to
	Letter	Start with <i>Dear...</i> End with <i>Yours faithfully...</i>
	Blog	Slightly more informal; but not as chatty as the examples <u>you</u> will have read online Include the audience (we, our) Include personal stories and experiences
Audience	Formal	Teacher Headteacher Politician
	Informal	Friends Class at school Year group Family
Purpose	To persuade or argue	You need to provide evidence (facts, statistics, anecdotes) to convince your readers to agree with you
	To inform or describe	Explain your point of view on a topic or detail your experiences

Using a range of sentence structures – start with...

1. –ing verbs	Consider the idea that...
2. Two or three adjectives	Unsettling, worrying and disturbing , the idea...
3. –ly adverbs	Importantly , we must consider...
4. A preposition (over, under)	Above all else...
5. A simile	Like a...
6. A connective	First , we..
7. The noun – adjective, adjective - sentence:	Social media – dangerous and attractive – draws all of us in...
8. More, more, more sentence:	The more you tweet, the more likes you get...

Using a range of punctuation

.	End a sentence
,	Separate clauses in a sentence (where you take a breath)
-	Add additional information in an informal way
;	Add additional information – full sentence before and after the ;
:	Introduce a list OR a shocking idea e.g. Morning arrived: disaster!
()	Include additional information that isn't essential to the sentence
?	Pose a question
!	Show shock or surprise (use sparingly)
'	Indicate possession (Amy's work) or omission (I can't do it)

Excellence criteria for self-assessment

Content and organisation: 24 marks	Target
	Communication is convincing – it reads like an article
	Communication is compelling – it is an article I would be interested in reading
	Tone, style and register are matched to audience – you have written in the style of a journalist
	Extensive and ambitious use of vocabulary
	Sustained crafting of linguistic devices – you have used a range of language devices throughout
Technical accuracy: 16 marks	Use of structural features – e.g. circular structure
	Inclusion of a range of complex ideas – e.g. you explore different points of view and perspectives
	Paragraphs are linked
	Sentence demarcation is accurate – full stops, commas etc are in the correct place
	Wide range of punctuation used accurately
	Uses the full range of sentence forms for effect
Technical accuracy: 16 marks	Secure control of complex grammatical structures
	High level of accuracy in spelling
	Extensive and ambitious use of vocabulary

The Soldier by Rupert Brooke
The one about dying unselfishly for your country.



- "there's some corner of a foreign field/ That is for ever England"
- "A pulse in the eternal mind"
- "hearts at peace, under an English heaven."

Content: In this poem, the persona, a soldier heading to war, talks about the possibility of dying in a foreign country. He claims that this should not be an occasion for sadness, but that by dying he will have made "a corner of a foreign field" a small part of England. He **personifies** England as his mother, who gave birth to him and raised him to become the person he is. He feels that he owes his life to her and therefore unselfishly sacrifices his life. He believes dying will be comforting and that he is only giving back the things that England gave to him and his memory and sacrifice will live on after death.

Context: The poem is **idealistic**. Rupert Brooke was a young, untested soldier, who had attended public school and was Cambridge educated. Athletic and called "the handsomest young man in England," he was part of the Bloomsbury group of authors and becoming known for his poetry. He wrote this poem at the start of the **First World War** as part of a series of **sonnets** and Winston Churchill admired its **selfless patriotism**. Brooke wrote idealistically about the war. He had not seen action and was never to. After embarking for war, he contracted blood-poisoning from a mosquito bite and died on French hospital ship. The poem has become a **symbol for a lost generation of youth**.

Form: This poem is a **sonnet**, traditionally used for love poetry. Rather than a person, this sonnet expresses Brooke's love and devotion to his country. Written in the **first person**, it follows an unwavering **iambic pentameter** and clear **rhyme scheme**, that demonstrates the persona's commitment to England. It is characterised as **Georgian** poetry with **motifs** of nature, youth and innocence.

Structure: The first **8 lines, or octave**, focus on how England enriched his life and he owes it to her. Whereas, the last **6 lines, or sestet**, reflect on how his death is meaningful, and reciprocal. It will bring him peace, and England security. Usually, there is conflict or debate between the two parts of a sonnet, but in *The Soldier* there is only harmony. The structure of the poem embodies the harmonious relationship between man and country.

Language Features:

- England is **personified** through the **extended metaphor** of a mother who has nurtured a son who is willing to die to protect her, embodying ideas of heroic sacrifice.
- **Natural imagery** is used extensively to express his love of the English countryside and creates a **Romantic**, idealised idea of war without pain or suffering.
- **Religious imagery** reveals his sense of faith and belief that his sacrifice will be immortalised by God.

Key Themes:

- Deep and lasting love (for his country) that is unselfish / Nature and Place
- Faith, belief and worship
- Attitudes to war and patriotism

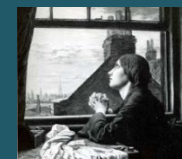
Good to compare with:

- Sonnet 43
- A Wife in London
- Living Space
- Dulce. Mametz Wood. The Manhunt

A Wife in London by Thomas Hardy

The one with the tragic telegram and the ironic letter.

- "She sits in tawny vapour"
- "The street lamp glimmers cold"
- "He –has fallen - in the far South Land..."
- "His hand, whom the worm now knows"



Content: The poem opens with a description of a wife sitting at home alone in London, against the backdrop of fog and misery which enfolds her. A sharp knock at the door brings her to her senses, and a messenger delivers a telegram with the tragic news that her husband, who is at war in a distant country, has been killed. The poem moves to the following day. Here a letter is delivered to her from her husband who wrote it before he died. He talks with enthusiasm of his hopes for coming home and their future together. The joy and optimism with which he speaks serves to emphasise the terrible waste of his life and the wife's desolation and sadness.

Context: In the poem, Hardy speaks as an **observer** and chooses to focus on those left behind at home at times of war. The war he is speaking about is **the Boer War** – a series of campaigns fought against the Boers (or Dutch) over territory in the **south of Africa**. The war was a **distant one** and one many thought was unnecessary and wasteful of life, as many men died needlessly of diseases like enteric fever. He uses the isolation of the wife to emphasise her helplessness in the face of her separation from her husband – she could be any one of any number of wives left behind – and employs the letter "page full" of hope to show the futility of war and how many died in their prime.

Form: The **persona** in the poem is an observer who watches in a detached manner contributing to the helpless and melancholy tone. **The irregular rhythm** and dashes create pauses and reflect the disbelief of the wife at the news. There is an **asymmetrical rhyme scheme (ABBAB)** which is broken once in the half rhyme of "smartly" and "shortly" – reflecting the wife's struggle to absorb the news.

Structure: Hardy **deliberately divides** the poem into two opposing halves – **The Tragedy and The Irony**. The **first 2 stanzas** accentuate the wife's loneliness trapped in the web of London's fog and build to climax of anticipation with the tragic news. The second 2 stanzas **juxtapose** the news of the husband's death with his joyful prose, fresh and firm. Hardy does this to show how war can crush hope and joy.

Language Features:

- Hardy uses **visual imagery** and the **pathetic fallacy** of the fog to distil the wife's isolation and grief. The fog encloses her and foreshadows the grip of death into which she will fall, and **imagery of light** offers no warmth, hope or consolation.
- **The contrast** of the **opening imagery** with the husband's joyful language, punctuated by powerful **alliteration**, creates a deep sense of irony and loss.
- **The graphic imagery** of his "hand" once "fresh" and "firm" now intimately acquainted with the worm focuses on his physical decay and the horror of war.

Key Themes:

- Love and relationships
- Pain and suffering – Death and Loss
- The impact of war on the individual

Good to compare with:

- The Manhunt
- As Imperceptibly as Grief
- Dulce/ Mamez Wood

Dulce et Decorum Est by Wilfred Owen

The famous one about the horrific effects of a gas attack.

- "Bent double like old beggars... coughing like hags"
- "All went lame; all blind"
- "As under a green sea, I saw him drowning"
- "Obscene as cancer"



Content: The persona describes the suffering of the exhausted soldiers, which he is one of, as they march away from battle back to their rest camp. They are broken, injured and so tired they appear drunk. Suddenly, the shout of "Gas!" rings out. A chlorine gas shell has been dropped and the soldiers scramble to get their gas masks on. One soldier is unable to and flounders toward the persona choking on gas. The persona recounts how in all his dreams he still sees the man's face plunging towards him. He directly asks the reader if he had seen young men die in such an obscene way could they ever say to others that it is sweet and fitting to die for your country. He calls this a lie.

Context: 2nd Lt Wilfred Owen was a decorated soldier, who won the highest honour of the **Military Cross** for bravery in the front line of battle in **the First World War**. Unlike, Brooke he experienced the horror and depravity of battle first hand and felt that his one duty as a poet was to tell the **"truth."** He wasn't unpatriotic, in fact after treatment for shell shock (PTSD) he returned to the front, but was sadly killed in action on 4th Nov 1918, 7 days before the war ended. The **Latin phrase** in his poem means *It is sweet and fitting to die for your country*. It was often displayed in military training camps to inspire trainee soldiers to greater patriotism. Owen criticises this as a lie told by the establishment which he finds disgraceful.

Form: The poem has some **regular and irregular features**. The **regular ABAB rhyme scheme** reflects the relentless trudge and suffering of the soldiers plight; however the **stanzas are of irregular length** and the **iambic pentameter falters** at times, perhaps showing the unpredictability of war or the soldiers exhaustion. It can seem disjointed, fragmented and confusing – like war.

Structure: It is written in the **first person** and is almost certainly **autobiographical** in nature. It starts with a **past tense** description of the long trudge of the soldiers back to rest camp, and **develops** to the panic of the gas attack. It **then flashes forward** to the present and the horrific dreams the persona still has of the incident. It **ends** with a **graphic description** of the soldier's death on the back of cart and **questions** the honesty and integrity of those who spread the "old lie" to the young.

Language Features: (there are almost too many)

- **Similes** are used extensively by Owen to describe the condition of the men and the experience of the gas attack.
- **Graphically violent imagery** to describe the soldier's hideous death, including powerful **adjectives and verbs** convey the brutal, shocking reality of war.
- **Direct address** – "My friend" challenges the reader, authorities and other poets (including Jessie Pope) to consider the falsehood they pedal to youth of Britain.

Key Themes:

- War and its impact
- Pain, suffering, death, loss and PTSD
- Negative Emotions

Good to compare with:

- Mametz Wood
- The Manhunt
- London

Mametz Wood by Owen Sheers

The one where a mass grave of dead soldiers is unearthed.

- “the wasted young”
- “blown and broken bird’s egg of a skull”
- “a wound working a foreign body to the surface of the skin”



Content: The persona in the poem describes that how even now the farmers in France are still finding the remains of soldiers who died on the battlefields of the **First World War** in the earth as they plough. The remains seem to be near a place called **Mametz Wood** where a particularly brutal battle, that cost many lives, took place. The narrator references how they were commanded to walk into battle and face the devastating machine guns. The poem moves to the present and the discovery of a mass grave of soldiers that has just been discovered and recounts how they are linked arm in arm and how their mouths seem to be open as if they are mid song.

Context: *Mametz Wood* was written in 2005 by British poet Owen Sheers. Mametz is a village in Northern France; the woodland nearby was the site of an especially bloody battle during **World War I**, in which around 4,000 men from the British Army's Welsh Regiment were killed. Sheers's poem is set many years later, and considers the way that, even a century after the conflict, the land around Mametz Wood is still filled with fragments of the dead soldiers' bodies. The poem is thus a consideration of the horrors of war, its lasting effects, the fragility of life, and the time it takes nature to heal from such atrocities. It is a commemorative and **elegiac** in tone.

Form: The poem is written in **tercets** (3 line stanzas) that seem a little less robust than a quatrain, perhaps hinting at the delicate balance between life, death and nature. Sheers chooses to write in **the 3rd person**, which creates a sense of distance and detachment. He uses **enjambment** within and between stanzas, which could reflect the slow unearthing and passing of time as the pieces are dug up. It creates a reflective tone.

Structure: The **first 3 stanzas** focus on the “years” after the war and how farmers found the fragile remains of the “wasted young” leading the narrator to reflect on their death at the mercy of machine guns. The **4th stanza** brings us to the **present day** and how “even now” the earth is still healing from the horror. The **final 3 stanzas are written “this morning”** and create a sense of immediacy around the horrific discovery of a mass grave – a reminder that this war is forever present in our history.

Language Features:

- The earth is **personified** as a “sentinel” who guards the remains of the soldiers and ensures they do not slip from memory. It is also described as wounded, suggesting how it still needs to heal from the horror of war.
- **Images of brokenness and fragility** such as the **symbolism** of the “bird’s egg” emphasise the fragility of life but also how war can **dehumanise** those who fight in it.
- **Graphic imagery** is used to describe the mass grave to suggest the horrific manner of their death, but is contrasted with the **metaphor** of the “mosaic” emphasising their beauty and delicacy.

Key Themes:

- Attitudes to war/ death and loss
- The passage of time/ the past
- Nature

Good to compare with:

- Dulce/ The Soldier
- The Manhunt/ A Wife in London
- To Autumn

1. The Manhunt by Simon Armitage:
The one about the scarred soldier.

- "frozen river"
- "foetus of metal"
- "unexploded mine"



Content: The wife of a soldier gets to know her husband again after he returns home injured from the war. Her husband is physically scarred by the injuries he sustained in the war, but he also has deeply buried psychological scars as result of his traumatic experiences. The poem traces his physical scars and explores deeper into the "unexploded mine" of PTSD. Physically, they can remain close, but there is a gap between them now emotionally as he struggles to let her in.

Context: *The Manhunt* is a **contemporary poem** and was originally aired as part of a Channel 4 documentary, *Forgotten Heroes: The Not Dead*. In the film, the poem is read by Laura, the wife of Eddie Beddoes, who is the subject of the poem. He served as a peace-keeper in Bosnia before being discharged due to injury and depression. Armitage wrote the poem after interviewing veterans returning from war and as a means of exploring the psychological impact on those who survived intense trauma.

Form: The poem is written in **couplet –long stanzas**, which have lines of varying length, from **Laura's perspective**. At the start, the couplets rhyme, but the **rhyme** breaks down making the poem feel disjointed and conveys the theme of brokenness. It may reflect their struggle to reconnect and how she will have to learn who her husband now is.

Structure: Each **couplet** introduces a different injury and the reader explores the body and mind of the soldier alongside his wife, experiencing the process at the same time. The use of **enjambment** mimics the way she traces the injuries that run continuously across his body and explores the damage done. It demonstrates the slow progress she is carefully making.

Language Features:


- The soldier's body is described by using **adjectives of damage** to show how broken war has left him.
- Parts of the body and mind are described using **metaphors** suggesting his is compiled of broken objects and that part of his humanity has been erased.
- **The verbs** express her tenderness and caution in how she approaches him.
- The final **metaphor of the "unexploded mine"** refers to the tension and stress his memories cause which he has not come to terms with yet.

Key Themes:

- War and its lasting effects
- Love and relationships
- Pain and suffering
- Loss and change

Good to compare with:

- Dulce, Mamez Wood
- A Wife in London
- London
- As Imperceptibly a Grief

	Year 11 Mathematics Knowledge Organiser	Topic	What do we mean by Tier 2 Vocabulary?
		Tier 2 Vocabulary Part 1	Tier 2 words are also referred to as academic vocabulary. They are cross-curricular words, appearing frequently across topics and content areas. They can also be referred to as command words .

Change...to

Change a value from one unit to another.

Example in context
Change 260 millimetres into metres

Circle the reason for your answer

Follows a question about congruence. The options will be the congruence conditions SSS, SAS, ASA and RHS.

Example in context
The two triangles shown are congruent. Circle the reason that they are congruent.
SSS SAS ASA RHS

Compare...and/to/with

Work out or identify the values required and say which is smaller/larger, etc.
Where appropriate, consider the context when giving your answer.

Example in context

- Compare $\frac{5}{6}$ of 120 and 40% of 240? Which is larger?
- Billy says that there is a positive correlation between the data. Within the context of the question describe what this means?

Complete

Add the missing information to a table or diagram (often statistical).

Example in context
There were 18 people who attended on Saturday. Using this information complete the pictogram.

Construct

Draw accurately.
If told to use compasses, all construction arcs and lines should be shown.

Example in context
Construct accurately an equilateral triangle with sides of 6.5 cm.

Convert ...(in)to

Change a value from one numerical form to another or a measure from one unit to another.

Example in context
Convert 85% into a fraction in its simplest form

Describe (fully) the single transformation that maps...

Use mathematical terminology to define the given information.

Example in context

- With enlargement, give the scale factor and centre of enlargement.
- With reflection, give the equation of the line of reflection.
- With rotation, give the angle, direction and centre of rotation.
- With translation, give the translation vector.
- This should always be done fully, even if that word is absent.

Do not use a graphical method

Algebraic manipulation or interpretation is required.

Example in context
Solve the pair of simultaneous equations
Do not use a graphical method

Does the data support this statement?

Use calculations and/or statistical measures based on the given data to make a decision.

Example in context
Fatima says that Group A on average has done better. Does the data support this statement?

Draw

Give an accurate depiction of a graph, map, diagram, etc.

Example in context
Draw a sketch of the net of the cuboid shown

Estimate (a mean from grouped frequency)

Use class midpoints to work out an estimate of the mean.

Example in context

Height (cm)	Frequency
$140 \leq x < 150$	4
$150 \leq x < 160$	10
$160 \leq x < 170$	6

Estimate the mean

Estimate the value of (used with a calculation)

Use approximations to work out a value.

Example in context
By rounding each value to 1 significant figure, estimate

$$\frac{30.96^2}{\sqrt{98}} + 4.87^3$$

Evaluate... (Higher only)

Identify which part of the method, calculation or assertion is incorrect or explain why it must be correct.

Example in context
By evaluating Cameron's working out, show why they are wrong.

Express...as (Higher only)

Convert a number from one form to another

Example in context
Express $2.7\dot{5}\bar{6}$ as a fraction in its simplest form

Factorise fully

Take out any common factors of an expression or convert a quadratic expression into two linear factors.

Example in context
Factorise fully
 $15x^2 + 10x$

Give a reason for your answer/choice

Show a calculation and/or written evidence for your answer.

Example in context
By comparing the box plots, which team has performed better?
Give a reason for your choice



Year 11 Mathematics Knowledge Organiser

Topic
Tier 2 Vocabulary
Part 2

What do we mean by Tier 2 Vocabulary?

Tier 2 words are also referred to as academic vocabulary. They are cross-curricular words, appearing frequently across topics and content areas. They can also be referred to as **command words**.

Give your answer in terms of π

Don't use a decimal value of pi, just do the working with the coefficients of pi.

Example in context

Calculate the area of the circle.
Give your area in terms of π .

Give your answer to... decimal places/significant figures

Show the full answer in your working, but give the rounded value on the answer line.

Example in context

Use your calculator to work out $\sqrt{72.8}$
Give your answer to 2 decimal places

How does this affect...

Comment on how your answer to a previous question part is different due to a change to an assumption used.

Example in context

The scores in a class are 4, 6, 5, 7, 10
Another student scores 8.
How does this affect the range.

Is... correct?

Tick a box if given or state 'yes' or 'no' in your answer.

Example in context

Antoine thinks 9 is a prime number. Is Antoine correct?
Give a reason for your answer

Is your answer to part... sensible?

Use approximations to check if a previous answer makes sense in the context of the question.

Example in context

By rounding the numbers to 1 significant figure, is your answer to part (a) sensible?

Label

Identify required regions, lengths or axis labels.

Example in context

On the grid identify the region represented by $x \leq 5, y \leq 4, x + y > 6$
Label the region R

List

Write down all qualifying values or items.

Example in context

A six-sided dice is rolled and a fair coin is flipped.

List all the possible outcomes

Make... (different) criticism(s) of...

Write down the required number of errors or omissions in the given method or diagram.

Example in context

Eoin displays the data in a bar chart
Make two criticisms of the bar chart

Mark

Show a position on a map or diagram with the letter or symbol required.

Example in context

Mark the point which is equidistant from A and B.
Label it C.

Match each... to...

Join corresponding items in two lists by straight lines.

Example in context

Match each expression on the left with one on the right

$a + a + a + a$	$2a + 2b$
$a + a + b + b$	$4a$

Measure

Use a ruler to measure a length or a protractor to measure an angle.

Example in context

Measure the line below



Multiply out (and simplify)

Multiply out the bracket(s), collecting like terms where possible.

Example in context

Multiply out and simplify $4(x + 7) + 2(x - 3)$

One has been done for you

The given example shows the format in which the rest of the answers are required.

