Knowledge Organiser

Year 11

Cycle 2

CORE SUBJECTS

Name:

Tutor Group:

What is a Knowledge Organiser and why are they important?

A knowledge organiser is designed to summarise the key information, concepts, and vocabulary for a specific topic or unit of work in each subject. Its purpose is to help students:

- o Understand what they are expected to learn.
- o Make connections between ideas.
- o Retain and recall essential knowledge more effectively.
- o Support independent study and revision

Your Knowledge Organiser contains the essential knowledge that we expect every student to know. Regular use of the Knowledge Organiser helps you to recap, revise and revisit what you have learnt in lessons. This can be part of your homework in some subjects or as independent revision The aim is to help remember this knowledge in the long term and to help strengthen your memory.

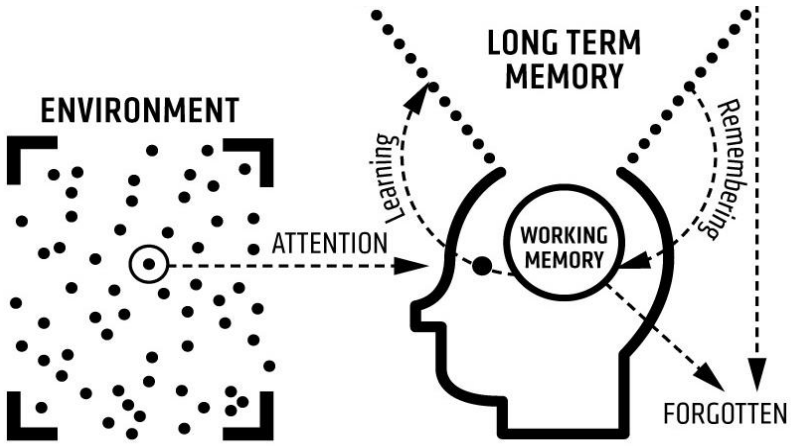
Each cycle there is an assessment in every subject and you will be assessed on the knowledge from your Knowledge Organiser; the more you revisit information the more likely it will be remembered for lessons, assessments and exams.

How we learn anything

We learn by focusing our attention on something. If we are distracted by other things in our environment (eg mobile phones, listening to music) it will affect how much/what we learn.

Information we pay attention to goes into our working memory, but our working memory is not very good and we quickly and easily forget things.

Learning happens when we think about, process or practise doing something so that it is stored in our long-term memory. Even then it can still be forgotten if we do not regularly think about it and go over it. *We remember what we think about*. Using your Knowledge Organiser outside of lessons helps you to remember things in the long-term.



Homework in Year 10-11

The purpose of homework

Homework plays a crucial role in reinforcing what you learn in the classroom, helping you to develop a deeper understanding of the material. It encourages independent learning, time management, and responsibility: skills that are essential for success both in school and in life.

Homework fosters a strong work ethic and a sense of discipline, preparing you for future academic and professional challenges. Homework is not just about completing tasks, it is about building lifelong learning habits. Learning is defined as a change in the long-term memory. You attend 5 hours of lessons per day, which is a lot of new information being taken in. Without additional opportunities to practise remembering, much of that information would be quickly forgotten.

Homework expectations

In Years 10-11 we expect every student to complete around 1 hour of homework a day, 5 days a week. English, Maths and Science will set around 1 per week each and the other GCSE subjects will be around 30 minutes each using the following timetable:

	Monday	Tuesday	Wednesday	Thursday	Friday
Subject 1	Science	Geog/History	Maths	Option Block F	Maths
Subject 2	English	Option Block E	English	Science	Option Block G

Maths and Science homework will be completed on Sparx. All other subjects may be a mixture of Seneca, Knowledge Organiser work and worksheets/tasks. Homework will be recorded on Class Charts to help students and parents keep track of what to do.

Year 11 Core Cycle 2

Knowledge Organiser Contents Page

Start with Week 1. Each week, complete the colour block. Write each word out 3 times and each definition once. Check it all with a purple pen. Tick what is correct, fix what is wrong. There are chapter summaries and extension tasks on the right to support your understanding of the text.

Coombeshead Academy *Inspiring Excellence* English Learning Area

wk	keyword	definition	example
Week 1	**Context**	The wider circumstances in which something exists.	The storyline has deeper meaning when it is considered in the context in which it was written.
	Fiction	A text that is based upon events that are not real.	The book she had chosen to read was from the fiction section.
	Foreshadowing	Where something is hinted at in a text before it happens.	The emphasis on Marley being dead at the start of the story foreshadows his importance later on.
	Allegory	A text that can be interpreted to reveal a hidden meaning, usually a political one.	Animal Farm is an allegory for the tyranny of the Russian Revolution.
	Pathetic Fallacy	Where the weather reflects the mood of the text.	Gothic stories usually have gloomy or spooky weather.
Week2	Redemption	The action of being saved from evil.	Marley begs Scrooge to redeem himself in life to avoid being punished in death.
	Isolation	Being away from people and refusing help.	**Scrooge has isolated himself.**
	Contrast	Qualities that are vastly different between characters.	Fred's generosity contrasts his uncle's selfishness.
	Poverty	State of extreme poorness	Bob Cratchit and his family live in poverty.

Week 1

Stave 1 summary: Marley's Ghost

The story opens on Christmas Eve in London. **Jacob Marley**, business partner of **Ebenezer Scrooge**, has been dead for seven years. Scrooge runs a moneylending business; he's cold-hearted and hates Christmas.
Scrooge rejects a request of charity from well-wishers, as well as an invitation from his nephew, **Fred**, to spend Christmas lunch with them. Scrooge's clerk, Bob Cratchit, is underpaid and is forced to work in the cold with only a tiny fire.

Scrooge returns to his dark, gloomy home. He sees Marley's face appear on his door knocker, and ghostly noises fill the house. Suddenly, **Marley's Ghost** appears, bound in heavy chains made of cashboxes and ledgers — symbols of his greed in life. Marley warns Scrooge that he will share the same miserable fate unless he changes. He tells Scrooge that three spirits will visit him over the next three nights to help him avoid his doom.
As Marley leaves, Scrooge is left terrified.

Week2

Stave 1 key quotations and themes:

1. Explode the quotation:

"Mankind was my business. The common welfare was my business".

(Marley to Scrooge)

2. Find 2 key quotations for each of these themes:
   - Greed and selfishness

	Greed	An intense and selfish desire for something.	Scrooge's greed for money has led to his isolation from society.			- Isolation - Redemption

Week 3	**Symbolism**	Where an image is used to represent something else.	**Scrooge's small fire at the start of the story symbolises his meanness.**		**Week 3**	**Stave 2 summary: The First of the Three Sprits**  **Scrooge wakes up at midnight, confused and anxious. When the clock strikes one, the Ghost of Christmas Past appears — a strange figure that looks both young and old at the same time, with light shining from its head.** **The ghost represents memory and reflection.** **The spirit takes Scrooge on a journey through scenes from his own past, including:** - **his own lonely childhood and his sister Fan, who makes comments about their father being 'kinder' now** - **Old Fezziwig (Scrooge's boss when he was a young man), who was famed for throwing generous Christmas parties** - **Belle, Scrooge's former fiancée, ending their engagement because of his obsession with money** - **Belle with the family she had after Scrooge- Scrooge realises this could have been his reality.** **Scrooge begs the spirit to stop and angrily tries to extinguish his light. He then falls asleep.**
	Charity	The voluntary giving of help to those in need.	Scrooge refuses to give charity, claiming that the poor should make use of the workhouses and prisons instead.			
	Regret	Feeling of sadness or disappointment over something.	Scrooge begins to regret the choices he has made over his lifetime.			
	Innocence	Being naïve to, or unaware of something.	Scrooge lost his innocence when he was forced to grow up young and became obsessed with money.			
	Reflection	The ability to look back on something and learn from it.	Scrooge begins to reflect upon the choices he made and what he should have done instead.			

Week 4	**Motif**	A recurring image throughout a text.	Fire/light is a motif in the novella because the amount of it relates to a character's generosity.		Week 4	**Stave 2 Key quotations and themes:** 1. **Explode the following quotation:** **"There was a boy singing a Christmas carol at my door last night. I should like to have given him something". (Scrooge as he begins to show empathy).** 2. **Find 2 key quotations for each of these themes:** - **Memory and regret** - **Loss of innocence** - **Power of generosity and love**
	Commentary	An expression of opinions about an event.	The novella can be considered a commentary on the consequences of not being charitable.			
	Imagery	The collective term for language that is not intended to be interpreted literally.	Dickens uses imagery when describing Marley's ghost to make him both recognisable and terrifying.			
	Empathy	The ability to understand and share the feelings of another.	Scrooge begins to feel empathy for those he previously disregarded.			
	Tone	The mood or atmosphere of something.	Scrooge's tone begins to shift as he reflects upon his behaviour.			

Week 5	**Commentary**	An expression of opinions about an event.	The novella can be considered a commentary on the consequences of not being charitable.		Week 5	**Stave 3 summary: The Second of the Three Spirits**  Scrooge awakes to find his room transformed with bright light, greenery, and food everywhere. The **Ghost of Christmas Present** appears. The ghost takes Scrooge through scenes showing how people across London celebrate Christmas with love and gratitude, even when they are poor. The scenes are: - Scrooge visits **Bob Cratchit's** home. Despite their poverty, the family are happy and loving. He meets **Tiny Tim**, Bob's youngest son, who is frail and sick but full of hope and kindness. Scrooge asks if Tiny Tim will live; the ghost sadly says that if nothing changes, "*the child will die.*" - The ghost shows miners, lighthouse keepers, and sailors all finding joy in Christmas, showing how **the Christmas spirit unites everyone**, no matter their situation. - They then visit Fred's Christmas party. Fred and his friends laugh about Scrooge's selfish behaviour but also express pity for him. Scrooge enjoys watching the fun and realises what he's missing by isolating himself. The ghost begins to age quickly. Beneath his robe, he reveals two starving, ragged children called **Ignorance** and **Want**. The ghost warns Scrooge to beware of them, especially *Ignorance*, who represents moral and social blindness. The spirit disappears as the clock strikes midnight, and Scrooge sees a dark, hooded figure approach — the **Ghost of Christmas Yet to Come.**
	Compassion	Showing pity and concern for the misfortunes of others.	Scrooge feels more compassion for the poor when he sees how they live.			
	Social Responsibility	The belief that all individual have a duty to fulfil; our actions must benefit society as a whole.	The ghosts help Scrooge to see how he has failed in his social responsibility.			
	Christmas Spirit	The feelings of joy, gratitude and generosity that are associated with Christmas.	Everyone in the story upholds the Christmas Spirit, except for Scrooge initially.			
	Ignorance	Having a lack of knowledge or information about something.	Scrooge is ignorant to the plight of those who have less than him- he believes they deserve to be poor because he has worked hard to become rich.			
Week 6	**Transformation**	A drastic change in something.	Scrooge undergoes a moral transformation.		Week 6	Stave 3 key quotations and themes: 1. Explode the following quotation: "Will Tiny Tim live?" (Scrooge showing his first bit of real concern)
	Pity	Feeling sorrow on behalf of someone else's misfortune.	Scrooge feels pity for the Cratchit family.			

	Characterisation	How a character has been crafted through description.	Tiny Tim has been characterised to present his inner goodness and innocence.			2. Find 2 key quotations for each of the following themes: - Generosity and compassion - Social Responsibility - Transformation
	Morality	The principles concerning behaviour that is right or wrong.	Scrooge's reflection enables him to see how his sense of morality has been warped up until now.			
	Inequality	Differences in circumstance and resources across people.	Scrooge begins to learn that inequality exists because of people like himself.			

Week 7	**Extended metaphor**	A metaphor that is introduced then further developed throughout the text.	The cold and foggy weather is used throughout the text to show Scrooge's unfeeling nature.		Week 7	**Stave 4 chapter summary: The Last of the Spirits** The **Ghost of Christmas Yet to Come appears. He looks like the Grim Reaper. The ghost doesn't speak; it only points. Scrooge, determined to change, follows it through several disturbing scenes:**  - Scrooge overhears some businessmen casually discussing someone's death — they only show interest in what the dead man's possessions might be worth. - In a dark part of London, Scrooge sees thieves and servants selling a dead man's stolen belongings. They mock the man and feel no guilt. Scrooge realises how hated this person must have been. - The spirit shows a corpse lying alone in bed, covered by a sheet. Scrooge cannot bring himself to lift the sheet and look at the face. He begins to fear the dead man might be himself. - Scrooge then sees the Cratchit family mourning the death of **Tiny Tim**. Bob Cratchit is grief-stricken, and the family supports one another lovingly. Scrooge is deeply moved and vows to change to prevent this tragedy. - Finally, the spirit takes Scrooge to a neglected grave in a lonely churchyard. The gravestone reads: **"EBENEZER SCROOGE."** Scrooge breaks down in despair, begging the ghost for mercy. He promises to change his ways. The ghost's hand trembles and then vanishes. Scrooge wakes up in his own bed — it's Christmas morning.
	Juxtaposition	Placing two opposing items/images together in a text to highlight the contrast between them.	Scrooge's thoughts and beliefs about Christmas juxtapose everyone else's.			
	Mortality	Being subject to death.	Scrooge is reminded of his own mortality, and how his death would be treated by others if he doesn't change.			
	Legacy	The long-lasting impact of someone's life.	Scrooge realises his legacy is one of bitterness and greed.			
	Fear	The feeling of being scared of something.	Scrooge's fear of his future is his motivator to change.			
Week 8	**Consequences**	Something that happens as a result of someone's choices.	Scrooge realises that his actions could have grave consequences for lots of people.		Week 8	**Stave 4 key quotations and themes:** 1. **Explode the following quotation:**

	Justice	The idea that people should be treated with consideration and fairness.	Scrooge realises that his treatment of others has been unjust.	
	Want	Have a desire to have or possess something.	Scrooge has always had a want for more wealth.	
	Christian Values	Moral principles based upon the teachings of Jesus.	Examples include: honesty, charity and compassion.	
	Dialogue	A language interaction between two or more participants.	The Ghost of Christmas yet to Come is given no dialogue.	
Week 9	**Reformed**	When someone's character now takes on a different form.	Scrooge was miserly and cold; he's now empathetic and compassionate. He has reformed.	
	Enlightened	A realisation that means you see things in a different way.	Scrooge is enlightened by the spirits; he realises that the poor deserve his help.	
	Supernatural	Something that cannot be explained through science or logic.	The presence of the ghost cannot be explained through science or logic.	
	Penitent	Feeling sorrow or regret for something you have done.	Scrooge is feeling penitent for what he was like previously.	
	Morally corrupt	A person who acts in a dishonest way, for their own gain.	Scrooge was morally corrupt at the start of the story.	

"I will honour Christmas in my heart, and try to keep it all the year".

2. **Find 2 key quotations for the following key themes:**
   - **Mortality and legacy**
   - **Fear as a motivator**
   - **Redemption**

Week 9

Stave 5 summary: The End of It

Scrooge wakes up on **Christmas morning** full of joy and relief — he has been given a second chance. Everything feels bright, warm, and full of possibility. He is transformed: generous, kind, and full of love for others.

- Scrooge immediately begins making amends. He buys a large turkey and anonymously sends it to the **Cratchit family**, surprising them and showing he genuinely cares.
- Scrooge goes to his nephew **Fred's** house, and for the first time, he joins in the Christmas celebrations with happiness and laughter. He enjoys being part of a family and reconnects with Fred.
- Scrooge becomes like a second father to **Tiny Tim**, supporting the family financially and emotionally. Tim survives and thrives thanks to Scrooge's kindness.
- From this day onward, Scrooge lives by the lessons he has learned. He embraces **compassion, generosity, and the**

						Christmas spirit. People notice his transformation, and he becomes respected and loved in the community.
Week 10	**Narrator**	The person recounting the events in a narrative.	The book has a third-person narrator.		Week 10	**Stave 5 key quotations and themes:** 1. **Explode the following quotation:** **'And so, as Tiny Tim observed, God bless Us, Every One!'** **(The last line of the story)** 2. **Find 2 key quotations for the following themes:** - **Redemption and transformation** - **Generosity and community** - **The Spirit of Christmas**
	Community	A group of people living in the same place, or having something in common.	Scrooge learns the importance of community.			
	Philanthropy	The act of seeking to promote the welfare of others.	The gentlemen who ask Scrooge for a donation to the poor practise philanthropy.			
	Social Divide	The differences in quality of life between those with money, and those without.	Scrooge's reformation helps to heal the social divide; he sees others as his equals.			
	Capitalism	A system in which resources are controlled by private owners for profit.	Scrooge held firm capitalist beliefs at the start of the story.			

Past paper questions to write essay plans/practise with:

1. How is Scrooge presented in *A Christmas Carol*?
2. How are the Cratchit family presented in *A Christmas Carol*?
3. How does Dickens explore the theme of redemption in *A Christmas Carol*?
4. How does Dickens criticize society in *A Christmas Carol*?
5. How does Dickens create atmosphere in *A Christmas Carol*?
6. How does Dickens use the supernatural to create intrigue and excitement in *A Christmas Carol*?

Practise your **SPaG**! by doing the following:

- Practise your **spellings**.
- Think of **synonyms** for words you use a lot.
- List all types of **punctuation** and know when to use them (EG: semi-colon; brackets; speech marks; colon; dash; etc…)
- Use **connectives** to link paragraphs.
- Use TiP ToP to **paragraph** correctly!

Relevant context to research and revise:

Social Responsibility: Dickens believed the wealthy had a duty to support the poor.

Victorian Poverty:

Christmas Traditions: Dickens helped to popularise modern Christmas traditions.

Personal Experience: Dickens' own tough upbringing helped to shape the commentary.

Morality and the Supernatural: Ghosts and the supernatural were often used to teach moral lessons in Victorian literature.

Year 11 Cycle 2 Geography Knowledge Organiser – UK Physical Landscapes - Rivers

Week 1 – Tuesday 9th December 2025

Lesson 1 – Drainage Basin

Key Terms:

Drainage Basin: The area which is drained by a river and its tributaries. Sometimes referred to as the catchment area.

Watershed: Higher ridge of land and the boundary between one drainage basin and another.

Drainage density: The total length of all the streams in the basin divided by the total area of the basin.

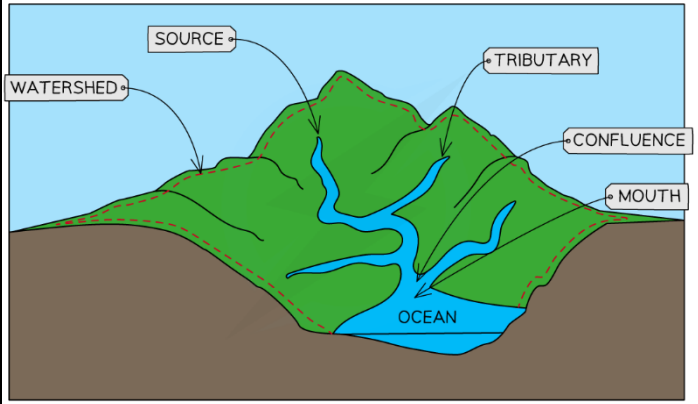
Content:

Source: Where a river begins.

Tributary: A smaller river flows that into a larger river.

Confluence: A place where two rivers meet.

Mouth: Where a river meets the sea.



Questions:

1. What is a drainage basin?
2. What is a watershed?
3. What is the drainage density?
4. Define the 4 key terms of a drainage basin

Lesson 2 – River Long Profile

Key Terms:

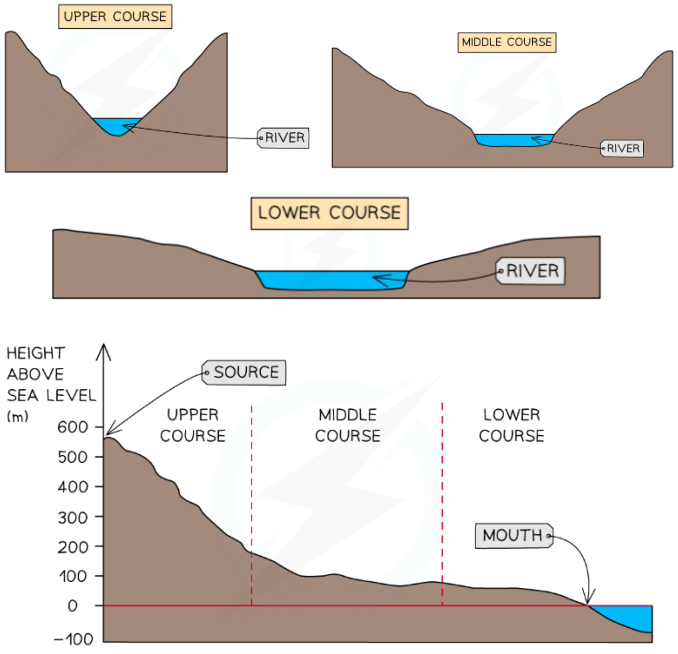
River profile: Shows changes in the height (altitude) of the course of a river from its source to its mouth.

Upper course: Shallow channel, steep valley sides and vertical (up and down) erosion.

Middle course: Deeper channel, gentle valley sides and lateral (side to side) erosion.

Lower course: Deep channel, flat floodplains and deposition dominant.

Content:



5. What is a river profile?
6. How many courses does a river have?
7. Draw a cross section for each of the different courses
8. Draw a long profile cross section of a river

Lesson 3 – River Processes

Key Terms:

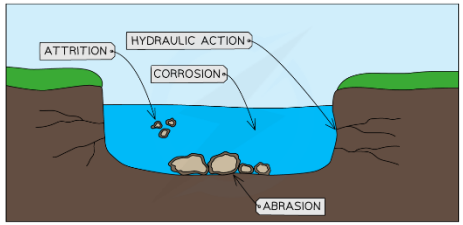
Erosion: Wearing away and removal of material by a force.

