



Your teacher will tell you which topic you should revise. Read and learn all the information in the topic, ready for a Quiz in lesson.

Topic 1: Scrooge characterisation in Stave 1

In **stave** one (the first chapter), Ebenezer Scrooge is depicted as an extremely cold, callous businessman who is insensitive, cold-hearted, and **miserly**.

Scrooge is immediately **presented** as an unpleasant character who is completely obsessed with making money. We quickly learn that Scrooge lives his life alone – no one even greets him in the street and beggars don't even ask him for help. Scrooge even dismisses his only remaining living relative (Fred) when he joyfully invites him to Christmas dinner. We see how badly Scrooge treats his employee, Bob Cratchit, and his upper-class **ignorance** when two gentlemen arrive to ask about giving money to charity. These 'portly gentlemen' who visit Scrooge ask for a Christmas donation to help the destitute orphans. Scrooge continues to be ill-mannered and miserly when he bitterly says he wants to 'be left alone'

Scrooge is a skinflint businessman who represents the greediest impulses of **Victorian** England's rich. He subscribes to the guidelines of the Poor Laws, which **oppress** the underclass, and has no warmth in his spirit for anything but money. Cratchit is the underclass's **representative**, a **humble**, powerless man who has no choice but to follow his employer's demands.



Key quotations:

"Oh! But he was a tight-fisted hand at the grindstone"

"a squeezing, wrenching, grasping, scraping, clutching, covetous, old sinner! Hard and sharp as flint,... secret, and self-contained, and **solitary** as an oyster."

"Let me hear another sound from you," said Scrooge, "and you'll keep your Christmas by losing your situation"

"Are there no prisons?... Are there no **workhouses**?"



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Topic 2: Stave 2 summary

Stave 2: The Ghost of Christmas Past:

At one o'clock, the curtains of Scrooge's bed are blown aside by a strange, **childlike** figure emanating an aura of wisdom and a richness of experience. The spirit uses a cap to cover the light that glows from its head. The **spectre** softly informs Scrooge that it is the Ghost of Christmas Past and orders the mesmerized man to rise and walk with him.

The ghost transports Scrooge to the countryside where he was raised. He sees his old school, his childhood mates, and familiar landmarks of his youth. Touched by these **memories**, Scrooge begins to sob. The ghost takes the weeping man into the school where a solitary boy--a young Ebenezer Scrooge--passes the Christmas holiday all alone. Here, we meet his little sister, Fan. She informs young Scrooge that their father is much **kinder** than he used to be. The aged Scrooge **regretfully** tells the ghost that Fan died many years ago and is the mother of his nephew Fred.



Scrooge is then taken to Fezziwig's – where Scrooge was an apprentice. This jovial rich man is hosting a party and has invited everyone with open arms. We see where Scrooge meets the love of his life, Belle. He is then shown a slightly older Scrooge with Belle. Despite being engaged, she has chosen to leave him because greed has **corrupted** the love he used to have for her. The older Scrooge cannot stand the sight of this and becomes tormented and frustrated – grabbing the Ghost's extinguisher cap in an attempt to get rid of what he is seeing.

Terminology:

1. **Antithesis** – Two opposing characters. Fezziwig is the antithesis to Scrooge in this Stave
2. **Allegory** – A story with a moral message attached
3. **Symbolism** – Representing an idea or message. The symbolism of fire continues in this Stave
4. **Motif** – A reoccurring idea or theme





Vocabulary	Wider Research	Apply
<p>Introduction Historical Social Dickensian Themes Characterisation Association Language Analyse Opinion Novella Minor Contrast Assessment Theme Supernatural Past Time Antithesis Purpose Reaction Improvement Media Sentence form Inform</p>	<p>Context for 'A Christmas Carol': https://www.youtube.com/watch?v=w7V4tXuhbk8</p> <p>Scrooge analysis: https://www.youtube.com/watch?v=F2kuQSbazUo</p> <p>Marley's ghost quiz: https://www.sparknotes.com/lit/christmascarol/section1/?quickquiz_id=874</p> <p>Analysing Stave 1: https://www.litcharts.com/lit/a-christmas-carol/stave-1</p> <p>Study guide for Stave 2: https://www.sparknotes.com/lit/christmascarol/section2/</p>	<ol style="list-style-type: none"> 1. Design your own Victorian London street. Annotate it with what would have typically been found. 2. Describe the emotions felt by Bob Cratchit in Stave 1. Consider 3 synonyms for each emotion 3. How are the streets described in the novella? Find evidence from the novella and complete 'explode the quote' task. 4. Create a flash card for each of the Scrooge quotations on Page 2. 5. Research Thomas Malthus – create a poster of your findings 6. Write 5 predictions of what you think will happen to Scrooge in the rest of the novella 7. Create a mind-map of all the characters we have met so far and make links between them 8. Writing task: Diary entry a day in the life of 10-Year-old in Victorian London 9. Writing task: Describe a workhouse 10. Writing task: Design your own poster that encourages people to donate money to the poor (that the 'Portly gentlemen' could use)



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Topic 1: **Décris-moi ta famille** *Describe for me your family*

Les nombres - Numbers

0 zéro	10 dix	20 vingt	30 trente
1 un	11 onze	21 vingt-et-un	31 trente-et-un
2 deux	12 douze	22 vingt-deux	32 trente-deux
3 trois	13 treize	23 vingt-trois	...
4 quatre	14 quatorze	24 vingt-quatre	40 quarante
5 cinq	15 quinze	25 vingt-cinq	50 cinquante
6 six	16 seize	26 vingt-six	60 soixante
7 sept	17 dix-sept	27 vingt-sept	
8 huit	18 dix-huit	28 vingt-huit	
9 neuf	19 dix-neuf	29 dix-neuf	

As-tu un animal?

Have you got a pet?

