

Gr. 5 - Understanding Matter & Energy

Conservation of Energy and Resources

Solar Cooking

Specific Expectations:

1.1 Analyse the long-term impacts on society and the environment of human uses of energy and natural resources, and suggest ways to reduce these impacts.

2.1 Follow established safety procedures for using tools and materials.

2.3 Use technological problem-solving skills to design, build, and test a device that transforms one form of energy into another and examine ways in which energy is being “lost” in the device.

2.4 Use appropriate science and technology vocabulary, including *energy*, *heat*, *light*, *sound*, *electrical*, *mechanical*, and *chemical*, in oral and written communication.

3.1 Identify a variety of forms of energy and given examples from everyday life of how that energy is used.

3.2 Identify renewable and non-renewable sources of energy.

3.3 Describe how energy is stored and transformed in a given device or system.

3.5 Explain that energy that is apparently “lost” from a system has been transformed into other energy forms.

Big Idea (for lesson):

Students investigate an example of energy change by developing their own “solar cooker”, and look into evidence of chemical changes and their general effects on the environment.

Accommodations:

- Increase time
- Visual Aids
- Manipulatives
- Chunking
- Step-by-Step
- Scaffolding
- Copy of Notes
- Student Grouping

Differentiated Instruction:

- Content: Use demo to show the content as you offer verbal descriptions.
- Process: Have students work in pairs and support each other if physical impediments exist.
- Product: Students may show their final product in pairs, and communicate their findings either verbally, visually, or through written means.
- Other: _____

Bloom's Taxonomy:

- Knowledge
- Comprehension
- Application
- Analysis

Multiple Intelligence:

- Verbal/Linguistic
- Logical/Mathematical
- Visual/Spatial
- Bodily/Kinesthetic

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- Synthesis
 Evaluation

- Naturalist
 Musical/Rhythmic
 Interpersonal
 Intrapersonal

Delivering The Lesson:

Portion & Timing	Grouping:			Introduction:	Materials
Minds On: 15 mins	W <input checked="" type="checkbox"/>	S <input checked="" type="checkbox"/>	I <input type="checkbox"/>	<p>Introduce students to the notion of conservation and transfer of energy by demonstrating the motion of a roll can (either build your own widget of it, or show the video)</p> <p>Teacher can circulate and ask questions of the different groups:</p> <p>-What do you think happens to the internal workings of the roll can as it's pushed? (<i>Answer: The elastic winds up tightly, but the bolt actually stays the way it is and the elastic spins around it.</i>)</p> <p>-What kind of energy do you put into the system? (<i>Answer: Kinetic energy to make the can move</i>)</p> <p>-What kind of energy does it change into? (<i>Answer: mostly elastic energy, but also some sound and friction before turning back into kinetic.</i>)</p> <p>-Would this keep going forever? Why or why not? (<i>Answer: No, because energy is being lost to friction and sound, so eventually it will not have enough energy to keep rolling.</i>)</p>	Roll Can & Solar Cooker – Magic Rollback Can – Sick Science! #-51.mp4
Action: 20 mins	W <input checked="" type="checkbox"/>	S <input checked="" type="checkbox"/>	I <input checked="" type="checkbox"/>	<p>Have students build their Solar Cooker according to the instructions on the handout.</p> <p>Teacher can circulate and ask questions of the different groups:</p> <p>-What properties of air allow for a dehydrator to work? (<i>Answer: When air is heated, it rises.</i>)</p> <p>-Would a dehydrator/solar cooker be practical on a larger scale? (<i>Answer: only</i></p>	Solar Cooker Handout (Materials listed)

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				<p><i>if they could be made very efficient and of cheap materials.)</i></p> <p><i>-Is Canada an ideal location for solar cookers? (Answer: during the summer, yes. The tilt of the earth's axis actually lines us up better at this time. The equator would overall be better as a location.)</i></p>	
<p>Consolidate: 5 mins</p>	<p>W <input checked="" type="checkbox"/></p>	<p>S <input type="checkbox"/></p>	<p>I <input type="checkbox"/></p>	<p>Teachers can end the class with a quick discussion of alternate sources of energy besides solar energy, and list the pro's/con's of these sources on chart paper (ie: biofuel, fossil fuels, wind, hydroelectric, nuclear, etc.)</p>	<p>Chart paper Markers</p>