



OUR LADY AND
ST HUBERT'S
CATHOLIC PRIMARY SCHOOL



Geography

Year 5 – Short Term Planning

Climate Change

Geography Knowledge Progression

Substantive Knowledge

Location Knowledge

- Name, locate and understand the significance of the Equator, Northern/ Southern Hemisphere, Tropic of Cancer/ Capricorn, latitude and longitude, Antarctic/ Arctic Circle and different climate zones.

Physical Geography

- Understand the basic process of global warming, its causes, implications and changes required. Identify and study the different climatic regions of UK and Europe.

Human Geography

- Describe and explain how some UK settlements have developed and changed over time, and why certain locations are more favourable than others. (Link with Rivers)
- Understand the effect of climate on land use and settlements in different areas of the world.
- Understand the importance of rivers on global trade and economies.

Geography Fieldwork and skills

- Begin to use six figure grid references
- Create detailed maps and label physical features.
- Use aerial images and graphs to acquire and begin to evaluate geographical information.

Disciplinary Knowledge

- Ask and investigate geographical questions, suggesting enquiries to test them.
- Analyse, communicate and explain geographical information by constructing maps with keys, labelled diagrams, age-appropriate and through writing at length, using appropriate geographical vocabulary.
- Choose an appropriate method to communicate information and give reasons for this.
- Express their own views about the people, places and environments studied, giving reasons. Compare their views with others and understand that some geographical knowledge is open to debate, challenge and discussion.
- Reach geographical conclusions, give reasons and critically evaluate and debate the impact of geographical processes and human effects on the world, from given evidence.

Enrichment

Session 1: Where in the World?

Learning Objective/s	Name, locate and understand the significance of different climate zones
Outcomes	<ol style="list-style-type: none"> Correctly locate the Equator, Hemispheres, Tropic of Cancer/Capricorn, latitude and longitude lines, and the Arctic/Antarctic Circles. Ask and investigate geographical questions related to the significance of these lines and zones Create detailed maps with keys and labelled diagrams explaining the importance of each geographical feature.
Key Vocabulary	Equator, Hemisphere, Tropic of Cancer, Tropic of Capricorn, latitude, longitude, Arctic Circle, Antarctic Circle, climate zones.
Substantive Knowledge - Specifics	<p>Substantive Knowledge:</p> <p>Equator: The Equator is an imaginary line around the middle of the Earth, equidistant from the North and South Poles. It divides the Earth into the Northern and Southern Hemispheres. It is located at 0° latitude. Regions near the Equator experience a tropical climate with little variation in temperature throughout the year.</p> <p>Northern and Southern Hemispheres: The Northern Hemisphere is the half of the Earth that lies north of the Equator.</p>

	<p>The Southern Hemisphere is the half of the Earth that lies south of the Equator. These hemispheres experience opposite seasons; when it is summer in the Northern Hemisphere, it is winter in the Southern Hemisphere, and vice versa.</p> <p>Tropic of Cancer and Tropic of Capricorn: The Tropic of Cancer is located at approximately 23.5° North latitude. The Tropic of Capricorn is located at approximately 23.5° South latitude. These lines mark the most northerly and southerly points at which the sun can be directly overhead. Regions between these lines are known as the tropics and typically have warm climates year-round.</p> <p>Latitude and Longitude: Latitude lines run parallel to the Equator and measure the distance north or south from the Equator in degrees. Longitude lines run from the North Pole to the South Pole and measure the distance east or west from the Prime Meridian in degrees. The Prime Meridian is located at 0° longitude and runs through Greenwich, England. These coordinates are used to precisely locate places on the Earth's surface.</p> <p>Arctic and Antarctic Circles: The Arctic Circle is located at approximately 66.5° North latitude. The Antarctic Circle is located at approximately 66.5° South latitude. Within these circles, there are periods during the year when the sun does not set (midnight sun) or does not rise (polar night).</p> <p>Climate Zones: Tropical Zone: Near the Equator, characterized by high temperatures and significant rainfall. Temperate Zone: Between the tropics and polar circles, characterized by moderate temperatures and distinct seasons. Polar Zone: Near the poles, characterized by extremely cold temperatures and ice-covered landscapes.</p>
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Lesson Pathway