Example in context

Write these numbers in standard form. One has been done for you

$$6 \times 10^4 = 6000$$

$$5.2 \times 10^3 = \underline{\hspace{2cm}}$$

Plot

Mark the points with a cross.

Example in context

Plot the points on the scatter graph.

Prove that... (Higher Tier only)

Give a formal algebraic proof with each step shown **or** a formal geometric proof with each step shown and justification for each step.

Example in context

Prove that $x^2 + x + 1$ is always positive

Rearrange... to make... the subject

Write the given formula with a different subject as specified.

Example in context

Rearrange $v = u + at$ to make a the subject

Reflect

Draw the image in the correct position.

Example in context


Reflect the shape in the x -axis

Rotate

Draw the image in the correct position.

Example in context

Rotate the shape 90° anticlockwise about the point (1, 0)

 Year 11 Mathematics Knowledge Organiser	Topic	What do we mean by Tier 2 Vocabulary?
	Tier 2 Vocabulary Part 3	Tier 2 words are also referred to as academic vocabulary. They are cross-curricular words, appearing frequently across topics and content areas. They can also be referred to as command words .

Shade

Show a required region by dark colouring or cross-hatching, etc.

Example in context

On the grid shade the region represented by $x \leq 5, y \leq 4, x + y > 6$
Label the region R.

Show all your construction lines

The drawing should be done by standard constructions with all arcs shown.

Example in context

Construct the angle bisector for the angle shown. You should show all your construction lines

Show how... could use the data to support their hypothesis (Higher \ only)

Work with the given information to give calculations and/or statistical measures that support the given hypothesis.

Example in context

Show how Freya could use the box plot correctly to support their hypothesis.

Show that...

Give every step of a process that will lead to the required outcome.

Example in context

In the diagram, DC is parallel to AB .
Show that triangle ABD is isosceles.

Show working to check...

Show working that helps you decide whether or not the given working was correct and give your decision.

Example in context

Kim says, "The sum of any two **different** square numbers is **always** even."
Is she correct? Write down a calculation to support your answer.

Simplify your answer

Cancel any fractions and collect any like terms.

Example in context

Write 16 as a fraction of 12.
Simplify your answer

Simplify (fully)

Collect terms or cancel a fraction. This should always be done fully, even if that word is absent from the instruction. Use of the word 'fully' is a hint that more than one simplification step will be required.

Example in context

Simplify fully $\frac{24}{30}$
Simplify fully $(2x - 3)^2 - (x - 4)^2$

Sketch

Give a depiction of a graph, map, diagram, etc, where the important features are identified.

Example in context

Sketch the graph of $y = x^2 - 3x - 4$ highlighting the coordinates where it crosses the axes

Solve

Find the value(s) that satisfy a given equation or inequality.

Example in context

Solve $x^2 - 3x - 4 = 0$
Solve $4x + 6 < 2x + 9$

State

Write the required information.

Example in context

State the integers that satisfy the inequality $-3 \leq x < 4$

State the units of your answer

The correct units must be given to gain full marks (there may be a stand-alone) mark for giving the correct units

Example in context

Find the volume of the cuboid. State the correct units of your answer

Translate

Draw the image in the correct position.

Example in context

Translate the shape by the vector $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$

Use approximations to...

Unless told otherwise, students should round the given values to one significant figure.

Example in context

Use approximations to provide an estimate for $\frac{63 \times 38}{0.42}$

Use the data/the graph/ your answer to part (a) to...

You should get your answer from the data/the graph/ a previous answer in order to move on rather than a direct calculation

Example in context

Hence, use your answer to part (a) to solve $x^2 - 3x - 4 = 0$

What error has... made? (Higher only)

Identify which part of the method or calculation is incorrect

Example in context

Jason is using the quadratic formula to solve the problem. He says there is only 1 solution. What error have they made?

Write down your full calculator display

Give your answer as a decimal and write all the digits shown on your calculator. At least 6 digits would be seen as sufficient.

Example in context

Calculate $\sqrt{76.8}$
Write down your full calculator display

You must show your working

A correct answer will not receive the marks unless working is given to show how the answer was arrived at.

Example in context

Increase £234 by 17%.
You **must** show your working



Year 11 Mathematics Knowledge Builder

Topic

Mathematics Sites

What can you do to assist yourself to be successful?

Revision sites are a great option for you to build upon your understanding. On this page we highlight sites (and other things) that can help you to improve and consolidate towards your achievement goals



vle.mathswatch.co.uk

Great for

One-Minute Maths Videos
Interactive Questions and worksheets
Online Past Papers
Six Week Revision Plans

My login details

Login	@greatsankey
Password	@greatsankey



www.corbettmaths.com

Great for

Videos, Textbook and Exam Practice Questions
Five a Day Questions
AQA Level 2 Further Mathematics Practice
Corbett Maths Cards (£6.50 from Maths Office)

There are no logon details needed, but they are great for just continual practice!



senecalearning.com

Great for

Building up knowledge for FREE
Learning in a different way to Mathswatch, Corbett and GCSEPod
Uses Memes and GIFs to help you maintain positivity

My Seneca login details – You create

Login	
Password	



www.gcsepod.com

Great for

Videos and Pods
Booklets of questions
Specific Grade 4/5 Booster Material

My login details

Login	
Password	



www.mathsgenie.com

Great for

Easy to navigate with specific topic practice
Can use at both GCSE and A-Level so you can see the progression across the subject
Video tutorials

There are no logon details needed, but they are great for just continual practice!

Over to you!

Do you have additional sites you use?
Make a note of them here to help you



Year 11 Mathematics Knowledge Builder

Topic

Formulae

What is a formulae?

Definition

A rule or fact written with mathematical symbols.

Etymology

early 17th century (in the sense 'fixed form of words'): from Latin, diminutive of *forma* 'shape, mould'.

You are expected to know the following formulae; they will not be given in the exam.

The quadratic formula (Higher only)

The solution of $ax^2 + bx + c = 0$ where $a \neq 0$

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

Circumference and Area of Circle

Where r is the radius and d is the diameter:

$$\text{Circumference of a circle} = 2\pi r = \pi d$$

$$\text{Area of a circle} = \pi r^2$$

Pythagoras and Trigonometry (Sine and Cosine are higher)

In any right-angled triangle where a , b and c are the length of the sides and c is the hypotenuse:

$$a^2 + b^2 = c^2$$

In any right-angled triangle ABC where a , b and c are the length of the sides and c is the hypotenuse:

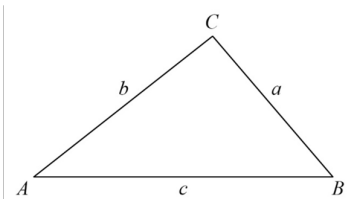
$$\sin A = \frac{a}{c} \quad \cos A = \frac{b}{c} \quad \tan A = \frac{a}{b}$$

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

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

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

$$\text{Area of triangle} = \frac{1}{2} ab \sin C$$

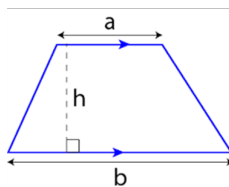


You are expected to know the following formulae and be able to derive them; they will not be given in the exam.

Perimeter, area, volume, surface area

Where a and b are the lengths of the parallel sides and h is their perpendicular separation:

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



Volume of a prism = area of cross section \times length

Compound Interest

Where P is the principal amount, r is the interest rate over a given period and n is number of times that the interest is compounded:

$$\text{Total accrued} = P \left(1 + \frac{r}{100} \right)^n$$

Probability (Higher Tier)

Where $P(A)$ is the probability of outcome A and $P(B)$ is the probability of outcome B :

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$P(A \text{ and } B) = P(A \text{ given } B) P(B)$$

You are not expected to know the following formulae; they will be given in the exam. It is good to know them

Perimeter, area, volume, surface area

Where r is the radius of the sphere or cone, l is the slant height of a cone and h is the perpendicular height of a cone

$$\text{Curved surface area of a cone} = \pi r l$$

$$\text{Surface area of a sphere} = 4\pi r^2$$

$$\text{Volume of a sphere} = \frac{4}{3} \pi r^3$$

$$\text{Volume of a cone} = \frac{1}{3} \pi r^2 h$$

Kinematics (Higher Tier)

Where

- a is constant acceleration
- u is initial velocity
- s is displacement from the position
- when $t = 0$ and t is time taken

$$v = u + at$$

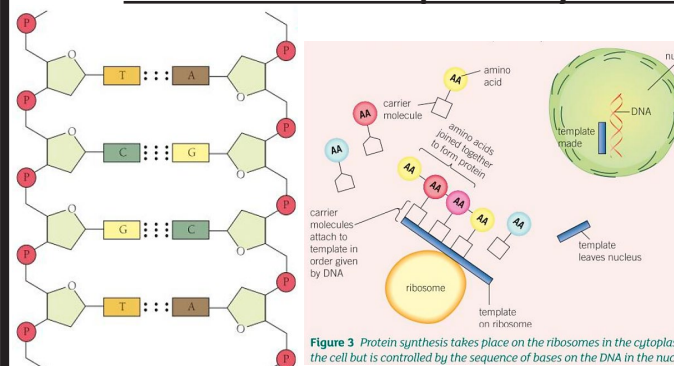
$$s = ut + \frac{1}{2} at^2$$

$$v^2 = u^2 + 2as$$

Sexual and asexual reproduction

	Asexual reproduction	Sexual reproduction
Advantages	Only one parent is needed. Process is very fast . Enables an organism to quickly colonise an area.	Lots of genetic variation . Population is less likely to be wiped out by disease/competitor/ new conditions. Allows evolution to occur.
Disadvantages	All offspring are clones . No genetic variation - can become extinct due to new disease/ competitor/ new conditions .	Much more time and energy consuming (need to find mate). Need to impress mate.

DNA structure and protein synthesis (Biology only)

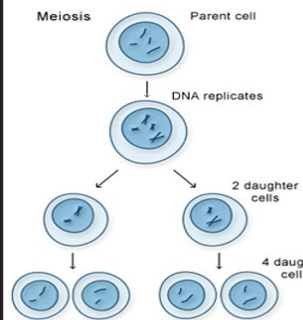


The long strands of DNA consist of alternating sugar and phosphate sections. Attached to each sugar is one of four bases- **A, C, G or T**. C is always linked with G, and A with T. Proteins are created according to **the order of the bases in the template**.

Figure 2 The way the bases bind is vital to the structure of the DNA and the way it works

Figure 3 Protein synthesis takes place on the ribosomes in the cytoplasm of the cell but is controlled by the sequence of bases on the DNA in the nucleus

Meiosis



Gametes (sex cells) are produced in meiosis. Gametes only have **one set of chromosomes (23)**. In meiosis, the genetic material is copied, and the cell divides twice forming 4 gametes. All of these gametes are **genetically different** from each other.

Inheritance in action

- homozygote** – an individual with two identical alleles for a characteristic, for example, **BB or bb**
- heterozygote** – an individual with different alleles for a characteristic, for example, **Bb**
- genotype** – this describes the alleles present or genetic makeup of an individual regarding a particular characteristic, for example, **Bb or bb**
- phenotype** – this describes the physical appearance of an individual regarding a particular characteristic, for example, black fur or brown fur in a mouse.

Phenotype: brown fur
Genotype: bb

Phenotype: black fur
Genotype: BB or Bb

Cross 1: bb × BB

Gametes	B	B
b	Bb	Bb
b	Bb	Bb

Offspring:
genotype: all Bb
phenotype: all black fur

Cross 2: bb × Bb

Gametes	B	b
b	Bb	bb
b	Bb	bb

Offspring:
genotype: 50% Bb, 50% bb
phenotype: 50% black fur, 50% brown fur

Figure 2 Determining phenotype

DNA and the genome

The **genome** of an organism is the entire genetic material of that organism. The whole **human genome** has now been studied and it allows genes that code for certain diseases to be found early. The genetic material in a nucleus is made of **DNA**, which is a polymer made up of 2 strands forming a **double helix**.

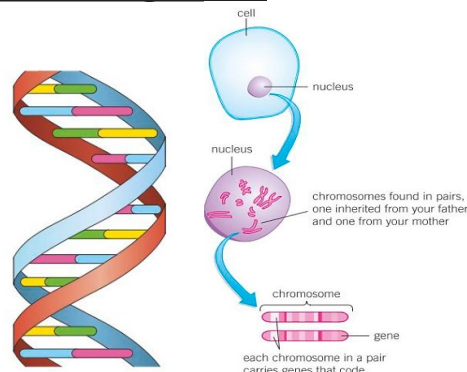


Figure 1 The DNA double helix

Figure 2 The relationship between a cell, the nucleus, the chromosomes, and the genes

Inherited disorders

Polydactyly is a genetic disorder in which someone is born with extra fingers or toes. It is caused by a **dominant allele**.

C = dominant allele (normal metabolism)
c = recessive allele (cystic fibrosis)

parents	father has polydactyly	mother does not have polydactyly
parents' genes	Pp	pp
parents' gametes	P p	p p

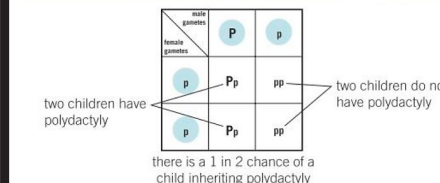


Figure 2 A genetic diagram for polydactyly

Both parents are carriers, so (Cc)

	C	c
C	CC	Cc
c	Cc	cc

Genotype of offspring:
25% normal (CC)
50% carriers (Cc)
25% affected by cystic fibrosis (cc)

Phenotype of offspring:
3/4, or 75% chance normal
1/4, or 25% chance cystic fibrosis

Figure 3 A genetic diagram for cystic fibrosis

Cystic fibrosis is a genetic disorder in which cells produce **excess mucus**. This mainly affects the **lungs and digestive system**. CF is caused by a **recessive gene**. People can be carriers of the gene and have children with CF.

Year 11 Biology Genetics and Reproduction Key Vocabulary

Key word	Definition	Contextual Sentence
alleles	Different forms of the same gene sometimes referred to as variants.	People have different eye colours due to having different alleles .
asexual reproduction	Involves only one individual and the offspring is identical to the parent. There is no fusion of gametes or mixing of genetic information.	Asexual reproduction can be used by an organism to quickly colonise an area.
bases (DNA)	Nitrogenous compounds that make up part of the structure of DNA and RNA. They are represented by the letters A, T, C, and G.	The proteins that DNA codes for can be altered if there is a change in the base sequence.
carriers	Individuals who are heterozygous for a recessive allele linked to a genetic disorder. Carriers have one healthy allele so are not affected themselves but they can pass on the affected allele to their offspring.	If two carriers of cystic fibrosis meet then they could potentially have a child who will have cystic fibrosis.
cystic fibrosis	An inherited disorder that affects the lungs, digestive, and reproductive system and is inherited through a recessive allele.	Only around half of the people who have cystic fibrosis will live past 40.
dominant allele	The phenotype will be apparent in the offspring even if only one of the alleles is inherited.	Polydactyly is a genetic disorder caused by a dominant allele .
genetic engineering	The process by which scientists can manipulate and change the genotype of an organism.	Genetic engineering can be used to genetically modify crops to give farmers better yields.
genotype	The genetic makeup of an individual for a particular characteristic, for example hair or eye colour.	The genotype of an individual will determine their phenotype.
heterozygote	Individual with different alleles for a characteristic.	A heterozygous person will have both a dominant and recessive allele.
homozygote	Individual with two identical alleles for a characteristic.	A homozygous person will have only either dominant or recessive alleles.
meiosis	Two stage process of cell division that reduces the chromosome number of daughter cells. It is involved in making gametes for sexual reproduction.	Sperm and egg cells are created through the process of meiosis .
mutation	A change in the genetic material of an organism.	Occasionally, mutations can cause a new adaptation to arise.
natural selection	Only those that are most suited to their environment will survive to breed and pass on their useful characteristics to their offspring.	Natural selection can eventually lead to a new species being formed (evolution).
nucleotide	A molecule made up of a sugar, a phosphate group, and one of four different bases. They are key units in the structure of DNA and RNA.	The DNA polymer is made from repeating nucleotide units.
phenotype	The physical appearance / biochemistry of an individual for a particular characteristic.	A person's phenotype is determined by their genotype.
polydactyly	A dominant inherited disorder that results in babies born with extra fingers and/or toes.	Polydactyly can be easily treated by removing the extra digits at an early age.
punnet square diagram	A way of modelling a genetic cross and predicting the outcome using probability.	Scientists can predict the probability of somebody inheriting a genetic disorder by using a punnet square diagram .
recessive	A phenotype that will only show up in the offspring if both of the alleles coding for that characteristic are inherited.	If somebody has a recessive genotype, then they will have two recessive alleles e.g bb.
sex chromosomes	Carry the information that determines the sex of an individual.	In humans females have XX sex chromosomes , with males having XY.
sexual reproduction	Involves the joining (fusion) of male and female gametes producing genetic variation in the offspring.	Sexual reproduction is more energy consuming than asexual reproduction, however it leads to variation which can be very beneficial.

Variation

Variation is the **differences in the characteristics** of individuals in a population. Variation may be due to differences in the genes inherited (**genetic causes**), the conditions in which organisms develop (**environmental causes**), or a combination of both genes and the environment.

Evolution by natural selection

Animals and plants are always in competition with other members of their own species. A **mutation** can change the DNA code of an individual and cause them to be born with an advantageous adaptation. This individual will be more likely to survive and reproduce. This is known as **survival of the fittest**:

- individual organisms within a particular species may show a wide range of phenotype and genetic variation
- individuals with characteristics most suited to the environment are more likely to survive to breed successfully
- the alleles (variants) that have enabled these individuals to survive are then passed on to the next generation.

If two populations of one species become so different they can no longer interbreed to produce fertile offspring, they have formed two new species.

Study tip

Remember the key steps in natural selection:

Mutation of gene → advantage to survival → breed → pass on genes.

Selective breeding

Selective breeding is a process where humans breed plants and animals for **desired characteristics**. These include disease resistance, increased food production, dogs with certain fur, flower: with certain colours. This is not a natural process and can only be done with **human intervention**. Sometimes, problems may occur including defects due to a **lack of variation**.

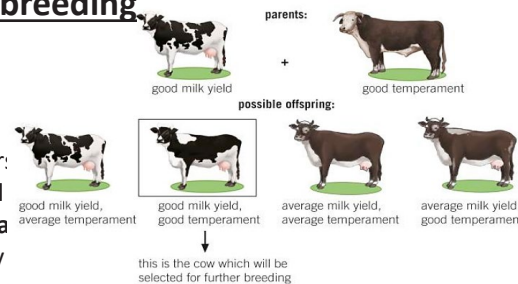


Figure 2 Sometimes an animal or plant with one desirable trait will be cross-bred with organisms showing another desirable trait. Only the offspring showing both of the favoured features will be used for further breeding

Genetic engineering

Genetic engineering involves **modifying** the genetic material of an organism. The **gene for a desirable characteristic** is cut out of one organism and transferred to the genetic material in the cells of another organism. This gives the genetically engineered organism a new, desirable characteristic. This is often used in plants to produce **GM crops** (genetically modified crops). These crops can give farmers **better yields** as they may have traits such as bigger fruits, disease / drought resistance, or better tasting fruits.

