Knowledge Organiser

Year 10

Cycle 3 - CORE

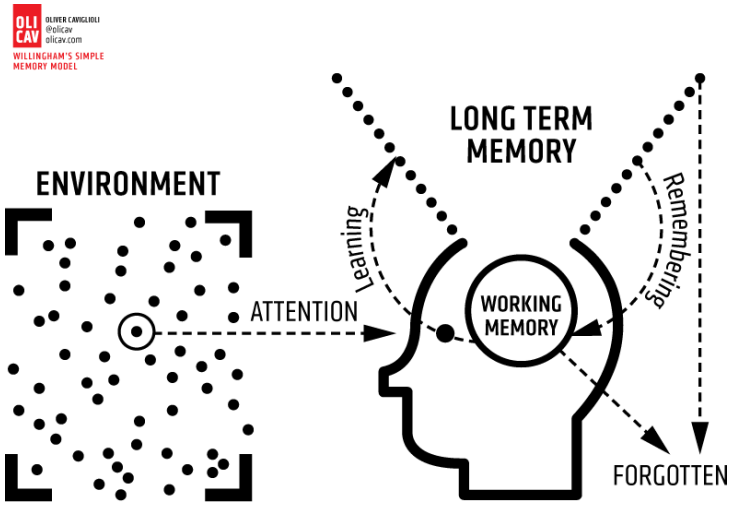
Name:

Inspiring Excellence

Using your Knowledge Organiser for homework

- Your Knowledge Organiser contains the essential knowledge that every student must know.
- Regular use of the Knowledge Organiser helps you to recap, revise and revisit what you have learnt in lessons.
- The aim is to help remember this knowledge in the long term and to help strengthen your memory
- You will use the Knowledge Organiser to help learn during homework.
- 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.

- For each homework you will be asked to look at a particular section of your Knowledge Organiser.
- Make sure you follow the homework timetable below so that you do the right homework for the right subjects each day.
- Each day (Monday to Friday) you will study 2 subjects for 30 minutes each.
- All Knowledge Organiser homework is completed in your blue Knowledge Workbooks
- All Maths and English homework is completed on SPARX and must be 100% completed each week.



Homework Timetable Year 10

	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

How to use your Knowledge Organiser

In your blue knowledge book you will always write the date, subject heading and ensure that they are underlined with a ruler.

Task 1: Questions

Where a subject includes questions to answer, you must answer these in your blue book. This is the main task to do as a minimum. If you have additional time, or where there are no questions, then do the following Tasks 2-4

Task 2: The Cover – Write – Check method

1. Study the relevant section of your Knowledge Organiser for several minutes.
2. Cover the Knowledge Organiser.
3. In your blue book, write out what you can remember.
4. Check the Knowledge Organiser to see if you got it right.
5. Correct any mistakes in purple pen.
6. Repeat the process – even if you got it 100% correct.
7. Complete sections that you have previously studied using the same process.

Task 3: Free recall

1. Pick a section of the Knowledge Organiser you have studied recently.
2. Without looking at the Knowledge Organiser write down everything you can remember about the topic.
3. Check the Knowledge Organiser to see how much you got right.
4. Correct any mistakes and add any missing parts in purple pen.

Task 4: Elaboration

1. Once you have completed the Cover – Write – Check method, add any additional details you can to your notes.
2. Remember your Knowledge Organiser only contains the core knowledge, there is much to learn beyond it so practise adding more detail when you can.

Year 10 Core Cycle 3

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. Then complete the weekly SPaG (spelling, punctuation and grammar) task.

Coombeshead Academy *Inspiring Excellence* English Learning Area

wk	keyword	definition	example
Week 1	**Context**	The wider circumstances in which something exists.	Taking a comment out of context can impact its true meaning.
	Viewpoint	A person's opinion or point of view.	From her viewpoint, the movie was enjoyable.
	Perspective	The background factors which impact a person's viewpoint.	From a teacher's perspective, homework is beneficial.
	Reasoning	Thinking about something in a logical, sensible way.	What is the reasoning behind your behaviour?
	Non-fiction	Informative writing based on true events.	My favourite type of non-fiction text is sports articles.
Week2	Summary	The main points of something.	Give me a summary of your school day.
	Inference	Using evidence to 'figure out' what is being said.	He inferred she'd had a good day from the smile on her face.
	Statement	A definite or clear expression of something in speech or writing	What statement is your writing making?
	Compare	To note the similarity or dissimilarity between things.	He compared his homework to his friend's, which was far better.

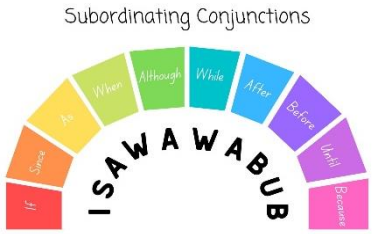
Week 1

Week 1 SPaG task

For each of the following sentences, identify the main clause and the subordinate clause.

1. Outside the window, rain began to fall.
2. He shared his sweets with his friend as it was their birthday.
3. She went to bed after brushing her teeth.
4. Before going home, Ben went to the park.
5. After we went to the cinema, we went out for dinner.

Subordinate clauses begin with subordinating conjunctions. Use this to help you!



Week2

Week 2 SPaG task

Apostrophes are used to show omission (when words are contracted and letters removed e.g. do not becomes don't) or possession (to show when something belongs to someone). Put apostrophes in the correct places in the sentences below.

1. **My dogs new toy is broken already!**
2. **I cant wait to go to the park later.**

	Implicit	When something is suggested, not directly expressed.	The implicit negativity between the friends made him uncomfortable.			3. Its over there. 4. Dans haircut looks really cool. 5. Im excited to go to my friends house.

Week 3	**Analyse**	Examine how a writer uses language and structure to create a particular effect.	After analysing the text, I learnt how the narrator feels.		**Week 3**	**Week 3 SPaG Task** **A comma splice is when two sentences are incorrectly joined by a comma. The below passage contains 3 comma splices. Identify them and correct the commas into the required punctuation marks.** **At the weekend I went out with my family, we went to the zoo. We saw monkeys, crocodiles and lots of insects, they were all so interesting to see and learn about. However my favourite animal was the elephant, he was so majestic and intelligent.**  "He's in a comma."
	Effect	How the reader thinks/feels as a result of the writer's use of language or structure.	The effect of the simile is a sense of comfort.			
	Methods	The things a writer purposely uses to achieve a particular effect.	The writer uses methods such as metaphors in their story.			
	Explicit	Something stated clearly, leaving no room for confusion or doubt.	She made her feelings explicit by shouting.			
	Opinion	A judgement made about something.	What is your opinion on the latest Netflix series?			

Week 4	**Critically**	To analyse the merits and faults of a piece of work.	She thought critically about his offer.		Week 4	**Week 4 SPaG Task** **Correct the spelling errors in the following words.** 1. proberly 2. allways 3. beutiful 4. intresting 5. definately 6. permenently 7. diffrent 8. wierd 9. suprise 10. seperate 
	Evaluate	To assess something, such as its effectiveness.	After evaluating the evidence, he deemed it unnecessary.			
	Examine	Inspect something thoroughly.	Examination allowed them to figure out what was wrong with the animal.			
	Explore	Discuss in detail.	He explored the writer's use of repetition in the text.			
	Describe	Give a detailed account of.	The writer describes his characters in full detail.			

Week 5	**Perceptive**	Showing insight.	He was very perceptive to his friend's moods.
	Cohesion	Forming a united whole.	The conclusion of the story added to the cohesion of it.
	Coherent	Logical and consistent.	Her argument on why the legal driving age should be made higher was very coherent.
	Structure	The arrangement of ideas within a text.	The structure of the text emphasises the tension within it.
	Influence	To be able to have an effect on something.	His writing to the local council helped influence their decision.
Week 6	**Tone**	The mood of the text.	The language choices made by the writer created a serious tone.
	Semantic field	A group of words related by their meanings.	The words "blood", "battle" and "bullets" form a semantic field of war.
	List	Connected items written consecutively.	The writer used a list to give the impression that they had a long day.
	Alliteration	Words beginning with the same letter or letter sound close together in a text.	Alliteration of the 'b' sound creates a powerful, aggressive sound.
	Repetition	Purposely repeating a word or phrase for effect.	Repetition of the word 'unfair' made her point clear.

Week 5

Week 5 SPaG Task

Identify the word classes of the highlighted words in the sentences below.

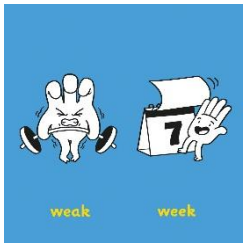
1. He quickly ran to the bus stop; he didn't want to miss the bus.
2. The wind rattled the old shutters.
3. The classroom was missing some tables and chairs.
4. I played football yesterday.
5. I don't like eating sweets; they are too sugary.

Week 6

Week 6 SPaG Task

Add in the correct homophone into these sentences – there, their or they're.

1. _____ was no one else at the bus stop this morning.
2. _____ new shoes are really cool.
3. _____ going to visit their grandparent's this weekend.
4. _____ was no one at _____ house when I knocked earlier.
5. _____ going to regret not coming out with us; we had so much fun.



Week 7	**Extended metaphor**	A metaphor that is introduced then further developed throughout the text.	The extended metaphor of the sea being compared to an angry dog was effective.
	Juxtaposition	Placing two opposing items/images together in a text to highlight the contrast between them.	His actions were in juxtaposition to his thoughts.
	Statistics	Numerical data used to prove ideas or points.	Statistics have shown that use of social media can cause mood swings in young children.
	Facts	Something that can be proven to be true.	His knowledge of political facts helped him to convince his audience.
	Anecdote	A short interesting story about a real person or incident.	She shared a relatable anecdote about growing up with siblings.
Week 8	**Analogy**	A comparison between one thing and another, for the purpose of explanation.	A popular analogy is 'like finding a needle in a haystack' to describe something difficult.
	Hyperbole	Exaggerates statements not meant to be taken literally.	Her use of hyperbole added a comedic tone but was very convincing.
	Hypothetical	An idea presented as a possibility, not real life.	His hypothetical scenario made the audience wish it were reality.
	Oxymoron	Using contradictory terms in conjunction.	A popular oxymoron is the word 'bittersweet'.