	AfL: check substantive knowledge from Year 4.
Review	<p>1. Review (10 minutes)</p> <ul style="list-style-type: none"> • Activity: Start with a quick recap of the basic geography concepts previously learned. • Discussion: Review what the Equator is and how it divides the Earth. • Question: Ask students to name any countries or continents they know near the Equator.
New Material (Instruction/Explanation)	<p>2. New Material (15 minutes)</p> <ul style="list-style-type: none"> • Northern and Southern Hemispheres: <ul style="list-style-type: none"> ○ The Northern Hemisphere is north of the Equator. ○ The Southern Hemisphere is south of the Equator. ○ Opposite seasons occur in these hemispheres. • Tropic of Cancer and Tropic of Capricorn: <ul style="list-style-type: none"> ○ Tropic of Cancer: 23.5° North latitude. ○ Tropic of Capricorn: 23.5° South latitude. ○ These mark the farthest points north and south where the sun can be directly overhead. • Latitude and Longitude: <ul style="list-style-type: none"> ○ Latitude lines run parallel to the Equator; measure north or south. ○ Longitude lines run from the North Pole to the South Pole; measure east or west from the Prime Meridian (0° longitude). ○ Prime Meridian runs through Greenwich, England. • Arctic and Antarctic Circles: <ul style="list-style-type: none"> ○ Arctic Circle: 66.5° North latitude. ○ Antarctic Circle: 66.5° South latitude. ○ Regions within these circles experience the midnight sun and polar night. • Climate Zones: <ul style="list-style-type: none"> ○ Tropical Zone: Near the Equator; high temperatures, significant rainfall.
Questioning	
Modelling	
Guided/Active Practice	
Check Responses (Children Explain)	
Feedback	
Provide scaffolding/Reteach	
Independent practice Monitor	

	<ul style="list-style-type: none"> ○ Temperate Zone: Between the tropics and polar circles; moderate temperatures, distinct seasons. ○ Polar Zone: Near the poles; extremely cold temperatures, ice-covered landscapes. <p>3. Questioning (10 minutes)</p> <ul style="list-style-type: none"> ● Interactive Discussion: Pose questions to the students to check understanding. <ul style="list-style-type: none"> ○ What are the main differences between the Northern and Southern Hemispheres? ○ Why are the Tropic of Cancer and Tropic of Capricorn significant? ○ How do latitude and longitude help in locating places? ○ What unique phenomena occur within the Arctic and Antarctic Circles? ○ Can you describe the main characteristics of the tropical, temperate, and polar zones? <p>4. Modelling (10 minutes)</p> <ul style="list-style-type: none"> ● Demonstration: Use a globe or world map to visually demonstrate the concepts. <ul style="list-style-type: none"> ○ Show the Equator, Northern and Southern Hemispheres. ○ Point out the Tropic of Cancer and Tropic of Capricorn. ○ Highlight lines of latitude and longitude, including the Prime Meridian. ○ Show the Arctic and Antarctic Circles. ○ Identify and describe the climate zones. <p>5. Independent Practice (15 minutes)</p> <ul style="list-style-type: none"> ● Activity: Have students create their own notes and diagrams. <ul style="list-style-type: none"> ○ Draw the Earth, labeling the Equator, Northern and Southern Hemispheres. ○ Mark the Tropic of Cancer and Tropic of Capricorn. ○ Draw lines of latitude and longitude, including the Prime Meridian. ○ Indicate the Arctic and Antarctic Circles. ○ Illustrate and label the climate zones with brief descriptions. ● Reflection: Encourage students to write a few sentences summarizing what they learned about each topic. <p>6. Conclusion (5 minutes)</p> <ul style="list-style-type: none"> ● Review Key Points: Recap the main ideas of the lesson. ● Questions and Answers: Address any remaining questions from the students. ● Homework: Assign a short worksheet with questions about the hemispheres, tropics, latitude and longitude, Arctic and Antarctic Circles, and climate zones for reinforcement.
Resources/Weblinks	

Session 2: Climatic regions of the UK and Europe	
Learning Objective/s	Identify and study the different climatic regions of the UK and Europe.
Outcomes	Children will label a map of South America, identifying the countries and capitals Children will highlight the location of the amazon rainforest and river.
Key Vocabulary	Climate regions, temperate, polar, Mediterranean, continental, oceanic.
Substantive Knowledge - Specifics	<p>Climate Zones in the UK and Europe: Temperate Maritime Climate (UK, Western Europe): Mild temperatures with cool summers and mild winters. Frequent rainfall throughout the year. Examples: United Kingdom, Ireland, coastal areas of France and Germany.</p> <p>Mediterranean Climate (Southern Europe): Hot, dry summers and mild, wet winters. Low rainfall in summer, leading to dry conditions.</p>