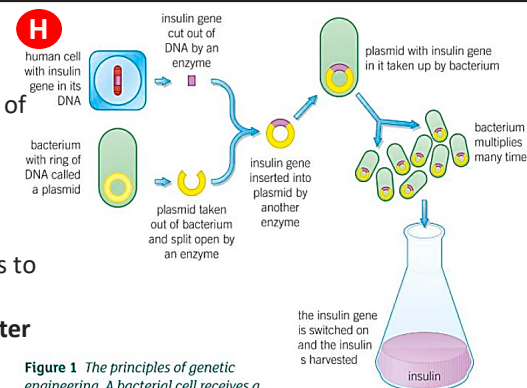


Figure 1 The principles of genetic engineering. A bacterial cell receives a human gene so it makes a human protein – in this case, the hormone insulin

Cloning (Biology only)

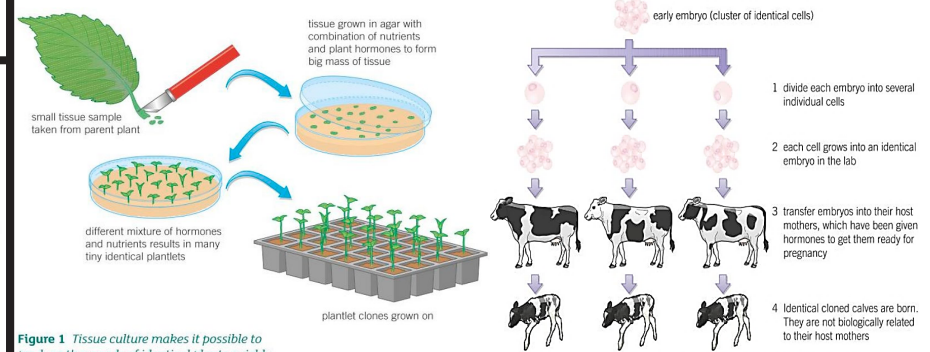


Figure 1 Tissue culture makes it possible to produce thousands of identical plants quickly and easily from one small tissue sample

Figure 2 Cloning cattle embryos

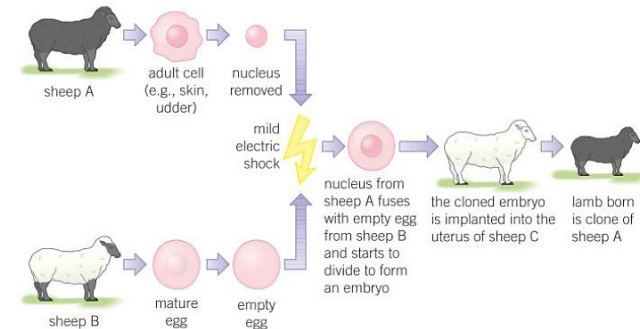


Figure 2 Adult cell cloning remains a very difficult technique, but scientists hope it may bring benefits in the future

Ethics of genetic technologies

For	Against
Allows farmers to increase their crop yield.	Some people see it as interfering with nature.
Has the potential to cure genetic diseases.	Long term effect on health still unknown.
Plants can be engineered to survive in harsh conditions.	Genes may spread to wild populations of plants.

Year 11 Biology: Variation and Evolution Key Vocabulary

Key word	Definition	Contextual Sentence
mutation	A change in the genetic material of an organism.	Occasionally, mutations can cause a new adaptation to arise.
natural selection	Only those that are most suited to their environment will survive to breed and pass on their useful characteristics to their offspring.	Natural selection can eventually lead to a new species being formed (evolution).
selective breeding	Speeds up natural selection by selecting animals or plants for breeding that have a required characteristic.	Many species of dogs have been selectively bred by humans so that they have certain types of fur or behave in a certain way.
tissue culture	A modern way of cloning plants that allows thousands of new plants to be created from one piece of plant tissue.	Tissue culture is often used in industry to create multiple copies of a plant with a certain characteristic (e.g. a certain tasting fruit).

Year 11 Chemistry: Atoms & Matter RECAP

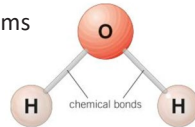
Atoms

Atoms are the smallest part of a substance that can exist. If all the atoms are the same, the substance is known as an **element**.

Molecules

A **molecule** is when two or more **atoms** are chemically bonded together. For example, look at the diagram of a water **molecule**.

Pure water will always have twice as many hydrogen atoms as oxygen atoms. That means its chemical formula is written as H₂O.



Compound

A **compound** is when two or more different **elements** chemically bond together.

Formula Writing

If there is no subscript after the atom's symbol in a chemical formula, it is read as "1", which means the ratio of H atoms compared to O atoms is 2:1

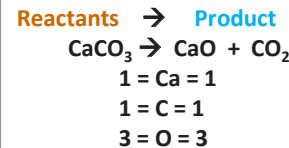
Compounds	Mixtures
Compounds have a fixed composition (the ratio of elements is always the same in any particular compound).	Mixtures have no fixed composition (the proportions vary depending on the amount of each substance mixed together).
Chemical reaction must be used to separate the elements in a compound.	The different elements or compounds in a mixture can be separated (by physical means, using the difference in properties of each substance in the mixture).
There are chemical bonds between atoms of the different elements in the compound.	There are no chemical bonds between atoms of the different substances in a mixture

Chemical equations

Chemical equations show the chemicals used, called **reactants** and then new chemicals it forms, are called the **products** of a reaction.

Chemical equations

Using symbol equations helps you to see how much of each substance is involved in a reaction. For example, calcium carbonate **decomposes** (breaks down) when heated. You can show the reaction using a symbol equation like this;



States & symbols

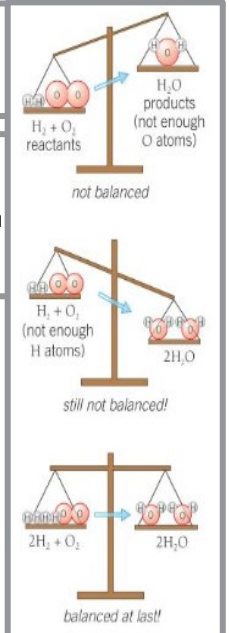
This is what state the substance is in at a given temperature.

This could be

solid (s),
liquid (l)
gas (g)

Substances have a melting point and a boiling point.

In chemistry, we also give a state symbol to substances dissolved in water. This is known as an **aqueous solution** with the state symbol being **(aq)**.



This equation is balanced; there is the same number of each type of **atoms** on both sides of the equation. You can see this from the counting under the equation and from the diagram on the right. This is very important because **atoms** cannot be created nor destroyed in a chemical reaction. This means that;

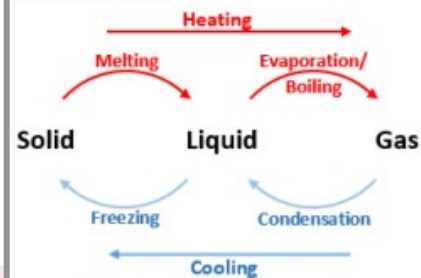
“The total mass of the products formed in a reaction is equal to the total mass of the reactants” (which is the Law of Conservation.)

Changing states

You can see on the graph below that when a substance changes state. The line of the graph stops rising when a substance changes state.

Here, a **solid** is changing to a liquid. The reason it stops rising is that enough **energy** is transferred from the surrounding area to the solid so forces between the particles in the solid break. Once the particles break apart from their fixed position it is no longer a **solid**. Once this happens the transfer of **energy** from the surroundings to the substance causes the temperature to continue to rise.

States of Matter:



State of matter energy diagram

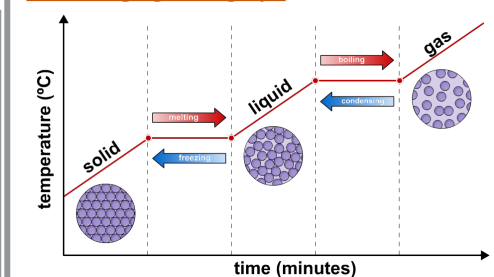
To the left is a diagram of the **changes of state**. If you increase or decrease the energy of the substances the state will change (e.g. solid → liquid).

Solids are held together in a fixed pattern/shape and have a fixed volume. **Solids** can not be compressed (squashed).

Liquids have a fixed volume and the particles are packed close together in a random order moving over each other, this allows them to flow and change shape.

Gases have no fixed shape or volume. The particles move around at a much faster speed. The **gases** will fill the area given but they can be compressed.

The changing state graph



This history of the Atmosphere

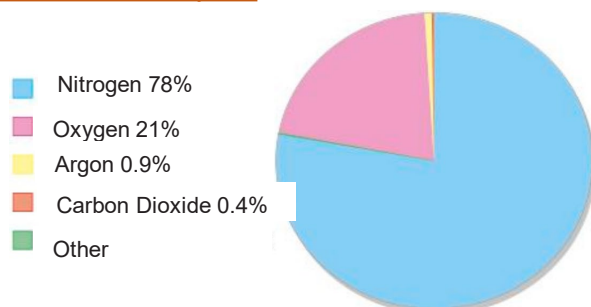
There are lots of ideas about how the Earth and atmosphere formed based on some evidence found. These are called theories. Scientists use theories when there is a lack of evidence to say what really happened. No one was around 4.6 billion years ago to take photos and write it all down!!!

One theory is that intense volcanic activity release gases, such as CO_2 , CH_4 , H_2O and N_2 into the atmosphere, which is similar to Mars or Venus now. It is thought that there was little/no oxygen.

From this, as the Earth started to cool down, the water vapour (H_2O) would **condense** and fall to the ground to make the oceans. It is also believed that **comets** brought more water to the Earth.

The CO_2 in the atmosphere would have **dissolved** in the oceans, this then led to carbon-based organisms forming and oxygen being produced over time, in the process of **photosynthesis**. This contributed to the **increasing the oxygen levels**.

The Current Atmosphere



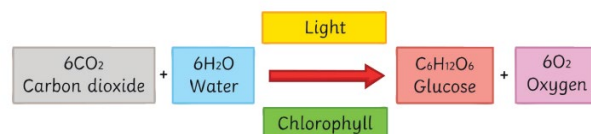
Over the last 200 million years, the proportions of gases in the Earth's atmosphere has stabilised. See the pie chart above.

Approximately four-fifths (80%) of the atmosphere is **nitrogen** and one-fifth (20%) is **oxygen**.

There are some noble gases in the atmosphere, the most abundant is argon, but there is also a small amount of neon, krypton and xenon.

How did the oxygen levels increase over time?

Around 2.7 billion years ago the first carbon-based organism formed; algae. It is believed that it first produced oxygen, through the process of **photosynthesis**. As the organisms evolved, the levels of oxygen increased. This led to more complex life forms developing.



How did the carbon dioxide levels decrease over time?

There are a few ways that carbon dioxide was reduced over time;

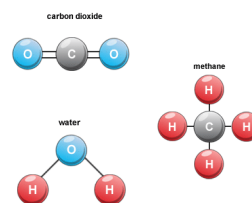
1. Carbon dioxide **dissolved in the water** (oceans).
2. A lot of carbon dioxide become **locked-up** in the Earth's Crust. The dissolved carbon dioxide (CO_2) produced carbonate compounds, that formed a precipitate, what we know today as limestone, a sedimentary rock. The chemical name for limestone is calcium carbonate.
3. Plants **absorb** carbon dioxide during the process of photosynthesis. Any lifeforms that relied on plants fell to the bottom of the seabed and were trapped under layers of sand and mud, over time and under a lot of pressure and heat, and an environment where there was no oxygen, it was turned into fossil fuels.

Meet the greenhouse gases?

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

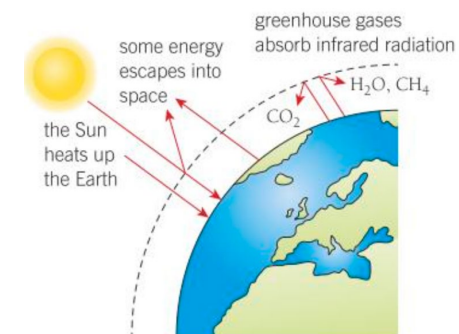
The main greenhouse gases are:

- **Carbon dioxide (CO_2)**
 - **Methane (CH_4)**
 - **Water Vapour (H_2O)**
- Others can include (extra info)
- Chlorofluorocarbons (CFCs)
 - Nitrous oxides (NO_x)



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.



Evidence of greenhouse gases

Over the last 200 years, there is an increase in the volume of CO_2 produced. This is mainly due to the advances in technology and the use of fossil fuels. CO_2 has been locked-up in fossil fuels for millions of years, but as we burn it, it releases CO_2 .

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.

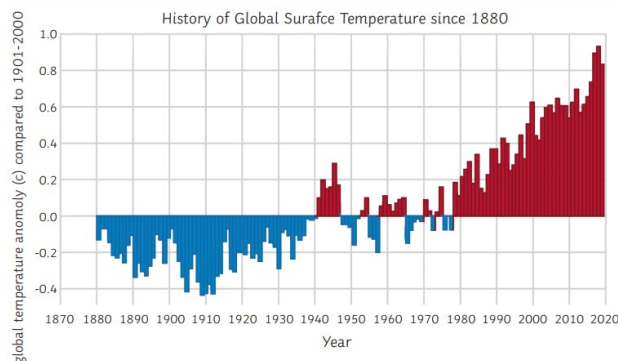
Scientists use "hard" evidence to link the levels of CO_2 with the climate and any changes. One source of evidence is the ice cores from Greenland, which have trapped gases over time. These can be dated and analysed for changes.

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.

Climate Change

Climate change is the long-term shifts in temperature and weather patterns. These changes can be natural or man-made.

Below is a graph that shows the surface temperature since 1880. This shows climate change. When considering the evidence, use a reputable source. This was taken from the University of Berkeley in USA.



Some scientists predict, based on evidence and research, that global warming may increase the Earth's average temperature by as much as 5.8°C by the year 2100. This would have a huge impact on the climate

The consequences of rising levels of greenhouse gases

We are already seeing the start of the consequences of climate change;

- Winters are getting shorter
- Rising sea levels: the ice caps are melting and this is expanding the warmer seas.
- Flooding of low-lying land.
- Increase coastal erosion (so islands could disappear)
- Increasing spurts of extreme weather conditions, such as severe storms.
- Changes in rainfall: temperature/volume/distribution. This could impact communities that produce food and less food will be produced.
- More wildlife becoming extinct, and the fast change in climate puts stress on the ecosystems.

What can we do?

We can reduce our carbon footprint. Reduce the amount of carbon dioxide we produce on a day-to-day basis.

What is a carbon footprint?

The carbon footprint of a product, service or event is; **the total amount of carbon dioxide and other greenhouse gases emitted over its full life cycle.**

When companies are making a new product, they have to consider how much carbon dioxide/ greenhouse gases it will produce by making, transporting, using and recycling the product.

Other ways to reduce the carbon footprint

Electricity companies can use **carbon capture & storage**, using the waste product CO₂ from burning fossil fuels and capturing CO₂ produced and storing it underground in porous rock. However, it may increase electricity bills by roughly 10%.

Methane could decrease if more people ate plant-based meals, reducing the need for as many cattle. It also allows for more efficient use of the land to grow crops.

Car sharing / using public transport/walking will minimize the use of fuel for cars.

Why can't we just stop using fossil fuels?

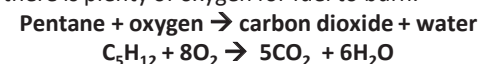
Reducing greenhouse gases in the atmosphere relies mainly on reducing the use of fossil fuels, using alternative sources of energy and conserving energy.

Most economies of developed countries rely on fossil fuels and putting strategies in place to reduce this will cost money and take time to set up.

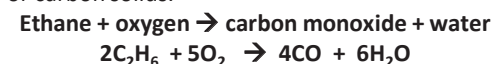
However, the changes are necessary because of the potential risks arising from global climate changes, such as sea levels rising and threats to food production.

Burning fossil fuels

There are two types of combustion: complete and incomplete combustion. **Complete combustion** happens when there is plenty of oxygen for fuel to burn.



Incomplete combustion happens when there is not enough oxygen to burn fully. The products for this can be CO, H₂O and / or carbon solids.



Why is incomplete combustion so bad?

Carbon monoxide is a poisonous gas.

It's a colourless and odourless gas that can kill. It works by binding to the haemoglobin in your red blood cells and prevents oxygen from being carried around your body to your cells.

Carbon particulates (solids) irritate the lining of your lungs, this could make pre-existing conditions worse, like asthma. There are also links that it can cause cancer. The particulates also cause global dimming where the sun's rays are blocked out and reduce visibility.

Burning fuel in a car

This can produce what is known as **nitrogen oxides** with a general formula of **NO_x**.

This happens when oxygen and nitrogen come together in a **hot environment**, like a car engine and there is enough activation energy to cause a reaction.

The NO_x compounds can react with UV light in the atmosphere and produce photochemical smog, mainly in densely populated areas.

NO and **NO₂** are **toxic** and can trigger **asthma attacks**, they can also react with water to form nitric acid, and form **acid rain**.

Also when you burn fuel there are **impurities** in the hydrocarbons, such as **sulphur**. When this is released, **sulfur** reacts with the **oxygen** to form sulfur dioxide, which can then dissolve in rainwater to form **acid rain**. This can damage forests, and plants and erode buildings. It can then react further to form sulfur trioxide.

An **atom** can achieve a full outer **electron** shell by losing or gaining **electrons**. This charged **atom** is called an **ion**.

Why do atoms react together?

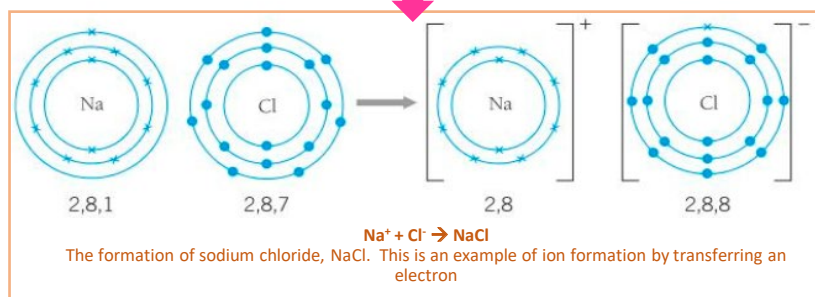
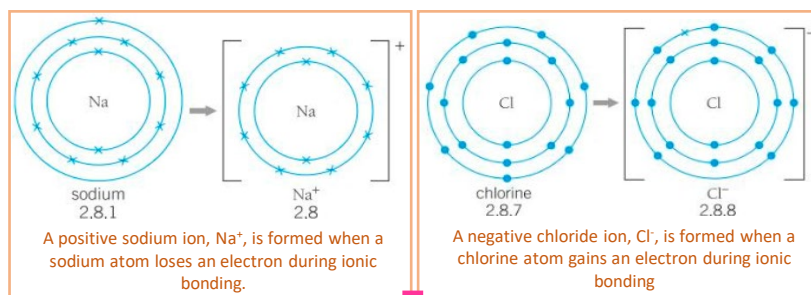
All **atoms** want a full outer shell. This is the reason chemical reactions happen. **Atoms** will either transfer **electrons** or share **electrons** depending on the bonding. There are 3 types of bonding; Ionic, Covalent and Metallic.

Positive Ions

When an **atom** loses an **electron** it becomes a positive **ion**. This is because they have more positive **protons**, but have less negative **electrons**. Therefore the overall charge is positive. See the diagram of Sodium.

Negative Ions

When an **atom** gains an **electron** it becomes a negative **ion**. This is because they have more negative **electrons**, than positive **protons**. This makes the overall charge of the **ion** negative. This can be seen using the chlorine diagram.



Charges on Ions

The charge on the **ion** depends on how many **electrons** they gain or lose. The table shows the general ones. Transition metals will form the **ion** based on the roman numbers in its name; Iron (II) oxide will form a Fe^{2+} **ion**.

GROUP	ION
1	+1
2	+2
3	+3
4	Rarely form ions
5	-3
6	-2
7	-1
0	Don't form ions as they have a full outer shell

Ionic bonding occurs when a metal and a non-metal combine. This process creates an **electrostatic force** that joins a positive ion and negative ion together, resulting in what is known as an ionic bond.

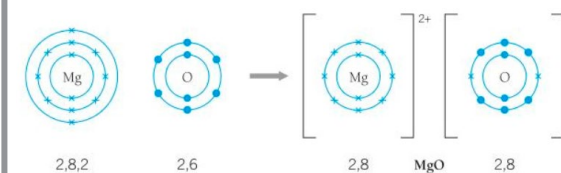
Ionic bonding: Calcium Chloride

Calcium needs to lose two **electrons** from its outer shell. Chlorine can only gain one **electron**, so in this case you will need two chlorine **atoms** to bond with.

Ionic bonding: Magnesium oxide

As you can see from the diagram for ionic bonding, you can see that the magnesium **atom** loses 2 **electrons** from its outer shell forms a Mg^{2+} **ion** and it will transfer the two **electron** to the oxygen **atom**, forming a negative oxide **ion**, O^{2-} .

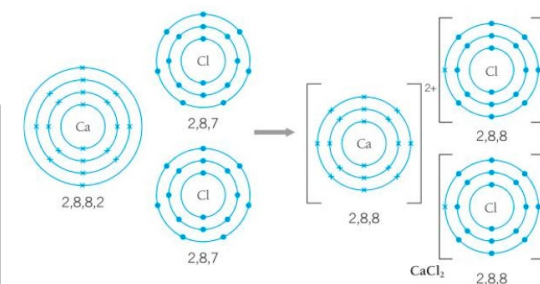
Notice how the **ions** are drawn in square brackets with the charge written in the top right.



Force of Attraction

The force between the positive **ion** and the negative **ion** is called **electrostatic force**.