Week 7

Week 7 SPaG Task

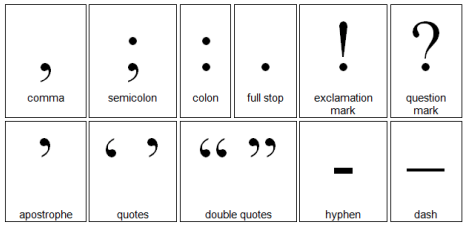
Add a subordinate clause to the beginning, middle or end of these main clauses to create complex sentences.

1. The rain fell
2. He walked home
3. The night darkened
4. She won the race
5. We waited for the bus

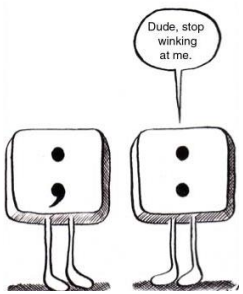
Week 8

Week 8 SPaG Task

Accurately punctuate the following text.



A few miles south of Soledad the Salinas River drops in close to the hillside bank and runs deep and green The water is warm too for it has slipped twinkling over the yellow sands in the sunlight before reaching the narrow pool On one side of the river the golden foothill slopes curve up to the strong and rocky Gabilan mountains but on the valley side the water is lined with trees willows fresh and green with every spring carrying in their lower leaf junctures the debris of the winter's flooding and sycamores with mottled white recumbent limbs and branches that arch over the pool

	Quotes from an expert	Using expert statements to prove a point.	To quote an expert, Dr Johnson at the University of Exeter said, "this is the clearest data to prove climate change is real".			
Week 9	**Register**	The level of formality required, depending on context.	Ensure your register matches the type of text you are writing.		Week 9	Week 9 SPaG Task Identify the adverbial phrases in the following sentences. 1. I ate my breakfast in the morning. 2. I played netball with my friends. 3. When we played football, we lost the ball behind the shed. 4. Everywhere we looked there were signs of Spring. 5. We stayed at home due to the rain. 
	Formal	Using more sophisticated, grammatically correct language.	You must use formal language in any non-fiction writing.			
	Informal	Using more casual, everyday language.	Informal language is widely used when conversing with friends.			
	Article	A piece of formal writing included in a newspaper or magazine.	The newspaper article detailed the events of a crime that occurred last night.			
	Speech	A formal address delivered to an audience.	Her speech detailed her opinions on a new school uniform.			
Week 10	**Letter**	A formal written communication.	He wrote a letter to the local MP to express his views on local issues.		Week 10	Week 10 SPaG Task Semi-colons can be used in place of a full stop to join two main clauses that are closely linked. Put a semi-colon in the correct place in the following: 1. Dad is looking old his hair is getting thinner. 2. I was late for school today there was traffic. 3. I can't wait for break I am so hungry. 4. I need to go shopping I have run out of food. 5. Someone needs to help me I am carrying too much. 
	Essay	A formal piece of writing in which the author gives and evidences their argument on a topic.	Her essay about Macbeth's ambition was excellently written.			
	Leaflet	A printed sheet of paper containing information.	The guides were handing out leaflets at the door of the museum.			
	Blog	A regularly updated webpage, usually run by an individual about their own experiences or ideas.	Her latest blog post detailed her thoughts on the recent general election.			
	Literary non-fiction	Non-fiction writing which gives a story-telling elements to real events.	'Touching the Void' is an example of literary non-fiction.			

Find some examples of 19th, 20th, and 21st century **non-fiction** texts online.

Try to find texts that are **linked by a theme**. Popular ones include: parenting, travel, education, prisons/law, animals, relationships, etc…

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…)
- Vary your **sentence types** (simple, compound, complex, and minor!)
- Use **connectives** to link paragraphs.
- Use TiP ToP to **paragraph** correctly!

<u>Research:</u>

AQA GCSE English Language Paper 2 past papers and mark schemes.

Year 10 Cycle 3 Geography Knowledge Organiser – Geographical Skills and fieldwork (Paper 3)

Week 1 – Tuesday 25th March 2025

Lesson 1 – Introduction to issue evaluation

Key Terms:

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

Longitude: Vertical lines that measure east or west of the meridian in Greenwich, England.

Latitude: Horizontal lines that measure distance north or south of the equator.

Content:

Paper 3 is divided into 2 parts:

- Part 1 – Issue evaluation
- Part 2 – Fieldwork

Paper 3 tests the use of a variety of skills and techniques to investigate issues and communicate findings. 30% of grade.

Geographical skill – Measures of central tendency

Mean: Calculated by adding up all the values in a data set and dividing by the number of values.

Median: This is the central point value in a ranked set of data.

Mode: This is the most common value in a data set.

Range: The difference between the highest and lowest values

Geographical Skill - 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.

Questions:

1. What does paper 3 include?
2. What are the 4 measures of central tendency?
3. What does inter quartile range mean?
4. How do you calculate quartile and inter-quartile ranges?

Lesson 2 – Choropleth maps and bar charts

Key Terms:

Choropleth map: Uses different colours or different densities of the same colour to show the distribution of data categories over a country/region/area.

Bar chart: Numerical values of variables are represented by the height or length of lines or rectangles of equal width.

Content:

Advantages of choropleth maps:

- Different shades make it easy to interpret.
- Data presented by country/region/area which makes it easy to see patterns.
- Good indication of how changes can happen over space.

Disadvantages of choropleth maps:

- There may be variations within the country/region/area.
- Suggests there are sudden changes at the boundaries which is usually not the case.

Advantages of bar charts:

- Summarise large data set in visual form.
- See trends better than in tables.
- Easily understood and widely used.

Disadvantages of bar charts:

- Require additional explanation.
- Fail to show causes, effects, or patterns.

5. What is a choropleth map?
6. State 2 advantages and disadvantages of choropleth maps
7. What is a bar chart?
8. State 2 advantages and disadvantages of bar charts

Exam Practice

Study the table showing data collected during a river study.

River enquiry, April 2015

Stream flow

Date of the month	Flow (cumecs, approx.)
4	4
5	4
6	5
7	3
8	7
9	9
10	6
11	5
12	4
13	4
14	3
15	5
16	6

Cumecs = cubic metres per second

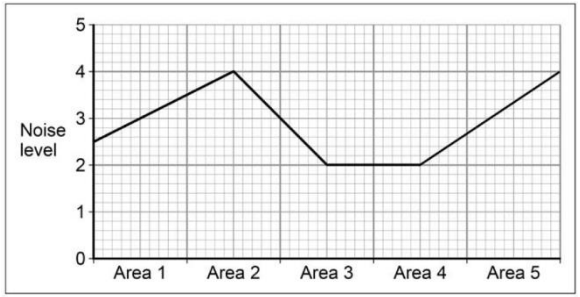
1. Use the stream flow data to calculate the following (2 marks):

Mean:

Median:

Mode:

Study the figure, a diagram showing how a student presented noise pollution survey.



2. Suggest a more appropriate way of presenting the noise pollution data. Give **one** reason for your choice. (2 marks)

Year 10 Cycle 3 Geography Knowledge Organiser – Geographical Skills and fieldwork (Paper 3)

Week 2 – Tuesday 1st April 2025		
Lesson 3 – Line graphs and pie charts	**Lesson 4 – Sustainable and command words**	**Lesson 5 – Geographical investigation**
Key Terms: **Line graph:** Shows how one variable changes over time. **Pie chart:** A circle divided into a segment; it shows the proportions of a total.	**Key Terms:** **Command words:** Words and phrases used to tell how a question should be answered. **Decision making:** The selection of a course of action from two or more possible choices to solve a given problem. **Sustainable:** Meeting current needs without compromising the ability of future generations to meet their needs.	**Key Terms:** **Geographical investigation:** The use of enquiry skills where you generate questions about a topic, formulate a hypothesis about it, and then conduct a field study to collect data to test or prove your hypothesis. **Hypothesis:** A testable statement about the relationship between two or more variables.
Content: **Advantages of line graphs:** • Show changes over time clearly. • Show a large amount of a data on one graph. • Can be easily understood and require little explanation. **Disadvantages of line graphs:** • The scale needs to be carefully considered to show trends accurately. • Works better with smaller sets of data. **Advantages of pie charts:** • Good way of showing how the total is divided up. • Visually effective – easy to see contribution of a segment to the whole. **Disadvantages of pie charts:** • Hard to assess the percentage accurately. • Comparing one pie chart to another is difficult.	**Content:** **What do some command words mean?** • **Suggest**: Put forward an idea or solution. • **Discuss:** Present key points about different views or the strength and weaknesses of an idea. • **Explain:** Set out the causes and/or factors which has influence. **Three features of sustainable are:** • **Social:** Meeting current and future peoples' needs e.g., food, water, housing, education, healthcare. • **Economic:** Ensuring that people and/or a country can make money and help them, and/or the country develops. • **Environmental:** That the environment is protected and balanced, and not over exploited.	**Content:** **Six stages of a geographical investigation:** 1. Idea for investigation 2. Planning for the research 3. Collecting information 4. Presenting the information 5. Analysing the information and drawing conclusions 6. Evaluating the enquiry **Hypothesis:** Creating a hypothesis involves taking a question and converting it into a statement that can be tested. A hypothesis states a prediction about what the research or investigation will find based on a theory. **Example of a hypothesis in geography:** • Longshore drift moves sediment down the beach. • Dereliction causes an increase in crime levels.
Questions: 1. What are line graphs? 2. State 2 advantages and disadvantages of line graphs 3. What are pie charts? 4. State 2 advantages and disadvantages of pie charts	5. What are command words? 6. Give 3 command words and what they mean 7. What does sustainable mean? 8. What three features does sustainable include?	9. What is a geographical investigation? 10. List the 6 stages of a geographical investigation 11. What is a hypothesis? 12. Give 2 examples of a hypothesis

Year 10 Cycle 3 Geography Knowledge Organiser – Geographical Skills and fieldwork (Paper 3)

Week 3 – Tuesday 22nd April 2025

Lesson 6 – Sampling and types of data

Key Terms:

Sampling: Taking a predetermined number of observations from a larger population.