J'ai ...	I have ...
un chat	a cat
un chien	a dog
un cochon d'Inde	a Guinea pig
un hamster	a hamster
un lapin	a rabbit
un lézard	a lizard
un oiseau	a bird
un poisson	a fish
un serpent	a snake

Grammaire:

Possessive adjectives: "my" and "your" they change according to number (singular/plural) and genre (masculine/feminine) of the noun they accompany.

ex. My: **mon frère:** my brother
ma soeur: my sister
mes parents: my parents

Your: **ton frère:** your brother
ta soeur: your sister
tes parents: your parents

Non, je n'ai pas d'animal.	No, I don't have any pet.
Mais, je voudrais ...	But, I would like ...
Oui, j'ai ... et ...	Yes, I have ... and ...
Aussi, je voudrais ...	Also, I would like ...

la famille d'accueil: foster family
le (beau-) père: (step-) father
le grand- père: grandfather
le (demi-) frère: (half/step-) brother
le fils/la fille: son/daughter

la (belle-) mère: (step-) mother
la grand- mère: grandmother
la (demi-) sœur: (half/step-) sister
les parents: parents





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Topic 2: Il/ elle est comment? What is he/she like?

- Il/elle est: *he/she is*
 - petit(e): *small*
 - grand(e): *big/tall*
 - de taille moyenne: *medium sized*
- Il/elle a les yeux: *he/she has...eyes*
verts/bleus/marron: *green/blue/brown*
- Il/elle a les cheveux: *he/she has...hair*
 - noirs/blonds: *black/blond*
 - roux/gris/bruns: *red/grey/brown*
 - courts/longs /mi-longs: *short/long/medium-length*
 - bouclés/ raides: *curly/straight*
- Il a une barbe: *he has a beard*
- Il/elle a des taches de rousseur: *he/she has freckles*
- Il/elle a des tatouages: *he/she has tattoos*
- Il/elle porte des lunettes: *he/she wears glasses*



Important verbs : AVOIR and ÊTRE

in the present tense

AVOIR	TO HAVE
j'ai	I have
tu as	You (informal) have
il/elle/on a	He/she/we has/have
nous avons	we have
vous avez	you (plural / formal / polite) have
ils/elles ont	They (masc./ fem.) have

ÊTRE	TO BE
je suis	I am
tu es	You (informal) are
il/elle/on est	He/she / we is/are
nous sommes	we are
vous êtes	you (plural/ formal/ polite) are
ils/elles sont	they are



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Topic 3: En ville. In town

Qu'est-ce-qu'il y a dans....? What is there in....?

ta ville/ton village = your town/village

il y a.... = there is.....

un centre de loisirs = a leisure centre

un centre commercial = a shopping centre

un château = a castle

un marché = a market

un musée = a museum

une patinoire = an ice rink

une piscine = a swimming pool

des magasins = some shops

il n'y a pas d'église = there isn't a church

le prix = the price **un euro** = one euro

trois euros cinquante = 3,50€

Tu aimes habiter ici? Do you like to live here?

J'aime = I like

J'adore = I love

Je n'aime pas = I don't like

Je déteste = I hate

habiter ici = to live here

parce que / car = because

c'est = it is **très** = very **trop** = too **vraiment** = really

amusant = fun **génial** = great **intéressant** = interesting

ennuyeux = boring **nul** = rubbish

Unité 1: Où vas-tu le weekend? Where do you at the weekend ?

Je vais....I go

- **au bowling** = to the bowling alley
- **au cinéma** = to the cinema
- **au parc** = to the park
- **au stade** = to the stadium
- **à la plage** = to the beach
- **à la piscine** = to the swimming pool
- **à l'église** = to the church
- **aux magasins** = to the shops

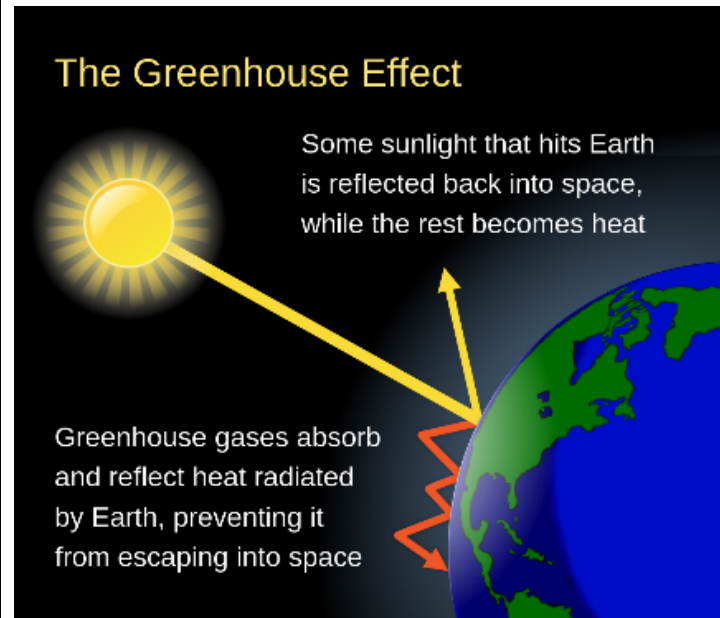
samedi matin/ après-midi/soir = on Saturday morning/ afternoon/evening



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Topic 1: Climate change - the facts

- Climate change is the long-term shift in average weather patterns across the world. Since the mid-1800s, humans have contributed to the release of carbon dioxide and other greenhouse gases into the air.
- This causes global temperatures to rise, resulting in long-term changes to the climate.
- The Industrial Revolution began in the mid-1800s when humans began to burn fossil fuels such as coal, oil, and gas for fuel.
- Burning fossil fuels produces energy, but also releases greenhouse gases such as carbon dioxide, methane, and nitrous oxide into the air.