Transportation: The movement of material through the force of water.

Deposition: When a river does not have enough energy to carry its material and it drops it.

Bedload: Large material that is deposited by a river.

Content:



Hydraulic Action: Force of the water removes material from the bed and banks of the river.

Abrasion: Material carried in the river scrape the banks.

Attrition: Material being carried hits each other.

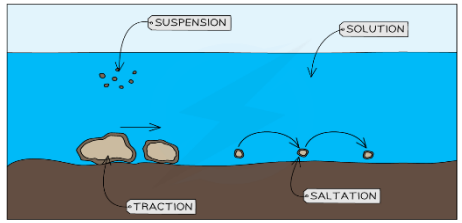
Corrosion: Material is dissolved by the slightly acidic water.

Traction: Large rocks are rolled along the river bed.

Saltation: Material bounces along the river bed.

Suspension: Material carried within the water flow.

Solution: Material is dissolved in the water.



9. Describe the 4 types of erosion
10. Describe the 4 types of transportation
11. What is deposition?
12. What is bedload?

Year 11 Cycle 2 Geography Knowledge Organiser – UK Physical Landscapes - Rivers

Week 2 – Tuesday 16th December 2025

Lesson 4 – V-Shape Valley and Interlocking spurs

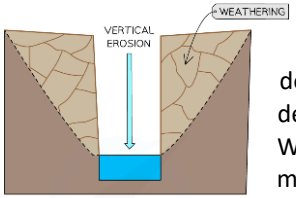
Key Terms:

Vertical erosion: The wearing away and deepening of the river bed.

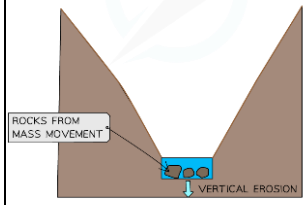
Weathering: The breaking down or dissolving of rock and minerals in situ (in place).

Mass movement: Downslope movement of materials, such as rock, soil, or mud due to gravity.

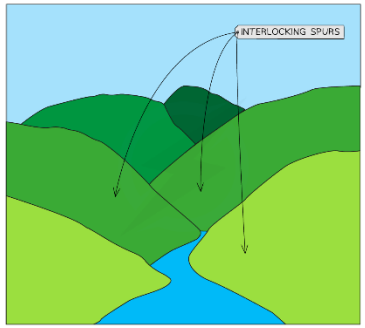
Content:



Vertical erosion is dominant in the upper course. This cuts down into the river bed and deepens the channel. Weathering and mass movement lead to material from the valley sides collapsing, leaving a steep ***V-shaped valley***.



When a river is not powerful enough to cut though hard rock so flows around it, forming ***interlocking spurs.***



Questions:

1. What is vertical erosion?
2. How are V-shaped valleys formed?
3. Draw a diagram of a V-shaped valley
4. How are interlocking spurs formed?

Lesson 5 – Waterfall and gorge

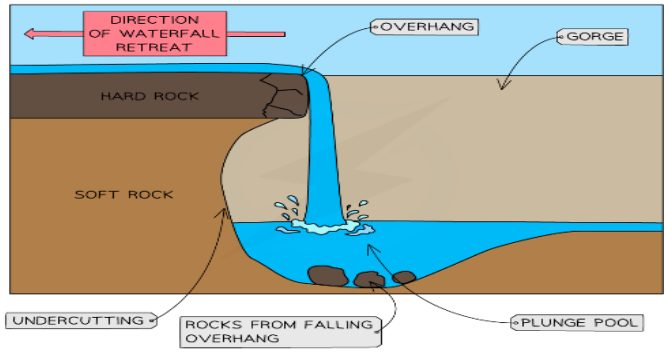
Key Terms:

Plunge pool: A deep hole created by erosion at the base of a waterfall.

Gorge: Narrow valley with steep sides created when a waterfall retreats backwards up the river channel.

Content:

- The soft rock erodes (hydraulic action and abrasion) quicker, undercutting the hard rock and creating a plunge pool.
- This leads to the development of an overhang of hard rock which eventually over time, collapses.
- The overhang falls into the plunge pool increasing abrasion and making the plunge pool deeper.
- The process then begins again and the waterfall retreats upstream leaving a steep sided gorge.

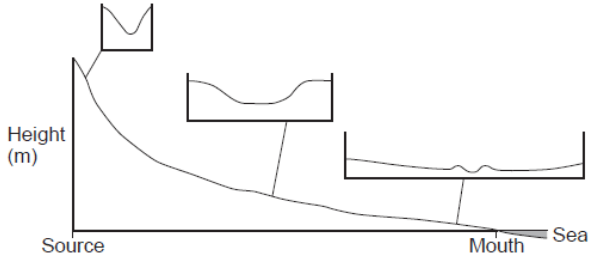


5. How are waterfalls formed?
6. Draw a diagram of a waterfall
7. What are the two types of erosion that create waterfalls?
8. What is a gorge?

Seneca and Exam Question Practice

SENECA **AQA Geography: 3.3.1, 3.3.3 & 3.3.4**

1. Using the figure below, describe how the cross profile of the river valley changes downstream (2 marks)



2. Identify the landform shown in the figure below (1 mark)

Year 11 Cycle 2 Geography Knowledge Organiser – UK Physical Landscapes - Rivers

Week 3 – Tuesday 6th January 2026

Lesson 6 – Meanders

Key Terms:

Lateral erosion: Erosion on the sides/banks of a river.

Thalweg: Line of fastest flow of water or the deepest water along a river course.

Content:

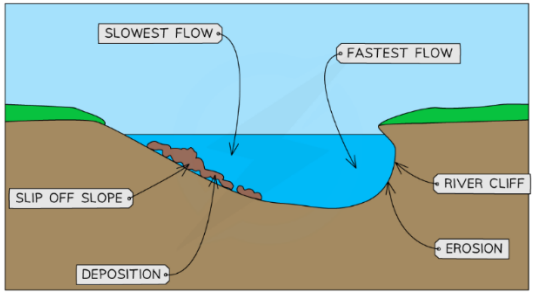
The fastest water flow is on the outside of the river bends, leading to erosion:

- The erosion (hydraulic action and abrasion) undercuts the riverbank forming a river cliff
- The riverbank collapses and the edge of the meander moves further out

The slowest flow is on the inside of the river bends, leading to deposition:

- The deposits form a slip-off slope

Deposition on one side and erosion on the other leads to the meander migrating across the valley



Questions:

1. What is lateral erosion?
2. What two types of erosion happen on a meander?
3. Explain the formation of a meander
4. Draw a cross section of a meander

Lesson 7 – Oxbow Lake

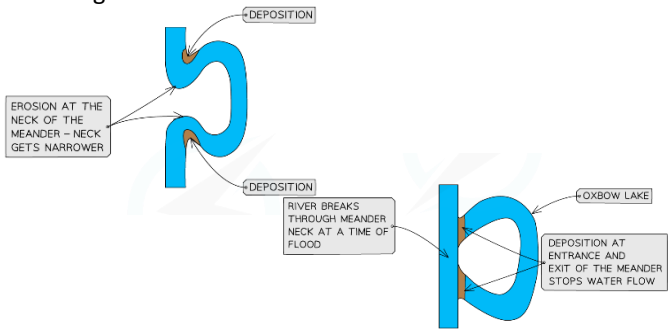
Key Terms:

Oxbow Lake: A meander that has become separated from the main channel.

Deposition: When a river drops the material it was carrying due to a decrease in velocity (speed) of the water.

Content:

- With distance downstream the size of the meanders increases
- The erosion on outside bends can eventually lead to the formation of a meander neck
- At a time of the flood, the river may cut through the neck of the meander forming a straighter course for the water
- The flow of water at entry and exit from the meander will be slower, leading to deposition
- The meander becomes cut off from the main river channel, forming an oxbow lake



5. What is an oxbow lake?
6. What is deposition?
7. Explain the formation of an oxbow lake
8. Draw a diagram of an oxbow lake

Lesson 8 – Floodplain and Levees

Key Terms:

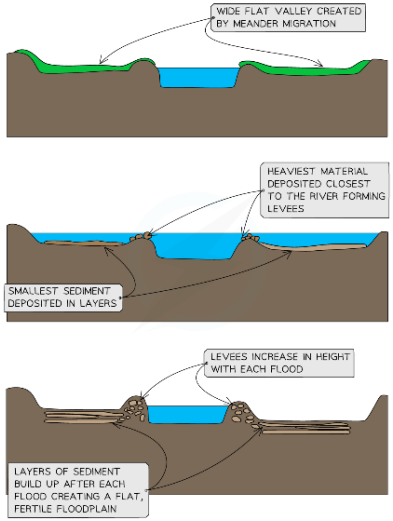
Floodplain: Flat expanses of land on either side of a river.

Levee: Natural embankments along the sides of a river.

Discharge: The volume of water which flows through a certain point in a given time. Usually measured in cubic meters per second.

Content:

- The migration of meanders leads to the formation of the floodplain
- High discharge may cause the river to overflow the banks
- More of the water is in contact with the land surface as the water spreads across the floodplain
- Increased friction reduces velocity and material is deposited across the floodplain gradually increasing the floodplain height
- The heaviest material is deposited first nearest to the river channel forming natural embankments called levees



9. What is a floodplain?
10. Explain the formation of a floodplain
11. What is a levee?
12. Draw a diagram of a levee

Year 11 Cycle 2 Geography Knowledge Organiser – UK Physical Landscapes - Rivers

Week 4 – Tuesday 13th January 2026

Lesson 9 – Estuaries

Key Terms:
Estuaries: An area where a freshwater river or stream meets the ocean.

Content:
- Large deposits of sediment form mudflats and salt marshes
- These are the result of the interaction between the river and tides:
  - Incoming tides bring in sediment which mixes with the sediment being carried by the river
  - When the incoming tide of salt water meets the freshwater of the river, the river velocity drops and deposition occurs
  - The deposited sediment builds up in layers to form mudflats which rise above the water surface, particularly at low tide
  - Eventually the vegetation starts to grow on the mudflats and form salt marshes

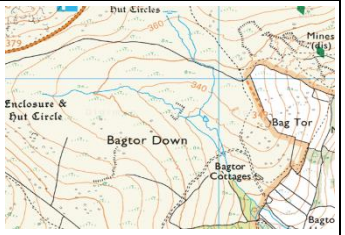
Questions:
1. What is an estuary?
2. What causes deposition to occur?
3. What do the deposited layers create?
4. what is formed when vegetation grows on a mudflat?

Lesson 10 – River landforms mapwork

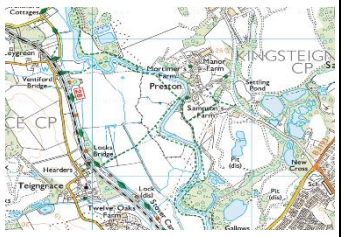
Key Terms:
OS Map: A detailed map produced by the British map-making organisation – Ordnance Survey.

Grid References: Map references indicating a location using vertical and horizontal lines identified by numbers.

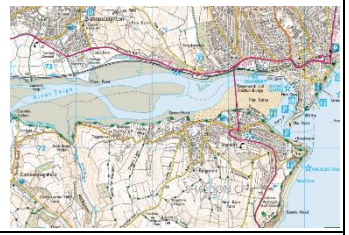
Content:
Upper course on an OS Map: Upland area and contour lines close together to show the steep valley sides. Narrow blue line to show a narrow river channel.



Middle course on an OS Map: Contour lines become further spread out to show the floodplains and blue channel becomes wider and meanders (bends/curves).



Lower course on an OS Map: Very wide channel and can show an estuary/mudflat (brown area within the channel). River enters the sea (mouth).



Questions:
5. What is an OS map?
6. What does the upper course look like on an OS map?
7. What does the middle course look like on an OS map?
8. What does the lower course look like on an OS map?

Seneca and Exam Question Practice

SENECA **AQA Geography: 3.3.5, 3.3.6 & 3.3.7**

1. Explain how a meander may be formed by both erosion and deposition. Use **one or more** diagrams to support your answer (4 marks)

2. Using the figure below, describe **two** characteristics of an estuary (2 marks)

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Year 11 Cycle 2 Geography Knowledge Organiser – UK Physical Landscapes - Rivers

Week 5 – Tuesday 20th January 2026

Lesson 11 – River Tees

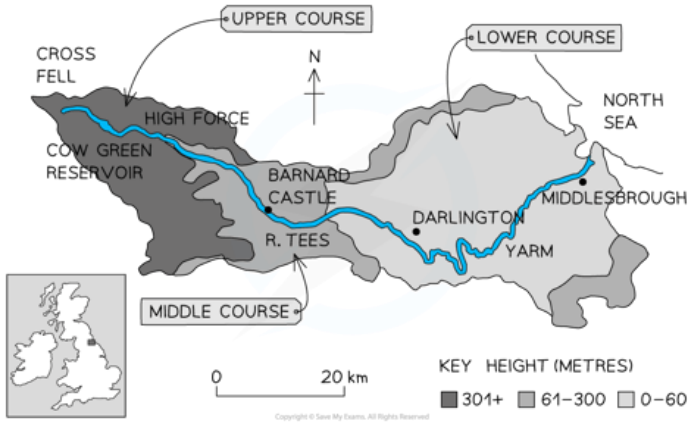
Key Terms:

River Tees: Located in north-east England. It is 85 miles from source to mouth. It flows eastwards from the source in the Pennines to the mouth where it flows into the North Sea.

Content:

Features along the River Tees:

- High Force Waterfall (UK's largest waterfall) and a steep sided gorge.
- Meander at Darlington.
- Meander, oxbow lake, floodplain and levees around Yarm.
- Large estuary and mudflats that supports wildlife.



Questions:

1. Where is the River Tees?
2. What is the name of the waterfall?
3. What can be found at Yarm?
4. What is the estuary like?

Lesson 12 – Flood Hydrographs

Key Terms:

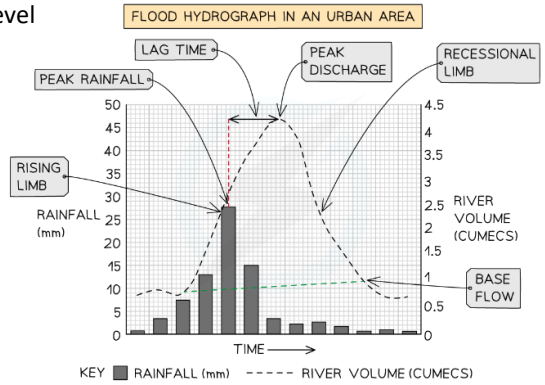
Flood hydrograph: A graph that shows how a drainage basin responds to a period of rainfall.

Discharge: The volume of water which flows through a certain point in a given time. Usually measured in cubic meters per second.

Content:

Features of a flood hydrograph:

- **Base flow:** Normal level of the river
- **Peak rainfall:** Highest rainfall level
- **Rising limb:** Increase in river discharge
- **Peak discharge:** Highest level of river discharge
- **Lag time:** Time difference between peak rainfall and peak discharge
- **Recessional limb or falling limb:** River discharge falling to normal level



5. What is a flood hydrograph?
6. What is the peak rainfall and peak discharge?
7. How is the lag time calculated?
8. Draw a sketch of a flood hydrograph

Lesson 13 – Factors affecting flood hydrographs

Key Terms:

Surface runoff: The flow of water across the surface when the land is unable to absorb it.

Impermeable: A surface that does not allow water to pass through it, therefore stays on the top.

Content:

Physical factors that affect flood hydrographs:

- **Relief:** Steep slopes encourage a rapid transfer of water towards river channels.
- **Precipitation:** Torrential rainstorms or prolonged rainfall can lead to sudden flash floods as rivers cannot contain the volume of water.
- **Geology:** Impermeable rocks encourage water to flow overland and into rivers.

Human factors that affect flood hydrographs:

- **Urbanisation:** Building on floodplains creates impermeable surfaces, such as tarmac and increases surface runoff.
- **Deforestation:** Less interception from trees means more water hits the ground and surface runoff increases.
- **Agriculture:** Soil left unused and exposed can lead to an increase in surface runoff. Rain can also flow quickly along the ploughed furrows (narrow trenches).

9. What is surface runoff?
10. What is impermeable?
11. Describe 3 physical factors that affect hydrographs
12. Describe 3 human factors that affect hydrographs

Year 11 Cycle 2 Geography Knowledge Organiser – UK Physical Landscapes - Rivers

Week 6 – Tuesday 27th January 2026

Lesson 14 – Flood protection – hard engineering

Key Terms:

Flood risk: The predicted frequency of floods in an area.

Hard engineering: Involves the building of entirely artificial structures to reduce or stop the impact of river processes.

Content:

Dam and reservoir: A barrier (made on earth, concrete or stone) built across a valley to interrupt river flow and create a man-made lake (reservoir) which stores water and controls the discharge of the river.

Embankments: Raised banks constructed along the river; they effectively make the river deeper so it can hold more water. They are expensive and do not look natural but they do protect the land around them.

Flood Relief channels: Building new artificial channel which are used when a river is close to maximum discharge. They take the pressure off the main channels when floods are likely, therefore reducing flood risk

Channel straightening: Removing meanders from a river to make the river straighter. Straightening the river (also called channelising) allows it to carry more water quickly downstream, so it doesn't build up and is less likely to flood.

Questions:

1. How does dams and reservoirs reduce flood risk?
2. How do embankments reduce flood risk?
3. How does flood relief channels reduce flood risk?
4. How does channel straightening reduce flood risk?

Lesson 15 – Flood protection – soft engineering

Key Terms:

Soft engineering: Involves managing a river using natural materials and mimicking natural processes to protect more vulnerable areas.

Afforestation: The process of planting large numbers of trees on land which has few or no trees on it.

Content:

Flood plain zoning: Restricts different land uses to certain locations on the flood plain. Areas close to the river are kept clear of high value land uses such as housing.

Flood warning: Rivers are monitored by satellites and computers so flood risk can be predicted. Areas at risk are warned so preparation can take place. For example, flood gates, sand bags and moving valuable items.

Afforestation: Planting trees can intercept rainfall, slowing the transfer of water to river channels reducing the risk of flooding. It also creates habitats and increases biodiversity.

River restoration: This is where previously a course of a river has been changed artificially is returned to its original course. It uses natural processes and features (meanders, vegetation and wetlands) so slow down river flow and reduce the likelihood of flooding downstream.

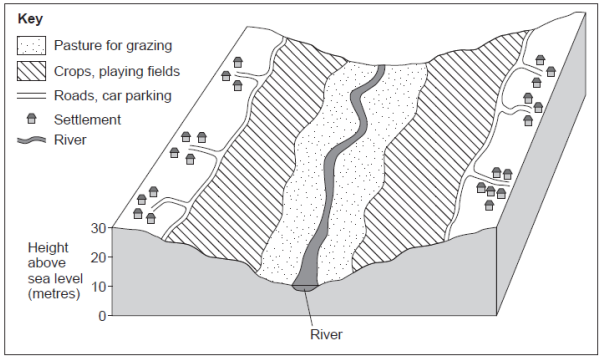
5. How does flood plain zoning reduce flood risk?
6. How do flood warnings reduce flood risk?
7. How does afforestation reduce flood risk?
8. How does river restoration reduce flood risk?

Seneca and Exam Question Practice

SENECA **AQA Geography: 3.3.2, 3.3.9 & 3.3.10**

1. Explain how physical factors can affect flood risk (4 marks)

2. Using the figure, explain how soft engineering strategies can help to reduce the impact of river flooding (4 marks)



Year 11 Cycle 2 Geography Knowledge Organiser – UK Physical Landscapes - Rivers

Week 7 – Tuesday 3rd February 2026		
Lesson 16 – Harbertonford flood protection	**Lesson 17 – River fieldwork**	**Lesson 18 – River fieldwork techniques**
Key Terms: **Harbertonford:** A village on the A381 near Totnes set on the River Harbourne - a tributary of the Dart. It has flooded 21 times in 60 years. **Channelisation:** A method of river engineering that widens or deepens rivers to increase the capacity for flow volume at specific sections of the river.	**Key Terms:** **Geographical investigation:** The use of enquiry skills to formulate a hypothesis and then collect data to test the hypothesis. **Hypothesis:** A testable statement about the relationship between two or more variables. **Sampling:** Taking a predetermined number of observations from a larger population.	**Key Terms:** **Primary data:** Data you collect yourself (or in groups) in the field. **Cross-sectional area:** The length between the edge of one bank to the other.
Content: **Why does Harbertonford need flood protection?** • Properties built on low-lying flood plain. • Main road increases surface runoff. • Confluence of 3 rivers. • Narrow valley (descending 300m in 12km). **How is the flood risk reduced in Harbertonford?** • The Palmer Dam used to control the flow of the river. • Riverbed was lowered to increase capacity. • 200m wall has been created to protect residential area from overtopping. • 1km upstream a wildlife area created containing flood-resistant trees and shrubs. **Is it a success?** • Scheme cost £2.6 million, • Wildlife is doing well. • Residents are protected. • Residents downstream are experiencing fast river flows.	**Content:** **Potential hypothesis:** • The long profile of a river becomes gentler as you move downstream • Channel width increased with distance along the long profile • Velocity increases along the long profile of a river • Discharge increases along the long profile of a river • Channel depth increases with distance along the long profile of a river • Bedload becomes smaller and more rounded along the long profile of a river **Potential risks:** Slippy or uneven surfaces, deep or fast flowing water, cold water **Sampling:** Systematic sampling – sampling sites at equal intervals downstream – will help remove bias in site selection, whilst ensuring that your data best illustrates any changes downstream. Access can be an issue and some sites may be moved.	**Content:** There are several ways to collect fieldwork data. This should be done several times along the river profile. **Gradient:** Clinometer to measure the gradient. **Velocity:** Flow meter to measure the speed of the water. **Width:** Use a tape measure to measure the river from edge to edge across the surface of the channel. **Discharge:** Measure the cross-sectional area of a river using a tape measure and multiply it be the velocity. **Depth:** Measure the depth of the river at 3 points in the middle and calculate the average. **Bedload:** Measure the long-axis of 10 pieces of bedload and identify their shape using Power's Roundness Index.
Questions: 1. Where is Harbertonford? 2. Why did Harbertonford need flood protection? 3. How is the flood risk reduced in Harbertonford? 4. Has the flood protection been successful?	5. Give 4 potential hypotheses for river fieldwork 6. What are the potential risks with river fieldwork? 7. What is sampling? 8. What sampling is used for river fieldwork and why?	9. What is primary data? 10. How can gradient, velocity and width data be collected? 11. What is a cross-sectional area? 12. How can discharge, depth and bedload data be collected?

