

Changing climates

Lesson 1: Weather or climate?

Key concepts	Range and content	Key questions	Teaching and learning activities	Resources
<p>Place - understanding the physical and human characteristics of real places. Developing 'geographical imaginations' of places.</p> <p>Physical processes – understanding how sequences of events and activities in the physical and human worlds lead to change in places, landscapes and societies.</p>	<p><i>Physical geography: the study of weather and climate, and why they vary from place to place.</i></p>	<p>What is the difference between weather and climate?</p> <p>Weather is what happens day to day, so it can vary a lot.</p> <p>Climate is the average weather, over a period of time of many years, usually 30 years.</p>	<p>STARTER:</p> <p>Ask students what's the weather is like outside by looking out of the window. Look at the <u>images of extreme weather</u>. Ask how does each type of extreme weather make you feel? What would a typical day be like in summer, winter, spring and autumn?</p> <p>MAIN ACTIVITIES:</p> <p>Give out the <u>location cards</u> to each group. Create climate graphs for each place using the WMO link.</p> <p>Compare climate with the weather on the day using the WMO weather information</p> <p>PLENARY :</p> <p>'Wish you were here'. Write a <u>postcard</u> from a holiday in a place in the UK or abroad. Describe the climate of the place (what it is supposed to be like when you are there) and also describe the weather on the day of writing and over the course of the holiday..</p>	<p>Downloads:</p> <p>Images of extreme weather PowerPoint</p> <p>Location cards 1 & 2</p> <p>Postcard template</p> <p>Links:</p> <p>World Meteorological Organization http://www.worldweather.org/</p>
Key processes	Curriculum opportunities			Assessment opportunities
<p>Geographical Enquiry</p> <p>Graphicacy and visual literacy</p> <p>Geographical communication</p>	<p><i>Build and expand on pupils' personal experiences of geography</i></p> <p><i>Use a variety of resources</i></p>			'Wish you were here' postcard activity

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Lesson 2: Why is our climate like this?

Key concepts	Range and content	Key questions and ideas	Teaching and learning activities	Resources
<p>Place - understanding the physical and human characteristics of real places.</p> <p>Scale - appreciating different scales – from personal and local to national, international and global.</p> <p>Physical processes – understanding how sequences of events and activities in the physical and human worlds lead to change in places, landscapes and societies.</p>	<p><i>A variety of scales, from personal, local, regional, national, international and continental, to global.</i></p> <p><i>Physical geography: the study of weather and climate, and why they vary from place to place.</i></p>	<p>What is the climate system?</p> <p>What are the main influences on climate?</p> <p>The climate system includes and is influenced by complex interactions between the atmosphere, oceans, land, ice, and biosphere.</p>	<p>STARTER:</p> <p>As a class or in groups look at the 'Climate System Interactive' or the Word version of global the Climate System</p> <p>MAIN ACTIVITIES:</p> <p>In groups students each look at one influence on climate:</p> <p>(i) latitude; (ii) location, relative to continents and oceans; (iii) situation in relation to large-scale atmospheric circulation patterns; (iv) altitude; (v) local geographical features, such as topography or the nature of the built-up area.</p> <p>How would the students explain each process to a young audience of 10 year olds? What are the key words they would use? In pairs, write a 5 minute presentation.</p> <p>PLENARY: Students devise criteria for judging each pair's presentation. Which pair made the best presentation and why?</p>	<p>Interactive:</p> <p>The Climate System</p> <p>Downloads:</p> <p>The Climate System word version of interactive</p>
Key processes	Curriculum opportunities			Assessment opportunities
<p>Geographical enquiry</p> <p>Graphicacy and visual literacy - use atlases, globes, maps at a range of scales, photographs, satellite images and other geographical data.</p> <p>Geographical communication - communicate knowledge and understanding using geographical vocabulary and conventions in both speech and writing.</p>	<p><i>Use varied resources, including maps, visual media and Geographical Information Systems</i></p>			Peer review of presentations

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Lesson 3: Can climate change?