- Over time, large quantities of these gases have built up in the atmosphere.
- Once in the atmosphere, greenhouse gases form a 'blanket' around the planet. This blanket traps the heat from the sun. This is increasing the 'greenhouse effect' and instead of keeping the Earth at a stable temperature, it is causing the planet to heat up.
- One-quarter of human-made greenhouse gas emissions come from burning fossil fuels for electricity and heat production.
- To feed our livestock and ourselves, people have chopped down large areas of the forest and used the land to grow crops. Forests are very good at removing carbon dioxide from the atmosphere, and so cutting down trees allows carbon dioxide to build up in the atmosphere even more.
- Land can also be used to rear livestock, such as cattle for meat and milk. These animals produce additional gases, like methane. They also eat crops that might otherwise have been needed by humans, meaning that even more land is required.

Natural causes?

There is also evidence that natural events such as volcanic activity, changes in solar activity and changes in the Earth's orbit are contributors to climate change but scientists estimate their possible impact to be minimal compared to human activities.



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Topic 2: The impacts of climate change

How is climate change impacting our planet?

From releasing greenhouse gases and aerosols into the atmosphere, to changing the use of land – human activity is the main driver of climate change. This has a range of impacts on the climate system, ecosystems, and people.

- Rising ocean levels – Rising temperatures are causing glaciers and ice sheets to melt, adding more water to the oceans and causing the ocean level to rise. Oceans absorb 90% of the extra heat from global warming: warmer water expands, and so our oceans are taking up more space.
- Ocean acidification – Ocean acidification occurs when the ocean absorbs carbon dioxide and becomes more acidic. It is often called the 'evil twin' of climate change.
- Extreme weather events – Climate change is causing many extreme weather events to become more intense and frequent, such as heatwaves, droughts, and floods.



- Flooding of coastal regions – Coastal cities are at risk from flooding as sea levels continue to rise.
- Food insecurity – High temperatures, extreme weather events, flooding, and droughts can damage farmland. This makes it difficult for farmers to grow crops and means that the number of crops they can grow each year is uncertain.
- Conflict and climate migrants – Climate change is a stress multiplier – it can take existing problems, such as lack of food or shelter, and make them worse. This can cause people to fight over resources (food, water, and shelter), or to migrate to different areas, countries or continents.
- Damage to marine ecosystems – Rising ocean temperatures, ocean acidification, and ocean anoxia (lack of oxygen) are damaging to marine life such as fish and coral reefs.

The most crucial step to limit climate change is to make big and rapid reductions in global greenhouse gas emissions. There are many different ways this can be done and governments, businesses, organisations and individuals around the world can all contribute. In June 2019, the UK became the world's first major economy to pass a law committing the country to a target of 'net zero' emissions by 2050.



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Topic 3: The Great Barrier Reef, Australia



World heritage listed in 1981, the Great Barrier Reef is the world's largest and most complex reef system and one of Australia's most treasured natural wonders. The Great Barrier Reef stretches more than 2300 kilometres along Queensland's coastline and is made up of around 3000 individual coral reefs. Larger than New Zealand (344,400 square kilometres or 70 million football fields), it is home to a breath-taking array of life including a number of rare and threatened species as well as:

- 1625 types of fish
- 600 types of coral
- 100 species of jellyfish
- 3000 varieties of molluscs
- more than 30 species of marine mammals such as whales, dugong and dolphins
- 133 varieties of sharks and rays

The greatest threat to the Reef is climate change. Reef health (coral, seagrass and marine life) has been declining due to poor water quality and the cumulative impacts of climate change, including warmer weather leading to coral bleaching and increased severe weather events, such as cyclones. Over the past two decades, the Great Barrier Reef has experienced several mass coral bleaching events. Bleaching occurs when corals are stressed, in this case from overheating.

- Excess nutrients, fine sediments and pesticides from agricultural run-off and other industries pose the biggest risk to reef water quality.
- Sediment smothers corals and reduces the amount of light reaching seagrasses and other plants, affecting their growth and survival as well as the survival of the marine animals that depend on them for food and shelter.





Vocabulary	Wider Research	Apply
<ol style="list-style-type: none">1. Atmosphere2. Carbon3. Climate4. Conflict5. Development6. Drought7. Earth8. Ecosystem9. Emissions10. Extreme weather11. Flooding12. Fossil fuels13. Glaciers14. Greenhouse effect15. Heatwave16. Human17. Hunting18. Impact19. Infrared radiation20. Infrastructure21. Marine22. Mass tourism23. Non-renewable24. Ocean acidification25. Overfishing26. Physical27. Poaching28. Renewable29. Resources30. Sustainable	<p>https://www.geographyinthenews.org.uk/issues/issue-31/investigating-what-causes-climate-change/ks3/</p> <p>https://www.bbc.co.uk/bitesize/clips/z7wnvcw</p> <p>https://www.bbc.co.uk/bitesize/clips/zp6g9j6</p> <p>https://www.youtube.com/watch?v=pJ1HRGA8g10</p> <p>https://www.youtube.com/watch?v=uOMRF7t5Vn0</p> <p>https://www.youtube.com/watch?v=7ZnvFkiZmDM</p> <p>https://www.youtube.com/watch?v=7sJHnwpXFV8</p> <p>https://www.bbc.co.uk/news/science-environment-62758811</p>	<p>Get creative</p> <ol style="list-style-type: none">1. Create a poster about the causes of climate change.2. What steps is the UK government taking to reduce our impact on the climate change? Complete your own research.3. Where is climate change having the biggest effect? HINT: Look at Australia, Pakistan and the African continent.4. Create a leaflet to show the dangers of over-fishing and poaching. What key messages do you need to get across for these issues? <p>GCSE Style Questions:</p> <ol style="list-style-type: none">1. Explain the greenhouse effect. [3 marks]2. What are the social impacts of immigration? [3 marks]3. Describe the impact of climate change on the planet. [4 marks]4. Why is the Great Barrier Reef valuable to humans? [4 marks]5. What are the threats to the Great Barrier Reef? [6 marks]6. How does tourism impact the planet in both positive and negative ways? [6 marks]7. To what extent do you agree that a changing climate is the biggest threat the planet faces in 2022? [8 marks]



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Topic 1: Problems for the Weimar Government

The setting up of the Weimar Republic did not signal peace for Germany and its citizens, it merely ushered in a period of chaos and violence. The 5 years after WW1 saw an attempted Communist revolution, political assassinations, armed uprisings and massive inflation.