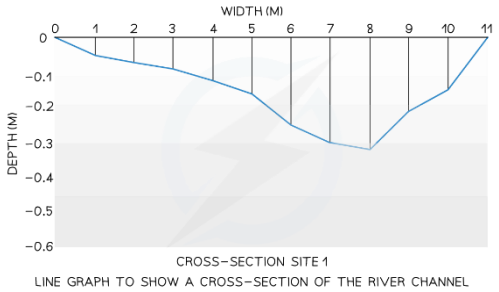
Year 11 Cycle 2 Geography Knowledge Organiser – UK Physical Landscapes - Rivers

Week 8 – Tuesday 10th February 2026

Lesson 19 – River data presentation

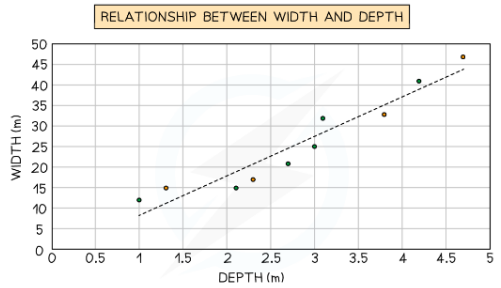
Key Terms:
Data presentation: A visual way to look and the data and make interpretations.

Content:
Line graphs: To show river cross sections of a river channel



LINE GRAPH TO SHOW A CROSS–SECTION OF THE RIVER CHANNEL

Scatter graphs: Shows the relationships between different factors.



SCATTERGRAPH TO SHOW THE RELATIONSHIP BETWEEN WIDTH AND DEPTH ON A RIVER LONG PROFILE

Questions:
1. What is data presentation?
2. What can line graphs show?
3. Draw a sketch of a line graph showing a cross section
4. What can a scatter graph show?

Lesson 20 – River data analysis

Key Terms:
Analysis: The act of studying something in detail to understand more about it.

Central tendency: A single value that attempts to describe a set of data by identifying the central position within that set of data.

Interquartile range (IQR): A measure of how spread out the data is from the mid-point.

Content:
Measures of central tendency:
Mean: Calculated by adding up all the values and dividing by the number of values in the data set.

Median: The middle value of the data set once the numbers are arranged in rank order.

Mode: The value which occurs most frequently in a set of data.

Measure of dispersion:
Range: The spread of data around the average. Calculated by subtracting the largest value from the smallest value.

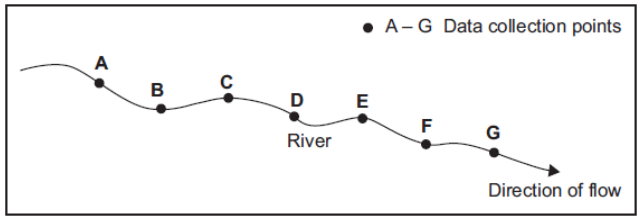
Quartiles and inter-quartile ranges (IQR)
1. Rank the data and calculate the overall median.
2. Calculate the median for the set of numbers below (LQ) and above (UQ) the overall median.
3. Calculate the Interquartile Range (IQR) by calculating the difference between the UQ and LQ.

5. What does central tendency mean?
6. Describe the 3 measures of central tendency
7. What is interquartile range?
8. How do you calculate quartiles and inter-quartile range?

Exam Question Practice

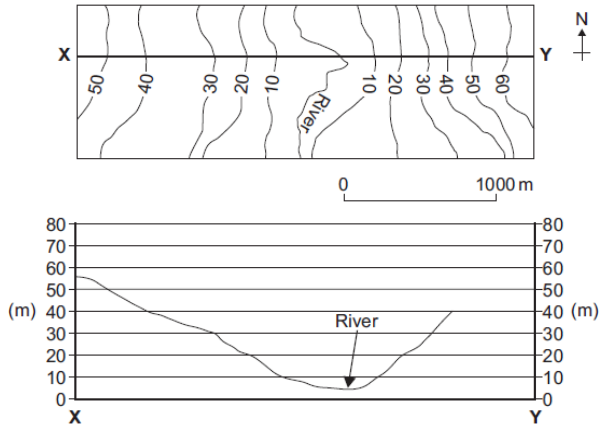
1. Name the sampling method using in the figure below (1 mark)

2. Suggest why the type of sampling shown in the figure is not always possible in a fieldwork enquiry (2 marks)



3. Complete the cross section from **X-Y** on the figure (1 mark)

4. Describe the slope of the land from point **X** to the river (1 mark)



Buckland Abbey (Monastery) Knowledge Organiser

1	Who founded Buckland Abbey in 1273?	Amicia, Countess of Devon
2	What order of monks were at Buckland Abbey?	Cistercian
3	What was a 'lay brother'?	A monk who mostly did manual labour rather than mostly religious duties
4	Which end of a church is most holy?	East End – it faces Jerusalem
5	In what shape were churches built in medieval times?	A cross (Cruciform)
6	Name 5 buildings that existed in the monastic era.	The abbey, the Great Barn, an infirmary, dormitories, Cloisters, north and south transepts
7	What is the Rule of St Benedict?	Collection of religious texts read by the Choir monks
8	What would have been produced on site as a Monastery?	Beer, bread, agricultural produce, wool.
9	What feature dominated the abbey building?	The crossing tower
10	Name 2 reasons the monks picked such an isolated place in Dartmoor to build an abbey.	To avoid distractions (better for religious reflection). Good water supply. Building materials.
11	Why might an artist's modern day reconstruction of what Buckland looked like as a monastery not be accurate?	Lack of sources and lots of changes made over the years (particularly by Richard Grenville).
12	How might an artist overcome the problem of not knowing what Buckland used to look like?	There are some remains of the original monastery. Comparison to other monasteries like Fountains Abbey.
13	What are the architectural features of the monastic buildings?	Buttresses, slit windows, bar tracery (stonework that supports glass in a stained glass windows), arched windows, made of stone.
14	What is a bar tracery?	Stonework that supports glass in a stained glass window

Key Terms

Abbot	a man who is the head of an abbey of monks
Abbey	the building or buildings occupied by a community of monks or nuns, also known as a monastery
Dormitories	the building in which the monks sleep
Chapter House	the building where monks hold meetings and where a chapter of the Rule of St Benedict would be read to them every morning
Buttress	a structure of stone or brick built against a wall to strengthen or support it.

Buckland Abbey (Tudor Home) Knowledge Organiser

1	Which King dissolved the monasteries by 1539?	Henry VIII
2	Who bought Buckland from Henry VIII?	Richard Grenville the Elder
3	Why did Henry Break from Rome? (To leave the Catholic church and create the Church of England)	To get a divorce from Catherine of Aragon and to gain the wealth of England's monasteries.
4	In what decade does Richard Grenville (the grandson) make alterations?	1570s
5	What kind of changes did Richard Grenville the Grandson make?	Removed North and South transepts; demolished cloisters and dormitories; Created a second floor in the Nave; Changed the Chancel into a service wing for servants + kitchen.
6	Why did Grenville make the changes?	Changed the building to take away its Catholic roots. Complex and solid build of the abbey meant to was too difficult and costly to change much.
7	What did MOST Tudor gentlemen do when buying an old monastery?	Demolish it and build a new home from scratch.
8	What other general features of Buckland show that it was a Tudor manor?	Rectangle/square windows (a design popular in the Tudor era. These did not exist in the monastic era.
9	How can we prove that the Grenville family had the fireplaces built in Drake's Chamber?	They have the family device or logo on them.
10	Who did Grenville sell Buckland to in 1580?	Sir Francis Drake
11	When the Drakes took over Buckland, did they invest heavily in it between 1590-1740?	No because their main property became Nutwell Lodge in Exeter from 1699 onwards and Buckland became a second home, visited irregularly.

Key Terms

Break From Rome	When Henry VIII broke away from the Catholic Faith and replaced the Pope as the Head of the Church in England. This occurred in 1533-4 and he dissolved the Catholic monasteries in England by 1539.
Tudor Era	A period in History with Tudor monarchs (like Henry VIII and Elizabeth I)
Catholic	A Christian who follows the Catholic faith and who follows the words of the Pope
Protestant	A Christian who does not follow the words of the Pope. They are 'protesting' against Catholicism.
Dissolution	The process of closing (dissolving) the monasteries in England. It happened from 1536. Buckland was

Buckland Abbey (Agricultural Revolution) Knowledge Organiser

1	Name two ways that the Agricultural Revolution made farming more productive	Enclosure meant more food could be grown. New machinery like the Seed Drill. Selective breeding to improve the quality of sheep, cows, pigs.
2	Which agricultural reformer visited Buckland in the late 18th century (late 1700s)?	William Marshall
3	How was the Great Barn amended?	3 new doors added, allowing carts to be driven the whole length of the barn.
4	Who owned Buckland when changes were made during this era?	Lord Francis Augustus Heathfield
5	Which extra buildings were built during this time?	The Ox Sheds and The Linhay
6	What animal was used to plough the fields?	Oxen
7	A diary was kept by Marshall, telling us about daily life. How many days per week did agricultural labourers work?	6
8	Did just men work at Buckland?	No – oxen and children too.
9	Name different tradesmen named in Marshall's diary	Mason, wheelwright, blacksmith, miller, cooper, harness-maker and a Mole Catcher.
10	Name types of crops grown at Buckland	Wheat, barley, oats, turnips, potatoes, cabbages, peas, dairy produce, honey and cider.
11	What did the owner of Buckland do with the wealth generated by improved farming?	Built the impressive wooden Georgian staircase.
12	Did the Drake's live Permanently at Buckland Abbey?	No, they were based at Nutwell Lodge near Exeter
13	What did the area which is now the Education Centre used to be	The Milking yard for dairy cows.

Key Terms

Agricultural Revolution	a period of technological improvement and increased crop productivity that occurred during the 18th and early 19th centuries in England and Europe
Linhay	A type of farm building found in Devon and Somerset. It has two storeys – the hay loft at the top and bottom storey is for keeping cattle in during winter. The hay at the top acted as insulation for the cows to keep warm
An estate (noun)	an extensive area of land in the country, usually with a large house, owned by one person or family
Georgian period	The **Georgian era** is a period in British history from 1714 to c. 1830–37, named after the kings George I, George II, George III and George IV.

Buckland Abbey (National Trust) Knowledge Organiser

1	Which resident of Buckland does the National Trust celebrate the most?	Sir Francis Drake
2	Name ways in which Drake is commemorated	There is a sundial to commemorate 400th anniversary of his death. A Drake statue in the Lifetimes gallery. Drake's Drum on display. Paintings and artefacts. Stag horns in kitchen.
3	What have the Ox Sheds been converted into?	Shops, galleries, toilets, video presentation room..
4	Name some changes the National Trust has made to make it attractive for tourists	Access made easier (e.g. for wheelchair users); Information signs ; Restaurants, toilets to ensure people are relaxed; opportunity to spend money (e.g. Gift Shop)
5	What has been done to attract children to Buckland?	The upstairs of the main house is modelled as a ship with entertainment for children, like being able to dress up. Ice cream!
6	What is the Linhay now used for?	To display agricultural machinery such as different types of ploughs
7	What is the Great Barn used for now?	It has a Victorian Cider Press (simply because it is interesting to tourists) and sometimes art exhibitions
8	What is the Guest House now used for?	The building tourists walk into to pay for entry/present their membership card of the National Trust. Another part of the Guest House is the gift shop. The Restaurant/Café.
9	What is the significance of Education Room?	Provides a base for visiting schools – shows the National Trust care about education

Key Terms

National Trust	**UK conservation charity, protecting historic places and green spaces**
English Heritage	Another charity, founded by the government to preserve historic sites.

Buckland Abbey (Compared with Fountains Abbey) Knowledge Organiser

1	What was Fountains Abbey built from?	Sandstone
2	Was the abbey bigger or smaller than Buckland?	Bigger
3	How many people worked at Fountains when the abbey was at the height of its wealth?	200
4	What ornamentation was there on Fountains Abbey?	The Green Man (like a gargoyle) and carving of the Abbot's face.
5	How were choir monks and laybrothers kept separate in terms of the abbey buildings at Fountains?	Stairs and dormitories were separate
6	Name additional buildings at Fountains Abbey other than the abbey	Dormitories, Refectory, library, Chapter House, Kitchen
7	Name three ways Fountains abbey is DIFFERENT to Buckland Abbey	Had a library and separate place for lay brothers The burial ground at Fountains Abbey is much more understood – as there are gravestones which mark the burials of 19 Abbots The cloisters are on the south side of the monastery (like nearly all monasteries) whereas Buckland was on the North (due to draining issues).
8	Fountains Abbey was dissolved in 1539 like Buckland was. In the 1600s ,Stephen Proctor decided to make a Tudor Home on the site. Did he convert the abbey or use the stone from the Abbey ruins to build a new house?	Used the stone from the ruins to build a new house.
9	When was Fountains Abbey at its wealthiest?	1200s
10	Why did Fountains Abbey face financial troubles in the 1300s?	It experienced sheep disease. The Black Death killed many of its inhabitants. Famine in Scotland meant Scots came from the north to steal from Fountains Abbey

Key Terms

Fountains Abbey	The ruins of an Abbey in North Yorkshire

Crime and punishment Knowledge Organiser. 1 Medieval period, c.500-c.1500.

Causes and Nature of Crime

Causes of crime during this period:

POVERTY

- Regular outbreaks of famine and disease caused pressure (e.g. Black Death of the 1340s)
- Government policies of taxation (e.g. Poll Tax 1370s) made people poorer
- Regular warfare had an impact as well – destroyed communites and because of increased taxation needed to fight the wars

ROYAL and CHURCH control

- Led to protests in the period

AGRICULTURAL community

- Access to farming materials may have been the cause of the high violent crime rate

Saxon period, c.500-1066

- Crimes against the person, e.g. assault / murder
- Crimes against property, e.g. theft
- Crimes against authority, e.g. treason
- Moral crimes (links to Church / religion), e.g. drunkenness, adultery, etc.

Normans, 1066 - c.1200, continuity and change.

- William generally retained Edward the Confessor's laws
  Reason for continuity: stressed continuity and that William was Edward's legitimate successor

Later Medieval, c.1200 – c.1500, continuity and change.

- **Challenges to authority becamse common e.g. Peasants' Revolt 1381 – this was a change as people had been less likely to protest earler in this period**
- Heresy Laws introduced from 1382 to deal with challenges to Church beliefs
  Reason for change: increasing challenges to the Church in England (Lollards) and over Europe
- Increased focus on treason
- Theft was the main crime (73.5% or all crimes) followed by Murder (18.2% of all crimes)

Policing and Law enforcement

Policing – community based:

Saxon period, c.500– 1066.

- Feedal system helped to keep control
- Hue and cry – witnesses / whole village expected to chase suspect; fines if failed to do so: no organised police force
- Tithings – all males over 12 in a group of 10 – responsible for each other's behaviour
- Hundremen- in charge of the hundred (10 tithings)- more serious crime

Normans, 1066 - c.1200, continuity

- No change after Norman Conquest (1066)
  Reason for continuity: system cheap and reasonably effective.

Later Medieval, c.1200 – c.1500, continuity and change

- 1285, Parish Constable introduced
  Reason for change: to organise hue and cry and link with county Sheriff for more important crimes / crimes outside village boundaries
- Watchman introduced - night-time patrols
  Reason for change: more organised efforts at policing
- Tithings fade out by the 1400s
  Reason for change: looser feudal ties of peasants after Black Death (1348/50)
- 1326, Justices of the Peace first appointed to look after the law in their local area

Punishment and attitudes

Saxon period, c.1000 – 1066.

- *Based on deterrence and retribution*
- *Public and corporal (physical)*
- Fines
- Corporal punishment - stocks, pillory, whipping, maiming
- Capital punishment – hanging
- Retribution – severity of punishment matched crime (treason – death; repeat offences maiming, etc.)
- Deterrent – painful / humiliating public punishment in front of community (linked to cost and lack of policing)
- NOT prison

Normans, 1066 - c.1200, continuity and change.

- Increase in crimes punishable by death or mutilation
- Reason for change: Norman harshness and need for deterrent as a small minority
- Retribution and deterrent overwhelmingly main purposes

Later Medieval, c.1200 – c.1500, continuity and change.

- 1305, introduction of 'hung, drawn and quartered' punishment for treason
  Reason for change: retribution / deterrent - hideous punishment to stress enormity of crime

Key considerations

Saxon period, c.500 – 1066.

Society:

- Agricultural: vast majority lived in small villages.
- Society was rural and community based
- Massive importance of community in policing, trials and public punishment.
- Growth of towns during Middle Ages (c.1200 onwards) reduced effectiveness of community.
- Importance of Church / religion in all areas of life (and death)

Institutions – government

- Saxons – slow growth of royal power.
- Normans, 1066 - . increased harshness of laws and punishments, e.g. brutality (Harrying of the North); Forest Laws; Murdrum Law; castles, etc. Particularly linked to deterrence as Normans a tiny minority of c.7000 among 2m Saxons.
- Later Middle Ages: Norman / Saxon divisions faded; development of government institutions seen in courts / coroners, etc.

Institutions – Church / religion

- Christian religion massively influential in all areas of life and crime, etc.
- **Society:** profound belief in God; massive wealth and influence of Church; tension between Church and government
- **Crimes:** Religious influence on moral crimes e.g. drunkenness, adultery, failure to attend church; Heresy – crimes against Church beliefs especially after 1382.
- **Policing:** Sanctuary linked to concept of mercy. Certain holy places left the criminal immune from arrest: had 40 days to decide whether to stand trial or go into exile.

Individuals

- William the Conqueror 1066 – Norman laws, harshness, personal love of hunting.

Attitudes

- Importance of religion

Science and technology

- Domination by religion

Crime and punishment Knowledge Organiser. 2 Early Modern period, c.1500-c.1700.

Causes and Nature of Crime

For the most part, crimes stayed the same

- Theft was still a common crime at 75% of all crime and many convicted of violent crimes (15% of all convictions)

Key causes of crime

Rise in population from 2.9m(1500) to 4.5m (1600) – led poverty and thus to vagrancy
Inflation (rising prices) – led to poverty and thus vagrancy
Bad harvests – rise in the price of food
Monasteries closed by Henry VII from 1530s onwards – monasteries had looked after the poor
Religious changes – during the 1500s there were a number of changes in religion. For example, Mary I was Catholic (1553-8) and her sister Elizabeth I was Protestant (1558-1603). This led to heresy as the main religion in the country changed under each ruler and people found themselves following the 'wrong' religion.

New crimes

- **Heresy:** even more important in the context of the religious Reformation.
  Used by Henry VIII, e.g. Anne Askew. Particularly used by Mary (1553-1558) – 283 Protestants burned

Not significant after c.1560.

- **Treason:** linked to sense to threat to the state from religious and other opponents.
  Used by Elizabeth (1558-1603) against Catholic priests and Catholic plotters. Elizabeth used Spies and
  Used by James I (1603-1625) against 1605 Gunpowder Plotters.
- **Vagrancy – vagrants were beggars who roamed the country tying to find food and work.** Linked to social and religious developments. Social problems – rich / poor divide; rising population, unemployment, homeless in search of work,
- 1495 Vagabonds and Beggars Act; 1547 Vagrancy Act; 1597 Act for Relief of the Poor; 1602 Poor Law Act

Rise of smuggling / poaching begins in the late 1600s, 1671 Game Act. See next sheet.

Policing and Law enforcement

Generally as before:

- Community-based, unpaid.
- Villages – hue and cry.
- Town Constables and Town Watch.

Developments:

Justices of the Peace (JP)- role grows

- JP (aka magistrates) - role grows in looking after local policing. Oversees local parish constables.
- 1601 has to monitor and control beggers and vagrants (after 1601 Poor Law)
- Workload of JP grew considerably

Charleys

- Voluntary watchman no longer effective in London, so 1663 Charles II introduced Charleys- paid watchmen.
- Low pay and object of ridicule**, <u>but the first law offices that were paid by public money</u>**

- Community based policing still strong, but effectiveness of community-based methods starts to decline, esp. in the growing number of larger towns. People anonymous / lesser sense of close community.

- Professional 'thief-takers' e.g. Jonathan Wild.

