

Knowledge Organiser

Year 11

Cycle 1

CORE SUBJECTS

Name:

Tutor Group:



What is a Knowledge Organiser and why are they important?

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

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

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

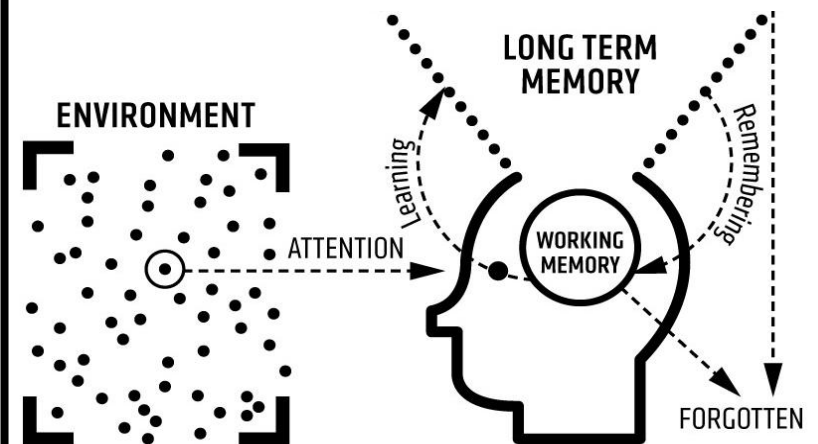
Each cycle there is an assessment in every subject and you will be assessed on the knowledge from your Knowledge Organiser; the more you revisit information the more likely it will be remembered for lessons, assessments and exams.

How we learn anything

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

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

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



Homework in Year 10-11

The purpose of homework

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

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

Homework expectations

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

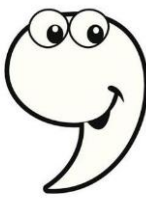
	Monday	Tuesday	Wednesday	Thursday	Friday
Subject 1	Science	Geog/History	Maths	Option Block F	Maths
Subject 2	English	Option Block E	English	Science	Option Block G

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

Year 11 Core Cycle 1
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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.	Week 1	Week 1 SPaG task For each of the following sentences, identify the main clause and the subordinate clause. - Outside the window, rain began to fall. - He shared his sweets with his friend as it was their birthday. - She went to bed after brushing her teeth. - Before going home, Ben went to the park. - After we went to the cinema, we went out for dinner. Subordinating Conjunctions  Subordinate clauses begin with subordinating conjunctions. Use this to help you!
	Fiction	A text that is based upon events that are not real.	The book she had chosen to read was from the fiction section.		
	Commentary	An expression of opinions about an event.	The teacher gave a commentary as to why the model answer was so good.		
	Reasoning	Thinking about something in a logical, sensible way.	What is the reasoning behind your behaviour?		
	Logical	Something that is according to the rules or expected.	Her reaction to her friend's betrayal was logical.		
Week 2	Explicit	Information that is clearly stated.	The teacher explicitly told us to wear our blazers.	Week 2	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.  - My dogs new toy is broken already! - I cant wait to go to the park later.
	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.		

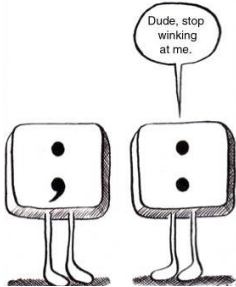
	Implicit	When something is suggested, not directly expressed.	The implicit negativity between the friends made him uncomfortable.		3. Its over there. 4. Dans haircut looks really cool. 5. Im excited to go to my friends house.
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Week 3	Analyse	Examine 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.		
	Declarative	A sentence that provides a statement in the form of a declaration.	1. The sky was blue. 2. I am hungry.		
	Exclamative	A word or phrase that implies a sudden or strong emotion. It ends with an exclamation mark.	I am so frustrated with you!		

Week 4	Critically	To analyse the merits and faults of a piece of work.	She thought critically about his proposal.	Week 4	Week 4 SPaG Task Correct the spelling errors in the following words. 1. properly 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.	Week 5	Week 5 SPaG Task Identify the word classes of the highlighted words in the sentences below. - He quickly ran to the bus stop; he didn't want to miss the bus. - The wind rattled the old shutters. - The classroom was missing some tables and chairs. - I played football yesterday. - I don't like eating sweets; they are too sugary. Verbs A word that describes what a person or thing does, such as: run, hit, rain, be, seem, become, grow Nouns A word that identifies a person, place thing idea or quality, such as: woman, dog, building, London, truth, birth Adjectives A word that describes a noun, such as: red, bad, giant, hairy, shy Adverbs A word that gives more information about a verb adjective or another adverb, such as: lazily, easily, abroad very
	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.		
	Symbolic	Where an image or concept is used to represent something else.	Marley's chains in 'A Christmas Carol' symbolise his regrets.		
Week 6	Tone	The mood of the text.	The language choices made by the writer created a serious tone.	Week 6	Week 6 SPaG Task Add in the correct homophone into these sentences – there, their or they're. _____ was no one else at the bus stop this morning. _____ new shoes are really cool. _____ going to visit their grandparent's this weekend. _____ was no one at _____ house when I knocked earlier. _____ going to regret not coming out with us; we had so much fun. 
	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 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.	Week 7	Week 7 SPaG Task Add a subordinate clause to the beginning, middle or end of these main clauses to create complex sentences. - The rain fell - He walked home - The night darkened - She won the race - We waited for the bus 
	Juxtaposition	Placing two opposing items/images together in a text to highlight the contrast between them.	His actions were in juxtaposition to his thoughts.		
	Oxymoron	Where two words with opposite meanings are placed next to each other.	Deafening silence Pretty ugly		
	Personification	Where a non-human object is given human qualities.	The chair danced as the room shook.		
	Anecdote	A short 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.	Week 8	Week 8 SPaG Task Accurately punctuate the following text. , comma ; semicolon : colon . full stop ! exclamation mark ? question mark , apostrophe “ ” quotes “ ” double quotes - hyphen — dash

	Adverb	A word or phrase that tells us how the verb is being done.	The man ran quickly .		
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.		
	Dialogue	A language interaction between two or more participants.	The length of turns in the dialogue tell us about the character's status.		
	Length of turn	How long each character speaks for in a dialogue.	Birling has long length of turns- this implies he is arrogant.		
Week 10	Narrator	The person recounting the events in a narrative.	The book has a third-person narrator.	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. 
	Allegory	A text that can be revealed to have a hidden meaning.	'Animal Farm' is an allegory for the Russian Revolution.		
	Ambiguity	Where something is left open to interpretation.	The books ended on a cliff-hanger- it was ambiguous.		
	Foreshadowing	Where an event is hinted at earlier in the text.	The stormy weather is used to foreshadow the tragedy later in the book.		
	Cliche	An idea or expression that has been overused.	They were enemies at the start of the book and now they're in love- such a cliché.		

Inspiring Excellence- Developing Revision Skill

1. Use the image below to come up with as many different narrative ideas that you can.
2. Create a mind map of each paragraph for one of the structures you plan above.
3. Number your paragraph ideas in the order you wish to include them in your writing.
4. Alter your orders- see what different effects you can create by swapping events around.



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!

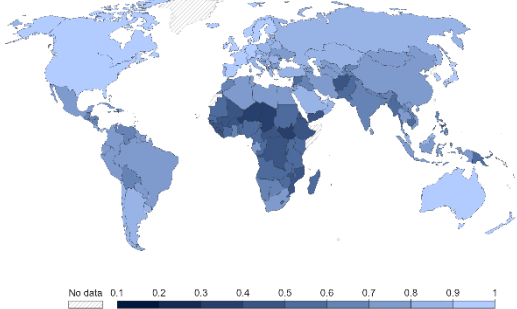
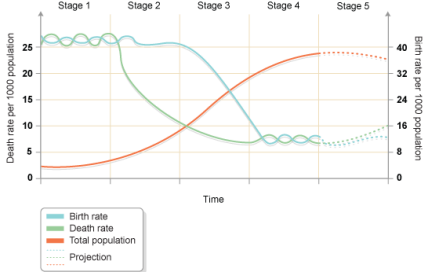
Research:
AQA GCSE English Language Paper 1 past papers and mark schemes.



Year 11 Cycle 1 Geography Knowledge Organiser – The Changing Economic World



Week 1 – Tuesday 9th September 2025

Lesson 1 – What is development & how it's measured?	Lesson 2 – Limitations of development indicators & HDI	Lesson 3 –Demographic Transition Model (DTM)
Key Terms: Development: The progress of a country in terms of economic growth, the use of technology and human welfare. Development Gap: The difference in the standard of living and wellbeing between the world's richest (HICs) and poorest (LICs) countries.	Key Terms: Human Development Index (HDI): A statistical tool used to measure a country's overall achievement in its social and economic dimensions.	Key Terms: Demographic Transition Model (DTM): A diagram that shows how a population changes over time in response to changing birth and death rates. Population pyramid: The breakdown of a population by gender and age at a given point in time.
Content: There are several ways to measure the development of a country. These are called development indicators. Examples of development indicators: • Birth rate: The number of births per 1000 people. • Death rate: The number of deaths per 1000 people. • Life expectancy: The age you are expected to live until. • Infant mortality: The number of children who die before their 1st birthday. • Literacy rate: The percentage of people who can read and write within a country. • Gross National Income (GNI): The total value of goods and services produced by a country, plus money earned from, and paid to, other countries. • Gross Domestic Product (GDP): The total value of goods produced and services provided in a country during one year.	Content: The problem with any development indicator is that it is an average figure for the whole country, and often hides huge differences in the standard of living within a country. Human Development Index uses social (life expectancy, years at school) and economic (GNI per head) measures to give each country a score between 0.1 and 1. Human Development Index, 2021 The Human Development Index (HDI) is a summary measure of key dimensions of human development: a long and healthy life, a good education, and having a decent standard of living.  No data 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1	Content: Reasons for changing birth rates: Religion, tradition, family planning, contraception, education, status of women. Reasons for changing death rates: Food availability, sanitation levels, living conditions, healthcare availability. The population of a country changes as it develops and passes through the stages of the Demographic Transition Model. 
Questions: 1. What is development? 2. What is the development gap? 3. What is birth and death rate? 4. What is literacy rate and Gross National income?	5. What is the Human Development Index (HDI)? 6. What is the problem with development indicators? 7. What 3 measures does the HDI use to calculate the score? 8. Where are areas of high and low HDI?	9. What is the Demographic Transition Model (DTM)? 10. What is a population pyramid? 11. State the reasons for a changing birth rate 12. State the reasons for a changing death rate