Above all Germans had to accept what they felt was a vindictive peace settlement – the Treaty of Versailles. Many Germans said that all the problems of the post-war years were the result of the decisions that had been made by the politicians of the new Weimar Republic. These politicians were given the name ‘November Criminals’. However, by the end of 1923, political and economic stability were being restored to Germany.

The Treaty of Versailles 1919 (hint – you can remember the key terms of the treaty using the word **LAMB)**

LAND Germany lost land on all sides of its borders as well as its overseas colonies. In Europe Alsace-Lorraine went back to France, Eupen-Malmedy was recognised as Belgian and France took coal from the Saar Region.

ARMY AND **N**AVY Germany’s army and navy were significantly reduced in size and its air force was abolished. Maximum of 100,000 troops were allowed in the army and conscription and tanks were banned. German navy was reduced to only 6 battleship and no submarines.

MONEY – Germany had to pay back reparations to Britain and France to cover damages caused by the war. In 1922 the amount to be paid was set at £6.6 billion.

BLAME – Germany had to accept the blame for starting the war under article 231 of the treaty known as the ‘War Guilt Clause’.

Hyperinflation

The Weimar Government were struggling to pay the £6.6 billion reparation payments which led to France and Belgium sending troops to the Ruhr, Germany’s main industrial area. The workers refused to work for the occupying forces and went on strike. These workers were seen as heroes to the rest of Germany and the Weimar Government continued to pay their wages to support them. When they could no longer afford to pay the workers, the government began printing more money to do so which contributed to hyperinflation. Hyperinflation is when a country’s currency loses its value to an extreme affect and was virtually worthless:

November 1918 a loaf of bread cost 1 mark.

November 1922 a loaf of bread cost 163 marks.

September 1923 a loaf of bread cost 1,500,000 marks.

November 1923 a loaf of bread cost 200,000,000,000 marks.



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Topic 2: Britain after the War

Politics

In 1918, more rights were given to voters – all men were able to vote, from the age of 21, and, for the first time, women were able to vote from the age of 30. In 1924, the Labour Party took power for the first time.

Women’s Rights

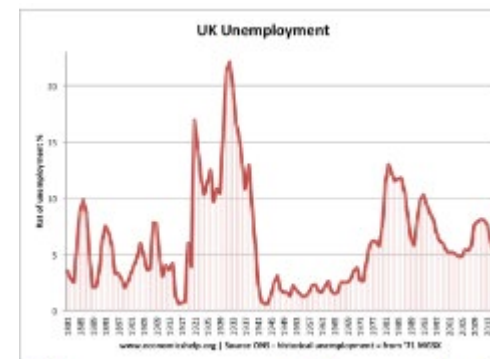
Millions of women worked in factories and were part of the war effort at home but the government forced many women out of work when the war finished – 75% of women who had worked during the war were fired within 18 months of the war ending. If women stayed in work, their wages were much lower than a man working in the same job and for many women at work, if they got married they would be fired.

Workers’ Rights

Before this point, there were not many laws regulating children in the workplace. A law was passed that banned workplaces from employing children under the age of 14. Male workers were treated more favourably than women and lots of help and support was given to veterans and for disabled soldiers, to get them back into the workplace.

The Economy

The war was extremely expensive for Britain and, by the end, Britain had huge debts. The war had cost £3 billion and affected Britain’s trade industry. To pay back this debt and to recover the economy, taxes were raised to 25% and Britain had to borrow large loans from America. By 1921, unemployment was extremely high at 2 million, which was 20% of the workforce. Before WWI, Britain had been the world’s largest economic power but was replaced by America from 1916 onwards.





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Topic 3: The Wall Street Crash and the Great Depression

The Wall Street Crash

During the 1920s, businesses in the US boomed. Many consumers had more money to spend on goods which meant that demand increased. However, half of the population of America were too poor to afford these goods and businesses began to supply more than the demand and when businesses couldn't sell these goods, prices and then wages began to fall.

At the same time, many people and banks had been buying shares in these US businesses as their share prices kept increasing and they thought they would be able to sell their shares at a higher price. When businesses started to fail because their prices and wages were dropping, people began to sell their shares in a panic and this panic began to spread extremely quickly. Eventually, so many people were selling shares that the banks began to go bankrupt because most banks had been purchasing shares but, also, many banks had given out loans to help people buy shares that they would no longer be able to pay back.

The Great Depression

After the Wall Street Crash, unemployment shot up to 12 million people (25% of working people in America) which was nearly 10x higher than it had been before. This was because many businesses had closed down. The USA did not have a welfare state (a country that gives citizens benefits such as unemployment support) and only a small amount of help was available, but this was not anywhere near enough for the amount of people who needed support. People were unable to work, could not pay bills or rent and could not afford food. "Breadlines" – a queue of people waiting for food outside soup kitchens became a common sight. Millions of homeless people began traveling the country, looking for work or for somewhere to live.

People living in rural areas were also affected. Many farmers had taken out loans in the 1920s to modernise their farms but found themselves bankrupt due to the Great Depression and had to sell their land. Less food was farmed, and this helped keep prices for necessities, such as food, high.

President Franklin D Roosevelt was elected in 1932 and promised to fix the Great Depression. Whether he was successful, or not, the worst of the Great Depression was over by 1941, just as the US entered WWII.