Key concepts	Range and content	Key questions and ideas	Teaching and learning activities	Resources
<p>Interdependence - <i>Understanding the significance of interdependence in change, at all scales.</i></p> <p>Physical processes – <i>understanding how sequences of events and activities in the physical and human worlds lead to change in places, landscapes and societies.</i></p>	<p><i>Interactions between people and their environments, including causes and consequences of these interactions, and how to plan for and manage their future impact. This should include the investigation of climate change.</i></p>	<p>Is the climate changing?</p> <p>What are the natural causes?</p> <p>What are the human causes?</p> <p>Climate has always changed over time but the last 150 years have seen a steep warming trend.</p> <p>The climate is variable and has always changed due to natural causes.</p> <p>Most scientists now agree that it is human activity that is changing climates now.</p>	<p>STARTER:</p> <p>What have been the variables in the Earth's climate? What are the natural causes? Use the Interactive 'Rising Temperatures' to discuss the Earth's climate.</p> <p>MAIN:</p> <p>For each location on the location cards research the carbon emissions, total greenhouse gases and compare with the population maps. Use links to WorldMapper maps or students may also use statistics researched from the International Energy Agency.</p> <p>Ask students why it is important to look at these statistics? For each location, students should also find out what energy sources are used most. Students choose how to present this data to the rest of the class.</p> <p>PLENARY:</p> <p>Students rank the data with the highest polluters in tonnes and the most energy use per capita.</p>	<p>Interactives:</p> <p>Rising Temperatures?</p> <p>Downloads:</p> <p>Rising Temperatures?</p> <p>Location cards</p> <p>Links: International Energy Agency WorldMapper</p>
Key processes	Curriculum opportunities			Assessment opportunities
<p>Geographical enquiry</p> <p>Graphicacy and visual literacy - <i>use atlases, globes, maps at a range of scales, photographs, satellite images and other geographical data.</i></p>	<p><i>Use a range of approaches to enquiry</i></p> <p><i>Explore real and relevant context for learning about change in the contemporary world</i></p> <p><i>Examine an issue or region in the news</i></p> <p><i>Investigate important issues of relevance to the UK and globally using a range of skills, including ICT</i></p>			<p>Interpreting and analysing data</p>

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Lesson 4: What will the climate be in the future?

Key concepts	Range and content	Key questions and ideas	Teaching and learning activities	Resources
<p>Place - <i>understanding the physical and human characteristics of real places.</i></p> <p>Interdependence - <i>Exploring the social, economic, environmental and political connections between places. Understanding the significance of interdependence in change, at all scales.</i></p>	<p><i>Interactions between people and their environments, including causes and consequences of these interactions, and how to plan for and manage their future impact.</i></p>	<p>What will the climate be in the future?</p> <p>How do scientists predict the future climate?</p> <p>Scientists use computer models to predict future climate.</p> <p>These models use future scenarios of the world.</p> <p>Debate continues about the amount and rate of climate change.</p>	<p>STARTER:</p> <p>Show video clip to discuss the predictions to the climate. How do scientists make these predictions?</p> <p>MAIN ACTIVITIES:</p> <p>The clip uses data from graphs from the IPCC. The scenario fact sheet can be used to explain what the different predictions are based on. Students should be aware of the uncertainty of predictions which are dependent on future scenarios. Use the graphs to answer the questions on emissions and global warming projections.</p> <p>PLENARY:</p> <p>What is the most likely scenario? Use a continuum to decide where to stand from most likely to least likely.</p>	<p>Downloads:</p> <p>IPCC uses different scenarios – ‘storylines’ factsheet</p> <p>Projection based on Emissions scenario sheet.</p> <p>Links:</p> <p>Video from Green TV http://www.green.tv/6_degrees</p>
				Assessment opportunities
				Interpretation of the graphs.
Key processes	Curriculum opportunities			
<p>Geographical enquiry</p> <p>Graphicacy and visual literacy</p>	<p><i>Explore real and relevant context for learning about change in the contemporary world</i></p> <p><i>Examine an issue or region in the news</i></p>			

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Lesson 5: Does it matter if climate changes?

Key concepts	Range and content	Key questions and ideas	Teaching and learning activities	Resources
<p>Place - Understanding the physical and human characteristics of real places.</p> <p>Scale - Appreciating different scales – from personal and local to national, international and global.</p> <p>Interdependence - Exploring the social, economic, environmental and political connections between places. Understanding the significance of interdependence in change, at all scales.</p> <p>Environmental interaction and sustainable Development - Understand that the physical and human dimensions of the environment are interrelated and together influence environmental change</p>	<p><i>A variety of scales, from personal, local, regional, national, international and continental, to global.</i></p> <p><i>A range of investigations, focusing on places, themes or issues.</i></p> <p><i>The location of places and environments.</i></p> <p><i>Interactions between people and their environments, including causes and consequences of these interactions, and how to plan for and manage their future impact.</i></p>	<p>What are the impacts of changing climates on different parts of the world?</p> <p>People, places and environments are all affected by climate.</p> <p>Those that are least able to adapt to impacts will be the most vulnerable.</p>	<p>STARTER:</p> <p>Watch DEFRA video on changing climate. What impacts are shown in the video? What messages are being communicated in it? Is it effective?</p> <p>MAIN ACTIVITY:</p> <p>In same groups for each location, create a table to summarise the climate predictions from IPCC factsheet and future impacts on their region for each category – water, ecosystems, food, coasts, industry, and health using the table on the BBC website.</p> <p>PLENARY:</p> <p>Which parts of the world may be most affected by a changing climate? Are all the impacts negative? What about the opportunities?</p>	<p>Downloads:</p> <p>IPCC Regional Climate Predictions</p> <p>Summary sheet template</p> <p>Links:</p> <p>DEFRA film on YouTube</p> <p>BBC - Table of impacts</p>
Key processes	Curriculum opportunities			Assessment opportunities
<p>Geographical enquiry</p> <p>Geographical communication</p>	<p><i>Explore real and relevant context for learning about change in the contemporary world.</i></p> <p><i>Examine an issue or region in the news</i></p>			<p>Creating information tables; class discussion</p>