Data: Facts and statistics collected for reference or analysis.

Content:

Types of Sampling:

- **Random:** Collecting data at random e.g., picking up stones from any part of a riverbed.
- **Systematic:** Collecting data at specific intervals e.g., measuring the depth of the river at 30m intervals.
- **Stratified:** Collecting data from different subsets of a parent population to obtain a fair representation of each group. The subsets have a known size e.g., collecting information from different age groups during a survey.

Types of data:

- **Primary data:** Data you collect yourself (or in groups) in the field.
- **Secondary data:** Collected from another person or organisation.

Questions:

1. What is sampling?
2. Outline the 3 different types of sampling
3. What is data?
4. What is primary and secondary data?

Lesson 7 – Quantitative and qualitive data

Key Terms:

Quantitative data: Numerical or fact-based e.g., measuring the diameter of a rock.

Qualitative data: Non-numerical and opinion-based e.g., asking people for their opinion on a questionnaire.

Content:

Examples of quantitative data:

- Sediment size.
- Beach width.
- Pedestrian count.
- Environmental quality survey (EQS).

Examples of qualitative data:

- Questionnaires.
- Focus groups.
- Interviews.

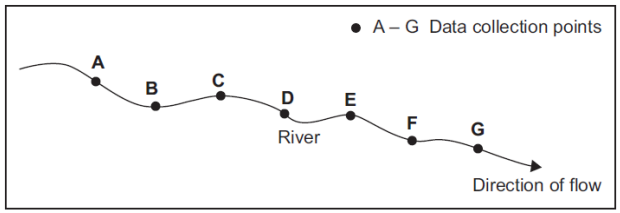
What do you need to remember when collecting data?

- The need for accuracy.
- The need for equipment.
- The need for teamwork.
- The need for sampling.

5. What is quantitative data?
6. Give 4 examples of quantitative data
7. What is qualitative data?
8. Give 3 examples of qualitative data

Exam Practice

Study the figure, part of a student's planning sheet in a fieldwork enquiry.



1. Select the sampling method shown in the figure (1 mark)

A. Opportunity sampling, selecting points which are easiest to access.
B. Random sampling, based on chance.
C. Stratified sampling, where more points are chosen from one area.
D. Systematic sampling where points are chosen in regular intervals.

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

Study the table, data collected by means of a questionnaire about the employment structure of a town.

Primary (%)	5
Secondary (%)	25
Tertiary (%)	70

3. Suggest **two** methods that could be used to present the employment structure data (2 marks)

Year 10 Cycle 3 Geography Knowledge Organiser – Geographical Skills and fieldwork (Paper 3)

Week 4 – Tuesday 39th April 2025

Lesson 8 – Environmental quality survey

Key Terms:

Environmental quality survey (EQS): Uses an observer's judgement to assess an area's particular characteristics.

Subjective: Based on or influenced by personal feelings, tastes, or opinions.

Objective: Factual information based on observations and measurements.

Content:

Often, they work on a sliding scale of quality (like 1 to 5) to represent less good to good. Alternatively, you can use a Bi-polar scale (like -5 to +5) to indicate a negative assessment through to a positive assessment, with 0 representing neither good or bad.

As it is based on personal judgements the data collected using environmental quality surveys is subjective.

Characteristics measure include:

- Buildings.
- Traffic.
- Open spaces and garden.
- General quality.

	–2	–1	0	+1	+2	
Lots of traffic pollution				✓		No traffic pollution
Lots of litter	✓					No litter
Unattractive buildings					✓	Attractive buildings
Lots of vandalism		✓				No vandalism
No landscaping					✓	Good landscaping

Questions:

1. What is an environmental quality survey?
2. How do environmental quality surveys work?
3. What characteristics can be measured?
4. What is the difference between subjective and objective?

Lesson 9 – Field sketches

Key Terms:

Field sketch: A simplistic free-hand drawing of a particular location.

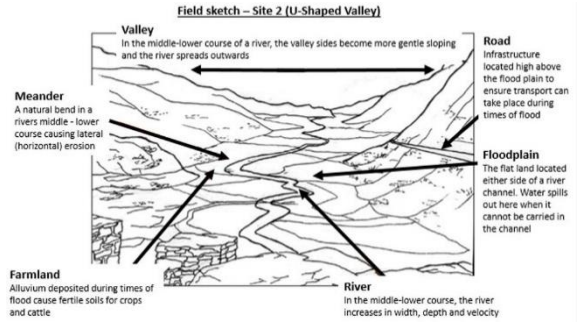
Annotate: Detailed labels with an explanation of what is shown.

Content:

Sketches can be drawn by anyone. They are a useful form of qualitative data. They help geographers remember the places they have visited.

Drawing a field sketch:

1. Identify the landscape to be sketched.
2. Draw the outline of the main features.
3. Add detail to your sketch to record more information.
4. Annotate with information about the landscape and conditions.



Questions:

5. What is a field sketch?
6. What does annotate mean?
7. What type of data is a field sketch?
8. State the 4 stages to drawing a field sketch

Lesson 10 – Questionnaires

Key Terms:

Questionnaire: Consists of a set of questions or other types of prompts that aims to collect information from a respondent.

Closed question: Restrict answers by giving options.

Open question: Allow people to write their response.

Content:

Why are questionnaires used?

Questionnaires are often used to obtain information from a group of people. We use them in Geography because questions can be targeted to get the information you need i.e. linked to your hypothesis.

What makes a good questionnaire?

Order: Start with basic details and move on to more difficult questions.

Clear questions: Simple language, appropriate to the age of the people answering the questions.
Relevant to what you are investigating.

Not Personal: Avoid questions that need very personal or embarrassing answers.

Avoid bias: Avoid questions that push people towards an answer.

Questions:

9. What is a questionnaire?
10. What is a closed question?
11. What is an open question?
12. What 4 things makes a good questionnaire?

Year 10 Cycle 3 Geography Knowledge Organiser – Geographical Skills and fieldwork (Paper 3)

Week 5 – Tuesday 6th May 2025

Lesson 11 – OS maps and sketch maps

Key Terms:

Sketch Map: Simplified version of a particular part of an OS map.

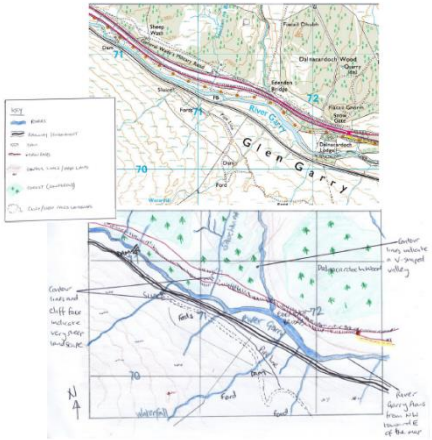
Annotate: Detailed labels with an explanation of what is shown.

Content:

Drawing sketch maps:

1. Select an area of OS map (usually 4 squares) you wish to draw from.
2. On a piece of paper, draw the 4 squares.
3. Pick out the relevant features from the map and add them to yours, using the grid lines as a guide.
4. Annotate with appropriate explanations.

Annotated field map: You look around you and produce a map of your surroundings, picking out things that are relevant to your investigation.



Questions:

1. What is a sketch map?
2. What does annotate mean?
3. State the 4 stages of drawing a sketch map
4. How do you create an annotated field map?

Lesson 12 – Divided (compound) bar graphs and histograms

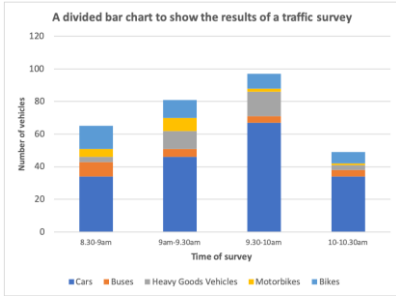
Key Terms:

Divided (compound) bar graph: The bar represents the whole data set and is divided into several segments to represent the proportional size of each category.

Histogram: Bars used to show continuous data that is measured on an interval scale.

Content:

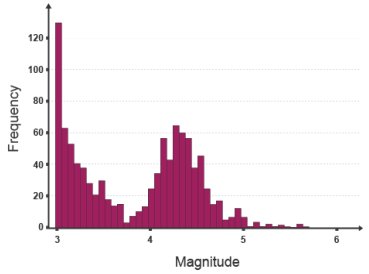
Divided (compound) bar graph: Used to show comparisons between two or more sets of data for each category.



Advantage: Can compare multiple sets of data.

Disadvantage: Hard to show large/small data on same graph and can be too "busy" so harder to read.

Historgram: Similar to bar charts, but they show how frequencies rather than groups of data. They are no gaps between the bars as the data is continuous.



5. What is a divided (compound) bar graph?
6. State an advantage and disadvantage of divided (compound) bar graphs
7. What is a histogram?
8. What is the difference between a histogram and a bar chart?

Exam Practice

1. Suggest one reason why each of the following questions might be useful for an enquiry about visitors to Windermere (2 marks)

- Where have you come from?

- Why are you visiting Windermere?

As part of a geographical enquiry, students carried out an environmental quality survey in one part of a town centre. The results are shown in the table.

	–2	–1	0	+1	+2	
Lots of traffic pollution				✓		No traffic pollution
Lots of litter	✓					No litter
Unattractive buildings					✓	Attractive buildings
Lots of vandalism		✓				No vandalism
No landscaping					✓	Good landscaping

2. Suggest **one** advantage and **one** disadvantage of using the technique shown to measure environmental quality (2 marks)

Year 10 Cycle 3 Geography Knowledge Organiser – Geographical Skills and fieldwork (Paper 3)

Week 6 – Tuesday 13th May 2025

Lesson 13 – Kite diagrams

Key Terms:

Transect: A line across a habitat or part of a habitat.

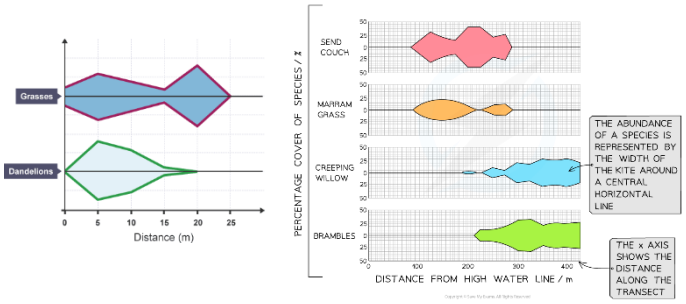
Kite diagram: A graph that shows the number of animals (or percentage cover for plants) against distance along a transect.

