

Summer 6-2017

Energy Forms (5th grade)

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Unit: Energy Forms
Grade: Fifth grade

Stage 1: Desired Results

Understandings

Students will understand that...

...energy adds value to the space and lives around them.

... “Energy and persistence conquer all things.” -Benjamin Franklin

Essential Questions

Knowledge & Skill

How does energy impact life on Earth?

Why are alternative forms of energy valuable?

(NEISD scope & sequence; TEKS; Core; etc.)

5.6A explore the uses of energy, including mechanical, light, thermal, electrical, and sound energy
5.7C identify alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels
5.1B make informed choices in the conservation, disposal, and recycling of materials
5.3C draw or develop a model that represents how something works or looks that cannot be seen such as how a soda dispensing machine works

Stage 2: Assessment Evidence

Performance Task: **Saving The Wump World**

Present the students with the following scenario: You have been sent from your planet to find a new place for your species to live. You have found the Wump World after the Pollutians have abandoned it and the Wumps have begun to explore what was once their planet. Your ultimate goal is to create a viable energy plan, including alternative forms of energy, for the Wump World which allows for your species to co-exist with the Wumps. Your plan must include a list of resources available on the planet and how you are going to use these resources to promote life on the new Wump World. Finally, design a poster demonstrating a happy coexistence between your species and the Wumps. Examples of energy being harnessed should be evident.

Other evidence:

(quizzes, tests, academic prompts, self-assessments, etc.

note – these are usually included where appropriate in Stage 3 as well)

Ticket out the door

Journaling

Observing

Check for understanding

Peer evaluation

Stage 3: Learning Activities

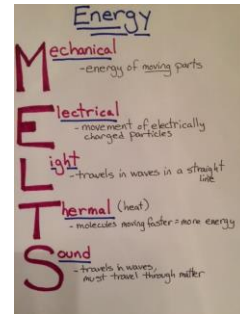
(Steps taken to get students to answer Stage 1 questions and complete performance task)

Lesson 1: Pre-assessment: **What is energy?**

Show the following video: <https://www.brainpop.com/science/energy/energysources/>

Brainstorm a list of the various types of energy and how they are used. Have students, in groups, categorized the types of energy in categories that they create. Students will share their categories and explain their reasons for the categories. After hearing everyone's reasoning, come up with a class consensus for the energy categories. Add the categories and types of energy into Science Notebook.

Lesson 2: **M.E.L.T.S.**



In science notebook, create an anchor chart similar to this one.

After charts are made, have students in partners or groups create hand movements to symbolize each type of energy. Connect the categories created in Lesson 1 with the new MELTS categories.

Lesson 3: **The Lorax**

Show students the following quote: “Be the change you want to see in the world.” -Mahatma Gandhi. Students will quickly interpret the quote in their Response Journal. Students share interpretation with partner, then share out with class. After discussion, have students reflect, in their Response Journal, on what change they would like to see in the world. Share entries with partner, then again, with the group.

Read aloud: The Lorax by Dr. Seuss.

Class discussion: How can the boy in the story now “change the world”? Why is this change necessary? What should the Once-ler have done differently? Is it possible for Once-ler, his family, and the creatures from the story to coexist? How?

What types of energy were used in the story? Would the story have had a different result if different types of energy had been used?

Ask students if they have any other questions to discuss.

After class discussion, have students return to their Response Journal and answer the following question: How does energy impact life on Earth?

Lesson 4: **The Thneed Machine.** How did it work?

Students will recall Lesson 3 and the various machines in the book, The Lorax. Each student will choose one of the machines used by the Once-ler (the vehicles, the Thneed maker, any machine not necessarily seen, but visualized by the student or a new and improved Thneed machine). The students will illustrate the machine, then make a second illustration of a cross section of the machine with details on how the machine will work?

Lesson 5: Benjamin Franklin.

Students will go to the following website: <http://www.ushistory.org/franklin/science/> . Students will create a Google Slides presentation explaining Benjamin Franklin’s contribution to science with the following: bifocals, electricity, Franklin Stove, Mapping the Gulf Stream, Swim Fins, and the Glass Armonica. Along with the explanation, the students will label each contribution to the form of energy it is best suited (MELTS). Answer the following question on the last slide: How did Benjamin Franklin use energy to impact life on Earth? How did Benjamin Franklin’s persistence influence the world?