Year 11 Cycle 1 Geography Knowledge Organiser – The Changing Economic World



Week 2 – Tuesday 16th September 2025

Lesson 4 – Causes of uneven development	Lesson 5 – Consequences of uneven development	Seneca and Exam Practice
Key Terms: Uneven development: Unequal distribution of people, resources and wealth. Landlocked: A country or region almost or entirely surrounded by land. Colonised: The sending of settlers to a place and establishing political control over it.	Key Terms: Gini Coefficient: A measure of wealth or income inequality within a country Economic migrant: When people move from one area to another to improve their standard of living.	 SENECA AQA Geography: 5.1.1 – 5.1.4 1. Give one disadvantage of using a single measure of development such as income (2 marks) 2. Outline how one historical factor can lead to uneven development (2 marks) 3. Explain how physical and economic factors have caused uneven development (4 marks)
Content: There are 3 main reasons for uneven development: Socio-economic: War means money is wasted on fighting. There are very few industries meaning goods need importing. Poor countries borrow a lot of money and any money they make goes to paying back the loan. Environmental: Some countries have very few natural resources to trade. Climate makes life difficult; unreliable rains or severe flooding. Landlocked countries find it difficult to trade with no access to the oceans. Historical: Friendly trading between countries for things like tobacco, timber and spices. One country is taken over by trading partner by force. Trading partner eventually forced out, but leaves the country with little to no industry, education or skills.	Content: Consequence 1 - Inconsistencies in wealth: As a country develops it gains wealth from trading, but the wealth is not evenly distributed. Consequence 2 - Inconsistencies in health: Many LICs are dependent on HICs for aid as they lack healthcare facilities. Consequence 3 - International migration: This can be voluntary with people searching for a better life (economic migrants). People are more aware of the development gap due to mobile technologies. Evidence of development gap narrowing: Global development particularly in Asia and countries are industrialising. Evidence of development gap widening: Development in Africa is lagging behind, worldwide more than one billion live on less than \$1 a day.	
Questions: 1. What is uneven development? 2. State 2 socio-economic reasons 3. State 2 environmental reasons 4. What is a historical reason for uneven development?	5. How can inconsistencies in wealth be created? 6. How can inconsistencies in health be created? 7. How does uneven development cause migration? 8. Give evidence for the development gap narrowing and widening	



Year 11 Cycle 1 Geography Knowledge Organiser – The Changing Economic World



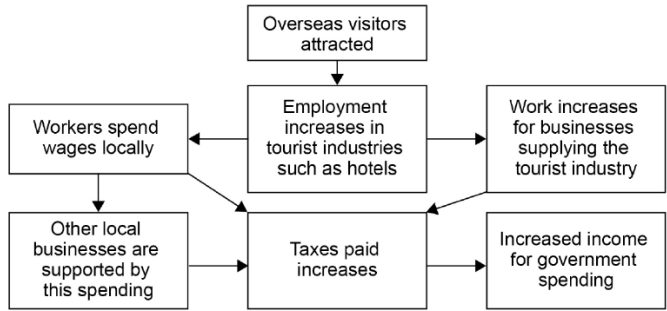
Week 3 – Tuesday 23rd September 2025

Lesson 6 – Strategies to reduce the development gap	Lesson 7 – Tourism in an LIC	Lesson 8 – Geography of Nigeria
Key Terms: Transnational corporation (TNC): A large business that operates in a number of countries. Primary products: Goods sold for production or consumption in the state they were found in e.g., copper, oil, wheat, or coffee.	Key Terms: Tunisia: The northernmost country in Africa on the Mediterranean coast, between Algeria to the west and Libya to the east. Multiplier effect: This occurs when a positive change happens, which then has a knock-on effect on other businesses or attracts new businesses.	Key Terms: NEE (Newly Emerging Economy): A country that is experiencing high rates of economic development and rapid industrialisation.
Content: There are 7 strategies to reduce the development gap: 1. Aid: A gift of money, goods or services and does not need to be repaid. 2. Economic investment: TNCs invest money into countries that produce their goods. Local people employed and triggers further investment. 3. Industrial development: Countries invest in factories and sites of industry. Manufactured goods sold at a higher price than primary products. 4. Debt relief: When all or some of a country's debt is cancelled. This means they have more money to develop, e.g. Zambia had \$4billion cancelled. 5. Fair trade: Ensures farmers are guaranteed a fair price for their crops. 6. Microfinance: Small loans given to people in LICs to start their own business. 7. Intermediate technologies: Technology supplied is appropriate to the needs, skills, knowledge and wealth of local people to improve lives.	Content: Why is Tunisia a popular tourist destination? • Climate: Hot and dry summers (29 - 32°C and 2-10mm) • Accessibility: Only 4.5 hours from the UK • Activities: 7 UNESCO world heritage sites, beaches, film locations and camel trekking. • Cost: Cheaper than other Mediterranean destinations. Benefits of tourism to Tunisia: • Social: Tunisia connected to other cultures and traditions, literacy rates increased, school compulsory for girls. • Economic: \$2 billion in 2018, increased GDP to \$43b, jobs created. Is tourism sustainable in Tunisia? • Terrorism: After an attack, big drop in visitor numbers (430,000 to 28,000). • COVID pandemic: Visitor numbers fell by 78% and tourism earnings down by 65%. Hotels closed and many lost their jobs.	Content: Location of Nigeria: • 5°-12° north of the equator in the northern hemisphere • West Africa • Coastline in the south west – Gulf of Guinea in the Atlantic Ocean • Bordered by Benin (W), Niger (N) Chad (N/NE) and Cameroon (E) Climate and biomes of Nigeria: • North Nigeria: Drier in the north and a savannah grassland biome. Near the arid Sahel region • South Nigeria: Hot and humid climate and a tropical rainforest biome. Capital city: Abuja which is located in the centre of Nigeria Population: 213 million (2021) Life expectancy: 52 years (80 years UK)
Questions: 1. How can debt relief reduce the development gap? 2. How can fair trade reduce the development gap? 3. How can fair trade reduce the development gap? 4. How can microfinance reduce the development gap?	5. What is the multiplier effect? 6. State 4 reasons why Tunisia is a popular tourist destination 7. State 5 benefits of tourism to Tunisia 8. State 2 ways that affected tourism in Tunisia	9. Where is Nigeria? 10. What is the climate of Nigeria like? 11. What and where is Nigeria's capital city? 12. What is Nigeria's population and life expectancy?



Year 11 Cycle 1 Geography Knowledge Organiser – The Changing Economic World



Week 4 – Tuesday 30 th September 2025		
Lesson 9 – What's Nigeria about?	Lesson 10 – Why is Nigeria developing?	Seneca and Exam Practice
Key Terms: Civil war: Conflict between citizens of the same country. Political instability: A natural tendency of a government to collapse either because of conflicts or growing struggles, sometimes violent, between various political parties.	Key Terms: Industrial structure: Percentage of people working in each type of job/industry. Primary industry: Extraction of raw materials e.g. farming, fishing, mining. Secondary industry: Production and manufacturing of good from raw materials. Tertiary industry: The service sector.	 SENECA AQA Geography: 5.1.4 – 5.1.5 & 5.1.10 1. Suggest one way microfinance loans can help reduce the development gap (1 mark) 2. Outline one way that Fairtrade helps to deal with the problems of unequal development (2 marks) 3. Study the figure, a diagram to explain the impact of tourism on a country.
Content: Political context: • Berlin conference in 1883: Powerful European countries meet to divide up Africa and used their resources. • Independence: Became independent from UK in 1960, but caused a civil war (1967-1970) and political instability till 2011 when elections were seen to be fair. Social context: • More than 500 different ethnic groups, but there are 3 main ethnic groups. • South Nigeria is where Igbo and the Yoruba live and are mainly Christian. • North Nigeria is where Hausa live and are mainly Muslim. Cultural context: • Nollywood: Nigerian cinema. 2nd largest film industry in the world. • Football: Have won the African Cup of Nations 3 times.	Content: Nigeria has the largest economy in Africa and is predicted to be one of the top 20 world economies by 2050. Nigeria's changing industrial structure: 1991: • Primary: 58% • Secondary: 9% • Tertiary: 33% 2020: • Primary: 23% • Secondary: 27% • Tertiary: 50% Why has Nigeria's economy developed? • Rapid advances in technology • Investment in science and technology training • Many people speak English giving a possible growth of telecommunications • Cheap and plentiful labour supply	 <pre> graph TD A[Overseas visitors attracted] --> B[Employment increases in tourist industries such as hotels] B --> C[Workers spend wages locally] B --> D[Work increases for businesses supplying the tourist industry] C --> E[Other local businesses are supported by this spending] D --> F[Taxes paid increases] E --> F F --> G[Increased income for government spending] </pre> Using the figure and your own understanding, suggest how the growth of tourism in a LIC or NEE might help reduce the development gap (4 marks)
Questions: 1. What is political instability? 2. State 2 political events in Nigeria's history 3. State 3 social facts about Nigeria 4. State 2 cultural facts about Nigeria	5. What is an industrial structure? 6. What is primary, secondary and tertiary industry? 7. How has primary, secondary and tertiary sectors changed between 1991 and 2020? 8. State 3 reasons why Nigeria's economy has developed	