Content:

The number of organisms of each species can be observed and recorded at regular intervals along the transect.

Drawing a kite diagram:

1. Make a scale line for the distance covered.
2. One row for each toe of plant/vegetation cover.
3. Each row needs a width to allow 100 per cent.
4. Draw a line through the middle of the row.
5. At each survey point, the value is plotted on both sides of the line down the middle.
6. The points are joined up for each row.



Questions:

1. What is a transect?
2. What is a kite diagram?
3. What is a kite diagram used to show?
4. State the 6 stages in drawing a kite diagram

Lesson 14 – Scatter, radar and triangular graphs

Key Terms:

Scatter graph: Show relationships between two sets of data.

Radar graph: Uses a radial (circular) display with several different quantitative axes.

Triangular graph: An equilateral triangle with three 'axes'.

Content:

Scatter graph: This needs one independent variable (on x-axis) and one dependent variable (on y-axis). Do not join up each point but use a line of best fit instead.
Advantages: Best fit line gives visual guide to strength of relationship and clearly shows anomalies.
Disadvantages: Need paired data, need enough points to show a relationship and best fit line not always clear.

Radar graph: A way of displaying multiple variable quantities.
Advantages: Very visual – easy to see patterns and easy to compare data sets.
Disadvantage: Can be difficult to construct.

Triangular graph: Triangular graphs are used to show the relationship between 3 sets of data and are used when the 3 sets of data combined add up to 100%.
Advantages: Large amounts of data can be shown in one graph.
Disadvantages: Can be difficult to construct and can only be used for data with 3 components adding up to 100%.

5. What are scatter, radar and triangular graphs?
6. State an advantage and disadvantage of a scatter graph
7. State an advantage and disadvantage of a radar graph
8. State an advantage and disadvantage of a triangular graph

Lesson 15 – Pictograms

Key Terms:

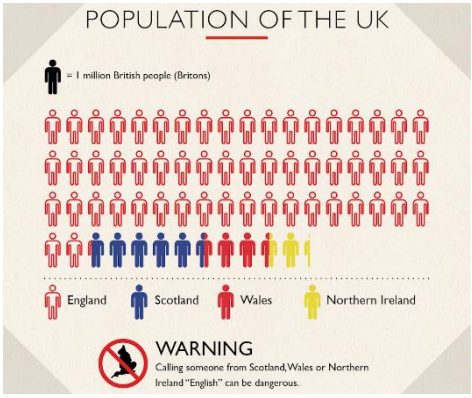
Pictogram: Uses small pictures or icons to represent data.

Content:

A pictogram uses symbols to stand in for data. You can use a pictogram whenever you want to make simple data more visually interesting, more memorable, or more engaging.

Advantages: Pictures clearly show what is being counted and numbers easily seen by key.

Disadvantages: Accuracy of data can be a problem and many other methods easier to construct.



9. What is a pictogram?
10. When do you use a pictogram?
11. What are the advantages of a pictogram?
12. What are the disadvantages of a pictogram?

Year 10 Cycle 3 Geography Knowledge Organiser – Geographical Skills and fieldwork (Paper 3)

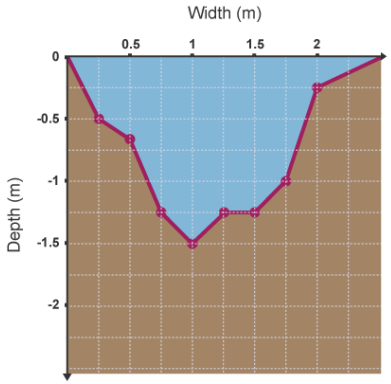
Week 7 – Tuesday 20th May 2025

Lesson 16 – Cross sections

Key Terms:
Cross Section: Line graphs that show a sideways view of a landscape.

Content:
Cross sections can show features such as hills and valleys, or depths, such as the depth of a river. Cross-sections of hills use contour lines to determine the height of the land.

Cross-sections of river depths are drawn using negative numbers so that the line graph looks like depth, rather than height.



Questions:
1. What is a cross section?
2. What are cross sections used to show?
3. When would a cross section have negative numbers?
4. Draw an example of a cross section

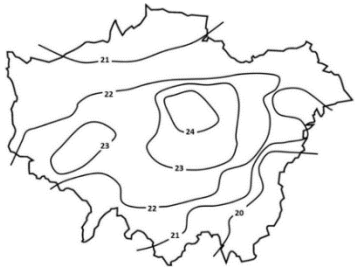
Lesson 17 – Isoline, flow line and desire line maps

Key Terms:
Isoline map: Show lines that join up areas or values that are equal.

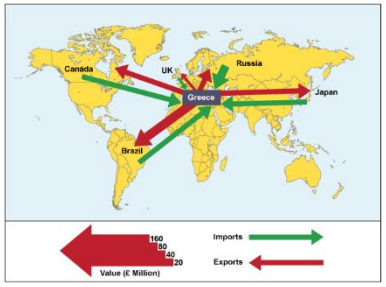
Flow line map: Shows the exact path of movement.

Desire line map: Shows a general direction of movement.

Content:
Isoline map: Isoline maps help to recognise patterns and relationships between the geography of an area and data that might have been collected on the ground, such as air temperature or pedestrian counts.



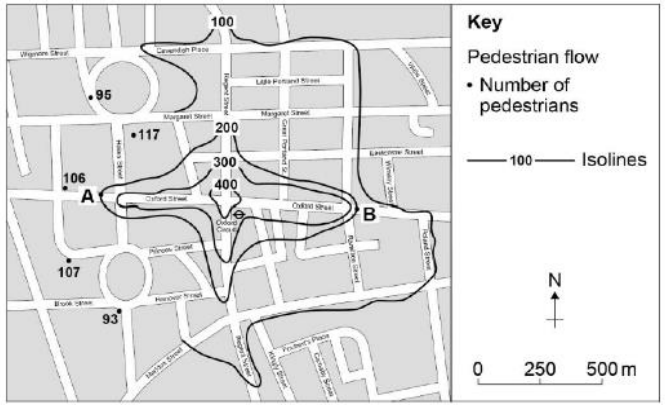
Flow line and desire line maps: Movements are shown as lines. Thick lines show high amounts of movement and thin lines show low amounts. Trade or migration patterns are often shown using desire or flow lines.



5. What is an isoline map?
6. What are the benefits of using an isoline map?
7. What are flow line and desire line maps?
8. What does the thick and thin lines show?

Exam Practice

Study the figure, an isoline map of pedestrian flow in part of London using results from a 5-minute pedestrian count.



1. Explain why the pattern of pedestrian flow shown in the figure may not be accurate (2 marks)

2. Suggest **one** alternative method of presenting the information shown in the figure (1 mark)

Year 10 Cycle 3 Geography Knowledge Organiser – Geographical Skills and fieldwork (Paper 3)

Week 8 – Tuesday 3rd June 2025

Lesson 18 – Proportional symbols map

Key Terms:

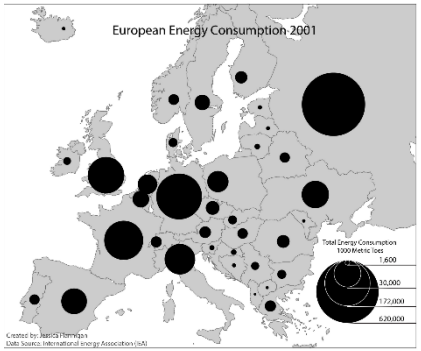
Proportional symbol map: A type of map that includes symbols that change in size based on the value they represent.

Content:

Proportional symbol maps are very flexible because you can use either numerical data (e.g., income, age) or ordered categorical data (e.g., low, medium, and high). They're also flexible because they can be used for data attached to geographic points (e.g., a precise location) or data attached to geographic areas (e.g., countries).

Advantages: Useful to see differences between places and easy to read as each symbol is proportional to its value.

Disadvantages:
Difficult to calculate the actual value, the size may cover other locations and time consuming to make.



Questions:

1. What is a proportional symbols map?
2. How are proportional symbols map flexible?
3. State an advantage of a proportional symbols map
4. State a disadvantage of a proportional symbols map

Lesson 19 – Analysis and central tendencies

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.

Content:

Geographical skill: Percentage increase - First: work out the difference (increase) between the two numbers you are comparing. Then: divide the increase by the original number and multiply the answer by 100. If your answer is a negative number, then this is a percentage decrease.

Measures of central tendency

Mean advantage: Considers of all values to calculate the average.
Mean disadvantage: Very small or large values can affect the mean.
Median advantage: Not affected by very large or very small values.
Median disadvantage: If there is an even number, median is found by average the two middle numbers, therefore the median value might not be an original number.
Mode advantage: Only one that can be used if the data set is not numbers e.g., types of cars.
Mode disadvantage: There can be more than one so not always representative of the data.

5. What does analysis mean?
6. State an advantage and disadvantage of using mean
7. State an advantage and disadvantage of using median
8. State an advantage and disadvantage of using mode

Lesson 20 – Conclusions

Key Terms:

Conclusion: Summarise the main findings and offer geographical explanations for the results.

Content:

What should a conclusion include?

- Summarise the finding using selected data to support the point.
- Pull together the findings to make a few statements directly linked with the title and hypothesis.
- Comment on whether the results were what was expected.
- Any unusual results should be acknowledged and explained.

9. What does the term conclusion mean?
10. What do you summarise?
11. What should you link the findings to?
12. What should be done with unusual results?

Year 10 Cycle 3 Geography Knowledge Organiser – Geographical Skills and fieldwork (Paper 3)

Week 9 – Tuesday 10th June 2025

Lesson 21 – Evaluation

Key Terms:

Evaluation: Reflecting on the reliability and validity of all sections of a geographical investigation.

Validity: The suitability of the method to answer the question that it was intended to answer.

Content:

What should an evaluation include?

