

Gr. 2 – Understanding Earth & Space Systems

Air and Water in the Environment

Windmill

<p>Specific Expectations:</p> <p>2.1 Follow established safety procedures during science and technology investigations.</p> <p>2.2 Investigate, through experimentation, the characteristics of air and its uses.</p> <p>3.1 Identify air as a gaseous substance that surrounds us and whose movement we feel as wind.</p> <p>3.3 Describe ways in which living things, including humans, depend on air and water.</p>			
<p>Big Idea (for lesson):</p> <p>Students investigate wind power as a source of energy, and its general characteristics. Students design and test different models to see which catches the wind best to produce movement.</p>			
<p>Accommodations:</p> <p><input checked="" type="checkbox"/> Increase time</p> <p><input checked="" type="checkbox"/> Visual Aids</p> <p><input checked="" type="checkbox"/> Manipulatives</p> <p><input checked="" type="checkbox"/> Chunking</p> <p><input checked="" type="checkbox"/> Step-by-Step</p> <p><input checked="" type="checkbox"/> Scaffolding</p> <p><input checked="" type="checkbox"/> Copy of Notes</p> <p><input checked="" type="checkbox"/> Student Grouping</p>		<p>Differentiated Instruction:</p> <p><input checked="" type="checkbox"/> Content: Use demo to show the content as you offer verbal descriptions.</p> <p><input checked="" type="checkbox"/> Process: Have students work in pairs and support each other if physical impediments exist.</p> <p><input checked="" type="checkbox"/> Product: Students may show their final product in pairs, and communicate their findings either verbally, visually, or through written means.</p> <p><input type="checkbox"/> Other: _____</p>	
<p>Bloom's Taxonomy:</p> <p><input checked="" type="checkbox"/> Knowledge</p> <p><input checked="" type="checkbox"/> Comprehension</p> <p><input checked="" type="checkbox"/> Application</p> <p><input checked="" type="checkbox"/> Analysis</p> <p><input checked="" type="checkbox"/> Synthesis</p> <p><input checked="" type="checkbox"/> Evaluation</p>		<p>Multiple Intelligence:</p> <p><input checked="" type="checkbox"/> Verbal/Linguistic</p> <p><input checked="" type="checkbox"/> Logical/Mathematical</p> <p><input checked="" type="checkbox"/> Visual/Spatial</p> <p><input checked="" type="checkbox"/> Bodily/Kinesthetic</p> <p><input checked="" type="checkbox"/> Naturalist</p> <p><input type="checkbox"/> Musical/Rhythmic</p> <p><input checked="" type="checkbox"/> Interpersonal</p> <p><input checked="" type="checkbox"/> Intrapersonal</p>	

Delivering The Lesson:

Portion & Timing	Grouping:			Introduction:	Materials
Minds On: 10 mins	W <input checked="" type="checkbox"/>	S <input type="checkbox"/>	I <input type="checkbox"/>	Teacher can do a demonstration to introduce how movement of water can do work by changing one type of energy to another. Follow the instructions here to build an easy	4 Styrofoam plates Pencil Stiff straw

Gr. 2 – Understanding Earth & Space Systems

Air and Water in the Environment

				<p>water wheel: http://howto.wired.com/wiki/Build_a_Plastic_Cup_Waterwheel Ask students where the energy that lifts the pulley comes from? (<i>Answer: The force of the water turning the wheel.</i>) Ask students if they can think of any other sources of energy that are captured by turning wheels? (<i>Answer: Windmills!</i>).</p>	<p>9 small plastic cups Masking tape String Water container/hose</p>
<p>Action: 15 mins</p>	<p>W <input checked="" type="checkbox"/></p>	<p>S <input checked="" type="checkbox"/></p>	<p>I <input checked="" type="checkbox"/></p>	<p>Have students build their own windmills according to the instructions on the handout. Teacher can circulate and ask questions of the different groups: -Besides wind and water, can you think of other places that energy comes from? (<i>Answers listed on handout.</i>) -What type of things do we use energy to do? -Is the energy from our windmill doing any real work? (<i>Answer: No, but we can make it do work with some adjustments.</i>)</p>	<p>Windmill Handout (Materials listed)</p>
<p>Consolidate: 15 mins</p>	<p>W <input checked="" type="checkbox"/></p>	<p>S <input type="checkbox"/></p>	<p>I <input type="checkbox"/></p>	<p>With a little bit of preparation, you can have an electrical set-up that can be connected to the windmill. The instructions are found at the following website: http://www.hometrainingtools.com/a/wind-energy-science-newsletter -Explain to students that the addition of the motor makes it into a generator. Show students that electricity flows through and lights the bulb. Ask students what type of energy the spinning mechanical energy changes into? (<i>Answer: electrical energy, then light.</i>) -How is this set-up similar to real windmills? (<i>Answer: they have large-scale generators that also convert mechanical energy into electrical, and potentially light!</i>) -How are we dependent on air and water besides for power purposes? (<i>Answer: food, water, breathing, etc.</i>)</p>	<p>Pinwheel windmill (from handout) Small electric motor Alligator clip leads 1.5 V bulb Strong fan</p>