

IGCSE Geography Unit 8: Energy and Water Resources

Recommended Prior Knowledge

An understanding of the different sources of energy. A good general knowledge, particularly of topical events such as global climate change.

Context

It is recommended that this is the last of the core units to be studied. The unit also incorporates work on Environmental Risks and Benefits through the study of global warming and water pollution. Case studies of sources of energy are incorporated as appropriate. The skills gained in this unit will have useful applications throughout.

Outline

The unit offers opportunities to appreciate how we depend upon water and energy resources to maintain our quality of life. It also develops an environmental awareness particularly of the need for conservation and sustainable development. The scheme of work offers opportunities for pupils to develop a wide range of graphical techniques and develops pupils' decision-making skills. Suggested activities from the core texts are differentiated.

Learning Outcomes		Suggested Teaching Activities	Resources
3.4a	Describe the significance of non-renewable fossil fuels and renewable energy supplies.	Pupils define key terms: resource, energy and fossil fuel. Pupils give examples of fossil fuels and understand that they are non-renewable or finite. Pupils define renewable or infinite and brainstorm a list of renewable energy sources. They discuss the role of management in determining whether certain fuels such as firewood can be sustainable.	<p>The New Wider World Pages 118 - 119. Exercise 2 Page 133.</p> <p>Longman Geography for GCSE Pages 214 - 217.</p> <p>http://www.s-cool.co.uk/ (Select GCSE Geography - Tourism and Resources - Managing Resources)</p> <p>http://www.georesources.co.uk/energy3.htm</p>
3.4a	Describe the significance of non-renewable fossil fuels and renewable energy supplies.	Pupils discuss the reasons for the growing demand for energy. Pupils construct a <i>scattergraph</i> to show the relationship between energy demand and the level of development of a country - describe and explain the differences that they notice. Pupils discuss the role of energy conservation in trying to meet this demand - produce an information leaflet to advise people how to save energy e.g. home insulation.	<p>The New Wider World Page 126 - 127.</p> <p>Longman Geography for GCSE Pages 212 and 213. Question 5 Paper 3 November 1998.</p>

Learning Outcomes		Suggested Teaching Activities	Resources
3.4a	Describe the significance of non-renewable fossil fuels and renewable energy supplies.	Pupils draw diagrams to explain the conditions under which fossil fuels are formed and how they are extracted. They construct a table to show the advantages and disadvantages of non-renewable sources of energy to include: coal, oil, natural gas and wood. Pupils draw <i>graphs</i> to show the changing energy budget of the UK - describe and explain the changes. Pupils appreciate the growing importance of nuclear power as a source of energy and take notes on the advantages and disadvantages of this source of power.	<p>The New Wider World Pages 119 - 121.</p> <p>Longman Geography for GCSE Pages 214 - 217</p> <p>Question 6 Paper 1/2 May 1999</p> <p>Question 6 Paper 1/2 May 2000</p> <p>Question 7 Paper 3 May 2000</p> <p>Question 7 Paper 3 May 1998</p> <p>http://www.schoolscience.co.uk/content/4/chemistry/fossil/p1.html</p> <p>http://people.howstuffworks.com/nuclear-power.htm</p>
3.4a	Describe the significance of non-renewable fossil fuels and renewable energy supplies.	Class discussions to give reasons as to why many countries are seeking to develop alternative sources of energy. Pupils draw diagrams to explain how each of the renewable sources of energy operates and give examples of schemes. They construct a table to show the advantages and disadvantages of renewable energy to include: geothermal, wind, waves, tides, running water, solar and biogas. Pupils understand that the use of renewable energy may be limited in certain locations because of physical restrictions. Decision making exercise - what is the best site for a wind farm or HEP station?	<p>The New Wider World Pages 122 - 125.</p> <p>Longman Geography for GCSE Pages 222 - 225.</p> <p>http://www.schoolsnet.com</p> <p>http://www.greenpeace.org.uk/ (Search the site for pages relating to Renewable Energy)</p> <p>Question 6 Paper 1/2 May 2000</p> <p>http://geothermal.marin.org/pwrheat.html</p>
3.5	Describe how energy production may pose threats to the environment - the greenhouse effect and global warming.	Pupils define greenhouse effect and global warming. They use Internet and textbook references to write a newspaper article to explain the causes (include diagram) and consequences of global warming using examples. Pupils suggest ways in which global warming can be reduced to include energy conservation and use of renewable sources.	<p>The New Wider World Pages 218 and 220. Exercise 5 Page 228.</p> <p>Longman Geography for GCSE Pages 232 - 233.</p> <p>Essential Mapwork Skills Pages 84 - 85</p>

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			<p>http://www.ace.mmu.ac.uk/eae/</p> <p>http://www.cof.edu/ete/main.html (Select Global Climate Change)</p> <p>http://www.panda.org/about_wwf/what_we_do/climate_change/index.cfm</p> <p>http://www.greenpeace.org.uk/ (Select Climate for a number of pages relating to global warming)</p> <p>http://archive.greenpeace.org/climate/climatefaq.html</p> <p>Question 6 Paper 3 November 1999</p>
3.4b	Describe the factors influencing the development and siting of power stations.	Pupils take notes on the location factors for coal, oil, gas and nuclear fired power stations. Decision making activity - what is the best site for a power station (specify). Pupils follow up this activity by a role-play to appreciate why people will have mixed feelings about a power station in their local area.	<p>The New Wider World Page 115</p> <p>Longman Geography for GCSE Pages 218 -220.</p>
3.4c	Describe the uses, provision and competition for water resources and the impact of water shortages.	Pupils understand that 1% of water on earth is fresh water and describe the sources of fresh water e.g. rivers, underground etc. Pupils list the ways in which they use water in the home for domestic purposes and research some uses of water in industry and agriculture. Pupils write a report to include location maps and diagrams to show how the water resource can be managed to meet all demands - case study: The Nile Basin.	<p>The New Wider World Page 222 to 225. Exercise 7 Page 229.</p> <p>Longman Geography for GCSE Pages 43.</p> <p>http://www.geography.learnontheinternet.co.uk/topics/ (Select Links - Rivers - number of useful pages relating to the Nile case study)</p>
3.5	Describe how developments in agriculture and industry may pose threats to the environment - water pollution.	Pupils write short accounts from newspaper articles to discuss some of the ways in which agriculture and industry can cause water pollution. Case study: The Pollution of the River Po.	<p>http://www.zephyrus.demon.co.uk/geography/resources/environ/water.html</p>