- Describe the data collection methods, including any equipment used and was it the right equipment.
- Identify problems with data collection method and suggestions for improvement.
- Identify limitations of the data collected.
- Suggest other data that might be useful.
- Evaluating the conclusion – did the study help answer the question, was the hypothesis specific enough, was the location suitable, how could the data be made more accurate?
- Suggest how to extend the scope of the study.

Questions:

1. What does the term evaluation mean?
2. What does validity mean?
3. What should you describe and identity in an evaluation?
4. How do you evaluate the conclusion?

Lesson 22 – Dawlish Fieldwork 1

Key Terms:

Hypothesis: A testable statement about the relationship between two or more variables.

Sampling: Taking a predetermined number of observations from a larger population.

Content:

Location of Dawlish Warren: Southern England in the county of Devon. It is located just east of Dawlish on the English Channel and extends out into the mouth of the River Exe.

Hypothesis: The groynes at Dawlish Warren affect the rates of longshore drift

Why do we sample?

Simply there is not enough time to measure everything, therefore data is gathered from a small part of the whole thing using a sampling technique.

What sampling method has been chosen?

Systematic sampling: Samples are chosen in a regular way and are evenly distributed.

Advantages: More straight forward and gives a good coverage of the area.

Disadvantages: It's more bias as not all points have an equal chance of being selected.

5. Where is Dawlish Warren?
6. Why do we sample?
7. What sampling method has been chosen?
8. What are the advantages and disadvantages of the chosen sampling method?

Exam Practice

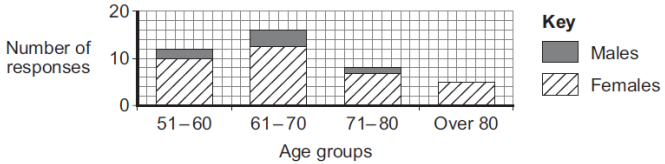
Students measured the flow of water in two different rivers over 7 days. The table shows the results, in rank order, for the two rivers.

1. Complete the table below by calculating the interquartile range for River B (1 mark)

	River A (Flow in cubic metres/second)	River B (Flow in cubic metres/second)
	6.2	11.8
Upper quartile →	6.0	10.4
	5.6	8.7
	5.2	5.1
	5.0	2.1
Lower quartile →	4.5	1.4
	3.7	1.2
Median	**5.2**	**5.1**
Interquartile range	**1.5**	

A group of students used a questionnaire to assess whether local facilities for the older population were good enough.

The following diagram shows the age groups of people who were asked to complete the questionnaire.



2. Suggest **two** additional data collection techniques that the students could use to find out of local facilities are good enough for the older population (2 marks).

Year 10 Cycle 3 Geography Knowledge Organiser – Geographical Skills and fieldwork (Paper 3)

Week 10 – Tuesday 17th June 2025		
Lesson 23 – Dawlish fieldwork 2	**Lesson 24 – Bristol fieldwork 1**	**Lesson 25 – Bristol fieldwork 2**
Key Terms: **Methodology:** The different the ways that data can be collected. **Fieldwork:** The process of observing and collecting data about people, cultures, and natural environments. **Foreshore:** The intertidal zone, the part of a shore between high- and low-water marks.	**Key Terms:** **Urban Change:** Any change within an urban environment associated with growth or decline of an urban area. **Social opportunities:** Chances to improve peoples' quality of life, for instance sport, shopping, culture, and events.	**Key Terms:** **Land use:** Function of the land and what it is used for. **RICEPOTS:** A system for recording urban land use.
Content: **Measuring evidence of longshore drift:** This will be completed at all odd number groynes along Dawlish Warren: 1. On the Dawlish side of the groyne, measure the distance between the top of the groyne and the sand. Record the distance. 2. Move to the Exmouth side of the groyne and repeat the measurement and record the distance. This allows for both sides to be completed and if there is a difference, longshore drift is occurring, and the groynes are doing their job. **Measuring the rate of longshore drift:** 1. Measure out 10m using a tape measure close to the water and mark the start and end point. 2. Put a float into the water in the foreshore at the start. 3. Observe and record the time and direction of the object across the 10m	**Content:** **Where is Bristol Harbourside?** Bristol is found in the southwest of England and is near the Severn Estuary. The Harbourside is located to the southwest of Bristol city centre. **Hypothesis:** Urban Change at Bristol Harbourside has created social opportunities. **What sampling method has been chosen?** Different sampling techniques are used for the different types of data collected. **Harbourside Land use:** No sampling technique is used as the whole harbourside is covered. **Environment of the Harbourside:** Stratified sampling used to ensure there was a wide coverage of the harbourside and to ensure that results were proportional and representative of the whole.	**Content:** Data will be collected through 3 different methods whilst walking to 24 identified locations in and around the Harbourside. **Harbourside land use:** When walking between the 24 different locations, how the land is being used is recorded on a map using the RICEPOTS index. It will help identify what opportunities are on offer e.g., employment, housing, and leisure activities. **Environment of the Harbourside:** There were two different fieldwork techniques used: • **Environmental quality survey (EQs):** At the 24 identified locations, a survey will be completed where the area will be judged against a criteria and a score produced. • **Pedestrian count:** At certain sites, the number of people passing by will be counted for a certain amount of time. This is to see how busy the harbourside is. The busier it is, clearly people want to be there.
Questions: 1. What is a methodology? 2. How will evidence of longshore drift be measured? 3. Why are both sides of the groyne measured? 4. What 3 steps are used to measure the rate of longshore drift?	5. What does urban change and social opportunities mean? 6. Where is Bristol Harbourside? 7. What is the hypothesis? 8. What sampling method has been chosen?	9. What does land use mean? 10. How many locations will be visited? 11. How will Harbourside land use data be collected? 12. How will environment of the Harbourside data be collected?

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

Name three states which joined the USA between 1790 and 1838	Maine; Alabama; Ohio; Indiana; Illinois; Michigan; Tennessee; Mississippi; Vermont
Name one early President of the USA 1789-1838	George Washington; John Adams; Thomas Jefferson James Monroe;
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
How many slaves lived in the South by 1838?	Over 2 million
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
What piece of machinery did Eli Whitney invent?	Cotton Gin
How much cotton was the USA exporting by 1838?	Over a million bales a year
Explain how the Missouri Compromise tried to solve divisions over slavery in the USA	New states added in the West 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
Name three of the Five Civilised Tribes	The Cherokee; Chickasaw; Choctaw; Creek; Seminole
What was the Indian Removal Act of 1830?	A law that promised money to tribes if they relocated to the west of the Mississippi
Which tribe challenged the Indian Removal Act in the Supreme Court?	Cherokee
Which President was responsible for the Indian Removal Act?	Andrew Jackson.
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

Name the two main branches of the Sioux Indians	Lakota and Dakota. Lakota Sioux were more experienced with guns and horses.
What was the main source of food for the Cheyenne?	Buffalo
What was the name of the sacred centre of Sioux culture?	Black Hills of Dakota
Explain why the Sioux moved on to the Plains	Sioux homelands began filling up with other Indian tribes escaping white expansion in the East
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
Name two diseases which killed people on the trails to Oregon and California	Cholera and Typhoid
Who led the Mormons to Utah?	Brigham Young
Why were the Mormons so keen to settle in the West (in Utah)?	They wanted to practise their religion. They had been persecuted in the East and their leader, Joseph Smith had been killed.
Where was gold first discovered in California in 1848?	Sutter's Mill, California Territory
Name two states or territories added to the USA between 1839 and 1860	California, Colorado, Utah, Kansas
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.
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)
Impacts of Pike's Peak	Population increase led to Colorado becoming 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

Which political party was established in 1854?	The Republican Party (an anti-slavery party)
What Act was passed in 1854 that allowed states to decide if they wanted to be free or slave states?	Kansas-Nebraska Act
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
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
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.
When was the Emancipation Proclamation (which freed all slaves) issued?	1863
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.
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.
In what year did soldiers get equal pay in the army?	1864 (but they still couldn't serve as officers)
What was the Sea Islands Experiment?	Islands of the coast of South Carolina were given to freed slaves of the South
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)
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
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
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

Name an impact of the railroads on Indians	Disrupted buffalo hunting grounds; Encouraged settlers and cattle ranchers to settle on Plains.
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.
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.
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.
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.
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.
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.
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.
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.
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.
What were the results of Red Cloud's War?	The US were defeated. Fort Laramie Treaty signed promising no settlers on Sioux land.
What caused the Great Sioux War?	Gold discovered on sacred ground. US govt. ordered all Sioux to leave but many refused.
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

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.
Which group tried to protect the rights of Native Americans?	'Friends of the Indian' set up in 1883
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
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.
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
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.
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.
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
How did the growth of cities create new opportunities for people between 1877 and 1900?	Work, entertainment, education and freedom.
What problems did the growth of cities lead to?	Overcrowding & Disease
Why did people want to move to America?	American economy was booming by 1880s; USA offered freedom of religion and thought
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

Life Skills Knowledge Organiser – Cycle 3 Year 10

Lesson 1 – CV'S

Places to access support
https://www.unifrog.org/

Content:
A **CV** stands for 'curriculum vitae' (that's Latin) and it is a summary of a job applicants experience and educational background.

What should a CV include?

- Employers need to know what qualifications you have:
- Keep it simple- GCSE's, AS Levels, A Levels
- If you haven't had your results yet, include predicted results
- Don't lie- if you are successful you may have to provide proof
- Include vocational qualifications
- Work experience is very important to add to your CV and includes the following:
- Paid employment
- Volunteering
- Work Experience
- Informal work

Include relevant skills and strengths. Examples of things you could include:

- Member of a school council
- Captain of a sports team
- Grades in music or dance
- Training: first aid, mental health first aid or food hygiene certificate
- Advanced computer skills

To structure your CV, include sections for **Personal Information**, an optional **Personal Statement** summarizing your skills and goals in 2-3 lines, **Key Skills**, **Work Experience**, **Education**, and **References**.

Questions

1. What is a CV, and what does it summarise?
2. What types of qualifications should you include on your CV?
3. Why is it important not to lie on your CV?
4. What kinds of work experience should you include in your CV?
5. What are some examples of skills and strengths you can add to your CV?