Vocabulary	Wider Research	Apply							
<ol style="list-style-type: none"> 1) Kaiser 2) Reichstag 3) Armistice 4) Constitution 5) Chancellor 6) President 7) Article 48 8) Republic 9) Democracy 10) Dictatorship 11) Reparations 12) Hyperinflation 13) Weimar 14) Economy 15) Nation 16) Politics 17) Rights 18) Employment 19) Unemployment 20) Legislation 21) Workplace 22) Loans 23) Shares 24) Bankrupt 25) Supply 26) Demand 27) Depression 28) Stock Market 29) Crash 30) Agriculture 	<p>Overview of WW1 https://www.history.com/topics/world-war-i/world-war-i-history</p> <p>Treaty of Versailles https://www.history.com/topics/world-war-i/treaty-of-versailles-1</p> <p>Kaiser Wilhelm II background study http://www.bbc.co.uk/history/historic_figures/wilhelm_kaiser_ii.shtml</p> <p>Hyperinflation https://www.historylearningsite.co.uk/modern-world-history-1918-to-1980/weimar-germany/hyperinflation-and-weimar-germany/</p> <p>The Wall Street Crash https://www.bbc.co.uk/bitesize/guides/zp277yc/revision/1</p> <p>The Great Depression https://www.bbc.co.uk/bitesize/guides/zp277yc/revision/3</p> <p>Farms during the Great Depression https://www.bbc.co.uk/bitesize/guides/zp277yc/revision/4</p> <p>Roosevelt and the New Deal https://www.bbc.co.uk/bitesize/guides/zp277yc/revision/5</p>	<p>1. Create a dictionary for this topic. Include all the key vocabulary, definition and use the word in a sentence.</p> <table border="1" data-bbox="1294 427 2121 770"> <thead> <tr> <th data-bbox="1294 427 1572 528">Key Word</th> <th data-bbox="1572 427 1848 528">Definition</th> <th data-bbox="1848 427 2121 528">Use the word in a sentence</th> </tr> </thead> <tbody> <tr> <td data-bbox="1294 528 1572 770"> </td> <td data-bbox="1572 528 1848 770"> </td> <td data-bbox="1848 528 2121 770"> </td> </tr> </tbody> </table> <p>2. Write a newspaper article/blog explaining what the Treaty of Versailles meant for Germany.</p> <p>3. Write a newspaper article/blog criticising how unfair the Treaty of Versailles was for Germany.</p> <p>4. Research what happened in Britain between WWI and WWII.</p> <p>5. Explain how the Great Depression affected American citizens. (2 paragraphs).</p> <p>6. Create a mind map summarising the Wall Street Crash and the Great Depression</p> <div data-bbox="1601 1161 1904 1353" style="text-align: right;"> </div>		Key Word	Definition	Use the word in a sentence			
Key Word	Definition	Use the word in a sentence							



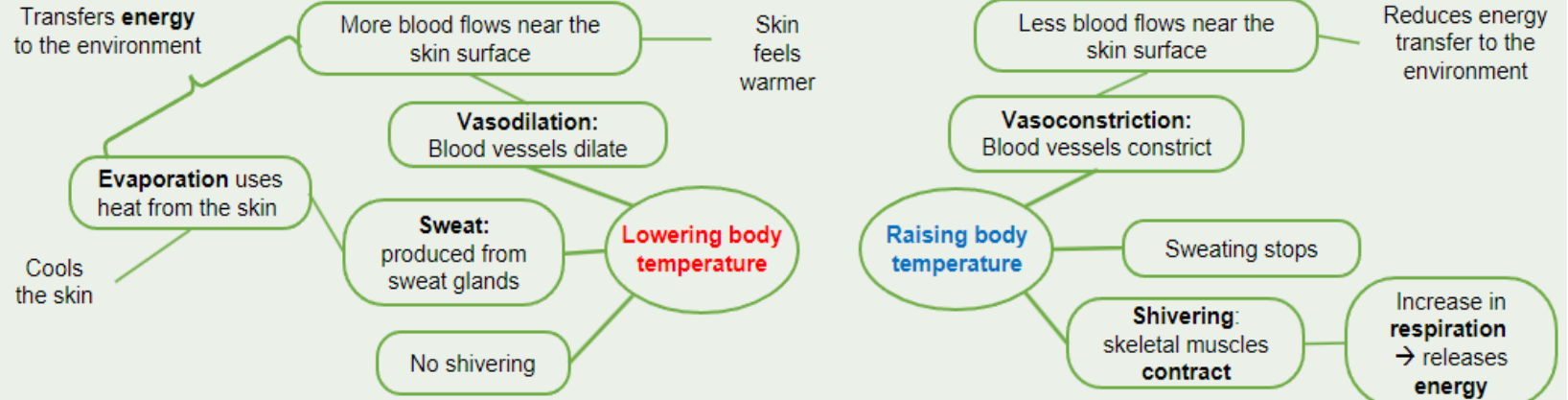
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B1.1 – Controlling body temperature

Monitoring body temperature

- Body temperature is monitored and controlled by the **thermoregulatory centre** in the brain.
- Detects a change in body temperature by:
 - receiving **nervous** impulses from temperature **receptors** in the **skin**
 - containing **receptors** that detect a change the temperature of **blood** that circulates through it

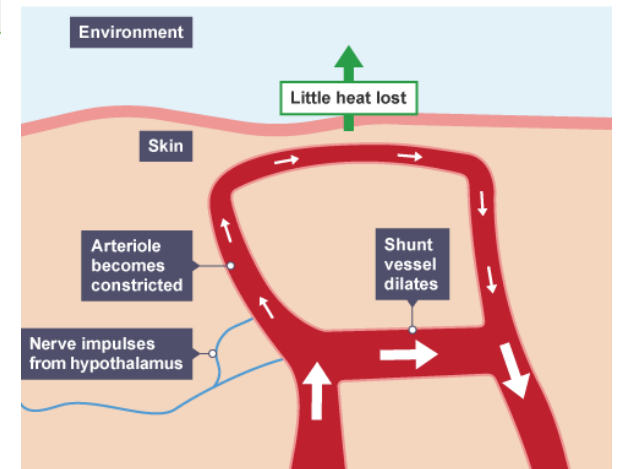
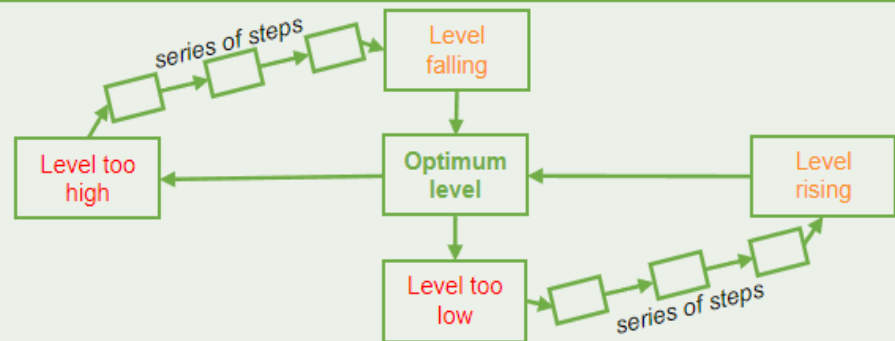
Mechanisms to change body temperature