Year 11 Cycle 1 Geography Knowledge Organiser – The Changing Economic World



Week 5 – Tuesday 7th October 2025

Lesson 11 – Nigeria and trade	Lesson 12 – Nigeria and TNCs	Lesson 13 – Nigeria and Aid
Key Terms: Export: Goods that are sold abroad. Import: Goods that are bought from another country. OPEC: Organisation of Petroleum Exporting Countries. ECOWAS: Economic Community of West African States.	Key Terms: Transnational Corporation (TNC): A large business that operates in a number of countries. Niger Delta: A vast low-lying region through which the waters of the Niger River drain into the Gulf of Guinea. Multiplier effect: This occurs when a positive change happens, which then has a knock-on effect on other businesses or attracts new businesses.	Key Terms: Aid: Assistance given from one country to another in the form of money, food, technology or advice. Bilateral aid: Aid given from one country to another, often with specific conditions on how it should be spent. Multilateral aid: Aid given by countries through international organisations, such as the World Bank.
Content: Who does Nigeria trade with? • Export partners: USA (17%), India (11%), Spain (7.3%), Brazil (6.3%), South Africa (5.1%) and UK (5%). • Import partners: China (19%), USA (11%), India (6.4%), Netherlands (6.1%), UK (4.9%) and Belgium (4.4%). What does Nigeria import and export? • Import: Petroleum products (petrol, diesel, kerosene), automobiles, mobile devices and grains like rice and wheat. • Export: Crude oil, natural gas, rubber, cotton and cocoa. Nigeria's political and trade links: • OPEC: Allows Nigeria to influence the price of oil and the maintenance of a regular supply. • ECOWAS: Develop trade links and gain favourable trade deals. • African Union: Nigeria's is a major contributor and is able to have political influence over other countries in Africa. • British commonwealth: Political link with the UK and other commonwealth countries.	Content: Shell in Nigeria: • Shell is one of the world's largest oil companies with its headquarters in the Netherlands. • Shell began operating in the Niger Delta in southern Nigeria after oil was discovered in 1958.  Advantages of Shell in Nigeria: • Direct employment for 65,000 people and 250,000 in related industries. • Provides school and training for Nigeria's young people. • 91% of Shell contracts when to Nigerian companies. Disadvantages of Shell in Nigeria: • Oil spills cause water and soil pollution – 75% of rural areas have no access to clean water. • Frequent oil flares send toxic fumes into the air. • Increase in poverty due to pollution.	Content: Why does Nigeria need aid? • The benefits of Nigeria being an NEE is not evenly spread across the country. • Over 60 million people live on less than \$1 (76p) per day. • Nigeria is in debt - \$423 billion. Where does Nigeria aid come from? Biggest contributors are: International development agency/World bank, USA, UK, Global Fund and EU. How does Nigeria benefit from the aid given? • Nets for Life project produces education on Malaria and gives households nets to prevent the spread of the disease. • World bank-funded loans to businesses to help the economy move away from being dependent on oil. • UK government funded health and HIV programmes for Nigeria's rural population.
Questions: 1. What does export and import mean? 2. State 5 of Nigeria's export and import partners 3. What does Nigeria import and export? 4. Describe Nigeria's political and trade links	5. What is a Transnational Corporation (TNC)? 6. What is Shell doing in Nigeria? 7. State 3 advantages of Shell in Nigeria 8. State 3 disadvantages of Shell in Nigeria	9. What does aid mean? 10. State 3 reasons why Nigeria needs aid 11. State 5 sources of Nigeria's aid 12. State 3 ways Nigeria benefits from the aid given



Year 11 Cycle 1 Geography Knowledge Organiser – The Changing Economic World



Week 6 – Tuesday 14th October 2025

Lesson 14 – Social impacts of development	Lesson 15 – Environmental impacts of development	Seneca and Exam Practice
Key Terms: Quality of life: The standard of health, comfort, and happiness experienced by an individual or group. Sanitation: Access to facilities for safe disposal of human waste and the ability to maintain hygienic conditions.	Key Terms: Unregulated: Not controlled or supervised. Desertification: The process by which land becomes drier and degraded, as a result of climate change or human activities, or both. Mangrove: A group of trees and shrubs that live in the coastal intertidal zone.	 SENECA AQA Geography: 5.1.10 – 5.1.11 1. Outline one way in which international aid has had an impact on a named LIC or NEE (2 marks) 2. Suggest two ways that the level of economic development of a country might affect the quality of life of its people (4 marks)
Content: As a country develops, the quality of life of its people improves. Key quality of life indicators: • Life expectancy: 46 in 1990 and 52 in 2013 • Mortality rate (per 1000): 213 in 1990 and 117 in 2013 • Access to sanitation facilities: 37% in 1990 and 28% in 2013 • Access to safe water: 46% in 1990 and 64% in 2013 • Secondary school enrolment: 25% in 1990 and 44% in 2010 Development is not always evenly spread and not everyone will benefit. 60% of the population of Nigeria still live in poverty – less than \$1 a day.	Content: Fast and unregulated growth of industry in Nigeria has led to following environmental problems: • 70-80% of Nigeria's forests have been destroyed. • Breathing and heart problems caused by poisonous gases industrial chimneys produce. • Chemical waste can get into water supplies. • Desertification is now a problem with the construction of dams changing the natural flow of water. Bodo Oil Spill 2008 and 2009: • Leaks in a major pipeline in Bodo caused 11 million gallons of oil to spill over a 20km² area. • Killed fish and the local ecosystem. • Fishermen unable to earn money. • Loss of mangrove habitat. 	
Questions: 1. What is quality of life? 2. How has life expectancy and mortality rate changed? 3. How has access to sanitation and clean water changed? 4. What percentage of Nigeria's population still live in poverty?	5. What is a mangrove? 6. What does unregulated mean? 7. State 4 environmental problems with unregulated growth of industry 8. State 4 impacts of the Bodo Oil spill in 2008 and 2009	



Year 11 Cycle 1 Geography Knowledge Organiser – The Changing Economic World



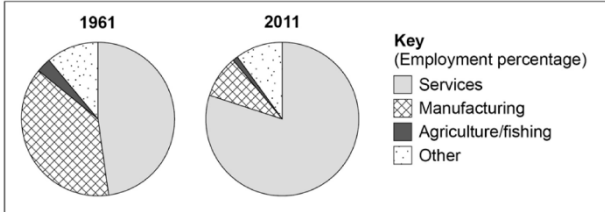
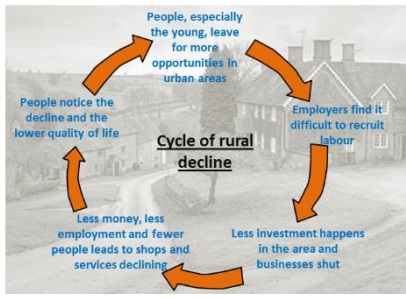
Week 7 – Tuesday 21 st October 2025		
Lesson 16 – How has the UK economy changed?	Lesson 17 – Modern industrial development	Lesson 18 – Environmental impacts of modern industry
Key Terms: Deindustrialisation: The reduction of industrial activity in a region or economy. Globalisation: The increasing connections between places and people across the planet, established through trade, politics and cultural exchanges, and helped by technology and transport.	Key Terms: Growth corridor: Industries develop along a major communication route.	Key Terms: Science Park: A purpose-built cluster of office spaces, labs, workrooms and meeting areas designed to support research and development in science and tech. Sustainability: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
Content: UK's changing industrial structure: 1800: Primary: 58%, Secondary: 9%, Tertiary: 33% 1990: Primary: 23%, Secondary: 27%, Tertiary: 50% 2016: Primary: 2%, Secondary: 10%, Tertiary: 79%, Quaternary: 10% Why has the UK economy changed? Deindustrialisation: Advantages of deindustrialisation: Less environmental pollution, brownfield sites for new housing. Disadvantages of deindustrialisation: Loss of jobs, disused buildings, clean up to stop pollution. Globalisation: Benefits of globalisation: More trade with the world, items become cheaper, new ideas, technology and jobs. Problems with globalisation: Jobs moved out of the country, lower wages and less manufacturing.	Content: Which types of industries are growing in the UK? A post-industrial economy is one that replaces manufacturing with tertiary (service) industries. The quaternary industry is now developing in the UK, which includes IT, new creative industries and biotechnology. Information Technology (IT) Industries: • 1.3 million people employed in IT. • UK viewed as one of the top IT countries, totally £6.3bn in 2018. • Digital technology companies grew by 4.5% in 2017. Service industries: • Financial services employ 2 million people and contribute 10% of UK's GP • Accounts for 18% of the UK's workforce growth Research (biomedical, AI, Cyber, cleantech) industries: • Contributes £3 billion to UK economy and employs 60,000 • Attract investment and generates future jobs.	Content: Cambridge Science Park: • Located north of Cambridge between the A14 and A10. • Built on farmland on the edge of the city. • 65 companies employing over 2000 people. How is Cambridge Science Park sustainable? • Buildings designed to maximise the use of natural light and reduce electricity use. • 20 acres of landscaping provides natural habitat and building is not allowed in these areas. • 132 cycle spaces and 9 showers to encourage people to cycle to work. How is Cambridge Science Park not sustainable? • Only high skilled jobs re now suitable for the entire population. • 3800 workers travelling by car has led to massive traffic congestion – 60mins to leave the area. • 11% of commuters currently car share.
Questions: 1. What is globalisation? 2. Describe the UK's changing industrial structure 3. State 2 advantages and disadvantages of deindustrialisation 4. State 2 advantages and disadvantages of globalisation	5. Which industries are growing in the UK? 6. State 3 facts about the UK's IT industries 7. State 2 facts about the UK's service industries 8. State 2 facts about the UK's research industries	9. What is a science park? 10. State 3 facts about the Cambridge Science Park 11. State 3 ways Cambridge Science Park is sustainable 12. State 3 ways Cambridge Science Park is not sustainable