Looking at the sodium chloride where one **electron** is transferred, whereas magnesium oxide transfers two **electrons**. This means that's magnesium oxide has a stronger bond than sodium chloride

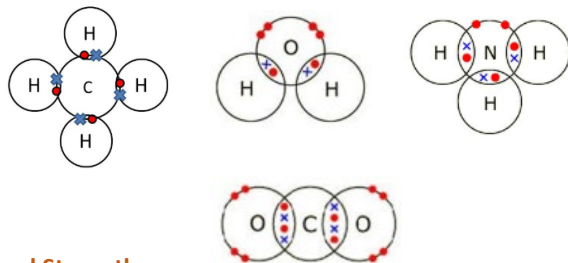


Covalent Bonding

Non-metal **atoms** can achieve a full outer shell with other non-metals **atoms** by sharing **electrons**. This is called covalent bonding.

What you need to be able to draw

The simple covalent **molecules** you need to be able to draw are hydrogen (H_2), Oxygen (O_2), Nitrogen (N_2), hydrogen chloride (HCl), water (H_2O), methane (CH_4), carbon dioxide (CO_2) ammonia (NH_3).



Bond Strength

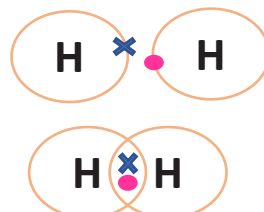
A double bond is harder to break than a single bond and a triple bond is harder to break than a double bond.

Sharing Electrons

Covalent bonds share **electrons** to form a pair of **electrons**. The positive nuclei of the **atoms** are strongly attracted to the shared pair of negative **electrons** in the covalent bond, so covalent bonds are very strong and require a lot of **energy** to break. You can have single bonds, double bonds and triple bonds. You can represent it by a dot and cross diagram and also by a displayed formula (eg: $N \equiv N$).

Single Bond

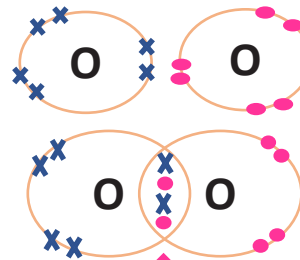
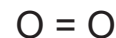
1 shared pair of **electrons**



A shared pair of **electrons** given both **atoms** a stable arrangement and forms a covalent bond

Double Bond

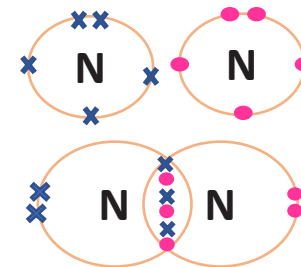
2 shared pair of **electrons**



This is a double covalent bond (with two pairs of **electrons**). Only the **electrons** in the highest **energy** level (outer shell) are shown here

Triple Bond

3 shared pair of **electrons**



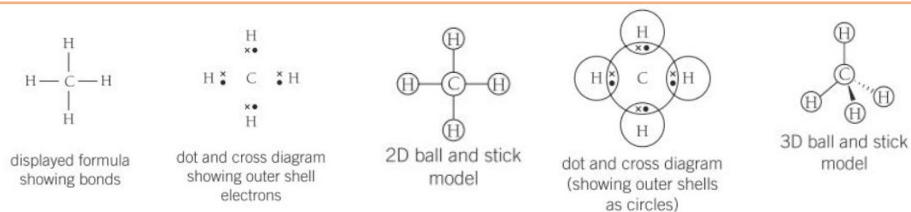
This is a triple covalent bond (with three pairs of **electrons**).

The Structure Of Simple Molecules

Small, simple **molecules** can be represented in different ways, depending on what information you need from the diagram.

Models

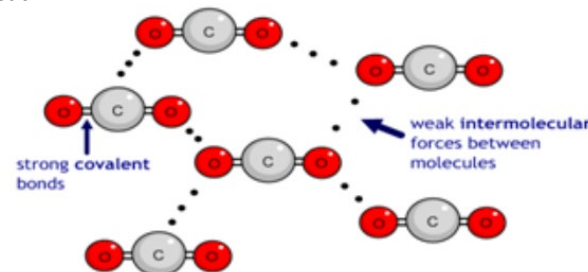
Way in which you can represent simple covalent **molecules**. Models are great to show an idea across, however, you need to consider which model you need to use as they all have advantages and disadvantages. As a scientist, you need to decide which is the best model to use.



Simple covalent molecules properties

Simple covalent **molecules** have low melting and boiling points. This is because of the weak **intermolecular forces** acting **between** the **molecules** not the breaking of the strong covalent bonds between the **atoms**.

Simple covalent **molecules** share **electrons** therefore do not have any free **electrons** or have any charges, this means that they cannot conduct electricity and they are poor conductors of heat.



What is electrolysis?

Electrolysis is a process carried out on ionic substances. Electrolysis means breaking down ionic compounds using electricity.

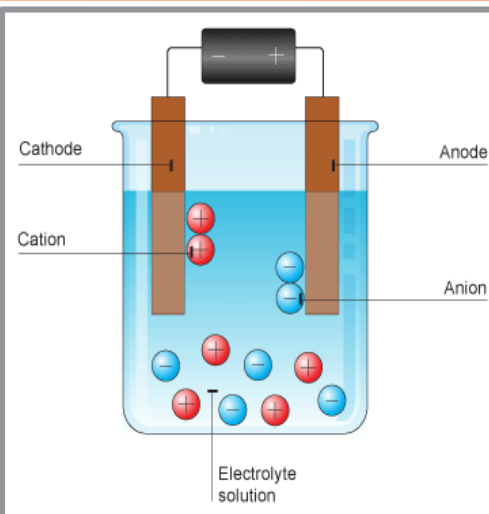
The ionic compound has to be either **molten** or **aqueous** (dissolved in water), it won't work on a solid as the ions need to be **free to move**.

How electrolysis works?

To establish the electrical circuit, immerse the electrodes in the liquid or aqueous solution.

Connect the top of each electrode to a power supply. The positive electrode is known as the anode, while the negative electrode is referred to as the cathode.

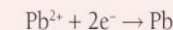
Once the power supply is activated, the cation or positive ions move towards the cathode or negative electrode, while the anion or negative ions move towards the anode or positive electrode.



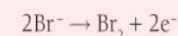
Half equations

You represent what is happening at each electrode using **half equations**.

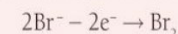
At the cathode (negative electrode) you get reduction of a positive ion:



At the anode (positive electrode) you get oxidation of a negative ion:



Sometimes half equations at the anode are written to show the electrons being removed from negative ions, like this:



You can write the half equation for negative ions either way. They both show the same oxidation of the negatively charged ions.

What happens at the electrodes?

When the ions meet the electrode they lose their charge and become elements. You will either see metal deposits forming or gas being given off.

In a molten substance, it is fairly easy to figure out what is formed however in an aqueous solution you will need to work it out using the reactivity series because of the water ions present.

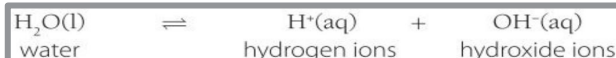
Aqueous solutions

Rules 1: Positive ions / negative electrode.

The least reactive substance will be made.

Rule 2: Negative ion / positive electrode

If it's a group 7 element, that will form. If not, then oxygen will form. This is from four OH⁻ ions breaking apart and forming oxygen and water.



Extraction of Aluminium

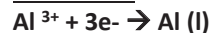
Aluminium Extraction Aluminium is extracted out of the ground by electrolysis.

Reduction with Carbon doesn't work because Carbon can't displace the more reactive Aluminium from its Oxide.

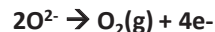
Aluminium Oxide \rightarrow Aluminium + Oxygen

Aluminium Oxide is crushed, mixed with a chemical called cryolite to lower the melting point then heated to be molten.

At Cathode



At Anode



This is Reduction: Gaining Of Electrons

This is Oxidation Loss Of Electrons

The process is expensive because;

- Very High temperatures are needed to melt the Aluminium Oxide.
- Lots of electricity is needed for the process.
- The Carbon Anodes need constant replacement as they react with Oxygen to form CO₂ gas

Electrolysis of Brine

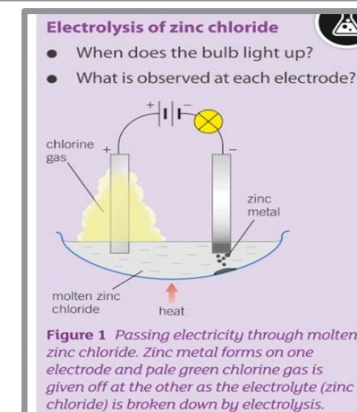
Brine is another word for a solution of Sodium Chloride

When electrolysed, three useful products are made;

- Chlorine
- Hydrogen
- Sodium Hydroxide

At Cathode- $2\text{H}^+ + 2\text{e}^- \rightarrow \text{H}_2(\text{g})$

At Anode- $2\text{Cl}^- \rightarrow \text{Cl}_2(\text{g}) + 2\text{e}^-$

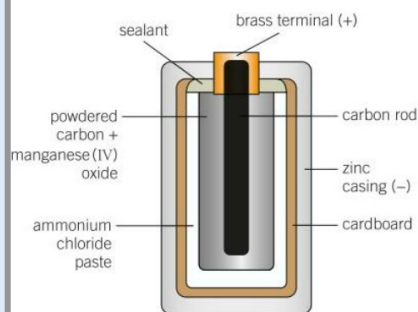


Chemical cells and batteries (Seps)

A chemical cell converts chemical energy into electrical energy. More than one cell is called a battery. There are two types of chemical cell; rechargeable and non-rechargeable.

Non-rechargeable cells will produce a voltage until the chemicals inside are used up. Once this happens it will not work and will need to be recycled.

Rechargeable cells/ batteries can be recharged many times. An electrical current is passed through the cell. This works by reversing the chemical reactions to be used again.



The first mass-produced cells (Seps)

The first mass-produced cells were similar to this diagram, a zinc-carbon dry cell. This diagram represents cell that produces a voltage of 1.5V. It cannot be recharged. It is prone to leaking if left in the appliance. These cells should always be disposed of in a recycling center.

Other cells can be recharged and used more than once. The recharging process, the battery is connected to a power supply that reverses the chemical reactions.

Voltage (Seps)

The voltage of a cell is affected by the metals used inside it.

Metals tend to lose electrons to form ions. If two different metals are dipped in a salt solution and are connected by a wire, the more reactive metal will lose electrons. This is a simple cell.

The bigger the difference in the reactivity of the two metals, the bigger the voltage produced.

E.g. aluminium and zinc = small voltage as they are close on reactivity series. By aluminium and copper = larger voltage as they are further apart.

Advantages & Disadvantages of Fuel Cells (Seps)

Advantages

- Do not need to be electrically recharged
- No pollutants are produced
- Can be a range of sizes for different uses

Disadvantages

- Hydrogen is highly flammable
- Hydrogen is sometimes produced for the cell by non-renewable means
- Hydrogen is difficult to store

How to dispose of cells/batteries

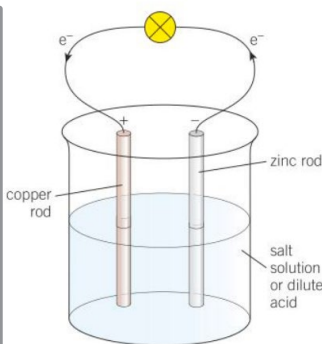
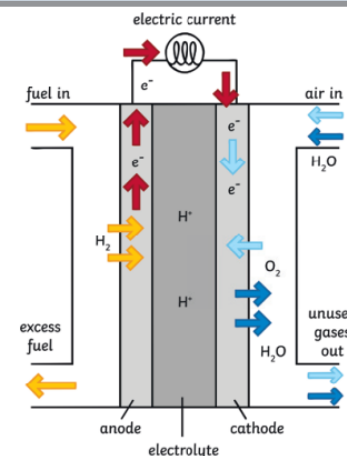
Cells/batteries must be taken to a waste disposal site for batteries. Some supermarkets have them or the local waste disposal service run by your council. The dry cells are prone to leaking over a period of time which can be harmful.

Hydrogen Fuel Cells (Seps)

Hydrogen fuel cells provide an alternative to burning fossil fuels. They cause less pollution but they are highly flammable and difficult to store.

Fuel cells work differently to chemical cells in that they need to be supplied with continuously with a fuel and oxygen. This will allow the fuel cell to produce a voltage.

Inside the fuel cell, hydrogen is oxidized electrochemically. This allows for the reaction to take place at a lower temperature. The fuel is not combusted and the cells only produce water.



So what's happening in the diagram above?

An electrical cell made from zinc and copper. The **electrons** flow from the more reactive metal (which is zinc) to the less reactive metal (copper).

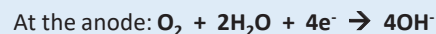
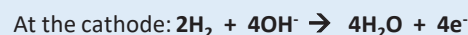
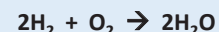
This means that zinc is acting as the **negative terminal** of the cell, providing **electrons** to the external circuit. The **current** will flow in the circuit opposite until one of the reactants is used up.

This is the principle that is used when you see people using lemons as a battery to charge their phones on TV.

Ionic equations (Seps)

Ionic equations show the movement of ions/electrons without showing the spectator ions. Spectator ions are ions that don't change within the reaction. E.g.: if a sulphate ion is still a sulphate ion on the products – it hasn't changed.

Within the fuel cell, you have the following reaction;



This means that oxygen is being reduced (gains electrons) and hydrogen is being oxidized (loss of electrons). Oxidation and reduction happen simultaneously, this is known as a redox reaction.

Li	Lithium
K	Potassium
Ba	Barium
Ca	Calcium
Na	Sodium
Mg	Magnesium
Al	Aluminum
C	Carbon
Zn	Zinc
Fe	Iron
Ni	Nickel
Sn	Tin
Pb	Lead
H	Hydrogen
Cu	Copper
Hg	Mercury
Ag	Silver
Au	Gold
Pt	Platinum

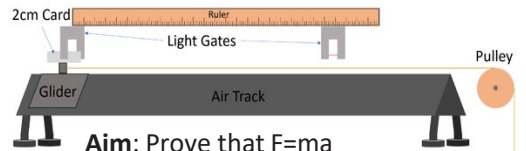
Newton's Second Law

The **acceleration** of an object increases if the resultant **force** on it increases, and decreases if the **mass** of the object increases.

$$F=ma$$

So $F \propto a$ and $F \propto 1/m$

Force and Acceleration (Require Practical)



Aim: Prove that $F=ma$

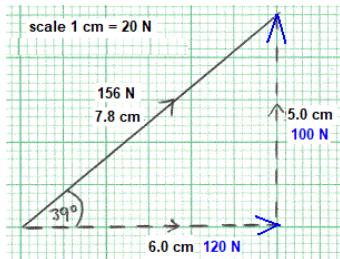
Method: Accelerate glider using weight.

Measure acceleration using the light gate.

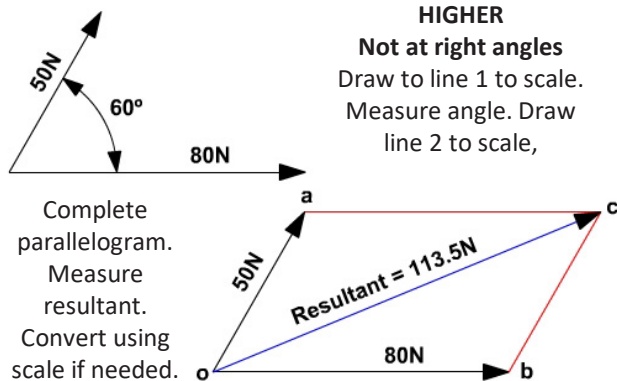
Increase mass and therefore weight. Measure acceleration. Plot graph.

Straight line through origin = aim proven.

Scale Drawings



At right angles
Draw to scale and measure hypotenuse with a ruler



HIGHER
Not at right angles
Draw to line 1 to scale. Measure angle. Draw line 2 to scale,

Complete parallelogram. Measure resultant. Convert using scale if needed.

Stopping Distance

= **thinking distance** + **braking distance**

Thinking Distance

Time taken to see an incident and apply the brake, also known as reaction time.

Affected by: Tiredness, Alcohol, Drugs, Distractions

Braking Distance

Time taken for car to come to a stop once the brakes have been applied.

Affected by: Brake/ Road Condition, Weather, mass of car.

When the brakes are applied, **work is done** by the **frictional force** between the brakes and the wheels. It **reduces the kinetic energy** of the vehicle (because its speed decreases) and **increases the temperature** of the brakes

Car Safety

Safety features are designed to decrease impact force by increasing impact time.

Features include, **seat belts, crumple zones, air bags, crash helmets**

Momentum (Separates Only)

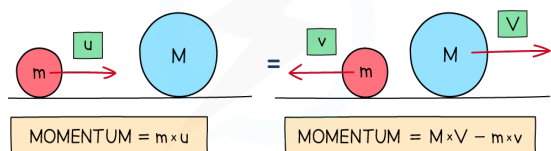
Momentum (kg m/s) = Mass (kg) x Velocity (m/s)

Momentum is a vector quantity, so it has a size and a direction.

+ and - are use to show direction in calculations.

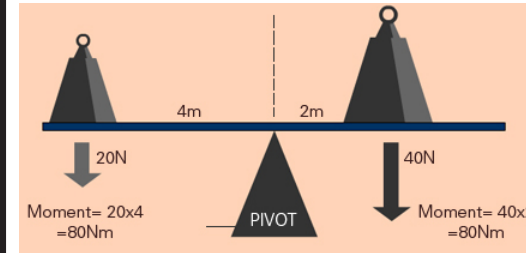
Conservation of momentum (Separates Only)

Momentum before a collision = Momentum after a collision



Moments (separates only)

Moment (Nm) = force (N) x distance from pivot (m)



Principle of moments
Clockwise moment = anti-clockwise moment

Force and Pressure (Separates only)

Solids

Pressure is the force per unit area. Increasing the area of an object will decrease the pressure on surface.

Pressure (Pa) = Force (N) / Area (m²)

Liquids

The pressure in a liquid at rest is increased by **depth, density** of liquid and **gravity**. Pressure increase with depth.

Pressure in a Column

Pressure (Pa) = Height (m) x density (kg/m³) x gravity (N/Kg)

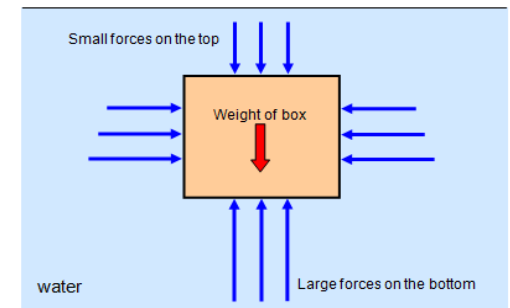
Given equation

Atmospheric Pressure

Pressure decreases with height, due to fewer air particles colliding with a surface. It can be calculated using the equation above.

Up thrust

As pressure **increases** with **depth**, the bottom of a submerged object has a **greater force** on it than the top, causing an overall **upwards force**.



Key Vocabulary	Definition	Contextual Sentence
Braking Distance	the distance travelled by a vehicle during the time it takes for its brakes to act	The road was very wet that day, increasing the braking distance of the car.
Conservation of momentum	in a closed system, the total momentum before an event is equal to the total momentum after the event. Momentum is conserved in any collision or explosion, provided no external forces act on the objects that collide or explode	Snooker and bowling are both real world examples of the conservation of momentum .
directly proportional	a graph will show this if the line of best fit is a straight line through the origin	Hooke's law states that extension is directly proportional to force.
elastic	a material is elastic if it is able to regain its shape after it has been squashed or stretched	The rubber band was elastic .
extension	the increase in length of a spring (or a strip of material) from its original length	The extension of the spring was measured when weights were applied to it.
gravitational field strength, g	the force of gravity on an object of mass 1 kg (in newtons per kilogram, N/kg). It is also the acceleration of free fall	The gravitational field strength on the Moon is less than on Earth.
inertia	the tendency of an object to stay at rest or to continue in uniform motion	The truck was hard to move due to its very large inertia .
limit of proportionality	the limit for Hooke's law applied to the extension of a stretched spring	The student deformed the spring by making it reach its limit of proportionality .
momentum	this equals mass (in kg) x velocity (in m/s)	Even though the Elephant was slow moving its momentum was massive due to its mass.
Newton's second law of motion	the acceleration of an object is proportional to the resultant force on the object, and inversely proportional to the mass of the object	Newton's Second Law of motion can also be written as $F=ma$
stopping distance	the distance travelled by the vehicle in the time it takes for the driver to think and brake	As the speed of the car increased, so did its stopping distance .
terminal velocity	the velocity reached by an object when the drag force on it is equal and opposite to the force making it move	Cat's have a no fatal terminal velocity so can survived a fall from 7 stories or more.
thinking distance	the distance travelled by the vehicle in the time it takes the driver to react	The driver of the car was drunk and therefore had a long stopping distance .
weight	the force of gravity on an object (in newtons, N)	Your weight on the Moon is less than you weight on Earth, but your mass would be the same.

