

Curriculum Foundations

1. What are young people expected (broadly) to know and do having learnt this curriculum, which explains why it is in the overall curriculum?

What is the unique offering of the subject of geography?

The subject of geography is the study of the variation of and interaction between physical and human phenomena across the surface of the world. In this definition the term surface includes the Earth's crust, its landscape, the plants and animals that inhabit it, the atmosphere, people and culture, the built environment, and political territories (Figure 1). Of course, other subjects also study these features. What distinguishes Geography's contribution is its interest in the relationships between these different phenomena, which can explain spatial patterns and account for the unique characteristics of places. For example, economists aim for an understanding of how economies work and function, while geographers study economic activity to understand how it is arranged and connected spatially, and to examine how it is related to other geographical phenomena, such as resource distribution, climate, and population (based on Standish 2021).

A similar distinction can be made between scientists and geographers. Where scientists are interested in physical processes and abstracting these into models and theories, geographers are interested in understanding how models of physical processes are enacted at a particular location, and the connection between that process and other components such as the atmosphere, biosphere, and human activity. For example, whilst a scientist is interested in the nutrient cycle and how this can be disrupted by tree felling, geographers are concerned with the deterioration of soil quality in the tropical rainforest compared to temperate biomes, the rising trend of deforestation in south-east Asia on account of its industrial expansion, and the threats to the endangered species of that region.



Figure 1 – An illustration of some of the components of Earth's surface.

What can the study of geography offer young people?

For students, the study of geography offers a uniquely powerful lens through which to see the world, helping them to see connections between places and scales that would otherwise be missed. Students are pushed beyond the confines of their everyday experience, to encounter places and landscapes that they would otherwise not meaningfully understand. This brings a sense of awe and wonder of the world, increases care and compassion for the planet and its inhabitants, and raises understanding of different ways of living. Geography also teaches students about their own local environment, compelling them to reconsider what they thought they knew in a wider context. The study of geography is also a matter of citizenship as it helps young people to encounter and engage with their world and find their place within it, offering them a stronger voice to discuss the issues that matter.

What can a great geographer do by the end of the key stage?

By the end of Key Stage 3, a great geographer can be expected to...


- explain how physical landscapes were formed, sequentially and using specialist vocabulary.
- identify spatial trends, noting patterns and exceptions, illustrating with place specific examples.
- examine how human activities interact with the physical environment, including environmental fragility, offering management solutions, creating opportunities for people, and presenting hazards to populations.
- understand why people may hold contrasting viewpoints on issues of environmental management.
- use frameworks of sustainability to determine the likely outcomes of decisions around environmental management.
- recognise a process or phenomena occurring in a place and work backwards to identify what large scale trend it is a part of. In doing so, they make synoptic links between discrete areas of the curriculum.
- use substantive geographical knowledge built over several units or years to describe and explain complex geographical phenomena or issues (see Figure 2 on next page).
- examine how increasing global connectivity provides opportunities for some but can also increase disparity.
- comment geographically on controversial issues of the day, such as resource demand, conflict, climate change, disparities in development, legacies of colonialism, and use evidence to inform judgements.
- make well informed predictions about how human and physical landscapes may change in the future.
- use a range of cartographic, graphical, and numerical skills to explain geographical phenomena, including GIS.
- confidently gather, present, and analyse geographical data and draw conclusions.
- test geographical models and theories against place-specific data.








Why is the Grand Ethiopian Renaissance Dam causing tension in north-east Africa?


I know...


 Earth is habitable because it has water. People rely on water for domestic, agricultural and industrial purposes.

 Some countries rely on agriculture for income.

 Bands of high and low rainfall occur across the planet.

 Earth's surface is constantly changing due to factors including geology and the rock cycle

 Water erodes and deposits rock.

 The River Nile transports water downstream from Ethiopia through the arid lands of Sudan and Egypt. The river deposits sediment forming fertile floodplains which support agriculture.

Annual Question	Autumn		Spring		Summer	
	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Year 7 'What are the key physical and human processes on our planet?'	Geography and me	Our planet	Resources and trade	Brilliant Biomes	Fantastic UK Landscapes	UK Coasts
Year 8 'Does humanity live sustainably with the environment?'	River Rivals	Food and Famine	Endless Energy?	Climate Change	Polar	The Middle East

So I understand...



Ethiopia's Grand Renaissance Dam will store water upstream, reducing the volume of water and sediment reaching Sudan and Egypt. These countries depend on Nile water for their survival and income. As a result, the GERD is causing tension in north-east Africa.

Figure 2 – An example of how sequenced knowledge is built and applied over time to understand complex geographical ideas.

2. Why is the content structured in the way you have chosen?



KS3 Geography Mastery Curriculum Overview

	Annual Question	Autumn		Spring		Summer	
		Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Year 7	'What are the key physical and human processes on our planet?'	Geography and me <ul style="list-style-type: none"> My location UK geography (physical and human) OS maps Personal geography (fieldwork) 	Our planet <ul style="list-style-type: none"> Earth's physical geography (continents, oceans, layers, atmosphere, water cycle) Earth's human geography (population, wealth distribution) 	Resources and trade <ul style="list-style-type: none"> Raw materials Manufacturing Trade Supply chains UK industrial change 	Brilliant Biomes <ul style="list-style-type: none"> Ecosystems and biomes Latitude and biome formation (temperature & rainfall) Deciduous forest biome Biome (fieldwork) 	Fantastic UK Landscapes <ul style="list-style-type: none"> Landscape layers Geology and the rock cycle 3 unique UK landforms Using (OS maps & GIS) to explore UK landscapes 	UK Coasts <ul style="list-style-type: none"> Erosion & deposition Coastal geology Beaches, cliffs, headlands, bays Using (OS maps & GIS) to explore UK coasts
Year 8	'Does humanity live sustainably with the environment?'	River Rivals <ul style="list-style-type: none"> River features and landforms Floodplain formation Importance of rivers The Grand Ethiopian Renaissance Dam Water conflict (NE Africa) 	Food and Famine <ul style="list-style-type: none"> Importance of food Food security (Central African Republic) Rising global food demand 	Endless Energy? <ul style="list-style-type: none"> Rising global energy demand Fossil fuels (Russia) Renewables (Uruguay) (Decision making) solar panel site 	Climate Change <ul style="list-style-type: none"> Natural climate change Enhanced greenhouse effect Unequal impacts Strategies 	Polar Environments <ul style="list-style-type: none"> Cause of extreme cold (Earth's tilt) Plant and animal adaptations Yamal Peninsula (Russian Arctic) Indigenous Nenets 	The Middle East <ul style="list-style-type: none"> Concept of the 'Middle East' High pressure belt and aridity Changing borders and conflict (Syria) Wealth, industry, culture
Year 9	'How globally connected is the world?'	Global Oceans <ul style="list-style-type: none"> Ocean tectonics 2011 tsunami (Japan) Layers of the ocean Ocean currents Carbon sink 	Ocean Ecosystems & Governance <ul style="list-style-type: none"> Coral reefs Great Pacific Garbage Patch The Law of the Seas Illegal foreign fishing in Somali waters 	The Global Economy <ul style="list-style-type: none"> Idea of 'the economy' Industrialisation and deindustrialisation (China and the UK) HICs, MICs, LICs Globalisation TNCs 	Development Disparity <ul style="list-style-type: none"> Idea of 'development' Development indicators Factors affecting development (India) Development strategies 	Glacial Landforms & Processes <ul style="list-style-type: none"> Glacier distribution (altitude and latitude) Glacier formation and retreat Corries, arêtes, pyramidal peaks, and U-shaped valleys Glacial landforms on (OS maps & GIS) 	UK Regions Fieldwork Investigation <ul style="list-style-type: none"> Revision of coastal, river, and glacial landscapes, geology Lake District (fieldwork) (virtual) Our UK region (fieldwork) Comparative (fieldwork report)

The **Year 7** Autumn term secures foundational geographical knowledge before moving onto major physical and human processes occurring on Earth's surface.

Year 8 builds on this by exploring human interactions with the natural world. Each unit examines reliance on the natural environment and the impacts of resource extraction as populations and wealth rise. We consider how sustainable our actions are, and what creative solutions might look like.

Year 9 units draws synoptic links across the curriculum. Units 1–4 explore global connectivity through the lenses of oceans (autumn) and economy and development (spring). The summer term brings the curriculum full circle back to UK geography, finishing with a final comparative fieldwork investigation drawing on knowledge and skills across the course.



What is the curriculum narrative in each year?

Geography is a horizontal discipline with topics that overlap. Geographical concepts can act as unifying threads for these themes. In Geography Mastery the four selected concepts are processes, interactions, connections, and perspectives. In order to pitch these concepts at a KS3 level, Geography Mastery uses annual questions that speak to each of these overarching concepts, which build in complexity through the key stage.

In any good story, the significance of certain events only takes on meaning if read in the order that the author intended. So too, the significance of each segment of knowledge in a mastery curriculum is only fully understood if taught in sequence. In Geography Mastery, the narrative hinges upon three **Annual Questions**:

In Year 7 students consider the question of 'What are the key physical and human processes on our planet?'

By the end of Year 7, a good geographer would be able to explain sequentially a range of Earth's key processes, using specialist vocabulary, referring to place specific examples, and showing how these processes change the surface of the planet over time.

In **Year 7**, Units 1 and 2 establish foundational geographical ideas and skills, for example continents and oceans, describing locations using compass directions, understanding maps at a range of scales, the distinctive physical and human characteristics of the UK, and identifying how there is an uneven distribution of wealth and quality of life across the world. Unit 1 includes a fieldwork project based on students' personal geographies and helps them to see how geography as a subject can enhance understanding of their own lives, as well as introducing them to fieldwork early on.

Units 3-6 address specific human and physical components of the Earth's surface and the processes that form it, including trade and resources, biomes, UK landscapes (power of tectonics, ice, and water) and coastal landscapes. Example processes include the water cycle, nutrient cycle, rock cycle, glacial erosion, and continental drift. Students characterise biomes such as tropical rainforests and hot deserts and they explain the importance of trade and resources and understand how this influences settlement. It is important that by the end of Year 7 students have a strong understanding of physical processes, because this enables them to meaningfully understand human interaction with the environment in Year 8.

Year 7 students also need to recognise key spatial patterns that can be plotted on a world map, for example locations of continents and oceans, the distribution of wealth, the location of biomes at different latitudes, and the layout of tectonic plates.



In Year 8 students consider the question of 'Does humanity live sustainably with the environment?'

By the end of Year 8, a good geographer would be able to explain how people rely on the natural environment, and how human activity impacts the natural world, sometimes altering physical processes and often threatening the planet.



In **Year 8**, Units 1-3 look at the ways in which people depend on natural resources and how this can impact the environment and create political tensions. For example, in Unit 1 River Rivals students assess how building the Grand Ethiopian Renaissance Dam will increase energy supply but decrease water supply for downstream nations. In Unit 2 Food and Famine students study the physical and human causes of food insecurity in north-east Africa. In Unit 3 Endless Energy students understand the positive role that renewable energy supply can have for the planet's climate future and at the same time understand why uptake is currently low.

By Unit 4 Climate Change students examine uneven impacts of climate change across the globe (such as in arid regions studied in Unit 2) and can draw on their knowledge of the role of fossil fuels in causing this (linking to Unit 3). In Unit 5 students study polar environments with a focus on the Russian Arctic. They learn how atmospheric processes affect ecosystems and make further links to the causes and impacts of climate change. In Unit 6, a regional study of the Middle East draws together several geographical topics learned in Year 8, pointing towards the challenge of living sustainably in harsh physical environments. By the end of Year 8 students have understood the importance of natural resources to humanity, how these resources are both depleted and managed, and the threats that resource use can have at local, regional, and planetary scales. This theme of interaction in Year 8 sets students up well for making synoptic links in Year 9.

By **Year 9**, students are expected to make meaningful synoptic links across a range of areas in the curriculum. This has guided the selection of themes that lend themselves well to this type of analysis. Year 9 starts with a double unit on oceans. This opens the question of how the world is globally connected through the oceans, as the unifying feature connecting the continents. The unit starts by stripping back to the idea of the Earth as a rocky planet. Students appreciate that the ocean floors are also part of tectonic plates. Through this study of ocean tectonics, students see how tectonic plate movement both forms land and creates human hazards. In the next sub-unit on ocean processes, students learn how oceans interact with the atmosphere to regulate climate and provide a habitable living space for marine flora and fauna. In ocean biomes, students study the distribution, anatomy, and characteristics of coral reef ecosystems, examining how they are threatened by industry and climate change. In the fourth sub-section students add the layer of human activity and study how the oceans are governed and mismanaged leading to the plundering of ocean resources and rising political tensions.

In Year 9 students consider the question of 'How globally connected is the world?'

By the end Year 9, a good geographer would be able to identify the intricate ways in which the world is globally connected, drawing on a range of physical and human geography knowledge to explain what is happening on our planet, at a range of scales. A good geographer would be able to assess how global connection improves life for many but also increases disparity.



The second approach to answering the Y9 annual question is a study of the economy and development. In Unit 3 The Global Economy students learn how the rise and fall of industry can be used to explain current economic trends around the world. They learn how globalisation has changed the pattern and volume of trade, bringing both benefits and costs to people, and impacts to the environment. In Unit 4 Development Disparity students recognise the broad definition of the term development, identify a range of complex causes of disparity, study India in depth as an example of a place with signs of both development and disparity, and then examine development strategies that have been used during the 20th and 21st centuries. By the end of this unit students are equipped to answer the annual question, via the lens of oceans or the global economy and development. This closing of the annual question at the end of Unit 4 means schools are free to commence the GCSE in the summer term of Year 9, as is a common practice. Though this would remove an in-depth glaciation unit and the UK synoptic study, the essential knowledge to support students to be successful at GCSE has been covered. Equally schools that are keen to ensure opportunity for their own chosen units can insert them after Unit 4 of Year 9.

Unit 5 Glacial Landforms and Processes speaks to the annual theme of global connectivity, by examining how climate change is causing glacial retreat and global sea level rise, with significant impacts to people, economies, and environments across the globe. Glaciation is often packaged as an optional unit at GCSE and A Level and is less commonly taught by schools. Many geography students who undertake GCSE and A Level leave school having never studied glaciation. This unit offers a survey of dramatic glacial landforms and explains their formation. It uses examples of currently glaciated regions such as the Alps and past glaciated regions such as the Lake District and Snowdonia in the UK. At this point in Year 9 students have sufficient competency to 'dig deep' on complex and fascinating physical geography processes. In Year 9 Unit 6 UK Regions Fieldwork Investigation, students conduct fieldwork to gather data about the physical and human geography of two UK regions. Virtual fieldwork materials are provided for the Lake District, and guidance is provided to support teachers to develop fieldwork materials relating to their own UK region. The unit culminates in an independent, comparative fieldwork report. It is often argued that students only study the UK at KS2 and early on in KS3 and therefore leave with a superficial understanding of their region. From this investigation students leave with a firm understanding of the physical and human processes that shape two UK regions, and gain considerable skills in pulling together an investigation, analysing and synthesising their research. This echoes the Year 12 NEA, something that teachers often find students ill-prepared for. This brings the curriculum narrative full circle as we started the key stage with a foundational introduction to students' own place and UK geography. Schools should note that the summative Assessment in Year 9 cover up to and including Unit 5.

Which places are studied in depth in KS3?

In geography the journey through places is of paramount importance. Good geographers avoid the pitfalls of a 'single stories'; instead, they are able to characterise places, recognising patterns and exceptions and linking these processes and themes to a broader context. For this reason, 'places' are interleaved and revisited through the curriculum. All places required by the National Curriculum Programme of Study (PoS) have been included. Most focal countries and regions are in Africa, Asia, and Europe. The rationale is that by returning to the same broad regions, more complex pictures can be painted, rather than attempting to cover all continents meaningfully at KS3.

Place	Where in the curriculum?	Justification
The UK	<ul style="list-style-type: none"> • Y7 U1 Geography and Me • Y7 U2 Our Planet • Y7 U5 Fantastic UK Landscapes • Y7 U6 UK Coasts • Y8 U3 Food and Famine • Y9 U3 The Global Economy • Y9 U5 Glacial Landforms and processes • Y9 U6 UK Regions Fieldwork Investigation 	<p>All students should have a strong grounding in the country in which they live. The UK has a fantastic array of physical landforms and this is fruitful ground for studying physical processes, as well as linking into wider scale processes. It is powerful to learn about changes to the UK economy as these shifts explain much about the social and political landscape of our nation, as well as fitting into the large-scale context of globalisation and deindustrialisation.</p> <p>Often the UK is only studied at KS2 or the start at KS3 leaving students with a superficial understanding of their own context. This is why the UK is returned to in Year 9 via study of The Global Economy, Glacial Landforms and Processes, and the UK Regions Fieldwork Investigation.</p>
North-east Africa	<ul style="list-style-type: none"> • Y7 U4 Brilliant Biomes • Y8 U1 River Rivals • Y8 U2 Food and Famine • Y9 U3 Global Economy • Y9 U4 Development Disparity 	<p>North-east Africa presents a complex picture with rapidly changing economies, several of which face the challenge of conserving resources and managing arid environments. Reasons for aridity are introduced in Year 7 in Brilliant Biomes, then in Year 8 students examine interactions between physical and human processes in the region, as part of the Year 8 annual question. Several countries are revisited in Year 9 in Development Disparity, such as infrastructure projects in Ethiopia and factors affecting conflict and development in Somalia. There is a requirement in the PoS to study a region within Africa.</p>
Russia	<ul style="list-style-type: none"> • Y8 U3 Endless Energy • Y8 U5 Polar Environments 	<p>As the largest country in the world, Russia has a myriad of contrasting environments, both physical and human. Russia is introduced in Polar Environments, before narrowing down to the Arctic region of Russia as the unit's key example of a polar environment. Russia is also given</p>

		brief mention in the Endless Energy unit as an example of how fossil fuels can be the source of political tensions. There is a requirement in the PoS to study Russia.
Middle East	<ul style="list-style-type: none"> • Y8 U1 River Rivals • Y8 U6 The Middle East - A Regional Study 	The Middle East is a complex region of 17 countries. Many have an arid or semi-arid environment and face the challenge of managing sustainable resource use. As such it provides superb landscape for drawing together the Y8 annual theme. Regional studies offer students the chance to draw together several studied themes to build up a picture of a large-scale region. Prior to this unit, students will have also studied Egypt in Unit 1 River Rivals and the UAE in Unit 2 Food and Famine. Students revisit the Middle East in Year 9 Unit 3 as part of the study of the Global Economy. There is a requirement in the PoS to study a region in Asia.
Japan	<ul style="list-style-type: none"> • Y9 U1 Global Oceans 	In Global Oceans students are introduced to the plate tectonics that influence Japan and learn about the devastating impacts of the 2011 tsunami. This event challenged modern assumptions about how highly developed countries could escape the perils of natural hazards and reminds students of the sheer power of tectonic processes.
South-east Asia	<ul style="list-style-type: none"> • Y7 U4 Brilliant Biomes • Y9 U2 Ocean Ecosystems and Governance • Y9 U4 Development Disparity 	In Year 7 students learn that tropical rainforests abound in south-east Asia and are introduced to the characteristics of the biome. In Year 8 students are introduced to the broad concept of resource extraction impacting the natural environment. In Year 9 students learn that rapidly growing populations in south-east Asia, in tandem with rising global demand for ocean resources, is putting immense pressure on the region's ecosystems, for example coral reefs. Students then revisit south-east Asia in The Global Economy and Development Disparity, building synoptic understanding of the region.
China	<ul style="list-style-type: none"> • Y9 U3 Global Economy 	China is mentioned as a nation that exemplifies the modern evolution from agrarian to industrial society. This is followed by a focus on the east coast of China and how physical and human factors have led to industrialisation in this region. The role of TNCs in the Shenzhen area is also explored. There is a requirement in the PoS to develop locational knowledge of China.
India	<ul style="list-style-type: none"> • Y9 U4 Development Disparity • Y9 U5 Glacial Landforms and Processes 	India is introduced as a large and populous country with diverse physical and human landscapes. It is explained how physical and human factors have both helped and hindered development in India. In Unit 5 the Himalayan mountain range is mentioned as a location for glacial landforms and processes. There is a requirement in the PoS to develop locational knowledge of India.

Table 1 – The journey of places studied and revisited during the key stage.



3. How have you identified *specifically* what young people should know and be able to do from studying this curriculum?

What process informed the scope and sequence of the curriculum?

To plan out the scope of the curriculum, the curriculum design leads have...

- ensured that the curriculum met all objectives of the National Curriculum Programme of Study.
- paid attention to GCSE and A Level specifications, ensuring that students would be prepared to access GCSE and eventually A Level pathways. For example, by dedicating a topic to glaciation, which is rarely taken up at GCSE and poorly understood at A Level. Another example is in setting up an independent project at the end of Year 9, similar in style to the A Level NEA, so students have some experience of this prior to A Level.
- followed some of the recommendations of the A Level advisory board (which aimed to bridge the gap between university and A Level). It recommends that topics such as food security, oceans, and global governance be further included in A Level. A KS3 version of several of these topics has been incorporated.
- listened to the advice of geography teachers who identified common gaps at the start of KS4 and KS5 for example explaining the formation of physical landscapes, reading OS maps and synthesising fieldwork data.
- conducted a working party of specialist geography teachers in the network, who made recommendations for the curriculum foundations and curriculum map.
- met with three professional advisors from the geographical community, who offered reflections on the Geography Mastery programme.
- presumed limited knowledge from KS2, given the wide-ranging experiences of 11-year olds in their primary education, and ensured provision in early units that aims brings all students to an equal footing.
- considered seminal work of geographer Margaret Roberts 'Geography through Enquiry' and decided on the approach of 'closed enquiry' in which the teacher sets up the geographical enquiry and prepares the knowledge and data that students examine to answer the question. All units are based around an end of unit enquiry question and all lessons have an enquiry question as their title, which becomes main written task that students answer at the end of the lesson.
- conducted expansive research and boiled down the essential knowledge from each topic for students to know and written these up as core knowledge statements.



What literature influenced the scope and sequence of the curriculum?

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See pp. 12-41 for the complete 2023-24 Year 7 Unit Overviews

See pp. 42-101 for **DRAFT** Year 8 and 9 Unit Overviews



Geography Mastery KS3 – Unit Overview

Year 7 Unit 1 – *Geography and Me*

Unit rationale

Students arrive in Year 7 with varied experiences of learning the subject of geography. Some have had no formal induction into the subject. The first and second units introduce students to the subject of geography and aim to bring them to an equal footing. Unit 1 helps students to locate and characterise their local area and the UK, which is important before attempting to grapple with larger geographical scales and global themes from Unit 2 onwards.

This unit addresses the Year 7 annual question of ‘What are the key physical and human processes on our planet?’

Scope

A baseline lesson introduces students to the study of geography. A writing activity based on photo description gives teachers an impression of students’ written competency in the subject.

Unit 1 contextualises students’ locale. Students learn to use a range of maps and compass directions to describe location and direction. They use OS maps to characterise their local area. We then study key physical characteristics of the British Isles (for example relief and rivers) and key human geography characteristics of the UK (for example its four nations and capital cities).

Next the unit looks at how early and modern migration has shaped the UK. These lessons are the foundation to students’ first fieldwork project investigating the personal geography of a family member.

Sequence

Links to prior learning

Before young people reach the door of their geography classroom, they already bring with them many personal geographies (Biddulph 2010). In the Unit 1 personal geography fieldwork, students make connections between their own lives and the subject of geography. As well as being meaningful for students, this process inducts them as geographers and helps teachers to better understand the young people they are teaching.

Links to future units

The study of one’s local area is foundational to completing further UK-based units including Unit 5 Fantastic UK Landscapes and Unit 6 UK Coasts. This theme is returned to in Year 9 Unit 6 UK Regions Fieldwork Investigation.

Once students have a grasp of their own local area and are able to put it in some context, they are in a better position to understand the large-scale themes introduced in Unit 2 Our Planet.



Core Knowledge (assessable)

Lesson 1 – How do I think like a geographer?

In this lesson we learn to define the subject of geography and consider how we think like geographers.

- **Key term** – The word **geography** means description of the Earth. Geo = Earth. Graphy = Writing.
- The subject of geography is the study of the Earth's surface, including land and ocean, living things, people and atmosphere.
- Physical geography is the study of Earth's natural features, e.g., rivers, weather, forests.
- Human geography is the study of people and places, e.g., where people live, wealth, migration.
- Thinking like a geographer involves asking questions, e.g., how natural features form, and what makes a place unique.
- **Skill** – Photos can be used to identify physical and human features.
- **Stretch (optional)** – Are physical and human geography always separate?
- **Lesson vocabulary** – geography, geographer, Earth, map, physical geography, human geography, atmosphere, environment.

Lesson 2 – Why are maps important?

In this lesson we learn how maps are useful and how to use maps and compass points to describe location.

- **Key term** – a **map** is a diagram of part of Earth's surface.
- A map represents information about a place, for example where rivers and cities are located.
- Compass points can be used to show directions.
- The eight points of a compass are: north, north-east, east, south-east, south, south-west, west, north-west.
- **Skill** – Compass directions can be used to describe location and direction between two locations.
- **Stretch (optional)** – How do I draw a map of my local area?
- **Lesson vocabulary** – map, diagram, representation, local, compass, direction.

Lesson 3 – What can maps tell us about our local area?

In this lesson we learn to identify physical and human features of an area using an OS map.

- **Key term** – an **Ordnance Survey** (OS) map shows detailed characteristics of a place.
- Physical and human features are represented by symbols on the map. The map key shows what each symbol represents.
- The physical environment includes natural features such as woodlands and rivers.
- The human environment includes built features such as roads and buildings.
- **Skill** – Using an OS map to characterise the local area.
- **Stretch (optional)** – How does the New Forest look different to a built-up area on an OS map?
- **Lesson vocabulary** – Ordnance Survey map, characteristic, key, symbol, feature, built environment, natural environment.



Lesson 4 – What is the physical geography of the British Isles?

In this lesson we learn what counts as ‘the British Isles’ and identify the physical geography characteristics within it.

- **Key term – topography** means the pattern of natural features on Earth’s surface e.g., areas of mountains.
- The British Isles:
 - include the landmasses of Great Britain, Ireland, and several small islands.
 - are a group of islands, surrounded by coastline.
 - are surrounded by the Atlantic Ocean, Celtic Sea, Irish Sea, North Sea, and the English Channel.
 - have highland regions in the north and west, and lowland areas in the south-east.
 - have many rivers, including the Thames, Severn, Tay, Shannon.
- **Skill** – Using a topographic map to show highland and lowland regions, seas, rivers, and coastlines.
- **Stretch (optional)** – How long is Great Britain?
- **Lesson vocabulary** – topography, British Isles, coastline, landmass, Ireland, highland, lowland, river, topographic map.

Lesson 5 – What is the human geography of the UK?

In this lesson we learn to identify the nations, capital cities the UK, and population characteristics of the United Kingdom.

- **Key term – population** means the number of people living in a particular area.
- The United Kingdom (UK) is a country made of four nations: England, Northern Ireland, Scotland, and Wales.
- Unlike the British Isles, the UK does not include the Republic of Ireland.
- The population of the UK is nearly 70 million.
- Most people in the UK live in England.
- The UK has an ageing population.
- The majority of the UK’s population is White British. There are a range of ethnic groups.
- London is the capital of England. Belfast, of Northern Ireland. Edinburgh, of Scotland. Cardiff, of Wales.
- London is the centre of government for the whole of the UK.
- **Skill** – Using a country map to identify the nations and capital cities of the UK.
- **Stretch (optional)** – What are counties?
- **Lesson vocabulary** – population, country, capital city, country map, government, United Kingdom, British Isles.