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Lesson 6: Hello from 2050

Key concepts	Range and content	Key questions and ideas	Teaching and learning activities	Resources
<p>Place - Understanding the physical and human characteristics of real places.</p> <p>Scale - Appreciating different scales – from personal and local to national, international and global.</p> <p>Interdependence - Exploring the social, economic, environmental and political connections between places. Understanding the significance of interdependence in change, at all scales.</p> <p>Environmental interaction and sustainable Development - Understand that the physical and human dimensions of the environment are interrelated and together influence environmental change</p>	<p><i>A variety of scales, from personal, local, regional, national, international and continental, to global.</i></p> <p><i>A range of investigations, focusing on places, themes or issues.</i></p> <p><i>The location of places and environments.</i></p> <p><i>Interactions between people and their environments, including causes and consequences of these interactions, and how to plan for and manage their future impact.</i></p>	<p>What is the weather like and how have people adapted?</p> <p>Some of the impacts of climate change are inevitable so can people and places need to adapt.</p>	<p>STARTER:</p> <p>How might people and places adapt to a changing climate? Use <u>extreme weather images</u> from lesson 1 for ideas. What is already happening?</p> <p>MAIN ACTIVITY:</p> <p>Review the future forecasts and impacts for each location. Students research using the web links on each location to create a weather forecast from 2050. Student could present their weather forecast for their location to the rest of the class.</p> <p>PLENARY:</p> <p>Take a vote - which one of the 6 locations will be the most vulnerable and why?</p>	<p>Interactive:</p> <p>Climate Change: those at greatest risk from cyclones and rising seas.</p> <p>Downloads:</p> <p>Climate Change: those at greatest risk from cyclones and rising seas.</p> <p>Images of extreme weather</p> <p>Location cards</p>
Key processes	Curriculum opportunities			Assessment opportunities
<p>Geographical enquiry</p> <p>Geographical communication</p>	<p><i>Personal experiences of geography – using the pupils' experiences to deepen awareness and understanding of sustainable development</i></p>			<p>Research, presentations, voting and justifying opinions.</p>

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Lesson 7: What can we do to develop sustainably?

Key concepts	Range and content	Key question and ideas	Teaching and learning activities	Resources
<p>Place - Understanding the physical and human characteristics of real places.</p> <p>Physical and human processes – Exploring the social, economic, environmental and political connections between places.</p> <p>Cultural understanding and diversity - Appreciating how people's values and attitudes differ and may influence social, environmental, economic and political issues, and developing their own values and attitudes about such issues.</p>	<p><i>A variety of scales, from personal, local, regional, national, international and continental, to global.</i></p> <p><i>A range of investigations, focusing on places, themes or issues.</i></p> <p><i>The location of places and environments.</i></p> <p><i>Human geography built and managed environments and human processes.</i></p> <p><i>Interactions between people and their environments, including causes and consequences of these interactions, and how to plan for and manage their future impact.</i></p>	<p>Are different ways of life more or less sustainable?</p> <p>What actions can be taken now to limit the impacts of global warming?</p> <p>Who can effect the most change- individuals or governments</p> <p>Actions can be taken individually, locally, nationally and globally.</p>	<p>STARTER:</p> <p>Students list of a range of actions</p> <p>Do the <u>Who can do what?</u> drag and drop intercative</p> <p>MAIN ACTIVITY:</p> <p>Ask students what they understand by the term sustainable? Read the case studies. Read about what is being done in the 6 locations to develop sustainable technologies, including India and China. Rank in order of most to least impacts. What can we do in the UK to develop sustainable lifestyles?</p> <p>PLENARY:</p> <p>Discuss the quote from Bangladeshi Environment Minister; "For you in the west, it is a lifestyle change, for us it is a matter of life and death."</p>	<p>Interactive:</p> <p>Who can do what?</p> <p>Downloads:</p> <p>Who can do what (Word)</p> <p>Case studies information sheet</p> <p>Links:</p> <p>YourClimateYourLife to find out impacts on lifestyles and actions to take in the UK</p> <p>Assessment opportunities</p> <p>Whole-class and small-group discussion</p>
Key processes	Curriculum opportunities			
<p>Geographical enquiry</p> <p>Geographical communication</p>	<p><i>Make links between geography and other cross-curricular dimensions</i></p> <p><i>Explore real and relevant context for learning about change in the contemporary world</i></p>			