Punishment and attitudes

Generally as before:

- Fines
- Corporal punishment - stocks, pillory, whipping, maiming
- Capital punishment – hanging (in public)
- Bridewell / House of Correction (including hard labour) for vagabonds.
- Purpose: Linked to concepts of deterrence, retribution, removal and, to an extent, reform / rehabilitation (chance to create new life). Also helped England to populate and secure colonies.
- NOT prison

Heresy punichment e.g under Queen Mary (1553-8)

- Nearly 300 protestants burnt at the stake
- 130 executions of Cathcolics under Queen Elizabeth (1558-1603)

Purpose of punishment:

- Retribution – severity of punishment matched crime (treason – hanged, drawn and quartered; repeat offences maiming, etc.).
- Deterrent – painful / humiliating public punishment (linked to cost and lack of policing).
- Removal – return to parish, Houses of Correction, transportation
- Reform / rehabilitation – to an extent in Houses of Correction and transportation

Key considerations

Society:

- Still mainly agricultural with tight local communities.
- Growth of towns continued.
- Growing division between rich and poor.
- Religious change, division and instability of Reformation had an effect over whole period.
- Political instability and division due to the Civil Wars (1642-1651/60) had impact.

Institutions – government

- Led the implementation of religious change under Henry VIII, Edward VI, Elizabeth and James I. Strongly opposed by Queen Mary.
- Close links between the government and the established Church of England. Gunpowder Plot an attack on both.
- Use of treason laws to deal with opponents.

Institutions – Church / religion

- Change and instability in Reformation causing Catholic / Protestant division had effect over whole period.
- Use of heresy laws (to c.1558) to deal with opponents.
- Links to attitudes to vagrants.
- Gunpowder Plot links religion to attack on government.

Attitudes

- Still dominated by harsh concepts such as retribution and deterrent and humiliating public punishment.
  .
- Increasing social tension caused by growth in gap between rich and poor.
  - Hostility of vagabonds.

Science and technology

- Increasing influence of science (e.g. Royal Society, 1662)

Crime and punishment Knowledge Organiser : 3. Industrial period, c.1700 – c.1900. Part 1: extended 18th century, c.1700 to c.1820.

Causes and Nature of Crime

Causes of crime:

- Huge population increase 16m 1800 to 42m in 1900
- High taxation because of increased warfare in this period
- Increase in customs and exise duties (led to smuggling) e.g. 70% of the cost of Tea was taxation
- Societal and economic changes during the Industrial Revolution (see next page) led to a growth in social and political protest between 1790-1850 e.g. Peterloo Massacre 1819, Chartist Movement 1829-48

Generally crime was as before:

- Treason – still most serious crime.

New crimes:

Smuggling:

- Generally luxury goods, e.g. tea, wine, spirits, silk which government important duties made very expensive. Import duties main source of government income.
- Thousands of smugglers and some violent organised gangs (Hawkhurst Gang).
- Seen as 'social crime' with cross-class participation.
- Hard for government to combat due to ineffective customs force, long coast-line, support / alibis for smugglers.
- Decreased after William Pitt (1780s) and Robert Peel, etc. reduced import duties.

Highway robbery:

- Rise in late 17th/C18th: most common in this period: linked to increased wealth and solitary travel, ineffective banking, availability of horses and guns, poverty; demobilised soldiers.
- Image: dashing gentlemen who robbed rich (e.g. Dick Turpin): but poor main victims.
- Fall in early C19th: stagecoaches often with armed guards; increase in travel; growth of towns; controls on inns; mounted patrols around London; effective banking.

Crimes associated with urbanisation

- As Britain became more urban there was a growth of crimes such as pickpocketing

Policing and Law enforcement

Initially as before:

- Community-based, unpaid.
- Villages – hue and cry.
- Town Constables and Town Watch. Some towns paid these people but many were unpaid and ineffective.

Developments:

- Continued decline in the effectiveness of community-based methods due to growth of towns and cities.
- Bow Street Runners, 1748 – early 1800s.
  Henry and John Fielding's small London-based Bow Street police force.
  Sought to deter by increased likelihood of detection. Collected and shared evidence.
  After 1785 Runners paid by government.
  Similar methods used by other forces in the London / Middlesex area.
- Attitudes towards a professional police force: many people saw police as expensive and a dangerous government intrusion in people's freedoms.
- 1829, creation of Metropolitan Police, see below.

Punishment and attitudes

Initially as before:

- Fines; corporal punishment - stocks, pillory, whipping, maiming; capital punishment – hanging (see Bloody Code, below); Transportation to America until c.1776, later Australia; Houses of Correction, etc. - NOT prison initially.

Developments:

Transportation to America, c.1620-1776:

- See reasons for transportation, above.
- Old punishment but increasingly an alternative to death.
- After American Independence, 1776, new location needed.

Transportation to Australia, 1787-1868:

- Transportation old punishment but increasingly used as alternative to death. 160,000 transported (1/6 women).
- Purpose: Initially a strong deterrent due to separation from homeland, use of hulks, long / dangerous voyage and hard / primitive conditions in Australia. Also a more humane alternative to death; removal of criminals; population of new colonies; elements of rehabilitation through new chance.
- Sentences usually 7/14 years: convicts earned 'ticket of leave'.
- Decline – see below.

Prisons:

- Historically prison used pre-trial / pre- execution, for debtors and vagabonds (Houses of Correction).
- Rise in use in C.18th as less harsh alternative to death in era of Bloody Code.
- Early conditions: crowded mixed cells – violence / abuse and 'schools for crime'; corrupt gaolers; rich paid for better food / conditions.
- **Developments to 1820s:**
  John Howard's 1770s investigations and writings (*State of Prisons, 1777*) regarding conditions, corruption; emphasis on rehabilitation.
  Elizabeth Fry: Quaker; work with women and children prisoners; emphasis on Christian teaching, humane treatment and conditions, useful work, etc.
  Both Howard and Fry believed that prisoners were reformable.
- For impact of reformers and developments after c.1820- see below.

Purpose of punishment:

- Retribution: severity of punishment partly matched crime. Although 225 capital crimes under Bloody Code, most sentences were commuted unless major crime.
- Deterrent: harsh / painful / humiliating public punishment but Bloody Code arguably ineffective. Transportation / early prison conditions very unpleasant.
- Removal: transportation; increasing use of prisons
- Reform / rehabilitation: to an extent in transportation and, to an increasing extend in prisons through influence of Howard and Fry.

Key considerations

Society:

- Initially mainly agricultural. Increasingly urban as Industrial Revolution began to have an impact.
- England generally politically and religiously stable but division between rich landowning elite and poor.
- Ruling class fear of threat of crime. Strong efforts by to protect their lives and property, e.g. Bloody Code.
- After 1789 increasing political fears due to threat of repeat of the French Revolution (1789 -) in England.
- After end of French / Napoleonic Wars (1792-1815) economic depression and fears of political revolution intensify into early 1820s.

Institutions – government

- Government generally low income (mainly customs duties) and ineffective: main focus – fighting wars.
- Government explicitly linked to landowning ruling classes: only c.7% of men have the vote.
- Government / parliament passed laws to protect their property, e.g. Bloody Code generally, poaching.
- Government low involvement (e.g. absence of prisons, policing, etc.). Government involvement much greater from 1820s onwards, see below.

Institutions – Church / religion

- Decline in importance though Church still influential.
- Strong Christian motivation of reformers such as Howard and Fry.

Individuals

- Prisons – John Howard and Elizabeth Fry – but real influence felt after c.1820 (e.g. Gaols Act, 1823).
- Policing – John / Henry Fielding and Bow Street Runners but small-scale.

Attitudes

- Class divisions strong. Ruling classes passed laws to protect their property. Mass of population saw many laws as 'social crimes' and ignored them.
- Still dominated by harsh concepts such as retribution and deterrent and humiliating public punishment.
- Some evidence of tenderness, e.g. under Bloody Code victims, witnesses, juries, etc. wouldn't push case and death sentences increasingly commuted to prison / transportation, etc.
- Evidence of reform / rehabilitation ideas through Christian-influenced reformers, e.g. Howard and Fry.
- Low involvement by government or public:
  Prisons uncontrolled and conditions terrible.
  Few effective police forces except around London (Bow Street Runners).

Science and technology

- Some evidence of influence of science and technology, e.g. in transport, banking, trade, etc.

Crime and punishment Knowledge Organiser : 3. Industrial period, c.1700 – c.1900. Part 2: shorter 19th century, c.1820-1900.

Causes and Nature of Crime

Crimes generally.

- As above.

Changes:

Political challenge to the ruling classes, e.g. Peterloo Massacre 1819, Chartist Movement 1829-48 and the Tolpuddle Martyrs, 1834:

- Linked to social / economic and political divisions between rich and poor. ; poverty and unemployment after French / Napoleonic Wars (1792-1815); desire of rich to safeguard their property.
- Political: ruling elite fear of repeat of French Revolution (1789-) in Britain; ruling classes desire to exclude workers from political involvement. Desire of working classes to have a political voice when only 8% of men had vote.
- Events: Rebecca Riots 1839-42 – farmers angry about rent increases and road tolls disguised themselves as women and attacked the tollgates and workhouses

Policing and Law enforcement

Policing developments after c.1820:

- Metropolitan Police Act, 1829.
  Robert Peel, Home Secretary, persuaded parliament it was necessary: rising crime, controls on police powers, fear of radical protestors.
- Characteristics / equipment
  Initially a small force wearing non-military blue uniform.
  Limited equipment including whistle and truncheon.
  Decentralised – each town / county had own force – this stressed it wasn't central government control.
  Initially some public opinion hostile.
- Developments:
  1842 – first detectives.
  1856 – towns / counties had to have police force.
  1869 first National Crime Records.
  1878 CID detectives created.
  Use of fingerprinting and telegraph communication.

Punishment and attitudes

Transportation to Australia, from c.1840s-1868:

- **Decline:** hostility in Australia due to links to crime and demeaning nature; cost: c.£500,000 a year; improved conditions / 1851 Gold Rush made Australia desirable location.

Prisons – developments after c.1820.

- Influence of Howard / Fry (see above) on government especially Robert Peel (Home Secretary in 1820s) leading to Gaols Act, 1823.
- **Gaols Act, 1823.** Work of Robert Peel influenced by Howard and Fry. Improved prison conditions; paid warders; separated types of criminal; Christian instruction; visits by Prison Inspectors. (But only applied to 130 biggest prisons and sometimes ignored.)
- **Pentonville Prison, 1842: Separate System, c.1842-1860s/70s.**
  - Separate System prison – model for 90 others built 1842-77.
  - Purpose:
    Reasons for change:
    Generally: belief that criminals reformable but also desire to deter; e.g. to put reform ideas into effect but in a tough way, e.g. teaching, useful work and sanitary conditions with solitary confinement.
    Deterrent – loss of liberty; solitary confinement, etc.
    Reform / rehabilitation through Christian teaching and opportunity for reflection; useful work – learning skills; healthy / sanitary conditions; separation from negative influences.
    Influenced by reformers (Howard / Fry) regarding conditions, Christian teaching and useful work but Fry criticised the total separation.
  - Conditions:
    Each prisoner had own cell including hammock, toilet and basin, often loom. Kept separate from other prisoners at all times – masks worn in exercise yard / chapel. Some prisoners went mad due to separation.
- **Silent System, c.1860s-1902/1922.**
  - Conditions:
    Total silence at all times; 'Hard board, hard labour, hard fare'. Strict conditions, dull / monotonous food and useless monotonous work, e.g. crank and treadmill.
  - Purpose:
    Reasons for change:
    Cost of Separate System; fears of crime – influence of press, garrotting scares in 1860s; growth of beliefs in separate - less evolved –criminal class which could not be reformed / rehabilitated only deterred from crime; influence of Sir Edmund du Cane, Assistant Director of Prisons in late 19thC.
    Deterrent – loss of liberty; harsh conditions, meaningless work.

Key considerations

Society:

- Full impact of industrialisation creating a mainly urban / industrial society – factories, mines, etc. Great increase in wealth over this period.
- Initially deep social division between rich and poor: always evident but less divisive towards 1900.
- Improvement of working class experience over the period, especially after 1850s (Mid-Victorian economic boom):
  - Increased wages – better living conditions.
  - Better working conditions.
  - Improved education, especially after 1870.
  - Increased political rights- many urban workers gained right to vote, 1867 / 1884.

Institutions – government

- Initially sought to protect ruling class interests (e.g. Tolpuddle Martyrs).
- Increasing role in society based on:
  - Increased government revenue (government has more money to spend) due to increased national wealth and more taxation, e.g. income tax.
  - Development of moral conscience – govt want to help improve conditions / experience, e.g. prison conditions, working-class education.
  - Political necessity: after 1867 working classes were c.50% of voters – their demands had to be responded to.
- Evidence of increasing role:
  - Prisons: Gaols Act, 1823 and subsequent laws, etc.
  - Metropolitan Police Act, 1829 and subsequent laws, etc.
  - Laws regarding limiting death penalty.

Institutions – Church / religion

- Humanitarian / moral influence of Christianity influences, for example, prison conditions and death penalty limits.

Individuals

- Continuing influence of Christian-inspired reformers such as Howard and Fry.
- Massive influence of Robert Peel:
  - Home Secretary and Prime Minister during period 1822-1846. Very effective at persuading government / parliament of need for reform.
  - Influenced by Christian reformers.
  - Impact on prisons (Gaols Act) and policing, etc.

Attitudes – see also above.

- Influence of Christianity on reformers, etc. (on prisons, death penalty).
- Initial belief that criminals reformable / could be rehabilitated but later (1860s-) belief in unreformable less evolved criminal class.
- Acceptance of greater role for government; government greater wealth to afford to be involved (e.g. in prison building, creation of police force).
- Increasing belief that government must be involved to improve conditions of the working classes.
- Concept of 'social crimes' continued regarding poaching and smuggling.

Science and technology

- Industrialisation creating national wealth. Impact on transport, etc.

Crime and punishment Knowledge Organiser : 4. Twentieth century to the present, c.1900 – present.

Causes and Nature of Crime

Causes:

- Development of a more multicultural society following mass immigration to the UK post World War II (1945 onwards) – led to more race related crime
- Rise in mass-car ownership / use; number of accidents
- Development of computers – led to new ways to commit fraud
- Less respect for authority from the 1950s onwards- led to football hooliganism and violent crime

Race

- Race Relations Act, 1968 made it illegal to refuse work / housing, etc. on racial grounds; Criminal Justice Act, 2005 stated that racial hatred made another crime worse; Racial and Religious Hatred Act added crime of spreading hatred.
- Context: mass non-white immigration post-WWII, e.g. West Indians, Pakistanis, etc. Mass European, etc. immigration since 2000; asylum seekers from Afghanistan, Middle East, etc.
- Reasons for change: context, above; hope for tolerant multi-cultural society; more liberal social attitudes.

Driving offences – speeding / drunk driving:

- In past considered a 'social crime' and ignored / laughed at.
- Post-1967 limits on alcohol in blood plus government campaigns against drunk driving; old speeding laws much more vigorously enforced.
- 1983 seatbelts compulsory, 2003 mobile phone use in cars banned

Hooliganism and violent crime

- Happened before 20th Century but not serious (1885 Preston-Aston match – riot)
- Peaked in 1970s/1980s - organised gangs e.g. British and Itlaian fans fought at Heysel Stadium Belgium 1985
- Died down because Special Police Force set up dedicated to dealing with hooliganism, fans segregated during and before matches, grounds have seating, CCTV

Drugs:

- In past legal but relatively little used; made illegal 1971 Misuse of Drugs Act.
- Reasons for change: increased use in 1960s; harder / more dangerous drugs such as LSD, etc.
- Modern debate about freedom to take drugs which don't harm others.

Modern versions of old crimes:

- Terrorism: existed in past (e.g. Gunpowder Plot, 1605). In modern times linked to IRA (Irish Republican Army) in 1970s and 80s and to Al-Qaeda, 'Islamic State' in 2000s / 2010s.
- **People-trafficking:** in past 'white slave trade' lured girls into prostitution. 21stC gangs can control immigrant girls in same way.
- **Cybercrime: use of internet, etc. technology in crime:**
  Fraud – pretending to be another to get bank details / money, etc. Existed in past, now on-line.
  Copyright theft – stealing rights of artist / writer. In past included photocopying, etc. now downloads, etc.
  Extortion – using threats / blackmail to make victim pay. Now often refers to online images / data.

Terrorism

- Increased threat (though earlier examples include 1605 Gunpowder Plot).
- Initial threat in the 20th Century – IRA, 1960s onwards e.g. 1996 bombing of Arndale Centre on Manchester, 200 people injured. Good Friday Agreement (political agreement about N Ireland's future) led to descrease in IRA terrorism.
- More recently terrorism linked to Islamist extremism e.g. 7/7 attack -Al Qaeda

Policing and Law enforcement

Developments in policing:

Organisation:

- Now a small number of large police forces.

Role of women:

- First WPCs in 1920s

Training:

- 1947, Police Training College.

Equipment / transport:

- Police bicycles, 1909
- Police cars, 1920s/30s
- Two-way radio, 1930s
- 999 introduced

Technological support:

- Fingerprint Branch, 1901.
- National Fingerprint System.
- Blood types discovered, 1901.
- Progress in forensic science
- First police computers, 1960s
- Breathalysers, speed cameras
- Police National Computer, 1980 with 25 million records
- First DNA conviction, 1988
- Automatic fingerprint Identification, 1995
- National DNA database
- CCTV / mass surveillance video
- Biometric screening

Specialist units:

- Fraud Squad
- Specialist drugs units
- Dog handling units
- Special Branch

Crime Prevention:

- 1980s- Neighbourhood Watch
- Similarities - old community-based policing
- Differences – not compulsory; not a national system; only a help to professional police

Punishment and attitudes

PRISON developments:

From the Silent System to more humane prisons:

- 1902 Hard labour (crank / treadmill) ended.
- 1922 End of Silent System; abolition of solitary confinement; visits allowed; end of convict crop / arrow uniforms, etc. (Alexander Patterson.)
- 1933 Open Prisons, e.g. New Hall, Wakefield. Rehabilitation - to prepare prisoners for normal life after prison.
- 1967 Parole – good behaviour led to reduced sentence.
- Category A – D prisons – D being 'open prison' and used for non violent offenders
- Reasons for change: return of reform / rehabilitation ideas especially through influence, 1922-47, of Prisons Commissioner Alexander Patterson; sympathetic liberal ideas that there was not a 'criminal type' but that difficult individual experiences (at home / community) could negatively affect individuals.

Alternatives to prison:

- 1907 Probation Officers
- 1967 Suspended Sentences abd Parole introduced
- 1972 Community Service Orders
- 1990s / 2000s Electronic tagging; drug and alcohol treatment programmes; ASBOs; restorative justice.
- Reasons: cost of prison; belief that prison could have a negative impact on inmates which might make a life of crime more likely; also see above.

Treatment of young offenders:

- C19th young offenders kept in normal prisons.
- 1902 first Borstal
- Borstals – 1902- 1982, reform schools for juvenile offenders),
- 1982 Youth Custody Centres replaced Borstals
- Reasons for changes: focus on rehabilitation; avoid negative impact of prison; view that many young offenders victims of negative domestic and social influences; young needed help not punishment; care for drug abusers, etc.

DEATH PENALTY developments:

- In 1900 death penalty available for 4 crimes.
- 1908 / 1933 hanging of under 16s/18s ended.
- Miscarriages of justice / controversial executions: 1950 Timothy Evans; 1953 Derek Bentley; 1956 Ruth Ellis.
- 1957 Homicide Act restrictions
- 1965 Murder Act + 1969 Amendment ends use of death penalty; 1998 final abolition.
- *Reasons for change:* influence of government – changes to the law; changing public opinion linked to Miscarriages of justice / controversial executions

Purpose of punishment:

- Reform / rehabilitation increasingly seen by government / liberal public opinion as most important purpose. Deterrent still important especially to press and much of public.

Key considerations

Society:

- Mass immigration from 1940s onwards.
- Toleration especially during / after WWII; 1960s; early 21stC.

Institutions – government:

- Changes to laws including on crimes; prisons, alternatives to prison, young offenders; death penalty; etc.

Institutions – Church / religion:

- Continued moral / humanitarian influence of Church, e.g. opposition to death penalty.
- Decline in influence of Christian religion seen in changes to 'moral' crimes such as homosexuality and abortion.

Individuals

Attitudes:

- Influence of liberal / humanitarian beliefs on definition of crimes, use of prisons / treatment of prisoners and on punishment.
- Particular influence of tolerant / liberal / humanitarian influences in 1960s linked to eliminating traditional (often Christian religion-based) prejudices and restrictions on behaviour. Also evident in early 21stC regarding race, religion, sexuality, etc.
- Changing attitudes towards race (racial toleration) leading to changes in 'crimes'.
- Desire to combat intolerance: racism and religious hate crimes; homophobia.
- Concepts of 'social crimes'
  Continuity: small-scale smuggling and poaching. Change: attitudes to drunk driving, speeding.

Science and technology:

- Links to old crimes being committed in new ways, especially online but also terrorism
- Developments in police equipment, databases, forensic science, etc.
- Developments in alternatives to prison, e.g. electronic tagging, etc.