Key terminology

Negative feedback Feedback loops that counteract changes in the body, stabilising the levels of that substance/factor

Negative feedback cycle





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Key terminology		Adaptation of a neurone	Human brain role and structure
Neurone	A cell specialised to transmit electrical signals		<ul style="list-style-type: none"> The brain controls complex behavior The brain is made of billions of interconnected neurones The brain has different regions that carry out different functions <p>Cerebrum – controls complex behaviour such as memory, personality, and conscious thought (E.G, decision-making)</p> <p>Hypothalamus – regulates temperature and controls the pituitary gland</p> <p>Cerebellum – controls balance and involuntary movements</p> <p>Pituitary gland – stores and releases many hormones</p> <p>Medulla – controls automatic actions such as heart rate and breathing rate</p>
Nerve	A bundle of multiple neurones		
Stimulus	A change in the environment		
The nervous system			
<ul style="list-style-type: none"> Enables humans to: <ul style="list-style-type: none"> React to their surroundings Coordinate their behavior <pre> graph LR Stimulus --> Receptor --> SensoryNeurone[Sensory neurone] SensoryNeurone --> Coordinator Coordinator --> MotorNeurone[Motor neurone] MotorNeurone --> Effector --> Response subgraph CNS [Central Nervous System] Receptor Coordinator MotorNeurone end subgraph Effectors [Effectors] Effector end </pre> <ul style="list-style-type: none"> Muscles – contracting Glands – secreting hormones 			
<ul style="list-style-type: none"> Information passes along neurones as electrical impulses 			



Your teacher will tell you which topic you should revise. Read and learn all the information in the topic, ready for a Quiz in lesson.

B1.2 – The effect of hormones

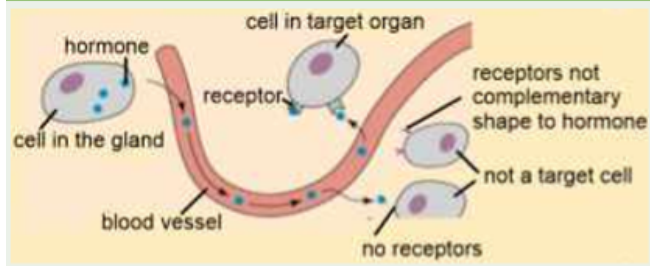
Key terminology

Hormone system	Composed of glands that release hormones directly into the bloodstream, regulating distant target organs
Gland	A group of cells that makes and/or releases chemicals into the body
Hormone	Chemicals released by glands, that produce an effect in specific target organs
Target organ	An organ that responds to a specific hormone, due to complementary receptors

Hormone examples

Hormone	When released	Impact	Importance
Insulin	When blood sugar levels are too high	Sugar taken in by liver and muscle cells, and stored.	Prevents cell damage after meals are eaten.
Leptin	When there is a lot of fat tissue in the body	Lowers a person's appetite	Stops a person overeating and becoming obese
Melatonin	When it is dark (peak 2-4 am)	Regulates a person's circadian rhythm	Stops a person feeling disorientated during the day
Thyroxin	When a person is cold	Increases metabolism (cellular reactions)	Regulates body temperature and metabolism

Principles of hormonal control



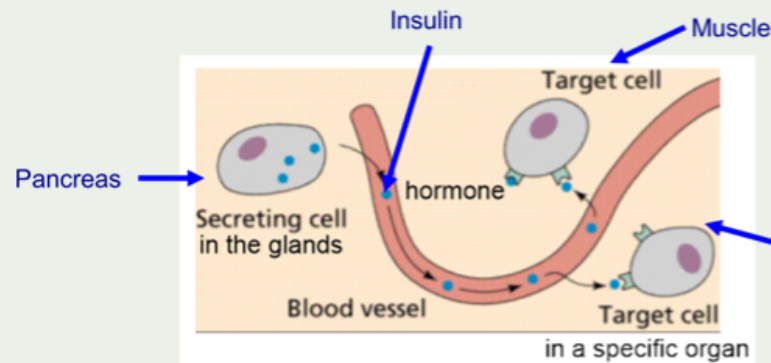
Gland secrete chemical messengers, called hormones, into the blood

Target cells in target organs detect the hormone and respond.

- Target cells can detect the hormone because they have a complementary shaped receptor.

Effects are **slower** but act for **longer**
(compared with the nervous system)

Details of insulin control of blood sugar levels



Insulin is released from the pancreas when blood sugar levels are too high

Insulin is detected by muscle and liver cells

Muscle and liver cells take in sugar from the blood, and convert it to glycogen for storage



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A HISTORY OF THE ATOM: THEORIES AND MODELS

How have our ideas about atoms changed over the years? This graphic looks at atomic models and how they developed.

SOLID SPHERE MODEL



JOHN DALTON



1803

Dalton drew upon the Ancient Greek idea of atoms (the word 'atom' comes from the Greek 'atomos' meaning indivisible). His theory stated that atoms are indivisible, those of a given element are identical, and compounds are combinations of different types of atoms.