	<p>Examples: Spain, Italy, Greece, southern France.</p> <p>Continental Climate (Eastern and Central Europe): Greater temperature variation with hot summers and cold winters. Less rainfall overall, with a distinct summer maximum. Examples: Poland, Hungary, inland areas of France and Germany.</p> <p>Polar Climate (Northern Europe): Extremely cold temperatures most of the year. Limited vegetation and short growing seasons. Examples: Northern Norway, Sweden, Finland, and Iceland.</p> <p>Factors Influencing Climate: Latitude: Distance from the Equator affects temperature and climate zones. Altitude: Higher elevations generally have cooler temperatures. Proximity to Water: Coastal areas typically have milder climates than inland areas. Prevailing Winds: Winds can bring moisture and affect temperature patterns.</p>
Lesson Pathway	
<p>Review</p> <p>New Material (Instruction/Explanation)</p> <p>Questioning</p> <p>Modelling</p> <p>Guided/Active Practice</p> <p>Check Responses (Children Explain)</p> <p>Feedback</p> <p>Provide scaffolding/Reteach</p> <p>Independent practice Monitor</p>	<p>AfL on difference between Europe and the UK, check understanding of previous concepts – can chn remember off by heart?</p> <p>Introduce idea of climatic regions – demonstrate those regions for the UK and for Europe. <i>What are the three main climate zones in Europe?</i> <i>Which climate zone is the UK in?</i> <i>Can you name a country in Europe that experiences a Mediterranean climate?</i> <i>Why does the UK have milder winters compared to some other parts of Europe at the same latitude?</i> <i>How do mountains affect the climate in Europe?</i> <i>What is the difference between weather and climate?</i> <i>If you were to visit Spain in the summer, what kind of weather would you expect and why?</i> <i>How might the climate in Scandinavia affect what people wear or how they build their houses?</i> <i>Compare the climate of Southern Italy with that of Norway. How are they different and why?</i> <i>What might happen to the climate of a place if it is located near the sea compared to a place far inland?</i> <i>Why is it important for people to know about the climate of the area they live in?</i></p> <p>Model using mapmaker on National Geographic in order to overlay cities with climatic zones. Chn to compare population sizes and climatic zones.</p>
Resources/Weblinks	MapMaker Launch Guide - National Geographic Society

Session 3:	
Learning Objective/s	Understand the basic process of global warming, its causes, implications, and changes required.
Outcomes	
Key Vocabulary	Global warming, greenhouse gases, carbon dioxide, fossil fuels, climate change, mitigation.
Substantive Knowledge - Specifics	<p>Definition and Process of Global Warming:</p> <p>Global Warming: The long-term increase in Earth's average surface temperature due to human activities. Greenhouse Effect: Natural process where certain gases (greenhouse gases) trap heat in Earth's atmosphere, keeping the planet warm enough to support life. Enhanced Greenhouse Effect: Human activities increase the concentration of greenhouse gases, trapping more heat and causing global temperatures to rise.</p> <p>Causes of Global Warming:</p> <p>Greenhouse Gases: Carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and fluorinated gases.</p>