Lesson 6 – Have people always lived in the UK?

In this lesson we learn what migration is and its importance in the UK.

- **Key term – migration** means the movement of people from one place to another to live.
- Immigration occurs when people move into a country to live.
- All residents in the UK are either immigrants or descended from immigrants.
- Many different groups of people have immigrated to the UK since 10,000 BC.
- The main reasons for migration are for jobs and a better life or for safety.
- **Skill** – Maps and timelines can be used to chart immigration to the UK.
- **Stretch (optional)** – How has migration shaped the UK?
- **Lesson vocabulary** – migration, immigration, immigrant, descended, ancestor, timeline, empire, threat, violence, war, employment.

Lesson 7 – Revision + Checkpoint Assessment (15 multiple-choice questions)

In Lesson 7 students revise the core knowledge of the unit (Lessons 1 – 6). At the end of the lesson, they complete a 10 multiple-choice question quiz (Checkpoint Assessment). This helps you gain insight into the misconceptions and knowledge gaps that exist in your class, in order to prepare a targeted reteach in Lesson 8.

Lesson 8 – Reteach

In Lesson 8 students complete activities to address misconceptions and knowledge gaps revealed by the Checkpoint Assessment. You can choose reteach activities appropriate to your students' incorrect responses or design your own reteach tasks.

Lesson 9 – How do I research personal geography?

In this lesson we learn about the role of fieldwork in geography and plan our own fieldwork to collect data on personal geography.

- **Key term – fieldwork** happens when we gather data to answer a geographical question.
- Personal geography includes where a person is from and where their family members were born, and their languages.
- Geographers can use number data or data from observations, e.g., photographs.
- Interview questions can be asked to investigate someone's personal geography.
- **Skill** – Preparing and interviewing someone to find out about their personal geography.
- **Stretch (optional)** – What makes a successful interview?
- **Lesson vocabulary** – fieldwork, geographical question, investigation, data, observation, interview, personal geography.



Lesson 10 – How do I present personal geography fieldwork?

In this lesson we learn what makes an excellent personal geography fieldwork project.

- **Key term – criteria** are a set of standards used for judging something.
- A good personal geography fieldwork project:
 - locates places on a map.
 - describes a range of data gathered from the interview.
 - uses labelled photos or diagrams to explain the data.
- **Skill** – Using criteria to recognise what a good fieldwork project looks like using an example.
- **Lesson vocabulary** – criteria, present, explain, label, fieldwork project.

Lesson 11 – Presenting my project

In this lesson we learn to compose a fieldwork report including writing, maps and annotating images.

- Presenting personal geography fieldwork involves:
 - selecting the most important data to include.
 - a design layout that clearly presents written and visual data.
 - capturing the intent and meaning of an interviewee's responses.
- **Skill** – Using writing, maps, and images to confidently explain their personal geography.
- **Lesson vocabulary** – describe, design, annotate, summarise.

Lesson 12 – What are other people's personal geographies?

In this lesson we are learning to describe stories of heritage and migration from people who live in the UK.

- **Key term – quality of life** is a description of people's standard of health, comfort, and happiness.
- Heritage means the traditions, history, and culture of a place that are still important to people today.
- **Personal geography competencies involve:**
 - Having empathy (imagining what life is like for them and what it feels like).
 - Accepting that what the person thinks or believes might be different to me.
- **Stretch (optional)** – An example of the personal geography of someone from Syria who migrated to the UK in 2013.
- **Vocabulary** – quality of life, experience, empathy, heritage.

Assessment

- A low-stakes writing exercise using a photo stimulus in Lesson 1 helps teachers diagnose students' prior experience of the subject and standard of writing.
- Students answer a 10 MCQ quiz in Lesson 7 (Checkpoint Assessment) to check for understanding of Unit 1 core knowledge.
- Students write a mini-fieldwork project about the personal geography of a family member.
- The Autumn Term Diagnostic assesses Unit 1 and Unit 2 core knowledge and skills (30x MCQs & a 4-mark written component).



Geography Mastery KS3 – Unit Overview

Year 7 Unit 2 – *Our Planet*

Unit rationale

Students arrive in Year 7 with varied experiences of the subject of geography. Units 1 and 2 introduce students to the subject and aim to bring them to an equal footing. After Unit 1's introduction to geography at personal, local, and national scales, Unit 2 introduces students to important physical and human processes at the global scale, for example continental drift and the water cycle. This unit helps students understand some of the key physical processes that make planet Earth so unique and teeming with life (unlike the other planets). It also helps students to understand some of the key human processes taking place on Earth's surface, for instance global population change, and reasons for varying quality of life. Establishing these foundational concepts provides necessary context for the narrower and deeper content appearing from Unit 3 onwards.

This unit addresses the Year 7 annual question of 'What are the key physical and human processes on our planet?'

Scope

The first half of Unit 2 looks at Earth's physical geography. Students learn that Earth is a 4.5-billion-year-old rocky planet that orbits the sun. On the surface of the tectonic plates are large landmasses called continents and bodies of water called oceans. The continents have slowly moved over millions and billions of years. Beneath the Earth's crust are the mantle and core layers. The crust is moved by the mantle. Above the surface of the Earth is the atmosphere which creates habitable conditions and is where weather happens. The water cycle maintains life and affects global weather.

The second part of the unit introduces Earth's human geography. It establishes the idea that countries are bordered areas of land within continents, decided on by people. Earth has a global population of 8 billion. Over 50% live in cities and 40% within 100km of the coast. There is an uneven distribution of wealth and quality of life across the world. Broadly countries can be grouped by income category.

Sequence

This unit is the second induction unit to geography, this time taking a global perspective. All students arrive with a notion that we inhabit planet Earth and that we can study the natural and human processes that occur on it. This unit aims to introduce the different 'spheres' of activity on planet Earth (tectonic, atmospheric, hydrological, biological, and human activity).

By the end of the first part of this unit students have broad understanding of Earth's tectonic and atmospheric processes, and recognise the conditions needed for life on Earth. This physical geography understanding is foundational to Unit 4 Brilliant Biomes, Unit 5 UK Fantastic UK Landscapes and Unit 6 UK Coasts, where students learn about how tectonics, water, ice, and geology shape the landscape.

The broad knowledge of population, settlement and development gained in the second part of unit is foundational to Unit 3 which explores the themes of trade and resources, and to deeper economic studies in Year 9 Units 3 and 4.



Core Knowledge (assessed through MCQ)

The **Unit 2 Pre-unit Quiz** (10 MCQs) is designed to help you diagnose gaps in prior learning that need closing before commencing the unit. Lesson 1 is designed to address likely gaps revealed by the Pre-unit Quiz.

Lesson 1 – Which knowledge do I need for Unit 2 Our Planet?

In this lesson we recap concepts and skills from KS2 which are important for success in Unit 2 Our Planet.

Part 1 – Earth's physical geography

Lesson 2 – What is planet Earth?

In this lesson we learn to characterise Earth, including its age and its surface.

- **Key term** – a **continent** a major landmass which includes several countries (except Antarctica).
- Earth is a planet.
- It is a spherical mass of rock that orbits the sun.
- It is 4.5 billion years old.
- The surface of Earth is uneven, with high areas and low areas.
- Water covers about 70% of Earth's surface.
- Oceans are huge bodies of saltwater. The five major oceans are the Arctic, Atlantic, Indian, Pacific, and Southern oceans.
- Continents are huge areas of land, above the level of the water. The seven continents are Africa, Antarctica, Asia, Europe, North America, South America, Oceania.
- **Skill** – Using a world map to identify the continents and major oceans.
- **Stretch (optional)** – The Earth formed when gravity pulled together dust and gas.
- **Lesson vocabulary** – ocean, seafloor, orbit, continent, landmass, planet.

Lesson 3 – What is underneath Earth's surface?

In this lesson we learn to describe the changing formation of continents, and the structure of Earth beneath its surface.

- **Key term** – **molten** means melted rock or metal due to heat.
- 250 million years ago there was one **supercontinent** called Pangea.
- Pangea broke apart slowly over time, forming the seven continents we have today.
- This movement is known as continental drift.
- The Earth is made up of layers of rock and metal.
- The crust is the outermost layer. It is a thin layer of solid rock.
- The mantle lies beneath the crust. It is hot melted rock.
- The core lies at the centre of the Earth. It is extremely hot metal.
- Continental drift occurs due to sections of crust floating on the mantle layer.

(continued overleaf)



(Lesson 3 continued)

- **Skill** – Using a cross section diagram to identify layers of the Earth.
- **Stretch (optional)** –Where plates meet is where earthquakes and volcanoes can happen.
- **Lesson vocabulary** – molten, Pangea, continental drift, crust, mantle, core, cross section.

Lesson 4 – Why do we need the atmosphere?

In this lesson we learn to explain how Earth's atmospheric conditions support life.

- **Key term** – **habitable** means providing conditions that are good enough to live in.
- Earth is unique from other planets in our solar system as it is full of life.
- Earth is surrounded by a thin layer of gas, called the atmosphere.
- The troposphere is the lowest layer. It is the air around us, where clouds form and where weather happens.
- The atmosphere (especially the troposphere) creates habitable conditions for life. It...
 - Contains gases vital for life e.g. oxygen that animals need to breathe and carbon dioxide for plants to make their own food.
 - Carbon dioxide also traps heat, keeping the planet warm enough for life.
 - Holds water as vapour, preventing it from escaping into space.
- **Skill** – Using diagrams of the globe to understand how the atmosphere traps heat.
- **Stretch (optional)** – How do other atmospheric layers (stratosphere and mesosphere) support life on Earth?
- **Lesson vocabulary** – atmosphere, troposphere, stratosphere, mesosphere, outer space, habitable, oxygen, carbon dioxide, weather.

Lesson 5 – Why is water so important on Earth?

In this lesson we learn to describe the water cycle and explain why it is necessary for life on Earth.

- **Key term** – a **cycle** is a group of events that happen in a particular order and are repeated.
- There is a fixed amount of water on Earth that is continually cycled through land, ocean, and atmosphere.
- The water cycle is when water evaporates (mostly from oceans) and condenses to form clouds in the atmosphere. This falls as precipitation (rain and snow).
- Water moves through rivers and soil back to the ocean.
- Saltwater is found in the oceans. Freshwater is stored on land, or in the atmosphere.
- Water shapes the appearance of Earth's surface e.g., types of landscapes.
- Plants and animals need water to live, and many use it as a habitat.
- **Skill** – Using labelled diagrams to explain the water cycle.
- **Stretch (optional)** – How much freshwater is there on Earth?
- **Lesson vocabulary** – water cycle, water vapour, condensation, evaporation, precipitation, soil, freshwater.



Part 2 – Earth's human geography

Lesson 6 – What makes a country a country?

In this lesson we learn to explain what a country consists of and to find out what most countries have in common.

- **Key term – to govern** means to be in control of and responsible for people in a country or place.
- Countries are bordered areas of land within continents, e.g. the UK is located within Europe. A country may border other countries, or the sea.
- Each country has a government that makes decisions for the people that live in that country.
- The people of a country are called its citizens. They have rights and responsibilities as set out by the government.
- Most countries have one or two official languages.
- Culture means a shared way of life e.g., language, religion, clothing, food, leisure activities, values. Some countries have one main culture. Many are multi-cultural.
- **Skills –** Political maps can be used to identify continents, countries, and their boundaries. A country profile can be used to identify key characteristics.
- **Stretch (optional) –** Have countries always existed?
- **Lesson vocabulary –** country, government, language, official language, culture, citizen, border, boundary, rights, leisure, multi-cultural.

Lesson 7 – Why has the global population changed?

In this lesson we learn to describe changes to the global population over time and to explain how improvements in health have led to these changes.

- **Key term – sanitation** means taking dirty water and waste away to protect people's health.
- From the start of human history until 1804 the global population was under 1 billion.
- The total global population is now 8 billion people and rising rapidly.
- Most of this increase has occurred in the past 200 years.
- The global population increased due to improved health, including:
 - Cleaner water for drinking and washing.
 - Medical improvements e.g., medicines, vaccines.
 - Improved nutrition leading to healthier living.
 - Improved sanitation e.g., pipes to take away human waste.
- **Skill –** A line graph can be used to show global population change.
- **Stretch (optional) –** What do we know about how many people are being born?
- **Lesson vocabulary –** population, global, increase, steady, rapid, line graph, sewage, nutrition, vaccine, antibiotic, penicillin, cholera, anaesthetic.



Lesson 8 – Where do people live in the world?

In this lesson we learn to describe global population distribution and to explain reasons for where people live.

- **Key term – urban** means a built-up area such as a city or town.
- The global population is spread out unevenly.
- Asia is the most densely populated continent.
- The percentage of people living in urban areas is rising. Today, more than half of the global population lives in urban areas.
- People often move to cities for a better quality of life e.g. jobs, better healthcare.
- Many cities are built along the coast because:
 - The land is flat and easy to build on.
 - It is suitable for trade, creating jobs.
- There are not many large cities in harsh environments e.g. deserts, on mountains.
- **Skill** – Describing distribution on a world map and using compass directions.
- **Stretch (optional)** – Are more people moving to cities in the UK?
- **Lesson vocabulary** – urban, dense, sparse, countryside, distribution, uneven, coast, trade.

Lesson 9 – Is everywhere wealthy?

In this lesson we learn to use income bands to identify the global pattern of wealth.

- **Key term – income** means the amount of money earned.
- Countries are often categorised into one of three income categories:
 - HICs (high-income countries). More than \$13,200 per person, per year.
 - MICs (middle-income countries). Between \$1,100 and \$13,200 per person, per year.
 - LICs (low-income countries). Less than \$1,100 per person per year.
- Average income can indicate what the quality of life is like in a country.
- **Skill** – Using a choropleth map to describe average income distribution.
- **Stretch (optional)** – How do we measure quality of life?
- **Lesson vocabulary** – income, category, HIC, MIC, LIC, quality of life, development, life expectancy, World Bank, wealth.

Lesson 10 – Revision + Checkpoint Assessment (15 multiple-choice questions)

In Lesson 10 students revise the core knowledge of the unit (Lessons 1 – 9). At the end of the lesson, they complete a 15 multiple-choice question quiz (Checkpoint Assessment). This helps you gain insight into the misconceptions and knowledge gaps that exist in your class, in order to prepare a targeted reteach in Lesson 11.

Lesson 11 – Reteach

In Lesson 11 students complete activities to address misconceptions and knowledge gaps revealed by the Checkpoint Assessment. You can choose reteach activities appropriate to your students' incorrect responses (see the Supplementary Reteach Tasks) or design your own reteach tasks.



Lesson 12 – Focus on Writing

In Lesson 12 students draw on Unit 2 knowledge to answer the question: **What makes planet Earth habitable for life?** Exemplar answers are provided to help teachers identify expectations depending on their class.

Teachers can opt to use one or two lessons for the Focus on Writing task. One lesson slot would enable students to answer the question; two lesson slots enable feedback, improvement and/or targeted use of the exemplars.

Assessment

- A Pre-unit Quiz comprising 10 MCQs helps teachers diagnose whether students have retained prior content that will help them to progress in this unit.
- Students answer a 15 MCQ quiz in Lesson 10 (Checkpoint Assessment) to check for understanding of Unit 2 core knowledge.
- Students write a unit essay in Lesson 12.
- The Autumn Term Diagnostic assesses Unit 1 and Unit 2 core knowledge and skills (30x MCQs & a 4-mark written component).



Unit Overview

Year 7 Unit 3 – Resources and Trade

Unit rationale

This is the first human geography unit that students learn in KS3. The unit introduces the idea that Earth's surface is rich in a variety of natural resources, and that resources are extracted for human use. It is vital for geography students to know that resources are distributed unevenly, in order to understand why global trade exists and why some countries are wealthier than others. It is also important that early in the key stage students have a basic grasp of economic activities, for example employment in resource extraction, manufacturing, and services, so that they can understand resource management and economic development in Years 8 and 9.

This unit addresses the Year 7 annual question of 'What are the key physical and human processes on our planet?'

Scope

Resources are needed in everyday life. Raw materials are found naturally as part of Earth's surface, and many are manufactured into usable products. A supply chain helps us to understand the journey of a product from raw material to manufactured product and finally to the consumer. Currently most manufacturing is taking place in MICs, with HICs having a high proportion of service jobs.

Countries trade with one another to obtain goods and services and to generate income. Countries often group together into trade blocs to reduce the cost of trade and to make migration easier.

In the 1800s the UK became an important manufacturing centre, causing a population shift from rural to urban areas. Following a decline in manufacturing, most employment today is in services. The UK is reliant on international trade for food and resources. OS maps can be used to locate different sites of employment and infrastructure in the UK via map symbols.

Sequence

Link to past units

Unit 3 works builds on human geography concepts studied in Unit 1, e.g., UK place knowledge is revisited and deepened in Unit 3 by examining how settlements and infrastructure are shown on OS maps.

Unit 3 builds world map reading skills first introduced in Unit 2, e.g., via maps showing resource distribution and trade routes. The concepts of 'country' and 'continent' were introduced in Unit 2 and are applied in Unit 3 when students examine patterns of trade between specific countries and continents.

Link to future units

Understanding links between resources, trade, settlement, and employment supports deep engagement with complex themes in later units, e.g., resource management in Y8 (water, food, energy) and globalisation and development in Y9. There are also two focus lessons on the UK economy which provides some of the context for the independent project unit on UK regions in Year 9.



Core Knowledge (assessable)

The **Unit 3 Pre-unit Quiz** (10 MCQs) is designed to help you diagnose gaps in prior learning that need closing before commencing the unit. Lesson 1 is designed to address likely gaps revealed by the Pre-unit Quiz.

Lesson 1 – Which knowledge do I need for Unit 3 Resources and Trade?

In this lesson we recap concepts and skills from past units which are important for success in Unit 3 Resources and Trade.

Lesson 2 – What are raw materials?

In this lesson learn to identify many types of raw materials that are found on or in Earth's surface.

- **Key term – agriculture** means farming crops and animals for food and other products.
- Raw materials are natural items that humans need e.g. water, metals, wood.
- Earth's surface can produce many natural resources including:
 - Water, which is used in homes, farms and factories.
 - Crops e.g. wheat and cotton.
 - Trees are used to produce timber (wood) and paper.
 - Animals are used to produce goods such as meat and wool.
- Earth's surface can be mined to extract minerals including oil (to make plastic), metal and stone.
- **Skill** – A symbols map can be used to identify the location of resources.
- **Stretch (optional)** – How do we extract water from under the ground?
- **Lesson vocabulary** – agriculture, raw, raw materials, timber, crop, oil, natural, precious, mine, extract, quarry.

Lesson 3 – What is manufacturing?

In this lesson we learn how raw materials are turned into finished products ready for sale.

- **Key term – manufacturing** means using machinery to turn a raw material into something useful to humans.
- Manufacturing takes place in factories. Supply chain means the journey that a product goes through, starting as a raw material in one location, being manufactured in another, then sold and used in yet another.
- HICs buy a lot of the manufactured goods from MICs and sell them to consumers.
- **Skill** – A flowchart can be used to show a supply chain.
- **Stretch (optional)** – Why does most manufacturing happen in MICs?
- **Lesson vocabulary** – manufacturing, machinery, product, supply chain, customer.

Lesson 4 – What are services?

In this lesson we learn what services are, why they are important, and why most people in HICs have service jobs.

- **Key term** – a **service** is a type of job that involves helping people e.g., office jobs, working in a hospital or shop.
- Some service jobs are highly paid and require many years of education and qualifications e.g. a doctor.
- Services rely on manufactured goods e.g. a school needs books; a hairdresser needs a hairdryer.



- Most jobs in HICs are jobs in services.
- The percentage of people working in raw materials, manufacturing and services varies across the world.
- **Skill** – Using pie charts to identify and compare employment structures of different countries.
- **Stretch (optional)** – Why is the percentage of people working in services highest in HICs?
- **Lesson vocabulary** – service, import, consumer, qualification, healthcare, education.

Lesson 5 – Why do countries trade?

In this lesson we learn why goods and services are traded around the world and explore the types of trade that happen within the European Union.

- **Key term – trade** means the buying and selling of goods and services.
- Countries trade with each other to obtain the goods and services they need and to earn money.
- The European Union is a group of countries that have joined together to make trade cheaper and easier, and to make migration easier between European countries.
- **Skill** – Using maps of Europe to identify countries, regions and EU member states.
- **Stretch (optional)** – How has Brexit affected the UK?
- **Lesson vocabulary** – trade, international, port, European Union, fee, partnership, organisation.

Lesson 6 – How did the UK make its wealth in the past?

In this lesson we explain the importance of manufacturing for the UK in the past.

- **Key term – employed** means having a job.
- In the UK before 1750 most people worked on farms.
- Around 1800-1900 many moved to towns and cities to work in factories e.g., Sheffield for steel production.
- By 1990 most factories had closed, causing unemployment.
- **Skill** – Reading line graphs to identify changes over time.
- **Stretch (optional)** – Has there always been international trade in the UK?
- **Lesson vocabulary** – employed, rural, urban, line graph, industry, steel, coal mining, protest, closure.

Lesson 7 – How does the UK make its wealth today?

In this lesson we describe the resources, patterns of trade and employment in the UK today.

- **Key term – import** means to buy something from another country.
- Around half of the food and most of the manufactured products needed in the UK are imported.
- Important trading partners of the UK include Europe, USA and China.
- Over 80% of people in the UK are employed in services.
- **Skill** – Line graphs can be used to show employment changes over time.
- **Stretch (optional)** – How has the decline in manufacturing affected different regions of the UK?
- **Lesson vocabulary** – import, export, banking, trading partner, energy resource, natural gas.



Lesson 8 – How can we use OS maps to explore employment in the UK?

In this lesson we learn how to use OS map symbols and four-figure grid references to identify types of employment in rural and urban areas of the UK.

- **Key term** – a **grid** is a network of lines that cross each other to form equal squares.
- OS map symbols indicate the type of employment in an area.
- OS maps use grids to divide areas of land into numbered squares. These squares can be used to give a place a four figure grid reference.
- On OS maps, eastings are the numbers on a gridline that increase as you move eastwards. Northings are gridline numbers that increase as you move north.
- **Skill** – Using symbols and the key and 4FGRs on OS maps.
- **Stretch (optional)** – Using photos in conjunction with OS map extracts to identify compass directions.
- **Lesson vocabulary** – grid, grid square, grid reference, eastings, northings, four-figure grid reference, OS map, symbol, key.

Lesson 9 Revision + Checkpoint Assessment (15 multiple choice questions)

In Lesson 9 students revise the core knowledge of the unit (Lessons 2 – 8). At the end of the lesson, they complete a 15 multiple-choice question quiz (Checkpoint Assessment). This helps you gain insight into the misconceptions and knowledge gaps that exist in your class, in order to prepare a targeted reteach in Lesson 10.

Lesson 10 Reteach

In Lesson 10 students complete activities to address misconceptions and knowledge gaps revealed by the Checkpoint Assessment. You can choose reteach activities appropriate to your students' incorrect responses (see the Supplementary Reteach Tasks) or design your own reteach tasks.

Lesson 11 Focus on Writing

In Lesson 11 students draw on Unit 3 knowledge to answer the question: **Why do countries trade?** Exemplar answers are provided to help teachers identify expectations depending on their class.

Teachers can opt to use one or two lessons for the Focus on Writing task. One lesson slot would enable students to answer the question; two lesson slots enable feedback, improvement and/or targeted use of the exemplars.

Performance Assessed Element

- A Pre-unit Quiz comprising 10 MCQs helps teachers diagnose whether students have retained prior content that will help them to progress in this unit.
- Students answer a 15 MCQ quiz in Lesson 9 (Checkpoint Assessment) to check for understanding of Unit 3 core knowledge.
- Students write a unit essay in Lesson 11.
- The Spring Term Diagnostic assesses core knowledge and skills from Units 1-4 (30x MCQs & a 4-mark written component).



Geography Mastery KS3 – Unit Overview

Year 7 Unit 4 – *Brilliant Biomes*

Unit rationale

Biomes are major ecological communities such as tropical rainforests. Studying biomes helps geographers deepen their understanding of Earth's vast diversity. It helps students piece together foundational concepts such as latitude, temperature, and water and nutrient cycles, to explain why different biomes form in different locations, and why biodiversity varies from biome to biome. It is important for geographers to consider the importance of biomes to the natural world and to people. From this understanding, students can think meaningfully about how human actions can threaten biomes, and why this matters. This unit addresses the Year 7 annual question of 'What are the key physical and human processes on our planet?'

Scope

Ecosystems are interconnected communities of biotic (living) and abiotic (non-living) components. Food webs are simplified depictions of energy flows within an ecosystem, for example from seed to mouse to adder to hawk. When plants and animals die some of the nutrients stored in their bodies return to the soil.

Biomes are large-scale ecosystems, for example tropical rainforests and hot deserts. Biome distribution can largely be explained by latitude. Latitudes with warm, sunny, rainy climates support a wide array of plant and animal life; at latitudes with extreme climates the inverse is true.

Between 30°N and 60°N a temperate climate and plenty of rainfall has enabled the deciduous forest biome to form. This biome has a fairly wide range of plant and animal life and is mainly made up of broadleaf trees which shed their leaves in autumn to survive the winter. This leaf shedding adds nutrients to the soil, supporting the deciduous forest food web.

The UK is located within the deciduous forest biome. Biomes fieldwork involves observing our location, and the vegetation, soil, animals, and climate of our surroundings.

Sequence

Links to prior learning

Unit 4 builds on Unit 1 UK place knowledge via study of the deciduous biome and local biomes fieldwork.

In Unit 2 students learned how the atmosphere and water cycle enable Earth to be inhabited by plants and animals. In Unit 4 this knowledge is deepened by learning that biodiversity is highest in places with warm, rainy climates.

By this point students have mastered the seven continents and compass directions. They revisit the core geographical skill of describing distribution through the lens of biomes. A more complex skill of the three-axes climate graphs is introduced, which combines a bar and line graph.

In Unit 1 students were introduced to fieldwork. This unit develops fieldwork skills by taking students out of the classroom to collect biomes data.

Links to future units

This unit introduces the idea that an ecosystem is a delicately balanced community. This is revisited in later units, e.g., Y8 U1 River Rivals and Y9 U2 Ocean Ecosystems and Governance. The fieldwork skills developed in Unit 4 are built on further in subsequent units, e.g., Y9 Unit 6.



Core Knowledge (assessable)

Lesson 1 – Which knowledge do I need for Unit 4 Brilliant Biomes?

In this lesson we recap concepts and skills from past units which are important for success in Unit 4 Brilliant Biomes.

- **Key term – water cycle** refers to the continual cycling of water through sea, air, and land.
- Key processes that cause water to cycle continually are evaporation, condensation, and precipitation.
- Earth's atmosphere traps water vapour, preventing it from escaping to space.
- Precipitation happens when water falls to Earth, e.g., as rain or snow. After falling to Earth's surface water moves through rivers and soil to the sea.
- Water supports life on Earth, e.g., plants require water to grow. Places that receive lots of rainfall have more plants.
- Plants use carbon dioxide to make their own food. Plants release oxygen. Animals and people require oxygen to breathe.
- Habitat means the natural environment of a plant or animal.
- **Skill** – Using a water cycle diagram to explain key processes that move water through sea, air, and land.
- **Lesson vocabulary** – water cycle, evaporation, condensation, precipitation, rainfall, snow, liquid, water vapour, cloud, oxygen, carbon dioxide, habitat.