Lesson 2 – Volunteering and Work Experience

Places to access support
https://getvolunteering.co.uk/

Content:
What is volunteering? Volunteering is where an individual or group provides services for no financial or social gain, to benefit another person, group or organisation. Volunteering can have positive benefits for the volunteer as well as the person or group being served.

Why is it important? By volunteering, you could be the reason someone gets a hot meal at a food bank. It could even be by increasing the confidence of a child in a scouts group, or helping someone buy some new clothes at a charity shop!

Conduct in the workplace
Being in a work environment is different to hanging out with your friends or being at school. Everyone at work has a purpose and a job to get done, and should behave in a way that doesn't negatively affect their own or their colleagues' performance.
Follow these simple rules to go by, to ensure you are a star employee at your work experience placement!

- Remember your manners; say please and thank you, and always be respectful.
- Be smartly/ appropriately dressed and turn up on time!
- Listen. Lots of workplaces will have specific rules that must be followed.
- Ask questions: If there's something in particular you want to know or learn, ask! There's no such thing as a silly question and your work experience employer is there to show and tell you all about their industry.
- Act responsibly and be tidy in your work
- Follow the health and safety rules of the organisation
- If you are going to be late or need to be off because of illness, you must telephone your work experience employer immediately and explain the situation to them.

Questions

1. What is volunteering, and how can it benefit both the volunteer and others?
2. Why is volunteering important?
3. How is working in a workplace different from being at school or with friends?
4. What are some important rules to follow during work experience?
5. What should you do if you're going to be late or need time off during your work experience?

Life Skills Knowledge Organiser – Cycle 3 Year 10

Lesson 3- British Identity

Places to access support
https://www.ons.gov.uk/

Content:

The **UK is identified as one country**, for example in its membership of the UN. In sport, the UK can be seen as one nation, eg when referring to the Olympic team. Whereas in other sports, there are separate teams representing each country that makes up the UK.

In 2002 government proposed the introduction of **Citizenship tests** for people wanting to become British citizens. This came into force in 2005. Immigrants seeking British citizenship have to **pass a test on knowledge of the British way of life**. These tests have been widely criticised because of lack of agreement on what is British and the fact that many people born in Britain would probably fail the tests.

Here are three examples of citizenship questions:
In which year did the UK officially join the European Economic Community (EEC)? Who was the longest-reigning monarch in British history?
What is the main purpose of the National Health Service (NHS)?

Questions

1. How is the UK represented in the Olympics?
2. When were the Citizenship tests introduced in the UK?
3. What was the purpose of the UK Citizenship tests introduced in 2005?
4. Why have the UK Citizenship tests been criticized?
5. Can you name one example of a question asked in the UK Citizenship test?

Lesson 4 – Human Rights and International Law

Places to access support
https://www.un.org/en/about-us/universal-declaration-of-human-rights

Content:

Where do our rights come from?
Rights come from lots of different places. Understanding where they come from can help you to find out what to do if they're being ignored. They mostly come from:
United Nations Convention on the Rights of Children (UNCRC). This is a set of standards we follow in the UK that lists the rights that every child should have. These include the right to relax and play, to express yourself freely and to have an education. The Unicef website has more information about the UNCRC.

What rights do I have?
We all share lots of the same rights, but we also have some different rights depending on our age and our needs. You might not realise it, but rights are a part of your everyday life.

These are just some of the rights you have:
Everywhere – you have the right to your own beliefs or religion and the right to be protected from violence and abuse.
At home – you have the right to a standard of living, such as money, food and housing that meets your needs.
At school or college – you have the right to education even if you don't go to school, you're in hospital or youth custody.
At work – you have the right to breaks, time off for holidays and to be kept safe.

Questions

1. Where do our rights come from, and why is it important to understand this?
2. What is the United Nations Convention on the Rights of Children (UNCRC)?
3. What rights do you have at home?
4. What rights do you have at school or college?
5. What rights do you have when you're at work?

Life Skills Knowledge Organiser – Cycle 3 Year 10

Lesson 5– UK Politics

Places to access support
https://www.parliament.uk/about/how/elections-and-voting/general/

Content:
UK Parliament is separate from government. **UK Parliament is a law-making authority** in the UK, and it also works to check and challenge the work of government through various processes known as scrutiny. **UK Parliament is made up of three parts: the House of Commons, the House of Lords and the Monarch, who has a ceremonial role**.

The **House of Commons** is the democratically elected part of Parliament. Its 650 members are voted in, usually every five years, when there is a general election.
The **House of Lords** is the appointed part of Parliament. It is independent from and complements the work of the elected House of Commons – they share responsibility for making laws and checking and challenging the work of government.
The third part of Parliament is the **Monarch**. As Head of State, the Monarch's role in Parliament is predominantly ceremonial. They are politically neutral, so do not support any political party or get involved in day-to-day politics. The Monarch approves the bills passed by Parliament, enabling them to become law. The Monarch invites the leader of the party that wins the most seats in a general election to form the UK Government, and opens the new parliamentary session each year.

Questions
1. What is the difference between UK Parliament and the government?
2. What are the three parts that make up UK Parliament?
3. How are members of the House of Commons selected?
4. What is the role of the House of Lords in UK Parliament?
5. What is the Monarch's role in UK Parliament, and how are they involved in law-making?

Lesson 6– Democracy and Voting

Places to access support
https://www.parliament.uk/about/how/elections-and-voting/general/

Content:
In British politics, when we talk about 'the UK Government' we are referring specifically to the **Prime Minister, the Cabinet and their junior ministers and officials**. This is the **team of people responsible for leading and running the UK.** They are drawn from the political party which won the **most seats at the last general election**.

After an election, the leader of the winning party is appointed as Prime Minister and chooses other party members to work in government with them for five years, until the next general election. Even though an MP may be a member of the party that forms the government, if they are not members of that chosen team they are not part of the government.

The time when people vote is called an election.

In a **general election**, like the one coming up later this year, people vote to choose an MP to represent them in Parliament. They vote for the person who they think has good ideas and will make the best decisions for them as individuals and for the country as a whole. Elections are key to democracy. They are people's chance to have a say in how the country is run.

In a general election, people (citizens) elect politicians (MPs) to represent them. The MPs then work in Parliament to help run the country and make sure the will of the people is represented.

Questions
1. How does UK Parliament differ from the government?
2. What are the three parts that make up the UK Parliament?
3. How are members of the House of Commons chosen?
4. What responsibilities does the House of Lords have in Parliament?
5. What is the Monarch's role in UK Parliament, and how do they participate in law-making?

Lesson 7– Democracy and Elections
Places to access support https://www.parliament.uk/about/how/elections-and-voting/general/
Content: A key part of elections being **free and fair** is that they are regular. **In the UK, the maximum time for one Parliament to lead the country is five years.** This was made law by the Dissolution and Calling of Parliament Act 2022. After five years, a general election must be held to give people a chance to have a say in whether their MP and the Government should change. **Each political party publishes a manifesto**. This is a booklet explaining what the party stands for and its policies. It is like a set of promises about what the party will do if it wins the election and forms the next Government. Candidates for a party use the manifesto to try to persuade people to vote for them. In UK elections, seats are allocated based on the first-past-the-post voting system. Here's how it works: **Constituencies:** The UK is divided into geographic areas called constituencies, each represented by one Member of Parliament (MP). **Candidates:** Each constituency has candidates from different political parties (and independent candidates) running for election. **Voting:** Voters in each constituency choose one candidate by marking an "X" next to their name. Voters can only select one candidate. **Winning:** The candidate who gets the most votes in a constituency (a plurality of votes) wins the seat. It's not necessary to get more than half the votes, just the most compared to other candidates. **Total Seats:** The party that wins the most seats in the House of Commons (at least 326 seats) forms the government. If no party wins a majority (a situation called a hung parliament), parties may form coalitions or alliances to govern.
Questions 1. How often are general elections held in the UK, and why is this important for fairness? 2. What is a manifesto, and how do candidates use it in UK elections? 3. How are seats allocated in UK elections? 4. What does "first-past-the-post" mean in the context of UK elections? 5. What happens if no party wins a majority in a UK general election?

Y10 C3 Key knowledge Maths

Use this guide to make sure you know **what to do, when to do it and how to do it**:

Maths homework is to complete sparx

What to do

- Do Sparx **on the days in the homework** timetable
- **Compulsory Homework**: You **must do this** part of your homework every week
- **XP Boost/**Target Homework: Do this to **gain loads of XP** and to improve your maths!

Top Tips

- Do your homework as soon as you can
- Watch the help video
- If you are stuck, speak to your maths teacher before hand-in or pop in to Sparx Support club during breaks

Always:

- Write down the date
- Write down your bookwork code
- Read the question carefully
- Show all your workings
- Highlight/underline your final answer
- Tick if correct/cross if wrong

Your Maths Homework is to complete your sparx

Your Maths Homework is to complete your sparx

Item	Description
Median and quartiles	The **median** is the **middle** value of an ordered list **Quartiles** split the list into **quarters**. 4, 5, 7, 11, 15, 20, 25, 26, 27 Lower quartile 6 — Median 15 — Upper quartile 25.5
Interquartile range	$\boldsymbol{Interquartile\ range = Upper\ quartile - Lower\ quartile}$
Cumulative frequency	The running total of frequencies
Tangent to a curve at a point	The **straight line** that "just touches" the curve at that point.
Speed and velocity	Speed is the distance travelled in a given amount of time. Velocity describes a **speed and** a **direction** of travel.
Velocity	Velocity is the **gradient** of a distance-time graph.
Acceleration	Acceleration is the **gradient** of a velocity-time graph.
Distance travelled	Distance travelled is the **area** under a velocity time graph.
Histogram	A histogram is similar to a bar chart. The number of items in each bar is represented by the **area of the bar**, not the height (as with a bar chart).
Frequency density	The height of a bar in a histogram. Given by $\boldsymbol{Frequency\ density = Frequency \div Classwidth}$
Composite function	A composite function is a function made of more than one function. For example, $fg(x)$ represents a function made of the f and g functions. $x \rightarrow g(x) \rightarrow f(x) \rightarrow fg(x)$
Inverse function	An inverse function is a function that "reverses" another function. For example, $f^{-1}(x)$ reverses $f(x)$

RPE Year 10 – Unit 3 – Extremism

Key Words			
Extremism	Holding extreme political or religious views.	Supremacy	A belief that someone or something is better than everyone else.
Terrorism	The unlawful use of violence and intimidation to bring about political or social change.	Radicalised	A process where someone comes to believe in extreme beliefs.
Fundamentalist	Where people stick very strictly to the rules/beliefs of religion.		