	<p>Sources of Emissions:</p> <p>Burning Fossil Fuels: Coal, oil, and natural gas used for electricity, heating, and transportation.</p> <p>Deforestation: Cutting down forests reduces the number of trees that can absorb CO₂.</p> <p>Agriculture: Livestock produce methane, and certain agricultural practices release nitrous oxide.</p> <p>Industrial Processes: Manufacturing and chemical production release various greenhouse gases.</p> <p>Implications of Global Warming:</p> <p>Rising Temperatures: Increased global temperatures lead to heatwaves and changes in weather patterns.</p> <p>Melting Ice Caps and Glaciers: Leads to rising sea levels, threatening coastal communities.</p> <p>Extreme Weather Events: Increased frequency and severity of hurricanes, droughts, and floods.</p> <p>Impact on Ecosystems: Changes in climate affect biodiversity, habitats, and species migration patterns.</p> <p>Human Health: Increased risk of heat-related illnesses, spread of infectious diseases, and food and water scarcity.</p> <p>Mitigation and Adaptation:</p> <p>Mitigation: Actions to reduce or prevent the emission of greenhouse gases.</p> <p>Renewable Energy: Solar, wind, hydro, and geothermal energy sources.</p> <p>Energy Efficiency: Improving the efficiency of buildings, vehicles, and appliances.</p> <p>Reforestation and Afforestation: Planting trees to absorb CO₂.</p> <p>Carbon Capture and Storage: Technologies to capture and store CO₂ emissions from power plants and industrial processes.</p> <p>Adaptation:</p> <p>Adjusting practices, processes, and policies to minimize the damage caused by global warming.</p> <p>Building Resilience: Strengthening infrastructure to withstand extreme weather.</p> <p>Water Management: Developing strategies to manage water resources during droughts and floods.</p> <p>Agricultural Practices: Adjusting planting dates and crop varieties to cope with changing climate conditions.</p>
Lesson Pathway	
<p>Review</p> <p>New Material (Instruction/Explanation)</p> <p>Questioning</p> <p>Modelling</p> <p>Guided/Active Practice</p> <p>Check Responses (Children Explain)</p> <p>Feedback</p> <p>Provide scaffolding/Reteach</p> <p>Independent practice Monitor</p>	<p>Review (5 minutes)</p> <ul style="list-style-type: none"> • Begin with a quick recap of previous lessons on weather and climate. • Ask students what they remember about the greenhouse effect and climate change. <p>2. New Material (Instruction/Explanation) (15 minutes)</p> <ul style="list-style-type: none"> • Definition and Process of Global Warming: <ul style="list-style-type: none"> ○ Explain that global warming is the long-term increase in Earth's average surface temperature due to human activities. ○ Describe the greenhouse effect: a natural process where certain gases trap heat in Earth's atmosphere, making it warm enough to support life. ○ Explain the enhanced greenhouse effect: human activities increase greenhouse gas concentrations, trapping more heat and raising global temperatures. <p>Questioning (5 minutes)</p> <ul style="list-style-type: none"> • What is global warming? • How does the greenhouse effect work? • What human activities contribute to the enhanced greenhouse effect? • What are some consequences of global warming? • How can we mitigate and adapt to global warming? <p>4. Modelling (10 minutes)</p> <ul style="list-style-type: none"> • Use a simple experiment to model the greenhouse effect: <ul style="list-style-type: none"> ○ Place two thermometers in separate jars. ○ Cover one jar with plastic wrap (to represent the greenhouse effect) and leave the other open.

	<ul style="list-style-type: none"> ○ Place both jars under a lamp (to simulate the sun) and observe the temperature difference. <p>5. Guided/Active Practice (10 minutes)</p> <ul style="list-style-type: none"> • Divide students into small groups and provide each group with a scenario (e.g., a coastal town, an agricultural area). • Ask each group to discuss and list ways their scenario could be affected by global warming and possible mitigation/adaptation strategies. • Children record definitions in their books for global warming causes and impacts <p>6. Check Responses (Children Explain) (10 minutes)</p> <ul style="list-style-type: none"> • Have each group present their scenario, the impacts of global warming, and their proposed solutions. • Encourage other students to ask questions and provide feedback. <ul style="list-style-type: none"> ○
Resources/Weblinks	PowerPoint

Session 4: Human Geography of the Rainforest	
Learning Objective/s	Understand the effect of climate on land use and settlements in different areas of the world.
Outcomes	
Key Vocabulary	Land use, settlements, agriculture, urbanization, climate impact.
Substantive Knowledge - Specifics	<p><u>Climate and Land Use:</u></p> <p>Agricultural Practices: Tropical Climates: Suitable for crops like rice, sugarcane, and coffee due to year-round warmth and rainfall. Temperate Climates: Support a variety of crops like wheat, corn, and vegetables with distinct growing seasons. Arid Climates: Limited to drought-resistant crops such as millet and sorghum, often requiring irrigation. Forestry: Temperate Forests: Found in regions with moderate temperatures and precipitation, supporting diverse tree species. Tropical Rainforests: Located near the Equator, home to rich biodiversity but vulnerable to deforestation. Boreal Forests: Cold regions with coniferous trees, significant for timber and paper industries.</p> <p><u>Climate and Settlements:</u></p> <p>Urban Development: Mild Climates: Cities like London and Paris, where moderate weather supports dense populations and infrastructure. Harsh Climates: Fewer large settlements in extremely hot, cold, or arid regions due to challenging living conditions. Historical Settlement Patterns: Settlements often developed near water sources and fertile land for agriculture. Trade routes influenced by climate, such as the Silk Road avoiding deserts and mountains. Case Studies: <u>The Nile River Valley (Egypt):</u></p>

