

Q405: Saturday Science Session 2

Lesson Topic: Sources of Energy

Grade level(s): 1st & 2nd

Instructor Names

Desired Results	
Overarching Focus Question for the Session (<i>the phenomenon being explored across the 3-weeks</i>) <ul style="list-style-type: none">How do we use energy in our everyday lives?	
Central Focus/Topic for today: Students will understand: <ul style="list-style-type: none">Three natural sources of energy (sun (solar), wind, water) Therefore, the guiding question for today's learning is: <ul style="list-style-type: none">How do we get our energy?	Relationship that this central focus has to the overarching big idea/question for the unit <ul style="list-style-type: none">As the students are creating and experimenting with the different items that they are creating, they are able to get a better understanding of the different sources of energy. They are able to see how we use the various sources of energy in our daily livesThey will begin to understand the transformation of energy (solar → electrical) and how that connects to their everyday lives (ex: heating their house, lighting their lamps, etc.)
Student objectives (outcomes): <i>(Remember, this is like the performance expectation statement in the NGSS, so you need to be incorporating Science Practice in this/these statement(s).)</i> Students will be able to: <ul style="list-style-type: none">Explain three natural sources of energy and how they apply to their everyday livesExplain how natural/renewable resources can be used for energyDevelop/create a model that represents the sources of energy and what they doInvestigate how the sources of energy are used in moving a boat, spinning a pinwheel, and lighting a house	
Timeline of Activities for the Day	
<i>*Provide a breakdown of how long each activity will take, who will lead the segments of the activities, when breaks will occur or other transition points, etc.</i> <i>*Identify by highlighting in blue the portion of the lesson you team wants video-recorded each week. This should be ~45 mins</i>	

9:30- 9:40→ Review expectations and write them on anchor chart paper. We will create new expectations as a class if needed.

9:40- 9:50 → Show BrainPop video/ discussion

9:50- 10:35 → Split into 3 groups to make pinwheels and boats for the Jordan river () will lead one group, () will lead another group, and () will lead the third group)

10:35- 11:00 → Bathroom/ snack break

11:00-11:10 → Transition to outside

11:10- 11:40 → Go outside to test the boats in the Jordan River and pinwheels in the wind

11:40- 12:00 → Come back inside for discussion

Learning Plan (First three E's of the 5E model)

Any of these phases can be repeated should you have more than one activity to describe OR a complex activity with multiple iterations of some phases.

ENGAGE

→ Video

- ◆ Students will be watching a BrainPop video to remind them of the different sources of energy which were introduced last week.
 - <https://www.brainpop.com/science/energy/energysources/> (Sources of energy)

EXPLORE

→ Sources of Energy Stations

→ () and () will each be leading their own small groups of about 8 students each. All three types of energy will be discussed and all three models (pinwheel, house, boat) will be done at one table group, without rotating.

Description of Stations:

◆ Wind (Pinwheel)

- Students will use the pre-cut paper, pins, and pencils to create their own pinwheels with the help of the teacher. The teachers will attach the pins so students do not get hurt assembling their pinwheel.

◆ Sun (Solar panels lighting a house)

- Students will be building their one miniature house out of popsicle sticks and play dough. After they do this, they will be attaching the solar panel to the light bulb. The light bulb goes inside of the house. Teachers will assist students with attaching the solar panels if needed.

◆ Water (Boat)

- Students will be creating boats out of aluminum foil. They will be given pieces of foil and will have to fold it into a boat shape so the water can push it down river. Teachers can help students design their boat in a way that floats if students are having trouble.
- Each teacher will provide information/background about the three types of energy as students are creating their pinwheels, boats, and houses in preparation for the investigation portion of the lesson

EXPLAIN

→ Investigation Outside

- ◆ **Wind**→ teachers will find a windy area to demonstrate to the students how the wind is traveling through the pinwheel to make it spin.
 - **Questions:** Why is the pinwheel moving? What kind of energy is this? How do you know? Can you think of any other examples where wind energy is used? How do you think it works?
- ◆ **Sun**→ students will find sunlight to hold up the solar panels to in order for the lightbulb to illuminate.
 - **Questions:** How is the sun causing the lightbulb to light up? How do you think this happens in real life too? In your home? What are other examples of things that use energy from the sun?
 - If it is not sunny, lamps can be used as the solar energy, but explain how it is similar
- ◆ **Water**→ teachers will find an area of the Jordan River that is less crowded, more comfortable for students to stand together if possible, and one with good water flow. Place the boats in the water and have them float to show how the water is moving the boat. If it is too much, have the teachers and volunteers be the ones to place the student's boats in the water and be the ones to retrieve it.
 - **Questions:** How are your boats moving? What do you think is affecting the speed of the boat? What would happen if the flow was faster? Slower? Does the shape/ size of the boat matter? What are other examples where water is used as an energy source?

ELABORATING/EXTENDING Understanding

→ Teachers will lead a follow-up discussion back inside the class

- ◆ Do we use these sources of energy in our daily lives?
 - How so? How have you experienced/interacted with wind, water, and sun?

◆ What other sources do we get our energy from?

Assessment Evidence (*This is the Evaluation Phase of the 5E approach)

Performance Task(s):

- **Assembling the representations of energy**
- **Investigation of energy**→ What is causing the boat and pinwheel to move? What is lighting the house? What type of energy causes these things to happen? Why? Other everyday examples that use these types of energy?

Other Evidence:

- **Student responses-** Do they understand that we can use energy coming from flowing water, wind and the sun? We can use these sources of energy to heat our homes, charge a phone or ipad and to turn on lights.

Materials + Quantity:

- Aluminum foil- boat activity (enough for 25 boats)
- Duct tape and scotch tape (3 rolls preferred of each)
- Push pins- pinwheel activity (25)
- Pencils with erasers- pinwheel activity (25)
- Different room with lower tables/ chairs that don't go up and down (9:30-12 will be in and out of room)
- Solar panels (9 is preferred but if not, we can work with 6)
- Wires to connect solar panel to lightbulb (enough for 9 or 6 complete sets)
- Tiny light bulbs (9 or 6)
- Jars of play dough (9)
- Popsicle sticks (estimated 250)

Required Accommodations/Modifications:

- **Pinwheel**→ paper will already be cut and the teacher will use the pin to attach to the pencil, so that the students do not get injured
- A few extra of everything will be made for the students who are not successful in their attempts to make it, so that they are not left out
- If it is not sunny outside, we will use a lamp to represent solar energy and it should work the same way.

Additional Modifications for Individual Students:

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