Lesson 2 – What is an ecosystem?

In this lesson we examine the relationships that exist between living and non-living elements of an ecosystem and learn how to read a food web.

- **Key term** – An **ecosystem** is a community of living and non-living components which interact within a specific habitat.
- Biotic (living) components include plants and animals. Abiotic (non-living) components include sunlight, water, and soil.
- A food web is a diagram showing lots of energy flows within an ecosystem.
- When plants and animals die, a lot of the nutrients stored within them transfer to the soil. This supports plant growth.
- **Skills** – Using a food web to describe interactions and flows of energy within an ecosystem.
- **Stretch** – What are trophic levels?
- **Lesson vocabulary** – ecosystem, interact, biotic, abiotic, soil, sunlight, oxygen, nutrient, temperature, food web, energy.

Lesson 3 – What are the major biomes of the world?

In this lesson we record and compare the unique characteristics of a range of biomes using a documentary resource and a comparative grid.

- **Key term** – a **biome** is a large-scale ecosystem.
- Examples of major biomes are deciduous forest, hot desert, savanna, tropical rainforest, and tundra.
- Each biome has unique characteristics, e.g., climate, vegetation, animals, and soil fertility.
- **Skills** – A grid can be used to categorise and compare the characteristics of multiple biomes.
- **Stretch** – Write a paragraph describing the characteristics of one biome of your choice - location, climate, soil, vegetation, animals.
- **Lesson vocabulary** – biome, large-scale, deciduous forest, hot desert, savanna, tropical rainforest, tundra, characteristics, location, climate, animals, vegetation, soil fertility, comparative grid.



Lesson 4 – How do I read latitude on a map?

In this lesson we learn major lines of latitude such as the equator and the tropics, and practise using latitude to describe biome distribution.

- **Key term – latitude** means distance north or south of the equator, measured in degrees, e.g., the North Pole's latitude is 90°N.
- Latitude is shown on maps and globes via horizontal lines.
- Five major latitude lines are: the equator at 0°, the Tropic of Cancer at 23°N, the Tropic of Capricorn at 23°S, the Arctic Circle at 66°N, and the Antarctic Circle at 66°S.
- Biomes are largely distributed according to latitude, e.g., tropical rainforests are located between the Tropics of Cancer and Capricorn.
- **Skills** – Reading lines of latitude and using latitude to describe biome distribution.
- **Stretch** – What is longitude?
- **Lesson vocabulary** – latitude, equator, Tropic of Cancer, Tropic of Capricorn, degrees, North, South, hemisphere, poles, distribution, horizontal.

Lesson 5 – How does latitude influence biomes?

In this lesson we learn how the climate that exists at each latitude determines the biomes that form there.

- **Key term – climate** refers to the usual weather in a place, in particular rainfall and temperature.
- The climate of a place is largely determined by latitude:
 - Rainfall occurs in horizontal bands around the planet, e.g., near the equator rainfall is high; at 75°N it is low.
 - At low latitudes temperatures are warmest, i.e., near the equator. As latitude increases, temperatures get colder, i.e., near the Poles.
- Vegetation and animal life flourish in places with sunny, warm, and rainy climates.
- **Skills** – Reading line graphs and bar charts. Cross-referencing a range of maps (latitude, rainfall, temperature) to explain biome formation.
- **Stretch** – Why do rainfall bands exist?
- **Lesson vocabulary** – climate, temperature, extreme, concentrated, heat energy, sunlight, rainfall band, latitude, flourish.



Lesson 6 – What are the characteristics of the deciduous forest?

In this lesson we find out about the deciduous forest in which we live, examining the unique vegetation and forest layers of this beautiful biome.

- **Key term – deciduous** refers to something that sheds, e.g., deciduous trees lose their leaves each year.
- Deciduous forest:
 - is made up mainly of broadleaf trees such as oak and ash.
 - forms between 30°N and 60°N. At these latitudes the climate is temperate (mild) and there is plenty of rainfall.
 - has four layers: ground layer, herb layer, sub-canopy, and canopy.
 - is the main biome found in the UK.
- Deciduous trees shed their leaves in autumn to conserve energy, nutrients, and water. New leaves grow in spring.
- **Skills** – Reading a climate graph of the New Forest.
- **Stretch** – How are coniferous forests different to deciduous forests?
- **Lesson vocabulary** – deciduous, temperate, broadleaf, shed, season, autumn, winter, spring, summer, nutrients, New Forest, ground layer, herb layer, shrub layer, canopy, oak, ash.

Lesson 7 – How biodiverse is the deciduous forest biome?

In this lesson we learn that the deciduous forest is a moderately biodiverse biome and explore some of the reasons for this.

- **Key term – biodiversity** refers to the variety of plant and animal species in an area.
- Biodiversity is highest at low latitudes and lowest at high latitudes.
- The deciduous forest has a moderate level of biodiversity. Reasons include:
 - Autumn leaf shedding adds nutrients to the soil, supporting plant growth.
 - A fairly wide range of plant types grow in the deciduous forest. This provides habitats for varied species, e.g., frogs and adders at the ground layer, and insects and birds in the canopy.
 - Many plant and animal types can survive in the temperate climate.
- **Skills** – Using data to describe and compare the biodiversity level of the deciduous forest biome.
- **Stretch** – Why is the deciduous forest biome only moderately biodiverse?
- **Lesson vocabulary** – biodiversity, biodiverse, variety, moderate, leaf litter, species, nutrients, survive.



Lesson 8 – Which biome do we live in? (Fieldwork)

In this lesson we use observational fieldwork to gather evidence of the biome in which we live.

- **Key term – Fieldwork** involves gathering information to answer a geographical question.
- **Fieldwork competencies** –
 - Making observations about the local area.
 - Collecting and recording fieldwork data via methods such as photo annotation, vegetation analysis, and climate analysis.
 - Cross-referencing local vegetation against seasonal photographs and leaf identification charts to draw conclusions about our biome.
- **Skill** – Using observation and comparison to gather biome data.
- **Lesson vocabulary** – fieldwork, observation, local area, record, cross-reference, photo annotation, vegetation analysis, climate analysis.

Lesson 9 – Revision & Checkpoint Assessment (15 multiple-choice questions)

In Lesson 9 students revise the core knowledge of the unit (Lessons 1 – 8). At the end of the lesson, they complete a 15 multiple-choice question quiz (Checkpoint Assessment). This helps you gain insight into the misconceptions and knowledge gaps that exist in your class, in order to prepare a targeted reteach in Lesson 10.

Lesson 10 – Reteach

In Lesson 10 students complete activities to address misconceptions and knowledge gaps revealed by the Checkpoint Assessment. You can choose reteach activities appropriate to your students' incorrect responses or design your own reteach tasks.

Lesson 11 – Focus on Writing

In Lesson 11 students draw on Unit 4 knowledge to answer the question: **Describe and explain the characteristics of the deciduous forest biome.** Exemplar answers are provided to help teachers identify expectations depending on their class.

Teachers can opt to use one or two lessons for the Focus on Writing task. One lesson slot would enable students to answer the question; two lesson slots enable feedback, improvement and/or targeted use of the exemplars.

Assessment

- A Pre-unit Quiz comprising 10 MCQs helps teachers diagnose whether students have retained prior content that will help them to progress in this unit.
- Students answer a 15 MCQ quiz in Lesson 9 (Checkpoint Assessment) to check for understanding of Unit 4 core knowledge.
- Students write a unit essay in Lesson 11.
- The Spring Term Diagnostic assesses Unit 1 – 4 core knowledge and skills (30x MCQs & a 4-mark written component).



Geography Mastery KS3 – Unit Overview

Year 7 Unit 5 – *Fantastic UK Landscapes*

Unit rationale

The UK contains a vast array of different natural landscapes. Studying these landscapes helps geographers to see Earth's natural processes at play and develop a sense of wonder at the power of Earth's natural forces. It requires students to make sense of the sequence of physical processes, explain a range of factors involved and examine how the surface of Earth changes over very long time spans. It is important for young geographers to consider the physical variation of UK landscapes and develop place knowledge of iconic sites. The mastery of physical process in this unit provides a foundation to subsequent KS3 units on rivers, coasts and glaciers. This unit addresses the Year 7 annual question of 'What are the key physical and human processes on our planet?'

Scope

Landscapes are visible parts of Earth's surface. Each landscape is made up of natural features e.g., rivers and mountains, overlaid on layers of rock. Rocks are continuously created and destroyed in the rock cycle which shows the link between igneous, sedimentary and metamorphic rock formation.

Magnificent landscapes exist in the UK. Tectonic and atmospheric processes act on underlying geology to create different landforms. Three examples are:

- Giant's Causeway, Northern Ireland – basalt columns formed by volcanic eruptions (igneous rock).
- Wenlock Edge, England – a limestone ridge formed by layers of sedimentary rock, tectonic uplift and river erosion.
- Grampian Mountains, Scotland – a mountain range formed by plate collision and volcanic eruptions (metamorphic and igneous rock).

Sequence

Link to past units

Unit 1 introduced the location and physical geography of the UK. Unit 5 builds on this by exploring examples of UK landscapes and landforms and revisiting how to use topographic maps.

In Unit 2 students were introduced to physical geography processes (atmospheric and tectonic). In this unit students understand how these processes can influence the formation of natural features in the landscape.

In Units 1 and 3 we introduced OS maps, symbols and grid references. In Unit 5 students build their map skills, learning to use contour lines and spot heights to describe the landscape.

Link to future units

This unit establishes the idea that physical geography processes impact the natural landscape. These ideas are revisited in several later units, e.g., 7.6 UK Coasts, 8.1 River Rivals, 8.5 Polar Environments, 9.1 Global Oceans (including ocean tectonics), and 9.5 Glacial Landforms and Processes.

We use OS maps and Digimap for Schools (GIS) to explore the UK's landforms and uneven topography, e.g., via contour lines and spot heights.

Unit 5 focuses specifically on the natural geography of the UK. This is picked up in depth in Year 9 via the Independent Project comparing two UK regions.

Core Knowledge (assessable)

Lesson 1 – Which knowledge do I need for Unit 5 Fantastic UK Landscapes?

In this lesson we are revising concepts needed for Unit 5 including Earth's structure and topographic maps of the UK.

- **Key term – a core** is a centre of something.
- Earth is made up of crust, mantle and core.
- The crust is the uppermost layer and sits on top of the mantle.
- Topography means the shape of the land. It is shown on a topographic map.
- The height and shape of the surface of Earth's crust is not the same everywhere.
- **Skills** – Use cross sectional diagrams to describe the Earth's layers, and topographic maps to describe Earth's uneven surface.
- **Lesson vocabulary** – core, mantle, crust, height, topography, surface, continent, Pangea, cross-section.

Lesson 2 – What are landscapes?

In this lesson we learn to describe landscapes including landforms and human features.

- **Key term – Landscape** refers to an area of Earth's surface that is visible from one place.
- A landform is an individual physical component within a landscape, e.g., a hill, or beach.
- Landscapes can also contain human geographical features e.g., buildings.
- Landscapes have different shapes e.g., flat or hilly.
- Beneath the visible part of the landscape is soil and rock. This is part of Earth's crust layer.
- **Skills** – Use geographical vocabulary to describe landscapes.
- **Stretch** – Using photographs to draw field sketches.
- **Lesson vocabulary** – landscape, landform, feature, loch, mountain, crust, soil, rock, visible, physical, human.



Lesson 3 – How can OS maps help us investigate landscapes?

In this lesson we learn to read spot heights and contour lines on OS maps in order to describe the topography of landscapes.

- **Key term** – A **peak** is the highest part of a hill or mountain.
- A spot height is a dot with a number next to it indicating the height of the land above sea level (in metres).
- Spot heights are used to show the highest points of the landscape.
- A contour line is an orange line connecting points of equal height above sea level.
- Contour lines are used to show the shape of the land e.g., a steep hill or flat area.
- **Skills** – Use spot heights and contour lines on an OS map to describe a landscape.
- **Stretch** – Matching OS maps to photographs.
- **Lesson vocabulary** – peak, topography, contour, spot height, symbol, OS map.

Lesson 4 – How can rocks be ‘forever’?

In this lesson we are learning to describe the rock cycle.

- **Key term** – **metamorphosis** happens when one thing changes into something completely different.
- Rock is continuously created and destroyed in the rock cycle where:
 - Heat from Earth’s core melts rock in the mantle layer. When melted rock cools within or on the crust it forms igneous rock, e.g., basalt.
 - Layers of rock particles are compacted within the crust, forming sedimentary rock, e.g., limestone.
 - Heat and pressure act on sedimentary or igneous rock changing it into metamorphic rock e.g., slate.
- **Skills** – Use the rock cycle to understand rock formation.
- **Stretch** – Why are there so many different sorts of rocks?
- **Lesson vocabulary** – metamorphosis, rock cycle, igneous, sedimentary, metamorphic, mantle, volcano, pressure, compaction, texture, basalt, slate, limestone, particles.

Lesson 5 – How did Giant’s Causeway form?

In this lesson we are learning to explain the physical geography processes that formed the Giant’s Causeway.

- **Key term** – a **column** is something with a tall narrow shape.
- Giant’s Causeway is a natural structure of hexagonal rock columns, located in Northern Ireland.
- 60 million years ago there were eruptions of magma from Earth’s mantle layer.
- As the magma cooled, it formed igneous rock (basalt).
- The cooling process caused the rock to fracture into hexagonal columns.
- **Skills** – Drawing diagrams to support explanations of landforms.
- **Stretch** – What has Pangea got to do with Giant’s Causeway?
- **Lesson vocabulary** – column, igneous, basalt, erupt, lava, magma, fracture, mantle, hexagonal, solidified.



Lesson 6 – How did Wenlock Edge form?

In this lesson we are learning the physical geography processes that formed Wenlock Edge.

- **Key term** – a **ridge** is a long narrow hill.
- Wenlock Edge is a limestone ridge found in England.
- It formed >400 million years ago when layers of sediment compacted to form limestone and shale rock.
- Tectonic movement caused part of the crust to lift creating diagonal lines of rock.
- Rivers have worn away the shale leaving behind the limestone ridge.
- **Skills** – Using photos and diagrams to explain landscape formation.
- **Stretch** – What can we learn from the Wenlock Edge limestone?
- **Lesson vocabulary** – valley, ridge, limestone, shale, Shropshire, sedimentary rock, slope, resistant.

Lesson 7 – How did the Grampian Mountain range form?

In this lesson we are learning how tectonic processes formed the UK's highest mountain range.

- **Key term** – A **mountain range** is a group of mountains near each other that formed at a similar time.
- The Grampian Mountains make up a large mountain range in Scotland. They are mainly formed of metamorphic and igneous rock.
- They formed 430 million years ago when tectonic plates collided, causing a crumpling of Earth's crust.
- Since then, heat and pressure in the crust changed sedimentary rock into metamorphic rock.
- Later, volcanic activity in the region added igneous rock layers.
- **Skills** – Using photos and diagrams to explain landscape formation.
- **Stretch** – Why are the Grampian Mountains lower than they used to be?
- **Lesson vocabulary** – mountain range, collide, crumple, tectonic plate, fold mountains, Ben Nevis.

Lesson 8 – How do I explore UK landscapes using online map programs?

In this lesson we are learning to use Google Maps and Digimap to explore Scotland's Northwest Highlands.

- **Key term** – an **aerial** image is a photo taken from above, e.g., by a satellite or drone.
- Google Earth is an online map program that uses aerial photos to create 2D and 3D images of most of Earth's surface.
- Digimap is an online map program that contains aerial photos and OS maps of most of the UK.
- **Skills** – using online map programs to...
 - search for specific landforms or regions.
 - use 2D and 3D functions to explore landscapes.
 - use measurement tools to identify distance.
 - decipher and describe topography via contour lines and spot height.
- **Stretch** – Explore the geology of the Northwest Highlands.
- **Lesson Vocabulary** – aerial, online map program, Google Earth, Digimap, satellite, topography, scale, contour line, spot height, landscape, peak, valley, Northwest Highlands.



Lesson 9 – Revision & Checkpoint Assessment (15 multiple-choice questions)

In Lesson 9 students revise the core knowledge of the unit (Lessons 1 – 8). At the end of the lesson, they complete a 15 multiple-choice question quiz (Checkpoint Assessment). This helps you gain insight into the misconceptions and knowledge gaps that exist in your class, in order to prepare a targeted reteach in Lesson 10.

Lesson 10 – Reteach

In Lesson 10 students complete activities to address misconceptions and knowledge gaps revealed by the Checkpoint Assessment. You can choose reteach activities appropriate to your students' incorrect responses (see the Supplementary Reteach Tasks) or design your own reteach tasks.

Lesson 11 – Focus on Writing

In Lesson 11 students draw on Unit 5 knowledge to answer the question: **Explain how each rock type forms using examples of UK landforms.** Exemplar answers are provided to help teachers identify expectations depending on their class.

Teachers can opt to use one or two lessons for the Focus on Writing task. One lesson slot would enable students to answer the question; two lesson slots enable feedback, improvement and/or targeted use of the exemplars.

Assessment

- A Pre-unit Quiz comprising 10 MCQs helps teachers diagnose whether students have retained prior content that will help them to progress in this unit.
- Students answer a 15 MCQ quiz in Lesson 9 (Checkpoint Assessment) to check for understanding of Unit 5 core knowledge.
- Students write a unit essay in Lesson 11.
- The Summer summative assessment assesses Units 1 – 5 core knowledge and skills via a 40-mark written paper (tariffs range from 1 – 4 marks).



Geography Mastery KS3 – Unit Overview

Year 7 Unit 6 – UK Coasts

Unit rationale

Coastal landscapes are an important part of UK geography, given our high coast to land ratio. This coasts unit is deeply physical. It aims to develop a sound understanding of physical processes and how landforms such as cliffs and beaches form. The unit provides deliberate opportunities for verbal and written explanation of coastal processes and landform formation – skills that require repeated practise and refinement. It is important to embed this physical understanding before students move onto units dealing with human interactions with the natural world in Year 8.

This unit builds on the geology content of Unit 5 and addresses the Year 7 annual question 'What are the key physical and human processes on our planet?'

Scope

The coast is the meeting point between terrestrial and marine environments. Coastal processes are continually changing these dynamic landscapes. Example coastal landforms include cliffs, beaches, headlands, and bays, all of which can be identified along UK coastlines.

The combination of underlying geology and wave action explains the formation of headlands and bays. Beaches are formed when eroded rock carried by waves are deposited as waves lose energy. Many of the waves that hit the UK travel long distances and gain considerable strength and thus shape dramatic coastlines, e.g., the steep cliffs at Caithness that form via hydraulic action.

OS maps can help us characterise coastal environments, and six figure grid references can be used to identify specific areas. Online map programs such as Google Earth and Digimap enable exploration of the UK coast, and we can apply our understanding of coastal processes to explain how the landforms that we find have been formed.

Sequence

Link to past units

- This unit comes after Unit 5 Fantastic UK Landscapes to ensure that students have a foundational understanding of geology and changing landscapes in the UK.
- Students are familiar with OS maps and the use of a map key, which was introduced in 7.1 and revisited in 7.5 along with contour lines and spot height. In this unit students learn the skills of 4- and 6-figure grid references and are then able to identify where coastal features are located on OS map extracts.

Link to future units

- Students next return to landform processes in Year 8 Unit 1 when they learn the formation of river floodplains.
- In Year 9 students revisit landform processes in Unit 1 (e.g., mid-ocean ridges) and in Unit 5 (glaciation). Year 7 Units 5 and 6 are a good basis for more in-depth approach to the study of geomorphology in Year 9.



Core Knowledge (assessable)

Lesson 1 – Which knowledge do I need for Unit 6 UK Coasts?

In this lesson we recap concepts and skills from past units which are important for success in Unit 6 UK Coasts.

- **Key term** – in geography, **resistant** means strong rock that is not easily broken down.
- There are many different types of rock. Some are more resistant than others.
- Landscapes are always changing, for example due to volcanic eruptions, or when ice and water break rock down.
- The UK is a country made up of several islands.
- OS (Ordnance Survey) maps show UK landscapes in detail, via symbols and the key, and contour lines.
- **Skill** – Using OS map symbols, the key and contour lines to identify features of a landscape.
- **Lesson vocabulary** – resistant, landscape, rock, volcanic eruption, lava, OS map, symbol, key, contour line, UK, island.

Lesson 2 – What are coasts?

In this lesson we explain what the coast is and are introduced to a range of coastal landforms.

- **Key term** – **coast** refers to an area of land that meets the sea.
- The coast is always changing due to waves breaking apart rock and moving it from one place to another.
- Coasts have unique landforms, including cliffs, beaches, headlands, and bays.
- As an island nation much of the UK's landscape is coastal.
- **Skill** – Using Google Earth to describe the landforms found at different stretches of UK coast / Identifying a range of coastal landforms in photos.
- **Stretch** – How waves can change the shape of the coastline.
- **Lesson vocabulary** – coast, wave, landform, cliff, beach, arch, headland, bay, landscape.

Lesson 3 – How did cliffs form at Caithness?

In this lesson we learn how two main processes of erosion cause cliffs to form.

- **Key term** – **erosion** happens when rock is broken apart and transported away.
- The county of Caithness in northern Scotland has many sea cliffs made of sandstone, a strong sedimentary rock.
- A sea cliff is a high, steep mass of rock at the coast.
- Sea cliffs form due to erosion where:
 - Powerful waves strike the land at the coast. This forces air into cracks in the rock, which blasts the rock apart (hydraulic action).
 - These processes create a notch in the rock.
 - When the weight of the overhanging rock gets too heavy it collapses into the sea, leaving a steep cliff face.
 - Over time this process repeats, causing the cliff to retreat.
- **Skill** – Drawing a diagram to show how a cliff forms and retreats over time.
- **Stretch** – Why are the waves that strike the coast at Caithness so powerful?
- **Lesson vocabulary** – sea cliff, process, erosion, hydraulic action, notch, overhang, collapse, cliff face, retreat, sandstone, Caithness.



Lesson 4 – How did Harlech beach form?

In this lesson we learn how deposition of eroded sediment causes beaches to form.

- **Key term – deposition** happens when the waves drop pebbles and sediment onto the beach.
- A beach is a narrow strip of sand and other sediments that have been deposited along a coastline.
- Harlech beach is a sandy beach located in north-west Wales.
- The formation of beaches relies on erosion to provide sediment, and deposition to build up the beach:
 - Waves carry eroded rock, e.g., sand and pebbles. This is called a sediment load.
 - When waves reach the coast, they slow down causing them to deposit their load. This forms a strip of sediment along the coastline, called a beach.
- **Skill** – Explaining how erosion and deposition contribute to beach formation.
- **Stretch** – What are sand dunes and how do they form?
- **Lesson vocabulary** – beach, sediment, sand, pebbles, sediment load, energy, deposit, deposition, erosion.

Lesson 5 – How do Google Earth and OS maps show the Dorset coast?

In this lesson we learn how to use Google Earth and OS maps to explore the unique characteristics of the Dorset coast.

- **Key term – coastline** means the shape of the land along the edge of the sea. Each coastline has its own unique shape.
- Headlands are sections of rock that stick out to sea.
- Bays are large, curved indents in the coastline.
- Dorset is a county (large area) located along England's south coast. It has a jagged coastline.
- Google Earth shows that Dorset has a variety of coastal landforms including cliffs, beaches, arches, headlands and bays.
- OS maps use symbols and contour lines to show the physical and human features of the Dorset coastline.
- **Skill** – Using an OS extract and Google Earth to describe the Dorset coastline.
- **Stretch** – How did Durdle Door form?
- **Lesson vocabulary** – coastline, Dorset, jagged, headland, bay, Google Earth, identify, function, computer software, zoom, pan, tilt, rotate, OS map, key, symbol.

Lesson 6 – Why is the Dorset coastline so jagged?

In this lesson we learn how geology and coastal processes interact to form headlands and bays in Dorset.

- **Key term – alternating** means a repeated pattern of two things, e.g., red, green, red, green.
- A geological map shows the types of rocks found in an area.
- Resistant geology refers to strong rocks that erode slowly, e.g., limestone.
- Non-resistant geology refers to rocks that are weaker, and erode rapidly, e.g., clay.
- The Dorset coast has alternating bands of resistant and non-resistant rock.
- This geological pattern combined with erosion from powerful waves has formed headlands and bays.
- **Skill** – Annotating a geology map to show and explain how a coastline with alternating geology will change over time.
- **Stretch** – What does a geological map tell us about Dorset?
- **Lesson vocabulary** – resistant, non-resistant, geology, alternating, band, bay, headland, Dorset.



Lesson 7 – How can we use grid references to understand the coast?

In this lesson we use four- and six-figure grid references on OS map extracts to explore and describe coastal landscapes.

- **Key term** – a grid is a network of lines that cross each other to form equal squares.
- OS maps use grids to divide areas of land into numbered squares. These squares can be used to give a place a four or six figure grid reference.
 - Four-figure grid references (4FGRs) identify a large square of land, often 1km².
 - Six-figure grid references identify a small square (100m²) within a four-figure grid square.
- On OS maps:
 - Eastings are the numbers on a gridline that increase as you move eastwards.
 - Northings are the numbers on a gridline that increase as you move north.
- **Skill** – Using 4FGRs and 6FGRs on OS maps.
- **Stretch** – Using oblique photos in conjunction with OS map extracts to identify compass directions.
- **Lesson vocabulary** – grid, grid square, grid reference, eastings, northings, four figure grid reference, six figure grid reference.

Lesson 8 – How can I use Digimap to explore the coast? (ICT lesson)

In this lesson we apply a range of map skills whilst using the Digimap computer program to explore the UK coast.

- **Key term** – **Digimap** is an online map program containing OS maps and aerial images of the UK.
- By showing coastal landforms, OS maps and aerial photos offer clues to the physical processes at play along a stretch of coast.
- **Skills – Using Digimap to:**
 - Recognise coastal landforms in aerial photos.
 - Use symbols and the key on OS maps to identify coastal landforms (e.g., cliffs) and general characteristics (e.g., scale).
 - Find 6 figure grid references for specific coastal landforms.
- **Stretch** – Comparison of the characteristics of two stretches of UK coast (landforms and processes).
- **Lesson vocabulary** – Digimap, online map program, symbol, key, scale, aerial, landform.

Lesson 9 – Revision and Post-unit Quiz (15 MCQ)

In Lesson 9 students revise the core knowledge of the unit (Lessons 1 – 8). At the end of the lesson, they complete a 15 multiple-choice question quiz. This helps you to gain insight into the misconceptions and knowledge gaps that exist in your class, in order to prepare a targeted reteach in Lesson 10.

Lesson 10 – Unit 6 Reteach

In Lesson 10 students complete activities to address misconceptions and knowledge gaps revealed by the Unit 6 Post-unit Quiz. You can choose reteach activities appropriate to your students' incorrect responses (see the L10 Supplementary Reteach Tasks) or design your own reteach tasks.



Lesson 11 – Focus on Writing

In Lesson 11 students draw on Unit 6 knowledge to answer the question: **Describe how the coastline shown in Figure 1 will change over time and explain why** (geology and physical processes). Exemplar answers are provided to help teachers identify expectations depending on their class.

Teachers can opt to use one or two lessons for the Focus on Writing task. One lesson slot would enable students to answer the question; two lesson slots enable feedback, improvement and/or targeted use of the exemplars.