	<p>Dependent on annual flooding for fertile soil, supporting agriculture in an otherwise arid region.</p> <p><u>The Great Plains (USA):</u> Suitable for extensive farming due to the temperate climate and flat terrain.</p> <p><u>The Sahel (Africa):</u> Challenges with land use due to semi-arid climate, leading to practices like nomadic herding.</p>
Lesson Pathway	
<p>Review</p> <p>New Material (Instruction/Explanation)</p> <p>Questioning</p> <p>Modelling</p> <p>Guided/Active Practice</p> <p>Check Responses (Children Explain)</p> <p>Feedback</p> <p>Provide scaffolding/Reteach</p> <p>Independent practice Monitor</p>	<p>1. Review (5 minutes)</p> <ul style="list-style-type: none"> • Begin with a quick recap of previous lessons on weather and climate. • Ask students what they remember about different climates (e.g., tropical, temperate, arid) and how these might affect human activities. <p>2. New Material (Instruction/Explanation) (15 minutes)</p> <ul style="list-style-type: none"> • Climate and Land Use: <ul style="list-style-type: none"> ○ Agricultural Practices: <ul style="list-style-type: none"> ▪ Tropical Climates: Suitable for crops like rice, sugarcane, and coffee due to year-round warmth and rainfall. ▪ Temperate Climates: Support a variety of crops like wheat, corn, and vegetables with distinct growing seasons. ▪ Arid Climates: Limited to drought-resistant crops such as millet and sorghum, often requiring irrigation. ○ Forestry: <ul style="list-style-type: none"> ▪ Temperate Forests: Found in regions with moderate temperatures and precipitation, supporting diverse tree species. ▪ Tropical Rainforests: Located near the Equator, home to rich biodiversity but vulnerable to deforestation. ▪ Boreal Forests: Cold regions with coniferous trees, significant for timber and paper industries. • Climate and Settlements: <ul style="list-style-type: none"> ○ Urban Development: <ul style="list-style-type: none"> ▪ Mild Climates: Cities like London and Paris, where moderate weather supports dense populations and infrastructure. ▪ Harsh Climates: Fewer large settlements in extremely hot, cold, or arid regions due to challenging living conditions. ○ Historical Settlement Patterns: <ul style="list-style-type: none"> ▪ Settlements often developed near water sources and fertile land for agriculture. ▪ Trade routes influenced by climate, such as the Silk Road avoiding deserts and mountains. • Case Studies: <ul style="list-style-type: none"> ○ The Nile River Valley (Egypt): <ul style="list-style-type: none"> ▪ Dependent on annual flooding for fertile soil, supporting agriculture in an otherwise arid region. ○ The Great Plains (USA): <ul style="list-style-type: none"> ▪ Suitable for extensive farming due to the temperate climate and flat terrain. ○ The Sahel (Africa): <ul style="list-style-type: none"> ▪ Challenges with land use due to semi-arid climate, leading to practices like nomadic herding. <p>3. Questioning (5 minutes)</p> <ul style="list-style-type: none"> • What types of crops are grown in tropical climates and why? • How do temperate climates support diverse agricultural practices? • Why is irrigation important in arid climates? • How does climate influence where cities are developed?

- Can you think of a historical settlement that developed because of its climate and location?

Misconceptions:

Misconception: Climate has no impact on where people choose to live.

Misconception: All types of crops can be grown in any climate.

Misconception: Any flat land can support extensive farming regardless of climate.

Misconception: Crops in arid climates don't need much water because it's hot.

Misconception: Tropical rainforests are always wet and never affected by drought.

4. Modelling (10 minutes)

- Use a world map to highlight different climate zones and corresponding land use practices.
- Show pictures or short videos of agricultural practices and settlements in various climates (e.g., rice paddies in tropical regions, wheat fields in temperate regions).