Year 11 Cycle 1 Geography Knowledge Organiser – The Changing Economic World



Week 8 – Tuesday 4th November 2025

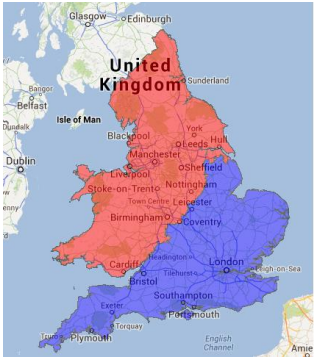
Week 8 – Tuesday 4 th November 2025		
Lesson 19 – Areas of economic growth in the UK	Lesson 20 – Areas of economic decline in the UK	Seneca and Exam Practice
Key Terms: East Hertfordshire: One of 10 district in Hertfordshire. It is the east of the county and borders the county of Essex.	Key Terms: Outer Hebrides: A chain of 65 small islands in close together in the North West of Scotland. Ageing population: The increase in the proportion of people who are 65 or older.	 SENECA AQA Geography: 5.1.12 – 5.1.13 1. Study the figure, pie charts showing information about the changing industrial structure of the United Kingdom.  Key (Employment percentage) - Services - Manufacturing - Agriculture/fishing - Other Suggest reasons for the changes shown in the figure (4 marks) 2. Give two reasons why there has been a growth in the number of science parks in the UK (2 marks)
Content: Bishop Stortford: • Historic market town in East Hertfordshire, England. • Just west of the M11 and 27 miles north of central London. • Population of 41,000 in 2020. • Majority of the population aged between 30-60 years. • 85% of the population have very good or good health. • 1.6% are unemployed and 70% own their homes. Why are people moving to Bishop Stortford? • Stansted airport around 10mins away. • M11 on the outskirts with good links to the M25. • 30mins by train to Liverpool Street station, central London. • Private and public schools with good results. • Development of Jackson Square indoor shopping centre. • Lots of independent shops that have been there for decades.	Content: Outer Hebrides: • Most people live in the Isle of Lewis • Declining population – 50% less than 1901. • Large decrease in people aged between 0-44 years. • Small increase in people aged 65+ years. Why is the Outer Hebrides population declining? • Local economy reliant on farming and young people leave for more work and opportunities • Employers find it difficult to find employees and close down, leading to fewer and fewer opportunities. • Pressure on housing and healthcare due to an ageing population. • School closures due to falling number of school aged children. 	
Questions: 1. Where is Bishop Stortford? 2. State 4 facts about Bishop Stortford 3. State 4 reasons why people are moving to Bishop Stortford 4. What impacts can an increasing population have on an area?	5. Where are the Outer Hebrides? 6. State 4 facts about the Outer Hebrides 7. What is an ageing population? 8. State 4 reasons why the population in the Outer Hebrides is declining	



Year 11 Cycle 1 Geography Knowledge Organiser – The Changing Economic World



Week 9 – Tuesday 11th November 2025

Lesson 21 – Regional differences in the UK	Lesson 22 – Strategies to reduce UK regional differences	Lesson 23 – UK road and rail improvements
Key Terms: North South Divide: A term used to describe the social, economic and cultural differences between the London and the south-east of England and the rest of England.	Key Terms: Northern Powerhouse: The government's vision for a super-connected, globally-competitive northern economy. Devolution: The transfer of power to a lower level, from central government to local or regional administration. Multiplier effect: This occurs when a positive change happens, which then has a knock-on effect on other businesses or attracts new businesses.	Key Terms: Commercial: The activity of buying and selling, especially on a large scale. Stakeholder: A person with an interest or concern with something.
Content: Why is there a north south divide? North of England: Work centred around manufacturing. Many of these have closed leading to higher unemployment (deindustrialisation). South of England: Centre of trade and business, and still is today. This attracts many new businesses. Evidence of a north south divide: Income: £13,560 in the north and £20,509 in the south. Unemployment: 7.7% in the north and 4.4% in the south. House prices: £154,000 in the north and £305,000 in the south Life expectancy: 74 in the north and 84 in the south. 	Content: Northern Powerhouse: More investment in transport infrastructure to improve connections to and within the north. Raise education and skill levels across the north and ensure the north is an excellent place to start and grow a business. Devolution: The election of the Mayor for Greater Manchester, given £1 billion of devolved funds to spend on improving the city and attracting new businesses. Fewer decisions about the city are made in London and more decisions are made by the people of Manchester. Attracting professional jobs: Popularity of Manchester and Leeds have encouraged professionals to settle in the north and business to relocate to the north. For example, the BBC moved many of its offices to MediaCityUK in Salford in 2011. This has led to the multiplier effect.	Content: Cross rail (Elizabeth Line): - Elizabeth line between Reading and Heathrow (60 miles). 41 stations and serves 200 million people a year. - Link London's major commercial and business districts. HS2 (High Speed Railway): - New 170-mile-long high-speed rail line being built from London to the North west, linking London, Birmingham, Manchester with Scotland. - Estimated total cost of between £72-98 billion. 34,000 jobs created during construction. South West Super Highway (A303): - Links the M3 in the south east to the M5 in the south west. £2 billion road widening project to improve journey times. - Involves digging a 3km tunnel under Stonehenge.
Questions: - What is the north south divide? - Why is there a divide for the north? - Describe the location of the north south divide - State 4 pieces of evidence that shows there is a north south divide	- What is the Northern Powerhouse? - How is the Northern Powerhouse reducing regional differences? - How is devolution reducing regional differences? - How does attracting professional jobs reduce regional differences?	- What is a stakeholder? - State 3 facts about the cross rail - State 3 facts about HS2 - State 3 facts about the South West Super Highway



Year 11 Cycle 1 Geography Knowledge Organiser – The Changing Economic World



Week 10 – Tuesday 18th November 2025

Lesson 24 – UK port and airport improvements

Key Terms:

Port: A landing place for ships to load and unload their cargo and passengers.

Markets: Where buyers and sellers come together to buy and sell goods and services.

Content:

Liverpool 2

- £300 million investment to expand the UK's largest deep-water transatlantic container terminal at the Port of Liverpool.
- Allow the biggest container ships in the world access to the UK.
- More central location within the UK and closer to import and export markets – reducing cost, carbon and congestion.

Heathrow Expansion (3rd Runway):

- A new full-length runway that would allow 50 million more passengers a year.
- 40 new destinations and connecting to new markets, increasing international connectivity.
- Generate up to £211 billion economic benefits.

Questions:

1. What is a port?
2. State 3 facts about Liverpool2
3. What are markets?
4. State 3 facts about Heathrow's expansion

Lesson 25 – UK in the wider world

Key Terms:

European Union (EU): An economic and political Partnership between 27 European countries.

Referendum: A public vote on a single political question for a direct decision.

Commonwealth: Voluntary association of 56 independent and equal countries. Almost all were formally under British rule.

Content:

Why did the UK leave the European Union (EU)?

The UK had a referendum on Thursday 23rd June 2016, where the UK public voted to leave the EU (52% 17.4 million votes). The UK officially left the EU on 31st January 2020. Many people voted for the following reasons:

- Reduce immigration
- Take control over UK law
- Create new trade partnerships
- Reduce money being sent to the EU
- Managing our own economy

UK and the Commonwealth:

The UK works with the Commonwealth to ensure that:

- Democratic principles are promoted
- Human rights are upheld
- Support economic development
- Provide a voice to some of the world's smallest countries

5. What is the EU?

6. State 5 reasons why the UK chose to leave the EU

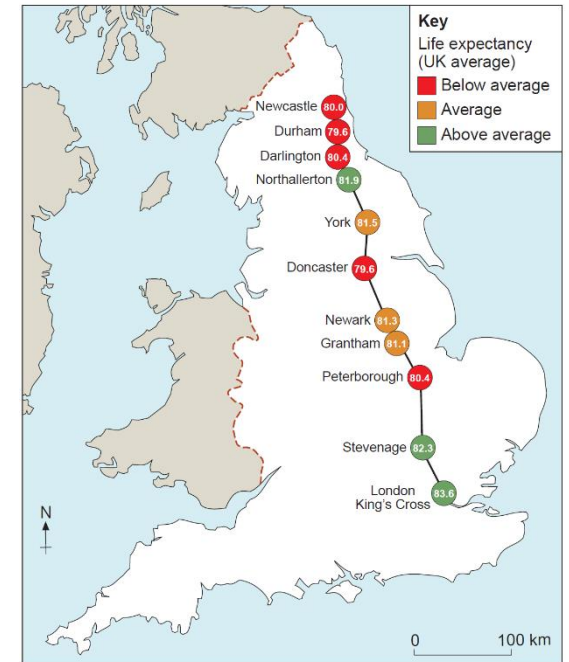
7. What is the Commonwealth?

8. State 4 ways the UK works with the Commonwealth

Seneca and Exam Practice



1. Study **the figure**, showing life expectancy at selected places along the East Coast main railway.



1a. Calculate the median life expectancy shown in **the figure**. Show your working (2 marks)

1b. How might the data in **the figure** suggest a north-south divide in the UK? (2 marks)

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 13 th 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 14 th and 15 th 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
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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 1877 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

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

Year 11 Life Skills- Relationships

Lesson 1- Consent and online relationships	Lesson 2- The impact of drugs and alcohol on sexual behaviour	Lesson 3- Domestic Abuse
Sexual Consent- The giving of permission by a person to engage in any form of sexual activity including penetrative and oral sex. When can consent not be given? 1. When a person is drunk or high, to the point that they are unable to speak or look after themselves. 2. Asleep or Passed Out – if they are not conscious they are unable to agree to any sexual activity. If someone passes out whilst engaging in sexual activity – STOP! 3. They are Underage – Legally a person under the age of 16 cannot give consent to any sexual activity. 4. Mental disability or learning difficulties which mean they are unable to fully understand what they are consenting to. Sexting is when someone sends or receives a sexually explicit text, image or video. This includes sending 'nude pics', 'rude pics', or 'nude selfies'. Taking, possessing or sharing a sexually explicit picture or video of someone under 18 is against the law. It doesn't matter if they gave you permission, someone else sent it to you, you've never met them before, you are under 18 too or it's a selfie. You and anyone else involved could be investigated by the police, and this could even affect your future education and employment.	How alcohol affects you drink by drink Based on a standard (175ml) 13% volume glass of white wine or 4% strength pint of lager 1 glass of white wine or a pint of lager (just over 2 units): -You're talkative and feel relaxed. - Your self-confidence increases. - Driving ability is already impaired, which is why it's best to drink no alcohol if you're driving. 2 glasses of white wine or 2 pints of lager (just over 4 units): -Your blood flow increases. -You feel less inhibited and your attention span is shorter. -You start dehydrating, one of the causes of a hangover. 3 glasses of white wine or 3 pints of lager (just under 7 units): -Your reaction time is slower. -Your liver has to work harder. -Your sex drive may increase, while your judgement may decrease. 4 glasses of white wine or 4 pints of lager (just over 9 units): -You're easily confused. -You're noticeably emotional. -Your sex drive could now decrease, and you may become less capable.	Domestic Abuse: Violence or other abuse by one person against another in a domestic setting, such as in marriage or cohabitation or between siblings. Physical Abuse: Hitting, slapping, shoving, grabbing, pinching, biting, hair pulling, etc. are types of physical abuse. This type of abuse also includes denying a partner medical care or forcing alcohol and/or drug use upon him or her. Sexual Abuse: Coercing or attempting to coerce any sexual contact or behaviour without consent. Includes, but is certainly not limited to, marital rape, attacks on sexual parts of the body, forcing sex after physical violence has occurred, or treating one in a sexually demeaning manner. Emotional Abuse: Undermining an individual's sense of self-worth and/or self-esteem is abusive. May include, but is not limited to constant criticism, diminishing one's abilities, name-calling, or damaging one's relationship with his or her children Economic Abuse: Making or attempting to make an individual financially dependent by maintaining total control over financial resources, withholding one's access to money, or forbidding one's attendance at school or employment. Psychological Abuse: Elements include causing fear by intimidation; threatening physical harm to self, partner, children, or partner's family or friends; destruction of pets and property; and forcing isolation from family, friends, or school and/or work.