Key Information	
Islam key beliefs 	• The **six articles of faith** in Sunni Islam and **five roots of Usul ad-Din** in Shi'a Islam, including key similarities and differences. • The **oneness of God (Tawhid)**, Quran Surah 112 and the nature of God: **omnipotence, beneficence, mercy, fairness and justice** (Adalat in Shi'a Islam), including different ideas about God's relationship with the world: **immanence and transcendence.** • Angels, their nature and role including **Jibril** and **Mik'ail** and **predestination** and **human freedom** (free will) and its relationship to the **Day of Judgement**. • Life after Death (**Akhirah**), **human responsibility** and **accountability, resurrection, heaven and hell.** • Authority: Prophethood (**Risalah**) including the role and importance of **Adam, Ibrahim and Muhammad.** • Authority: The Holy Books – **Qur'an:** revelation and authority, **the Torah, the Psalms, the Gospel** and their authority. The **imamate** in Shi'a Islam: its role and significance.
Extremism 	• **Extremism** in its broadest sense is an individual or group of individuals who take an extreme position from that of the norm or take an extreme action. • Commonly, those with extremist perspectives have a particular perspective or belief 'in the sense that they take their opinions or beliefs to the limit and do not allow much room for the existence of any other views of life.'
Malala 	• **Malala Yousafzai** is an activist for female education. She was attacked by the **Taliban** (religious extremists). She is quoted as saying: ***'The extremists are afraid of books and pens. The power of education frightens them.'***
Radicalisation 	• It is important to remember that **radicalisation** does not just happen to Muslims. • A person who becomes involved with any **extremist group** can be said to be radicalised. • The UK government has been worried about the rise in extremism for some years. In 2014, it introduced a new responsibility to schools to teach about what the government has called **British Values**.

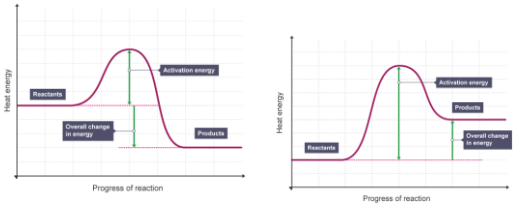
Lessons 1 & 2 **Biodiversity & the impact of population change**	**Lessons 3 & 4** **Pollution and the destruction of peat bogs**	**Lessons 5 & 6** **Deforestation and maintaining biodiversity**
Biodiversity: The range of different living things in an ecosystem or on Earth. The greater the biodiversity the more stable the ecosystem. Human activities that reduce biodiversity: • Deforestation • Pollution • Dumping waste • Development and building • Global warming Consequences of loss of biodiversity: • Loss of undiscovered sources of food and medicine • Useful chemicals • Increased greenhouse gases- climate change An increasing population can impact pollution, food supply, health and disease, water supplies, wildlife/habitat, energy resources	**Land pollution**: Bodily waste, waste water from homes (sewage), toxic chemicals from industrial waste, side effect of farming from pesticides, insecticides and fungicides used to treat crops. **Water pollution**: Farming run off (fertilisers, pesticides, insecticides and fungicides), land fill run off. **Air pollution**: Smoke from combustion leads to particulates and lead to global dimming, acid rain (nitrogen oxides) from the burning of fossil fuels **Peat**: massive carbon store home to many different species of living organisms. Limited decomposition due to high pH and low oxygen conditions. Peat is being <u>destroyed</u>, it is used as a fuel and compost. Using peat in any way leads to a release of the stored carbon, also destroys habitats and leads to a decrease in biodiversity. When peat is dug up, **oxygen** is introduced, decomposers are able to start decay, they release oxygen through respiration of the peat materials. <u>Benefits of peat farming</u>: cheap, natural compost to boost nutrients in soil, easy to use and helps boost yields.	**Deforestation**: Clearing of the land of forest Deforestation is occurring to provide more **space** to produce more food (crops and animal farming), provide **timber** for fuel or material, space for biofuel crops and space for **building and developing**. <u>Consequences of deforestation:</u> • Increased carbon dioxide in the atmosphere, • Reduced biodiversity, • Increased global warming. There are a number of <u>programmes designed to helped maintain and increase biodiversity</u>: • Breeding programmes • Laws and regulations • Nature reserves • Recycling • Reforestation and replanting of hedgerows. Programmes to maintain biodiversity **may not be successful**: • Cost, • Animals may not have natural habitat remaining, • Hunting and poaching still an issue, • Space is needed for building and farming, • Laws can be difficult to enforce, • Lack of education.

Lessons 1 & 2 **Aerobic respiration**	**Lesson 3** **Anaerobic respiration**	**Lessons 4 & 5** **Response to exercise and metabolism**
Respiration: The process of releasing energy from food **Energy**: The capacity of a body or a system to do work Respiration is an **exothermic** reaction. All living organisms must respire to release energy for: • Movement • Temperature control • Growth and repair Aerobic respiration word equation: Glucose + Oxygen → Carbon dioxide + water + energy Aerobic respiration symbol equation: $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$ + Energy **Reactants of aerobic respiration** = Glucose and Oxygen **Products of aerobic respiration** = Carbon dioxide, water and energy Aerobic respiration takes place in the **mitochondria**. Aerobic respiration happens all the time in all cells.	**Anaerobic respiration:** Releasing energy from food without oxygen. Anaerobic respiration is <u>the incomplete breakdown</u> of glucose to lactic acid. Takes place in the **cytoplasm** Word equation for anaerobic respiration: Glucose → Lactic acid + Energy Symbol equation for anaerobic respiration: $C_6H_{12}O_6 \rightarrow C_3H_6O_3$ + Energy **Reactants of anaerobic respiration** = Glucose **Products of anaerobic respiration** = lactic acid + energy. Cells will respire anaerobically when energy demand is <u>very high</u> and there isn't enough time to get oxygen to the respiring muscles. Used during high intensity, quick, explosive activities such as 100m sprint. Anaerobic respiration cannot be used for long because lactic acid builds up and it is toxic. This causes muscular fatigue. Fermentation: Anaerobic respiration in yeast and plant cells. Word equation for fermentation: Glucose → ethanol + carbon dioxide Symbol equation for fermentation: $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2C0_2$	Rate of respiration **increases** when you exercise. To allow increase in rate of respiration: • Increased breathing rate • Increased depth of breathing • Increased heart rate After resorting to respiring anaerobically, when you stop exercising you will have an **oxygen debt**. <u>Oxygen debt</u> refers to the amount of extra oxygen required to react with the built-up lactic acid. Lactic acid reacts with oxygen to form carbon dioxide and water: Lactic acid → oxygen + water To provide the <u>extra oxygen</u> needed to pay the oxygen debt, heart rate and breathing rate remain elevated after exercise. **Muscular fatigue**: where cells in the muscle are unable to contact properly due to the build up of lactic acid. **Metabolism**: all chemical reactions happening in an organism.

Revision Guide: Foundation pages 134-137 , Higher pages 134-137

Lessons 1
Exothermic and endothermic reactions

In an exothermic reaction Thermal energy ,(heat) leaves , (exits) the reaction.
During an exothermic reaction thermal energy is released into the surrounding. This makes the surrounding get hotter and the temperature increases.
Exothermic reactions always happen when chemical bonds are formed , (made). We sometimes call this bond making.
In an Endothermic reaction Thermal energy ,(heat),is absorbed from the surroundings.
During an Endothermic reaction thermal energy is absorbed from the surroundings. This makes the surroundings get colder and the temperature decreases.
Endothermic reactions always happen when chemical bonds are broken . We sometimes call this bond breaking.
Endothermic reactions absorb heat, these reactions are known as thermal decomposition reactions.
Combustion reactions are exothermic . Combustion reactions happen when a fuel burns in Oxygen to make carbon dioxide and water .
Endothermic reactions are used in cold packs to treat sports injuries by reducing inflammation and the sensation of pain.



Lessons 2
Required practical

1. Using a measuring cylinder measure 30 cm^3 dilute hydrochloric acid and put it into the polystyrene cup.
2. Stand the cup inside the beaker. This will make it more stable.
3. Use the thermometer to measure the temperature of the acid.
4. Using a measuring cylinder measure 5 cm^3 sodium hydroxide solution.
5. Pour the sodium hydroxide into the polystyrene cup. Fit the lid and gently stir the solution with the thermometer through the hole.
6. Look carefully at the temperature rise on the thermometer.
7. When the reading on the thermometer **stops changing**, record the highest temperature reached in the table.
8. Repeat steps 4–7, add further 5 cm^3 amounts of sodium hydroxide to the cup each time, record your temperature reading in the results table.
9. Repeat until a maximum of 40cm^3 of sodium hydroxide has been added. Be careful when stirring the final 2 readings as temperature change is very sensitive.
10. Wash out all the equipment and repeat the experiment for your second trial.

Lessons 3
Calculating bond energy, (higher)

Activation energy must be met to break bonds of the reactants.
Energy is also needed to form bonds of the new products.
Different bonds requires different amounts of energy.
This energy is called a bond energy and can be found in a table like the one below.

Average Bond Energies, kJ/mol	
Bond	Energy
C-H	413
O-H	463
C-C	348
C-O	358
H-H	436
C-N	293
O=O	495
C=C	614

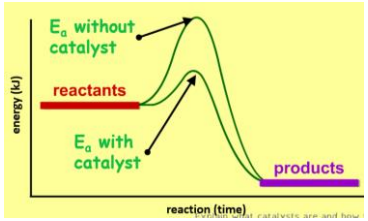
Calculating bond energy changes tells us if a reaction is exothermic or endothermic.
To calculate energy change you will need work out the number of bonds in the reactants and add up the bond energies.
You will then need to work out the number bonds in the products and add up all the bond energies .