Assessment

- A Pre-unit Quiz comprising 10 MCQs helps teachers diagnose whether students have retained prior content that will help them to progress in this unit.
- Students answer a 15 MCQ quiz in Lesson 9 (Checkpoint Assessment) to check for understanding of Unit 5 core knowledge.
- Students write a unit essay in Lesson 11.



Unit Overview

Year 8 Unit 1 – River Rivals

DRAFT

Unit Rationale

Most of Earth’s surface can be explained by one or more of tectonic, ice, or water processes. Rivers are a major part of the ‘water’ chapter in the story of Earth’s changing surface. Studying rivers is also an important way to deepen students’ understanding of ecosystems, how humans rely on and impact the natural world, and how these impacts intensify as populations grow and water use increases. Finally, a rivers unit is a helpful lens through which to understand resource rivalry and conflict.

Scope

A river is a natural, moving body of water that transports water over the land to the sea. Rivers begin in elevated areas and flow downhill towards flatter land. They widen and deepen as they flow from source to mouth. Along a river waterfalls, meanders and floodplains can be found. A floodplain, suitable for farming, is formed by the frequent flooding of the river, which deposits fertile sediment; this builds up over time.

Rivers play a vital role for natural and human environments. The Sudd wetlands exemplifies how rivers provide water, food, nutrients and habitats for plants and animals and maintain soil fertility. Rivers improve quality of life and enable economic development. Rapid population growth in the Nile river basin has led to over extraction and water pollution.

The Grand Ethiopian Renaissance Dam (GERD) on the Blue Nile in Ethiopia is a controversial hydroelectric power dam, completed in 2022. Whilst it is expected to improve levels of economic development for Ethiopia and improve electricity supply throughout the region, water availability may reduce in Sudan and Egypt. The full impacts of the dam are not yet known.

Sequence

Link to past units

Year 7 Unit 5 provided a strong foundation to the role of fluvial processes carving the landscape. Unit 6 has introduced students to the processes of erosion and deposition, which also occur in river environments.

Year 7 Unit 3 introduced the importance of resources for everyday life. River Rivals is the first of three units to explore controversy around resource use.

In Year 7 Unit 2 students were introduced to the idea of banding countries by income. In this unit students learn how building a hydroelectric dam is likely to improve income and development in Ethiopia, an LIC.

In Year 7 students mostly focused on singular country studies e.g., the UK in Unit 5 and Unit 6. Now in Year 8 students start to see connections between countries. Rivers are indifferent to country borders. Students will engage with the idea of how a resource is shared between nations and the tensions this can raise (Latin *rivalis* = rival who shares the same stream).

Link to future units

This unit explores the importance of water for productive agriculture. This is built upon in Unit 2 Food and Famine.



This unit also introduces students to north-east Africa, a region that is studied again in Y8 Unit 2 Food and Famine and Y9 Unit 2 Ocean Ecosystems and Governance. Revisiting one region through multiple topic lenses builds complex place knowledge.

This unit addresses the Year 8 annual question of ‘Does humanity live sustainably with the environment?’

Core Knowledge (assessed through MCQ)

Recap lesson - Which knowledge do I need for Unit 1 River Rivals?

In this lesson we recap concepts and skills from past units which are important for success in Unit 1 River Rivals.

Key recap concepts:

- **Key term** – A **resource** is something that humans need e.g., food, water, equipment.
- Water is an important natural resource. It enables people, animals, and plants (including crops) to survive.
- Some places receive more precipitation (rainfall) than others.
- Water moves through rivers and soil back to the ocean.
- Water is collected from rivers and from under the ground for human use, e.g., in homes, farms, and factories.
- A landform is a natural feature formed by physical processes. Water creates landforms via processes of erosion and deposition: -
 - Erosion happens when rock is broken down and transported.
 - Water (e.g., waves and rivers) carries sediment.
 - Deposition happens when eroded rock is deposited (dropped), e.g., when water slows down.
- Some places in the world are wealthier than others.
- Low- and middle-income countries (LICs and MICs) often earn a lot of their income from farming.
- A continent is a major landmass. Most continents include several countries.
- **Skill** – Recognising countries and continents on regional and world maps.
- **Lesson Vocabulary** – resource, river, water source, survive, crops, farming, income, HIC, MIC, LIC, continent, country, north-east Africa, landform, erosion, deposition.

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Lesson 1 – What is a river?

In this lesson we are learning to describe the features of a river and the role that a river plays within a drainage basin.

- A river is a natural moving body of water that transports water over the land towards the sea.
- The start of the river is called the source and is located on high ground.
- The mouth is where the river meets the sea.
- A tributary is a small river or stream that joins a larger river.
- A drainage basin is an area of land that is drained by a river and its tributaries.
- Watershed means the edge of a drainage basin.
- The River Nile is located in north east Africa.
- **Skills** - Use maps, aerial photographs and Google Earth to identify and describe rivers and their features.
- **Stretch** – Comparing the Nile river and the Nile drainage basin
- **Vocab**- river, source, mouth, tributary, drainage basin, watershed, River Nile

Lesson 2 – How does a river change from source to mouth?

In this lesson we contrast the characteristics of a river in its upper and lower courses using long and cross profiles.

- The upper course is the first stretch of a river, beginning at the source.
- The lower course is the final stretch of a river, ending at the mouth.
- The river channel is the landform through which the river flows.
- Cross profiles show the shape of a river channel at a given point in the river
- The river channel becomes wider and deeper downstream.
- This is because water is added to the river via tributaries and overland flow.
- Long profiles show how the relief changes from the upper to lower course.
- In the upper course the land is high and steep; in the lower course the land is low and flat.
- **Skills** - Interpret cross sections and long profiles to describe how rivers change from source to mouth.
- **Stretch** – How erosion affects the river channel.
- **Vocab** - upper course, lower course, river channel, cross section, long profile, width, depth, height, overland flow

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Lesson 3– What landforms can we find along a river?

In this lesson we learn to identify and describe waterfalls, meanders and floodplains in photographs and maps.

- A landform is a natural feature of the earth's surface.
- Waterfalls, meanders and floodplains are examples of river landforms.
- A waterfall is a steep flow of water from a height, located in the upper course.
- A meander is a bend in the river channel, located in the lower course.
- A floodplain is the area of land on either side of the river channel which is covered with water when the river floods.
- Floodplains are found in the lower course.
- **Skills** - Identify and describe river landforms using oblique photographs, aerial photographs and maps.
- **Stretch** – Exploring why geographers use multiple types of images to understand landforms.
- **Vocab** – landform, waterfall, meander, floodplain

Lesson 4 – Why are rivers important in the natural environment?

In this lesson we discover the crucial role that rivers play in maintaining balanced ecosystems.

- Rivers play a vital role in the water cycle, by transporting water to the sea.
- 'Ecosystem' refers to all of the animals and plants that live in a particular environment and the delicate relationships between them.
- Rivers provide water, food, nutrients and habitats for plants and animals. This keeps them healthy and maintains stability in the food chain.
- Rivers distribute sediment which maintains soil fertility along the riverbanks.
- Changing one element of a river can cause ecosystem imbalance.
- **Skill** – Using diagrammatic representations of river ecosystems and food chains to explain the environmental importance of rivers.
- **Stretch** – changes that would occur to the Sudd if the hippo became extinct.
- **Vocab** – ecosystem, imbalance, distribute, nutrients, habitat, riverbanks, fertility, food chain

Lesson 5 – Why are rivers important to people?

In this lesson we are learning to explain the vital role of the River Nile in improving quality of life in the Nile basin.

- Rivers are an important water source. This has led to human settlement near rivers for example throughout the Nile river valley.
- Quality of life refers to people's standard of health, comfort and happiness.
- Rivers improve quality of life and enable economic development by:
 - Providing water for domestic use
 - Providing transportation routes
 - Enabling fishing
 - Creating fertile soils and an irrigation source for agriculture
 - Providing employment.
- **Skill** - Reading and extracting geographical information from extended first-person texts.
- **Stretch** – Cultural uses of the Nile.
- **Vocab**- water source, settlements, arid, quality of life, domestic use, agriculture, fishing, fertile, irrigation, employment

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Lesson 6 – Why are rivers in jeopardy?

In this lesson we discover how rising populations impact the River Nile, particularly through over extraction of water.

- Rapid population growth in the Nile river basin has increased water demand, leading to over extraction.
- Over extraction reduces water availability and deprives downstream areas of nutrients and sediment.
- The Nile has high levels of domestic, industrial and agricultural pollutants. This creates ecosystem imbalance.
- Jeopardy means being in danger of being damaged or destroyed.
- **Skill** - Use statistical data, diagrams and first-hand accounts to explain how population increase affects the River Nile and its ecosystems.
- **Stretch** – Investigating who wins and who loses from using the Nile.
- **Vocab** - population growth, water demand, over extraction, pollutants, jeopardy

Lesson 7 – Why is Ethiopia building a dam?

In this lesson we discover what a dam is and why Ethiopia is building the Grand Ethiopian Renaissance Dam (GERD) along the Blue Nile.

- A dam is a wall built across a river, to control water flow, conserve water supplies and/or generate hydroelectric power (HEP).
- The Grand Ethiopian Renaissance Dam (GERD) on the Blue Nile in Ethiopia is nearing completion. It is a HEP dam.
- The GERD is expected to improve levels of economic development, quality of life and water availability in Ethiopia.
- Ethiopia intends to generate money through the sale of HEP.
- **Skill** - Use a range of sources including maps and development indicators to understand how a dam can help a LIC to develop.
- **Stretch** – Reasons why some people are sceptical about the GERD.
- **Vocab** – dam, hydroelectric power, GERD, Ethiopia, Blue Nile

Lesson 8 – How will the GERD impact the Nile River basin? In this lesson we examine possible impacts of the GERD and discover how the dam is causing tension in the Nile River basin.

- It is likely that the GERD will reduce water availability in Sudan and Egypt, putting livelihoods and the environment at risk.
- The dam is expected to increase availability of cheap electricity in the region.
- The GERD has created tension in north east Africa as Ethiopia will control a major water resource in this very dry region.
- The term ‘rivals’ means people who compete with each other for same objective or resource.
- **Skills** - Use a range of sources including stakeholder opinions to evaluate likely impacts of the GERD in the Nile basin.
- **Stretch** – Exploring how the GERD may or may not resolve tensions.
- **Vocab** – availability, livelihood, Sudan, tension, rival.

Assessment

- Students answer a 10 question MCQ before starting the unit, a further 10 after Lesson 3 and another 10 after Lesson 6. (Eedi platform). Re-teach lessons with tailored targets provided.
- Focus on writing lesson: **How will the GERD impact the Nile River basin?** Essay-writing guidance is provided for students in the Mastery booklet. Exemplars and guidance on how to band essays are provided in the Teacher Guidance booklet.



Unit Overview

Year 8 Unit 2 – *Food and Famine*

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Unit rationale

800 million people around the world go hungry each year, and this hunger is not evenly distributed. Geographers seek to explain such spatial patterns, and specifically in this unit, students examine why some places experience food security while others do not. The unit encourages students to think deeply about how physical and human factors operate in tandem to create food insecurity in certain places. The unit teaches students to compare country-level data in order to arrive at an evidenced conclusion about the causes of food insecurity. This unit addresses the Year 8 annual question of ‘Does humanity live sustainably with the environment?’

Scope

Food is critical to human health and survival. Many places have food scarcity which can lead to undernourishment, famine, overcultivation and rising food prices. Physical causes of food scarcity are most pronounced in arid regions. They include poor soil fertility, unreliable rainfall, and rising temperatures, however alone they are not enough to cause serious food insecurity. Human causes of food insecurity include poverty and conflict. The Central African Republic suffers extreme food insecurity due conflict and resulting rising food prices and human displacement. Strategies exist to improve food supply in arid regions.

Rapid population growth and rising incomes increase demand for global meat consumption and have consequences for the environment. An extra depth lesson explores how a changing climate and soil depletion will affect the UK’s ability to produce food in the future and examines the rising movement for ethical consumerism.

Sequence

Link to past units

This unit follows River Rivals where students were introduced to the vital importance of natural resources, controversy around resource use, and the fact that these are particularly pressing issues in the arid region of north-east Africa.

This unit also builds on development issues discussed in River Rivals, introducing the Central African Republic and South Sudan as LICs, and the UAE and the UK as HICs, whose wealth enables them to import a higher proportion of food.

Link to future units

This unit precedes Unit 3 Endless Energy which explores the uneven pattern of energy resources, demand, supply, and environmental impacts. All three units point towards the annual question of ‘Does humanity live sustainably with the environment?’

This unit is foundational to Y8 Unit 4- Climate Change, where the impacts of climate change on arid region are discussed, as well as Y8 Unit 6 – The Middle East, where knowledge of arid climate zones is deepened.

Core Knowledge (assessed through MCQ)



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Lesson 1 - Why is food important?

In this lesson we explore how a lack of food can cause undernourishment and long-term problems such as overgrazing, social unrest and rising food prices.

- Food is an essential resource, meaning that it is critical to human health and survival.
- Food plenty means when people have enough nutritious food enough of the time.
- Food scarcity means a shortage of food.
- Food scarcity can lead to undernourishment, famine, overcultivation and rising food prices.
- Famine occurs when there are extreme food shortages resulting in little or no food.
- **Skill** – Read extended texts in order to identify impacts of food scarcity.
- **Stretch** – Understanding the Sudanese food riots of 2018.
- **Lesson vocabulary** – food plenty, food scarcity, undernourishment, famine, overgrazing, social unrest

Lesson 2 - Where is all of the food?

In this lesson we use datasets to categorise and map countries according to their average calorie consumption.

- Food consumption varies globally.
- Places can be categorised according to their per capita calorie consumption.
- HICs generally have a low risk of hunger and high rates of obesity.
- LICs generally experience greater risk of food scarcity and higher rates of hunger.
- **Skill** – Use datasets to create a choropleth map to show regions at low, moderate and high risk of food scarcity.
- **Stretch** – Understanding food poverty in the UK.
- **Lesson vocabulary** – HIC, LIC, consumption, hunger, obesity, calorie, per capita

Lesson 3 - What are the physical factors that cause food insecurity?

In this lesson we examine how the key physical factors of soil fertility and increasing aridity affect a country's ability to provide food.

- Food production relies on fertile soils and water availability.
- Soil fertility impacts the range of crops that can be grown in an area and the size of the harvest.
- Unreliable rainfall and rising temperatures can cause land to become more arid (dry).
- Extreme temperatures can kill crops and livestock.
- **Skill** – Use graphs, charts and other data to explain how physical factors cause food scarcity.
- **Stretch** - Climate change will impact food security in the Sahel.
- **Lesson vocabulary** – soil, arid, fertile, harvest, drought, crop, livestock

Lesson 4 - What are the human factors that cause food insecurity?

In this lesson we discover how poverty and conflict limit people's access to food.

- Food insecurity occurs when people lack regular access to enough safe and nutritious food.
- Poverty reduces ability to purchase food.
- Conflict can slow or prevent flows of food.
- Rates of poverty and conflict are higher in LICs which makes them especially likely to experience food scarcity.
- **Skill** – Use evidence from first-hand accounts to explain the human factors that cause food scarcity.
- **Stretch** – Understanding how conflict has led to displacement of the South Sudanese.
- **Lesson vocabulary** – poverty, conflict, vulnerable

Lesson 5 - Are physical or human factors more important in food insecurity?

In this lesson we compare food profiles of the UK, the UAE and Central African Republic, in order to decide whether physical or human factors are the key cause of food insecurity.

- Food insecurity happens when negative physical and human factors occur at the same time.
- Negative physical factors alone (e.g. aridity) are usually not enough to cause serious food insecurity.
- The Central African Republic suffers extreme food insecurity due to a combination of conflict, rising food prices, displacement of people.
- **Skill** – Select data from country profiles to determine whether physical or human factors are the more significant cause of food insecurity.
- **Stretch** – Understanding why the UK has food plenty.
- **Lesson vocabulary** – Central African Republic, conflict, displacement, UK, United Arab Emirates

Lesson 6 - How can places achieve food plenty?

In this lesson we examine some of the strategies that arid countries use to improve food supply.

- An arid region is one with very low precipitation.
- Arid countries are in particular need of technologies that increase food supply.
- Technology choices vary depending on factors such as level of development and local skills.
- Hydroponics are a costly and high-tech strategy used to increase food supply in Israel; the Sunflower pump is a low-cost strategy used to increase food supply in Kenya.
- **Skill** – Label and annotate diagrams and photographs to describe how solar-powered irrigation and hydroponics technologies can improve food supply.
- **Stretch** – Case study of how aeroponics can increase food supply.
- **Lesson vocabulary** – technology, arid, food supply, local skills

Lesson 7 - Why is large-scale farming a problem?

In this lesson we discover how large-scale farming in tropical regions has irreversible impacts on the environment.

- Large-scale farming refers to farming large areas of land for commercial purposes.
- Large-scale farming in tropical regions causes deforestation and soil erosion.
- **Skill** – Use satellite images/maps to compare rainforest cover over time. Use statistical sources to describe the impacts of large-scale farming.
- **Stretch** – Perspectives on environmental management.
- **Lesson vocabulary** – large scale farming, tropical region, commercial, palm oil, deforestation, irreversible, stewardship

Lesson 8 - What is the world's food future?

In this lesson we discover the impacts of population growth and rising incomes on global meat consumption and the environment.

- Rising populations leads to greater demand for food and agricultural land.
- Rising incomes in developing regions increases demand for animal products.
- Producing meat and dairy products uses more natural resources: deforestation for livestock farming; growing grain to feed animals; and high-water use.
- **Skill** – Use statistical information to discuss how population and wealth increases will shape global food futures.
- **Stretch** – Describing strategies to meet increasing food demand.
- **Lesson vocabulary** – demand, disposable income, animal products, sustainable

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Extra depth (optional)

Lesson 9 - Why do crops grow better in the UK than Sudan?

In this lesson we discover what soil profiles are, why soils vary and why agriculture is usually more successful in temperate regions than in deserts.

- Fertile soils and high precipitation rates are required for successful agriculture (farming).
- A soil profile is a vertical section of the soil showing horizontal soil layers.
- Soil in temperate regions like the UK is fertile and moist.
- Soil in arid regions like Sudan is fertile but dry.
- Crops grow more successfully in the UK than Sudan because of the combination of fertile soil and high precipitation levels.
- **Skill** – Use a range of geographical sources including soil profiles and choropleth maps to explain why the UK is agriculturally successful.
- **Stretch** – Oxisols soil profiles in the tropical rainforest.
- **Lesson vocabulary** – soil profile, fertile, precipitation, temperate, arid

Lesson 10 - Will we be able to feed ourselves?

In this lesson we explore how a changing climate and soil depletion will affect the UK's ability to produce food in the future.

- Soil degradation refers to a decline in soil condition.
- Intensive farming practices are causing soil degradation in the UK due to fertiliser and pesticide use, and soil compaction from heavy machinery.
- Soil degradation will reduce the UK's capacity to produce enough food in the future.
- There is disagreement about the harvest potential of UK soil.
- **Skill** – Read extended texts and extract statistics to respond to the question of whether we will be able to feed ourselves.
- **Stretch** – Strategies to improve soil health in the UK
- **Lesson vocabulary** – degradation, intensive farming, compaction, fertiliser, pesticide

Performance Assessed Element

- Before starting the unit students complete a **Pre-Unit Quiz** comprising 10 MCQs. This helps teachers to diagnose whether students have retained prior content that will help them to progress in this unit.
- Students complete a **Mid-Unit Quiz** after Lesson 5 and a **Post-Unit Quiz** after Lesson 8 (10 MCQs each). Re-teach lesson with tailored targets provided.
- All quizzes can be completed using the Eedi platform or from the slides in the classroom.
- Students write an **essay** to answer the question: **Are physical or human factors more important in food insecurity?** Guidance on how to band essays and an exemplar are provided.

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Unit Overview

Year 8 Unit 3 – *Endless Energy?*

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Unit rationale

Energy is used in all elements of modern life. This unit introduces renewables and non-renewables and explains how we generate energy from these sources to meet our domestic, industrial, and transportation needs. Given that current fossil fuel use is responsible for the largest global environmental crisis ever seen, it is critical that students understand why the world is so reliant on them, why renewable uptake is currently slow, and what a sustainable energy future might look like. When students understand these fundamentals, they have a sound basis from which to grapple with challenging concepts like climate change, sea level rise, and glacial retreat in subsequent units. This unit addresses the Year 8 annual question of ‘Does humanity live sustainably with the environment?’

Scope

The global demand for energy is rising due to the rising global population, economic development, and rising wealth.

Non-renewable energy sources (fossil fuels) are widely used but are finite and unevenly distributed. They are heavily polluting, cause global warming and are often at the core of disputes between countries. Renewable energy resources (examples solar and hydropower) are non-polluting and infinite and have huge potential to reduce the impacts of global warming.

The global energy mix shows a rise in the use of all fossil fuels, a slight increase in renewables, and an overall rise in the total use of energy. More countries are moving towards renewables to reduce environmental impacts, but due to a range of challenges there is not yet wide uptake and global fossil fuel reliance remains at 80%.

The first extra depth lesson explores why Uruguay is a leader in renewable energy and the second is a decision-making exercise where students decide on the best site for a solar energy project in the UK using aerial and OS maps.

Sequence

Link to past units

The study of geology in Year 7 supports with understanding the origins of fossil fuels and why their distribution is uneven. In Year 7 students also learned that countries trade with one another to access resources that they cannot produce, for example oil.

Endless Energy is the third Year 8 unit looking at natural resources. By this point students have an understanding that resource availability is unevenly distributed and can raise tensions. Energy resources are particularly contentious, as they are pervasive in all aspects of modern life, they support the provision of water and food, and their global demand is rising. Energy is likely to continue to cause geopolitical tensions in the future.

Link to future units

This unit precedes Unit 4 on Climate Change where students will learn the long-term planetary-scale impacts of continued fossil fuel use. Having a solid understanding of why the world is so dependent on fossil fuels lends it itself to a richer understanding of why the climate crisis is so hard to resolve.



Core Knowledge (assessed through MCQ)

Lesson 1 – Why is energy important?

In this lesson we examine the ways in which energy shapes our lives today. We look at the role of energy in industry, transport, and the home.

- Energy is power that is used for an activity.
- Energy is used to make electricity, fuel transportation, power factories, and heat homes.
- Modern sources of energy have been used widely for the past 150+ years ago. These have transformed modern lifestyles.
- **Skill** – historic and current photographs can be compared to see changes.
- **Stretch** – Explaining why people live ‘off grid’.
- **Lesson vocabulary** – energy, fuel, electricity, boiler, transmit, pylon, furnace, combustion

Lesson 2– Why is the world using more energy?

In this lesson we discover why the demand for energy is rising and examine the connection between a country’s level of development and energy use.

- The demand for energy is rising due to rising global population, economic development, and rising wealth of populations.
- Economic development increases the demand for energy for industry and transportation.
- Consequent rising middle classes demand more energy for domestic use and transportation.
- China and India are two countries that have significantly increased their energy demand.
- **Skill** – Area charts can be used to show changing trends for different regions.
- **Stretch** – Understanding the value of the measure ‘energy use per capita’.
- **Lesson vocabulary** – economic development, energy demand, industry, area chart

Lesson 3 – What are the sources of energy?

In this lesson we learn the difference between renewable and non-renewable (finite) energy sources and describe how fossil fuels, solar and hydropower can be harnessed.

- Renewable energy sources do not run out.
- Non-renewable energy sources are finite.
- The main non-renewable energy sources are fossil fuels (coal, oil, and natural gas).
- Fossil fuels are made from the remains of plants and animals that lived millions of years ago.
- Fossil fuels are burnt to create heat or converted into electricity.
- Two renewable energy sources are solar and hydropower.
- Sunlight is absorbed through solar panels and converted into electricity.
- In hydropower the force of the water through a dam turns a turbine and generates electricity.
- **Skill** –Flowcharts can show a sequence of how something works.
- **Stretch** – A case study of wind power as a renewable energy source.
- **Lesson vocabulary** – renewable, finite, generator, turbine, inverter, fossil fuels, oil, natural gas, hydropower, solar power

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Lesson 4 – Where is the world's energy?

In this lesson we use maps to explore how fossil fuels and solar energy are distributed globally and offer reasons for their uneven distribution.

- Solar energy has the largest potential along the tropics, in areas that receive high concentrations of sunlight.
- Countries that produce the most solar energy tend to be HICs as solar panels are expensive to install.
- Fossil fuel distribution is random. Countries that produce the most fossil fuels tend to be HICs as fossil fuels are expensive to extract.
- **Skill** – Using choropleth maps to identify the global distribution of energy resources.
- **Stretch** – The threat of searching for oil resources in the Arctic.
- **Lesson vocabulary** – distribution, the Tropics, sunlight concentration, solar panel, install, extract, choropleth map

Lesson 5 – Why do we rely on fossil fuels?

In this lesson we examine the reasons why fossil fuels are so widely used today, how they are projected to run out, and identify their negative consequences for the environment.

- Fossil fuels make up over 80% of the global energy mix. They are relatively cheap to produce and transport and can provide a constant supply.
- At current rate of production all fossil fuels could run out within 150 years.
- Fossil fuels can damage fragile environments, pollute the air, and worsen climate change.
- Coal is the most polluting. Oil spills can damage ecosystems.
- **Skill** – Projections calculate the situation for the future based on current evidence.
- **Stretch** – Understanding the value of the 'peak oil' model.
- **Lesson vocabulary** – projection, oil reserve, infrastructure, reliance

Lesson 6 – Why did Russia turn off its gas pipeline?

In this lesson we examine why Russia is an energy superpower and explain how this has caused energy disputes in the European region.

- Russia is an energy superpower as it produces high volumes of gas and oil which are transported around the world.
- Gas and oil from Russia are transported to countries in Europe and Asia via pipelines, with proposed pipelines to China.
- In 2009 Russia turned off the pipelines to the Ukraine over a price dispute.
- This caused several countries in Europe to be without heat or electricity during the height of winter.
- **Skill** – Arrows on a flow map show the direction and location of energy pipelines.
- **Stretch** – Understanding the controversy of the Nord Stream pipeline in Europe.
- **Lesson vocabulary** – pipeline, dependent, political tension, energy superpower

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Lesson 7 – How is the energy mix changing?

In this lesson we examine how the global energy mix has changed over time and contrast the energy mix in different countries.

- The energy mix is the amount and type of energy sources that a region uses.
- The global energy mix shows a rise in the use of all fossil fuels, a slight increase of renewables, and an overall rise in the total use of energy.
- HICs are decreasing their reliance on coal and using more renewable energy sources.
- Countries with more manufacturing such as China are using a greater proportion of fossil fuels.
- **Skill** – area charts are based on line graphs and can be used to show both trends and proportions.
- **Stretch** – Understanding 'leapfrogging' to clean development in LICs.
- **Lesson vocabulary** – energy mix, MIC, biofuels, manufacturing



Lesson 8 – Are renewables a silver bullet? + Focus on writing lesson.

In this lesson we explore the potential of using renewable energy more widely and answer the question of why it is not used more already.

- Renewable energy has an infinite supply. It is non-polluting.
- There is limited use of renewable energy currently due the need for specific locations, intermittent supply and difficulties with storing energy. There are high set up costs for LICs.
- Barriers to using more solar power include intermittent supply, suitable location, difficulties of storage and using land that could be used for food production.
- For hydroelectric power to work a suitable location across a river is needed. It involves flooding large areas of land destroying habitats. There are high set up costs.
- **Skill** –inclusion of viewpoints, maps and charts to inform arguments.
- **Stretch** – Understanding who the key players are that produce the infrastructure to support renewable energy.
- **Lesson vocabulary** – silver bullet, intermittent, suitability, installation

Extra Depth (optional)

Lesson 9 – Why is Uruguay a leader in renewables?