5. Guided/Active Practice (10 minutes)

- Children make notes on impact of UK settlements

6. Feedback (5 minutes)

- Provide positive reinforcement and constructive feedback on group presentations.
- Highlight key points and correct any misconceptions.

7. Provide Scaffolding/Reteach (5 minutes)

- Address any areas of confusion or common misconceptions.
- Use additional examples or analogies to clarify complex concepts, such as the importance of water sources for settlements.

8. Independent Practice (10 minutes)

- Assign a worksheet with questions about the impact of climate on land use and settlements.
- Include tasks such as matching climates to appropriate land uses, identifying case studies, and explaining settlement patterns.

Materials Needed:

- World map and climate zone charts.
- Pictures or videos of different agricultural practices and settlements.
- Worksheets for independent practice.

Assessment:

- Evaluate group presentations and worksheets to assess understanding.
- Use questioning and feedback to gauge comprehension during the lesson.

Reflection:

- Reflect on the effectiveness of the lesson.

	<ul style="list-style-type: none"> Note any areas where students struggled and consider adjustments for future lessons.
Resources/Weblinks	MapMaker Launch Guide - National Geographic Society

Session 5: Should deforestation ever be allowed?	
Learning Objective/s	Understand the impact of climate change on rivers and how it affects global trade and economies.
Outcomes	
Key Vocabulary	Rivers, trade, economy, transport, commerce.
Substantive Knowledge - Specifics	<p>Climate Change and River Systems:</p> <p>Changes in Precipitation Patterns: Altered rainfall patterns can lead to more intense and frequent flooding or droughts, affecting river flow and water levels. Example: Increased rainfall in some regions can cause river flooding, while reduced rainfall in others can lead to river drying.</p> <p>Melting Glaciers and Snowpacks: Glaciers and snowpacks that feed many major rivers are melting faster, altering the seasonal flow of rivers. Example: The Ganges River, fed by Himalayan glaciers, may experience reduced flow in the long term.</p> <p>Impact on River Ecosystems:</p> <p>Temperature Changes: Warmer water temperatures affect aquatic ecosystems, impacting fish and other wildlife. Example: Warmer temperatures in the Yangtze River affect fish populations and biodiversity.</p> <p>Water Quality: Climate change can exacerbate pollution levels in rivers, reducing water quality and affecting human and ecosystem health. Example: Increased runoff during heavy rains can carry pollutants into rivers.</p> <p>Economic Impact of Climate Change on Rivers:</p> <p>Transportation and Trade: Changes in river flow can disrupt transportation routes, affecting the movement of goods. Example: Low water levels in the Rhine River can restrict shipping and increase transportation costs.</p> <p>Agriculture and Industry: Irrigation-dependent agriculture and industries relying on river water may face shortages or increased costs.</p>

