

Lesson	Items covered	National Curriculum Links (pub. 2007)
<b>1</b> Why Renewable Energy?	What is renewable energy? Why is renewable energy important? - Security of supply - Climate change  Meter readings to monitor the school's energy usage  LogiCity climate change game	Ma2.2k,l,o,p (use appropriate maths procedures)  Ma2.3a-e (interpret and evaluate)  Ma 3.1d (number and algebra)  Ma3.3b,c (presentation and analysis)  Sc2.2 a,b (critical understanding of evidence)  Geog (key concepts 1-6)  PSHE1.2d (become critical consumers)  D&T1.1b (apply knowledge to design products)  ICT 1.1 (key concept-capability)  ICT 2.2 (developing ideas)  ICT 2.4 (evaluating)
<b>2</b> Introduction to Wind Power	Learn how a wind turbine functions, and its component parts  Experiment with the Wind Turbine Kit.  Connect the wind turbine to motor, fan or LED modules.  Connect the wind turbine to a voltmeter and measure the output.	Sc1.1 (scientific thinking)  Sc1.2 (applications and implications of science)  Sc2.1 (practical enquiry)  Sc 3.1 (energy, electricity and forces)
<b>3</b> Number and Pitch of Blades	Experiment with different numbers of blades on the wind turbine and measure the voltage.  Experiment with different blade angles on the wind turbine and measure the voltage  Discuss why 3 blades are typically used on large	Sc1.1 (scientific thinking)  Sc1.2 (applications and implications of science)  Sc2.1 (practical

	commercial wind turbines	enquiry) Sc 3.1 (energy, electricity and forces) PSHE 1.4a (economic understanding) Ma1.1a-c (key concept- competence)
<b>4</b> Width and Length of Blades	Experiment with different size blades on the wind turbine and measure the voltage.  The students will make blades of varying width and length and attach these to the wind turbine.	Sc1.1 (scientific thinking) Sc1.2 (applications and implications of science) Sc2.1 (practical enquiry) Sc 3.1 (energy, electricity and forces) PSHE 1.4a (economic understanding) Ma1.1a-c (key concept- competence)
<b>5</b> Wind Speed and Direction	Use the wind turbine kit to measure the voltage at different wind speeds and different directions.  Observe how the wind turbine changes direction to face into the wind, should the wind direction change.	Sc1.1 (scientific thinking) Sc1.2 (applications and implications of science) Sc2.1 (practical enquiry) Sc 3.1 (energy, electricity and forces) Ma1.1a-c (key concept- competence)
<b>6</b> Performance Under Load	With the wind turbine at optimum efficiency, investigate what happens when an electrical load is applied.	Sc1.1 (scientific thinking) Sc1.2 (applications and implications of science) Sc2.1 (practical enquiry) Sc 3.1 (energy, electricity and forces) Ma1.1a-c (key

		<p>concept- competence)</p> <p>En1.1 key concept- competence)</p> <p>En2.1 a (present information clearly and appropriately)</p>
<p><b>7</b> Introduction to Solar Photovoltaics (PV)</p>	<p>What is solar photovoltaic technology?</p> <p>Experiment with the Photovoltaic Kit.</p> <p>Connect the PV cell to motor, fan or LED modules.</p> <p>Connect the PV to a voltmeter and measure the output. Experiment by covering varying proportions of the PV cell's surface and record results.</p>	<p>Sc1.1 (scientific thinking)</p> <p>Sc1.2 (applications and implications of science)</p> <p>Sc2.1 (practical enquiry)</p> <p>Sc 3.1 (energy, electricity and forces)</p>
<p><b>8</b> Solar Photovoltaics (PV) Uses and Applications</p>	<p>Discuss applications of photovoltaic technology.</p> <p>Discuss the advantages and disadvantages of photovoltaic power.</p> <p>Design an electrical appliance powered by PV.</p>	<p>Sc1.1 (scientific thinking)</p> <p>Sc1.2 (applications and implications of science)</p> <p>Sc2.1 (practical enquiry)</p> <p>Sc 3.1 (energy, electricity and forces)</p> <p>PSHE 1.4a (economic understanding)</p>
<p><b>9</b> Introduction to Solar Thermal Heating</p>	<p>What is solar thermal heating?</p> <p>How do solar thermal heating systems work?</p> <p>Discuss the advantages and disadvantages of solar thermal energy.</p> <p>Experiment with the Solar Water Heater Kit.</p> <p>Observe how the sun's energy can be used to heat water.</p>	<p>Sc1.1 (scientific thinking)</p> <p>Sc1.2 (applications and implications of science)</p> <p>Sc2.1 (practical enquiry)</p> <p>Sc 3.1 (energy, electricity and forces)</p> <p>PSHE 1.4a (economic understanding)</p> <p>Ma1.1b (communicating maths effectively) 2.2d,h (analysis)</p>

<p><b>10</b> Solar Thermal Insulation</p>	<p>Experiment with the Solar Water Heater Kit.</p> <p>Observe what effect the foam insulation block has on the efficiency of solar thermal water heating.</p>	<p>Sc1.1 (scientific thinking)</p> <p>Sc1.2 (applications and implications of science)</p> <p>Sc2.1 (practical enquiry)</p> <p>Sc 3.1 (energy, electricity and forces)</p> <p>Ma1.1b(communicating maths effectively) 2.2d,h(analysis)</p>
<p><b>11</b> Solar Thermal Cover</p>	<p>Experiment with the Solar Water Heater Kit.</p> <p>Observe what effect opening or closing the plastic case has on the efficiency of solar thermal water heating.</p>	<p>Sc1.1 (scientific thinking)</p> <p>Sc1.2 (applications and implications of science)</p> <p>Sc2.1 (practical enquiry)</p> <p>Sc 3.1 (energy, electricity and forces)</p> <p>PSHE 1.4a (economic understanding)</p> <p>Ma1.1b (communicating maths effectively)2.2d,h,i (analysis)</p>
<p><b>12</b> What have you learnt?</p>	<p>Synopsis of previous lessons.</p> <p>Revise and summarise all aspects of renewable energy and energy conservation.</p> <p>Discuss experiments with the renewable energy kits, and the results of the school energy monitoring.</p> <p>Produce a poster, poem or rap promoting renewable energy and energy conservation. Present to the group.</p>	<p>Ma1.1b, (communicating maths effectively)1.4a and b (critical understanding)</p> <p>D&amp;T1.1b, (apply knowledge to design products)</p> <p>PSHE 1.4a(economic understanding)</p> <p>En1.1d,1.1e (competence)</p> <p>1.4a,1.4c (critical understanding)</p> <p>2.1a and b (speaking and listening)</p>

# KS3 Scheme of Work

		Sc1.1 (scientific thinking) Sc1.2 (applications and implications of science) Sc2.1 (practical enquiry)
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