Lesson 4- Forced marriage	Lesson 5- Choices in Pregnancy	Lesson 6- Fertility and Menopause
Forced Marriage: A forced marriage is when either one or both of the people getting married are being coerced into the marriage. This means that they do not give their full consent to be getting married, and they aren't given the right to refuse the marriage. Forced marriage is considered to be a violation of Article 12 of the European Convention on Human Rights. Arranged Marriage: An arranged marriage is not forced. An arranged marriage is when the family of the person getting married take responsibility for finding a suitable match. Both people in an arranged marriage have to consent to the marriage, and are given the right to refuse the match. Parents looking to arrange a marriage for their child might take into consideration factors like the potential partner's religion, finances, family background, career choices, social standing and potentially many other factors. The point of the arranged marriage is to find a partnership that will create happiness for both the people getting married and their families. Resources: https://www.supportline.org.uk/problems/forced-marriages/ https://www.refuge.org.uk/our-work/forms-of-violence-and-abuse/forced-marriage/ https://www.childline.org.uk/	<u>Key terms</u> Conception The point when the sperm meets the egg and a foetus is conceived. Embryo An organism in the early stages of growth and differentiation, from fertilization to the beginning of the third month of pregnancy (in humans) Fertility The ability of people to conceive a child. Pregnancy The condition or period of being pregnant. Abortion An abortion is a procedure to end a pregnancy. It's also sometimes known as a termination of pregnancy. The pregnancy is ended either by taking medicines or having a surgical procedure Adoption Legally taking another person's child and bringing it up as one's own. Resources: https://www.sexwise.org.uk/unplanned-pregnancy https://www.gov.uk/child-adoption https://www.nhs.uk/	Fertility The ability of people to conceive a child. Infertility The inability or difficulty to conceive a baby through natural methods Menstruation- Also known as a period. The process in a woman of discharging blood and other material from the lining of the uterus at intervals of about one lunar month from puberty until the menopause, except during pregnancy. Menopause- The menopause is when a woman stops having periods. It's a natural part of ageing that usually happens between 45 and 55 years old Symptoms: Most women will experience menopausal symptoms. Some of these can be quite severe and have a significant impact on everyday activities. <u>Common symptoms include:</u> -hot flushes -night sweats -vaginal dryness and discomfort during sex -difficulty sleeping -low mood or anxiety -reduced sex drive (libido) -problems with memory and concentration https://www.nhs.uk/conditions/menopause/

Y11C1 Key Maths Knowledge

Your Maths Homework is to complete your sparx

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

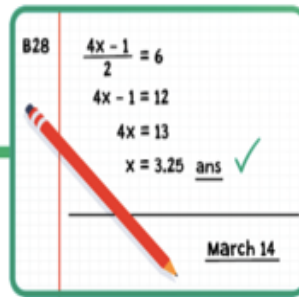
- Do Sparx on the days in the homework timetable
- **Compulsory Homework:** You must do this part of your homework every week
- Optional/Target Homework: Do this to gain loads of XP and to improve your maths!

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



We want you to do well with your maths and doing Sparx will help.

If you've tried something, watched the video and are still not sure how to do something make sure you ask for help!

You're expected to complete it every week and catch up if you haven't.

RPE - Year 11 - Medical Ethics.

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

Key Ideas			
Cloning & Genetic Engineering 	Christian Views ☐ Each human has been uniquely created by God with a purpose: a human clone is a copy, unnaturally created. ☐ We have a God given responsibility to look after and care for God's creation (Stewardship). ☐ Catholics believe human life, which begins at conception, is made in the image of God so is sacred: embryo research and high death rates during testing is disrespectful to life. ☐ Cloning separates the procreation of children from sex so therefore is unnatural. ☐ Jesus helped those who suffered, and God loves all of His creations. The Bible teaches us to be loving and compassionate (agape): trying to cure terrible illnesses is a caring thing to do. ☐ God is the creator and science should not attempt to take on this role. - 'There is a time to live and a time to die.' ☐ God gave Adam dominion over all of creation – can use cloning for the benefit of humans.		
When does life begin 	• Most people, whether they hold a religious belief or not, would accept that human life is special and worthy of being preserved. For religious believers, life is special because it comes ultimately from God. Life is a gift and is unique and priceless. • Many Christians believe that all babies have a soul from the moment of conception and so are fully human. This is based on the teaching in Genesis 1:27 that people are made in the image of God; that God has a plan for every individual (Jeremiah 1:5) and that God is the creative spark from the moment of conception (Psalm 139:13). This means that they believe the foetus is fully human.		
Abortion 	- Abortion is the removal of a foetus from the womb in order to end a pregnancy. - In the UK (except Northern Ireland) it is legal during the first 24 weeks of pregnancy unless the mother's life is in danger or the foetus is severely deformed. ☒ The Catholic Church is strongly against abortion. They believe in sanctity of life, the idea that life is a sacred gift from God which only God can take away. They see the foetus as a living thing. ☒ The Church of England think abortion is sometimes acceptable as a pregnancy as a result of rape or where the child would be very ill would lead to a very poor quality of life.		
Euthanasia 	- Euthanasia is the painless killing of a patient with a terminal illness. - Voluntary euthanasia is where the patient asks for their life to be ended. - Non-voluntary euthanasia is where the patient is not capable of asking to die, perhaps in a coma. - All forms of euthanasia are currently illegal in the UK. ☒ The Catholic Church is strongly against euthanasia. They believe that only God can give and take life and that life is sacred (sanctity of life). ☒ Some liberal Christians think euthanasia can be an act of mercy which Jesus tells them is a good thing to do, this is especially the case when someone's quality of life is very poor.		
The Afterlife 	- Christians believe that when you die you will be judged and that those who are found to be good will go to heaven but those who have sinned and gone against God's wishes will go to hell. <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> Roman Catholics believe that there is a middle stage called purgatory where souls go to be purified of sin before they go to heaven </td><td style="width: 50%; vertical-align: top;"> Some Christians believe that Jesus will return on a future Day of Judgement when all souls will be judged </td></tr> </table>	Roman Catholics believe that there is a middle stage called purgatory where souls go to be purified of sin before they go to heaven	Some Christians believe that Jesus will return on a future Day of Judgement when all souls will be judged
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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: $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + \text{Energy}$ 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: $C_6H_{12}O_6 \rightarrow C_3H_6O_3 + \text{Energy}$ 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: $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$	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 contract properly due to the build up of lactic acid. Metabolism: all chemical reactions happening in an organism.

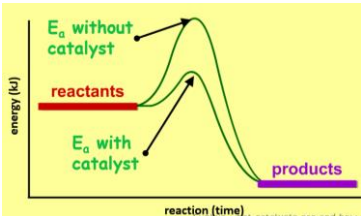
Lessons 1& 2 Plant organs and tissues	Lesson 3 Photosynthesis	Lesson 4 Limiting factors of photosynthesis
There are 3 main plant organs: • Leaves: Site of photosynthesis • Roots: Absorb water and minerals from the soil, anchor the plant firmly in to the ground. • Stems: Support the leaves and the flowers, connect roots to the leaves, flowers and fruits The leaf is an organ made up of tissue layers these include: • Waxy cuticle: A waterproof layer to prevent water loss • Epidermis: Protective covering • Palisade mesophyll: Contain cells packed with chloroplasts for photosynthesis • Stomata: Hole in the underside of leaves to allow CO₂ in to the leaf and O₂ out. • Guard cells: Control the stomata by opening or closing them • Spongy mesophyll: cells surrounded by lots of air spaces to allow gases to diffuse in and out. Meristem are found at the tips of roots or shoots. Responsible for growth. A plant in a hot, dry climate will have a lower stomatal density than a colder, wetter environment to help reduce water loss.	Photosynthesis word equation: Photosynthesis symbol equation: The reactions for photosynthesis are carbon dioxide and water. The products of photosynthesis are glucose and oxygen. Light energy and chlorophyll are needed to drive the photosynthesis reaction. Photosynthesis takes place in the chloroplast in the palisade mesophyll cells of the leaf. Carbon dioxide enters and oxygen exits the leaf by diffusion through the stomata. The leaf can be tested for starch using iodine. Starch turns blue/black in the presence of iodine.	A limiting factor is something that can affect the rate of a reaction depending on its availability. There are 4 limiting factors of photosynthesis: • Temperature: Increasing temperature increases the rate of photosynthesis to a certain point after which any further increase in temperature decreases rate. • Carbon dioxide concentration: The higher the concentration of carbon dioxide the faster the rate of photosynthesis to a certain point. Beyond that there are other limiting factors affecting rate. • Light intensity: Increasing the light intensity increases rate of photosynthesis to a certain point. Beyond which other limiting factors are affect rate. • Amount of chlorophyll: Increasing the amount of chlorophyll increases the rate of photosynthesis to a certain point. Beyond which other limiting factors are affecting rate. A lack of chlorophyll can be caused by disease or lack of nutrients needed to make chlorophyll.