Key Vocabulary	Definition	Contextual Sentence
Pascal	The unit of pressure, equal to 1N per m ³	Atmospheric pressure on Earth is 101,325 Pascals
Up thrust	the upward force that acts on a body partly or completely submerged in a fluid	Up thrust is a force that acts upwards on objects in water.

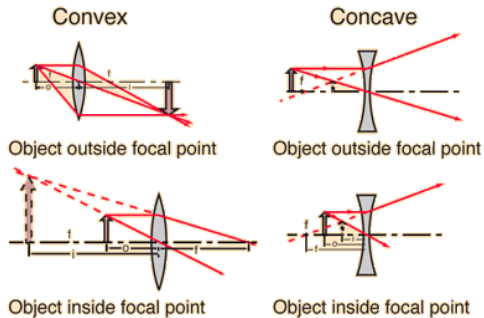
Ray diagrams

In a ray diagram, you draw each ray as:

- A **straight** line;
- An **arrow** pointing in the direction

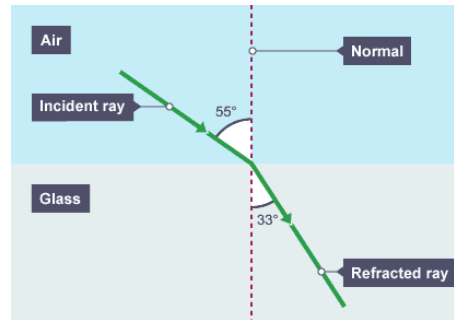
Converging (Convex) - rays that meet at a point to form the image

Diverging rays (concave) - rays that scatter away and do not form any image.



Refraction

The change in direction of a wave at such a boundary, due to changes in **density** and therefore **speed**.



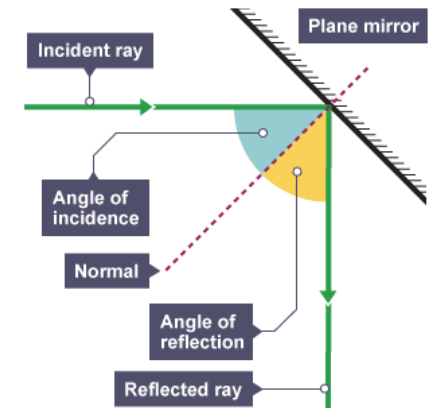
Wave **slows** down, its wavelength will **decrease**, its **frequency** remains the same, due to the fact that its wavelength is shorter.

Reflection

The law of reflection states that:
angle of incidence = angle of reflection

Specular Reflection

Smooth surface, all light rays reflect parallel to one another



Diffuse Reflection

Rough surface, all light rays do not reflect parallel to one another

Ultra-Sound

Range of human hearing = **20Hz, to 20,000Hz**.
Anything above this is **Ultra Sound**.

Medical imaging- non-ionising so is safe to use during pregnancy.

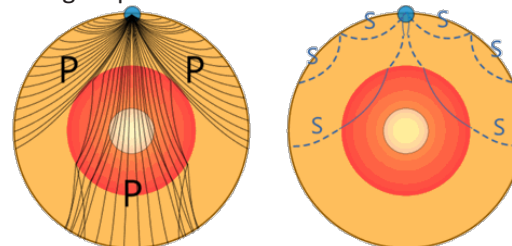
Echolocation: A pulse of ultra sound is sent out, and reflects from an object. The distance can be calculated using the equation

Distance travelled by wave = speed x time taken

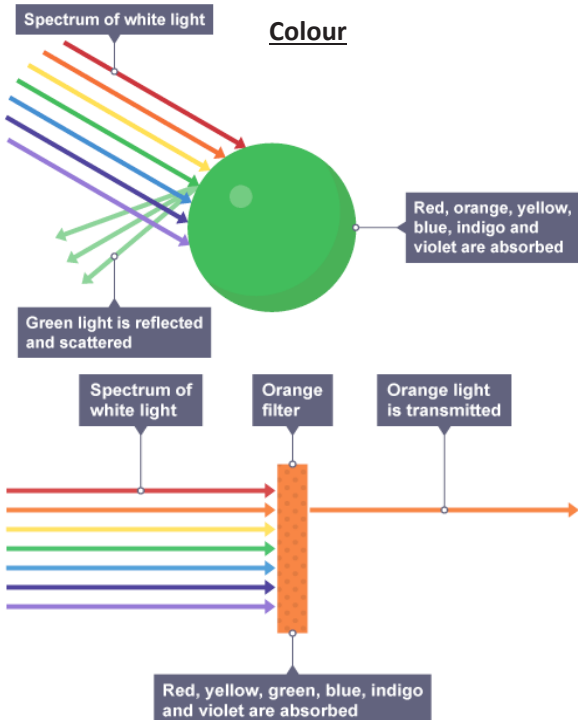
Seismic Waves

Primary (P) Wave : Longitudinal, fast moving, travel through liquids and solids. **Can** travel through liquid outer core of Earth

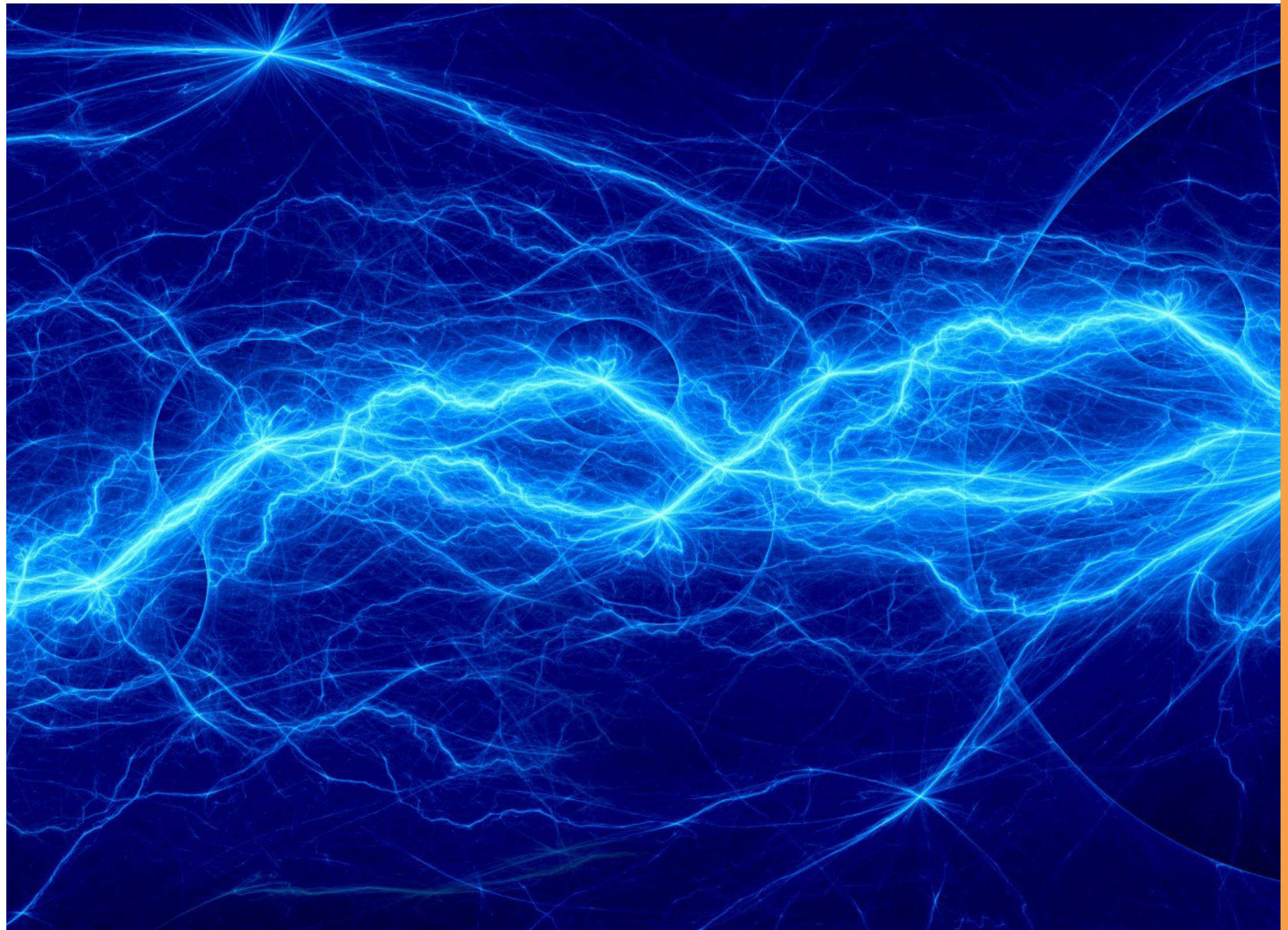
Secondary (S) Waves: Transverse, Slower than P waves, travel though solids only. Can't travel through liquid outer core.



Colour



Key Vocabulary	Definition	Contextual Sentence
Real image	The light rays actually converging or diverging from a source.	A real image is one that can be projected onto a screen
Virtual Image	The light rays appear to come from a source that is not really there.	A magnifying glass produce virtual image
Upright	The image is the same orientation as the object	The image produced by the magnifying glass was upright .
Inverted	The image is the opposite orientation to the object	The image produced the eye is inverted



Year 11 History
Autumn Term- America and the boom years

In the 1920s, many Americans enjoyed a high quality of living. These were usually wealthier, white Americans. Indigenous Americans, African Americans and immigrants were less fortunate. Goods were rolling off the production line of American factories and many believed America to be the richest country in the world.

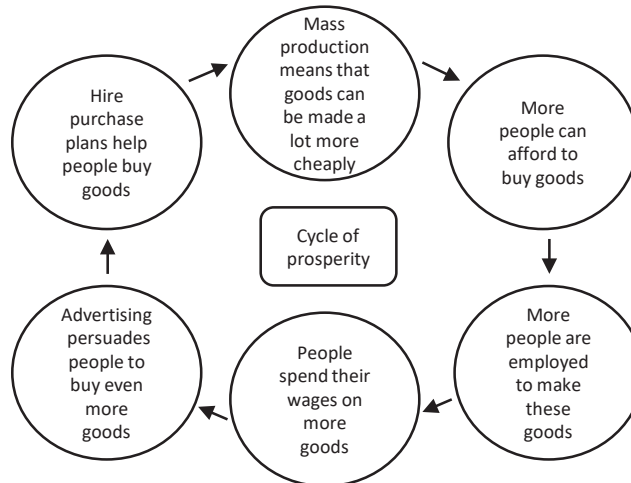
First World War	The USA stayed out of the war at first, following isolationism. This allowed the USA to prosper financially. Money was loaned to Britain and its allies. They used this money to buy food, weapons etc mainly from the USA. By the end of the war America was the only major nation without wartime debts. They led the world in the production of medicines, dyes etc.
The Consumer Society	The number of homes with electricity grew to 70% by 1927. This meant that people could buy modern electric goods such as vacuum cleaners, gramophones and refrigerators. Demand for these goods led to jobs in the factories that made them.
The role of the Republican government	The Republican government introduced several policies to support American business: <ul style="list-style-type: none"> • The Fordney-McCumber tariff put high taxes on imports, making foreign goods more expensive and US goods cheaper • Taxes were cut. People had more money to spend and the rich had money to invest in business, creating more jobs. • Laissez-faire approach meant that businesses were left alone to get on with creating wealth.
Growing industries/mass production	The growing motor car industry boosted the economy. Car making also supported other industries, large amounts of steel, leather, glass and rubber were needed as more cars were made. More business started to use the mass production techniques that were developed in the motor car industry. As companies made goods quicker they became cheaper.
New ways to buy and sell	Advertising in newspapers, coloured billboards and magazines urged people to buy the latest goods. Catalogues also made it easy to buy goods. Products could be delivered to the consumers door. Buy now and pay later schemes (hire purchase) meant that buyers could pay for goods in small instalments over a fixed period.

Playing the stock market

During the 1920s, millions of ordinary Americans bought shares in companies. They then made a profit by selling them on. In 1920 there was 4 million people who owned shares. By 1929, there were five times as many. Many people bought shares on the margin. This meant that they bought shares with money borrowed from the banks. This would often be with a small deposit of 10%. Buyers would then pay the remaining amount with the profits they made once the shares were sold.

The Ford motor company

Ford developed the assembly line technique. This meant that cars could be made quicker and cheaper. As production of Ford's Model T car got quicker, the price dropped. 15 million people bought Model Ts between 1911 and 1929. Ford called the Model T an affordable car for ordinary people. It changed the car industry forever.



Key Word	Definition
Economic boom	A period in a country's history when a vast majority of businesses are doing well, sales are high, wages are rising
Consumer goods	Goods that people buy
Rugged individualism	The idea that people should work hard and not rely on anyone, including the government for help
Isolationism	A policy in which a country does not get involved in foreign affairs
Laissez-faire	Policy of staying out of people's lives wherever possible

Inequalities	Summary
Poverty in the countryside	<ul style="list-style-type: none"> • By 1930 farmers were earning a third of their 1920 income. • There was less demand for US goods in Europe after WW1. • In response to the Fordney-McCumber tariff, some countries taxed US goods, making it harder to sell. • The use of high-tech farming machines produced more food to sell. Prices fell and farmers became poorer. • Farmers that had borrowed money from banks now couldn't repay their loans. many were forced to sell their farms or were evicted. 600,000 farmers lost their farms in 1924.
Problems in traditional industries	<ul style="list-style-type: none"> • Once prosperous countries were overtaken by rival industries. • Coal miners suffered as mines closed. Oil, gas and electricity became more popular. • Workers in cotton and wool factories suffered. There was less demand for their products with new man-made fibres such as rayon and the fashion for shorter dresses.
African-American workers	<ul style="list-style-type: none"> • Most African Americans lived in southern states . • Many worked as sharecroppers, who rented small areas of farmland from a landowner • As the farming industry suffered sharecroppers were particularly hard hit because they were already poor. • Many moved to cities to work but only found low paid jobs.
American Indians	<ul style="list-style-type: none"> • Large amounts of their land had been taken by mining companies and much of their traditional way of life had been lost. • Many American Indians had been forced to move to reservations. The soil there was often poor. Many lived in extreme poverty.

Year 11 History
Autumn Term- America and the boom years

Women before the war	Women during the war	Women after the war
<ul style="list-style-type: none"> • Most women led restricted lives and could not vote • Middle and upper class women were expected to always behave politely and wear sensible clothing • They rarely played energetic sport and wore little make up. • Relationships with men were strictly controlled. • Poorer women had to work hard, there were few opportunities for promotion. They had to settle for poorly paid jobs such as low skilled factory work and secretarial work. 	<ul style="list-style-type: none"> • Women took over the jobs of men who went away to fight. • They worked just as hard as men and the money earned gave them a sense of independence. • American women were given the right to vote in 1920, partly because of their war work. • By 1929, there were around 10.5 million women with jobs, around 25 per cent more than in 1920. 	<ul style="list-style-type: none"> • More women lived on their own . • They were less likely to stay in unhappy marriages – the divorce rate doubled. • Some women began to behave differently – wearing more revealing clothes and smoking. • The independent and fashionable young women of the 1920s were called flappers. • They were mainly middle/upper class women from northern states. • Some rode motorbike and went to clubs. • Their liberal attitude shocked the traditional members of society, who felt family life was under threat.

Why was Prohibition introduced?

- Morality – Alcohol was seen by some to be contributing to a decline in moral values. Some politicians believed that America would be a better, healthier place if alcohol was banned.
- Rural America – People in rural areas saw the new growing towns and cities as places where alcohol fuelled violence and crime. There had been a campaign against alcohol led by groups like the Anti-Saloon league.
- Religious organisation – Churches and religious organisations opposed alcohol because they blamed it for a variety of social problems such as violence, poverty, addiction and debt.
- Patriotism – Many beers on sale were imported from Germany or brewed by German immigrants. During WW1 it was argued that Americas who drank this beer were traitors.

What were the problems with Prohibition?

Around 1500 Prohibition agents tried to enforce the law. They tried to locate places that sold or made alcohol, then make arrests and confiscate the alcohol. However:

- The USA has 18,600 miles of coastline and land borders to patrol. The agents faced an impossible task of trying to prevent alcohol being smuggled in by sea or over the border (known as '**bootlegging**') from Mexico or Canada.
- Millions of people were willing to break the law and continue drinking.
- It was easy to get alcohol because criminal gangs got involved in making and supplying it. Gangs ran illegal bars ('**speakeasies**'), which sold **bootleg** alcohol. They also sold **moonshine** — a home-made spirit. Speakeasies were hidden in cellars or hotel rooms.
- The gangs made so much money that they were able to avoid arrest and prosecution because they bribed police officers and judges.

Organised crime

The gangs did not just get involved in the illegal alcohol trade. They also made money through fixing horse and dog racing and **racketeering** (when businessmen paid money to stop gangs smashing up their premises). A new phrase was coined to describe this behaviour — organised crime. One of the best known 'gangsters' was Al Capone.

The impact of Prohibition on society

By 1933, it was clear that Prohibition was not working. There were approximately 200,000 speakeasies in the USA. In New York, there were more speakeasies than bars before Prohibition. Instead of America becoming a less violent, moral country, it had seen the rise of gangsters, organised crime and police corruption.

- The Association Against the Prohibition Amendment (AAPA) attracted thousands of members. They argued Prohibition was a threat to a person's right to choose to drink and that Prohibition was making people lose respect for the law.
- It was argued that if alcohol was legalised again, lots of legal jobs would be created in the brewing industry.
- The government could also tax the alcohol, so the government would make money rather than the gangsters.

In the 1932 presidential election campaign, Franklin D Roosevelt gained many votes because he opposed Prohibition. He won the election, and in early 1933 he repealed Prohibition.

	Summary
Jazz music	<ul style="list-style-type: none"> • Jazz originated in Southern States of America among the African-Americans and spread north. • It was known for improvisation, fast tempos and lively rhythms. • The loud lively music appealed to young, both black and white. It became the most popular musical style in dance halls. • Jazz provided opportunities for black musicians such as Louis Armstrong. • New dance crazes like the Charleston became popular. • Some criticised jazz, particularly the older generation. They felt it encourage drunkenness.
Cinema	<ul style="list-style-type: none"> • The movie industry grew rapidly in the 1920s. • Many movie companies built studios in Hollywood. • Weekly audiences grew from 35 million in 1919 to 100 million in 1930. • Charlie Chaplin became household names at this time. • By 1929, Hollywood film studios were making over 500 films a year. • The Jazz singer was released in 1927 – the first feature film to include sound.
Sport	<ul style="list-style-type: none"> • Sportspeople such as Babe Ruth (baseball) and Bobby Jones (Golf) became celebrities. By 1930 Ruth was earning \$80,000 a year, the equivalent of nearly £7 million a year today. • Radio broadcasts, newspapers and magazines helped bring major sporting events to a mass audience.

Immigration

Between 1850 and 1914, around 40 million people emigrated to America.

Why move to America?

- Many European towns and cities were overcrowded. Land was in short supply and expensive.
- There were plenty of jobs in American production.
- American land was cheap and fertile. It was rich in natural resources.
- The idea that everyone has the right to achieve ('American Dream').
- There was poverty in Europe - terrible housing, poor health/diet.
- Various groups were persecuted for their religious or political beliefs in some European countries.
- The standard of living was higher, and workers paid more.
- Much of Europe was still divided by class. It was very difficult for working-class people to improve their lives.

The impact of immigration

- In the late 1800s/ early 1900s, immigrants began to arrive from southern and eastern Europe. Ethnic communities developed in many larger cities (Little Italy in New York).
- In some cities these immigrants were resented because they were poor, couldn't speak English and had unfamiliar traditions and religious practices. Many were Jewish or Catholic, whereas most of the population was Protestant.
- The First World War had added to suspicion of 'foreigners'. In the Russian Revolution, citizens had taken over land, banks and businesses. Some Americans feared that immigrants might try something similar.

The immigrant experience

- Some immigrants achieved great success, opening businesses and making a good living. However, for many, working and living conditions were generally very poor and difficult.
- Immigrants were poorly educated and worked for low wages in any job.
- Consequently, some felt that the immigrants were out to 'steal' jobs, creating prejudice.