Lesson 6: My Home, My Energy Usage.

Students will brainstorm a list of all the types of energy they use in their home in their Response Journals. Have students fill out the MELTS chart with their responses in their Science Notebook. Note: more than one form of energy may be checked.

	t.v.	heater											
M.													
E.	*	*											
L.	*												
T.		*											
S.	*												

Response questions after the chart has been filled out.

Why did some types of energy need more than one spot?

Were there some examples of energy that did not fit in any of the MELTS categories? What type of energy would best fit this example?

Lesson 7: Alternative Forms of Energy

Students will take out their MELTS chart from Lesson 5. Make a list on the board of the examples of energy that did not fit into the MELTS chart.

Watch the following videos on alternative forms of energy.

<https://www.youtube.com/watch?v=KEeH4EniM3E> and/or

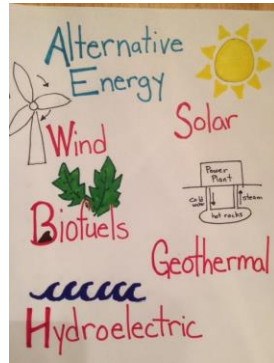
<https://www.youtube.com/watch?v=oIU5fFmDeSc>

Do any of the missing examples fit into any of the alternative energy forms?

Students enter the following chart into their Science Notebooks.

Alt. Energy	Definition
biomass	plant material that is burned for its energy
geothermal energy	comes from the heat within the Earth
hydroelectric	generated by moving water
wind	wind turns rotating machines, called turbines, to change the wind's kinetic energy into electrical energy
solar energy	radiant energy of the Sun, often turned into electrical energy with the help of solar cells

Students will create an anchor chart based on the information in the above chart. In partners, students create hand movements for each alternative form of energy.



In order to demonstrate how alternative forms of energy are used around the world show the following video. <https://www.youtube.com/watch?v=SrmsQzRQPPw>

Lesson 8: **Natural Resources.** What role do resources play in improving life on Earth? Watch <http://studyjams.scholastic.com/studyjams/jams/science/energy-light-sound/natural-resources.htm> or <https://www.brainpop.com/science/energy/naturalresources/>

Read the following article on natural resources: <http://www.eschooltoday.com/natural-resources/what-is-a-natural-resource.html>

Following the setup of the article/website, have students create the following chart in their Science Notebook. After reading each section, students will write down the main idea of each section.

Topic	Main Idea
What is it?	
Types of Natural Resources	
Role/Use of Natural Resources	
Distribution of Natural Resources	
Threats to Natural Resources	
Conflict/Problems	
Resource Recovery	

Conservation of Natural Resources	
Did you know?	

Students will then answer the following questions in their Science Notebook.

Why is conserving natural resources important?

What can you do at home to conserve natural resources?

What steps should we take to conserve resources in our classroom?

Lesson 9: **The Wump World**

Read aloud: The Wump World by Bill Peet or watch it

<https://www.youtube.com/watch?v=PORV4ZnKwDA>

Place students into groups of 4 to 6. Write down the following questions and place them in a Discussion bag.

*In your world, neighborhood, school, home, are you a Wump or a Pollutian? Explain.

*How did the Pollutians use energy to impact life on the Wump World?

*Were the Wumps too passive? What choices might have improved their lives? Would it have mattered to the Pollutians?

*What are some alternative energy choices that the Pollutians could have made?

Have students pull out one question at a time and have each student give an appropriate response with time for follow up questions and comments.

After all discussions have completed, have students reflect on the following question in their Response Journal: How does energy impact life on Earth? Why are alternative forms of energy valuable?

Performance Task Rubric

	Approaches	Meets	Exceeds
The energy plan is sustainable.	Energy plan leaves many unanswered questions.	Energy plan is well thought out.	Energy plan is thorough and benefits both species.
Alternative forms of energy are used.	1 alternative form of energy is used	2-3 alternative forms of energy are used	more than 3 alternative forms of energy are used
Your species and the Wumps co-exist.	Both species co-exist, but separately	Both species work together	Both species work together and will prosper
Poster	Few examples of the energy plan in progress	Many examples of the energy plan are illustrated	Strong evidence of energy being harnessed is illustrated.