+ RECOGNISED ATOMS OF A PARTICULAR ELEMENT DIFFER FROM OTHER ELEMENTS

- ATOMS AREN'T INDIVISIBLE - THEY'RE COMPOSED FROM SUBATOMIC PARTICLES

PLUM PUDDING MODEL



J. J. THOMSON



1904

Thomson discovered electrons (which he called 'corpuscles') in atoms in 1897, for which he won a Nobel Prize. He subsequently produced the 'plum pudding' model of the atom. It shows the atom as composed of electrons scattered throughout a spherical cloud of positive charge.

+ RECOGNISED ELECTRONS AS COMPONENTS OF ATOMS

- NO NUCLEUS; DIDN'T EXPLAIN LATER EXPERIMENTAL OBSERVATIONS

NUCLEAR MODEL



ERNEST RUTHERFORD



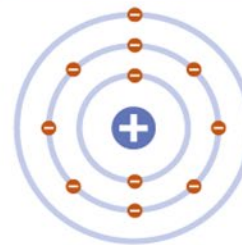
1911

Rutherford fired positively charged alpha particles at a thin sheet of gold foil. Most passed through with little deflection, but some deflected at large angles. This was only possible if the atom was mostly empty space, with the positive charge concentrated in the centre: the nucleus.

+ REALISED POSITIVE CHARGE WAS LOCALISED IN THE NUCLEUS OF AN ATOM

- DID NOT EXPLAIN WHY ELECTRONS REMAIN IN ORBIT AROUND THE NUCLEUS

PLANETARY MODEL



NIELS BOHR



1913

Bohr modified Rutherford's model of the atom by stating that electrons moved around the nucleus in orbits of fixed sizes and energies. Electron energy in this model was quantised; electrons could not occupy values of energy between the fixed energy levels.

+ PROPOSED STABLE ELECTRON ORBITS; EXPLAINED THE EMISSION SPECTRA OF SOME ELEMENTS

- MOVING ELECTRONS SHOULD EMIT ENERGY AND COLLAPSE INTO THE NUCLEUS, MODEL DID NOT WORK WELL FOR HEAVIER ATOMS

QUANTUM MODEL



ERWIN SCHRÖDINGER



1926


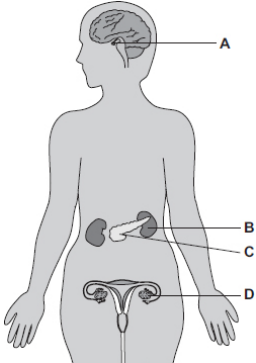
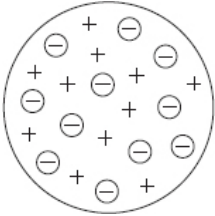
Schrödinger stated that electrons do not move in set paths around the nucleus, but in waves. It is impossible to know the exact location of the electrons; instead, we have 'clouds of probability' called orbitals, in which we are more likely to find an electron.

+ SHOWS ELECTRONS DON'T MOVE AROUND THE NUCLEUS IN ORBITS, BUT IN CLOUDS WHERE THEIR POSITION IS UNCERTAIN

+ STILL WIDELY ACCEPTED AS THE MOST ACCURATE MODEL OF THE ATOM





Vocabulary	Wider Research	Apply
<ol style="list-style-type: none"> 1. Temperature 2. Shiver 3. Friction 4. Control 5. Vasoconstriction 6. Vasodilation 7. Thermoregulation 8. Involuntary 9. Contraction 10. Evaporation 11. Sweat 12. Increase 13. Decrease 14. Vessels 15. Negative 16. Feedback 17. Atom 18. Sub-atomic 19. Particle 20. Theory 21. Discovery 22. Advance 23. Timeline 24. Democritus 25. Dalton 26. Thomson 27. Rutherford 28. Bohr 29. Chadwick 	<p>How the body works:</p> <p>[1] https://www.bbc.co.uk/bitesize/guides/zxgmfcw/revision/1</p> <p>[2] https://www.bbc.co.uk/bitesize/guides/zc8qdxs/revision/1</p> <p>[3] https://www.bbc.co.uk/bitesize/guides/z8t47p3/revision/1</p> <p>Elements:</p> <p>[1] https://www.bbc.co.uk/bitesize/guides/zp3dh39/revision/1</p> <p>[2] https://www.bbc.co.uk/bitesize/guides/z29rsrd/revision/1</p> <p>[3] https://www.bbc.co.uk/bitesize/guides/z36fcw/revision/4</p>	<ol style="list-style-type: none"> 1. Describe how a low blood glucose concentration would lead to a person feeling weak. 2. Draw the image and label the organs in the endocrine system -----> 3. The photograph below shows a doctor testing a reflex action of a patient. <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <p>When the doctor touches the patient's foot with a blunt rod, the patient's toes curl.</p> <p style="text-align: center;">Describe the pathway of this reflex action.</p> <ol style="list-style-type: none"> 4. Name the model of the atom -----> 5. Explain how this model of the atom was disproved. Who disproved him? How? What was the new discovery made? 6. Potassium is much more reactive than lithium. Explain this in terms of their electronic structures. <div style="text-align: right;">  </div>



Your teacher will tell you which topic you should revise. Read and learn all the information in the topic, ready for a Quiz in lesson.

Topic 1: Indices and standard form

Standard Form

Standard Form

Standard form is a way of writing very large or very small numbers by using powers of ten. It is also known as scientific notation.

Numbers in standard form are written in this format:

$$a \times 10^n$$

Where a is a number $1 \leq a < 10$ and n is an integer.

Approximating Calculations

Sometimes it is a good idea to estimate the value of a calculation rather than work it out exactly. In this situation, round the numbers in the question before performing the calculation. When approximating, numbers are rounded to one significant figure. The 'approximately equal to' sign, \approx , is used to show that values have been rounded.

Estimate the value of 23×67 .

Rounding to 1 significant figure gives: $20 \times 70 = 1,400$

Therefore: $23 \times 67 \approx 1,400$

Significant Figures

The method of rounding to a significant figure is often used as it can be applied to any kind of number, regardless of how big or small it is.