In this lesson we discover how a country can rely more on renewable energy, using Uruguay as a case study.

- Uruguay is a country located in South America.
- It has a coastline and is near to the Tropic of Capricorn.
- It is a world leader in the use of renewable energy.
- Renewables provide almost all electricity and nearly half total energy.
- Uruguay is well located for hydroelectric power, solar and wind.
- The energy change was achieved due to commitment from the government and people.
- **Skill** –Calculation of difference from the mean.
- **Stretch** – Understanding the UK's 10 Point Plan for Energy
- **Vocabulary** – tectonic plate margins, geothermal power, excess, energy capacity

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Lesson 10 – Where is a suitable site for solar energy? - Decision Making Exercise

In this lesson we consider several sites for a solar energy project in the UK in order to answer the question – why don't we switch to renewables today?

- The UK has some solar energy potential, but it is not constant.
- Solar energy is best located in where there is flat land, that is south facing, and far from residential and protected areas.
- **Skill** – decision of which site is most suitable based on criteria. Aerial photos and OS maps enable geographers to see many features over a wide area.
- **Stretch** – Understanding the limitations of using solar power to generate energy in the UK.
- **Vocabulary** – proposal, criteria, stakeholder, contour line, OS Map, oblique photo

Performance Assessed Element

- Students answer a 10 question MCQ before starting the unit, a further 10 after Lesson 4 and another 10 after Lesson 8. Re-teach lesson with targets provided.
- Essay: **Are renewables a silver bullet?** Exemplar provided and guidance on how to band essays and suggested targets.



Unit Overview

Year 8 Unit 4 – Climate Change

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Unit rationale

Climate change is the most pressing issue facing the planet. Geographers are deeply concerned with the causes and impacts of climate change, and crucially, how to slow it given growing populations, rising greenhouse gas emissions and variable global commitment to change. Young geographers are interested in the big moral and environmental debates of the day and should be supported to develop evidenced views using up to date statistics and case studies. This is especially important when studying climate change, as an issue crowded by noisy and often unsubstantiated opinions in the wider media. More broadly, gaining knowledge and understanding of climate change supports students to feel equipped to address it rather than being demoralised by its challenges. This unit addresses the Year 8 annual question of ‘Does humanity live sustainably with the environment?’

Scope

Though the Earth has always experienced climatic changes, present day global temperature rise is happening at an unprecedented rate. The burning of fossil fuels, disproportionately from high and middle-income countries has intensified the natural greenhouse effect.

Impacts of climate change follow an uneven distribution. Low lying regions and areas of extreme weather set to undergo the most significant changes. Middle- and low-income countries are set to suffer the most with limited capacity to cope. Climate change action exists at international, national, and individual scales, though many are sceptical that it will be enough.

Climate change has sparked divergent responses, from global protest movements to climate change denial.

Sequence

Link to past units

Units 1-3 all explored how human use of natural resources impact the environment.

Unit 3 explored the reasons for ongoing dependence on fossil fuels and the barriers to readily transitioning to a renewable energy future. Unit 4 develops this knowledge by examining how fossil fuel combustion contributes to the enhanced greenhouse effect and explores the uneven impacts of these climatic changes across the globe. It then assesses contribution that developing renewables can have in mitigating against climate change.

Link to future units

The unit precedes Year 8 Unit 5 Polar Environments where we look deeper at the consequences of climate change in a particular climate zone.

In Year 9 Unit 5, we examine how global temperature rise is causing glacial retreat and look at regional and global impacts of this.

Core Knowledge (assessed through MCQ)



Lesson 1 – What is climate?

In this lesson we learn the meaning of climate. We look at how climate varies across the planet by examining major climate zones.

- **Key term - Climate** refers to the average weather conditions of a place.
- Climate data is averaged from at least 30 years of weather data.
- A climate zone is a region with distinctive temperature and rainfall patterns.
- The location of climate zones is determined mainly by latitude.
- Major climate zones include polar, arid, temperate, and tropical.
- **Skill** – Latitude can be used to explain the location of climate zones.
- **Stretch**- Role of the earth's tilt in creating climate zones.
- **Lesson vocabulary** – Climate, climate zone, arid, temperate, characteristic, tropical, polar, latitude.

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Lesson 2– Has the climate always been like this?

In this lesson we discover how the climate has changed since Earth's formation. We describe the characteristics of Earth's climate today.

- **Key term - Climate change** occurs when average weather patterns change over decades or longer.
- Planet Earth is 4.5 billion years old.
- The Earth's climate has always been changing.
- Past climatic change has naturally occurred.
- Past climate change includes alternating cooler periods (glacials) and warmer periods (interglacials).
- We are currently in an interglacial, where few places are covered in ice.
- **Skill** – Line graphs can be used to show climatic changes over long timescales.
- **Stretch** - Even longer-range climate data shows how over the past 2.6 million years the climate has experienced a gradual cooling.
- **Lesson vocabulary** – Climate change, interglacial, past climate change, alternating, glacial, billion.

Lesson 3 – Why is Earth's atmosphere warmer than in space?

In this lesson we discover how the natural greenhouse effect maintains Earth's climatic conditions.

- **Key term** - The **atmosphere** is a layer of gas around the earth.
- A greenhouse is a building that traps heat to help plants grow.
- The natural greenhouse effect is a mechanism that maintains temperatures for life on Earth.
- Solar radiation enters Earth's atmosphere, is absorbed by Earth's surface, then re-radiated. Some of this heat is trapped by greenhouse gases in the atmosphere; some escapes to space.
- Greenhouse gases are heat-trapping gases, e.g. carbon dioxide.
- The natural greenhouse effect occurs constantly.
- **Skill** - Diagrams can be used to explain climate mechanisms and processes.
- **Stretch** - The greenhouse effect was discovered in the mid-19th Century using scientific apparatus.
- **Lesson vocabulary** – greenhouse, solar radiation, greenhouse gas, re-radiating, greenhouse effect, atmosphere.



Lesson 4 – How is fossil fuel use causing the climate to change?

In this lesson we explain how human activity is causing rapid temperature rise, focusing on the burning of fossil fuels.

- The enhanced greenhouse effect is where human activities cause additional greenhouse gases to enter the atmosphere.
- The gases trap more of the sun's heat energy, causing Earth's atmosphere to warm.
- **Key term - Global warming** is the rapid temperature rise of Earth's surface temperature.
- Burning fossil fuels for energy, to power manufacturing, construction and to fuel cars, all emits carbon dioxide into the atmosphere.
- As populations grow and wealth levels rise, demand for energy increases.
- **Skill** - Understanding a scientific process.
- **Stretch** - Deforestation and agriculture increase greenhouse gases in the atmosphere.
- **Lesson vocabulary** – enhanced greenhouse effect, construction, global warming, manufacturing

Lesson 5 – What is the evidence for climate change?

In this lesson we compare the different ways that sediment cores, temperature records, aerial photographs give evidence for climate change.

- **Key term** - We know about climate change now and in the past, from **evidence**.
- Since 1850 a reliable record exists of the Earth's atmospheric temperature.
- Temperature records indicate that the global climate is now warming.
- Aerial images show that ice melt is occurring, indicating average temperature rise.
- A sediment core is a tube of mud collected from the ocean floor.
- Tiny organisms from within the core reveal what the climate was like in the past, up to 5 million years ago.
- **Skill** - Contrasting aerial photos can show the changing size of ice coverage.
- **Stretch** - Tree ring analysis provides temperature and rainfall data for hundreds of years (the age of the tree).
- **Lesson vocabulary** – reliable, aerial photo, evidence, sediment core,

Lesson 6 – Are the impacts of climate change the same around the world?

In this lesson we examine a range of places to compare and contrast the impacts of climate change.

- Climate change is causing temperatures to rise, rainfall to become unreliable, and sea levels to rise.
- These impacts are unevenly distributed across the world.
- **Key term** - Places with low relief are at risk of flooding from sea level rise, making land **uninhabitable**.
- Rising temperatures and ice loss in polar regions disrupts food chains.
- **Skill** - Heat maps can be used to show variation in temperature rise.
- **Stretch** - Unreliable rainfall in arid regions increases risk of drought and desertification.
- **Lesson vocabulary** – sea level rise, relief, low lying, uninhabitable

Lesson 7 – Are we all equal players in a changing climate?

In this lesson we consider why climate change is likely to disproportionately affect poorer nations.

- There is a positive **correlation** between per capita wealth and carbon emissions.
- Although low- and middle-income countries contribute the least to carbon emissions, they are likely to experience the most severe impacts.
- Impacts are most severe when multiple risk factors exist together e.g. reliance on agriculture, existing aridity or low **capacity to cope**.
- **Skill** - Scatter graphs can be used to show correlations between two variables.
- **Stretch** - Climate change refugees are people forced to migrate, as a result of their land becoming inhabitable due to climate change.
- **Lesson vocabulary** – correlation, middle income country (MIC), capacity to cope, risk factor

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Lesson 8 – What is being done about climate change? + *Focus on writing lesson.*

In this lesson we look at actions being taken at individual, national and international scales to address climate change.

- Climate change action involves efforts to reduce greenhouse gas emissions and to increase capacity to cope with the impacts of climate change.
- Individual action involves changing personal behaviours. This includes reducing energy use from fossil fuels.
- National action involves government initiatives to reduce carbon emissions and expansion of renewable energies.
- **Key term** - International groups set **targets** to reduce global carbon emissions.
- The Paris Agreement aims to limit global temperature rise to well below 2°C.
- Many scientists are concerned that the current level of action is insufficient to avoid devastating impacts from climate change.
- **Skill** - Evaluating the effectiveness of a range of strategies.
- **Stretch** - Rewilding is an example of how individuals and communities can mitigate against climate change.
- **Lesson vocabulary** – initiative, target, Member of Parliament (MP), Paris Agreement

Extra Depth (optional)

Lesson 9 – Why is climate change projection so difficult?

In this lesson we analyse the different predictions for global temperature increase and consider why it is hard to accurately project the future climate scenario.

- **Key term - Scenario** – a description of a situation that may happen in the future.
- Climate change forecasts show that global average temperatures will likely rise by between 1-6°C by 2100.
- More than 2°C would result in severe impacts and 6°C would be catastrophic.
- Keeping the temperature rise below 1°C is only possible with drastic changes to human behaviour.
- Forecasts show a temperature range as it is difficult to predict human behaviour e.g. rates of deforestation, energy consumption, population growth.
- **Skill** - Line graphs can show the range of climate change forecasts.
- **Stretch** - The IPCC is an international group that publishes trustworthy information on climate change projections.
- **Lesson vocabulary** – forecast, scenario, best case scenario, worst case scenario, climate change model, catastrophic

Lesson 10 – What does everyone think about climate change?

In this lesson we explore the range of reactions to climate change, including the role of climate activism and climate change denial.

- Each of us has a viewpoint on climate change.
- Common viewpoints and reactions range from accepting, aware and sceptical.
- Climate change activism tries to influence world leaders to increase action on climate change.
- **Key term** - Climate change **denial** involves rejection of reliable scientific evidence for climate change.
- Social media can serve to strengthen people's existing beliefs.
- **Skill** - Viewpoints about climate change can reveal the complexity of a geographical issue.
- **Lesson vocabulary** – viewpoint, activism, denial, sceptical

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Performance Assessed Element

- Students answer a 10 question MCQ before starting the unit, a further 10 after Lesson 4 and another 10 after Lesson 8.. Re-teach lesson with targets provided.
- Essay: **What is being done about climate change?** Exemplar provided and guidance on how to band essays and suggested targets.
- Students answer the Spring Term Diagnostic, which will cover all of Unit 3 and the first half of Unit 4 (30 multiple choice questions on Eedi).



Unit Overview

Year 8 Unit 5 – Polar Environments

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Scope

Polar regions cover one fifth of Earth’s surface. They have formed in the high latitudes, where conditions are cold and inhospitable year-round. Such conditions have forced plant and animal species to adapt. Antarctica is a continent covered by land ice and surrounded by sea ice, compared with the Arctic which is frozen sea surrounded by land. Unlike the Antarctic, the Arctic polar region is inhabited by humans.

Polar environments play a crucial role in cooling the global climate as their white surfaces reflect radiation. Temperatures are rising faster in polar regions than anywhere else on Earth, causing loss of sea and land ice. This removes habitat and causes sea level rise. The tundra biome is located within polar regions, and its cold arid climate and flat hand is home to unique flora and fauna.

The Russian Arctic has small and scattered settlements, often near to fossil fuel deposits. Indigenous peoples live in the Arctic, including the nomadic Nenets of the Yamal region, whose lives are affected by climate change and fossil fuel development.

Sequence

Link to past units

This unit builds on Unit 3 Endless Energy by examining how fossil fuel extraction can bring economic benefits and social and environmental costs to the Yamal peninsula.

The unit also builds on Unit 4 Climate Change by deepening understanding of impacts of climate change in polar regions.

In Y7 Unit 4 Brilliant Biomes polar regions were introduced; Y8 Unit 5 deepens knowledge of this biome by introducing the characteristics of the tundra.

Link to future units

The mini-regional study on Russia is a good induction to an in-depth regional study in the Middle East unit. Both regions have developed fossil fuel-based economies and have inhospitable landscapes.

Polar Environments illustrates tundra landscapes and is a good starting point for Y9 Unit 5 Glacial Landforms and Processes.

This unit also examines the plight of indigenous communities and explores the idea of remote communities that are often neglected by central government. This is a theme that will be returned to in Y9 Unit 4 Development Disparity.

Core Knowledge (assessed through MCQ)



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Lesson 1 – What are polar environments like?

In this lesson we learn about the physical characteristics of polar regions and differences between the Arctic and Antarctic.

- **Key term - Polar** refers to the regions around the north and south poles, within the Arctic and Antarctic circles.
- The Arctic and Antarctic are polar environments located in the high latitudes (within the Arctic and Antarctic Circles).
- Polar environments experience very low temperatures year-round, and extreme cold in the winter.
- They receive low levels of precipitation, in the form of snow.
- The Arctic is a sea, much of which is frozen. It is surrounded by land.
- Antarctica is land, covered by a thick ice sheet. It is surrounded by sea.
- 4 million people currently live in the Arctic. People have lived there for up to 20,000 years.
- Scientists and researchers visit Antarctica although no permanent settlements exist there.
- **Skill** - Students can locate the Arctic and Antarctic Circles on a world map using latitude
- **Stretch** - Who owns the Arctic? Consider the claims of the Arctic nations in comparison to the Antarctic Treaty.
- **Lesson vocabulary** – polar, latitude, Arctic circle, Antarctic circle, precipitation, sea water, freshwater, ice sheet, settlement.

Lesson 2 – Why are polar environments important?

In this lesson we learn why polar environments are important regionally as habitat and globally as they impact Earth's climate and sea levels.

- **Key term** - A food web is a diagram showing the connections between plants and animals in an ecosystem.
- Polar environments provide habitats for many species, helping to maintain balance in polar food webs.
- Polar environments are important globally because they store fresh water as land ice. This affects the sea level.
- They cool the global climate. Their large white expanses reflect solar radiation away from Earth's surface.
- Global temperature rise is causing ice loss in polar environments which disrupts food webs and causes sea level rise.
- **Skill** - Food webs can be used to show the complex connections between organisms in polar environments.
- **Stretch** - Why are polar regions warming faster than anywhere on Earth?
- **Lesson vocabulary** – Food web, land ice, ice sheet, Greenland, Antarctica, fresh water, solar radiation, albedo effect, habitat, sea level rise.

Lesson 3 – Why are polar regions so cold?

In this lesson we explain how dispersed solar energy and the Earth's tilt cause extreme cold in polar regions.

- **Key term - Earth's tilt** refers to the angle at which the Earth leans in its orbit around the Sun.
- The Arctic and Antarctic mainly experience temperatures well below freezing.
- The Antarctic experiences colder temperatures than the Arctic.
- The curvature of the Earth means that in the high latitudes, the Sun's heat energy is dispersed over a large area. This means that heat energy is low in polar regions.
- The Earth's tilt means that during Earth's annual orbit around the Sun, each Pole experiences several months of very low heat concentration when it is tilted away from the Sun (winter).
- **Skill** - Diagrams of Earth's orbit can be used to show how heat energy and axial tilt cause low polar temperatures.
- **Stretch** - Why is it colder at the South Pole than the North Pole?
- **Lesson vocabulary** – Earth's tilt, curvature, heat energy, concentration, dispersed, seasons, extreme.



Lesson 4 – How do plants and animals survive in polar environments?

In this lesson we examine how plants and animals have adapted their physical characteristics and behaviours to survive harsh polar conditions.

- **Key term - Adaptation** occurs when a species slowly changes to survive the conditions in which it lives.
- In polar environments, extremely low temperatures, strong winds and snow and ice create challenging conditions for plants and animals to survive.
- Plant and animal species in polar environments have adapted their physical characteristics to survive polar conditions.
- Polar vegetation like cushion plants grow low and close together to limit damage from wind and snow.
- Lichen can grow beneath snow and does not need soil to grow.
- Many polar animals have developed thick, light-coloured fur to trap heat and to successfully hunt or hide from predators.
- Many animals have adapted their behaviours, for example hibernation or migration.
- **Skill** - Annotating images can show how plants and animals have adapted to polar environments.
- **Stretch** - Why are there no trees above the timberline?
- **Lesson vocabulary** – adaptation, physical characteristic, vegetation, cushion plants, lichen, behaviour, camouflage, hibernation, migration

Lesson 5 – What is it like in the Russian Arctic?

In this lesson we are introduced to the physical and human characteristics of the Russian Arctic, as the first lesson in a mini-series on the region.

- **Key term - Tundra** is a cold biome with mainly flat land and minimal vegetation.
- Russia is the largest country in the world, spanning both Europe and Asia.
- Due to its size it has several different landscapes.
- The Russian Arctic...
 - is a vast region in the far north of Russia.
 - includes polar and tundra biomes.
 - has a permafrost layer in the soil.
 - is sparsely populated with only 2 million inhabitants across the entire region.
 - is rich in oil, gas, and minerals.
- **Skill** - Photo analysis can characterise a region.
- **Stretch** - The melting permafrost
- **Lesson vocabulary** – coniferous forest, tundra, permafrost, Soviet Union, inhospitable, methane

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Lesson 6 – Why is the Yamal peninsula so important to Russia?

In this lesson we explore the importance of Russia's Yamal peninsula as a resource 'treasure chest' and consider the impacts of resource extraction on people and the environment.

- **Key term** - A **peninsula** is a long, thin piece of land that has water around most of it.
- The Yamal peninsula is located in the north west of the Russian Arctic.
- Vast new oil and gas deposits have been discovered in the Yamal peninsula. These are critically important for the Russian energy industry.
- Fossil fuel extraction threatens the environment:
 - as it requires the expansion of infrastructure, disrupting migration routes of reindeer, and damaging grazing land.
 - as it can cause oil spills, which threatens ecosystems.

- **Skill** - Regional maps can be used to understand the characteristics of the Yamal peninsula, e.g. scale, resources and infrastructure.
- **Stretch** - Northern Sea Route
- **Lesson vocabulary** – peninsula, deposits, Gazprom, migration route, grazing

Lesson 7 – What is life like in the Yamal region?

In this lesson we explore how people living in settlements and in the nomadic Nenets tribe survive and make a living in the harsh conditions of the Yamal region.

- It is challenging to live in the Yamal region.
- There are many towns and villages in the region. There are no large cities.
- Several settlements have sprung up due to gas extraction.
- Quality of life is lowest in rural areas.
- **Key term** - The Nenets people are **indigenous** to the Russian Arctic.
 - Traditionally the Nenets are nomadic. They migrate seasonally with their reindeer herds.
 - Traditional lifestyle includes reindeer herding, fishing and spiritual connection to the land.
 - Many children go to boarding school in the cities.
- **Skills** - Brainstorms can be used to summarise geographical information about people and places.
- **Stretch** – Who is Anna Nerkagi?
- **Lesson vocabulary** – Nenets, indigenous, nomadic, seasonal migration, settlement, oil and gas town, infrastructure, quality of life, depression.

Lesson 8 – Why did the Nenets’ reindeer die in 2014? + Focus on writing lesson.

In this lesson we investigate how the warming climate caused thousands of reindeer to die in 2014 and consider how this has impacted the Nenets.

- Reindeer rely on lichen for food.
- Climate change is causing more rain in polar environments. Rain solidifies snow and turns it to ice.
- **Key term** - In 2014 this caused many reindeer to die as lichen became **inaccessible** under the ice.
- Without their reindeer herds, the Nenets settle in urban areas or turn to non-traditional employment.
- Many suffer from poverty in urban areas and poor mental and physical health.
- **Skills** - Qualitative evidence from documentary sources can be used to identify and describe viewpoints.
- **Stretch** - Annotate a selection of photos and diagrams to revise the Polar Environments unit.
- **Lesson vocabulary** – inaccessible, solidify, lichen, access, reindeer, herd, livelihood, settle, urban, employment, poverty

Extra depth (optional)

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Lesson 9 – What are glaciers?

In this lesson we learn what glaciers are, where they are found, how they form, and why they are so important in shaping Earth's landscapes.

- **Key term - Glaciers** are masses of moving land ice.
- Most glaciers form in high latitudes.
- Compacted layers of snow forms dense ice.
- A glacier moves downhill under its own weight.
- Glaciers form U-Shaped valleys by eroding the land beneath and around them.
- Glaciers deposit eroded material such as boulders.
- **Skills** - Aerial images and diagrams can be used to understand the shape and scale of glaciers.
- **Stretch** – How is climate change likely to affect glaciers?
- **Vocabulary** - glacier, land ice, latitude, snow, compact, dense, gravity, erode, deposit, u-shaped valley

Lesson 10 – How did Russia's Belalakaya mountain become so steep?

In this lesson we explore how glacial erosion can form corries, arêtes, and pyramidal peaks like Russia's Belalakaya mountain.

- **Key term - A pyramidal peak** is a sharply pointed mountain peak with at least three sides, formed by glacial erosion.
- A corrie is a bowl-shaped hollow in the land. Snow accumulates in the hollow and compresses into ice.
- The thick ice moves, eroding the corrie deeper and steeper.
- Where two glaciers are side by side, two corries can form a sharp ridge called an arête.
- A pyramidal peak forms when three or more corries form around a mountain top.
- **Skills** - Google Earth can be used to show glacial landforms like pyramidal peaks.
- **Stretch** – Which clues exist in the landscape to show that glaciers were there in the past?
- **Vocabulary** - pyramidal peak, corrie, arête, erode, mountain peak, hollow, ridge, circular

Performance Assessed Element

- Students answer a 10 question MCQ before starting the unit, a further 10 after Lesson 4 and another 10 after Lesson 8. (Eedi platform). Re-teach lesson with tailored targets provided.
- Focus on writing: **Why did the Nenets' reindeer die in 2014?** Guidance for this essay in Mastery booklet. Exemplar provided and guidance on how to band essays and suggested targets.

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Unit Overview

Year 8 Unit 6 – *The Middle East (a regional study)*

Scope

The Middle East is a region that encompasses the western region of Asia and the north eastern tip of Africa. There are approximately 17 countries of the Middle East, whose borders have changed over time and were preceded by successive Empires. Physical maps of the Middle East illustrate mountain ranges, rivers, seas, and climate zones. Aridity in the Middle East can be explained by the high-pressure belt. The Middle East has more than 250 million inhabitants. Population density is uneven with 65% settled in urban areas. The income bands of countries of the Middle East are wide ranging. Much wealth is based on the extraction of fuels and minerals, as harsh climatic conditions mean that surface resources are limited. Imports therefore play an important role. The Middle East is a cultural treasure chest, boasting famous landmarks of the world's three major religions, but it is also a place of many conflicts, caused by limited resources, shifting borders, changing power, and religious and ethnic claims.

Sequence

Link to past units

This is the main regional study that students will encounter at KS3. The unit starts with understanding location, and proceeds into physical and human characteristics, before zoning in on key themes of resource use, a cultural treasure chest, and conflict. Students have been set up well to engage with this unit as several key themes have already been studied in Year 8 including arid climate zones (Unit 1 River Rivals and Unit 2 Food and Famine). The fossil fuel industry (Unit 3 Endless Energy, Unit 4 Climate Change and Unit 5 Polar Environments). Students are also familiar with regional maps illustrating physical and human geography characteristics. They have also conducted smaller regional studies on North East Africa and the Russian Arctic. This unit brings together several strands in the annual question of whether humanity can live sustainably with its environment.

Link to future units

In Y9 income banding will be examined further in Y9 Unit 4 Development Disparity, some of the economic trends will be contextualised in Y9 Unit 3 Global Economy. The study of conflict also provides a good basis for the Ocean governance component of Y9 Unit 2. This unit addresses the Year 8 annual question of 'Does humanity live sustainably with the environment?'

Core Knowledge (assessable)



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Lesson 1 – Where is the Middle East?

In this lesson we discover the meaning and location of the Middle East including its countries and capital cities and explore how country borders in the region have changed over time.

- **Key term – Middle East** refers to a region where Asia, Africa, and Europe meet.
- The Middle East region is located on the Tropic of Cancer and includes approximately 17 countries over three continents.
- Countries of the Middle East include Egypt, Saudi Arabia, UAE, Turkey, Syria.
- Capital cities of the Middle East include Cairo, Riyadh, Abu Dhabi, Ankara, Damascus.
- The name ‘The Middle East’ was first used by the British in the 1850s.
- Country borders in the Middle East have changed over time.
- **Skills** – Locate the Middle East on a world map and describe its location including continents. Students can locate some Middle Eastern countries on an unlabelled regional map.
- **Stretch** – Power of cartography to create modern borders.
- **Vocabulary** – Middle East, border, region, country, capital city, empire

Lesson 2 – What is the physical geography of the Middle East?

In this lesson we use maps and photographs to examine the physical geography characteristics of the Middle East, including its major rivers, seas and gulfs, mountain ranges, and tectonic plates.

- **Key term – Gulf** refers to a deep sea surrounded mostly by land.
- The Middle East is surrounded by several seas and gulfs including the Arabian and Mediterranean Seas and the Persian Gulf.
- Most countries in the Middle East have a coastline.
- There are few major rivers in the Middle East. Two major rivers include the Nile and the Tigris. Some countries have no permanent rivers at all.
- Much of the region is comprised of the Arabian Desert, including almost all of Saudi Arabia.
- Some countries in the Middle East have mountain ranges including Turkey, Iran, Saudi Arabia and Yemen.
- These are caused by tectonic plate movement.
- The Zagros Mountains were formed by the collision of the Eurasian and Arabian Plates.
- **Skills** – Analysis of topographical and tectonic plate maps to identify physical features of the Middle East.
- **Stretch** –The Dead Sea – lowest point on Earth (on land); high salinity content; was under the sea 3.7 million years ago.
- **Vocabulary** – gulf, seasonal, mountain range, collision, coastline, tectonic plate.

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Lesson 3 – Why is the Middle East so arid?

In this lesson we explore how high air pressure in the Middle East creates arid conditions and examine the major biomes of the region.

- **Key term – Air pressure** refers to the force of air pushing down on Earth’s surface.
- Much of the Middle East is arid due to its latitude, where there is a band of high pressure.