A 1917 law (sometimes called the Literacy Act) banned entry to any immigrant over the age of 16 who could not read a sentence of 40 words.

1924 National Origins Act: allowed only 150,000 immigrants to enter each year.

1921 Immigration Quota Law: allowed only 350,000 immigrants to enter each year.

Year 11 History Autumn Term- America and the boom years

Racial tension

- Slavery was abolished in the USA in 1865, by this time there were more black people than white in the South.
- White politicians, tried to keep control by passing laws (known as 'Jim Crow Laws') to keep African-Americans segregated.
- African-Americans were stopped from using the same restaurants, hotels, swimming pools etc. as white people. Ways were found to stop them voting.
- African-Americans were segregated in the military, and some states banned mixed-race marriages.
- African-Americans could not expect justice from the legal system, because judges and police upheld the Jim Crow Laws.

KKK methods

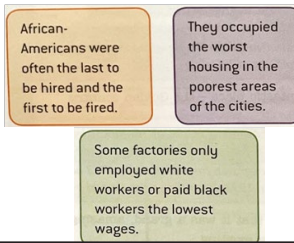
Dressed in white hoods and carrying US flags, their methods of violence and intimidation included whipping, branding, kidnapping and lynching.

The decline of the Klan

In 1925, a popular local Klan leader was convicted of the kidnapping, rape and murder of a young woman. At his trial, he exposed many of the secrets of the KKK. He was sentenced to life imprisonment and, within a year, KKK membership had fallen from 5 million to 300,000.

Leaving the South

Many African-Americans left the South and headed north, for better pay and opportunities in new industries. The African-American population of Chicago and New York more than doubled in the early 1900s. However, there was racism:



The Klan becomes popular again

By 1925, KKK membership was around 5 million.

- Most members were poor white people from rural areas of Southern states. They looked for someone to blame for poverty and turned on African-Americans. They felt willingness to work for lower wages took jobs from white people.
- The Klan was against anyone that wasn't like them — white and Protestant. They were against what they saw as a decline in morals.
- The secrecy of the Klan, with its coded language, hooded costume and strange rituals, was part of the appeal for many men who joined.

The Ku Klux Klan

What was the KKK?

A racist terror group with a membership of around 5 million in 1925.

What were its aims?

Maintain white supremacy over African-Americans and immigrants and 'keep them in their place'.

Rising fear of immigrants

- Some saw immigrants as an enemy who brought 'un-American' ideas into the country.
- Communism was feared. Americans were concerned that a communist revolution (like Russia in 1917) could happen in America — America had nearly 1.5 million Russians.
- An American Communist Party had been set up in 1919, and industrial unrest was increasing.
- Anarchists were another group feared in the 1920s. Anarchists believe that countries should not be ruled by governments, but by a system where everyone rules themselves through cooperation.

The Palmer raids and red scare

In July 1919, a bomb destroyed the house of Alexander Mitchell Palmer, the man in charge of America's law and police. A communist newspaper was found next to the body of the bomber.

- Later that year, an unidentified bomber blew up 30 people in New York. No one was found guilty — but many people's fear of communism increased more.
- Palmer vowed to get rid of America's communists — or 'Reds'.
- During the 'Palmer Raids', around 6000 suspected communists were arrested across 33 cities. Little evidence of any communist plots was found. This period is known as the 'Red Scare'.

The case of Sacco and Vanzetti

Nicola Sacco and Bartolomeo Vanzetti were Italian-born immigrant anarchists who were charged with robbing a shoe factory and murdering two staff in April 1920. Their 45-day trial began in May 1921.

There were doubts about the evidence against them. Even Judge Webster Thayer said that Vanzetti 'may not actually have committed the crime but he is morally to blame because he is our enemy'.

There was no conclusive evidence, but the jury found them guilty and sentenced them to death.

The pair said they were innocent. It was argued that they didn't understand what was going on because they spoke such poor English.

The importance of the case

- The trial was reported all over the world and there were huge demonstrations against the verdict.
- Protesters said the trial was unfair. The two men were found guilty as much for their race and anarchist ideas as for their actions.
- Despite years of protests/ appeals, the two men were executed on 23 August 1927.

The Wall Street Crash

'Playing the stock market' was popular due to the profits that could be made. Share prices rose, so investors would keep their shares for a short time and then sell them at a profit. Banks lent money to the investors knowing they would get their money back soon — with interest. However, in 1929 the stock market 'crashed'.

Inequalities of wealth

- Not all Americans could afford factory produced goods. There was a limit to the number of consumer goods, like cars and fridges people would/needed to buy.
- Factories were making goods faster than they could sell them (overproduction), profits were beginning to fall.



Problems abroad

- Companies struggled to sell their goods abroad because foreign governments had put taxes (tariffs) on US-made goods. These countries wanted to encourage people to buy goods made in their own country.



Lack of confidence

- Some shareholders began to doubt whether the companies they had invested in would keep making large profits.
- In September 1929, a few people began to sell their shares, worried that they wouldn't get their portion of company profits at the end of the year.



People start to panic

- More and more people began to sell their shares as word spread about the falling profits. Shareholders realised that their shares were only worth something if someone was willing to buy them.
- As they tried to sell their shares for cash, they dropped their price.



'Black Thursday'

- On 24 October 1929, 13 million shares were sold — five times as many as a normal day. Share prices in nearly all companies continued to drop. Some investors called this 'Black Thursday'; others called it the 'Crash'.



Banks go bankrupt

- Many Americans had borrowed money from banks to buy shares, hoping to pay back their loans when the shares rose in price.
- When share prices fell, investors couldn't sell their shares for enough to pay their bank back. When customers couldn't pay back their loans, the banks went bankrupt. In 1929 alone, 659 banks went bust. Some people lost all their savings.

Year 11 History Autumn Term- America and the bust years

Impact of the Great Depression	
Ordinary shareholders	<ul style="list-style-type: none"> • Millions of investors lost a fortune • They tried to pay back bank loans by selling valuables • Some struggled to pay rent and faced homelessness
Businessmen and their workers	<ul style="list-style-type: none"> • Factories had been overproducing. • After the Crash, people had less money to spend, so fewer goods were sold (underconsumption). • Factory owners cut production, wages, and jobs. • Closures affected local businesses too: for example, fewer workers eating at restaurants near factories meant some restaurants closed.
Bank managers	<ul style="list-style-type: none"> • When banks went bust bank managers and staff lost their jobs
The very rich	<ul style="list-style-type: none"> • Some rich people lost part of their wealth because they had invested in shares or owned factories that closed. • However, many owned lots of property and land and were not affected greatly.
Farmers	<ul style="list-style-type: none"> • Many farmers struggled before the Crash. • Farmers with bank loans for equipment had to pay back the money. Some couldn't afford to pay their debts or mortgages and lost their farms and workers. By 1932, 1 in 20 farmers had been evicted. • A combination of drought and poor farming methods turned the land into a 'Dust Bowl'.

Unemployment

- Around 13 million people by 1932 had lost their jobs
- By 1932, 12,000 people by a day lost their jobs.
- Between 1929 and 1932, factory production dropped by 45 per cent and house-building fell by 80%.

Hoovervilles

- The homeless queued in breadlines for food from soup kitchens
- Many took to living on the streets. Some moved to urban waste ground and built shack with scrap metal and old cloth. These were called Hoovervilles.
- Around 250,000 Americans stopped paying their mortgages in 1932 alone - most were evicted.

1932 Presidential election

The two main candidates for the 1932 presidential election were Herbert Hoover, who was hoping to be reelected and Franklin Delano Roosevelt (FDR). FDR won the election.

- Republican party
- Believed it wasn't the government's role to interfere in the daily lives of citizens (laissez faire)
- Had excellent early career in politics, during WW1.
- Elected president in 1928, during the economic boom.



Herbert Hoover

- Made his fortune in the mining industry
- Multi-millionaire by 40
- Retired from mining to enter politics

- Thought of Americans as rugged individuals, able to overcome problems without the government.
- Only after a few years of the depression he lent money to businesses and farms. Made cash available to unemployed and began large scale construction projects.
- Hoover was not a good public speaker. He looked uncaring, which made him unpopular.

- Privately educated, only child from a rich family.



Franklin Delano Roosevelt

- Democratic party
- His wife, Eleanor, may have influenced his decision to be a democrat. May of his family were republican.

- Helped organise the navy in WW1
- Contracted polio in 1921, used a wheelchair.
- Reentered politics in 1928, becoming the Governor of New York.
- As governor of New York spent \$20 million of tax money helping the unemployed.
- If elected promised the 3 Rs:
 - Relief
 - Recovery
 - Reform

Water Cycle Key Terms

Precipitation	Moisture falling from clouds as rain, snow or hail.
Interception	Vegetation prevent water reaching the ground.
Surface Runoff	Water flowing over surface of the land into rivers
Infiltration	Water absorbed into the soil from the ground.
Transpiration	Water lost through leaves of plants.

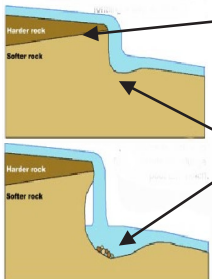
Physical and Human Causes of Flooding.

Physical: Prolong & heavy rainfall Long periods of rain causes soil to become saturated leading runoff.	Physical: Geology Impermeable rocks causes surface runoff to increase river discharge.
Physical: Relief Steep-sided valleys channels water to flow quickly into rivers causing greater discharge.	Human: Land Use Tarmac and concrete are impermeable. This prevents infiltration & causes surface runoff.

Upper Course of a River

Near the source, the river flows over steep gradient from the hill/mountains. This gives the river a lot of energy, so it will erode the riverbed vertically to form narrow valleys.

Formation of a Waterfall



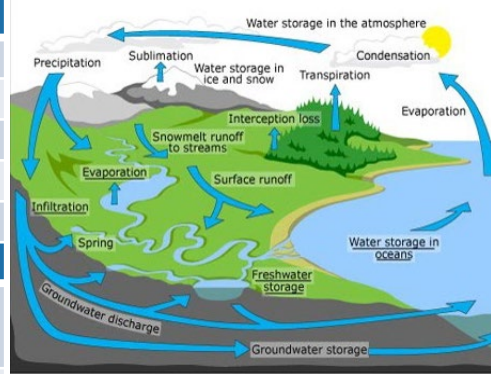
- 1) River flows over alternative types of rocks.
- 2) River erodes soft rock faster creating a step.
- 3) Further hydraulic action and abrasion form a plunge pool beneath.
- 4) Hard rock above is undercut leaving cap rock which collapses providing more material for erosion.
- 5) Waterfall retreats leaving steep sided gorge.

Middle Course of a River

Here the gradient get gentler, so the water has less energy and moves more slowly. The river will begin to erode laterally making the river wider.

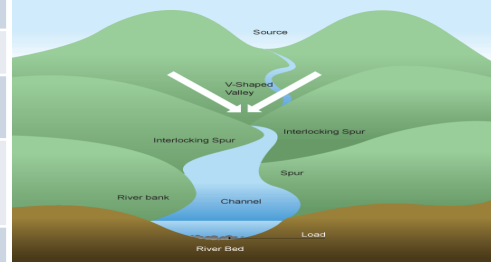
Formation of Ox-bow Lakes

Step 1	Step 2
Erosion of outer bank forms river cliff. Deposition inner bank forms slip off slope.	Further hydraulic action and abrasion of outer banks, neck gets smaller.
Step 3	Step 4
Erosion breaks through neck, so river takes the fastest route, redirecting flow	Evaporation and deposition cuts off main channel leaving an oxbow lake.



Formation of Interlocking Spurs

In the **upper** course of a river most of the erosion is **vertically** downwards. This creates **steep-sided V-shaped** valleys. The rivers lack the power to erode **laterally** (sideways), so they have to wind around the high hillsides that stick out into their paths on either side. The hillsides that interlock with each other as the river winds around them are called **interlocking spurs**.



Unit 1b



Physical Landscapes in the UK: Rivers

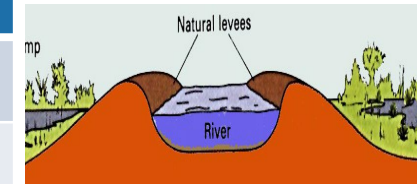
Lower Course of a River

Near the river's mouth, the river widens further and becomes flatter. Material transported is deposited.

Formation of Floodplains and levees

When a river floods, fine silt/alluvium is deposited on the valley floor. Closer to the river's banks, the heavier materials build up to form natural levees.

- ✓ Nutrient rich soil makes it ideal for farming.
- ✓ Flat land for building houses.



River Management Schemes

Soft Engineering

- Afforestation** – plant trees to soak up rainwater, reduces flood risk.
- Demountable Flood Barriers** put in place when warning raised.
- Managed Flooding** – naturally let areas flood, protect settlements.

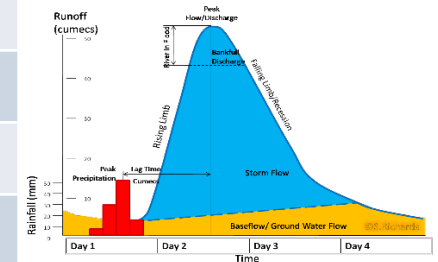
Hard Engineering

- Straightening Channel** – increases velocity to remove flood water.
- Artificial Levees** – heightens river so flood water is contained.
- Deepening or widening river** to increase capacity for a flood.

Hydrographs and River Discharge

River discharge is the volume of water that flows in a river. Hydrographs who discharge at a certain point in a river changes over time in relation to rainfall

1. **Peak discharge** is the discharge in a period of time.
2. **Lag time** is the delay between peak rainfall and peak discharge.
3. **Rising limb** is the increase in river discharge.
4. **Falling limb** is the decrease in river discharge to normal level.



Case Study: The River Tees

Location and Background

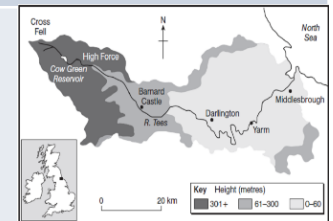
Located in the North of England and flows 137km from the Pennines to the North Sea at Red Car.

Geomorphic Processes

Upper – Features include V-Shaped valley, rapids and waterfalls. High Force waterfall drops 21m and is made from harder Whinstone and softer limestone rocks. Gradually a gorge has been formed.

Middle – Features include meanders and ox-bow lakes. The meander near Yarm encloses the town.

Lower – Greater lateral erosion creates features such as floodplains & levees. Mudflats at the river's estuary.



Management

- Towns such as Yarm and Middleborough are economically and socially important due to houses and jobs that are located there.
- Dams and reservoirs in the upper course, controls river's flow during high & low rainfall.
- Better flood warning systems, more flood zoning and river dredging reduces flooding.

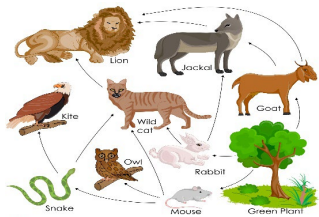
Tier 3 Vocab	Definition	Contextual Sentence
Agribusiness	Large-scale, industrial farming that is usually controlled by large companies.	Cargill is an example of a large agribusiness company that specialize in agricultural and food production.
Abiotic factors	The non-living components of an ecosystem, e.g. climate, soil, water.	Abiotic factors in the tropical rainforest include humidity, soil composition, temperature, and sunlight.
Abrasion	When bits of eroded rock in water or ice scrape against rock, eroding it	Abrasion wears away at the base of a waterfall, making the plunge pool deeper.
Attrition	When bits of eroded rock in water collide, break into smaller pieces and become more rounded	Attrition will change the size and shape of the sediment carried by the waves.
Biotic factors	The living components of an ecosystem, e.g. plants, animals, people.	The desert biome has many biotic factors such as desert grass, cacti, yucca plant and prickly pears.
Consumer	An organism that gets its energy by eating other organisms.	A rabbit is a primary consumer that eats grass.
Decomposer	An organism, e.g. fungus, that gets its energy by breaking down dead material.	The fungi decomposes the leaf litter on the forest floor of a tropical rainforest.
Deposition	The process of water dropping material as it slows down and loses energy.	Deposition occurs when water carrying sediment loses energy and slows down.
Desertification	A decline in the quality of land as it becomes drier and less productive.	The Sahel region in Africa experiences desertification due to both human and physical factors.
Ecosystem	A community of plants and animals and the environment in which they live.	Ecosystems can vary in scale from as being as small as a potted plant to as large as the Malaysian rainforest.
Ecotourism	Tourism that does minimal environmental damage, promotes conservation and benefits locals.	Ecotourism is one of Malaysia's biggest tourist attractions.
Erosion	The gradual wearing away of material, e.g. by moving water or ice.	Waves wear away the coast using three processes of erosion; hydraulic action, abrasion and solution.
Fragile environment	An environment that is easily disrupted and hard to restore to its natural state.	Hot and cold deserts are examples of very fragile environments.
Greenhouse effect	The warming of the planet as greenhouse gases (e.g. carbon dioxide and methane) absorb outgoing heat, so less is lost to space.	When trees are burnt, they release more carbon in the atmosphere. This will enhance the greenhouse effect.
Hydraulic Action	Erosion causes by sea or river water colliding with rocks.	Hydraulic action can take place in rivers and along coastlines.
Producer	An organism, e.g. grass, that uses energy from sunlight to produce food.	An Oak tree is an example of a producer that provides a source of food and shelter for other organisms.
Soil erosion	The loss of nutrient-rich, fertile topsoil due to natural processes or human activity.	An effect of deforestation in the tropical rainforest is soil erosion.

What is an Ecosystem?

An ecosystem is a system in which organisms interact with each other and with their environment.

Ecosystem's Components

Abiotic	These are non-living , such as air, water, heat and rock.
Biotic	These are living , such as plants, insects, and animals.
Flora	Plant life occurring in a particular region or time.
Fauna	Animal life of any particular region or time.

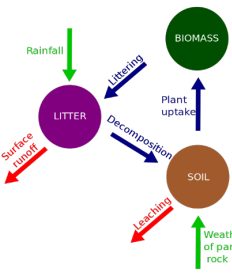


Food Web and Chains

Simple **food chains** are useful in explaining the basic principles behind ecosystems. They show only one species at a particular trophic level. **Food webs** however consists of a network of many food chains interconnected together.

Nutrient cycle

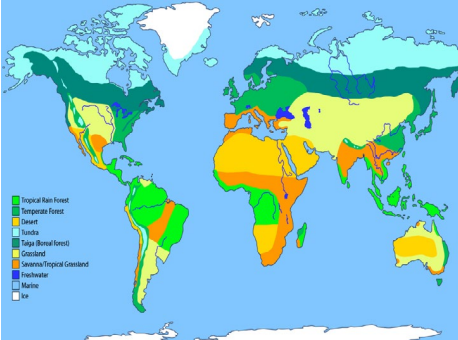
Plants take in **nutrients** to build into new organic matter. Nutrients are taken up when animals eat plants and then returned to the soil when animals die and the body is broken down by **decomposers**.



Litter	This is the surface layer of vegetation, which over time breaks down to become humus .
Biomass	The total mass of living organisms per unit area.

Biomes

A biome is a **large geographical area of distinctive plant and animal groups**, which are adapted to that particular environment. The climate and geography of a region determines what type of biome can exist in that region.



Coniferous forest
Deciduous forest
Tropical rainforests
Tundra
Temperate grasslands
Tropical grasslands
Hot deserts.

The **most productive biomes** – which have the greatest biomass- grow in climates that are **hot and wet**.

Biome's climate and plants

Biome	Location	Temperature	Rainfall	Flora	Fauna
Tropical rainforest	Centred along the Equator.	Hot all year (25-30°C)	Very high (over 200mm/year)	Tall trees forming a canopy; wide variety of species.	Greatest range of different animal species. Most live in canopy layer
Tropical grasslands	Between latitudes 5°- 30° north & south of Equator.	Warm all year (20-30°C)	Wet + dry season (500-1500mm/year)	Grasslands with widely spaced trees.	Large hoofed herbivores and carnivores dominate.
Hot desert	Found along the tropics of Cancer and Capricorn.	Hot by day (over 30°C) Cold by night	Very low (below 300mm/year)	Lack of plants and few species; adapted to drought.	Many animals are small and nocturnal: except for the camel.
Temperate forest	Between latitudes 40°- 60° north of Equator.	Warm summers + mild winters (5-20°C)	Variable rainfall (500-1500m /year)	Mainly deciduous trees; a variety of species.	Animals adapt to colder and warmer climates. Some migrate.
Tundra	Far Latitudes of 65° north and south of Equator	Cold winter + cool summers (below 10°C)	Low rainfall (below 500mm/ year)	Small plants grow close to the ground and only in summer.	Low number of species. Most animals found along coast.
Coral Reefs	Found within 30° north – south of Equator in tropical waters.	Warm water all year round with temperatures of 18°C	Wet + dry seasons. Rainfall varies greatly due to location.	Small range of plant life which includes algae and sea grasses that shelters reef animals.	Dominated by polyps and a diverse range of fish species.