Lesson 5 Photosynthesis required practical	Lessons 6 Uses of glucose and inverse square law for light intensity	Lessons 7 Plant transport systems
You will investigate: The effect of light intensity on the volume of oxygen produced by a plant by photosynthesis Independent variable: light intensity Dependent variable: Number of bubbles of oxygen produced in set time Control variable: Temperature, pond weed (size, species, piece), light source (type of light), time, concentration of carbon dioxide. The more oxygen produced in a set time period the faster the rate of photosynthesis. We can predict that higher light intensity would result in a greater volume of oxygen due to a faster rate of photosynthesis.	There are 5 uses of glucose: Starch: Glucose is converted to starch and stored Energy: Glucose is used as a reactant in the respiration reaction to release energy Amino acids: Glucose is used to make amino acids, to make proteins. Fats and oils: Glucose is converted to fats and oils for storage. Cellulose: Glucose is made in to cellulose for cell walls. <u>Inverse square law for light intensity:</u> For each distance of a plant from a lamp, light intensity will be proportional to $\frac{1}{d^2}$ where d= distance	Xylem: • Forms part of the vascular bundles in plants. • Transports water and mineral ions in one direction from roots to leaves. • Hollow tubes strengthened with lignin, impermeable to water. Phloem: • Forms part of the vascular bundles in plants. • Transports dissolved sugars from leaves all round the plant. Root Hair cells: • Absorb water from soil by osmosis • Absorb mineral ions from soil by diffusion and active transport Transpiration: The flow of water from roots to leaves Rate of transpiration can be measured using a <u>potometer</u>. There are 4 factors that affect rate of transpiration: Light intensity, temperature, wind and humidity. Translocation: The movement of food through the phloem around the plant.

Lessons 1 Sexual and asexual reproduction	Lessons 2 Meiosis	Lessons 3 DNA and the genome																																							
Sexual reproduction involves the fusions of male and female gametes Gametes: sex cells, sperm and eggs in animals, pollen and egg cells in plants In sexual reproduction genetic information is carried and passed on in genes. We inherit 1 set of genes from each parent. The mixing of genetic information leads to variation in the offspring. <table border="1"> <thead> <tr> <th></th><th>Sexual reproduction</th><th>Asexual reproduction</th></tr> </thead> <tbody> <tr> <td>Number of parents?</td><td>2 parents (male & female)</td><td>1 parent (male or female)</td></tr> <tr> <td>Are offspring called clones?</td><td>No offspring are not clones of the parents</td><td>Yes offspring is a clone of parent</td></tr> <tr> <td>What happens to make the offspring</td><td>Fusion of sperm and eggs</td><td>The parent splits (mitosis) or a bud is formed</td></tr> <tr> <td>Is there genetic variation in offspring</td><td>Yes offspring is a mix of both father and mother</td><td>No offspring are genetically identical to parent</td></tr> <tr> <td>Examples of organisms which reproduce in this way</td><td>Dogs, Humans, Hamsters, fish, snakes, birds,</td><td>Bacteria, Yeast, daffodils, strawberries</td></tr> </tbody> </table>		Sexual reproduction	Asexual reproduction	Number of parents?	2 parents (male & female)	1 parent (male or female)	Are offspring called clones?	No offspring are not clones of the parents	Yes offspring is a clone of parent	What happens to make the offspring	Fusion of sperm and eggs	The parent splits (mitosis) or a bud is formed	Is there genetic variation in offspring	Yes offspring is a mix of both father and mother	No offspring are genetically identical to parent	Examples of organisms which reproduce in this way	Dogs, Humans, Hamsters, fish, snakes, birds,	Bacteria, Yeast, daffodils, strawberries	Gametes are sex cells produced by a special type of cell division called meiosis. Meiosis is special as the chromosome number reduces by half. Gametes must have half set of genetic information, 23 chromosomes. This is vital because it ensures fertilisation results in a cell with a full set of genetic information. Gametes are described as haploid, this means half set of genetic information. Meiosis occurs in the testes and ovaries. <table border="1"> <thead> <tr> <th></th><th>Mitosis</th><th>Meiosis</th></tr> </thead> <tbody> <tr> <td>Where does it occur</td><td>All over the body</td><td>Sex organs</td></tr> <tr> <td>Number of divisions</td><td>1</td><td>2</td></tr> <tr> <td>Creates</td><td>All cells apart from gametes</td><td>Gametes</td></tr> <tr> <td>Number of chromosomes</td><td>46 (diploid)</td><td>23 (haploid)</td></tr> <tr> <td>Produces</td><td>Two cells</td><td>Four cells</td></tr> <tr> <td>Function</td><td>Cellular reproduction, growth</td><td>Sexual reproduction</td></tr> </tbody> </table>		Mitosis	Meiosis	Where does it occur	All over the body	Sex organs	Number of divisions	1	2	Creates	All cells apart from gametes	Gametes	Number of chromosomes	46 (diploid)	23 (haploid)	Produces	Two cells	Four cells	Function	Cellular reproduction, growth	Sexual reproduction	DNA is a chemical that all genetic material is made from. Contains coded information on how to make an organism and how to make it work. DNA is a polymer, it is made up of two strands, it is twisted to form a double helix. Chromosomes are made of DNA Short sections of DNA are called genes Genes are instructions to make proteins. Proteins are made from amino acids bonded together. If you change the order of amino acids, you will change the protein that you make. Genome: includes all the genetic material in an organism. Scientists have worked out the whole of the human genome, this is called the human genome project. The knowledge of the genome from the Human genome project will help with the identification of genes, understanding the link between genes and disease, aid the development of effective treatments and also helps with developing our understanding of evolution.
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Lessons 4 Sex determination	Lessons 5 Genetic inheritance	Lessons 6 Inherited genetic disorders
There are 46 chromosomes in every cell in the human body except gametes. There are 23 pairs of chromosomes. 22 pairs of chromosomes contain genes that control characteristics. 1 pair of chromosomes determine sex. Males have XY sex chromosomes Females have XX sex chromosomes. Using a punnet square as shown above, it is evident that there is a 50% chance will be female and 50% chance of having a male child.	You have 2 copies of every gene, one inherited from your father and one inherited from your mother. Allele: different versions of a gene e.g. hair colour alleles would include blonde, red, black and, brown. Heterozygous: When an individuals carries 2 different alleles for a particular gene. Homozygous: When an individual carries 2 identical alleles for a particular gene. Phenotype: What the organism actually looks like e.g. blue eyes, red flowers Genotype: The genetic make up of an organism- refers to the genes the organisms has. Dominant: An allele that will show up in the phenotype of an organism. Recessive: A characteristic that is masked by a dominant gene.	Polydactyl is an inherited genetic disorder caused by a dominant allele and results in extra fingers or toes. Polydactyl is unusual because it is caused by a dominant allele. Most genetic disorders are caused by inheriting 2 recessive alleles. Cystic fibrosis is an inherited genetic disorder of cell membranes. It results in the body producing lots of thick stick mucus which clogs up the air passages and the passages in the pancreas. Genetic screening: A test to analysis a person's DNA. Antenatal screening: Used to test the DNA of the foetus while it is still in the uterus. Pre-implantation genetic diagnosis: Used to test for genetic disease in an embryo before it is implanted in to the uterus of the female. This forms part of the process of IVF.

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 $rate = \frac{\text{amount of reactant lost}}{\text{time}} \text{ or } \frac{\text{amount of product formed}}{\text{time}}$ - 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 <u>activation energy</u>. - 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 <u>frequent</u> collisions at surface	You will investigate the Effect of Concentration on Rate of Reaction. <u>Independent variable</u>: concentration of hydrochloric acid <u>Dependent variable</u>: volume of hydrogen gas produced <u>Control variable</u>: amount of magnesium added, temperature of solution Concentration - The number of particles in a given volume. - At <u>high concentrations</u> there are <u>more particles</u>. - More particles in the same space means more frequent collisions. - If we double the concentration we double the frequency of collisions - More <u>frequent</u> collisions = faster rate of reaction. Pressure - Gases only - At <u>high pressure</u>, the particles are <u>closer together</u>. - This means the particles are more likely to <u>collide more frequently</u>. - More <u>frequent</u> 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 <i>frequently</i> - 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. REACTANTS $\rightleftharpoons$ PRODUCTS - A reversible reaction is a reaction that occurs in both the forward and reverse direction. - It is represented by the symbol $\rightleftharpoons$ - The amount of energy released in one direction must be the <u>same</u> as the energy absorbed in the opposite direction. hydrated copper sulphate - The forward reaction requires heat – it is endothermic Blue $\rightarrow$ White - The backwards reaction gives out heat – it is exothermic White $\rightarrow$ 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

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

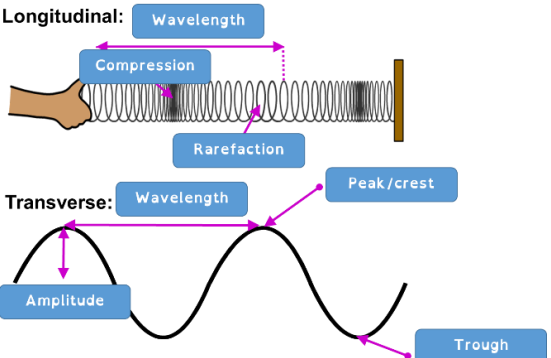
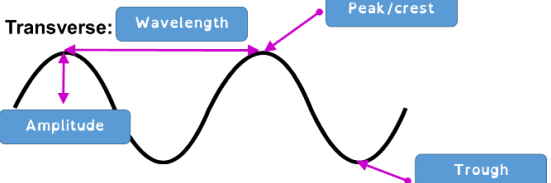
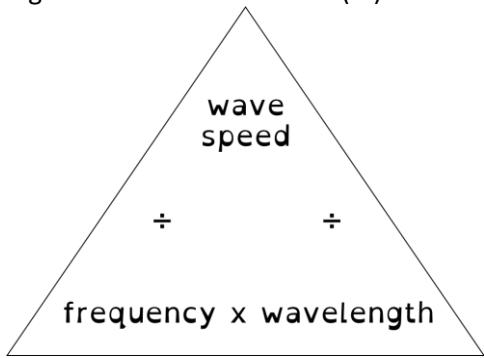
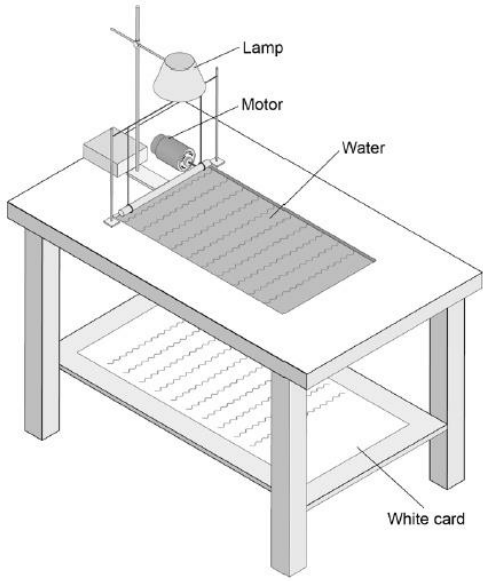
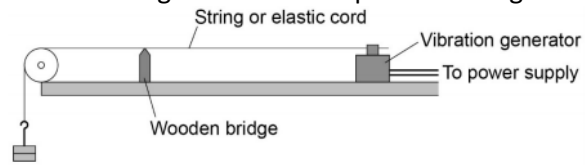
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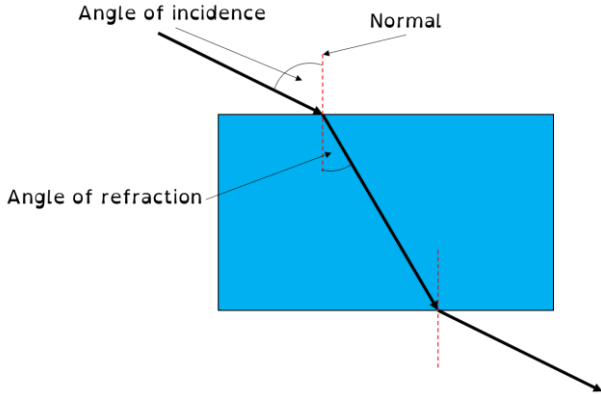
- If you increase the temperature it will try and reduce it
- If you increase the concentration of the reactants it will try and get rid of some
- If you increase the pressure it will try and reduce it
- If you add a catalyst...
- The position of equilibrium doesn't change (but it will speed up the forward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