- Warm air rises at the Equator, creating low pressure and rain. The air mass circulates, sinking at 30°N, which stops clouds from forming.
- The Middle East is wetter and cooler in the north and hotter and drier in the south.
- The region has three major biomes: hot desert, grassland, and shrubland.
- Hot desert is distributed in the centre and the south, along the Tropic of Cancer. Grassland and shrubland are common in the north, with most shrubland found in mountainous areas.
- Hot deserts are sandy and rocky with sparse vegetation. Grasslands are low, flat areas of grass and low bushes. Shrublands are rocky areas with small trees.
- **Skills** – Photos can be used to identify biome characteristics. Diagrams of air circulation can be used to explain high air pressure.
- **Stretch** – Low pressure at the Equator causes tropical rainforests to form.
- **Vocabulary** – air pressure, high pressure, cloud, condensation, biome, hot desert, grassland, shrubland, sparse

Lesson 4 – What is the human geography of the Middle East?

In this lesson we study the population characteristics of the Middle East and explain how the region's physical characteristics cause uneven population distribution.

- **Key term – Habitable** refers to a place that is suitable to live in.
- There are many different ethnic groups in the Middle East including Arabs, Kurds, Turks, and Persians.
- Many modern country borders do not match to the ethnic groups living there.
- There are several major languages spoken in the Middle East. The most common is Arabic.
- The Middle East has a population of >410 million. Since 1950 its population has grown rapidly.
- The northern region of the Middle East is more densely populated than the south.
- Populations are most dense where there is a factor that makes the land habitable e.g. a river valley, coastline or cooler climate.
- The Middle East now has two megacities.
- **Skills** – Choropleth maps can be used to describe population distribution in the Middle East.
- **Stretch** – Why has nomadism decreased in the Middle East?
- **Vocabulary** – habitable, settlement, ancient city, urbanisation, nomadism, population density, millennia, desalination

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Lesson 4a Mastery quiz 1 and reteach

Lesson 5 – How wealthy is the Middle East?

In this lesson we study the income groupings used by the World Bank and create a choropleth map to identify the income groupings of each country in the Middle East.

- **Key term – Gross national income** refers to the total yearly income of a country.
- The World Bank groups countries according to income per person. This includes High-, Middle-, and Low-income countries.
- This is calculated by dividing the national yearly income (in US dollars) by the total population.
- Average income data offer a general picture of a country's standard of living but provide no information about income equality.
- HICs usually have highly urbanised populations, high life expectancy, established infrastructure, and a workforce mainly in office jobs.



- MICs usually have rapidly urbanising populations, but still have large rural populations. They have relatively high life expectancy, decent infrastructure, and many people working in manufacturing.
- LICs usually have large rural populations, though more and more people are moving to cities. They have low-medium life expectancy, limited infrastructure, and many people working in farming and resource extraction. War and conflict is more common.
- **Skills** – Income data from the World Bank can be used to construct a choropleth map.
- **Stretch** –Explore variation within the MIC category (\$1036-\$12535) in the context of the Middle East using Dollar Street.
- **Vocabulary** – Gross national income, World Bank, income per person, choropleth map, inequality, limitation

Lesson 6 – Does the Middle East have all the resources it needs?

In this lesson we explore why the Middle East has oil and minerals in abundance yet cannot provide all basic goods required by the population.

- **Key term – Abundance** means a large quantity of something.
- The Middle East has vast underground deposits of oil and minerals.
- Millions of years ago much of the region was under sea water. Dead sea organisms compacted under the old seabed, forming oil deposits.
- Many countries in the Middle East export fuels and minerals as their main source of income e.g. Saudi Arabia and Iraq.
- The harsh climate of the Middle East makes it challenging for plants and animals to survive.
- This means that it is difficult to provide enough water, crops, meat, dairy, and textiles to meet the needs of the population.
- Most countries in the Middle East import basic goods that cannot be produced within the region, e.g. Saudi Arabia imports rice, beef and fruit and vegetables.
- Countries with milder climates have more diverse economies as they can produce and export a wider range of goods, e.g. Turkey exports textiles and foodstuffs.
- **Skills** – Charts and maps can be used to show imports and exports.
- **Stretch** –Why do many oil-based economies decide to diversify?
- **Vocabulary** – abundance, climate, surface resource, economy, deposit, textile, produce, import, export

Lesson 7 – Why is the Middle East a cultural treasure chest?

In this lesson we are learning why the Middle East has been an important region for people throughout history and will exemplify this through the city of Damascus.

- **Key term – Civilisation** refers to a large group of people in an area in a particular period of time e.g., the Ancient Egyptian civilisation.
- The Middle East has been a place of large and successful civilisations and several empires.
- The Middle East is the birthplace of three of the world’s three major religions: Christianity, Judaism, and Islam.
- Some major cities in the Middle East:
 - have been inhabited for thousands of years
 - were centres of power, business, and trade.
 - contain historic cultural landmarks
 - have become less powerful in the past 150 years.
- Damascus is the oldest city in the world. Today it is the capital of Syria.
- It was an important centre of trade and power throughout several empires.

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- **Skills** – Photographs can show evidence of historical landmarks
- **Stretch** – Istanbul, Turkey, has been the capital city of successive empires for millennia.
- **Vocabulary** – Civilisation, cultural treasure chest, empire, habitation, birthplace, pilgrimage, landmark

Lesson 8 – Why is there conflict in the Middle East?

In this lesson we learn why the Middle East has more conflict than most other regions and examine the causes and impacts of the Syrian civil war.

- **Key term – Conflict** means a serious and ongoing disagreement.
- War refers to a large conflict between countries. Civil war refers to a large conflict between citizens of the same country.
- The Middle East has more conflict than most other regions of the world.
- Some factors that lead to conflict include:
 - control of territory and resources, e.g. oil, or water.
 - unrest over political or economic conditions, e.g. the Arab Spring.
 - religious differences, or religious extremism.
 - foreign involvement.
- Major life-threatening conflicts currently exist in Yemen and Syria.
- Conflict has far-reaching social, economic, and environmental impacts.
- Most people in the Middle East are peaceful and desire no conflict.
- **Skills** – Use case studies to identify and explain factors leading to conflict in the Middle East.
- **Stretch** – Why has Iraq experienced so much conflict?
- **Vocabulary** – conflict, war, civil war, dispute, ethnic group, territory, unrest, extremism, terrorism

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Assessment

- Students answer a 10 question MCQ before starting the unit, a further 10 after Lesson 4 and another 10 after Lesson 8. (Eedi platform). Re-teach lesson with tailored targets provided.
- Focus on writing: **Why is there often conflict in the Middle East?** Guidance for this essay in mastery booklet. Exemplar provided and guidance on how to band essays and suggested targets.
- Summative assessment of mix tiered questions based on Y8 Units 1-5 (40 minutes), together with content from Y7, will appear in summer 2



Unit Overview

Year 9 Unit 1 – *Global Oceans (tectonics and processes)*

Unit Rationale

This unit explores physical processes taking place within and under the ocean. The first half of the unit examines ocean tectonics, and this is the main unit where students learn tectonics in-depth. Typically, at GCSE students study tectonics. To ensure the KS3 programme builds towards GCSE whilst avoiding repetition of similar content, oceans are used to illustrate tectonic processes, landforms, and hazards. The second half of the unit explores processes at play above the seafloor, for example the role of the ocean as a climate regulator. Through this, students can explain the importance of oceans to the planet. Studying oceans provides a unique lens through which to understand the annual theme of global connections. It also draws on some A Level concepts such as the carbon cycle.

Scope

Tectonic plate movement is occurring across the entire surface of the Earth. Much of this occurring under the oceans. Ocean tectonics can create land via sea floor spreading and subduction. Tectonic movement under the oceans can cause earthquakes and tsunamis, which are hazardous to human life. The 2011 Japanese tsunami was especially hazardous due to the high earthquake magnitude, the geology at the point of subduction, and the fact that the strategies in place did not account for such a large event.

The ocean is a huge body of saltwater that covers about 71 percent of the Earth's surface. There are 5 major oceans in the world. Oceans waters are at different depths and temperatures and are influenced by currents, which regulate the climate. Oceans are also carbon sinks which reduce the impact of the greenhouse effect. They are home to marine plants and animals. Human activity is present in the oceans including shipping, fishing, and tourism.

Extra depth lessons explore the seabed in further detail, notably the topography of the seafloor via bathymetric maps, and an examination of valuable seabed resources and the impact of their extraction.

Sequence

Link to past units

Y7 Unit 2 Our Planet introduces the structure of the Earth.

Y7 Unit 5 UK Landscapes explains the role of volcanoes in the rock cycle, and their role in forming the landmass of the UK.

Y7 Unit 6 UK Coasts introduces the relationship of oceans to the land, and the power of oceans to change land masses.

Y8 Units 3 and 4 explore how fossil fuel combustion leads to carbon emissions. This unit deepens students' understanding by examining the role of the ocean as a carbon sink.

Link to future units

After learning about the geological layer of the oceans, and how oceans interact with the atmosphere, students study the next 'sphere' of the ocean, the ocean biosphere, and finally the connection between oceans and human activity. This unit addresses the Year 9 annual question of 'How globally connected is the world?'



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Core Knowledge (assessable)

Part A – Ocean tectonics

Lesson 1 – What processes happen beneath the seafloor?

In this lesson we learn to explain the processes that cause tectonic plate movement.

- **Key term – Convection** – the flow of heat through a gas or a liquid as the hotter part rises and the cooler part sinks.
- Earth is made up of the layers of rock and metal.
 - The core is made of extremely hot nickel and iron and is the innermost layer.
 - The mantle is made up of molten rock (magma) and is the largest layer.
 - The crust is the outermost layer and comprises a thin layer of solid rock.
- The crust is made up of many large chunks called tectonic plates.
- The edge of a tectonic plate is called the plate margin.
- Tectonic movement happens on land and under the oceans.
- Tectonic plates move very slowly over time. This is called continental drift.
- In convection theory extreme heat from the core causes rock in the mantle to rise. As it moves closer to the crust, it cools, causing it to sink.
- This continual process sets up convection currents in the mantle which move the tectonic plates above.
- **Skill** – Using cross sectional diagrams to describe and explain the structure of the Earth, and convection.
- **Stretch** – How does the new theory of slab pull explain tectonic plate movement?
- **Lesson Vocabulary** – core, mantle, crust, magma, molten, tectonic plate, continental drift, plate margin.

Lesson 2 – How do ocean tectonics create land?

In this lesson we learn how tectonic plate movement under the seafloor causes volcanic islands and mid-ocean ridges to form.

- **Key term – Subduction** occurs when one tectonic plate forces or slips under another.
- Tectonic plates can collide, diverge or move alongside one another.
- At a constructive margin:-
 - tectonic plates diverge.
 - lava emerges through the crust onto the seafloor.
 - it cools and solidifies, forming new land.
 - over millions of years mid-ocean ridges form; these are underwater mountain ranges.
- The Mid-Atlantic Ridge:-
 - is a 10,000 mile long mid-ocean ridge beneath the Atlantic Ocean.
 - has formed where the North and South American plates move west, and the Eurasian and African plates move east.
- At a destructive margin:-
 - tectonic plates collide.
 - the denser plate subducts.
 - subducted crust heats and melts in the mantle.
 - lava can rise through the crust, forming volcanoes.

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- o over millions of years these volcanoes grew in size.
- o above the surface of the sea, islands are formed.
- The Lesser Antilles:-
 - o is an island arc, which is a curved chain of volcanic islands.
 - o formed in the Caribbean, where the South American plate subducts under the Caribbean plate.
- **Skill** – Creating annotated diagrams to show how tectonic processes under oceans form land.
- **Stretch** – Formation of underwater rift valleys.
- **Lesson Vocabulary** – solidify, seafloor, constructive margin, lava, mid-ocean ridge, Mid-Atlantic Ridge, destructive margin, subduct, erupt, volcanic island, island arc, Lesser Antilles, Caribbean.

Lesson 3 –What causes a tsunami?

In this lesson we learn how a tsunami forms, and why a major tsunami struck Japan in 2011.

- **Key term – Displace** means when something moves from its original position.
- An earthquake is intense shaking in the crust, caused by tectonic plate movement.
- Strong earthquakes can occur under the seafloor where tectonic plates collide.
- Earthquakes under the seafloor can displace huge volumes of ocean water, causing a tsunami to form.
- A tsunami is a series of extremely long waves caused by a large and sudden displacement of the ocean.
- Tsunami waves:-
 - o radiate outwards from the epicentre of the earthquake.
 - o move from the seafloor to the surface.
 - o can travel thousands of miles and can cross entire ocean basins.
 - o can travel at speeds up to 500 miles per hour.
 - o as they approach land they slow down, become taller and become hazardous.
- A tsunami occurred off the east coast of Japan in March 2011 along the Pacific/North American plate boundary.
- The Pacific plate moves rapidly towards the North American plate at 9cm per year.
- The Pacific plate is denser crust that subducts beneath the North American plate.
- A layer of thick, slippery clay allowed the Pacific plate to slip 50 metres underneath the North American plate causing the North American plate to spring upwards.
- **Skill** – Using a tectonic plates map to identify directions of movement and to calculate distance of movement over time.
- **Stretch** – What is it like to experience a tsunami?
- **Lesson Vocabulary** – earthquake, displace, tsunami, radiate, focus, epicentre, ocean basin, hazard, Pacific plate, North American plate, clay.

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Lesson 4 – Why was the 2011 Japanese tsunami so hazardous?

In this lesson we examine the physical and human reasons why the 2011 Japanese tsunami was so dangerous, considering factors such as magnitude, geology, and human response.

- **Key term – Magnitude** refers to the strength of an earthquake and is usually measured on the Richter Scale.
- The earthquake that caused the 2011 Japanese tsunami:-
 - o had a 9.0 magnitude.



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- lasted for 6 minutes.
- occurred at a shallow depth of 15 miles.
- created extreme and long lasting seafloor shaking.
- occurred 45 miles from the east coast of Japan.
- formed an enormous tsunami in the Pacific Ocean.
- The resultant tsunami:-
 - Moved westwards towards the Japanese coast.
 - Was 30m high and up to 400 mph when it reached the coastline.
 - Swept over entire cities and villages as far as 6 miles inland.
- Preparation was insufficient because:-
 - Many people did not evacuate as they did not appreciate the size of the tsunami.
 - The 2011 tsunami could not be prevented by the usual sea walls.
- Key impacts were
 - 20,000 fatalities, mainly from drowning.
 - Meltdown at the Fukushima Nuclear Power Plant due to a broken cooling system, causing one death and ground and water contamination.
- **Skill** – Using a tectonic plates map to identify directions of movement and to calculate distance of movement over time.
- **Stretch** – How does Japan minimise the risk from tsunamis?
- **Lesson Vocabulary** – magnitude, depth, Pacific Ocean, management strategies, sea wall, fatality, meltdown, Fukushima Nuclear Power Plant, contamination.

Part B – Ocean processes

Lesson 5 – What are oceans?

In this lesson we learn to use key terminology to describe ocean location, compare shallow and open water, and describe the characteristics of each ocean layer.

- **Key term – Nutrients** are substances that provide nourishment essential for the maintenance of life and for growth, e.g. proteins and vitamins.
- The Great Ocean is the body of salt water that covers 71% of Earth's surface.
- The Great Ocean comprises five major oceans: the Atlantic, Arctic, Pacific, Indian and Southern Oceans.
- Smaller bodies of salt water are called seas, e.g. the Mediterranean Sea.
- Shallow water exists around coastlines and islands, where the seafloor elevation is highest.
- Open water refers to large expanses of ocean or sea which are far from land.
- Oceans have three major layers: surface, thermocline, and deep ocean.
- The surface layer is 0-200 metres deep. It is the warmest, windiest layer, and low in nutrients.
- The thermocline is at a depth of 200-1000m.
- Deep ocean is more than 1000m deep. Water is dense, very salty, and very cold or freezing. It is rich in nutrients.
- **Skill** – Using a cross-section of water from the surface to the seafloor to identify characteristics of each ocean layer.
- **Stretch** – Why is the ocean so salty?
- **Lesson Vocabulary** – Great Ocean, Atlantic Ocean, Arctic Ocean, Pacific Ocean, Indian Ocean, Southern Ocean, sea, shallow water, open water, surface layer, thermocline, deep ocean, nutrients.



Lesson 6 – How are oceans important for plants, animals, and people?

In this lesson we learn how oceans are vital habitats which support global biodiversity, and how people rely on oceans for food and income.

- **Key term – Biodiversity** refers to the range and number of species in an area.
- Oceans contain up to 10 million marine plant and animal species. They are important for global biodiversity.
- Ocean plants provide habitat, spawning grounds, and food for marine species.
- Ocean plants add oxygen to the surrounding water, which is used by marine plants and animals for respiration.
- Ocean currents transport nutrient-rich water from the deep ocean to the surface layer. This supports marine life in the surface layer.
- Oceans provide goods used by people, including seafood and medicinal products.
- More than three billion people rely on oceans for food or their livelihoods, especially in low- and middle-income coastal countries.
- The use of oceans for resources and trade has caused dense populations to develop along coastlines.
- **Skill** – Using a choropleth map to describe population density along coastlines.
- **Stretch** – How is biodiversity measured?
- **Lesson Vocabulary** – habitat, biodiversity, marine, spawning grounds, oxygen, respiration, nutrient-rich water, ocean currents, medicinal products, livelihood, trade, dense populations.

Lesson 7 – How do oceans regulate the climate?

In this lesson we explain several ways that oceans regulate the climate, including the role of ocean currents, and the ocean's role in the hydrological cycle.

- **Key term – An ocean current** is a continuous, directed movement of ocean water due to factors including temperature, salinity, and wind.
- Oceans interact with the climate in three main ways:-
 - Oceans are an important part of the water cycle. Most evaporation starts in oceans.
 - Oceans absorb radiation from the sun, particularly in equatorial waters, maintaining warm conditions on Earth.
 - Ocean currents transport cold water to warm regions, and warm water to cold regions.
- In an ocean current cold water sinks. Warmer surface water is moved by the wind.
- Without ocean currents, equatorial regions would be even hotter and polar regions would be even colder.
- The global conveyor belt is a constantly moving system of ocean currents.
- The Gulf Stream is a strong ocean current that brings warm water into the Atlantic Ocean. It is part of the global conveyor belt.
 - **Skill** – Using a global conveyor belt map to describe global ocean currents.
 - **Stretch** – Why do tropical storms form in the Tropics?
 - **Lesson Vocabulary** – water cycle, ocean currents, saline, salinity, regulate, redistribute, Gulf Stream, global conveyor belt, equatorial, polar.

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Lesson 8 – How do oceans store carbon?

In this lesson we learn how oceans store carbon, slowing the rate of global warming.

- **Key term – Photosynthesis** is the process by which plants use sunlight, water, and carbon dioxide to create oxygen and energy.
- A carbon sink is a place that absorbs more carbon dioxide than it releases.
- Carbon sinks take CO₂ out of the atmosphere and store it.
- Oceans are important carbon sinks.
 - CO₂ dissolves in water into a form of carbon that cannot easily escape.
 - Marine plants absorb CO₂ via photosynthesis. Microscopic ocean plants called phytoplankton are the main example.
 - Phytoplankton use carbonate to make their protective shells.
 - When marine organisms die, their stored carbon is returned to the ocean.
- **Skill** – Using scientific models to explain how oceans act as carbon sinks.
- **Stretch** – How do oceans produce oxygen?
- **Lesson Vocabulary** – atmosphere, carbon sink, carbon dioxide, carbonate, dissolve, store, phytoplankton, microscopic, absorb, photosynthesis.

Extra Depth lessons (not assessable)

Lesson 9 – What is the purpose of bathymetry?

In this lesson we learn how the seafloor is mapped, and why bathymetry is important for people and conservation.

- **Key term – Bathymetry** is the study of the ‘floors’ of water bodies, including the ocean, rivers, streams, and lakes.
- Sonar is used to map the seafloor, by emitting sound waves and measuring how long they take to return.
- Bathymetric maps show the topography of the seafloor. They use colour and contour lines to show seafloor depth.
- Contour lines are lines on a map joining points of equal height.
- Bathymetry is important for:
 - Safe navigation of ships.
 - Creating models that predict currents, and hazards such as coastal flooding.
 - Finding ships and planes when an accident happens.
 - Exploration and extraction of resources under the seafloor.
 - Laying internet cables.
 - Conserving the habitats of seafloor organisms.
- **Skill** – Using bathymetric maps (including choropleth and contour lines) to describe the shape of the seafloor.
- **Stretch** – What is GIS and how is it used to map the seafloor?
- **Lesson Vocabulary** – bathymetry, topography, choropleth, contour line, sonar, sound wave, navigation, model, flooding, internet cable, monitor, conservation.

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Lesson 10 – Why is seafloor exploration booming?

In this lesson we learn how technological advances, population growth and rising wealth increase the exploration of seabed resources and examine the impacts of their extraction.



- **Key term – Seabed mining** refers to the extraction of resources located within the seafloor.
- Vast deposits of high-demand resources exist within the seabed, including:
 - Oil and gas, which are used for fuel.
 - Minerals such as manganese, copper, and cobalt, which are used in construction, electrical equipment, and electronic devices.
- Seafloor resource extraction creates economic opportunities:
 - Governments and private companies sell extracted resources for income or use the resources for national energy supply.
 - Extraction industries provide employment, e.g., on offshore oil rigs.
- It also creates environmental risks:
 - Extracting and shipping seabed oil can lead to oil leaks and spills.
 - Fossil fuel extraction contributes to climate change in the longer term.
 - Extracting seabed minerals can harm seabed habitats, e.g., via sediment plumes.
- **Skill** – Using maps to describe the distribution of seabed resources.
- **Stretch** – Should seabed resources be mined?
- **Lesson Vocabulary** – seabed mining, lucrative, fossil fuels, minerals, manganese, copper, cobalt, nodule, onshore, offshore, drilling, offshore oil rig, sediment plume.

Assessment

- Students answer a 10 question MCQ after Lesson 4 and Lesson 8. This is available on the Eedi platform and can be completed by hand or using the app.
- Students write an essay response to the question ‘Explain the importance of oceans’.

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Unit Overview

Year 9 Unit 2 – Ocean Ecosystems and Governance

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Unit rationale

This unit begins by introducing marine ecosystems, then looks in detail at coral reefs. Coral reefs have been chosen as a clear example of a marine ecosystem affected by human activities, notably fossil fuel use and overfishing. The second half of the unit introduces the concept of governance and the physical and human factors that make it so challenging to govern, protect, and clear up the ocean. Through this, students can explain multiple threats facing our oceans. Learning about ocean governance and about the impact of human actions on far-flung marine ecosystems develops students' understanding and articulacy on the abstract concept of global connectivity. The unit also draws on some A Level themes such as global governance and sustainability. This is the second of four units addressing the theme of global connections. It addresses the Year 9 annual question of 'How globally connected is the world?'

Scope

Marine ecosystems can be found in the open water or near the coast, and include mangroves, seamounts, and coral reefs. Coral reefs are biodiverse marine ecosystems located in shallow, warm tropical waters, for example in south-east Asia. Coral polyps are animals that build reefs and create habitat for a wide range of sea life. Coral reefs maintain biodiversity, protect the coastline and are sources of food and medicine. Coral reefs are under threat from overfishing. They are also under threat from rising sea temperatures which causes coral bleaching, ultimately a result of fossil fuel combustion.

Much of the land waste that enters the ocean is transported by ocean currents and surface winds to large swirling rubbish patches, far out in open water. The largest of these is the Great Pacific Garbage Patch, which is comprised of land waste, fishing nets, and microplastics. Ocean pollution is difficult to clear up and signals the need to reduce land waste. The UN Law of the Sea sets out rights and responsibilities around ocean use. This includes rules about which countries have the right to extract ocean resources from certain areas. It is extremely difficult to monitor actions at sea, so regulations are often ignored.

The case study of Somalia highlights the challenge of regulating ocean use, given ongoing conflict over foreign fishing vessels taking fish from Somali waters.

Sequence

Link to past units

Y9 Unit 1 Global Oceans demonstrated how oceans are part of tectonic systems and the atmosphere. Unit 2 adds layers of both marine life and human activity.

In Y7 Unit 4 Brilliant Biomes students are introduced to the delicate interconnections that exist within ecosystems.

In Y8 Unit 1 River Rivals and Unit 3 Endless Energy students learned about the negative impacts of industry on the environment. This unit deepens that knowledge by considering how the rise in manufactured goods increases the amount of rubbish reaching the ocean.

In Y8 Unit 4 Climate Change students learned how a variety of environments will be impacted by climate change. This unit looks in depth at how fossil fuel combustion causes coral bleaching, threatening coral reefs.

In Y8 Unit 2 Food and Famine students were introduced to the idea of conflict. Y8 Unit 6 The Middle East developed this by examining reasons for conflict.

Link to future units

This unit precedes Unit 3 The Global Economy which explores causes and impacts of rising global consumption of manufactured goods.

In Y9 Unit 4 Development Disparity students build on their understanding of global governance in learning about strategies that aim to reduce disparity.



Core Knowledge (assessable)

Part A – Ocean Ecosystems

Lesson 1 – What are marine ecosystems?

In this lesson we are learning to describe the characteristics of two marine ecosystems.

- Key term – An **ecosystem** is a community of living things (e.g., plants and animals) and non-living elements (e.g. temperature and sunlight) which interact.
- Marine ecosystems are aquatic environments with high levels of dissolved salt, found in or near the ocean.
- There are many types of marine ecosystem, e.g., mangrove forests, seamounts, coral reefs, and polar.
- Mangrove forests:
 - Are comprised of mangrove trees, which can adapt to survive in salty water.
 - Are found in tropical areas, in shallow brackish water where land and ocean meet.
 - Provide habitat for species. Fish, shrimp, and reptiles live among mangrove roots. Birds nest in the canopy.
- Seamounts:
 - Are undersea mountains formed by volcanic activity.
 - Are found near tectonic plate margins and hotspots.
 - Are extremely biodiverse due to their relief, which:
 - provides a surface for marine creatures to cling to.
 - causes upwelling of nutrient-rich water.
 - both of which attract fish, sharks, whales, and seabirds.
- **Skill** – using photographs and diagrams to explain how physical characteristics like relief can create biodiverse ecosystems.
- **Stretch** – Why are mangrove forests and seamount ecosystems under threat?
- **Lesson vocabulary** - marine, ecosystem, mangrove forest, seamount, brackish water, hotspot, biodiverse, upwelling.

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Lesson 2 – What is a coral reef?

In this lesson we are learning about the anatomy of a coral reef, and about the symbiotic relationship that enables coral to survive.

- **Key vocabulary** – **Symbiotic** means having two or more types of animals or plants that provide the conditions for the other to exist.
- Coral reefs are large limestone structures built by animals called polyps.
- Coral reef ecosystems form within the Tropics in warm, sunny, shallow waters.
- Coral reefs are extremely biodiverse.
- Coral polyps:-
 - are tiny, soft-bodied marine organisms.
 - are not plants because they do not produce their own food.
 - use calcium and carbonate from seawater to build a protective limestone exoskeleton.
- Coral polyps attach themselves to rock on the sea floor, then multiply. This creates coral colonies, which grow in size and can join to make coral reefs.

- Coral polyps and algae have a symbiotic relationship:-
 - Algae lives within the polyps, photosynthesises, and feeds the polyp.
 - Polyps provide algae with carbon dioxide and a protective home.
- Coral polyps catch and eat zooplankton.
- **Skill** – Labelling and annotating a diagram to describe the anatomy of a coral reef.
- **Stretch** - Are coral reefs carbon sinks?
- **Lesson Vocabulary** – symbiotic, coral polyp, coral colony, coral reef, exoskeleton, limestone, calcium, carbonate, photosynthesis, algae, zooplankton, tentacle.