Normans Knowledge Organiser

Norman Conquest (Anglo-Saxon England) Knowledge Organiser

List three features that made England strong in 1065	It was divided into shires which made it easier to administer. The currency was well-respected and this encouraged trade and taxation. Burhs were fortified towns - good for defence.
Name the types of people in Anglo-Saxon England	King; Earls; Thegns; Ceorls; Thralls
What was the Wergild?	If someone was killed, the person responsible would have to pay the person's worth eg. a Ceorl was worth 160 shillings, a thrall was worth nothing.
What was life like for women in Anglo-Saxon England?	In some ways good (e.g. a woman's wergild was the same as a man's). But for thralls it was not good (e.g. Gangs of men would buy women thralls, rape them and sell them on.)
What were the main influences on Anglo-Saxon religion?	Roman Catholic Church and Celtic traditions from Ireland (which meant different forms of worship and art).
In what ways did the English not follow the Church's rules?	Some villages didn't have a church – they worshipped around a stone cross. There was a belief in local English Saints. Too much eating, drinking and sex.
List 3 ways St Dunstan reformed the English Church?	Ended corruption among Church leaders; Improving education of monks, nuns and priests; rebuilding churches, abbeys and monasteries.
What famous jewel could show the Anglo-Saxon to be a 'golden' era?	The Alfred Jewel
What was the purpose of the burhs?	They were protected towns that people could go to during Viking raids
Who was the corrupt Archbishop of Canterbury in England?	Stigand

Key Terms

Earl	King's chief advisers. There were 6 in 1065. Harold Godwinson was the most powerful
Thegn	These were wealthy landowners. There were around 5,000. They ran local courts and collected taxes.
Ceorls	Most people in England were Ceorls. Most lived on Thegns' land and farmed
Thrall	Slaves. 10% of the population were Thralls
Witan	Group of Earls and Bishops that were advisers and decided who should king when one died.

Norman Conquest (How/Why William became King) Knowledge Organiser

Why were the Normans effective warriors?	They had private armies supplied with armour and weapons; used horses (cavalry).
How did William take control of Normandy in 1047?	He persuaded the King of the Franks to help him crush a rebellion, he was brutal towards the rebels and married Matilda of Flanders (Flanders was a powerful neighbouring country)
Who was King of England at the start of 1066?	Edward the Confessor
Name the claimants to the throne in 1066	Harold Godwinson; Harald Hardrada; William of Normandy; Edgar Aetheling
In what ways was William prepared to win the Battle of Hastings?	Had cavalry, the Saxons did not Assembled a fleet of over 700 ships Took over two months to assemble his invasion fleet William's knights had spent years training to fight from horseback
In what ways was William a good leader during the Battle of Hastings?	William used the trick of fake retreats (feints) William fought the Battle of Hastings from horseback, Harold was on foot Towards the end of the battle William ordered his archers to change the angle they were shooting their arrows at
In what ways was William lucky to win the Battle of Hastings?	Some of Harold's troops left the shield wall at the Battle of Hastings Harold's army had to first defeat the Vikings in the north of England Harold's army had to do two very long marches with battles at the end of each Many of Harold's army at Hastings were from the fyrd (inexperienced soldiers) Harold was killed at a crucial point in the Battle of Hastings
How did the Normans break the English shield wall?	A group of Norman soldiers turned from the battle and ran down the hill. Some English soldiers chased after them.

Key Terms

Stamford Bridge	The battle between the Anglo-Saxons (Godwinson) and the Vikings (Hardrada). The Anglo-Saxons won.
Fyrd	This is the untrained men in Godwinson's army who were called up to fight when needed.
Cavalry	The soldiers on horses.
Normandy	The place in Northern France that William and his army came from.

Norman Conquest (How did William control England) Knowledge Organiser

Why did William take key English nobles (Edwin and Morcar) to Normandy?	As hostages to discourage the English from rebelling.
Which city was destroyed by Edric the Wild?	Hereford
How did William get the city of Exeter to promise to be loyal to him?	He asked the people to swear an oath of loyalty to him. After they refused, William had a hostage's eyes gouged out, then attacked the city for 18 days. Exeter surrendered and in return for their loyalty, William promised to show them mercy. He also built castles like at Totnes.
What kind of reasons did people in England have for resisting the Norman rule?	Anger over loss of land; Damaged pride at being defeated and ruled by a foreigner; anger at having to pay greater taxes.
What was the Harrying of the North?	In 1070, William ordered for an attack on Northern England (the least likely to be loyal to him because of their Viking roots). Crops, animals and food were destroyed. As many as 100,000 died of starvation.
Why did William confiscate treasure from monasteries?	To pay for the cost of putting down rebellions. Also a method of control (that wasn't too brutal). He did this at the same time as reforming the church, for example, English churchmen were largely replaced by Normans.
Why did King Svein (of Denmark) decide to leave England?	There were not enough Danes to take England. After a hard winter, they were tired and hungry. William told them to go, so King Svein left with treasures from Ely and Peterborough.
How did William capture the island of Ely from Hereward the Wake?	Gathered an army. Sent ships and boats to block supplies. Built a causeway (a bridge). Bribed some monks to lead them to the island.

Key Terms

Gytha	Harold Godwinson's mother. She led the rebellion in Exeter
Coronation	The ceremony where the king or queen is crowned.
Harrying	To carry out attacks
Differ	Be different – as in 'how far do these interpretations differ?' (Are they different or similar?)
Rebellion	An act of armed resistance against a government or a leader.

Norman Conquest (Castles) Knowledge Organiser

What was a 'ringwork'?	A castle without a motte. They had earth enclosures
Name some key features of Norman castles	Motte, Bailey, Ramparts (earth banks), Palisade (Wooden fence at the top of the ramparts), Moat, Gatehouse, Tower.
How many castles had William built by 1071?	35
How many castles were there by 1086 (when William died)?	Around 500 – mostly built by Norman lords.
Why did Normans build castles?	To control surrounding land. As a status symbol – to project an image of power. They were also used as an administrative centre for a local area.
What is the traditional interpretation of castles?	They were built for military purposes
What is the revisionist interpretation of castles?	The structures were weak so they were more about status
What is the recent interpretation of castles?	Castles were for controlling the local population. Heavily defended sites containing garrisons of Norman cavalry
Provide a military purpose that castles were built for?	To provide a defended area for Normans in in control of rebellious areas. To provide a base for Normans so if a rebellion broke out in the local area, there were Normans nearby to deal with it.
What were the fortified sites that Anglo-Saxon thegns had built prior to Normans building castles?	Burh-Geats

Key Terms

Interpretation	A view of something in History. In this case a written or pictorial view of the Norman era
Rampart	Earth banks which could be several metres high.
Motte	The hill in the bailey that the tower sat on. Good for defence.
Bailey	An enclosure inside the ramparts.
Burh-geat	Small defended sites used in Anglo-Saxon England

Norman Conquest (Impact of the Normans) Knowledge Organiser

What is Domesday Book?	It's actually 2 volumes that record every piece of land and every item of property in the country.
Why did William order Domesday Book to be made?	William knew how much tax to charge individuals in England. He needed money to pay for defence against invasion. Some historians think it was a way of legally proving the land in England had been taken by the Normans – therefore making William the undisputed ruler.
How many circuits (regions) were there? How many commissioners (people who collected the information for Domesday Book) in each?	7 circuits, 4 commissioners in each.
What percentage of land was owned by English landowners in 1086?	2% (William had given the rest of England to those who fought alongside him or funded William's invasion of England)
How did William prevent his nobles becoming a threat to him?	By spreading their land out. William's cousin, Alan Rufus, owned land in 12 different shires.
What was the Murdrum fine?	If a Norman was murdered, the local community had to pay an enormous fine until the murderer was found.
What was the main language after the Conquest?	Latin for writing. French for the ruling class. English for the lower (English!) class. This highlighted the difference between conquerors and conquered even more.
In what ways did life get better for the English under the Normans?	Most people still worked on the land – farming was unaffected. The number of thralls reduced hugely. Trade expanded in southern towns.
In what way did life get worse for the English under the Normans?	Number of free peasants were reduced. Peasants' rights were restricted eg. stopped from fishing in rivers, banning collecting firewood from forests. Also for the English noble, they had their land taken from them.

Key Terms

Undisputed	Nobody challenges you (as in William was undisputed King of England)
Exploit	To take advantage of (e.g. The Normans exploited the Anglo-Saxons)
Trial by combat	A new law introduced by the Normans – a sword fight between the accused of a crime and the accuser – whoever won was telling the truth
Ruling class	People who are the more powerful in a country. e.g. The Normans were the ruling class.

Making of America (Growing Tensions 1789-1838) Knowledge Organiser

1	Name three states which joined the USA between 1790 and 1838	Maine; Alabama; Ohio; Indiana; Illinois; Michigan; Tennessee; Mississippi; Vermont; Missouri; Rhode Island; Kentucky; Louisiana; Arkansas
2	Name one early President of the USA 1789-1838	George Washington; John Adams; James Madison; Thomas Jefferson; James Monroe; John Adams; Andrew Jackson;
3	What powers did states have to make laws?	Each had its own Governor and could make their own laws but couldn't go against the US Constitution
4	How many slaves lived in the South by 1838?	Over 2 million
5	Give three reasons why slavery expanded	Cotton gin sped up the process of separating cotton fibres. - New cotton-growing lands became available after 1790 - A huge demand from the North and overseas
6	What piece of machinery did Eli Whitney invent?	Cotton Gin
7	How much cotton was the USA exporting by 1838?	Over a million bales a year
8	Explain how the Missouri Compromise tried to solve divisions over slavery in the USA	New states would be in pairs: For every free state there would have to be a slave state. This would keep the balance of power in government
9	Name three of the Five Civilised Tribes	The Cherokee; Chickasaw; Choctaw; Creek; Seminole
10	What was the Indian Removal Act of 1830?	A law that promised money to tribes if they relocated to the west of the Mississippi
11	Which tribe challenged the Indian Removal Act in the Supreme Court?	Cherokee
12	Which President was responsible for the Indian Removal Act?	Andrew Jackson.
13	What was the 'Trail of Tears?'	Cherokee were force marched to Indian Territory. 4000 died.

Key Terms

Supreme Court	Highest, most important court in the USA
Constitution	Set of 'rules' by which a country is run, eg. Who can vote
Congress	USA's place of government (Like UK's Houses of Parliament)
State	Areas of the USA with their own government and a governor. They can pass some laws.
Territory	Land with not enough people to be a State. They don't send representatives to Congress.

Making of America (Visions of the West 1839-1860) Knowledge Organiser		
1	Name the two main branches of the Sioux Indians	Lakota and Dakota. Lakota Sioux were more experienced with guns and horses.
2	What was the main source of food for the Cheyenne?	Buffalo
3	What was the name of the sacred centre of Sioux culture?	Black Hills of Dakota
4	Explain why the Sioux moved on to the Plains	Sioux homelands began filling up with other Indian tribes escaping white expansion in the East
5	Why did migrants from East USA want to travel West from the 1849s onwards?	Economic problems in the East.; Oregon and California had advertising campaigns to attract people.; Manifest Destiny – the belief that God wanted white people to settle in the West of America
6	Name two diseases which killed people on the trails to Oregon and California	Cholera and Typhoid
7	Who led the Mormons to Utah?	Brigham Young
8	Why were the Mormons so keen to settle in the West?	They wanted to practise their religion. They had been persecuted in the East and their leader, Joseph Smith had been killed.
9	Where was gold first discovered in California in 1848?	Sutter's Mill, California Territory
10	Name two states or territories added to the USA between 1839 and 1860	California, Colorado, Utah, Kansas
11	Why did more people go to Pike's Peak than to California to search for gold?	It was nearer and easier to get to. Plus trains could take you to the edge of the Plains.
12	What impact did the gold rush have on California?	Improved Californian economy (created jobs); Impacted negatively on Indians; environmental impact (mining damaged landscapes and created flooding)
13	Impacts of Pike's Peak	Population rose = Colorado became a state. New towns grew, tensions with Native Americans

Key Terms	
Sioux	The largest Indian tribe
Mormons	A religious group. Christian but with specific beliefs different to most Christians
Gold Rush	Many people travelling to find gold
Wakan Tanka	The Great Spirit – The idea that all living things had their own spirit which came from the earth.
Manifest Destiny	The belief that God's plan was for white Americans to settle the whole continent of America

Making of America (Cause and aftermath of Civil War) Knowledge Organiser

1	Which political party was established in 1854?	The Republican Party (an anti-slavery party)
2	What Act was passed in 1854 that allowed states to decide if they wanted to be free or slave states?	Kansas-Nebraska Act
3	Give a political reason for the start of the Civil War	People in the North were worried that slaveholders in the South were becoming too powerful. People in the South were angry at the election of President Lincoln
4	Give an economic reason for the start of the Civil War	The North was jealous that the South were benefitting from slavery – ie. not paying their workforce and receiving huge profits from cotton
5	How did the election of Abraham Lincoln in 1860 lead to Civil War?	His election in 1860 meant that South Carolina voted to secede (leave) the United States. It was quickly followed by 6 other states. Lincoln called this 'Confederacy' of states illegal.
6	When was the Emancipation Proclamation (which freed all slaves) issued?	1863
7	Name one positive change for black Americans during the Civil War	By 1862, South Carolina was freed and ex-slaves began setting up regiments. Many slaves in the South were given 40 acres of land by General Sherman.
8	Name one negative change for black Americans during the Civil War	Some slaves were made to hard labour (eg. digging ditches). Some slaves continued working on cotton plantations even though they were free. They were paid less than white soldiers.
9	In what year did soldiers get equal pay in the army?	1864 (but they still couldn't serve as officers)
10	What was the Sea Islands Experiment?	Islands of the coast of South Carolina were given to freed slaves of the South
11	Name two steps that Lincoln took to rebuild the USA	Passed the 13th Amendment freeing slaves. Set up the Freedman's Bureau (a charity to help ex-slaves)
12	Name two ways President Johnson failed to help black Americans	Ended the Freedman's Bureau; Allowed Southern states to introduce Black Codes (removed rights for blacks); pardoned (forgave) thousands of Confederate soldiers
13	Name two ways Radical Republicans helped black Americans	Re-established the Freedman's Bureau; Passed a Civil Rights Law in 1866; Passed the 14th and 15th Amendments (saying that blacks could be citizens and could vote); Sent in soldiers to police the South
14	Name two ways things got worse for Black Americans after 1870	Freedman's Bureau shut down in 1872; The Supreme Court said that voting rights were down to states to decide; In 1877, soldiers stationed in the South were removed.

Key Terms

Emancipation Proclamation	A statement made by Abraham Lincoln in 1863 declaring that all slaves will be free

Making of America (Settlement and conflict on the Plains) Knowledge Organiser

1	Name an impact of the railroads on Indians	Disrupted buffalo hunting grounds; Encouraged settlers and cattle ranchers to settle on Plains.
2	Name an impact of the railroads on workers	Created jobs for thousands (12,000 of whom were Chinese). Paid poorly and working conditions were terrible.
3	Name an impact of the railroads on the USA	New towns were created. More railroads were created. By 1880s, journey across USA could be done in days rather than months.
4	Why did the cattle industry cause tension and conflict on the Plains?	Texas Longhorn disrupted buffalo roaming areas. Overgrazing of Plains meant buffalo started to die out.
5	Give two reasons why people moved to the Plains	Cheap land; Railroads meant farmed goods could be sold easily; Homestead Act (1860) offered people 160 acres free for 5 years.
6	Why were the Plains so difficult to farm on?	Plains was a long way from big towns so supplies were difficult to get. Few trees so building was difficult. Cholera a problem. People felt isolated.
7	Name two solutions homesteaders used to survive on the Plains?	Houses were made from earth (sod) Dry-farming techniques and new types of wheat (like Turkey red) which grew well on the Plains. Barbed wire meant enclosing land was easy. Wind pumps used to draw clean water.
8	What caused Little Crow's War in 1862?	Little Crow (Chief) had signed a reservation agreement in return for supplies from US government. Reservation officials refused to give emergency supplies even when the Sioux were starving.
9	What were the results of Little Crow's War?	Little Crow was killed. 38 Santee Sioux were publically hanged. Remaining Santee Sioux were forced to move to reservation in Dakota.
10	What caused Red Cloud's War 1866-68?	Gold discovered on the Sioux reservation in 1862. Red Cloud began attacking some miners. The US government set up forts.
11	What were the results of Red Cloud's War?	The US were defeated. Fort Laramie Treaty signed promising no settlers on Sioux land.
12	What caused the Great Sioux War?	Gold discovered on sacred ground. US govt. ordered all Sioux to leave but many refused.
13	What were the results of the Great Sioux War?	General Custer defeated by Sitting Bull but Sioux eventually forced onto reservations.

Key Terms

Texas Longhorn	A breed of cattle that is particularly good for beef
Reservation	Areas of land that Indians were forced to live on
Dry-Farming	A technique of using soil to retain rainwater. This was used on the dry plains to grow crops.
Fort Laramie Treaty	Treaty signed in 1868 (after previously being signed in 1851) that guaranteed US settlers wouldn't enter Indian lands without permission
Cattle Ranchers	People who made lots of money by rearing cattle and selling it for beef

Making of America (Changing lives 1877-1900) Knowledge Organiser

1	Give three ways the US government tried to destroy the plains Indians culture	Tribes split up; Indians forced to convert to Christianity; Indian children forced to choose English names; history lessons showed Indians as barbaric.
2	Which group tried to protect the rights of Native Americans?	'Friends of the Indian' set up in 1883
3	How did they, in fact, help to destroy the Indian cultures?	They set up schools to help Indian children learn English. They persuaded the US government to pass the Dawes Act in 1887. It gave each Indian family 160 acres if they gave up their claims to tribal lands
4	How was life in the South for blacks still bad after the end of Reconstruction?	Majority worked as sharecroppers; Jim Crow laws meant there was segregation in the South; Blacks didn't have access to better paid jobs.
5	What opportunities were there in the West for blacks after the end of Reconstruction?	Homestead Act was open to blacks. By 1879, over 6000 black Americans had moved to Kansas. They were known as the exodusters
6	How did life for Blacks in the North improve after 1877?	In 1882 Booker T Washington set up a school to train black children to be farmers and house servants. In 1900 he set up the Negro Business League.
7	How did Big Business create positive opportunities between 1977 and 1900?	Cotton and tobacco demand increased so created jobs. Huge 'bonanza' farms meant jobs for many who couldn't afford their own land. Growth of railroads meant demand for coal, iron and steel.
8	What negative impact did Big Business have on people between 1877 and 1900	Cotton demand meant more blacks as poorly paid sharecroppers; American Tobacco Company refused to improve wages; Small farms lost out to Bonanza Farms
9	How did the growth of cities create new opportunities for people between 1877 and 1900?	Work, entertainment, education and freedom.
10	What problems did the growth of cities lead to?	Overcrowding & Disease
11	Why did people want to move to America?	American economy was booming by 1880s; USA offered freedom of religion and thought
12	What problems did immigrants face in America?	Immigrants often ended up in the poorest areas of cities; Laws preventing Chinese workers from moving freely in California. Immigrants often ended up in the poorest areas of cities.

Key Terms

Jim Crow laws	The name given to laws that separated white and black people in the South
Sharecropper	Many black people lived on land owned by whites and had to give them 2/3 of their crops as rent. It gave control to white people and felt a lot like slavery to black people.
Homestead Act	1862 law that said people could get 160 acres of land on the Plains if they paid a small fee and stayed on the land for 5 years.
Bonanza farms	Huge farms owned by large businesses. Around 10,000 acres in size

Nazi Germany (Democracy to Dictatorship) Knowledge Organiser

1	How did the Depression affect Germany?	High unemployment meant people found the Nazi message more appealing and voted for them.
2	When did Hitler become Chancellor?	January 1933
3	When was the Reichstag Fire?	February 1933
4	Which political party did the Nazis blame the fire on?	The Communists
5	When was the Enabling Act passed?	March 1933
6	How did the Enabling Act help Hitler secure power?	It gave him powers of a dictator. He used it to ban other political parties, make Trades Unions Nazi and took control of local governments and newspapers.
7	What does Gleichschaltung mean?	'Bringing Germany into line'
8	During the period of Gleichschaltung who was affected?	The Jewish were persecuted by law, Trade Unions were shut down as were political opposition.
9	When was the Night of the Long Knives?	June 1934
10	Who was the leader of the SA that was killed during the Night of the Long Knives?	Ernst Rohm
11	How did the Night of the Long Knives help Hitler?	The army became loyal to the Nazis; The SA's power was reduced; A culture of fear was created.
12	When did President Hindenburg die?	August 1934
13	How did Hindenburg's death help Hitler?	The German Army swore an oath of loyalty to Hitler. Hitler combined the offices of Chancellor and President to become 'Fuhrer' (meaning 'leader')

Key Terms

Reichstag	The German seat of government (like Britain's Parliament)
SA	The 'Storm Troopers'. The Nazis' army (different to Germany's army). It lost strength after the Night of the Long Knives.
SS	Hitler's personal army. This gained strength after the Night of the Long Knives. The members were more purely 'Aryan'.
Enabling Act	The law passed that meant Hitler could pass laws without consulting the Reichstag.
Fuhrer	The title Hitler created after Hindenburg died. It means 'Leader'

Nazi Germany (Controlling Germany) Knowledge Organiser

1	How did the Nazis control Germany?	Propaganda; Terror; Weak opposition; The Nazis were popular.
2	Who was the head of propaganda in Nazi Germany?	Josef Goebbels
3	Who led the SS?	Heinrich Himmler
4	What was the Gestapo?	Nazi Secret Police
5	What examples of terror did the Nazis use?	Nazis controlled the police, the judges, they used the SS and Gestapo and they used concentration camps.
6	What examples of propaganda did the Nazis use?	Newspapers, Posters, 'People's Radio' sets, Rallies, Film, Berlin Olympics
7	Which political groups opposed the Nazis?	The Communists; the Social Democrats
8	Why were political groups not effective?	Social Democrats and Communists remained divided. Communists were identified and arrested by Gestapo.
9	Name the anti-Nazi Protestant Church	The Confessional Church
10	Who led the Confessional Church?	Martin Niemoller
11	Why was the Church ineffective at opposing the Nazis?	Nazis closed down Church schools and arrested some Church leaders, like Niemoller.
12	What was the name of the 'Nazi' Church?	Reich Church
13	In what ways was the Church successful in opposing the Nazis?	6000 pastors joined the Confessional church; Cardinal Galen criticised the Nazis successfully.
14	Which youth groups opposed the Nazis?	Swing Kids; Young Communists; Edelweiss Pirates

Key Terms

Concentration Camp	A prison for people who went against the Nazi regime
Gestapo	Secret police. Relied on denunciations from people. Used brutal methods to get people to confess.
Denunciation	To tell the Nazi authorities about someone who is not loyal to the Nazi regime
Propaganda	Exaggerated or even false information that is published in order to influence people.