Unit 1b The Living World



CASE STUDY: UK Ecosystem: Delamere Forest



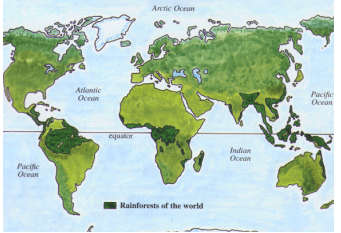
Delamere Forest contains a number of meres and mosses which comprise of a mosaic of open water and peatland areas, together with fringing heathland and woodland, provides habitats for locally and nationally rare species of aquatic plants. Many of these delicate or endangered habitats are so rare that they have been designated as Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and RAMSAR sites to protect them

Tropical Rainforest Biome

Tropical rainforest cover about **2 per cent** of the Earth's surface yet they are home to **over half of the world's plant and animals**.

Interdependence in the rainforest

A rainforest works through **interdependence**. This is where the plants and animals **depend on each other** for survival. If one component changes, there can be **serious knock-up effects** for the entire ecosystem.



Distribution of Tropical Rainforests

Tropical rainforests are **centred along the Equator** between the Tropic of Cancer and Capricorn. Rainforests can be found in South America, central Africa and South-East Asia. The **Amazon** is the world's largest rainforest and takes up the majority of northern South America, encompassing countries such as Brazil and Peru.

Management

The plan details management operations including approved felling and restocking for the 10 years to 2025, with outline proposals for a 50 year period.

The current threat to the primary conifer species in Delamere Forest from pests and diseases will lead to a greater variety of species being grown. To achieve this some stands of trees will be removed early to reduce the threat. The Forestry Commission will continue to work towards the restoration and management of the mosses and meres.



Layers of the Rainforest

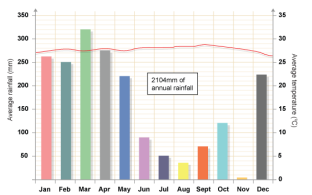
Emergent	Highest layer with trees reaching 50 metres .
Canopy	80% of life is found here as it receives most of the sunlight and rainfall .
U-Canopy	Consists of trees that reach 20 metres high .
Shrub Layer	Layer with small trees adapted to living in the shade .

Rainforest nutrient cycle

The **hot, damp conditions** on the forest floor allow for the **rapid decomposition** of dead plant material. This provides plentiful nutrients that are easily absorbed by plant roots. However, as these nutrients are in high demand from the many fast-growing plants, they do not remain in the soil for long and stay close to the surface. If vegetation is removed, the soils quickly become **infertile**.

Climate of Tropical Rainforests

- Evening temperatures rarely fall below **22°C**.
- Due to the **presence of clouds**, temperatures rarely rise above **32°C**.
- Most afternoons have heavy showers.
- At night with no clouds insulating, temperature drops.



Tropical Rainforests: Case Study Malaysia

Malaysia is a LIC country in south-east Asia. 67% of Malaysia is a tropical rainforest with 18% of it not being interfered with. However, Malaysia has the fastest rate of deforestation compared to anywhere in the world

Adaptations to the rainforest		Rainforest inhabitants
Orangutans	Large arms to swing & support in the tree canopy.	Many tribes have developed sustainable ways of survival. The rainforest provides inhabitants with... <ul style="list-style-type: none"> • Food through hunting and gathering. • Natural medicines from forest plants. • Homes and boats from forest wood.
Drip Tips	Allows heavy rain to run off leaves easily .	
Lianas & Vines	Climbs trees to reach sunlight at canopy.	

Issues related to biodiversity	What are the causes of deforestation?	
Why are there high rates of biodiversity?	Logging	Agriculture
<ul style="list-style-type: none"> • Warm and wet climate encourages a wide range of vegetation to grow. • There is rapid recycling of nutrients to speed plant growth. • Most of the rainforest is untouched. 	<ul style="list-style-type: none"> • Most widely reported cause of destructions to biodiversity. • Timber is harvested to create commercial items such as furniture and paper. • Violent confrontation between indigenous tribes and logging companies. 	<ul style="list-style-type: none"> • Large scale 'slash and burn' of land for ranches and palm oil. • Increases carbon emission. • River saltation and soil erosion increasing due to the large areas of exposed land. • Increase in palm oil is making the soil infertile.

Main issues with biodiversity decline	Mineral Extraction		Tourism
<ul style="list-style-type: none"> • Keystone species (a species that are important of other species) are extremely important in the rainforest ecosystem. Humans are threatening these vital components. • Decline in species could cause tribes being unable to survive. • Plants & animals may become extinct. • Key medical plants may become extinct. 	<ul style="list-style-type: none"> • Precious metals are found in the rainforest. • Areas mined can experience soil and water contamination. • Indigenous people are becoming displaced from their land due to roads being built to transport products. 	<ul style="list-style-type: none"> • Mass tourism is resulting in the building of hotels in extremely vulnerable areas. • Lead to negative relationship between the government and indigenous tribes • Tourism has exposed animals to human diseases. 	

Impacts of deforestation	Energy Development		Road Building
Economic development	Energy Development	Road Building	
<ul style="list-style-type: none"> + Mining, farming and logging creates employment and tax income for government. + Products such as palm oil provide valuable income for countries. - The loss of biodiversity will reduce tourism. 	<ul style="list-style-type: none"> • The high rainfall creates ideal conditions for hydro-electric power (HEP). • The Bakun Dam in Malaysia is key for creating energy in this developing country, however, both people and environment have suffered. 	<ul style="list-style-type: none"> • Roads are needed to bring supplies and provide access to new mining areas, settlements and energy projects. • In Malaysia, logging companies use an extensive network of roads for heavy machinery and to transport wood. 	

Soil erosion	Sustainability for the Rainforest	
<ul style="list-style-type: none"> - Once the land is exposed by deforestation, the soil is more vulnerable to rain. - With no roots to bind soil together, soil can easily wash away. 	Uncontrolled and unchecked exploitation can cause irreversible damage such as loss of biodiversity, soil erosion and climate change.	

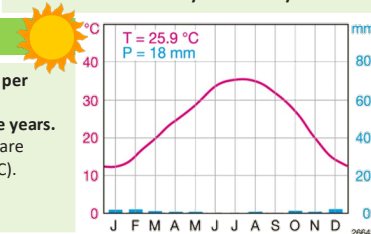
Climate Change	Possible strategies include:	
<ul style="list-style-type: none"> -When rainforests are cut down, the climate becomes drier. -Trees are carbon 'sinks'. With greater deforestation comes more greenhouse emissions in the atmosphere. -When trees are burnt, they release more carbon in the atmosphere. This will enhance the greenhouse effect. 	<ul style="list-style-type: none"> • Agro-forestry - Growing trees and crops at the same time. It prevents soil erosion and the crops benefit from the nutrients. • Selective logging - Trees are only felled when they reach a particular height. • Education - Ensuring those people understand the consequences of deforestation • Afforestation - If trees are cut down, they are replaced. • Forest reserves - Areas protected from exploitation. • Ecotourism - tourism that promotes the environments & conservation 	

Hot Desert: Case Study Sahara Desert/ Sahel desert-fringe

The Sahara desert is our largest desert – it covers a USA-sized area, stretching across many north African countries. There are many opportunities for economic development in the Sahara.

Distribution of the world's hot deserts	Major characteristics of hot deserts	
<p>Most of the world's hot deserts are found in the subtropics between 20 degrees and 30 degrees north & south of the Equator. The Tropics of Cancer and Capricorn run through most of the world's major deserts.</p> 	<ul style="list-style-type: none"> • Aridity – hot deserts are extremely dry, with annual rainfall below 250 mm. • Heat – hot deserts rise over 40 degrees. • Landscapes – Some places have dunes, but most are rocky with thorny bushes. 	

Hot Deserts inhabitants	Climate of Hot Deserts	
<ul style="list-style-type: none"> - People often live in large open tents to keep cool. - Food is often cooked slowly in the warm sandy soil. - Head scarves are worn by men to provide protection from the Sun. 	<ul style="list-style-type: none"> • Very little rainfall with less than 250 mm per year. • It might only rain once every two to three years. • Temperatures are hot in the day (45 °C) but are cold at night due to little cloud cover (5 °C). • In winter, deserts can sometimes receive occasional frost and snow. 	



Adaptations to the desert		Desert Interdependence
Cactus	<ul style="list-style-type: none"> • Large roots to absorb water soon after rainfall. • Needles instead of leaves to reduce surface area and therefore transpiration. 	Different parts of the hot desert ecosystem are closely linked together and depend on each other , especially in a such a harsh environment.
Camels	<ul style="list-style-type: none"> • Hump for storing fat (NOT water). • Wide feet for walking on sand. • Long eyelashes to protect from sand. 	

Opportunities and challenges in the Hot desert

Opportunities	Challenges
<ul style="list-style-type: none"> • Energy resources such as oil and gas in Algeria. • Mineral resources such as phosphate, iron and copper are found in Morocco • Great opportunities for renewable energy such as solar power in Tunisia • The Sahara desert has attracted tourists, especially sandboarding and cross-desert camel rides • Farming occurs in Egypt thanks to the Aswan Dam. 	<ul style="list-style-type: none"> • The extreme heat makes it difficult to work outside for very long. • High evaporation rates from irrigation canals and farmland. • Water supplies are limited, creating problems for the increasing number of people moving into area. • Access through the desert is tricky as roads are difficult to build and maintain.

Causes of Desertification – The Sahel region		Strategies to reduce Desertification
Desertification means the turning of semi-arid areas (or drylands) into deserts.	Climate Change Reduce rainfall and rising temperatures have meant less water for plants.	<ul style="list-style-type: none"> • Water management - growing crops that don't need much water. • Tree Planting - trees can act as windbreakers to protect the soil from wind and soil erosion. • Soil Management - leaving areas of land to rest and recover lost nutrients. • Technology – using less expensive, sustainable materials for people to maintain. i.e. sand fences, terraces to stabilise soil and solar cookers to reduce deforestation.
Fuel Wood People rely on wood for fuel. This removal of trees causes the soil to be exposed.	Overgrazing Too many animals mean plants are eaten faster than they can grow back. Causing soil erosion.	
Over-Cultivation If crops are grown in the same areas too often, nutrients in the soil will be used up causing soil erosion.	Population Growth A growing population puts pressure on the land leading to more deforestation, overgrazing and over-cultivation.	

Global Issues: GCSE Foundation Tier Spanish Knowledge Organiser

Key Ideas

- los problemas del medio ambiente
- lo que debemos hacer para proteger al medio ambiente
- qué hay en tu barrio
- cómo vas a ayudar al medio ambiente
- la pobreza
- cómo ayudar a los pobres



Key Vocabulary

Los sustantivos

el combustible	fuel
el calentamiento global	global warming
el carril bici	cycle lane
el centro de reciclaje	recycling centre
el desempleo/el paro	unemployment
el grifo	tap
el medio ambiente	environment
el petróleo	oil
la basura	rubbish
la bolsa de plástico	plastic bag
la caja (de cartón)	(cardboard) box
la calefacción central	central heating
la ducha	shower
la inundación	flood
la papelera	dustbin

la pobreza	poverty
los sintecho	homeless people

Los adjetivos

contaminado/a	polluted
peligroso/a	dangerous
preocupante	worrying

Los verbos

apagar	to switch off
aumentar	to increase
desaparecer	to disappear
destruir	to destroy
disminuir	to decrease
encender	to switch on
malgastar	to waste
proteger	to protect

reciclar	to recycle
salvar	to save
tirar	to throw (away)
usar	to use



Key Verbs

Infinitivo	Presente	Pasado (Pretérito)	Futuro
hacer - to do	yo hago ; él/ella hace ; nosotros/as hacemos	yo hice ; él/ella hizo ; nosotros/as hicimos	yo haré ; él/ella hará ; nosotros/as haremos
ser - to be	yo soy ; él/ella es ; nosotros/as somos	yo era ; él/ella era ; nosotros/as éramos	yo seré ; él/ella será ; nosotros/as seremos
estar - to be	yo estoy ; él/ella está ; nosotros/as estamos	yo estuve ; él/ella estuvo ; nosotros/as estuvimos	yo estaré ; él/ella estará ; nosotros/as estaremos
tener - to have	yo tengo ; él/ella tiene ; nosotros/as tenemos	yo tuve ; él/ella tuvo ; nosotros/as tuvimos	yo tendré ; él/ella tendrá ; nosotros/as tendremos
deber - to have to	yo debo ; él/ella debe ; nosotros/as debemos	yo debí ; él/ella debía ; nosotros/as debíamos	Yo deberé ; él/ella deberá ; nosotros/as

Key Phrases

para proteger al medio ambiente	to protect the environment
voy a ducharme	I'm going to have a shower
voy a apagar las luces	I'm going to switch the light off
utilizo/ uso el coche menos	I use the car less
hay demasiado(s)/a(s)	there are too many
no hay suficiente(s)	there are not enough
debemos	we must
hay demasiado desempleo	there is too much unemployment



Useful Grammatical Structures

- Use **modifiers** to modify an adjective. Examples include: bastante (quite); un poco (a bit).
- Use **intensifiers** to intensify an adjective. Examples include: realmente (really); muy (very); particularmente (particularly); totalmente (totally); completamente (completely).
- Use **connectives and conjunctions** to make longer sentences. Examples include: porque (because); ya que (as/because); pero (but); sin embargo (however); cuando (when); although (aunque).

Tricky Pronunciation: Practise these with your teacher!

el carril bici	cycle lane
ducharse	to shower
reciclar	to recycle
los sintecho	homeless people

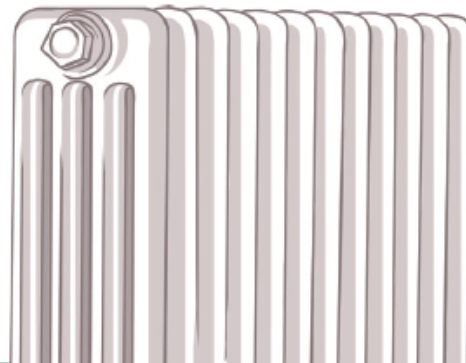


False Friends

utilizar	to use
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Tricky spellings

la calefacción	heating	Check there are two 'cc' and an accent on the 'o'.
desaparecer	to disappear	Check there is a single 's' and a single 'p'.



Key Questions

1. ¿Qué haces para proteger al medio ambiente?
What do you do to protect the environment?
2. ¿Cómo es el tráfico en tu pueblo/ ciudad?
What is the traffic like in your town/city?
3. ¿Qué vas a hacer para proteger al medio ambiente en el futuro?
What are you going to do to protect the environment in the future?
4. ¿Utilizas transporte público?
Do you use public transport?
5. ¿Hay muchos sintecho en tu pueblo/ ciudad?
Are there many homeless people in your town/city?
6. ¿Qué podemos hacer para ayudar a los pobres?
What must we do to help homeless people?



Social Issues: GCSE Foundation Tier Spanish Knowledge Organiser

Key Ideas

- Descripción de una dieta sana/malsana.
- Los peligros de fumar/beber alcohol.
- La importancia del deporte para la salud.
- Los sin techos en tu ciudad.
- Una organización benéfica que conoces.



Useful Grammatical Structures

- Use **modifiers** to modify an adjective.
Examples: bastante (quite); un poco (a bit).
- Use **intensifiers** to intensify an adjective.
Examples: realmente (really); muy (very); totalmente (totally); tan (so).
- Use **comparatives** to compare 2 or more items. Examples: más/menos+ adjective que... (more/less + adjective than...); tan + adjective como... (as + adjective as...).
- Use **connectives and conjunctions** to make longer sentences. Examples: porque (because); pero (but); sin embargo (however); cuando (when).
- Use a range of **negatives**. Examples: No como carne (I don't eat meat); Ya no como chocolate (I no longer eat chocolate); Nunca bebo coca cola (I never drink coke).
- Use the **perfect tense** to describe past events. Examples: fui (I went); comí (I ate); hice (I did); bebí (I drank); trabajé (I worked); ayudé (I helped).
- Use the **future tense** to describe future intentions. Example: voy a comer menos patatas fritas (I'm going to eat less crisps).

Key Vocabulary

Los nombres

el cigarillo	cigarette
el corazón	heart
el cuerpo	body
el dolor	pain, ache
la droga (blanda/dura)	(soft/hard) drug
el ejercicio (físico)	physical exercise
la enfermedad	illness
el entrenamiento	training
el estrés	stress
el fumador (pasivo)	(passive) smoker
el humo	smoke
la necesidad	need
la obra/organización benéfica	charity
el olor	smell
la participación	participation, taking part
la posibilidad	possibility
el propósito	aim, purpose, objective
los pulmones	lungs
la residencia (para ancianos)	old people's home
la salud	health
el sida	AIDS
la tentación	temptation
la tienda con fines benéficos	charity shop
la vida	life
el voluntario	volunteer

Los adjetivos

activo/a	active
borracho/a	drunk
cansado/a	tired
enfermo/a	ill
equilibrado/a	balanced
estresante	stressful
malsano/a	unhealthy
muerto/a	dead
saludable	healthy
sano/a	healthy/wholesome
vivo/a	alive
voluntario/a	voluntary

Los verbos

acostarse	to go to bed
caer(se)	to fall down
cansar(se)	to get tired
contribuir	to contribute
despertarse	to wake up
doler	to hurt
dormir(se)	to sleep/fall asleep
drogarse	to take drugs
emborracharse	to get drunk
encontrarse bien/mal	to feel well/ill
entrenar(se)	to train
estar bien/mal	to be well/ill
estar en forma	to be fit

evitar	to avoid
formar parte	to be part of
fumar	to smoke
levantarse	to get up
mantenerse en forma	to keep fit/in shape
mejorar(se)	to get better
morir	to die
oler	to smell
organizar	to organize
respirar	to breathe
tener dolor (de)...	to have a pain (in)...
tener sueño	to feel sleepy



Key Phrases

- Normalmente para el desayuno/el almuerzo/la cena, tomo...
For breakfast/lunch/dinner, usually, I have...
- Es bueno/malo para la salud - It's good/bad for your health
- Contiene mucho(s)/mucho(s)/demasiado(s)/demasiada(s)...
It contains a lot of/too much...
- Para mantenerse en forma, hay que hacer/comer/beber/evitar... To keep fit, you have to do/eat/drink/avoid...
- Fumar/El alcohol causa... Tobacco/Alcohol causes...
- ...causa la obesidad/ la pérdida de peso/ el aumento de peso
...causes obesity/weight loss/weight gain
- Mi tío dejó de fumar hace seis meses
My uncle quit smoking six months ago.
- Hay que hacer ejercicio a menudo para relajarse
You must do sports regularly to relax.
- Hay muchos sin techo en mi ciudad
There are many homeless people in my town.
- Soy miembro de una organización benéfica que se llama...
I am a member of a charity called...

Tricky Pronunciation: Practise these with your teacher!

el cigarillo	cigarette
el ejercicio	exercise
mejorar(se)	to get better



False Friends

lento/a	slow
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Tricky Spellings

el ejercicio físico	exercise	'f' instead of 'ph' in 'físico'.
emborracharse	to get drunk	Double 'r'.

Key Questions

1. ¿Qué hay que hacer para mantenerse en forma?
What do you have to do to stay in shape?
2. ¿Tienes una dieta sana? ¿Por qué (no)?
Do you have a healthy diet? Why (not)?
3. ¿Fumas? ¿Por qué (no)? Do you smoke? Why (not)?
4. ¿Cuáles son los peligros de fumar/beber alcohol?
What are the dangers of smoking/drinking alcohol?
5. ¿En tu opinión, por qué es importante hacer ejercicio regularmente?
In your opinion, why is it important to exercise regularly?
6. ¿Qué opinas de la situación de los sin techo?
What do you think about the situation of the homeless?
7. ¿Conoces alguna organización benéfica?
Do you know any charities?