Lesson 3 – Why are coral reefs important?

In this lesson we are learning the reasons why the coral reefs in south-east Asia are important for the natural world and human populations.

- **Key term – Endemic** means being from a particular geographic region.
- The Coral Triangle is one of the world’s largest coral reef zones.
- It is located in the western Pacific and surrounds several southeast Asian countries including Indonesia, Malaysia, and The Philippines.
- The Coral Triangle is extremely biodiverse with many endemic species.
- The Coral Triangle is important to people because:-
 - It provides income and food for more than 120 million people living in the region.
 - Tourism to the region generates £9 billion annually.
 - Coral reefs protect coastal communities from severe storms and tsunamis, and from coastal erosion.
 - Valuable resources are extracted from coral reefs including tuna, coral jewellery, and medicinal ingredients.
- **Skill** – Using statistics to explain the environmental and socioeconomic importance of coral reefs.
- **Stretch** – Why are coral reefs intrinsically valuable?
- **Lesson Vocabulary** – endemic species, southeast Asia, Coral Triangle, tsunamis, flooding, coastal erosion.

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Lesson 4 – Why are coral reefs under threat?

In this lesson we learn how climate change and overfishing threaten the Coral Triangle.

- **Key term – Unsustainable** means when something cannot continue at the current rate, e.g. the amount of fish extracted from the Coral Triangle is unsustainable as fish populations cannot replenish quickly enough.
- The Coral Triangle is under extreme threat from climate change:-
 - Rising sea temperatures cause coral bleaching, which can kill coral.
 - Increased carbon dioxide levels in the ocean causes acidification, which reduces the amount of calcium available to build coral exoskeletons, and dissolves carbonate shells.
- The Coral Triangle is under threat from overfishing, as many countries fish from the same waters.
 - Overfishing occurs when so many fish are caught that fish populations cannot replenish themselves.
 - Overfishing significantly reduces fish stocks and causes ecosystem imbalance.
- Any major coral loss reduces biodiversity, as species depend on the reef for food and habitat.
- **Skill** – Using visual stimulus (photographs and video footage) to explain threats to coral reefs.
- **Stretch** – How does land-based pollution harm coral reefs?
- **Lesson Vocabulary** – coral bleaching, acidification, dissolve, deteriorate, fish stock, overfishing, unsustainable, explosive, bottom trawling, replenish.



Part B – Ocean Governance

Lesson 5 – Why has the Great Pacific Garbage Patch formed?

In this lesson we are learning why large areas in the north Pacific are polluted with plastic and how this causes environmental problems.

- **Key term – Marine debris** is human-created waste that has been deliberately or accidentally released into the ocean.
- A marine garbage patch is a collection of marine debris and microplastics concentrated in an area of ocean.
- Plastic waste reaches oceans when rubbish ends up in drains and is transported out to sea, and when fishing nets are discarded at sea.
- Ocean currents and surface winds move the rubbish causing it to become concentrated in large patches.
- The Great Pacific Garbage Patch is the largest marine garbage patch. It is located in the north Pacific.
- Ocean plastic is harmful to marine animals because they can ingest it or become tangled in it.
- Garbage patches are challenging to clean up due to the amount of marine debris entering the ocean, the tiny size of microplastics, and the difficulty of governing international waters.
- **Skill:** Using geographical terminology to explain the causes and impacts of marine garbage patches.
- **Stretch:** Why don't we just scoop garbage patches out of the ocean?
- **Lesson vocabulary:** marine debris, marine garbage patch, microplastics, ingest, govern, international waters, drain, waterway.

Lesson 6 – Who controls the ocean?

In this lesson we are learning what rights countries have to control and use their ocean waters and what regulations they must follow.

- **Key term – Governance** refers to the decisions that a government makes relating to people, economy, and environment.
- Ocean governance differs to laws around land use because:
 - Ocean waters are not owned and are often shared.
 - It is difficult to monitor use of ocean waters.
- The United Nations is an international organisation that writes conventions (rules) on important global issues, e.g. environmental protection.
- The UN Law of the Sea sets out rights and regulations regarding oceans:
 - Countries with coastlines have the right to use ocean resources in the zone up to 200 miles from their coast.
 - Ocean areas more than 200 miles from a country are international waters, in which ships from all countries are allowed to travel.
 - Countries that agree to the Law of the Sea are obliged to protect the ocean and its biodiversity.
 - The Law of the Sea is recognised by some countries but not all.
- Action to protect and clean up oceans mainly happens at regional and local scales, e.g.:
 - The Coral Triangle Initiative is an agreement of the six Triangle countries to ensure food security whilst protecting ecosystems.
 - Trusts organise local river and coastline clean-ups throughout the UK.
- **Skill** – Using a regional map and map scale to identify overlapping zones of ocean use.
- **Stretch** – Which countries contribute most to ocean plastic?
- **Lesson Vocabulary** – governance, monitor, rights, regulations, United Nations, Law of the Sea, obliged, Coral Triangle Initiative, National Trust.

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Lesson 7 – What is the geography of Somalia?

In this lesson we are learning to describe the physical and human geography of Somalia, a coastal nation in the Horn of Africa.

- **Key term** – A **warlord** is a person who controls a region in a country without a strong national government, using force and intimidation.
- Somalia is an arrow-shaped country located at the tip of the Horn of Africa.
- It has an arid climate and regularly experiences drought.
- Somalia has the longest coastline of any country in mainland Africa.
- Somalia borders the Gulf of Aden, which is an important shipping route.
- Its waters are nutrient-rich due to upwelling near the country's coast. This supports large fish stocks.
- Fishing is an important source of food and income in Somalia.
- Somalia has a long history of conflict due to factors including ancient divisions, colonisation, and strict military rule.
- The Somali Civil War began in 1991: -
 - The civil war enabled warlords to gain control of large areas of Somalia.
 - Ongoing conflict has caused food insecurity, enabled terrorism, and slowed development.
- Somalia is a low income country.
- **Skill** – Use a regional map to describe the location of Somalia.
- **Stretch** – How does conflict limit development?
- **Lesson vocabulary** – Somalia, Horn of Africa, Gulf of Aden, shipping route, warlord, civil war, power vacuum, conflict, clan, colonisation, food insecurity, development.

Lesson 8 – Why are there foreign fishing boats in Somali waters?

In this lesson we explore why foreign fishing vessels take so many fish from Somali waters, and how this has led to conflict, piracy, and overfishing in the region.

- **Key term** – **Piracy** means attacking and robbing ships at sea.
- Foreign fishing vessels extract huge fish catches from Somali waters.
- This reduces the fish stocks available to Somali fishers.
- Foreign fishers are attracted to Somali waters because: -
 - They are rich in fish stocks.
 - They are poorly patrolled.
- The Somali government issues licenses to some foreign fishing vessels because it generates revenue.
- After the civil war began:-
 - The number of foreign fishing vessels in Somali waters increased.
 - Somali pirates began to extort foreign fishing vessels and cargo ships.
 - Foreign war ships came to protect the foreign vessels and the Gulf of Aden shipping route.
 - The level of piracy decreased. Overfishing increased again.
- **Skill** – Synthesise information from stakeholder experiences to describe the causes and consequences of foreign fishing vessels in Somali waters.
- **Stretch** – How do viewpoints on foreign fishing in Somali waters vary?
- **Lesson vocabulary** – piracy, pirate, extort, foreign fishing vessel, deterrence, license, ransom, hijack, warship, cargo ship, stakeholder.

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Lessons 9 and 10 – Our Blue Planet documentary task

In these extra depth lessons we use an episode of Blue Planet to revise key concepts from Units 1 and 2, focussing on the impact of human activities on the ocean, and action for change.

Assessment

- Before starting the unit students complete a **Pre-Unit Quiz** comprising 10 MCQs. This helps teachers to diagnose whether students have retained prior content that will help them to progress in this unit.
- Students complete a **Mid-Unit Quiz** after Lesson 4 and a **Post-Unit Quiz** after Lesson 8 (10 MCQs each). Re-teach lesson with tailored targets provided.
- All quizzes can be completed using the Eedi platform or from the slides in the classroom.
- In Lesson 8b students write an **essay** to answer the question: **What are the threats facing our oceans?** Guidance on how to band essays and an exemplar are provided.
- The **Autumn term diagnostic** is a formative assessment comprising two elements:
 - 30 multiple choice questions covering all of Unit 1 Global Oceans and lessons 1-4 from Unit 2 Ocean Ecosystems and Governance.
 - A 6-mark written question focussed on *Unit 1 Lesson 4 Why was the 2011 Japanese tsunami so hazardous?* Marking guidance and exemplars are provided.

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Unit Overview

Year 9 Unit 3 – Global Economy

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Unit rationale

This is the third of four units addressing the theme of global connections. It introduces students to key concepts in economic geography. It uses the case studies of China and the UK to exemplify processes of industrialisation and deindustrialisation. The unit also introduces globalisation, a process integral to the functioning of the global economy. It is important at this point in the key stage that students can articulate these processes in some detail using examples, and this knowledge is required to engage meaningfully with development processes in Unit 4. This unit addresses the Year 9 annual question of ‘How globally connected is the world?’

Scope

Economy refers to the trade, industry, income, and employment of a country or region. Global economy refers to the interconnectedness of economies across the world. Like many HICs, the UK experienced a long period of industrialisation, followed by more recent decline of industry, and the rise of the service and high-tech sectors. Like many MICs, China experienced a modern shift from an agricultural to industrial economy, and a more recent rise of the services sector. LICs tend to rely heavily on agriculture.

Globalisation refers to increasing global connectivity of resources, ideas, and people, enabled by the advancement of telecommunications and transport technology. Transnational corporations operate across several different countries and are integral to global trade and current patterns of consumption. The east coast of China is heavily industrialised and includes the cities of Shanghai and Shenzhen. TNCs started to operate in Shenzhen because of low operational costs and availability of labour.

Globalisation brings benefits such as ease of business, increased employment opportunities, rising wealth, and improved access to goods. Globalisation can also lead to exploitation, cultural diffusion, disproportionate TNC power, and unemployment in deindustrialising regions. Extra depth lessons explore the role of trade blocs in globalisation and the causes and impacts of the UK leaving the EU in 2016.

Sequence

Link to past units

In Y7 Unit 2 Our Planet and Unit 3 Resources and Trade, students identified uneven patterns of wealth, resources, and population across the world. Several Year 8 units introduced students to the role of industry, both supporting the economy and damaging the environment (Unit 1 River Rivals, Unit 3 Endless Energy, Unit 4 Climate Change, Unit 5 Polar Environments). Year 9 Unit 2 Ocean Ecosystems and Governance examines the impact of fossil fuel use on coral reefs and considers how the geography of south-east Asia increases the vulnerability of oceans to economic activity. In this unit students understand the context for the rise of industry that is present in several places that they have studied.

Link to future units

Understanding the context of the global economy and the disparities it brings is necessary to properly understand issues of development in Unit 4. The unit also explains the context for the UK’s current economic landscape, which is drawn upon in the independent project in Unit 6.



Core Knowledge (assessable)

Lesson 1 – Which knowledge do I need for Unit 3 Global Economy?

In this lesson we recap concepts and skills from past units which are important for success in Unit 3 Global Economy.

Key recap concepts:

- Key term – an **economic activity** is something that people do to earn money.
- Types of employment include agriculture, manufacturing, and services (e.g., office jobs, working in a hospital, shop staff).
- Raw materials are required to manufacture goods. There is a limited supply.
- Industry refers to economic activities such as manufacturing, coal extraction. It uses heavy machinery.
- Economic activity can have negative environmental impacts.
- Infrastructure is the basic systems and services of a place, such as transport and buildings.
- There is variation in the wealth of countries around the world. The World Bank categorises countries as low-, middle- or high-income.
- Income per person is calculated by dividing a country's total income by its population, to get an average figure.
- Many countries, especially LICs and MICs, are striving to increase their income.
- **Skill** – To name and locate the continents of the world.
- **Stretch** – Why are many Ethiopians abroad moving back to Ethiopia?
- **Lesson Vocabulary** – wealth, World Bank, LIC, MIC, HIC, economic activity, agriculture, manufacturing, services, industry, raw materials, infrastructure, income, livelihood, supply.

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Lesson 2 – What is 'the economy'?

In this lesson we learn what is meant by 'economy' and 'global economy' and consider how the economic characteristics of HICs, MICs and LICs vary.

- **Key term – Economy** refers to the trade, industry, income, and employment of a country or region.
- Gross National Income (GNI) is a country's total income from businesses located domestically and abroad. It is commonly used to measure the size of an economy.
- Each country's economy is influenced by its unique physical and human characteristics.
- Global economy refers to the interconnectedness of economies across the world.
- Control of the global economy is uneven. HICs control the majority of global wealth and trade. LICs control a very small proportion.
- Some generalisations can be made about the economies of countries in each income band: -
 - LIC economies are largely based on agriculture. Economic growth increases as LICs begin to develop manufacturing.
 - MIC economies are largely based on manufacturing and services. Economic growth is rapid due to the rise of manufacturing.
 - HIC economies are largely based on services. Economic growth is slower because HICs have already emerged out of the industrial phase.
- **Skill** – Using large number data (billions and trillions) to compare economies. Using GNI per person to categorise countries into income bands.
- **Stretch** – Is GNI the only way to measure wealth?
- **Lesson Vocabulary** – economy, trade, industry, employment, GNI, GNI per person, abroad, LIC, MIC, HIC, agriculture, manufacturing, services, import, export.

Lesson 3 – How has China's economy changed over time?

In this lesson we examine how rapid industrialisation transformed China from an agricultural nation into 'the world's factory'.

- **Key term – Industrialisation** – When a country develops its manufacturing and other heavy industries.
- China is a large country located in east Asia.
- Highland areas are found in China's western and northern regions. These areas can be extremely cold and remote. The population is mainly sparse here.
- Lowland areas are found in China's eastern regions, along the country's coastline. The population is dense here.
- China's population is 1.4 billion (1,400,000,000).



- It has the world's second-largest economy.
- China is an MIC. It is predicted to become a HIC by 2030.
- China began rapid industrialisation from the 1950's. Today it produces 30% of the world's manufactured goods.
- Income from manufacturing has led to a boom in services. Today nearly half of Chinese people work in services.
- **Skill** – Using choropleth maps to describe China's population distribution. Using employment structure data and pie charts to describe how China's economy has changed over time.
- **Stretch** – How did Special Economic Zones grow China's economy?
- **Lesson Vocabulary** – industrialisation, mechanisation, producer, services, highland, lowland, China, Asia, choropleth map, pie chart.

Lesson 4 – How has the UK's economy changed over time?

In this lesson we examine how industrialisation and deindustrialisation in the UK have affected its people and economy.

- **Key term – Deindustrialisation** – when a country's manufacturing sector or heavy industries decline.
- Europe and North America were the first regions to industrialise, making them powerful centres of world trade.
- By 1900 the UK's economy was rapidly growing due to mechanisation and industrialisation.
- Key industries that supported the UK economy in the 19th and 20th centuries were coal mining and textile manufacturing.
- By the 1980's these industries were in decline due to UK coal deposits running out and manufacturing moving abroad where labour was cheaper.
- Deindustrialisation led to unemployment in some UK regions, and a move to an economy based on finance and high-tech.
- **Skill** – Using a line graph to describe how the UK's employment structure has changed over time.
- **Stretch** – How does the UK economy rely on migrant workers?
- **Lesson Vocabulary** – deindustrialisation, decline, heavy industry, coal extraction, coal deposit, textile, abroad, operation costs, labour costs, unemployment, investment, finance, high-tech.

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Lesson 5 – What is globalisation and how does it happen?

In this lesson we learn about how the economies and people of the world are becoming more interconnected, in a process called globalisation.

- **Key term – Globalisation** – the process whereby the world becomes increasingly interconnected, due to advances in transport, trade, and technology.
- The process of globalisation has been accelerating since the 20th Century.
- Advances in transport have increased flows of good and people, e.g., via airplanes and cargo ships.
- Advances in technology have increased the ease and speed of communication, in particular via the internet and smartphones.
- Globalisation creates the sense of a 'shrinking world'.
- **Skill** – Using flow maps to describe the pattern and scale of global trade.
- **Stretch** – Are all places globalised?
- **Lesson Vocabulary** – globalisation, interconnected, transport, trade, technology, accelerate, airplane, cargo ship, internet, smartphone, business.

Lesson 6 – What are TNCs and why are they so powerful?

In this lesson we learn what transnational corporations are, how and where they operate, and why they are such powerful drivers of globalisation.

- **Key term – TNC** – Transnational Corporations are businesses that operate across several countries.
- TNCs drive globalisation by operating across multiple countries and fuelling global trade.
- Improvements in transport and technology have led to a rise in TNCs.
- TNCs have complex supply chains: –
 - The headquarters of the world's largest TNCs are mainly located in HICs.
 - Their factories are mainly located in LICs and MICs, where labour costs are low and there are fewer regulations. This increases profit.



- TNCs are very powerful because they shape global consumption, generate enormous revenue, and influence government decisions about trade.
- **Skill** – Using a map to identify manufacturing locations for one TNC. Using complex graphics to identify trends in the location of Top 100 TNC headquarters.
- **Stretch** – Are TNCs subject to global laws?
- **Lesson Vocabulary** – TNC, transnational, corporation, supply chain, headquarters, labour cost, regulation, profit, consumption, revenue, employment.

Lesson 7 – What are the benefits of globalisation?

In this lesson we explore the positive impacts of globalisation at global, national, and individual scales.

- **Key term – Multiplier effect** – when employment in one sector leads to growth of other businesses as employees spend their wages.
- Globalisation has benefits at a global scale: –
 - Established trade, travel, and communication infrastructure make it easy to do business across the world.
 - It increases opportunities for global collaboration e.g., on climate change.
- Globalisation has benefits at national and individual scales, by increasing: –
 - access to affordable goods.
 - ability to travel abroad.
 - employment opportunities, e.g., in manufacturing, shipping, and retail. This can create a multiplier effect.
 - national income, e.g., China has gained enormous wealth via manufacturing for global trade.
 - national development, e.g., when a TNC pays a host government taxes to operate there, the money can be invested into improving the country.
- **Skill** – Use income data to describe the benefits of globalisation.
- **Stretch** – Are the benefits of globalisation primarily economic, social, or environmental?
- **Lesson Vocabulary** – multiplier effect, scale, business, collaborate, infrastructure, taxes, invest.

Lesson 8 – What are the challenges of globalisation?

In this lesson we consider the negative impacts of globalisation on workers, the environment, the climate, and culture.

- **Key term – Cultural diffusion** – when ideas or goods from one region spread into other regions, changing lifestyles and traditions.
- Locating factories abroad in low-income regions with poor regulation can lead to staff exploitation.
- Relocating factories abroad can lead to deindustrialisation in HICs, causing unemployment.
- A lot of the wealth generated by globalisation flows back to the headquarter nation.
- The spread of ideas and goods from North America and western Europe into other regions can cause cultural diffusion.
- As access to cheap goods increases, people consume more. This is unsustainable because: –
 - it increases manufacturing and transport miles, adding greenhouse gases to the atmosphere.
 - it increases the land, air, and water pollution that result from industry.
 - it depletes natural resources.
- **Skill** – Using place examples exemplify challenges of globalisation, e.g., the UK, China.
- **Stretch** – How are the challenges of globalisation are being tackled?
- **Lesson Vocabulary** – transport miles, exploitation, relocate, cultural diffusion, per capita consumption, unsustainable, deplete, child labour.

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Lesson 9 Revision + Quiz (15 MCQ)

In Lesson 9 students revise the core knowledge of the unit (Lessons 2 – 8). At the end of the lesson they complete a 15 multiple-choice question quiz via Eedi or printed bubble sheets. This enables the teacher time to gain insight into the misconceptions and knowledge gaps that exist in their class, in order to prepare a targeted reteach in Lesson 10.



Lesson 10 Reteach

In Lesson 10 students complete activities to address misconceptions and knowledge gaps revealed by the Lesson 9 quiz. Teachers can choose reteach activities appropriate to their students' incorrect responses (see the suggested activities in the Teacher Guidance booklet), or design their own reteach tasks.

Lesson 11 Focus on Writing

In Lesson 11 students draw together knowledge from the current and past units to answer the question 'To what extent is globalisation good for all?' Homework questions are provided to help students revise relevant content. Teachers can opt to use one or two lessons for the Focus on Writing task. One lesson slot would enable students to write a full essay; two lesson slots enable feedback, essay improvement and/or targeted use of the exemplar essay.

Extra Depth (optional)

Lesson 12 – What are trade blocs?

In this lesson we learn what trade blocs are, why countries join them and consider the causes and impacts of the UK leaving the EU.

- **Key term – Trade bloc** – a group of nations that join together to minimise cost of trade.
- Trade blocs reduce or remove barriers to trade for member nations, e.g. tariffs. This: –
 - makes goods more affordable for member nations.
 - encourages each nation to produce the goods that it is best at producing, and to import those that it cannot make cheaply.
- The European Union (EU) is a powerful trade bloc.
- The UK has recently left the EU. Reasons for this include the beliefs that leaving the EU would: –
 - create economic advantages for the UK.
 - reduce migration to the UK.
 - increase UK independence.
- The impacts of the UK leaving the EU so far include: –
 - increased trade costs, e.g. tariffs.
 - migration from the EU has reduced. This has led to labour shortages in some industries, e.g. lorry drivers. This causes supply chain disruption.
 - the opportunity to form trade deals with other countries.
- **Skill** – Describing causes and impacts of the UK's departure from the EU.
- **Lesson Vocabulary** – trade bloc, European Union, tariff, migration, Leave, Remain.

Assessment

- Students answer a 10 question MCQ before starting the unit to diagnose whether prior content relevant to the forthcoming unit has been retained.
- Students answer a 15 question MCQ after Lesson 8. This is available on the Eedi platform and can be completed by hand or using the app.
- Students write an essay response to the question 'To what extent is globalisation good for all?'

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Unit Overview

Year 9 Unit 4 – Development Disparity

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Unit rationale

Studying development and disparity is an important part of geography. To grapple with development meaningfully, students require an understanding of concepts like natural resources, climate, trade, industrialisation, colonisation, conflict, and globalisation. It follows that development is taught at the end of the key stage when students are able to make synoptic links. This is the last in a series of four units addressing the theme of global connections. It addresses the Year 9 annual question of ‘How globally connected is the world?’

Scope

In geography, development means change or progress that affects people’s lives. A country’s level of development is influenced by its GNI per person and its quality of life. Development means different things to different people, e.g., economic growth, equality, or environmental protection. Development indicators help to measure levels of development, e.g., GNI per person, life expectancy, and the percentage of electricity from renewable sources. Choropleth maps reveal regional patterns of economic and social disparity; however, progress against environmental indicators is regionally variable. No single indicator can explain level of development. Development disparity is caused by physical factors (lack of natural resources, being landlocked, extreme climate) and human factors such as colonisation and its legacies.

India is a large country in southern Asia. It has varied climate zones and relief, and long coastlines. India has a large and rapidly growing population, significant inequality (especially rural to urban), and shares land borders with several countries. India was previously part of the British Empire. These factors have both helped and hindered India’s development, and wide disparities remain.

Strategies to reduce development disparities include large infrastructure projects, aid, and sustainable development, i.e., balancing economic, social, and environmental aims. Some development strategies are more effective than others.

Sequence

Link to past units

Y9 Unit 3 The Global Economy is a backdrop from which to understand Unit 4. Once students gain an understanding of the rise and fall of industry, some of the reasons for development gaps become clearer. The rise and fall of industry in the UK establishes context for British colonialism in India.

Several Y8 units touched on development in tangible way through the lens of resources. Y8 Unit 1 looked at how Ethiopia, an LIC, is using a large-scale infrastructure project to boost its economy. Y8 Unit 2 Food and Famine explored how arid environments, poverty, and conflict lead to food insecurity. Y8 Unit 3 Endless Energy showed that countries have unequal access to energy resources, and how this is in part explained by wealth disparities. Y8 Unit 4 Climate Change demonstrated how tropical and arid regions, where many LICs are located, are likely to suffer more from the consequences of climate change. In Y8 Polar Environments students learned that marginalised indigenous Nenets people are suffering from the impacts of the fossil fuel industry and climate change, in some cases leading to the end of traditional nomadic lifestyles. This unit is synoptic in nature, encouraging students to make links to prior units.

Link to future units

Understanding levels of development will support students in Unit 6 when they examine the human and physical geography of a UK region.

Core Knowledge (assessable)



Lesson 1 – Which knowledge do I need for Unit 4 Development Disparity?

In this lesson we recap concepts and skills from past units which are important for success in Unit 4 Development Disparity.

Key recap concepts:

- Key term – **Extensive** means large in amount or size.
- GNI (Gross National Income) is a country's total income per year.
- The higher a country's income, the better the provision of infrastructure and quality of life for most people.
- GNI per person is calculated by dividing a country's GNI by its population.
- The World Bank categorises countries according to income using GNI per person data, as either low-, middle- or high-income (LICs, MICs, HICs).
- Physical geography influences a country's level of development, e.g. a rainy climate in China's south east enables rice production.
- Human geography also influences a country's level of development, e.g. having a large workforce supports manufacturing.
- Access to essential resources e.g. water, food and energy can improve a country's level of development. This is dependent on human and physical factors.
- **Skill** – Use data and geographical terminology to describe physical and human characteristics of China.
- **Stretch** – Is quality of life the same for all people in a country?
- **Lesson Vocabulary** – extensive, quality of life, GNI, GNI per person, profitable, infrastructure.

Lesson 2 – What does development look like?

In this lesson we learn that development refers to a country's progress, and that there are varied viewpoints of what development looks like.

- **Key term** – **Development** means progress or change which affects people's lives.
- Level of development refers to the quality of life and income of a place.
- Wealth is the most common way to assess the level of development, often via GNI per person.
- Development does not mean the same thing to all people, e.g. development could be a measure of how well the environment is protected.
- A country's level of development changes over time.
- **Skill** – Using photographs to identify how views of development vary.
- **Stretch** – What is Arturo Escobar's view on development?
- **Lesson Vocabulary** – development, quality of life, income, wealth, viewpoint, Indigenous, conservationist.

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Lesson 3 – How is development measured?

In this lesson we learn how economic, social and environmental measures can be used to indicate level of development and learn some of their limitations.

- **Key term** – a **development indicator** is a measure of an aspect of development, e.g. the percentage of people who can read and write, or average income.
- Development can be indicated using economic, social, and environmental measures: –
 - GNI per person is an economic measure. It indicates how much money a government has available to spend per person in a country.
 - Life expectancy is a social measure. It indicates the standard and accessibility of healthcare.
 - The percentage of electricity coming from renewable sources is an environmental measure. It indicates a country's commitment to environmental protection.
- Measures which use averaged data give a general sense of a country's level of development, but they hide variations within a country.
- No single measure can capture the level of development of a country.
- **Skill** – Using development indicators to compare levels of development in India and the UK.
- **Stretch** – Which measure is used to show income inequality within a country?
- **Lesson Vocabulary** – development indicator, measure, indicate, economic, social, environmental, GNI per person, life expectancy, renewable sources, averaged data, variation, limitation.

Lesson 4 – What patterns and trends are revealed by development data?

In this lesson we use line graphs and choropleth maps to identify patterns and trends in global development.