Nazi Germany (Changing lives for Germans) Knowledge Organiser		
1	How did life for workers improve?	Most people had a job; Average wages rose; Beauty of Labour improved conditions.
2	How did life for workers get worse?	Trade Unions were abolished; People forced into National Labour Service; Cost of living rose.
3	What was the Strength through Joy?	It organised better leisure activities and holidays for workers (although most didn't benefit)
4	What was the one condition of the Marriage Loan?	The wife had to leave her job
5	In what ways were Nazi policies towards women successful?	Marriages increased to 772,000 by 1939; Number of women in higher education dropped.
6	In what ways were Nazi policies towards women unsuccessful?	Births dropped by 1939; Number of women in employment increased (eg. 3.3 million in industry)
7	What roles were children prepared for at school?	Girls to be mothers/housewives; boys to be soldiers.
8	In what ways were Nazi policies towards children successful?	School lessons designed to indoctrinate children; specialist schools for leaders; Hitler Youth made compulsory in 1939.
9	In what ways were Nazi policies towards children unsuccessful?	Many children bored by Hitler Youth and resented the message. 3 million had not joined by 1938
10	What were Jews banned from in March 1933?	Jewish lawyers banned from conducting legal affairs in Berlin.
11	What did the Nuremburg Laws of 1935 involve?	Marriages banned between Aryans and Jews. Jews are no longer citizens.
12	What happened on Kristallnacht in 1938?	267 synagogues destroyed; 91 Jews killed; 30,000 Jews sent to concentration camps.
13	What did Jews have to do by 1939?	Jews have to hand over jewellery, gold, silver and pearls.

Key Terms

Eugenics	The study of improving the human race. It is not at all considered a science today.
Beauty of Labour	Aimed to improve the workplace by building new toilets, showers and facilities.
Adolph Hitler Schools	Schools for children who were seen as future leaders of Nazi Germany. They were not very successful.
Hitler Youth	Groups (a bit like Scouts) for indoctrinating children and encouraging physical exercise.
Indoctrination	Brainwashing eg. Making sure schools indoctrinated children into Nazi thinking.

Nazi Germany (Germany in War) Knowledge Organiser

1	What kind of problems did Germans face when war broke out?	Foods, clothing, shoes and coal were strictly rationed; German civilians spent much time queuing and the quality of products was reduced. In the spring of 1940, the RAF began bombing campaigns in Germany.
2	What items were soon rationed in Germany?	Bread, potatoes, butter, milk, cheese, eggs, cereal.
3	By 1941, what percentage of Germans were in war-related work?	55%
4	Who was made Minister of Armaments and War Production?	Albert Speer
5	How did the war change lives for women?	1.5 million were in the workforce by 1941
6	Who carried out the 1944 bomb plot against Hitler?	Colonel von Stauffenburg
7	Which religious leaders publically criticised the Nazis?	Dietrich Bonhoeffer and Cardinal Galen
8	How did the White Rose Group criticise the Nazis?	Leaflets. One was called 'An appeal to all Germans'
9	Who led the White Rose Group?	Sophie and Hans Scholl
10	What examples of passive resistance were there?	Reading banned literature; listening to the BBC; hiding Jews
11	How did total war impact people in Germany?	Women to join war effort; more shortages; more propaganda
12	How many people died in the bombing of Dresden?	25,000
13	What did Goebbels do to ensure Germany was focused on war?	½ million workers had to be soldiers; forced labour from other countries; more propaganda
14	When did the Nazis surrender?	May 1945

Key Terms

Military expenditure	The amount a country spends on war
Passive resistance	Non-violent opposition
Total War	When everyone is enlisted to support the war effort
Volksturm	People's Storm (army). An army of young and old not already fighting. It was ineffective.

Nazi Germany (Occupation of Europe) Knowledge Organiser

1	What did Nazis aim to achieve in Poland?	Himmler in 1940 tried an experimental strategy in Poland – to remove as many of the Polish and Slavic people as possible and replace them with Germans.
2	What did the Nazis do to the Polish people?	Between 1939-45 over 1.5 million Poles were deported and forced to work in labour camps.
3	Why did the Nazis treat the Netherlands better?	Dutch people were considered by the Nazis to have an 'Aryan background'
4	What else demonstrated the Nazis were less harsh to the Netherlands?	The Dutch education system wasn't changed as the Nazis knew there would be a backlash to this.
5	What happen to the 1944 Polish Uprising to resist the Nazis?	The uprising was brutally crushed by the Nazis.
6	What kind of resistance happened in the Netherlands?	Anti-Nazi leaflets were printed and registry offices were attacked to gain access to ration cards and blank identity cards
7	What was the name of France that collaborated with the Nazis?	Vichy France
8	When did the Nazis starting putting Jews in ghettos?	1940
9	How many Jewish people did the Einsatzgruppen kill in 1941?	Around 1 million
10	What was the name of the gas used to kill Jewish people?	Zyklon B
11	What did senior Nazis decide at the Wannsee Conference in 1942?	To mass murder all Jewish people in Europe
12	How many people died at Auschwitz?	About 1.1 million killed

Key Terms

Hans Frank	The name of the Nazi Governor in charge of part of Poland
Ghettos	Enclosed districts where Jews would live in isolation from non-Jewish people
Einsatzgruppen	Killing units which were made up of SS, police& locals. When they reached villages the Einsatzgruppen rounded up Jews and communists
Wehrmacht	The German Army
Collaboration	Working with (the Nazis) to help them in their occupation

Year 11 Life Skills- Living in the Wider World		
Lesson 1- Preparing for Interview	**Lesson 2- Personal Statements and post 16 applications**	**Lesson 3- CV and job applications**
Mock interviews- Tuesday 14th December 5 tips for a successful interview 1) Be punctual at your interview. It is mandatory to be on time at a job interview. 2) Do your research on the company. 3) Don't forget about nonverbal communication 4) Be polite with everyone. 5) Be prepared for your interview. **Questions you might be asked at interview:** What do you know about our company? Why do you think you're a good fit for our company? Why do you want to work for us? What are your main strengths? Why should we hire you? When have you faced a challenging situation? Can you tell us about a personal achievement at work? Have you ever taken the initiative? Have you ever failed at a task? More questions and interview tips: https://nationalcareers.service.gov.uk/careers-advice/top-10-interview-questions	Your personal statement should include a brief overview of who you are, your strengths and any work experience and/or education you've got. Be sure to include skills you've gained, such as time management, customer service, teamwork, computer skills etc. **Why are you applying for your chosen course(s)?** Explain why you want to do your chosen course(s **Why does this course interest you?** You can write about anything you've read about the course(s) that you find interesting and would like to find out more about. **Why do you think you are suitable for the course(s)?** In this section, you can write about any experiences you have had that are related to the course(s), or any skills you've learnt that might help you. **Do your current studies (e.g. GCSEs) relate to the course(s) you have chosen? If so, how?** **Skills and achievements** (e.g music exams, sports achievements, Duke of Edinburgh Award, prefect positions) **Work history** Include details of placements, work experience, voluntary work, or jobs, especially if it is relevant to your chosen course(s) **Career plans** Use this section to tell the provider what you might like to do in the future as a career after completing the course. Explain how you would like to use the course(s) you have applied for to help you reach your goal https://www.ucas.com/further-education/post-16-qualifications/post-16-options/how-write-personal-statement-	**Skills-** The most effective CVs written by school leavers often give precedence to skills. Just as with your personal statement, try giving examples that are applicable to the role in question. For example, IT skills (naming specific programs), or soft skills such as problem solving, public speaking and interpersonal skills, not to mention a friendly and welcoming demeanour, are all desirable qualities to have. **Education-** Education should be included from GCSE level on. State the number and general grades you received (Maths and English at the very least). If you're awaiting any results, you may state mock/expected results where possible, although this is not essential. Write in reverse-chronological order, with the most recent events coming at the top. **Hobbies & Interests-** A Hobbies and Interests section is optional. However, if you lack any notable work experience, they can be a great way of getting your personality across. **Employment history-** If you do have some relevant work experience, even if it was only for a brief period, this can be a great help. If you have no employment history to speak of, you may wish to leave this section out. **References-** Always make sure that you do have credible references. Close family friends, teachers, or career councillors are all good options, and are usually more than happy to help.

Lesson 4- Career Pathways	Lesson 5- Employment Responsibilities	Lesson 6- Taking responsibility for your own finance
A levels Study a subject you took at GCSE in greater depth or choose a new one like economics, law or psychology. You could take 3 broad subjects you are interested in to keep your career options open or choose ones you need for a specific career. **Apprenticeships** Intermediate, advanced higher and degree apprenticeships combine practical on-the-job skills training with off-the-job learning. You'll get training that is relevant to your job and be paid a salary. Start at a level to suit you, with support if you have special needs or a disability. Location: You'll spend 80% of your time in the workplace and 20% off-the-job with some study in a college, training centre or Institute of Technology (IoT) **NVQs and SVQs** – provide you with skills to do a specific job and can be taken if you have a full-time job, or are on a course with a work placement **BTEC diplomas** – give you a broader knowledge of a particular sector or industry. They are available in a range of sizes which are equivalent to one, two, or three A levels. They can be taken in combination with other qualifications https://www.unifrog.org/ https://www.apprenticeships.gov.uk/	**Employers Responsibilities** Employers have a responsibility to provide some basic conditions for their employees. These are: **pay, career development, compassionate leave, holidays, health and safety, contracts, equality** (gender, race, religion, disability, sexual orientation, age) A **wage** is an hourly rate of pay that is calculated and paid each week, or monthly. A **salary** is a yearly rate of pay which is divided equally over twelve months. Employers must ensure their employees pay income tax, make National Insurance payments and, in certain circumstances, are a member of a pension scheme. **Employees have a range of responsibilities. These include:** Loyalty- You must keep the interests of your employer in mind with everything you do, and do nothing to harm the company Honesty- You must be truthful with your employers, colleagues and customers Timekeeping and deadlines- You must ensure that you are on time for work and complete each of your tasks before their deadlines Health and safety- You must take care of your own safety, and that of others Professionalism- You should make a commitment to do high quality work.	**Bank Accounts** To open a bank account you usually have to fill in an application form. Often, you can do this in a branch or online, and sometimes you can also do this over the phone. You will also have to provide proof of your identity including your full name, date of birth and address. You usually have to show the bank two separate documents that prove who you are, for example, your passport, and where you live, for example, a recent bill. **Credit**- the ability of a customer to obtain goods or services before payment, based on the trust that payment will be made in the future **Payday loans** are short-term loans for small amounts of money. They are available from high street shops and internet sites. Payday loans can be easy to get but interest rates are very high. **Interest** is the cost of borrowing money, where the borrower pays a fee to the lender for the loan. The interest, typically expressed as a percentage, can be either simple or compounded. **Credit Card**- lets you borrow funds from a pre-approved limit to pay for your purchases. The limit is decided by the institution issuing the card based on your credit score and history. **Credit Rating**- an estimate of the ability of a person or organisation to fulfil their financial commitments, based on previous dealings.

GCSE Mathematics Foundation Tier

Number · Algebra · Ratio, proportion and rates of change · Geometry & measures · Probability · Statistics

Here is pretty much all the Foundation Tier content we could fit onto an A3 sheet of paper, including all the formulae you are required to know for GCSE. An ➔ points to an illustrative example. The codes refer to the DfE subject content. Pin this to a wall, keep it on your desk, carry it in your bag, make notes on it (sorry, don't take it into the examination)…

BIDMAS N3

…or BODMAS. Use the correct order of operations; take care when using a calculator.

- **B**rackets
- **I**ndices (or p**O**wers)
- **D**ivision and **M**ultiplication
- **A**ddition and **S**ubtraction

Types of number N4

Integer: a "whole" number
Factors; the divisors of an integer
➔ **Factors of 12 are 1, 2, 3 ,4, 6, 12**
Multiples; a "times table" for an integer (will continue indefinitely)
➔ **Multiples of 12 are 12, 24, 36 …**
Prime number: an integer which has exactly two factors (1 and the number itself). Note: 1 is not a prime number.

HCF, LCM N4

Highest **C**ommon **F**actor (HCF)
➔ **Factors of 6 are 1, 2, 3, 6**
Factors of 9 are 1, 3, 9
HCF of 6 and 9 is 3
Lowest **C**ommon **M**ultiple (LCM)
➔ **Multiples of 6 are 6, 12, 18, 24, …**
Multiples of 9 are 9, 18, 27, 36, …
LCM of 6 and 9 is 18

Prime factors N4

Write a number as a product of its prime factors; use indices for repeated factors:
➔ $720 = 5 \times 3^2 \times 2^4$

Powers and roots N6, N7

Special indices: for any value a:

$$a^0 = 1$$

$$a^{-n} = \frac{1}{a^n}$$

➔ $3^{-4} = \frac{1}{3^4} = \frac{1}{81}$

Calculating with fractions N8

Adding or subtracting fractions; use a common denominator…
➔ $\frac{4}{5} - \frac{1}{3} = \frac{12}{15} - \frac{5}{15} = \frac{7}{15}$
Multiplying fractions; multiply numerators and denominators…
➔ $\frac{4}{7} \times \frac{2}{3} = \frac{8}{21}$
Dividing fractions; "flip" the second fraction, then multiply…
➔ $\frac{2}{7} \div \frac{5}{6} = \frac{2}{7} \times \frac{6}{5} = \frac{12}{35}$

Fractions, decimals N10

Fraction is numerator ÷ denominator
➔ $\frac{5}{8} = 5 \div 8 = 0.625$
Use place values to change decimals to fractions. Simplify where possible.
➔ $0.45 = \frac{45}{100} = \frac{9}{20}$
Learn the most frequently used ones:

$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{3}{4}$
0.5	0.25	0.1	0.2	0.75

Surds N8

Look for the biggest square number factor of the number:
➔ $\sqrt{80} = \sqrt{16 \times 5} = 4\sqrt{5}$

Standard form N9

Standard form numbers are of the form $a \times 10^n$, where $1 \le a < 10$ and n is an integer.

Standard units N13

1 tonne = 1 000 kilograms
1 kilogram = 1 000 grams

1 kilometre = 1 000 metres
1 metre = 100 centimetres
= 1 000 millimetres
1 centimetre = 10 millimetres

1 day = 24 hours
1 hour = 60 minutes = 3 600 seconds
1 minute = 60 seconds

Rounding N15

Truncate the number, then use a "decider digit" to round up or down.
Decimal places: use the decimal point
➔ **162.3681 to 2dp;**
162.36 | 81 **= 162.37 to 2dp**
Significant figures: use the first non-zero digit.
➔ **162.3681 to 2sf;**
16 | 2.3681 **= 160 to 2sf**
➔ **0.007 039 to 3sf;**
0.007 03 | 9 **= 0.007 04 to 3sf**

Error intervals N15

Find the range of numbers that will round to a given value:
➔ $x = 5.83$ **(2 decimal places)**
$5.825 \le x < 5.835$
➔ $y = 46$ **(2 significant figures)**
$45.5 \le y < 46.5$
Note use of ≤ and <, and that the last significant figure of each is 5.

Algebraic notation A1

$$ab = a \times b$$
$$3y = y + y + y$$
$$a^2 = a \times a$$
$$a^3 = a \times a \times a$$
$$a^2b = a \times a \times b$$
$$\frac{a}{b} = a \div b$$

Equations and identities A3

An equation is true for some particular value of x…
➔ $2x + 1 = 7$ **is true if** $x = 3$
…but an identity is true for every value of x
➔ $(x + a)^2 \equiv x^2 + 2ax + a^2$
(note the use of the symbol ≡)

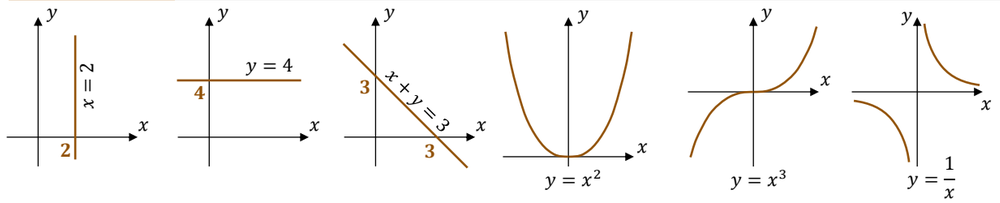
Laws of indices A4

For any value a:

$$a^x \times a^y = a^{x+y}$$
$$\frac{a^x}{a^y} = a^{x-y}$$
$$(a^x)^y = a^{xy}$$

➔ $\left(\frac{2pq^4}{p^3q}\right)^3 = \frac{8p^3q^{12}}{p^9q^3} = \frac{8q^9}{p^6}$ or $8q^9p^{-6}$

Standard graphs A12



$y = mx + c$ A9

Equation of straight line $y = mx + c$
m is the gradient; c is the y intercept:
➔ **Find the equation of the line that joins (0 , 3) to (2 , 11)**
Find its gradient…

$$\frac{11 - 3}{2 - 0} = \frac{8}{2} = 4$$

…and its y intercept…
Passes through (0 , 3), so c = 3.
Equation is $y = 4x + 3$.

Parallel lines: gradients are equal;
➔ $y = 2x + 3$ **and** $y = 2x - 5$ **both have gradient 2, so are parallel.**

Expanding brackets A4

$$p(q + r) = pq + pr$$
➔ $5(x - 2y) = 5x - 10y$
$$(x + a)(x + b) = x^2 + ax + bx + ab$$
➔ $(2x - 3)(x + 5)$
$= 2x^2 - 3x + 10x - 15$
$= 2x^2 + 7x - 15$
Reverse of expanding is factorising - putting an expression into brackets.

Quadratics A18

Solve a quadratic by factorising.
➔ **Solve** $x^2 - 8x + 15 = 0$
Put into brackets (taking care with any negative numbers)…
$(x - 3)(x - 5) = 0$
…then either $x - 3 = 0$ or $x - 5 = 0$, so that $x = 3$ **or** $x = 5$.

Difference of two squares A4

$$a^2 - b^2 = (a + b)(a - b)$$
➔ $x^2 - 25 = (x + 5)(x - 5)$

Simultaneous equations A19

➔ **Solve** $\begin{cases} 2x + 3y = 11 \\ 3x - 5y = 7 \end{cases}$
Multiply to match a term in x or y
$\begin{cases} 10x + 15y = 55 \\ 9x - 15y = 21 \end{cases}$
Add or subtract to cancel…
$19x = 76$, **so** $x = 4$
Finally, substitute and solve…
$2 \times 4 + 3y = 11$, **so** $y = 1$

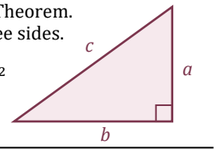
Rearrange a formula A5

The subject of a formula is the term on its own. Use rules that "balance" the formula to change its subject
➔ **Make** x **the subject of**
$2x + 3y = z$
Here, subtract $3y$ from both sides…
$2x = z - 3y$
…then divide both sides by 2…

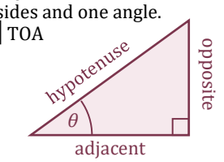
$$x = \frac{z - 3y}{2}$$

Right angled triangles G20, G22

Pythagoras Theorem.
Links all three sides.
No angles.
$a^2 + b^2 = c^2$



Trigonometry.
Links two sides and one angle.
SOH | CAH | TOA



$\sin\theta = \frac{\text{opp}}{\text{hyp}}$ $\cos\theta = \frac{\text{adj}}{\text{hyp}}$ $\tan\theta = \frac{\text{opp}}{\text{adj}}$

Use "2ndF" or "SHIFT" key to find a missing angle

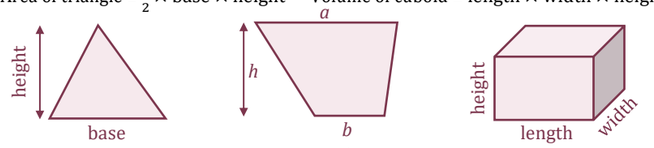
The longest side of any right angled triangle is the hypotenuse; check that your answer is consistent with this.