Lessons 1 & 2 Early atmosphere and its evolution	Lessons 3 & 4 Greenhouse effect and global warming	Lessons 5 Atmospheric pollutants										
The envelope of gases surrounding the earth or another planet is called an atmosphere. Atmospheres are formed from mixtures of different gases. Atmospheres can be formed from different combinations of gases. Different planets have different types of atmospheres. Scientists predict that the early atmosphere contained : • a large amount of carbon dioxide • little or no oxygen • Water vapour • small amounts of other gases, such as ammonia and methane One theory suggests that the early atmosphere came from intense volcanic activity. Combustion reactions happen in a volcano, where hydrogen and carbon react with oxygen to make Carbon dioxide and water vapour. As the Earth cooled the water vapour condensed to form oceans. Nitrogen was also released by volcanoes which gradually built up in the atmosphere because it is unreactive. <table><tr><th colspan="2">Earths atmosphere Today</th></tr><tr><td>Nitrogen</td><td>78%</td></tr><tr><td>Oxygen</td><td>21%</td></tr><tr><td>Water</td><td>1%</td></tr><tr><td>Carbon Dioxide</td><td>0.04%</td></tr></table> Photosynthesis by primitive plants and algae released oxygen, which gradually built up in the atmosphere. carbon dioxide + water → glucose + oxygen Oxygen is a reactive gas, as it built up in the atmosphere it reacted with other gases. Ammonia + Oxygen → Nitrogen oxide and water Methane + Oxygen → Carbon Dioxide +Water Carbon dioxide dissolved in the oceans, formed carbonate compounds and precipitated as limestone. Carbon dioxide is incorporated into living things which form fossil fuels.	Earths atmosphere Today		Nitrogen	78%	Oxygen	21%	Water	1%	Carbon Dioxide	0.04%	Greenhouse gases are gases that absorb heat radiated from the Earth then release energy in all directions, which keeps the Earth warm. Greenhouse gases present in the atmosphere include: • water vapour • carbon dioxide • methane Human activities are increasing the amount of some greenhouse gases in the atmosphere. For example: • farming cattle releases methane • farming rice in paddy fields releases methane • burning fossil fuels in vehicles and power stations releases carbon dioxide • deforestation releases carbon dioxide and reduces the absorption of carbon dioxide through photosynthesis Greenhouse effect 1. electromagnetic radiation a short wavelength, (e.g. UV) passes through the Earth's atmosphere 2. the Earth absorbs most of the radiation. 3. Some of the radiation is reflected as long wave radiation ,(infrared radiation) 4. some of the infrared radiation is absorbed by the covalent bonds between the atoms in greenhouse gases. 5. The greenhouse gases can then emit the infrared radiation back into the atmosphere. Global warming is the term used to describe the warming of the climate in the past 200 years The effects of global warming include: • glaciers and polar ice melting • sea levels rising • patterns of rainfall changing, producing floods or droughts • habitats changing	Combustion creates pollutant gases: Methane + Oxygen → Carbon dioxide + water Complete combustion of a hydrocarbon fuel occurs when there is a good supply of oxygen. It releases the maximum amount of energy and produces carbon dioxide and water. Incomplete combustion of a hydrocarbon fuel occurs when there is a poor supply of oxygen. Less energy is released. Water is produced along with carbon monoxide , carbon dioxide and carbon. Carbon monoxide is a poisonous gas It binds to haemoglobin in your red blood cells, preventing them from carrying oxygen to the cells in your body. Carbon monoxide is colourless and has no smell. Particulate carbon Causes health problems for humans because it irritates the lining of the lungs, can make asthma worse, and perhaps even cause cancer. Particulate carbon can also cause global dimming, which may reduce rainfall. Sulfur dioxide is caused when sulfur atoms which are present in some fossil fuels are oxidised: Sulfur dioxide is then further oxidised in the atmosphere to sulfur trioxide, SO₃. This gas dissolves in rainwater to make acid rain, which is a dilute solution of sulfuric acid, H₂SO₄. Acid rain harms and kills plants and animals, especially those that live in aquatic environments. It can also damage man-made objects like statues and buildings Nitrogen is not present in fuels, but the high temperatures and pressures inside a car engine can cause the nitrogen and oxygen in the air to react together to make oxides of nitrogen. Nitrogen oxide gases can cause acid rain, and they also react in the atmosphere with other pollutants to make photochemical smog. Smog can have major health effects, causing asthma attacks and even death.
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Carbon Dioxide	0.04%											

Lesson 1 Finite & Renewable Resources	Lessons 2 & 3 Pure & Potable Water & Required Practical	Lesson 4 Treating Waste Water															
Finite - Resources that are being used up faster than they can be replaced. - There is a <u>limited amount</u>. Renewable - Resources that can be replaced at the same rate at which they are used up. - Humans use the Earth's resources to provide warmth, shelter, food and transport - Natural resources provide food, timber (wood), clothing and fuels, this is supplemented by <u>agriculture</u> - Finite resources from the Earth, oceans and atmosphere are processed to provide energy and materials - Chemists provide new <u>synthetic</u> products which <u>supplement</u> or <u>replace</u> natural products. Sustainable Development - Meeting the needs of current generations <u>without</u> compromising the ability of future generations to meet their own needs. <table border="1"> <thead> <tr> <th>Natural product</th><th>Use</th><th>Synthetic product that <u>supplements</u> or <u>replaces</u> it</th></tr> </thead> <tbody> <tr> <td>cotton</td><td>clothing</td><td>polyester</td></tr> <tr> <td>wood</td><td>construction material</td><td>PVC</td></tr> </tbody> </table>	Natural product	Use	Synthetic product that <u>supplements</u> or <u>replaces</u> it	cotton	clothing	polyester	wood	construction material	PVC	Potable Water - Water that is fit (safe) to drink. Pure Water - We get pure water through distillation - Boil water into steam - Cool to condense steam and collect water - Distillation on a large scale would require a lot of energy which would make the process expensive we will look at this in more detail next lesson. - Pure water only contains H₂O molecules. Water Treatment <u>Screen</u> – stops large objects <u>Coarse filter</u> – large particles removed <u>Sedimentation</u> – particles fall to bottom, top water drained off <u>Fine filter</u> – very small particles removed <u>Chlorination</u> – Chlorine added to sterilise (kill germs) Chemistry Required Practical: Water Analysis To analyse the pH and dissolved solid content of 3 water samples Chemistry Required Practical: Water purification To obtain pure water from a solution containing water and dissolved solids.	- Waste water requires <u>treatment</u> before being released into the environment <u>Sewage</u> and <u>agricultural</u> waste water require the removal of: - Organic matter - Harmful microbes Sewage Treatment - Screening removes <u>large solid particles</u> i.e. grit by passing the sewage through a screen. - Sedimentation allows the small solid particles (sediment) to sink to the bottom of the tank forming <u>sewage sludge</u> while the liquid (effluent) remains above. - The sewage sludge is <u>dried</u> and <u>anaerobically digested</u> (broken down by microorganisms in the absence of oxygen). - The effluent is <u>aerobically digested</u> (broken down by microorganisms in the presence of oxygen). This removes <u>organic matter</u> and <u>harmful microbes</u>. <table border="1"> <thead> <tr> <th>Fresh water / ground water</th><th>Desalination</th><th>Treatment of waste water</th></tr> </thead> <tbody> <tr> <td>Filtration and sterilisation Requires sterilising agents and filtration equipment</td><td>Distillation or using membranes e.g. reverse osmosis Both require lots of energy</td><td>Screening, sedimentation, digestion (aerobic and anaerobic) Several steps, requires large treatment plant</td></tr> </tbody> </table>	Fresh water / ground water	Desalination	Treatment of waste water	Filtration and sterilisation Requires sterilising agents and filtration equipment	Distillation or using membranes e.g. reverse osmosis Both require lots of energy	Screening, sedimentation, digestion (aerobic and anaerobic) Several steps, requires large treatment plant
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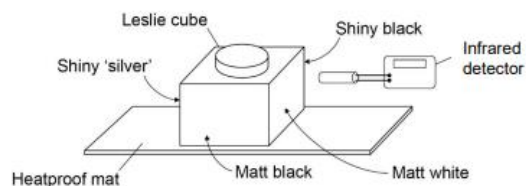
Lesson 5 Extracting Metals (Higher Tier)	Lesson 6 Life Cycle Assessments	Lesson 7 Reduce, Reuse & Recycle
Problems with traditional mining: • Large amounts of waste rock • Creates large holes in the Earth's crust • Requires lots of energy • Only worthwhile extracting high-grade ores Two alternatives to mining are: Phytomining: Advantages • Uses low grade copper ore • Requires less energy than smelting • Produces less air pollution • Reduces amount of waste rock Disadvantages • Can produce toxic chemicals • Much slower process • Electrolysis requires large amounts of electricity. Bioleaching: Advantages • Uses low grade copper ore • Very simple and cheap • Produces less air pollution • Reduces amount of waste rock Disadvantages • Can produce toxic chemicals • Much slower process • Efficiency is very low (lots of waste) • Electrolysis requires large amounts of electricity.	• Lifecycle analysis (LCA) is used to work out the environmental impact of a product throughout its whole life from extraction of materials through to final disposal. • 4 Key Stages: • Raw materials • Manufacture • Use • Disposal • 4 Impacts assessed • Water Consumption • Energy used • Carbon Footprint • Natural Resources • Life Cycle Assessments are useful for: • Comparing different materials for the same job. • Comparing the same material for different jobs:	Because both the materials and the energy sources we use are limited/finite, we need to reduce use of these resources. • So they don't run out! • Also, because obtaining raw materials from the Earth by <u>quarrying</u> and <u>mining</u> causes environmental impacts. • The three Rs help to <u>reduce the demand for our limited resources of materials and energy.</u> • The three Rs also <u>reduce the amount of waste</u> produced. Landfill takes up space and pollutes the surroundings. Glass, Metal and Plastic can be recycled in three steps: • Crush • Melt • Reform

