**An Energy Debate**

**Summary:**

This is a two day activity plan.

 Day 1: After a PowerPoint presentation covering energy resources students will complete the “An Energy Debate” student worksheet.

Day 2: Students will interact with the instructor while navigating a PowerPoint presentation to teach them energy inefficiencies in the home. Then they will break into groups (teams) and compete to design the most logical and energy efficient house plan. The winning team will receive an “Energy Star” award.

**Subject:**

* Science:
	+ TEKS: 6.7 A- Research and debate the advantages and disadvantages of using coal, oil, natural gas, nuclear power, biomass, wind, hydropower, geothermal, and solar resources.
	+ TEKS: 6.7 B- Design a logical plan to manage energy resources in the home, school, or community.

**Grade Level:**

* Target Grade: 6
* Upper Bound: 8
* Lower Bound: 6

**Time Required:** Two Class periods of about an hour each.

**Activity Team/Group Size:**

* Day 1: No groups, PowerPoint should be shown to the entire class, and the activity worksheet should be completed individually.
* Day 2: Groups of 2-3 for energy efficient house plan design contest.

**Materials:**

* Day 1
	+ Pencil/Pen
	+ “An Energy Debate” student worksheet
* Day 2 (Per group)
	+ Pencil/pen
	+ Graph Paper
	+ “Be the Change” student notes page

**Reusable Activity Cost Per Group [in dollars]:** All materials about $1 per student for paper.

**Learning Objectives:**

* To teach students about different energy sources as well as their advantages and disadvantages. To make students aware of the need to conserve energy, how it is produced, and how it affects the environment.

**Lesson Introduction / Motivation:**

* Day 1:
	+ Introduce the lesson with the “An Energy Debate” PowerPoint. Ask students if they know what the concept of energy production means. Have they heard it being used in the media? Explain that energy is what powers our current lifestyle, it is the reason that the lights come on when you flip the switch, etc.
* Day 2:
	+ Address the most commonly asked questions from the Day 1 exit activity. Then grab students’ attention by opening the “Be the Change” PowerPoint on the projector. Ask students if they currently do anything at home to conserve energy. Ask them to brainstorm ways that they already know of to conserve energy in their homes. This will give you a gauge to grade the quality of their answers during the home designing activity. Then begin the lesson plan.

**Lesson Plan:**

* Day 1:
	+ After introducing the lesson as stated above begin the “An Energy Debate” PowerPoint presentation. Keep students attention throughout the presentation by clicking through slides and pausing between the appearance of the title on the slide and its explanation text. Take time to ask the students what they know about the title on the slide, can they teach you anything? Be sure that there is class participation during the presentation.
	+ Remember that the slides with black boxes in the PowerPoint Presentation have videos attached; you can play the videos by clicking once in the black box. All videos are short, 3 minutes or less, and very informative and attention grabbing.
	+ After the presentation distribute the “An Energy Debate Student Worksheet”, have students try to fill it out individually. Allow 10-15 minutes for students to work individually, then collect the worksheets and begin the exit activity (This is found in the Day1 lesson closure section below).
* Day 2:
	+ When beginning the PowerPoint presentation tell the class that they will be applying what they learned on Day 1 to a home environment. Instruct them to pay attention to the energy inefficiencies in the home, and take complete notes on their student notes page because they will be designing an energy efficient home!
	+ Call on students to read slides during the presentation to hold student attention. After presenting a new way to save energy, ask students if they already implement this in their home already.
	+ At the end of the PowerPoint is the student assignment. Break students into groups of 2-3 depending on class size. Explain the home design contest as follows:
		- Now it’s your turn to be the change! You and your group members will design an energy efficient home on graph paper using your new energy saver knowledge. You must explain all aspects of the home that make it energy efficient, Ex; If you draw an energy efficient window on your house it must have an arrow to the window with the explanation that it is high-performance with protective coatings. The instructor will not assume that the part of the home drawn is energy efficient unless an explanation is given.
		- This is a contest; the home that has the most energy efficient qualities will win the “Energy Star” Award!
	+ It is up to the instructor’s discretion if only one group wins, or if the entire class gets “Energy Star” certificates for their home designs. Another option is to display the home designs as decorations for the classroom as well.
	+ After the assignment is explained have the students work on their designs until about five minutes before the bell, then stop the class and begin the exit activity (lesson closure).

**Lesson Closure:**

* Day 1:
	+ For students to leave class at the end of the period there will be a 3-2-1 activity. Ask each student to use a sheet of notebook or scratch paper and pen or pencil. Write down 3 things they learned, 2 things they have a question about, and 1 thing they want the (you) the instructor to know. Collect these as students leave class, and before introducing the Day 2 lesson address the most frequently asked questions from this activity with the class.
* Day 2:
	+ The exit activity will be “Numbered Heads Together”, keep students in their home design groups. In their groups they will create a list of 3-5 things that they learned from the lesson. Then call on one member from each group to report to the class something that they learned. Have them turn the list in as they exit the classroom. This will provide another way to gauge student grasp of the lesson.

**Assessment:**

* Day 1:
	+ Grade all student worksheets for accuracy, and assess the students’ ability to grasp the information based on completeness of their answer.
* Day 2:
	+ Grade house designs for completion. Asses the students’ ability to grasp the information based on the correctness of their item descriptions on the house. Give bonus points for student participation during the PowerPoint presentation, and for creativity of design. Remember to reward the winning group with their Energy Star certificates.

**Vocabulary / Definitions:**

* Nonrenewable**:** energy that comes from a natural resource which cannot be produced, grown, generated. Once used there is no more remaining. These resources often exist in a fixed amount and are consumed much faster than nature can create them. Examples are fossil fuels and nuclear power.
* Renewable:energy which comes from natural resources such as sunlight, wind, rain, tides, and geothermal heat, which are renewable (naturally replenished).
* Inexhaustible: energy unable to be used up because existing in abundance. Examples are wind and tidal energy.

**Background and Concepts for Teachers:**

* Read over the definitions above, and click through the PowerPoint presentation alone before presenting it in class. Be sure to have a grasp of each power resource concept to be able to field student questions if needed. Also, research before Day 1 of the lesson; find if there are any renewable power plant resources in your area. If so, inform the class of these local plants.

**Lesson Scaling:**

* To modify the lesson if time is running short, the group house designing competition could be an individual take home homework assignment.

**Multimedia Support and Attachments:**

* There is a PowerPoint attached for the lesson presentation of both lesson days.

**References:**

* https://docs.google.com/present/view?id=df477447\_565fg7pn7gh&pli=1
* http://www.energystar.gov/index.cfm?c=kids.kids\_index
* http://www.energyright.com/tips.htm
* [**http://pbskids.org/dragonflytv/games/game\_dogbreeding.html**](http://pbskids.org/dragonflytv/games/game_dogbreeding.html)
* [**http://pbskids.org/dragonflytv/games/game\_dogbreeding.html**](http://pbskids.org/dragonflytv/games/game_dogbreeding.html)
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Please email us your comments on this lesson:
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Please include the title of the lesson, whether you are a teacher, resident scientist or college faculty and what grade you used it for.

**Teacher’s Comments:**