Special values of sin, cos, tan
Learn (or be able to find without a calculator)…

$\theta°$	$\sin\theta°$	$\cos\theta°$	$\tan\theta°$
0	0	1	1
30	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{3}}$
45	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	1
60	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$
90	1	0	

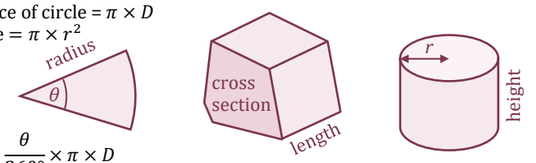
Areas and volumes G16, G17, G18, G23

Area of triangle = $\frac{1}{2} \times$ base × height
Volume of cuboid = length × width × height



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

Circumference of circle = $\pi \times D$
Area of circle = $\pi \times r^2$



Arc length = $\frac{\theta}{360°} \times \pi \times D$
Area of sector = $\frac{\theta}{360°} \times \pi \times r^2$
Volume of cylinder = $\pi r^2 \times$ height
Volume of prism = area of cross section × length

Transformations G7, G8

Reflection
- Line of reflection

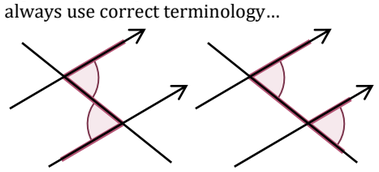
Translation
- Vector

Rotation
- Centre of rotation
- Angle of rotation
- Clockwise or anticlockwise

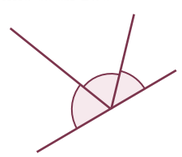
Enlargement
- Centre of enlargement
- Scale factor (if SF < 1 the shape will get smaller).

Angle facts G3

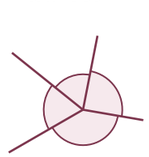
Equal angles in parallel lines: always use correct terminology…



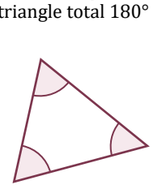
Angles on a straight line total 180°



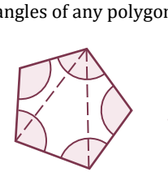
Angles in a full turn total 360°



Interior angles in a triangle total 180°

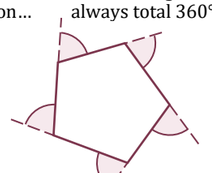


Use this for the interior angles of any polygon…



…or 180° × $(n - 2)$

Exterior angles always total 360°



Sequences A24, A25

Triangular numbers:

1st	2nd	3rd	4th	5th
1	3	6	10	15

Square numbers ($n^2 = n \times n$):

1^2	2^2	3^2	4^2	5^2
1	4	9	16	25

Cube numbers ($n^3 = n \times n \times n$):

1^3	2^3	3^3	4^3	5^3
1	8	27	64	125

nth term of an arithmetic (linear) sequence is $an + d$
➔ n**th term of 5,8,11,14,… is** $3n$**+2 (always increases by 3; first term is** $3 \times 1 + 2 = 5$.**)**
Geometric sequence; multiply each term by a constant ratio
➔ **3, 6, 12, 24, … (ratio is 2)**
Fibonacci sequence; make the next term by adding the previous two …
➔ **2, 4, 6, 10, 16, 26, 42, …**

Probability P8, P9

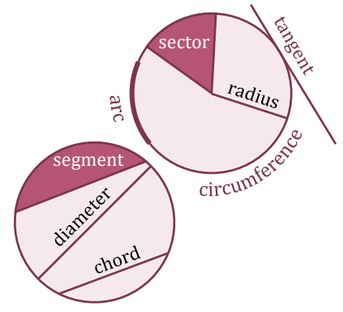
$$p = \frac{n(\text{equally likely favourable outcomes})}{n(\text{equally likely possible outcomes})}$$

$p = 0$	impossible
$0 < p < 0.5$	unlikely
$p = 0.5$	evens
$0.5 < p < 1$	likely
$p = 1$	certain

Probability rules P8, P9

Multiply for independent events
➔ **P(6 on dice and H on coin)**
$\frac{1}{6} \times \frac{1}{2} = \frac{1}{12}$
Add for mutually exclusive events
➔ **P(5 or 6 on dice)**
$\frac{1}{6} + \frac{1}{6} = \frac{2}{6}$
Apply these rules to tree diagrams.

Parts of a circle G9



Division using ratio R5

Use a ratio for unequal sharing
➔ **Divide £480 in the ratio 7 : 5**
7 + 5 = 12, then £480 ÷ 12 = £40
7 × £40 = £280, 5 × £40 = £200
(check: £280 + £200 = £480 ✓)

Ratio and fractions R8

Link between ratios and fractions
➔ **Boys to girls in ratio 2 : 3**
$\frac{2}{5}$ **are boys,** $\frac{3}{5}$ **are girls.**

Percentages R9

$$y \text{ percent of } x = \frac{y}{100} \times x$$

➔ **Increase £58 by 26%.**
$\frac{26}{100} \times £58 = £15.08$
£58 + £15.08 = £73.08

$$y \text{ as a percentage of } x = \frac{y}{x} \times 100\%$$

➔ **The population of a town increases from 3 500 to 4 620. Find the percentage increase.**
$\frac{1\,120}{3\,500} \times 100\% = 32\%$
Note: fraction = $\frac{\text{increase}}{\text{original}}$
Learn the most frequently used ones:

$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{10}$	$\frac{1}{5}$	$\frac{1}{100}$
50%	25%	10%	20%	1%

Speed, distance, time R11

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

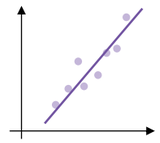
➔ **A car travels 90 miles in 1 hour, 30 minutes. Find its average speed.**
90 miles ÷ 1.5 hours = 60 mph

Averages S4

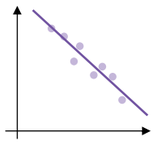
Mode: most frequently occurring
Median: put the data in numerical order, then choose the middle one
Mean = $\frac{\text{total of items of data}}{\text{number of items of data}}$

Correlation S6

Positive correlation



Negative correlation



GCSE Mathematics Higher Tier

Number · Algebra · Ratio, proportion and rates of change · Geometry & measures · Probability · Statistics

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Listing strategies N5

Product rule for counting:
➔ **$4 \times 3 \times 2 \times 1 = 24$ ways to arrange the letters P, I, X and L.**

Powers and roots N6, N7

Special indices: for any value a:

$$a^0 = 1$$
$$a^{-n} = \frac{1}{a^n}$$
$$a^{\left(\frac{p}{q}\right)} = \sqrt[q]{a^p}$$

➔ $3^{-4} = \frac{1}{3^4} = \frac{1}{81}$

➔ $8^{\left(\frac{2}{3}\right)} = \sqrt[3]{8^2} = 4$

Surds N8

Look for the biggest square number factor of the number:
➔ $\sqrt{80} = \sqrt{16 \times 5} = 4\sqrt{5}$

Rationalise the denominator N8

Multiply the numerator and denominator by an expression that makes the denominator an integer:

➔ $\frac{4}{\sqrt{7}} = \frac{4 \times \sqrt{7}}{\sqrt{7} \times \sqrt{7}} = \frac{4\sqrt{7}}{7}$

➔ $\frac{2}{4+\sqrt{5}}$

$= \frac{2}{4-\sqrt{5}} \times \frac{4-\sqrt{5}}{4-\sqrt{5}} = \frac{2(4-\sqrt{5})}{11}$

Standard form N9

Standard form numbers are of the form $a \times 10^n$, where $1 \le a < 10$ and n is an integer.

Recurring decimals N10

Make a recurring decimal a fraction:
➔ $n = 0.2\dot{3}6$
(two digits are in the recurring pattern, so multiply by 100)
$100n = 23.\dot{6}$
(this is the same as $23.6\dot{3}6\dot{)}$
$99n = 23.6\dot{3}6 - 0.2\dot{3}6 = 23.4$
$n = \frac{23.4}{99} = \frac{234}{990} = \frac{13}{55}$

Error intervals N15

Find the range of numbers that will round to a given value:
➔ **$x = 5.83$ (2 decimal places)**
$5.825 \le x < 5.835$
➔ **$y = 46$ (2 significant figures)**
$45.5 \le y < 46.5$
Note use of ≤ and <, and that the last significant figure of each is 5.

Equations and identities A3

An equation is true for some particular value of x…
➔ **$2x + 1 = 7$ is true if $x = 3$**
…but an identity is true for every value of x
➔ $(x + a)^2 \equiv x^2 + 2ax + a^2$
(note the use of the symbol ≡)

Laws of indices A4

For any value a:

$$a^x \times a^y = a^{x+y}$$
$$\frac{a^x}{a^y} = a^{x-y}$$
$$(a^x)^y = a^{xy}$$

➔ $\left(\frac{2pq^4}{p^3q}\right)^3 = \frac{8p^3q^{12}}{p^9q^3} = \frac{8q^9}{p^6}$ or $8q^9p^{-6}$

Difference of two squares A4

$$a^2 - b^2 = (a+b)(a-b)$$
➔ $x^2 - 25 = (x+5)(x-5)$

Rearrange a formula A5

The subject of a formula is the term on its own. Rearrange to
➔ **Make x the subject of**
$2x + ay = y - bx$
$2x + bx = y - ay$
$x(2 + b) = y - ay$
$x = \frac{y - ay}{2 + b}$

Functions A7

Combining functions:
$fg(x) = f(g(x))$
➔ **If $f(x) = x + 3$ and $g(x) = x^2$**
$fg(x) = x^2 + 3$
$gf(x) = (x + 3)^2$

The inverse of f is f^{-1}
➔ **If $f(x) = 2x + 5$ then**
$f^{-1}(x) = \frac{x - 5}{2}$

$y = mx + c$ A9

Equation of straight line $y = mx + c$
m is the gradient; c is the y intercept:
➔ **Find the equation of the line that joins (0 , 3) to (2 , 11)**
Find its gradient…
$\frac{11 - 3}{2 - 0} = \frac{8}{2} = 4$
…and its y intercept…
Passes through (0 , 3), so c = 3.
Equation is $y = 4x + 3$.

Parallel lines: gradients are equal; perpendicular lines: gradients are "negative reciprocals".
➔ **$y = 2x + 3$ and $y = 2x - 5$ are parallel to each other; $y = 2x + 3$ and $y = -\frac{1}{2}x + 3$ are perpendicular**

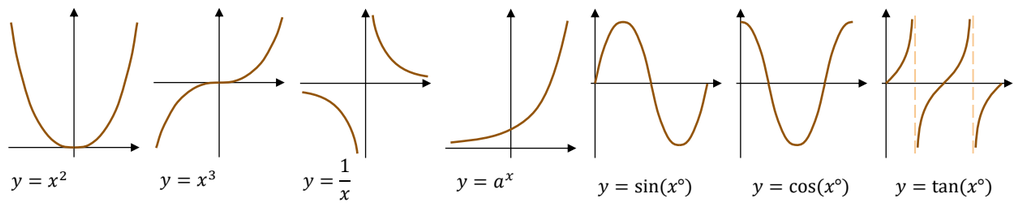
Transformations of curves A13

Starting with the curve $y = f(x)$:
Translate $\binom{0}{a}$ for $y = f(x) + a$
Translate $\binom{-a}{0}$ for $y = f(x + a)$
Reflect in x axis for $y = -f(x)$
Reflect y axis for $y = f(-x)$

Velocity - time graph A15

Gradient = acceleration (you may need to draw a tangent to the curve at a point to find the gradient);
Area under curve = distance travelled.

Standard graphs A12



Quadratics A11, A18

If a quadratic equation cannot be factorised, use the formula

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

➔ **Solve $2x^2 + 3x - 7 = 0$**

$x = \frac{-3-\sqrt{9-(-56)}}{2\times2} = -2.73$

or $x = \frac{-3+\sqrt{9-(-56)}}{2\times2} = 1.23$

Complete the square to find the turning point of a quadratic graph.
➔ $y = x^2 - 6x + 2$
$y = (x - 3)^2 - 9 + 2$
$y = (x - 3)^2 - 7$
Turning point is (3 , −7)

Equation of a circle A16

$x^2 + y^2 = r^2$ is a circle with centre (0 ,0) and radius r.
➔ **$x^2 + y^2 = 25$ has centre (0 , 0) and radius 5.**

Simultaneous equations A19

One linear, one quadratic;
➔ **Solve $\begin{cases} x + 3y = 10 \\ x^2 + y^2 = 20 \end{cases}$**
Rearrange the linear, and substitute into the quadratic
$x = 10 - 3y$
$\text{so } (10 - 3y)^2 + y^2 = 20$
Expand and solve the quadratic
$100 - 60y + 9y^2 + y^2 = 20$
$10y^2 - 60y + 80 = 0$
$y = 2 \text{ or } y = 4$
Finally, substitute into the linear and solve, pairing values…
$x + 3 \times 2 = 10 \text{ so } (x , y) = (4 , 2)$
$x + 3 \times 4 = 10 \text{ so } (x , y) = (-2 , 4)$

Sequences A24, A25

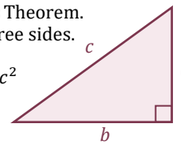
nth term of an arithmetic (linear) sequence is $bn + c$
➔ **nth term of 5,8,11,14,… is $3n+2$ (always increases by 3; first term is $3 \times 1 + 2 = 5$.)**
nth term of a quadratic sequence is $an^2 + bn + c$
➔ **First three terms of $n^2 + 3n - 1$ are 3, 9, 17, …**
Geometric sequence; multiply each term by a constant ratio
➔ **3, 6, 12, 24, … (ratio is 2)**
Fibonacci sequence; make the next term by adding the previous two …
➔ **2, 4, 6, 10, 16, 26, 42, …**

Iteration A20

You will be given the formula to use:
➔ **Solve $x^3 + 6x + 4 = 0$ by using the iteration $x_{n+1} = \sqrt[3]{6x_n - 4}$.**
Start with $x_1 = -2.8$.
$x_2 = \sqrt[3]{6 \times (-2.8) - 4} = -2.750\ldots$
$x_3 = \sqrt[3]{6 \times (-2.750\ldots) - 4} = \cdots$
Repeat until you know the solution, or you do as many as the question says.

Right angled triangles G20

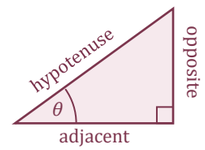
Pythagoras Theorem.
Links all three sides.
No angles.
$a^2 + b^2 = c^2$



Trigonometry.
Links two sides and one angle.
SOH | CAH | TOA

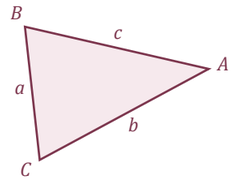
$\sin\theta = \frac{\text{opp}}{\text{hyp}}$ $\cos\theta = \frac{\text{adj}}{\text{hyp}}$ $\tan\theta = \frac{\text{opp}}{\text{adj}}$

Use "2ndF" or "SHIFT" key to find a missing angle



The longest side of any right angled triangle is the hypotenuse; check that your answer is consistent with this.

Advanced trigonometry G21, G22



A is opposite a
B is opposite b
C is opposite c

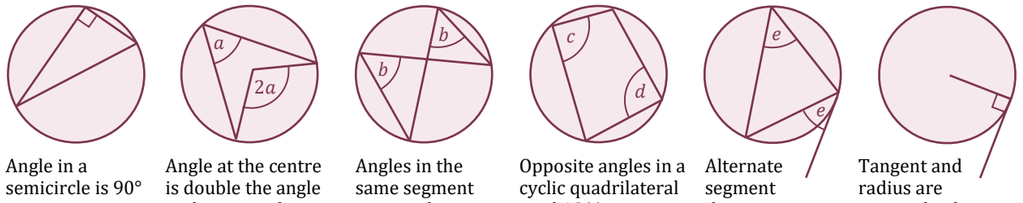
Sine Rule
Use if you are given an angle-side pair
Missing side: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$
Missing angle: $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$

Cosine Rule
Use if you can't use the sine rule
Missing side: $a^2 = b^2 + c^2 - 2bc\cos A$
Missing angle: $\cos A = \frac{b^2 + c^2 - a^2}{2bc}$

Special values of sin, cos, tan
Learn (or be able to find without a calculator)…

$\sin0° = 0$,	$\cos0° = 1$,	$\tan0° = 0$
$\sin30° = \frac{1}{2}$,	$\cos30° = \frac{\sqrt{3}}{2}$,	$\tan30° = \frac{1}{\sqrt{3}}$
$\sin45° = \frac{1}{\sqrt{2}}$,	$\cos45° = \frac{1}{\sqrt{2}}$,	$\tan45° = 1$
$\sin60° = \frac{\sqrt{3}}{2}$,	$\cos60° = \frac{1}{2}$,	$\tan60° = \sqrt{3}$
$\sin90° = 1$,	$\cos90° = 0$	

Circle theorems G10



Angle in a semicircle is 90°

Angle at the centre is double the angle at the circumference

Angles in the same segment are equal

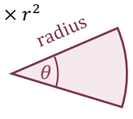
Opposite angles in a cyclic quadrilateral total 180°

Alternate segment theorem

Tangent and radius are perpendicular

Areas and volumes G16, G17, G18, G23

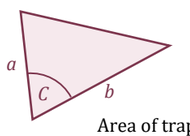
Circumference of circle = $\pi \times D$
Area of circle = $\pi \times r^2$

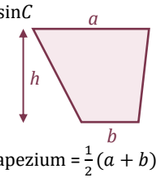


Arc length = $\frac{\theta}{360°} \times \pi \times D$

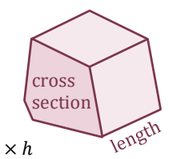
Area of sector = $\frac{\theta}{360°} \times \pi \times r^2$

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

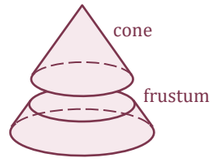




Area of trapezium = $\frac{1}{2}(a + b) \times h$



Volume of prism = area of cross section × length



Volume of cone = $\frac{1}{3}\pi r^2 h$
Volume of frustum is difference between the volumes of two cones

Transformations G7, G8

Reflection
- Line of reflection

Translation
- Vector

Rotation
- Centre of rotation
- Angle of rotation
- Clockwise or anticlockwise

Enlargement
- Centre of enlargement
- Scale factor (if −1 < SF < 1 the shape will get smaller).

Similar shapes G19

Ratios in similar shapes and solids:

• Length/perimeter	$1:n$	$a:b$
• Area	$1:n^2$	$a^2:b^2$
• Volume	$1:n^3$	$a^3:b^3$

Percentages: multipliers R9, R16

Percentage increase or decrease; use a multiplier (powers for repetition)
➔ **Initially there were 20 000 fish in a lake. The number decreases by 15% each year. Estimate the number of fish after 6 years.**
$20\,000 \times 0.85^6 = 7\,500$ (2sf)

Formula for compound interest
Total accrued = $P\left(1 + \frac{r}{100}\right)^n$
➔ **I invest £600 at 3% compound interest. What is my account worth after 5 years?**
$£600 \times \left(1 + \frac{3}{100}\right)^5 = £695.56$

Direct & inverse proportion R10

y is directly proportional to x:
$y = kx$ for a constant k
➔ **b is directly proportional to a^2; $a = 6$ when $b = 90$. Find b if $a = 8$.**
$b = ka^2$; $a = 6$ and $b = 90$ for k;
$90 = k \times 6^2$ so $k = 2.5$, $b = 2.5a^2$
$b = 2.5 \times 8^2 = 160$
y is inversely proportional to x:
$yx = k$ or $y = \frac{k}{x}$ for a constant k

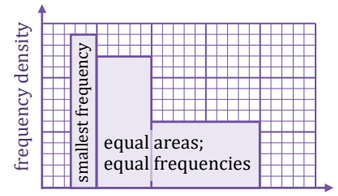
Probability rules P8, P9

Multiply for independent events
➔ **P(6 on dice and H on coin)**
$\frac{1}{6} \times \frac{1}{2} = \frac{1}{12}$
Add for mutually exclusive events
➔ **P(5 or 6 on dice)**
$\frac{1}{6} + \frac{1}{6} = \frac{2}{6}$
Apply these rules to tree diagrams.

In general…
P(A or B) = P(A) + P(B) − P(A and B)
P(A and B) = P(A given B) × P(B)

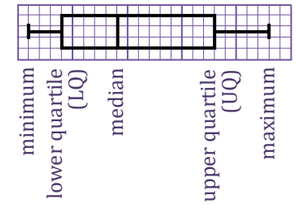
Histograms S3

Frequency = frequency density multiplied by class width. This means that bars with the same frequency have the same area.



Box plots S4

Interquartile range (IQR) = UQ − LQ



Beliefs and Values - Medical Ethics.