	<p>Example: Reduced flow in the Colorado River impacts agriculture and water supply in the southwestern USA.</p> <p>Adaptation and Mitigation Strategies:</p> <p>Infrastructure Adjustments: Building or enhancing levees, dams, and reservoirs to manage altered river flows. Example: The Netherlands has implemented advanced water management systems to cope with changing river levels.</p> <p>Sustainable Practices: Implementing practices to reduce pollution and manage water resources more efficiently. Example: Efforts to reduce agricultural runoff and enhance riverbank vegetation to improve water quality.</p>
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Lesson Pathway	
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<p style="text-align: center;">Review</p> <p style="text-align: center;">New Material (Instruction/Explanation)</p> <p style="text-align: center;">Questioning</p> <p style="text-align: center;">Modelling</p> <p style="text-align: center;">Guided/Active Practice</p> <p style="text-align: center;">Check Responses (Children Explain)</p> <p style="text-align: center;">Feedback</p> <p style="text-align: center;">Provide scaffolding/Reteach</p> <p style="text-align: center;">Independent practice Monitor</p>	<p>1. Review (5 minutes)</p> <ul style="list-style-type: none"> • Begin with a quick recap of previous lessons on climate change and its general effects. • Ask students what they remember about how climate change affects natural systems like rivers. <p>2. New Material (Instruction/Explanation) (15 minutes)</p> <ul style="list-style-type: none"> • Climate Change and River Systems: <ul style="list-style-type: none"> ○ Changes in Precipitation Patterns: <ul style="list-style-type: none"> ▪ Altered rainfall patterns can lead to more intense and frequent flooding or droughts, affecting river flow and water levels. ▪ Example: Increased rainfall can cause river flooding, while reduced rainfall can lead to river drying. ○ Melting Glaciers and Snowpacks: <ul style="list-style-type: none"> ▪ Glaciers and snowpacks feeding major rivers are melting faster, altering seasonal river flows. ▪ Example: The Ganges River may experience reduced flow in the long term due to Himalayan glacier melt. • Impact on River Ecosystems: <ul style="list-style-type: none"> ○ Temperature Changes: <ul style="list-style-type: none"> ▪ Warmer water temperatures affect aquatic ecosystems, impacting fish and other wildlife. ▪ Example: Warmer temperatures in the Yangtze River affect fish populations and biodiversity. ○ Water Quality: <ul style="list-style-type: none"> ▪ Climate change can exacerbate pollution levels in rivers, reducing water quality. ▪ Example: Increased runoff during heavy rains can carry pollutants into rivers. • Economic Impact of Climate Change on Rivers: <ul style="list-style-type: none"> ○ Transportation and Trade: <ul style="list-style-type: none"> ▪ Changes in river flow can disrupt transportation routes, affecting the movement of goods. ▪ Example: Low water levels in the Rhine River can restrict shipping and increase transportation costs.
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- **Agriculture and Industry:**
 - Irrigation-dependent agriculture and industries relying on river water may face shortages or increased costs.
 - Example: Reduced flow in the Colorado River impacts agriculture and water supply in the southwestern USA.
- **Adaptation and Mitigation Strategies:**
 - **Infrastructure Adjustments:**
 - Building or enhancing levees, dams, and reservoirs to manage altered river flows.
 - Example: The Netherlands' advanced water management systems.
 - **Sustainable Practices:**
 - Implementing practices to reduce pollution and manage water resources efficiently.
 - Example: Reducing agricultural runoff and enhancing riverbank vegetation.

3. Questioning (5 minutes)

- How does climate change affect precipitation patterns and river flows?
- What are some examples of rivers impacted by melting glaciers?
- How do temperature changes affect river ecosystems?
- What are the economic impacts of altered river flows on transportation and trade?
- What are some adaptation strategies to cope with these changes?

4. Modelling (10 minutes)

- Use a model or simulation to demonstrate how changes in precipitation and glacier melt affect river flows. [Glaciers interactive simulation | NOAA Climate.gov](#)
- Show how increased runoff during heavy rains can carry pollutants into rivers, using a simple experiment with water and food colouring.

5. Guided/Active Practice (10 minutes)

- Children make initial notes on lesson materials.
- Then, divide students into small groups and provide each group with a case study of a river affected by climate change.
- Ask each group to discuss the specific impacts on their assigned river, focusing on ecosystem, economic, and adaptation strategies.

6. Check Responses (Children Explain) (10 minutes)

- Have each group present their case study findings to the class.
- Encourage other students to ask questions and provide feedback on the presentations.

	<p>7. Feedback (5 minutes)</p> <ul style="list-style-type: none"> • Provide positive reinforcement and constructive feedback on group presentations. • Highlight key points and correct any misconceptions. <p>8. Provide Scaffolding/Reteach (5 minutes)</p> <ul style="list-style-type: none"> • Address any areas of confusion or common misconceptions. • Use additional examples or analogies to clarify complex concepts, such as the economic impact of low river levels on transportation.
Resources/Weblinks	

Session 6:	
Learning Objective/s	Describe and explain how climate change has influenced the development and adaptation of UK settlements over time
Outcomes	
Key Vocabulary	Climate change, flooding, temperature changes, urban planning, green spaces, rural to urban migration, economic activity, settlement resilience.
Substantive Knowledge - Specifics	<p>Historical Development of UK Settlements:</p> <p>Traditional Factors: Historically, settlements developed near rivers, coasts, and fertile land for agriculture, trade, and transportation. Example: London developed along the River Thames, benefiting from trade and transportation.</p> <p>Climate Change Impacts on Settlements:</p> <p>Increased Flooding: Rising sea levels and increased rainfall due to climate change lead to more frequent and severe flooding in coastal and riverine areas. Example: Flooding in areas like the Somerset Levels has become more common.</p> <p>Temperature Changes: Warmer temperatures affect energy use, health, and agriculture, influencing settlement sustainability. Example: Heatwaves in urban areas like London increase energy demand for cooling and pose health risks.</p> <p>Adapting Settlements to Climate Change:</p> <p>Infrastructure and Urban Planning: Implementing flood defences, sustainable drainage systems, and heat-resistant building materials. Example: The Thames Barrier in London protects against tidal surges and flooding.</p> <p>Green Spaces and Sustainability: Increasing green spaces, urban forests, and sustainable practices to enhance resilience. Example: Initiatives in Manchester to increase green roofs and parks to combat heat islands and manage stormwater.</p> <p>Changing Favourability of Locations:</p> <p>Rural to Urban Migration:</p>