Lesson 1 Introduction to waves	Lesson 2 The Wave Equation	Lesson 3 Required Practical – Properties of waves
- A wave is a disturbance that transfers energy without transferring matter. - In a transverse wave, the direction of oscillation is perpendicular (at right angles) to the direction of energy transfer. E.g., light, ripples in water. - In a longitudinal wave, the direction of oscillation is parallel to the direction of energy transfer. E.g., sound. - The amplitude of a wave is the maximum displacement of a point on a wave away from its undisturbed position. For a sound wave, this gives you the volume. - The wavelength of a wave is the distance from a point on one wave to the equivalent point on the adjacent wave. - The frequency of a wave is the number of waves passing a point each second. For a sound wave, this gives you the pitch. - The period of a wave is how long it takes for one wave to pass a point. Longitudinal:  Transverse: 	$Period = 1 \div frequency$ Period in seconds Frequency in Hertz (Hz) You do not need to memorise this equation. - The speed of sound can be found by clapping near a wall and listening for the echo. - If you clap in time with the echo, the time between claps will be equal to the time taken for the sound to travel from your hands to the wall and back. - You can use speed = distance $\div$ time - The distance will be twice the distance from the person to the wall. - The speed of sound in air is around 300 m/s.# $wave\ speed = frequency \times wavelength$ speed of the wave in m/s frequency of the wave in Hertz (Hz) wavelength of the wave in metres (m) 	- You will investigate the suitability of apparatus to measure the frequency, wavelength and speed of waves in a ripple tank and waves in a solid. - Waves in water are investigated using a ripple tank:  - Waves in a solid are investigated using a vibration generator and a piece of string. 

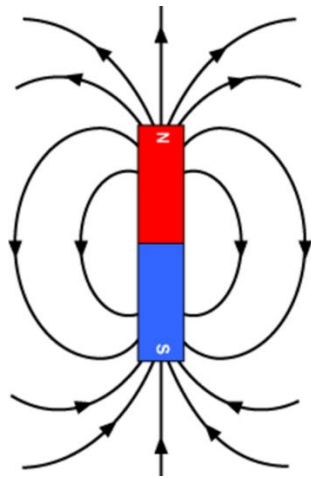
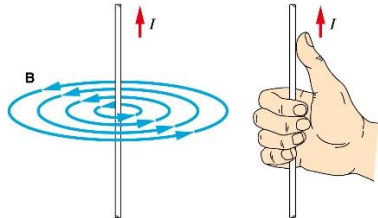
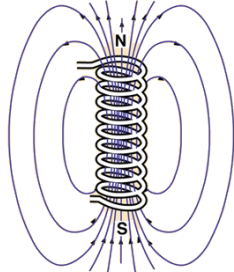
Lesson 4 The electromagnetic spectrum	Lesson 5 How electromagnetic waves are generated	Lesson 6 Refraction																								
- The electromagnetic spectrum is a continuous spectrum of electromagnetic waves that can be grouped together in terms of their wavelength and frequency. - The order of the spectrum from longest to shortest wavelength is: - Radio, microwave, infrared, visible light (from red to violet), ultraviolet, x-rays and gamma rays. <table border="1" data-bbox="129 592 757 927"> <thead> <tr> <th>Part</th><th>Use</th><th>Why is this type of wave suitable?</th></tr> </thead> <tbody> <tr> <td>Radio waves</td><td>Television and radio</td><td>Can travel a long distance through the Earth's atmosphere.</td></tr> <tr> <td>Microwave</td><td>Satellite communication</td><td>Can travel through the Earth's atmosphere.</td></tr> <tr> <td>Infrared</td><td>Electrical heaters</td><td>Absorbed by the skin as heat.</td></tr> <tr> <td>Visible</td><td>Fibre optic communications</td><td>Can travel a long distance through glass fibres.</td></tr> <tr> <td>Ultraviolet</td><td>Sun tanning</td><td>Absorbed by the skin to produce a dark pigment.</td></tr> <tr> <td>X-rays</td><td>Medical imaging</td><td>Is absorbed by bone but can travel through skin and tissues.</td></tr> <tr> <td>Gamma rays</td><td>Irradiation of food</td><td>Kills cells, so will kill bacteria/mould.</td></tr> </tbody> </table>	Part	Use	Why is this type of wave suitable?	Radio waves	Television and radio	Can travel a long distance through the Earth's atmosphere.	Microwave	Satellite communication	Can travel through the Earth's atmosphere.	Infrared	Electrical heaters	Absorbed by the skin as heat.	Visible	Fibre optic communications	Can travel a long distance through glass fibres.	Ultraviolet	Sun tanning	Absorbed by the skin to produce a dark pigment.	X-rays	Medical imaging	Is absorbed by bone but can travel through skin and tissues.	Gamma rays	Irradiation of food	Kills cells, so will kill bacteria/mould.	Changes in atoms or the nuclei of atoms can produce EM waves. - When a radio wave is absorbed it causes electrons to move backwards and forwards (oscillate). - This causes a current that constantly changes direction – an alternating current that has the same frequency as the wave Ultra-violet waves can cause skin to age prematurely and increase the risk of skin cancer. X-rays and gamma rays are ionising radiation that can cause mutation of genes and cancer. - Exposure to radiation (called “dose”) is measured in Sieverts (Sv). Radiation dose (in Sieverts) is a measure of the damage caused by the radiation in the body. Dose adds up (“cumulative”).	- Different wavelengths of electromagnetic waves are reflected, refracted, absorbed or transmitted differently by different substances and types of surface. - Refraction is the change in direction that can happen because light travels at different speeds in different materials. - Light travels more slowly in denser materials, and this means it changes direction towards the normal. - Refraction won't happen when the light enters a medium at 90° to the surface 
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Lesson 7
Required Practical - Radiation

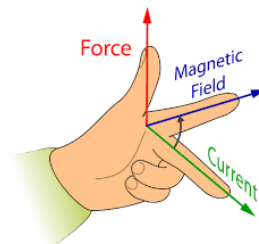
- You will investigate **how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface.**

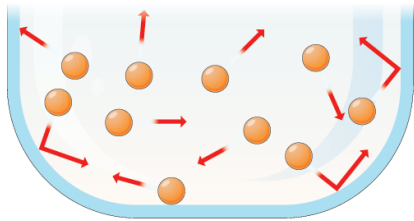


- Independent variable** – the colour of the surface.
- Dependent variable** – the temperature measured with the IR thermometer.
- Control variable** – the distance between the surface and the detector.

Lesson 1 Magnetic Field Patterns	Lesson 2 Induced Magnetism	Lesson 3 The magnetic effect of a current
- The region around a magnet is called a magnetic field. A permanent magnet is an object with a magnetic field. - The poles of a magnet are the areas where the magnetic fields are strongest – usually called North and South. Strictly, we should call these north-seeking and south-seeking. - Two like poles repel each other. Two unlike poles attract each other. - Attraction and repulsion between two magnetic poles are examples of a non-contact force. - The shape of a magnetic field can be found by placing iron filings on paper over a magnet or using a plotting compass. - The magnetic field around a bar magnet is symmetrical: 	- An induced magnet is a material that becomes a magnet when it is placed in a magnetic field. Induced magnetism always causes a force of attraction. - When removed from the magnetic field, an induced magnet loses most/all of its magnetism quickly - The strength of an induced magnet will depend on the strength of magnetic field it is placed and the time it is within the field. - The strength of a magnet can be simply investigated by seeing how many paperclips it picks up. - Smaller paperclips will allow the detection of smaller differences in strength.	- The magnetic field around a current-carrying wire is circular. - The strength of the field decreases as you get further from the wire and increases if the current increases.  - A solenoid is a coil of wire with a current flowing through it. - Outside the solenoid, the field looks like the field from a bar magnet. - Inside the solenoid, the field is strong and uniform.  - The strength of a solenoid can be increased by: - Increasing the current - Increasing the number of loops - Adding an iron core (to make an electromagnet.)

Lesson 4 HT ONLY: The motor effect	Lesson 5 HT ONLY: Magnetic Flux Density
- The motor effect states that there is a force on a current-carrying conductor in a magnetic field. - This occurs due to interaction between the magnetic fields. - Where the fields point in the same direction, the field becomes stronger. - Where the fields point in the opposite direction, the field becomes weaker. - There is a force on the wire from where the field is stronger to where it is weaker. Figure 1, 2 and 3 - The size of the force depends on the strength of the magnetic field, the size of the current and the angle between conductor and field (the largest force is when they are at right angles).	- The size of the force in the motor effect is given by the equation: $\text{Force} = \text{magnetic flux density} \times \text{current} \times \text{length}.$ Force in Newtons (N) Current in Amperes (A) Length in metres (m) Magnetic Flux Density, the “strength of the magnetic field” in Tesla (T) (You do not need to memorise this equation) - An object can be made to “float” in a magnetic field if its weight downwards is equal to the magnetic force on it upwards.



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