Key Words			
Abortion	The deliberate termination of a human pregnancy, most often performed during the first 24 weeks of pregnancy	**Hospice**	Hospice care is a style of care. Hospice teams include doctors, nurses, social workers, therapists, counsellors and trained volunteers. Hospices aim to feel more like a home than hospitals do
Cloning	Cloning is the process of producing genetically identical individuals of an organism either naturally or artificially	**Euthanasia**	The painless killing of a terminally ill patient
Genetic Engineering	The deliberate modification of the characteristics of an organism by manipulating its genetic material	**Quality of Life**	How easy or difficult someone's life is – e.g. some illnesses / injuries can cause a low quality of life
Evolution	Scientific theory of the development of humans from apes	**Sanctity of Life**	The belief that all life is sacred as man is made in God's image

Key Ideas		
Cloning & Genetic Engineering 	**Christian Views** ☐ Each human has been uniquely created by God with a purpose: a human clone is a copy, unnaturally created. ☐ We have a God given responsibility to look after and care for God's creation (**Stewardship**). ☐ Catholics believe human life, which begins at conception, is made in the **image of God** so is sacred: embryo research and high death rates during testing is disrespectful to life. ☐ Cloning separates the procreation of children from sex so therefore is unnatural. ☐ Jesus helped those who suffered, and God loves all of His creations. The Bible teaches us to be loving and compassionate (agape): trying to cure terrible illnesses is a caring thing to do. ☐ God is the creator and science should not attempt to take on this role. - ***'There is a time to live and a time to die.'*** ☐ God gave Adam dominion over all of creation – can use cloning for the benefit of humans.	
When does life begin 	• Most people, whether they hold a religious belief or not, would accept that human life is special and worthy of being preserved. For religious believers, life is special because it comes ultimately from God. Life is a gift and is unique and priceless. • Many Christians believe that all babies have a **sou**l from the moment of **conception** and so are fully human. This is based on the teaching in Genesis 1:27 that people are made in the image of God; that God has a plan for every individual (Jeremiah 1:5) and that God is the creative spark from the moment of conception (Psalm 139:13). This means that they believe the foetus is fully human.	
Abortion 	- **Abortion** is the removal of a foetus from the womb in order to end a pregnancy. - In the UK (except Northern Ireland) it is **legal** during the first 24 weeks of pregnancy unless the mother's life is in danger or the foetus is severely deformed. ☒ The ***Catholic Church*** is strongly against abortion. They believe in **sanctity of life**, the idea that life is a sacred gift from God which only God can take away. They see the foetus as a living thing. ☑ The ***Church of England*** think abortion is sometimes acceptable as a pregnancy as a result of rape or where the child would be very ill would lead to a very poor **quality of life.**	
Euthanasia 	- **Euthanasia** is the painless killing of a patient with a terminal illness. - **Voluntary** euthanasia is where the patient asks for their life to be ended. - **Non-voluntary** euthanasia is where the patient is not capable of asking to die, perhaps in a coma. - All forms of euthanasia are currently **illegal** in the UK. ☒ The ***Catholic Church*** is strongly against euthanasia. They believe that only God can give and take life and that life is sacred (**sanctity of life**) . ☑ Some ***liberal Christians*** think euthanasia can be an act of mercy which Jesus tells them is a good thing to do, this is especially the case when someone's **quality of life** is very poor.	
The Afterlife 	**-** Christians believe that when you die you will be judged and that those who are found to be good will go to **heaven** but those who have sinned and gone against God's wishes will go to **hell**.	
	Roman Catholics believe that there is a middle stage called **purgatory** where souls go to be purified of sin before they go to heaven	**Some Christians** believe that Jesus will return on a future **Day of Judgement** when all souls will be judged

Lessons 1
Sexual and asexual reproduction

Sexual reproduction involves the fusions of male and female gametes

Gametes: sex cells, sperm and eggs in animals, pollen and egg cells in plants

In sexual reproduction genetic information is carried and passed on in genes.

We inherit 1 set of genes from each parent.
The mixing of genetic information leads to variation in the offspring.

	Sexual reproduction	Asexual reproduction
Number of parents?	2 parents (male & female)	1 parent (male or female)
Are offspring called clones?	No offspring are not clones of the parents	Yes offspring is a clone of parent
What happens to make the offspring	Fusion of sperm and eggs	The parent splits (mitosis) or a bud is formed
Is there genetic variation in offspring	Yes offspring is a mix of both father and mother	No offspring are genetically identical to parent
Examples of organisms which reproduce in this way	Dogs, Humans, Hamsters, fish, snakes, birds,	Bacteria, Yeast, daffodils, strawberries

Lessons 2
Meiosis

Gametes are sex cells produced by a special type of cell division called meiosis.

Meiosis is special as the chromosome number reduces by half.

Gametes must have half set of genetic information, 23 chromosomes. This is vital because it ensures fertilisation results in a cell with a full set of genetic information.

Gametes are described as haploid, this means half set of genetic information.

Meiosis occurs in the testes and ovaries.

	Mitosis	Meiosis
Where does it occur	All over the body	Sex organs
Number of divisions	1	2
Creates	All cells apart from gametes	Gametes
Number of chromosomes	46 (diploid)	23 (haploid)
Produces	Two cells	Four cells
Function	Cellular reproduction, growth	Sexual reproduction

Lessons 3
DNA and the genome

DNA is a chemical that all genetic material is made from.

Contains coded information on how to make an organism and how to make it work.

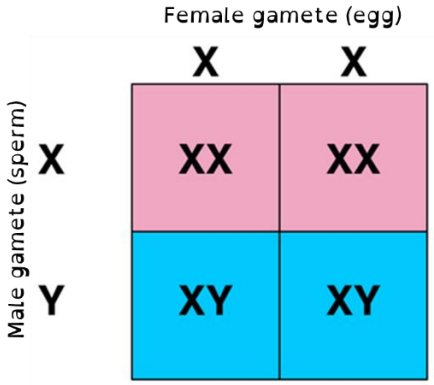
DNA is a polymer, it is made up of two strands, it is twisted to form a double helix.

Chromosomes are made of DNA
Short sections of DNA are called genes
Genes are instructions to make proteins.
Proteins are made from amino acids bonded together.
If you change the order of amino acids, you will change the protein that you make.

Genome: includes all the genetic material in an organism.

Scientists have worked out the whole of the human genome, this is called the human genome project.

The knowledge of the genome from the Human genome project will help with the identification of genes, understanding the link between genes and disease, aid the development of effective treatments and also helps with developing our understanding of evolution.

Lessons 4 Sex determination	Lessons 5 Genetic inheritance	Lessons 6 Inherited genetic disorders
There are 46 chromosomes in every cell in the human body except gametes. There are 23 pairs of chromosomes. 22 pairs of chromosomes contain genes that control characteristics. 1 pair of chromosomes determine sex. Males have XY sex chromosomes Females have XX sex chromosomes.  Using a punnet square as shown above, it is evident that there is a 50% chance will be female and 50% chance of having a male child.	You have 2 copies of every gene, one inherited from your father and one inherited from your mother. **Allele**: different versions of a gene e.g. hair colour alleles would include blonde, red, black and, brown. **Heterozygous**: When an individuals carries 2 different alleles for a particular gene. **Homozygous**: When an individual carries 2 identical alleles for a particular gene. **Phenotype**: What the organism actually looks like e.g. blue eyes, red flowers **Genotype**: The genetic make up of an organism- refers to the genes the organisms has. **Dominant**: An allele that will show up in the phenotype of an organism. **Recessive**: A characteristic that is masked by a dominant gene.	Polydactyl is an inherited genetic disorder caused by a dominant allele and results in extra fingers or toes. Polydactyl is unusual because it is caused by a dominant allele. Most genetic disorders are caused by inheriting 2 recessive alleles. Cystic fibrosis is an inherited genetic disorder of cell membranes. It results in the body producing lots of thick stick mucus which clogs up the air passages and the passages in the pancreas. Genetic screening: A test to analysis a person's DNA. Antenatal screening: Used to test the DNA of the foetus while it is still in the uterus. Pre-implantation genetic diagnosis: Used to test for genetic disease in an embryo before it is implanted in to the uterus of the female. This forms part of the process of IVF.

Lesson 1 Genetic Engineering	Lesson 2 Variation	Lessons 3 Selective Breeding
Genetic engineering: Modifying the genome of an organism by introducing a gene from another organism to give a desired characteristic. Benefits of genetic engineering: • Plant crops have been genetically engineered to be resistant to diseases or to produce bigger better fruits. • Bacterial cells have been genetically engineered to produce useful substances such as human insulin to treat diabetes. **Key points of genetic engineering:** 1. Enzyme is used to cut out the gene (instructions) from the DNA 2. The gene is inserted in to a vector, usually a bacterial plasmid 3. The vector is like a vehicle to get the gene in to cells 4. Once the genes are inside the animal, plants or microorganism they will develop the desired characteristic	**Variation**: differences between individuals of the same species. Variation can be caused by **environmental** factors, **genetic** or a **combination** of both. Types of variation **Continuous**: This type of data shows a complete range of measurements from one extreme to the other e.g. height. Caused by the combined effect of many genes and is often influenced by the environment. **Discontinuous**: This is where data falls in to a number or distinct class or category e.g. blood group. Genetically controlled. Presenting data **Continuous** data: line graph **Discontinuous data:** bar graph	**Selective breeding**: also called artificial selection. Process by which human breed plants and animals for particular genetic characteristics. **Process of selective breeding**: 1. Decide which characteristics are important 2. Choose parents that show these characteristics and breed them together 3. From the offspring those with the desired characteristic are bred together 4. Repeat for many generations until all offspring show the desired characteristic. **Selective breeding** is the traditional method for improving crops and livestock. **Selective breeding plants for food:** -Disease resistance -Weather resistance -More attractive -Better flavour -Easier to harvest -Higher yields. **Selective breeding animals for food:** -Cows for increased milk yield -Animals for learner meat -Better flavoured meat -Faster growth rate Selectively breed populations can be very similar and have very little genetic diversity. Entire populations can be vulnerable to the same environmental influence which can negatively affect health.

Lesson 4 Evolution	Lesson 5 Evidence for evolution fossils	Lessons 6 & 7 Evidence for evolution antibiotic resistance and extinction
All of today's species have evolved from simple life forms that first started to develop over 3 billion years ago. **Darwin's Theory of Evolution by natural selection** 1. Variation: there are differences between members of a species 2. Competition: members of a species are competing for resources 3. Survival of the fittest: the best and most adapted individuals survive. 4. Passing on genes: the survivors reproduce and pass on their adaptations to their offspring. Evolution through **natural selection** is a process of change in inherited characteristics of a population over time, which may result in the formation of a new species. **Mutation**: Changes to the DNA sequence, can result in new phenotypes. Bring about variation in a population. **Species**: organisms of the same species can interbreed and produce fertile offspring. **Speciation**: Over a long period, the phenotype of organisms can change so much due to natural selection that a completely new species is formed.	Initially there was no evidence to support **Darwin's theory of evolution by natural selection**. Religion presented a barrier to acceptance. **Fossils** provide **evidence** to support Darwin's theory. Fossils are formed in 3 ways. 1. Fossils can form from parts of organisms that haven't decayed because one or more of the conditions needed for decay were absent. 2. When parts of organisms are replaced by other materials such as mineral as they decay. 3. Preserved traces, footprints, burrows, faeces or rootlet traces. The **fossil record is incomplete**. There are 4 reasons for this: 1. Early life forms were soft bodied and left no fossil trace. 2. Most organisms decay completely when they die so form no fossil trace. 3. Fossils can be destroyed by geological activity. 4. We haven't found all the fossils yet.	**Antibiotic resistance**: When a bacterial that used to be killed by a drug isn't affected by it anymore. E.g. MRSA Developing antibiotic resistance: 1. Within a bacterial population there will be variation. Some individuals are susceptible to antibiotics and some might be resistant. 2. When an individual takes antibiotics to get rid of the bacterial infection, the susceptible bacteria will be killed off. 3. Eventually only the resistant bacteria are left. 4. The resistant bacteria will reproduce 5. Now the population will be made up of resistant bacteria 6. These bacteria will not be killed by the original antibiotic. Variation in the bacterial population is caused by **mutations**. Mutations leading to antibiotic resistance gives those individuals an **advantage**, they are more likely to survive and pass their genes on to the next generation. **Extinct**: When no individuals of a species remain. Causes of extinction: New predator, new disease, changes to the climate, new more successful competitors and catastrophic events.

Lesson 1
Finite & Renewable Resources

Finite

- Resources that are being used up faster than they can be replaced.
- There is a limited amount.

Renewable

- Resources that can be replaced at the same rate at which they are used up.

- Humans use the Earth's resources to provide warmth, shelter, food and transport
- Natural resources provide food, timber (wood), clothing and fuels, this is supplemented by agriculture
- Finite resources from the Earth, oceans and atmosphere are processed to provide energy and materials
- Chemists provide new synthetic products which supplement or replace natural products.

Sustainable Development

- Meeting the needs of current generations without compromising the ability of future generations to meet their own needs.

Natural product	Use	Synthetic product that supplements or replaces it
cotton	clothing	polyester
wood	construction material	PVC

Lessons 2 & 3
Pure & Potable Water & Required Practical

Potable Water

- Water that is fit (safe) to drink.

Pure Water

- We get pure water through distillation
- Boil water into steam
- Cool to condense steam and collect water
- Distillation on a large scale would require a lot of energy which would make the process expensive we will look at this in more detail next lesson.
- Pure water only contains H_2O molecules.

Water Treatment

- **Screen** – stops large objects
- **Coarse filter** – large particles removed
- **Sedimentation** –particles fall to bottom, top water drained off
- **Fine filter** – very small particles removed
- **Chlorination** – Chlorine added to sterilise (kill germs)

Chemistry Required Practical: Water Analysis
To analyse the pH and dissolved solid content of 3 water samples

Chemistry Required Practical: Water purification
To obtain pure water from a solution containing water and dissolved solids.

Lesson 4
Treating Waste Water

- Waste water requires treatment before being released into the environment

- Sewage and agricultural waste water require the removal of:
  - Organic matter
  - Harmful microbes

Sewage Treatment

1. Screening removes large solid particles i.e. grit by passing the sewage through a screen.
2. Sedimentation allows the small solid particles (sediment) to sink to the bottom of the tank forming sewage sludge while the liquid (effluent) remains above.
3. The sewage sludge is dried and anaerobically digested (broken down by microorganisms in the absence of oxygen).
4. The effluent is aerobically digested (broken down by microorganisms in the presence of oxygen). This removes organic matter and harmful microbes.

Fresh water / ground water	Desalination	Treatment of waste water
Filtration and sterilisation Requires sterilising agents and filtration equipment	Distillation or using membranes e.g. reverse osmosis Both require lots of energy	Screening, sedimentation, digestion (aerobic and anaerobic) Several steps, requires large treatment plant

Lesson 5 Extracting Metals (Higher Tier)	Lesson 6 Life Cycle Assessments	Lesson 7 Reduce, Reuse & Recycle

Problems with traditional mining:
• Large amounts of waste rock
• Creates large holes in the Earth's crust
• Requires lots of energy
• Only worthwhile extracting high-grade ores
Two alternatives to mining are:
Phytomining:
Advantages
• Uses low grade copper ore
• Requires less energy than smelting
• Produces less air pollution
• Reduces amount of waste rock
Disadvantages
• Can produce toxic chemicals
• Much slower process
• Electrolysis requires large amounts of electricity.
Bioleaching:
Advantages
• Uses low grade copper ore
• Very simple and cheap
• Produces less air pollution
• Reduces amount of waste rock
Disadvantages
• Can produce toxic chemicals
• Much slower process
• Efficiency is very low (lots of waste)
• Electrolysis requires large amounts of electricity.
	• Lifecycle analysis (LCA) is used to work out the **environmental impact** of a product throughout its whole life from extraction of materials through to final disposal.
	• 4 Key Stages:
	  • Raw materials
	  • Manufacture
	  • Use
	  • Disposal
	• 4 Impacts accessed
	  • Water Consumption
	  • Energy used
	  • Carbon Footprint
	  • Natural Resources
	• Life Cycle Assessments are useful for:
	  • Comparing different materials for the same job.
	  • Comparing the same material for different jobs:
		Because both the materials and the energy sources we use are limited/finite, we need to reduce use of these resources.
		• So they don't run out!
		• Also, because obtaining raw materials from the Earth by quarrying and mining causes environmental impacts.
		• The three Rs help to reduce the demand for our limited resources of materials and energy.
		• The three Rs also reduce the amount of waste produced. Landfill takes up space and pollutes the surroundings.
		Glass, Metal and Plastic can be recycled in three steps:
		• Crush
		• Melt
		• Reform

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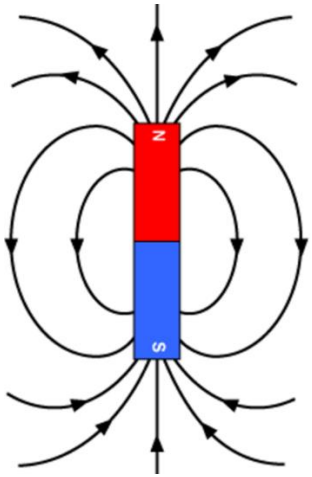
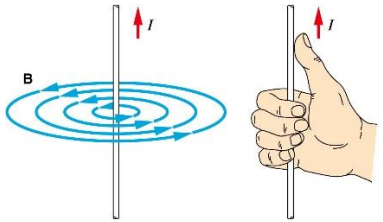
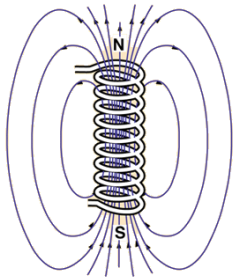
Lesson 1 Magnetic Field Patterns	Lesson 2 Induced Magnetism	Lesson 3 The magnetic effect of a current

• The region around a magnet is called a **magnetic field**. A permanent magnet is an object with a magnetic field.
• The **poles** of a magnet are the areas where the magnetic fields are strongest – usually called North and South. Strictly, we should call these north-seeking and south-seeking.
• Two like poles **repel** each other. Two unlike poles **attract** each other.
• Attraction and repulsion between two magnetic poles are examples of a non-contact force.
• The shape of a magnetic field can be found by placing **iron filings** on paper over a magnet or using a **plotting compass**.
• The magnetic field around a bar magnet is symmetrical:
 
	• An induced magnet is a material that becomes a magnet when it is placed in a magnetic field.
	• **Induced magnetism** always causes a force of attraction.
	• When removed from the magnetic field, an induced magnet loses most/all of its magnetism quickly
	• The strength of an induced magnet will depend on the strength of magnetic field it is placed and the time it is within the field.
	• The strength of a magnet can be simply investigated by seeing how many paperclips it picks up.
	• Smaller paperclips will allow the detection of smaller differences in strength.
		• The **magnetic field around a current-carrying wire is circular**.
		• The strength of the field decreases as you get further from the wire and increases if the current increases.
		 
		• A **solenoid** is a coil of wire with a current flowing through it.
		• Outside the solenoid, the field looks like the field from a bar magnet.
		• Inside the solenoid, the field is strong and uniform.
		 
		• The **strength of a solenoid** can be increased by:
		  • Increasing the current
		  • Increasing the number of loops
		  • Adding an iron core (to make an electromagnet.)

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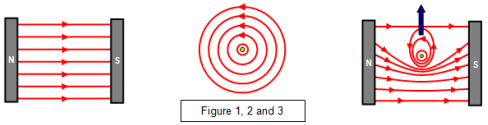
<table>
<tr><th colspan="2">Lesson 4
HT ONLY: The motor effect</th><th>Lesson 5
HT ONLY: Magnetic Flux Density</th></tr>
<tr>
<td>
• The motor effect states that there is a force on a current-carrying conductor in a magnetic field.
• This occurs due to interaction between the magnetic fields.
• Where the fields point in the same direction, the field becomes stronger.
• Where the fields point in the opposite direction, the field becomes weaker.
• There is a force on the wire from where the field is stronger to where it is weaker.


Figure 1, 2 and 3
• The size of the force depends on the strength of the magnetic field, the size of the current and the angle between conductor and field (the largest force is when they are at right angles).
</td>
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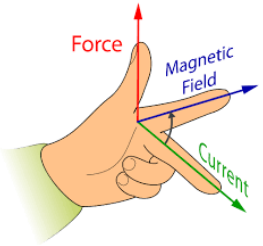
• The direction is found using Fleming's left-hand rule where:
• Thumb, first and second fingers all at right angles.
• First finger is the magnetic field from N→S
• Second finger is the current from + → -
• Thumb is direction of force


• A loop of wire will experience a force in the opposite direction on opposite sides – it is an electric motor.
• A motor can be made to rotate faster by: increasing current, increasing the number of coils, increasing the magnetic field strength, or making sure coil is parallel to field.
• The motor's direction is reversed by: reversing the current or reversing the magnetic field
</td>
<td>
• The size of the force in the motor effect is given by the equation:

Force = magnetic flux density x current x length.
Force in Newtons (N)
Current in Amperes (A)
Length in metres (m)
Magnetic Flux Density, the "strength of the magnetic field" in Tesla (T)

(You do not need to memorise this equation)

• An object can be made to "float" in a magnetic field if its weight downwards is equal to the magnetic force on it upwards.
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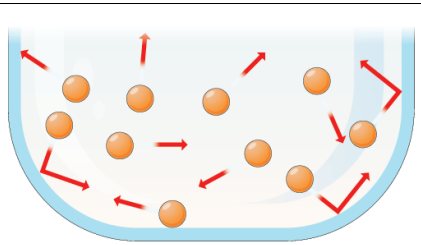
Lesson 7 Specific Latent Heat	Lesson 8 Brownian Motion	Lesson 9 Pressure in gases
• The **specific latent heat** of a substance is the amount of energy required to change the state of one kilogram of the substance with no change in temperature: • **Specific latent heat of fusion** – change of state from solid to liquid. • **Specific latent heat of vaporisation** – change of state from liquid to vapour *Thermal energy for a change of state = mass x specific latent heat* energy in joules , J mass in kilograms, kg specific latent heat in joules per kilogram, J/kg • The larger the value of specific latent heat, the more energy is needed for the change of state. • The specific latent heat of vaporisation of water is nearly 100 times larger than the specific latent heat of fusion of water.	• The motion of particles within a gas is **random**. They have a range of speeds and directions. • As the temperature of a gas increases, the internal energy of the gas increases. • As a gas is heated, the average kinetic energy of the particles within it increases. This means that the average speed of the particles increases. • Larger particles within a fluid (e.g., dust in air) move randomly and seem to "jiggle" about. This is because they are constantly being hit by the particles of the fluid, which move randomly. This is called **Brownian motion**.	 • Pressure in gases is caused because some of the particles collide with the sides of the container. • They change direction, which means (as their velocity changes) they are accelerating. • This means there is a force from the container on the particles. • Newton's 3rd law states that there is a force from the particles on the container. • This force gives rise to pressure. • Gas cylinders can explode in fires, even if they don't contain flammable gases, because the pressure inside the cylinder can rise dramatically.