Reactant bond energy – Product bond energy = Overall energy change

If the answer is positive the reaction has gained energy and is endothermic.
If the answer is negative the reaction has lost energy and is exothermic.

Lessons 1 Calculating Rates of Reaction	Lesson 2 Collision Theory & Surface Area	Lessons 3 Required Practical Concentration

• The rate of reaction = How quickly a reaction is happening.
  ○ How quickly reactants are turned into products
• $rate = \frac{amound\ of\ reactant\ lost}{time}\ or\ \frac{amount\ of\ product\ formed}{time}$
• We can record experimental data to allow us to calculate the rate of reaction, these include:
  ○ Measuring the decreasing mass of a reaction mixture.
  ○ Measure the increasing volume of gas given off.
  ○ Measuring the decreasing light passing through a solution
• If you change the temperature or surface area you will still get the same amount of product (you just get them quicker or slower)
• If you change the concentration you will get a different amount of product (and you will get them quicker or slower).
• Gradient of the line gives you the rate of reaction.
• If the gradient increases then the reaction rate is faster.
• If the gradient decreases then the reaction rate is slower.
• To record the gradient of a curve you need to take a tangent.
	• Reactions don't happen unless the substances are in contact.
	• Particles are constantly moving.
	• For a chemical reaction to take place the reactant particles must collide first.
	• For the collision to be effective the particles must have the right amount of energy.
	• The minimum amount of energy required for an effective collision is called the activation energy.
	• The higher the frequency of collision the faster the rate of reaction.
	
	Surface Area/Particle Size
	• The sum of all the areas of each side of a shape
	• Using smaller particles increases surface area
	• Increase in surface area allows more *frequent* collisions at surface
		You will investigate the **Effect of Concentration on Rate of Reaction.**
		
		• **Independent variable**: concentration of hydrochloric acid
		• **Dependent variable**: volume of hydrogen gas produced
		• **Control variable**: amount of magnesium added, temperature of solution
		
		Concentration
		• The number of particles in a given volume.
		• At high concentrations there are more particles.
		• More particles in the same space means more frequent collisions.
		• If we double the concentration we double the frequency of collisions
		• More frequent collisions = faster rate of reaction.
		Pressure
		• Gases only
		• At high pressure, the particles are closer together.
		• This means the particles are more likely to collide more frequently.
		• More frequent collisions = faster rate of reaction.

Lesson 4 Required Practical Temperature	Lessons 5 Catalysts	Lessons 6 & 7 Reversible Reactions & Dynamic Equilibrium
You will investigate the **Effect of temperature on Rate of Reaction.** • **Independent variable**: temperature of sodium thiosulfate • **Dependent variable**: time taken for cross to disappear. • **Control variable**: amount of hydrochloric acid, concentration of solution, concentration of hydrochloric acid Temperature • Particles turn heat energy into kinetic energy • When they get hotter they move faster • When they move faster they collide more *frequently* • Particles have more energy at higher temperatures • More collisions with energy higher than the activation energy (more effective collisions)	• Catalysts speed up the rate of reaction without getting used up (same amount at the start as you have at then end) unlike the reactants. • Catalysts are specific to reactions. • Catalysts lower the reaction's activation energy (E_a). • They do this by providing an alternative pathway • This reduces the energy needed to start a reaction • Lower activation energy means more collisions with energy higher than the activation energy. (more effective collisions)  	• Sometimes reactions can reverse themselves, and the products change back to being reactants again. • RE**ACTANTS ⇌ PRODUCTS** • A **reversible reaction** is a reaction that occurs in both the forward and reverse direction. • It is represented by the symbol ⇌ • The amount of energy released in one direction must be the same as the energy absorbed in the opposite direction. **hydrated copper sulphate** • The forward reaction requires heat – it is endothermic Blue → White • The backwards reaction gives out heat – it is exothermic White → Blue **Equilibrium** is when the rate of the forward reaction is equal to the rate of the backward reaction. There is no observable change For equilibrium to occur: • Closed system • Reversible reaction During equilibrium: • Concentrations of products and reactants stay the same. • But the concentrations are not necessarily equal

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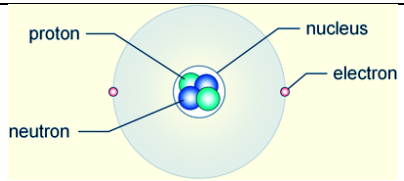
Lesson 8
Le Chatelier's Principle (Higher Tier)

- Describes how the position of equilibria changes to favour the forward or backward reaction
- Equilibrium shifts to reduce change
- When conditions are changed the reaction will do everything it can to counteract the change

Changes:

- If you increase the temperature it will try and reduce it
- If you increase the concentration of the reactants it will try and get rid of some
- If you increase the pressure it will try and reduce it
- If you add a catalyst…
- The position of equilibrium doesn't change (but it will speed up the forward and backward reaction equally)

Lesson 1
Atomic structure



	Proton	Neutron	Electron
Relative mass	1	1	1/2000 (very small)
Relative charge	+1	0	-1
Location	In the nucleus	In the nucleus	Orbits the nucleus in energy levels

- The **diameter of an atom** is approximately: **$1x10^{-10}$** m and the diameter of the **nucleus is 1/10,000** of this.
- **Electrons orbit** in the nucleus **in energy levels**.
- **Electromagnetic radiation can be absorbed by electrons**, increasing their energy and causing them to move to a higher energy level (further from the nucleus).
- When their energy decreases and they move to a lower energy level, electromagnetic energy is emitted.
- **An ion is an atom that has gained or lost one or more electrons.**
- The process of turning atoms into ions is called ionisation, and occurs when electrons are given enough energy to remove them from their orbit completely.

Lesson 2
Isotopes and the nuclear model

- The **atomic number** is the number of protons (the number of electrons is equal to this in an atom, but not an ion.)
- The **relative atomic mass** is the total number of protons and neutrons.
- Atoms of the same element can have different numbers of neutrons; these atoms are called **isotopes** of that element.
- The **plum pudding model** suggested that the atom is a ball of positive charge with negative electrons embedded in it.
- **Rutherford's experiment** provides evidence for the nuclear model of the atom.
- **Alpha particles** were fired at gold foil in a vacuum. The paths taken by the alpha particle led to the development of the nuclear model.
- The plum pudding model was rejected as it could not explain these results.
- **Niels Bohr** adapted the nuclear model by suggesting that electrons orbit the nucleus at specific distances. The theoretical calculations of Bohr agreed with experimental observations.
- The experimental work of **James Chadwick** provided the evidence to show the existence of **neutrons** within the nucleus. This was about 20 years after the nucleus became an accepted scientific idea.

Lesson 3
Nuclear radiation

- Some atomic nuclei are unstable. The nucleus gives out radiation as it changes to become more stable. This is a random process called **radioactive decay**.
- Radiation is dangerous because it is **ionising** – it can turn atoms into ions. The more strongly ionising a form of radiation is the more dangerous it is.

	Alpha Particle α	Beta Particle β	Gamma Ray γ
What is it?	Helium nucleus	An electron	Electromagnetic radiation from the nucleus
Charge	positive	negative	neutral
Range in air	a few cm	a few metres	> 1 km
Absorber materials	stopped by paper	stopped by thin aluminium	thick lead or concrete
Ionisation	strong	weak	very weak
Speed	slow	fast	speed of light

Lesson 4
Nuclear equations

	Alpha	Beta	Gamma	Neutron
Symbol	α	β	γ	n
Change to mass number of nucleus	-4	0	0	-1
Change to atomic number of nucleus	-2	+1	0	0
Short description of change	Two neutrons and two protons, it is the same as a helium nucleus.	A high speed electron ejected from the nucleus as a neutron turns into a proton.	Electromagnetic radiation from the nucleus	A neutron is ejected from the nucleus

- Nuclear equations are used to represent radioactive decay.
- In a nuclear equation, an alpha particle may be represented by the symbol:

$$^{4}_{2}He$$

and a beta particle by the symbol:

$$^{0}_{-1}e$$

- Alpha and beta decay may cause a change in the mass and/or charge of the nucleus.
- The general rule for **alpha decay** is:

$$^{A}_{Z}X \rightarrow ^{A-4}_{Z-2}Y + ^{4}_{2}He$$

- The general rule for **beta decay** is:

$$^{A}_{Z}X \rightarrow ^{A}_{Z+1}Y + ^{0}_{-1}e$$

- The general rule for **gamma decay** is:

$$^{A}_{Z}X \rightarrow ^{A}_{Z}X + ^{0}_{0}\gamma$$

- The general rule **neutron emission** is:

$$^{A}_{Z}X \rightarrow ^{A-1}_{Z}Y + ^{1}_{0}n$$

Lesson 5
Half-life

- **Activity** is the rate at which a source of unstable nuclei decays. Activity is measured in **becquerel (Bq)**
- **Count-rate** is the number of decays recorded each second by a detector (eg Geiger-Muller tube).
- **Radioactive decay is random** – it is not possible to predict:
  - When a particular nucleus will decay.
  - How long it will be before the next nucleus decays.
- Radioactive decay is spontaneous – there is nothing you can do to change the rate at which an isotope decays.
- Whilst we can't make predictions about individual nuclei we can find the average time it takes for half of the undecayed nuclei to decay.
- The **half-life** of a radioactive isotope is the time it takes for the number of nuclei of the isotope in a sample to halve, or the time it takes for the count rate (or activity) from a sample containing the isotope to fall to half its initial level.

Lessons 6 +7
Irradiation and contamination

- **Exposure to radiation** (called "**dose**") is measured in **Sieverts (Sv).** The dose is a measure of the risk of harm.
- **Dose adds up** ("cumulative")
- Scientists have studied the effect of radiation on humans.
- Their findings are published and shared with other scientists so they can be checked – this is called **peer review**.
- **Peer review is an important part of scientific research**.
- The hazard from radiation can be reduced by:
  - Spending as **little time** as possible in at-risk areas.
  - Keeping as **far away** as possible – using long-handled tools if possible.
  - Staying behind **lead or concrete** barriers/shields
- An object is **irradiated** if it is exposed to radiation. It does not become radioactive.
- Radioactive **contamination** is the unwanted presence of materials containing radioactive atoms on other materials.