- **Key term – Disparity** means a large difference that is unfair.
- Trend means the general direction of data over time, e.g. increasing or decreasing.
- The global level of development is improving. This trend is shown via global development data on line graphs.
- Maps can be used to describe patterns including commonalities by region, variations, and disparities.
- GNI per person choropleth maps reveal regional income variation. GNI per person is lowest in sub-Saharan African countries; mid-range in Asia; and highest in Europe, North America and Oceania.
- Choropleth maps showing the percentage of renewable energy do not reveal a direct link to income. Further information shows a combination of physical and human factors.
- **Skill** – Extracting data from line graphs and choropleth maps to describe trends and patterns in development.
- **Stretch** – Is life improving for everyone around the world?
- **Lesson Vocabulary** – disparity, trend, pattern, region, variation, sub-Saharan Africa, line graph, choropleth map.

Lesson 5 – What are the causes of development disparity?

In this lesson we examine some of the physical and human factors that have led to development disparity.

- **Key term – Colonisation** happens when one country takes control of another, usually for its resources.
- Some of the physical factors that hinder a country's development include: –
 - A lack of natural resources
 - Being landlocked or having steep relief
 - Extreme climate
- One important human factor affecting development is colonisation: –
 - Colonisation improved the income and quality of life in the colonising countries. These were mostly European.
 - Colonisers stunted development in colonised countries by taking natural resources and forcing people into slavery.
 - The independence of colonised countries in the 20th Century left power vacuums which enabled conflict. This has slowed development in many countries.
- **Skill** – Cross-referencing maps of empire and maps of GNI per person to draw conclusions about the impact of colonisation on development.
- **Stretch** – Does trade help all countries equally?
- **Lesson Vocabulary** – colonisation, natural resources, landlocked, coastline, climate, relief, coloniser, colony, stunt, power vacuum, conflict.

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Lesson 6 – Does India's physical geography help or hinder its development?

In this lesson we learn about India's climate, relief, and rivers, and consider how its physical geography affects its development.

- **Key term – Monsoon** means rainy season.
- India is a large country in south Asia, bordering the Indian Ocean.
- India has a long coastline that enables trade.
- It is rich in natural resources, e.g. coal and diamonds.
- Its relief and climate impact development: –
 - The far north has the cold Himalayan mountains which hinder development.
 - Coastal areas have low relief supporting trade and building infrastructure.

- Only some regions of India are suitable for farming, e.g. too arid in the north-west.
- There is plentiful water supply during the June-October monsoon season only.
- Monsoons can create risk, e.g. from landslides.
- India has several major rivers, e.g. the Ganges. These have formed fertile floodplains. However river flooding puts people at risk.
- **Skill** – Using relief maps to describe India’s physical geography.
- **Stretch** – What is the Deccan Plateau?
- **Lesson Vocabulary** – monsoon, season, Indian Ocean, relief, climate, arid, coastal, rainfall, Himalayan mountains, hinder, landslide.

Lesson 7 – Does India’s human geography help or hinder its development?

In this lesson we consider how human factors such as a booming population, inequality and colonial legacies affect India’s development.

- **Key term** – A **legacy** is something left over or caused by an historical event.
- India’s population: –
 - is 1.4 billion.
 - is growing rapidly.
 - provides a large workforce.
 - puts pressure on the environment.
 - is very unequal, with extreme wealth and extreme poverty.
- India was previously colonised by Britain. Impacts include: –
 - British control of Indian resources weakened India’s economy. Large railway networks were built to transport these resources for export.
 - Religious conflict in the region.
 - English is spoken well, but only by some.
- **Skill** – Using a line graph to describe India’s changing population.
- **Stretch** – Why do so few women do paid work in India?
- **Lesson Vocabulary** – legacy, workforce, taxes, unequal, poverty, railway network, religious conflict, Hindu, Muslim.

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Lesson 8 – Which development strategies exist?

In this lesson we examine how development strategies have changed over time and consider the impacts of these strategies.

- **Key term** – **Aid** means help that is given, e.g. monetary, supplies, expertise, or other.
- Development strategies were different in the past to today: –
 - In the 1950’s – 1970’s large infrastructure projects were commonly used, e.g. hydroelectric power dams.
 - In the 1980’s – 1990’s large amounts of monetary aid were loaned by organisations like the World Bank to promote trade, e.g. coffee exports.
 - In the 21st Century, development strategies often: -
 - involve input from people living in the region where the strategies are used.
 - aim for sustainable development, i.e. balancing economic, social and environmental aims. An example is the African Union’s Agenda 2063.
- Some development strategies have been more effective than others.
- **Skill** – Identifying a range of goals from a development strategy.
- **Stretch** – How is FDI used as a tool for development?
- **Lesson Vocabulary** – aid, international organisation, World Bank, loan, recipient, condition, debt, infrastructure, sustainable, community.

Lesson 9 Revision + Quiz (15 MCQ)

In Lesson 9 students revise the core knowledge of the unit (Lessons 2 – 8). At the end of the lesson they complete a 15 multiple-choice question quiz via Eedi or printed bubble sheets. This enables the teacher time to gain insight into the misconceptions and knowledge gaps that exist in their class, in order to prepare a targeted reteach in Lesson 10.

Lesson 10 Reteach

In Lesson 10 students complete activities to address misconceptions and knowledge gaps revealed by the Lesson 9 quiz. Teachers can choose reteach activities appropriate to their students' incorrect responses (see the Supplementary Reteach Tasks and the Teacher Guidance booklet) or design their own reteach tasks.

Lesson 11 – Focus on Writing

In Lesson 11 students draw on Unit 4 knowledge to answer the question: **Describe and explain India's level of development.**

Exemplar answers are provided to help teachers identify expectations depending on their class. Teachers can opt to use one or two lessons for the Focus on Writing task. One lesson slot would enable students to answer the question; two lesson slots enable feedback, improvement and/or targeted use of the exemplars.

Assessment

- Students answer a 10 question MCQ before starting the unit to diagnose whether prior content relevant to the forthcoming unit has been retained (Pre-unit quiz).
- Students answer a 15 question MCQ in Lesson 9 (Post-unit quiz). This is available on the Eedi platform and can be completed by hand or using the app. Reteach materials are provided.
- In the Focus on writing lesson, students write an essay answering the question: **Describe and explain India's level of development.** Student guidance is in the Mastery booklet. Exemplar and teacher guidance are in the Teacher Guidance Booklet.

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Unit Overview

Year 9 Unit 5 – *Glacial Landforms and Processes*

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Unit rationale

Studying glaciation and glacial landforms builds young geographers' understanding of how landscapes are created and how they change over time. It can develop understanding of landscapes from 'there are hills and a dip' to 'that is a U-shaped valley and it formed when a glacier carved its way through the land'. In this way, students gain geographical literacy and a better understanding of both UK landscapes and those further afield, e.g., Glacier National Park.

Studying glaciers also deepens understanding of the impacts of climate change. Glaciers provide the most visible evidence of global warming today. In addition to raising sea water levels, widespread loss of glaciers will likely alter ecosystems and impact climate patterns.

Scope

Glaciers form at high latitudes and high altitudes because these areas provide the low temperatures and high snowfall required for a glacier to form. Glaciers are moving bodies of ice that form from compressed layers of snow. Glaciers accumulate and ablate. These changes occur seasonally but are also affected by recent climate change, which can cause permanent glacial retreat.

Glaciers are powerful features that erode the landscape, creating landforms such as corries, arêtes and pyramidal peaks, and U-shaped valleys. Key processes at play in glacial erosion include abrasion and plucking. The thawing of glaciers causes deposition, leaving behind landforms such as erratics and terminal moraines. Photos and Google Earth can be used to show glaciers and their surrounding landscapes, e.g., in the Alps. OS maps and contour lines can be used to identify glaciated landforms in the UK, such as U-shaped valleys and tarns found in the Lake District.

The impacts of glacial retreat can be seen at regional and global scales. Glacier National Park in north-west USA has experienced significant glacial retreat, with impacts on meltwater and plant and animal life. When glaciers melt, reduced pressure can cause the bedrock below to rebound upwards, affecting sea levels. Glacial melt also adds water to the ocean, causing eustatic sea level change.

Sequence

Link to past units

Y7 Unit 6 Coasts explored the role of water in shaping coastal landscapes. Students learned how the Holderness Coast has eroded significantly over time.

Y8 Unit 4 Climate Change investigated the impacts of sea level rise, resulting from ice melt. This unit consider how rising global temperatures increase ablation, causing eustatic sea level change.

Y8 Unit 5 Polar Environments demonstrated the role that latitude plays in the formation of polar landscapes. The reasons why high latitudes have cold climates were explored as well as the main characteristics of the tundra biome.

Link to future units

This unit is an important grounding for Y9 Unit 6 Independent Project – My UK Region, as it offers explanations for the post-glacial landscapes of upland regions in the UK. (Fluvial, coastal and tectonic processes that also influence the landscape have been dealt with elsewhere in the curriculum).

Core Knowledge (assessable)

Lesson 1 – Which knowledge do I need for Unit 5 Glacial Landforms and Processes?

In this lesson we recap concepts and skills from past units which are important for success in Unit 5 Glacial Landforms and Processes.

Key recap concepts:

- **Key term – Latitude** means distance north or south of the equator, measured in degrees, e.g. Mount Everest's latitude is 28°N.
- Climate is the average weather conditions over 30 years.
- Climate changes over time. Recently, this change is due to human activity, but climate has always been changing for natural reasons.
- Periods of time where the Earth is relatively cold are called glacial. Warmer periods are called interglacial.
- The last glacial period ended around 12,000 years ago.
- During that glacial period, the north of the UK was covered in ice, including much of Scotland, northern England and northern Wales.
- High latitude areas are cold because they receive a lower concentration of solar radiation.
- Altitude refers the height of the land in relation to sea level.
- Erosion happens when rock is worn away and transported. Water and ice are powerful erosive forces.
- A landform is a natural feature of Earth's surface, e.g. a valley, mountain, or floodplain.
- **Skill** – Using lines of latitude to explain differences in temperature around the world.
- **Lesson Vocabulary** – latitude, altitude, equator, north, south, degrees, climate, erosion, landform glacial, interglacial, concentration, solar radiation.

Lesson 2 – What are glaciers?

In this lesson we learn what glaciers are, how and where they form, and why they move and change in size.

- **Key term – Glaciers** are large bodies of ice that flow downhill due to gravity.
- Glaciers form in areas of high altitude and high latitude. Low temperatures and high snowfall are common in these areas.
- Glaciers form by the accumulation of many layers of snow in areas of high land. The area where the snow builds up and forms a glacier is called the accumulation zone.
- Over many years, the weight of the snow causes lower layers to compact into dense ice.
- When the snow reaches a certain weight, the glacier will begin to flow.
- If the snow is accumulating faster than the glacier is ablating, then the glacier will grow.
- If the glacier is ablating faster than the snow is accumulating, then the glacier will retreat (shrink).
- **Skill** – Using maps to describe the distribution of glaciers.
- **Stretch** – Why do glaciers move at different speeds?
- **Lesson vocabulary** – accumulation, glacier, ice, gravity, altitude, latitude, temperature, snowfall, layer, accumulation zone, compact, dense, flow, retreat, ablation.

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Lesson 3 – How do corries, arêtes and pyramidal peaks form? (Erosional landforms Part 1)

In this lesson we learn how glaciers cause corries, arêtes and pyramidal peaks to form, and practise identifying these landforms in photographs and on maps.

- **Key term – Erosion** is the breakdown and transportation of rock.
- Corries, arêtes and pyramidal peaks are erosional landforms.
- A corrie is a bowl-shaped hollow in the land, formed by the erosion of a glacier in its early stages.
- An arête is a sharp ridge which forms between two neighbouring corries.
- A pyramidal peak is a sharply-pointed mountain peak, formed when three or more corries form around a mountain top.
- When a glacier has melted, a rain-water lake often forms in the old corrie. This is called a tarn.
- Many of these features can still be seen in the UK.
- A contour line is an orange line on a map joining points of equal height. Contour lines show land relief, enabling us to identify landforms.
- **Skill** – Identifying corries, arêtes, tarns and pyramidal peaks in photographs and on OS maps.
- **Stretch** – How do crevasses form?
- **Lesson vocabulary** – erosion, erosional landform, landform, corrie, arête, pyramidal peak, ridge, tarn, contour line, relief.

Lesson 4 – How do U-shaped valleys form? (Erosional landforms Part 2)

In this lesson we learn how glaciers form U-shaped valleys via plucking and abrasion, and how to recognise U-shaped valleys in photographs and on maps.

- **Key term – A valley** is a low area of land between higher areas of land, usually formed by water or ice erosion.
- Glaciers are the most erosive force on Earth.
- U-shaped valleys are erosional landforms. They form when glaciers scrape rocks away from existing valley sides.
- If water gets into cracks in rocks and then freezes it breaks the rocks apart. This is freeze-thaw weathering.
- Rocks that undergo freeze-thaw weathering can fall onto glaciers and become entrained in the ice.
- Rocks entrained in the glacier scrape along the valley-sides. This is called abrasion.
- Plucking occurs when rocks become frozen to the glacier and are plucked from the land as the glacier moves.
- Once a glacier has melted entirely, a small stream will often flow through the U-shaped valley, called a misfit stream.
- **Skill** – Identify U-shaped valleys in photographs and on OS maps.
- **Stretch** – What are striations and what do they tell us?
- **Lesson vocabulary** – erosion, transportation, valley, landscape, U-shaped valley, freeze-thaw weathering, entrain, abrasion, plucking, misfit stream.

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Lesson 5 – Which landforms do glaciers deposit in the landscape?

In this lesson we learn how glaciers leave behind depositional landforms, including terminal moraine and erratics.

- **Key term** – In Geography, **deposition** is the process of dropping or putting something down, e.g. rocks and other sediment.
- When glaciers reach warmer lowland areas they melt, so they deposit the materials that they were carrying. The material left behind is called till.



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- Most melting occurs at the front of the glacier. This leaves a long pile of deposited rocks called a terminal moraine.
- Rocks deposited far from the area in which they came are called erratics.
- Glacial deposition creates landforms that show where glaciers used to exist in the landscape.
- **Skill** – Identifying depositional glacial landforms in photographs and on OS maps.
- **Stretch** – How do kettle lakes form?
- **Lesson vocabulary** – deposition, sediment, lowland, terminal moraine, till, erratic.

Lesson 6 – What evidence of past glaciation can we see in the UK landscape? (ICT opportunity)

In this lesson we are learning to recognise glacial landforms in the UK landscape, using online OS Maps and aerial photos.

- **Key term – Geographical Information Systems (GIS)** are computer software programs that map and analyse many different types of data.
- Some areas of the UK show evidence of past glaciation, e.g. the Lake District in north England.
- Digimaps is a GIS program that contains OS maps and aerial photos.
- Place names can be used to locate landforms on Digimaps.
- Glacial landforms can be recognised in aerial photos and on OS maps using contour lines.
- **Skill** – Using Digimaps to display OS maps and aerial photos in order to identify glacial landforms.
- **Stretch** – What type of landscape can be found in my local area?
- **Lesson Vocabulary** – Geographical Information System, data, map, glaciated landscape, contour line, spot height, Digimaps.

Lesson 7 – What are the regional impacts of glacial retreat?

In this lesson we examine the impacts of glacial retreat in Glacier National Park, USA.

- **Key term – Meltwater** is water formed by the melting of snow and ice, especially from a glacier.
- Current atmospheric temperature rise is causing many glaciers to melt at an increasing rate.
- Changes in glacier size are evident from satellite images and by comparing photographs of glaciers over time. Most of the world's glaciers are retreating.
- Glacier National Park is located in north-west USA:–
 - Many of its glaciers are melting and some have melted completely.
 - Loss of glaciers disrupts the habitats of plant and animal species that live there.
 - In the dry, hot summer months glacial meltwater provides an important water source.
- As rapid glacial retreat is a new threat, we are currently unsure as to what the long-term impacts of glacial retreat will be.
- **Skill** – Comparing photographs to describe how glaciers have changed over time.
- **Stretch** – How does glacial retreat affect people?
- **Lesson vocabulary** – meltwater, atmospheric temperature, satellite, Glacier National Park, disrupt, habitat, threat.



Lesson 8 – What are the global impacts of glacial retreat?

In this lesson we examine the impacts of glacial retreat at a global scale, focussing on the impacts of eustatic sea level change.

- Key term – **Eustatic** refers to changes in the worldwide sea level.
- When glaciers melt, freshwater is added to the oceans, increasing sea level. This is called eustatic sea level rise.
- However the rate of sea level rise is not the same in all places around the world e.g. due to the rebounding of land in some areas after the last ice age.
- The impacts of eustatic sea level rise vary around the world: -
 - Low coastal areas and islands are especially vulnerable.
 - High population density intensifies the human and economic impacts, e.g. in south east Asia.
 - The level of wealth of a place can affect its resilience to sea level rise.
- **Skill** – Using a line graph to read eustatic sea level rise data.
- **Stretch** – How does glacial retreat lead to fjord formation?
- **Lesson vocabulary** – eustatic, gigatonne, rebound, sea level change, island, submerge, flooding, erosion, floodplain, wealth, resilience, protection, vulnerable.

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Lesson 9 Revision + Quiz (15 MCQ)

In Lesson 9 students revise the core knowledge of the unit (Lessons 2 – 8). At the end of the lesson they complete a 15 multiple-choice question quiz via Eedi or printed bubble sheets. This enables the teacher time to gain insight into the misconceptions and knowledge gaps that exist in their class, in order to prepare a targeted reteach in Lesson 10.

Lesson 10 Reteach

In Lesson 10 students complete activities to address misconceptions and knowledge gaps revealed by the Lesson 9 quiz. Teachers can choose reteach activities appropriate to their students' incorrect responses (see the Supplementary Reteach Tasks and the Teacher Guidance booklet) or design their own reteach tasks.

Lesson 11 Focus on Writing

In Lesson 11 students draw on Unit 4 knowledge and a provided OS map figure to answer the question ‘**What evidence of glaciation is shown in the OS map extract of Snowdonia?**’ Exemplar answers are provided to help teachers identify expectations depending on their class. Teachers can opt to use one or two lessons for the Focus on Writing task. One lesson slot would enable students to answer the question; two lesson slots enable feedback, improvement and/or targeted use of the exemplars.

Assessment

- Students answer a 15 question MCQ in Lesson 9. This is available on the Eedi platform and can be completed by hand or using the app.
- Students use an OS map extract to identify evidence of glaciation and explain how these glaciated landforms were formed.



Unit Overview

Year 9 Unit 6 – UK Regions Fieldwork Investigation

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Rationale

Fieldwork is an integral part of the discipline of Geography. Fieldwork helps students to understand that as geographers they can research and answer a geographical question by collecting and analysing data. By conducting this fieldwork, students deepen their knowledge of the physical and human geography of the UK, and critically, leave the key stage with an in-depth and meaningful understanding of the processes that have shaped the region where they live. The fieldwork draws on knowledge from across the curriculum, helping students to make synoptic links and comparisons. It prepares them for fieldwork at later key stages and fulfils the requirement of the KS3 National Programme of Study.

Scope

Students conduct a fieldwork investigation to compare the physical and human geography of their region and the Lake District. At the start of the unit, a variety of landscapes from prior units are revised (river, coastal, and glacial). Geology is revisited. Key human characteristics of places are revised, e.g., economic activities and population density.

Students learn about the physical and human geography of the Lake District. For physical geography they consider how glaciation, tectonic activity and geology have shaped the landscape of the region. They learn about the economic 'landscape' of the Lake District, considering how economic activities are linked to the physical environment and how they have changed over time. Students conduct virtual fieldwork and collect secondary data to characterise the geography of the Lake District.

Students learn about the physical and human geography of their own region, then conduct fieldwork in their local area, collecting primary data using methods such as field sketches and land use surveys. We encounter a range of source material including maps at range of scales, GIS programs, and historical photos.

Finally, students have two lessons to write up their research, with supporting guidance for the analysis, conclusion, and evaluation.

Sequence

Link to past units

This unit requires students to draw upon several past units to inform their understanding of a specific region in the UK. Students draw upon Y7 Unit 1 Geography and me? where they were first introduced to regional maps of the UK and conducted an overview of the physical features of the British Isles and human characteristics of the UK.

Students draw on several units where they explored physical processes taking place in the UK including Y7 Unit 6 UK Coasts, Y8 Unit 1 River Rivals, and Y9 Unit 5 Glacial Landforms and Processes.

Students also draw on units where they have explored the human phenomena that contextualises the UK including Y7 Unit 3 Resources and Trade and Y9 Unit 3 The Global Economy.

Link to future units

This unit sets students up well for conducting future fieldwork or independent projects that synthesise research.



Core Knowledge (assessable)

Lesson 1 – Which knowledge do I need for Unit 6 UK Regions Fieldwork Investigation?

In this lesson we recap concepts and skills from past units which are important for success in Unit 6 UK Regions Fieldwork Investigation.

Key recap concepts:

- **Key term** – A **region** is an area of land with similar geographical characteristics.
- Physical characteristics refers to the natural features of a place, e.g., its landforms.
- Water and ice can shape the landscape via processes of erosion and deposition.
- Many UK landscapes are shaped by rivers and streams. River landforms include waterfalls and floodplains.
- Some UK landscapes were shaped by glaciers. Glaciated landforms include corries and U-shaped valleys.
- Tectonic processes can change the landscape, e.g., via continental drift and volcanic eruption.
- Geology refers to rock type. There are 3 main rock types: igneous, sedimentary and metamorphic.
- Important human characteristics of a place include: –
 - Population size and density.
 - Economic activities. These are often linked to the physical environment and can change over time.
 - The built environment, e.g., infrastructure and housing.
- OS maps show the physical and human characteristics of a landscape via symbols and the key, contour lines, spot height, and the scale.
- Photographs can be used to show how the physical or human characteristics of a place have changed over time.
- Geographical fieldwork involves collecting and analysing data in order to answer a research question.
- **Skill** – Extracting information from OS maps and photographs to characterise a location.
- **Lesson Vocabulary** – region, physical characteristics, landform, glaciated, erosion, deposition, river, continental drift, tectonic processes, volcanic eruption, human characteristics, population density, sparse, dense, economic activities, infrastructure, OS map, symbols, contour lines, fieldwork.

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Lesson 2 – What is the geography of the Lake District?

In this lesson we learn about the physical and human characteristics of the Lake District using maps, photographs, and numerical data.

- **Key term** – A **national park** is an area protected by the government for the enjoyment of the general public or the preservation of wildlife.
- The Lake District is a region in north-west England.
- The physical characteristics of the Lake District include:
 - Mountains formed by tectonic collision.
 - Diverse geology including sedimentary rock like limestone and igneous rock made from magma.
 - A glaciated landscape, e.g., sharp ridges and smooth U-shaped valleys.
 - Large lakes formed when valleys carved by glaciers later filled with meltwater and rain.

- The human characteristics of the Lake District include:
 - Quarries to extract rocks such as limestone and slate. Quarrying and mining have historically been important sources of employment.
 - More recently, an economy reliant on tourism.
 - Sparse populations in most of the region due to steep relief. There are some more densely populated areas, e.g. the town of Keswick.
- **Skill** – Using a simple geological map to describe the geology of the Lake District.
- **Stretch** – What challenges does tourism bring to the Lake District?
- **Lesson vocabulary** – national park, quarry, geology, sedimentary, igneous, magma, tectonic collision, mining, tourism, sparse, relief.

Lesson 3 – How can I find out about the geography of the Lake District using virtual fieldwork?

In this lesson we conduct virtual fieldwork to gather secondary data about the physical and human geography of the Lake District.

- Key term – **Virtual fieldwork** involves ‘visiting’ an area using web-based research and programs.
- **Virtual fieldwork competencies:**
 - Using Digimaps and Google Earth to research and describe the physical and human characteristics of the Lake District.
 - Using search terms to find specific information about the Lake District, e.g. ‘Lake District geology’.
 - Locating a region of the UK by annotating a map and providing a description.
 - Describing the landscape of the Lake District from a photograph.
 - Providing explanations for the landscape.
 - Using OS maps to identify contour lines and spot height to describe relief.
 - Using basic geological maps to identify rock types.
 - Recording data into a table as a basis for the comparative fieldwork report at the end of Unit 6.
- **Stretch competency**– Researching the importance of the Lake District to people and wildlife.
- **Lesson vocabulary** – virtual fieldwork, secondary data, Digimaps, search term, screenshot, record.

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Lesson 4 – What is the geography of my UK region? (Classroom lesson, planned by teachers)

In this lesson we learn about the physical and human characteristics of my region using maps, photographs, and numerical data.

- Key term – **X** means... **Planning advice for teachers: insert one key term relevant to your local area fieldwork, e.g., mill, pedestrian, derelict, regeneration.**
- **Advice for creating core knowledge statements relating to your local area: Insert core knowledge that you expect students to retain at the end of the lesson. This should comprise a series of points relating to the physical and human geography of your local area. You might use Lesson 2 as a model.**
- The physical characteristics of [insert region name] include:
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- The human characteristics of [insert region name] include:
 -
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 -
- **Skill** – Using a simple geological map to describe the geology of my region.
- **Stretch** – Decide on a topic that will deepen students’ understanding of the geography of their region.
- **Lesson vocabulary** – [teachers to insert relevant vocabulary, e.g., urban, built environment, London clay, chalk, river basin, coast, dense, city, etc]

Lesson 5 – How can I conduct fieldwork in my local area?

In this lesson we leave the school grounds to collect primary data for our local area fieldwork.

- Key term – **Primary data** means your own or group data collected on the day of fieldwork.
- **Fieldwork competencies** –
 - Making observations about the local area.
 - Collecting and recording primary fieldwork data via methods such as field sketches, photo annotation, and land use surveys.
- **Skill** – Collecting data via observation and field sketches.
- **Lesson vocabulary** – primary data, fieldwork, local area, observation, record, field sketch, photo annotation, land use survey, shops and services tally.

Lesson 6 – How do I consolidate the results of my fieldwork?

In this lesson I use a Fieldwork Report Planning Table to ensure that I have complete sets of fieldwork data, to prepare me for the report write up next lesson.

- Key term – **Consolidate** means to strengthen something, or to make something whole.
- **Fieldwork data checklist: Have I...**
 - Completed the Lesson 3 table with data about the geography of the Lake District?
 - Completed the Lesson 5 fieldwork recording table with data about our local area?
 - Addressed any gaps, questions or elements that I need to ask about before I start my fieldwork report next lesson?
- **Skill** – Summarising the fieldwork aim, methods, and results.
- **Stretch** – Consider how the fieldwork could be improved (evaluation).
- **Lesson vocabulary** – consolidate, data set, revise, check, gap, question.



Lesson 7 and Lesson 8 – How do I write my fieldwork report?

In these lessons we write up our fieldwork reports to compare the physical and human geography of two UK regions.

- Key term – A **fieldwork report** is an extended piece of writing which answers a fieldwork question using a planned structure.
- **Competencies:** –
 - Selecting relevant data to characterise and compare the geography of two UK regions.
 - Using data to support comparisons, e.g., photographs or statistical data.
 - Writing a fieldwork report, including aim, methods, results, and conclusion.
- **Skill** – Completing a fieldwork report.
- **Stretch** – How could I improve my fieldwork if I did it again? (Evaluation)
- **Lesson vocabulary** – fieldwork report, structure, subheadings, evidence.

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Assessment

- Students answer a 10 question Pre-Unit quiz to diagnose gaps and misconceptions in foundational knowledge required for the regional study.
- Focus on writing: **What are the similarities and differences in the physical and human geography of two UK regions?** Guidance for this write-up in Mastery booklet. Exemplar provided and guidance on how to band essays.