When a newspaper reports a lottery winner has won £3 million, this has been rounded to one significant figure. It rounds to the most important figure in the number.

To round to a significant figure:

- look at the first non-zero digit if rounding to one significant figure
- look at the digit after the first non-zero digit if rounding to two significant figures
- draw a vertical line after the place value digit that is required
- look at the next digit
- if the next digit is 5 or more, increase the previous digit by one
- if it is 4 or less, keep the previous digit the same
- fill any spaces to the right of the line with zeros, stopping at the decimal point if there is one

Round 53,879 to 1 significant figure, then 2 significant figures.

- 5|3879 to 1 significant figure is 50,000
- 53|879 to 2 significant figures is 54,000

Notice that the number of significant figures in the question is the maximum number of non-zero digits in your answer.

In order to convert from standard form to ordinary numbers

- 1 Convert the power of ten to an ordinary number
- 2 Multiply the decimal number by this power of ten
- 3 Write your number as an ordinary number

E.g.
Convert 7.1×10^4 to standard form.

- 1 $10^4 = 10000$
- 2 7.1×10000
- 3 So 7.1×10^4 as an ordinary number is 71000

E.g.
Convert 4500 to standard form.

- 1 Writing 4500 as a decimal between 1 and 10 is 4.5
- 2 4.5×1000
- 3 $10^3 = 1000$
- 4 So 4500 written in standard form is 4.5×10^3

Estimate: $\frac{423-98}{16.4}$

Rounding to 1 significant figure gives:
 $\frac{400-100}{20} = \frac{300}{20} = \frac{30}{2} = 15$

Therefore: $\frac{423-98}{16.4} \approx 15$



Your teacher will tell you which topic you should revise. Read and learn all the information in the topic, ready for a Quiz in lesson.

Topic 2: Expressions and Formulae

Solving equations

An equation is a mathematical expression that contains an equals sign. There are two sides of an equation, the left is equal to the right. We can solve equations to find out the variables (unknown value) that satisfy the equation. The example on the right shows how to solve an equation with a bracket. First we need to expand the bracket by multiplying. Next we need to subtract the 6 from both sides to leave just the variable on one side, in this case 'x'. As we want to find the value of 'x' we need to divide by 3 on both sides which will give us the value of 4.

Here are some things we can do to solve an equation:

- Add or Subtract the same value from both sides.
- Clear out any fractions by Multiplying every term by the bottom parts.
- Divide every term by the same non-zero value.
- Combine Like Terms.
- Factoring.
- Expanding (the opposite of factoring) may also help.

$$3(x + 2) = 18$$

$$3x + 6 = 18$$

$$\begin{array}{r} -6 \\ -6 \end{array}$$

$$3x = 12$$

$$\begin{array}{r} \div 3 \\ \div 3 \end{array}$$

$$x = 4$$

Example

Find the value of $3b + 4$ when $b = 10$

$$3b \text{ means } 3 \times b = 3 \times 10 = 30$$

$$\text{So } 3b + 4 = 30 + 4 = 34$$

Substituting in expressions

Substitution means replacing variables in an algebraic expressions with numerical or algebraic values. An example of this can be seen on the right, we are given an expression and a value for 'b'. An expression is a mathematical statement which consists of numbers, variables and an operation. When we substitute b with 10 this now becomes the equation $3 \times 10 + 4 = 30$.

$$a^m \times a^n = a^{m+n}$$

$$a^m \div a^n = a^{m-n}$$

$$a^0 = 1$$

$$(a^m)^n = a^{m \times n} = a^{mn}$$

Index laws and brackets

Index laws are the rules for simplifying calculations or expressions involving powers of the same base number. When multiplying two powers of the same base number we add the two indices together. When dividing two powers of the same base together we subtract the indices. When a power of a base number is within a bracket and the bracket has a power, the two indices are multiplied together. See the example on the left.

Expanding double brackets

Writing two brackets next to each other means that they need to be multiplied. A method to expand double brackets is called FOIL, which stands for first, outer, inner and last. This is the order that will be used when multiplying the terms. The first term in each bracket is multiplied together then the two outer terms are multiplied. This is followed by multiplying the two inner terms and finally the two last terms. Please see an example below:

$$(a + 2)(a + 3)$$

$$\text{First - } a \times a = a^2$$

$$\text{Outer - } a \times 3 = 3a$$

$$\text{Inner - } 2 \times a = 2a$$

$$\text{Last - } 2 \times 3 = 6$$

Answer

$$= a^2 + 3a + 2a + 6$$

$$= a^2 + 5a + 6$$



Vocabulary	Wider Research	Apply
<p>Standard Form Integer Convert Power Approximation Significant figure Equation Expression Variable Multiply Expand Operator Substitution Indices Bracket Term</p>	<p>Topic 1: https://corbettmaths.com/2018/09/20/standard-form-videos/ https://corbettmaths.com/2012/08/21/approximation-to-calculations/ https://corbettmaths.com/2013/09/07/rounding-significant-figures/</p> <p>Topic 2: https://corbettmaths.com/2012/08/24/solving-equations/ https://corbettmaths.com/2012/08/20/substitution-into-expressions/ https://corbettmaths.com/2013/03/13/laws-of-indices-algebra/ https://corbettmaths.com/2013/12/23/expanding-two-brackets-video-14/</p>	<p>Topic 1: https://corbettmaths.com/2019/08/29/standard-form-practice-questions/ https://corbettmaths.com/2019/09/02/estimation-practice-questions/ https://corbettmaths.com/2019/09/05/rounding-significant-figures-practice-questions/</p> <p>Topic 2: https://corbettmaths.com/2019/08/28/solving-equations-practice-questions/ https://corbettmaths.com/2019/08/22/substitution-practice-questions/ https://corbettmaths.com/2018/04/04/laws-of-indices-2/ https://corbettmaths.com/2018/04/04/expanding-two-brackets/</p>