Key Verbs

Infinitivo	Presente	Pretérito	Futuro (Remember, you can also use the near future: Verb IR in the present tense + a + Infinitive)
Ir	voy, va, vamos	fui, fue, fuimos	iré, irá, iremos
Hacer	hago, hace, hacemos	hice, hizo, hicimos	haré, hará, haremos
Tener	tengo, tiene, tenemos	tuve, tuvo, tuvimos	tendré, tendrá, tendremos
Fumar	fumo, fuma, fumamos	fumé, fumó, fumamos	fumaré, fumará, fumaremos
Comer	como, come, comemos	comí, comió, comimos	comeré, comerá, comeremos
Beber	bebo, bebe, bebemos	bebí, bebió, bebimos	beberé, beberá, beberemos
Acostarse	me acuesto, se acuesta, nos acostamos	me acosté, se acostó, nos acostamos	me acostaré, se acostará, nos acostaremos

Technology in Everyday Life GCSE Foundation Tier French Knowledge Organiser

Key Ideas

- Les différentes technologies
- Comparer les technologies
- Les avantages et les inconvénients de l'internet
- Mes technologies préférées - opinions
- Ce que je ferais sans la technologie



Key Phrases

faire des achats	go shopping
à n'importe quelle heure	whenever / at whatever time

Key Verbs

Infinitif	Présent	Passé	Futur
faire – to do	je fais; il fait; elle fait; nous faisons	j'ai fait; il a fait; elle a fait; nous avons fait	je ferai; il fera; elle fera; nous ferons
être – to be	je suis; il est; elle est; nous sommes	j'ai été; il a été; elle a été; nous avons été	je serai; il sera; elle sera; nous serons
avoir – to have	j'ai; il a; elle a; nous avons	j'ai eu; il a eu; elle a eu; nous avons eu	j'aurai; il aura; elle aura; nous aurons
mettre – to put	je mets; il met; elle met; nous mettons	j'ai mis; il a mis; elle a mis; nous avons mis	je mettrai; il mettra; elle mettra; nous mettrons
surfer – to surf	je surfe; il surfe; elle surfe; nous surfons	j'ai surfé; il a surfé; elle a surfé; nous avons surfé	je surferai; il surfera; elle surfera; nous surferons

Key Vocabulary

Les noms

l'avantage (m)	avantage
le clavier	keyboard
le désavantage	disadvantage
l'écran (m)	screen
le forum	chat room
l'imprimante (f)	printer
l'inconvénient (m)	disadvantage/drawback
le jeu	game
le lecteur DVD	DVD player
le lecteur MP3	MP3 player
le mot de passe	password
l'ordinateur (m)	computer
l'ordinateur portable (m)	laptop
la tablette	tablet
le portable	mobile (phone)
le réseau social	social network
le site internet/web	website
la souris	mouse
le texto	text (message)
la touche	key

Les adjectifs

dangereux/dangereuse	dangerous
rapide	fast
lent(e)	slow
pratique	convenient

Les verbes

acheter	to buy
chercher	to look for
cliquer	to click
envoyer	to send
faire des achats	to shop
mettre	to put
mettre en ligne	to upload
passer du temps	to spend time
recevoir	to receive
rester en contact	to stay in contact/touch
surfer sur Internet	to surf the internet
taper	to type
tchater	to talk online
télécharger	to download

Key Questions

1. **Quelle est ton opinion de la technologie ?** What is your opinion of technology?
2. **Tu utilises la technologie comment ?** How do you use technology?
3. **Quels sont les avantages et les inconvénients de la technologie ?**
What are the advantages and disadvantages of the internet?
4. **Tu utilises quelles technologies ?** What technologies do you use?
5. **Tu utilises l'internet pour tes devoirs ?** Do you use the internet for your homework?
6. **Tu préfères quelles technologies ?** Which technologies do you prefer?
7. **Tu as un téléphone portable ?** Do you have mobile phone?
8. **Qu'est-ce que tu penses des smartphones ?** What do you think of smartphone?
9. **Qu'est-ce que tu ferais sans ton portable ?** What would you do without your mobile phone ?
10. **Tu as fait des achats sur internet ?** Have you done some online shopping?

False Friends

passer du temps	to spend time
tchater	to talk online

Useful Grammatical Structures

- Use **modifiers** to modify an adjective. Examples include: assez (quite); plutôt (rather); un peu (a bit)
- Use **intensifiers** to intensify an adjective. Examples include: vraiment (really); très (very); particulièrement (particularly); totalement (totally); complètement (completely); si (so)
- Use **connectives and conjunctions** to make longer sentences. Examples include: parce que (because); car (as/because); mais (but); cependant (however); quand (when)
- Use the **perfect tense with avoir or être** to describe past events. Examples include: je suis allé(e) (I went); je suis arrivé(e) (I arrived); j'ai visité; j'ai vu (I saw); j'ai voyagé (I travelled); j'ai mangé (I ate); j'ai bu (I drank)
- Use the **conditional of regular -er verbs** to describe what you would do. Examples include: je tchaterais (I would talk online) je surferais (I would surf) je regarderais (I would watch)

Tricky Pronunciation

Practise these with your teacher!

envoyer	to send
des achats	shopping
lent (e)	slow
social	social

Tricky Spellings

envoyer	to send	check the oy combination
l'ordinateur	the computer	check the -eur ending
le désavantage	the disadvantage	check the accent, no d
l'avantage	the advantage	no d



Global Issues GCSE Foundation Tier French Knowledge Organiser

Key Ideas

- Les problèmes de l'environnement
- Ce qu'il faut faire pour l'environnement
- Ce qu'il y a dans ton quartier
- Comment tu vas aider l'environnement
- La pauvreté
- Comment aider les pauvres

Key Phrases

pour protéger l'environnement	to protect the environment
je vais prendre une douche	I'm going to have a shower
je voudrais éteindre la lumière	I'm going to switch the light off
j'utilise moins la voiture	I use the car less
il y a trop de...	there are too many...
il n'y a pas assez de...	there are not enough...
il faut...	we must...
il y a trop de chômage	there is too much unemployment



Key Vocabulary

Les noms

le bain	bath
la boîte (en carton)	(cardboard) box
le centre de recyclage	recycling centre
le chômage	unemployment
le chauffage central	central heating
les déchets (m)	rubbish
la douche	shower
l'environnement (m)	environment
l'inondation (f)	flood
les ordures (f)	rubbish
la pauvreté	poverty
le pétrole	oil
la piste cyclable	cycle lane
la poubelle	dustbin
le réchauffement de la Terre	global warming
le robinet	tap
le sac en plastique	plastic bag
le sans-abri/le SDF	homeless person

Les adjectifs

pollué(e)	polluted
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Les verbes

allumer	to switch on
cultiver	to grow
détruire	to destroy
disparaître	to disappear
éteindre	to switch off
faire du recyclage	to recycle
gaspiller	to waste
jeter	to throw (away)
protéger	to protect
sauver	to save
utiliser	to use



Tricky Pronunciation

recycler	to recycle	utiliser	to use
gaspiller	to waste	la piste cyclable	cycle lane

Tricky spellings

gaspiller	to waste	Check for the double 'l'
disparaître	to disappear	Check for the "hat" on the 't'

Key Verbs

Infinitif	Présent	Passé	Futur
faire - to do	je fais; il fait; elle fait; nous faisons	j'ai fait; il a fait; elle a fait; nous avons fait	je ferai; il fera; elle fera; nous ferons
être - to be	je suis; il est; elle est; nous sommes	j'ai été; il a été; elle a été; nous avons été	je serai; il sera; elle sera; nous serons
avoir - to have	j'ai; il a; elle a; nous avons	j'ai eu; il a eu; elle a eu; nous avons eu	j'aurai; il aura; elle aura; nous aurons
falloir - must	il faut		
devoir - to have to	je dois; il doit; elle doit; on doit; nous devons		

Key Questions

Qu'est-ce que tu fais pour protéger l'environnement ?

What do you do to protect the environment?

Comment est la circulation dans ta ville ?

What is the traffic like in your town /city?

Qu'est-ce-que tu vas faire dans le futur pour protéger l'environnement ?

What are you going to do to protect the environment in the future?

Utilises-tu les transports en commun ?

Do you use public transport?

Est-ce-qu'il y a beaucoup de SDF dans ta ville ?

Are there many homeless people in your town/city?



False Friends

utiliser	to use
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Useful Grammatical Structures

- Use **modifiers** to modify an adjective.
Examples include: assez (**quite**); plutôt (**rather**); un peu (**a bit**).
- Use **intensifiers** to intensify an adjective.
Examples include: vraiment (**really**); très (**very**); particulièrement (**particularly**); totalement (**totally**); complètement (**completely**); si (**so**).
- Use **connectives and conjunctions** to make longer sentences.
Examples include: parce que (**because**); car (**as/because**); mais (**but**); cependant (**however**); quand (**when**).
- Use the **perfect tense with avoir or être** to describe past events.
Examples include: je suis allé(e) (**I went**); je suis arrivé(e) (**I arrived**); j'ai visité (**I visited**); j'ai vu (**I saw**); j'ai voyagé (**I travelled**); j'ai mangé (**I ate**); j'ai bu (**I drank**).



Global Issues GCSE Higher Tier German Knowledge Organiser

Key Ideas

- Die Umweltprobleme
- Die Lösungen
- Meine Umgebung
- Was ich machen werde, um die Umwelt zu helfen
- Wie wir den Obdachlosen helfen können

Substantive

der Abfall	rubbish/waste
die Abholzung	deforestation
das Benzin	petrol
der Brennstoff	fuel
der Fahrradweg	bicycle track/lane
der Flüchtling	refugee
der Gebrauch	usage
das Düngemittel	fertiliser
die Gesellschaft	society
die Gewalt	violence
die Heizung	heating
der Kaugummi	chewing gum
das Kraftwerk	power station
die Not	need
das Opfer	victim
der Sauerstoff	oxygen
der Schaden	damage
der Lärm	noise
die Luft	air
der Krieg	war
die Verschmutzung	pollution
die Sozialwohnung	council flat
die Auspuffgase	exhaust fumes
die Einwegflasche	non-recyclable bottle
der Verbrecher	criminal

Key Vocabulary

die Adjektive		die Adjektive	
arbeitslos	unemployed	schwach	weak
einsam	lonely	stark	strong
gefährlich	dangerous	überbevölkert	overpopulated
bleifrei	lead free	weltweit	worldwide
gewalttätig	violent		
obdachlos	homeless		
öffentlich	public		
reich	rich		
sauber	clean		
schädlich	damaging		
schmutzig	dirty		



Die Verben	
anbauen	to grow
entsorgen	to dispose (of waste)
fliehen	to flee
heizen	to heat
reinigen	to clean
verschwenden	to waste
verwenden	to use
überschreiten	to exceed
verschwinden	to disappear
zerstören	to destroy



Key Phrases

Die Umwelt wird zerstört	The environment is being destroyed
Die Verbrennung fossiler Brennstoffe führt zu Luftverschmutzung	The burning of fossil fuels is leading to air pollution
Plastikmüll in den Ozeanen ist ein großes Problem	Plastic rubbish in the oceans is a big problem
Kohlendioxid in der Atmosphäre führt zum Treibhauseffekt	CO ₂ in the atmosphere is leading to the greenhouse effect
Die globale Erwärmung führt zur Klimaveränderung und zur Verschmelzung der Eiskappen	Global warming is causing climate change and melting of the icecaps
Wir müssen/Ich werde...	We must/I will...
...öffentliche Verkehrsmittel benutzen	...use public transport
...Energie sparen/den Müll recyceln	...save energy/recycle rubbish
...erneuerbare Energien benutzen	...use renewable energies
...kurz duschen statt baden	...shower quickly rather than take a bath
...weniger Papier verbrauchen	...use less paper
Wo ich wohne, gibt es viele soziale Probleme	Where I live, there are lots of social problems
Es gibt Müll auf den Straßen	There is rubbish on the streets
Man sieht Obdachlose überall	You see homeless people everywhere
Man könnte Kleidung/Lebensmittel spenden	You could donate clothes or food

Key Verbs	Präsens	Vergangenheit	Futur	Konditional	Imperfekt
gehen = to go	ich gehe; du gehst; er/ sie geht; wir gehen	ich bin gegangen; du bist gegangen; er/sie ist gegangen; wir sind gegangen	ich werde gehen; du würdest gehen; er/sie wird gehen; wir werden gehen	ich würde gehen; du würdest gehen; er/ sie würde gehen; wir würden gehen	ich ging; du gingst; er/sie gi wir gingen
sein = to be	ich bin; du bist; er/sie ist; wir sind	ich bin gewesen; du bist gewesen; er/ sie ist gewesen; wir sind gewesen	ich werde sein; du wirst sein; er/sie wird sein; wir werden sein	ich würde sein; du würdest sein; er/sie würde sein; wir würden sein	ich war; du warst; er war; war; wir waren
fahren = to go/travel	ich fahre; du fährst; er/sie fährt; wir fahren	ich bin gefahren; du bist gefahren; er/ sie ist gefahren; wir sind gefahren	ich werde fahren; du wirst fahren; er/ sie wird fahren; wir werden fahren	ich würde fahren; du würdest fahren; er/ sie würde fahren; wir würden fahren	ich fuhr; du fuhrst; er/sie fu wir fuhren

Key Questions

1. Bist du umweltfreundlich? Warum/Warum nicht?	Are you environmentally friendly? Why/Why not?
2. Wie können wir die größten Umweltprobleme lösen?	How can we solve the biggest environmental problems?
3. Beschreib deine Gegend.	Describe your local area.
4. Was wirst du in der Zukunft machen, um die Umwelt zu schützen?	What are you going to do to protect the environment in the future?
5. Fährst du mit dem Rad?	Do you travel by bike?
6. Was hast du letztes Wochenende gemacht, um umweltfreundlich zu sein?	What did you do last weekend to be environmentally friendly?
7. Gibt es viele Obdachlose in deiner Stadt?	Are there many homeless people in your town/city?
8. Was sollte man tun, um den Obdachlosen zu helfen?	What should we do to help homeless people?



Tricky Pronunciation

öffentliche Verkehrsmittel	Pay attention to the umlaut.
zerstört	Pay attention to the umlaut.



Tricky Spellings

Klimaveränderung

recyclen

erneuerbar

False Friends

spenden to donate



Useful Grammatical Structures

Introduce your opinions using set phrases: *soweit dass mich angeht* (as far as I am concerned); *meiner Meinung nach muss man* (in my opinion one must); *es ist nicht zu leugnen, dass* (cannot be denied that).

For example: *Soweit das mich angeht, ist die Verbrennung fossiler Brennstoffe die größte Ursache des Klimawandels* (As far as I am concerned, the burning of fossil fuels is the biggest cause of climate change).

Use the infinitive form of the verb with *zu* to express 'in order to'. Examples include: *umweltfreundlich zu sein* (in order to be environmentally friendly); *um die Umwelt zu schützen* (in order to protect the environment); *um den Obdachlosen zu helfen* (in order to help the homeless).

German Knowledge Organiser

Key Ideas

- Ein gesunder/ungesunder Lebensstil
- Die Gefahren des Rauchens/Alkohols
- Was muss man machen, um fit zu sein?
- Die Freiwilligenarbeit im Ausland
- Die Wohltätigkeit

Key Vocabulary

Key Phrases

Zum Frühstück/Mittagessen/Abendessen esse ich normalerweise...	For breakfast/lunch/dinner, usually, I have...
Das ist gut/schlecht für die Gesundheit	It's good/bad for your health
Das enthält zu viel/wenig...	It contains too much/too little...
Um fit zu bleiben muss man ... essen/trinken/vermeiden	To keep fit, you have to eat/drink/avoid...
Ein hoher Alkoholkonsum...	A high consumption of alcohol
...führt zur Fettleibigkeit	...leads to obesity
Mein Onkel hat auf das Rauchen verzichtet	My uncle has stopped smoking
Um sich zu entspannen, muss man regelmäßig Sport treiben	You must do sports regularly to relax
Ich spende Geld an Hilfsorganisationen	I donate money to relief organisations
Ich arbeite mit ... an einem Wohltätigkeitsprojekt zusammen	I am working together with ... at a charity project
Ich will in Afrika arbeiten	I want to work in Africa
Es ist mir sehr wichtig, anderen Menschen zu helfen	It is very important for me to help other people
Ich will mich sozial engagieren	I want to get involved in community/social projects

Die Verben	
entspannen (sich)	to relax
gewinnen	to win
halten	to hold, to keep
helfen	to help
rauchen	to smoke
schmerzen haben	to have an ache
sorgen für	to care for
spenden	to donate
sterben	to die
weh tun	to hurt
zunehmen	to increase/to put on weight

Die Substantive	
der Alkohol	alcohol
die Ernährung	food, nutrition, nourishment
die Wohltätigkeit	charity
die Krankheit	illness
die Drogen (pl)	drugs
die Gleichheit	equality
der Krebs	cancer
das Krankenhaus	hospital
das Fett	fat
die Fettleibigkeit	obesity
der Geruch	smell
der Unfall	accident
die Gesundheit	health
die Leber	liver
der Drogenhändler	drug dealer
das Heim	home
die Wohltätigkeit	charity
der/die Drogensüchtige	drug addict
die Freiwilligenarbeit	voluntary work

Infinitiv	Präsens	Perfekt	Futur
rauchen - to smoke	ich rauche; du rauchst; er raucht; sie raucht; wir rauchen	ich habe geraucht; du hast geraucht; er hat geraucht; wir haben geraucht	ich werde rauchen; du wirst rauchen; er wird rauchen; sie wird rauchen; wir werden rauchen
spielen - to play	ich spiele; du spielst; er spielt; sie spielt; wir spielen	ich habe gespielt; du hast gespielt; er hat gespielt; sie hat gespielt; wir haben gespielt	ich werde spielen; du wirst spielen; er wird spielen; sie wird spielen; wir werden spielen
essen - to eat	ich esse; du isst; er isst; sie isst; wir essen	ich habe gegessen; du hast gegessen; er hat gegessen; sie hat gegessen; wir haben gegessen	ich werde essen; du wirst essen; er wird essen; sie wird essen; wir werden essen
trinken - to drink	ich trinke; du trinkst; er trinkt; sie trinkt; wir trinken	ich habe getrunken; du hast getrunken; er hat getrunken; sie hat getrunken; wir haben getrunken	ich werde trinken; du wirst trinken; er wird trinken; sie wird trinken; wir werden trinken

Die Adjektive	
anonym	anonymous
betrunken	drunk
fettig	fatty
fettleibig	obese
freiwillig	voluntarily
gesund	healthy
hilflos	helpless
menschlich	human, humane
schädlich	damaging
süchtig	addicted



Key Questions	
Was machst du, um fit zu bleiben?	What do you do to keep fit?
Bist du gesund?	Are you healthy?
Rauchst du? Trinkst du Alkohol? Warum/Warum nicht?	Do you smoke/drink? Why/Why not?
Was sind die negativen Auswirkungen des Alkoholkonsums/Drogenkonsums?	What are the negative effects of alcohol/drug consumption?
Warum ist es wichtig, fit zu sein?	Why is it important to keep fit?
Möchtest du freiwillig arbeiten?	Would you like to do volunteer work?

False Friends	
spenden	to donate
der Rat	advice



Useful Grammatical Structures

Introduce your opinions using set conjunctive adverbs. Examples include: *einerseits* (on the one hand); *andererseits/auf der anderen Seite* (on the other hand).

Einerseits kann man Alkohol genießen, ohne abhängig zu werden (On the one hand, you can enjoy alcohol without becoming addicted).

Auf der anderen Seite braucht man keinen Alkohol um cool/lustig zu sein (On the other hand, you don't need alcohol to be cool/fun).

Use adjectives (with the correct ending) to give more detail about key ideas. Examples include: *ein hoher/regelmäßiger/beschränkter Drogenkonsum/Alkoholkonsum* (a high/regular/limited consumption of drugs/alcohol).

Use more sophisticated opinion structures. Examples include: *Meiner Meinung nach/Meiner Ansicht nach/Soweit ich sehe/Was mich angeht* (in my opinion/as far as i can see/as far as i'm concerned) + verb + conjunction/ subordinating conjunction.

Use the subordinating conjunction *wenn* to introduce reasons. Remember to put the verb to the end.

Wenn man zu viel isst/Alkohol trinkt/raucht, kann man übergewichtig/süchtig werden (when you eat/drink too much alcohol/smoke too much you can become overweight/addicted).

Tricky Spellings	
freiwillig (voluntarily)	Note the double use of l.
das Frühstück (breakfast)	Pay attention to the double use of ü.
der Geruch (smell)	Pay attention to the pronunciation of uch.

Tricky Pronunciation	
Practise these with your teacher!	
Wohltätigkeit (charity)	Pay attention to the ä sound.
enthält (contains)	Pay attention to the ä sound.
Fettleibigkeit (obesity)	Pay attention to the ei sound.