	<p>Climate impacts on agriculture may push populations from rural to urban areas, seeking better opportunities and infrastructure.</p> <p>Example: Farmers facing drought in East Anglia may migrate to cities.</p> <p>Shifts in Economic Activity:</p> <p>Areas previously favourable for certain industries may decline, while others may become more important due to climate resilience.</p> <p>Example: Coastal areas vulnerable to sea level rise may see reduced investment, while inland areas might grow.</p>
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Lesson Pathway

<p style="text-align: center;">Review</p> <p style="text-align: center;">New Material (Instruction/Explanation)</p> <p style="text-align: center;">Questioning</p> <p style="text-align: center;">Modelling</p> <p style="text-align: center;">Guided/Active Practice</p> <p style="text-align: center;">Check Responses (Children Explain)</p> <p style="text-align: center;">Feedback</p> <p style="text-align: center;">Provide scaffolding/Reteach</p> <p style="text-align: center;">Independent practice Monitor</p>	<p>3. Questioning (5 minutes)</p> <ul style="list-style-type: none"> • How did traditional factors influence the development of settlements like London? • What are some effects of increased flooding on settlements? • How do warmer temperatures affect urban areas? • What strategies are being used to adapt settlements to climate change? • How might climate change influence migration from rural to urban areas? • How did the River Thames influence the development of London, and why is it still important today? • Why do you think increased rainfall due to climate change can lead to both flooding and droughts in different areas? • How do heatwaves in urban areas like London affect energy use and public health? • What are some ways that green spaces and urban forests can help cities adapt to climate change? • Why might some farmers in East Anglia consider moving to cities, and what challenges could they face? <p>4. Modelling (10 minutes)</p> <ul style="list-style-type: none"> • Use a model or map to show the historical development of UK settlements along rivers and coasts. • Demonstrate how rising sea levels and increased rainfall can lead to flooding using a simple water table or digital simulation. • Show examples of flood defences, green spaces, and urban planning adaptations through images or videos. <p>5. Guided/Active Practice (10 minutes)</p> <ul style="list-style-type: none"> • Children make notes on the impact of climate change on UK settlements. • Children evaluate the effects which are last/most damaging to UK infrastructure and settlements <p>6. Check Responses (Children Explain) (10 minutes)</p> <ul style="list-style-type: none"> • Have each group present their case study findings to the class. • Encourage other students to ask questions and provide feedback on the presentations. • Summarise key points from each group's presentation to reinforce learning and address any emerging misconceptions. <p>7. Feedback (5 minutes)</p> <ul style="list-style-type: none"> • Provide positive reinforcement and constructive feedback on group presentations. • Highlight particularly insightful points and gently correct any inaccuracies. • Encourage students by acknowledging their efforts and understanding. <p>8. Provide Scaffolding/Reteach (5 minutes)</p>
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	<ul style="list-style-type: none"> • Address any areas of confusion or common misconceptions. • Use additional examples or analogies to clarify complex concepts, such as the impact of temperature changes on urban areas and the importance of flood defenses. • Simplify any points that seemed to be particularly challenging, ensuring all students grasp the key concepts. <p>9. Independent Practice (10 minutes)</p> <ul style="list-style-type: none"> • Assign a worksheet with questions about the impact of climate change on settlements in the UK. <ul style="list-style-type: none"> ○ Include tasks such as matching historical and modern settlement factors, identifying adaptation strategies, and explaining economic impacts. ○ Use diagrams and maps for visual learners to label and describe key features. <p>10. Monitor (Throughout Independent Practice)</p> <ul style="list-style-type: none"> • Circulate the classroom to assist students with the worksheet. • Provide individualized support and answer any questions. • Ensure all students are engaged and understand the tasks.
Resources/Weblinks	