

**Q405: Saturday Science**  
**Session 1, Lesson 3**

**Lesson Topic:** Conservation of Energy

**Grade level(s):** 1-2

**Instructor Names:** \_\_\_\_\_

<b>Desired Results</b>	
<b>Overarching Focus Question for the Session</b> ( <i>the phenomenon being explored across the 3-weeks</i> ) <ul style="list-style-type: none"><li>• How do we use energy in our everyday lives?</li></ul>	
<b>Central Focus/Topic for today:</b> Students will understand: <ul style="list-style-type: none"><li>• In what ways energy is being wasted</li><li>• In what ways energy can be saved</li><li>• How they can save energy in their schools and homes</li></ul> Therefore, the guiding question for today's learning is: <ul style="list-style-type: none"><li>• In what ways are humans wasting energy? How can we conserve energy?</li></ul>	<b>Relationship that this central focus has to the overarching big idea/question for the unit</b> <ul style="list-style-type: none"><li>• By finding wasteful ways energy is being used indoors (leaving lights on, leaving computers on...), students can apply this to their own homes and figure out ways that they can save energy</li><li>• In a similar way, when students find wasteful ways energy is being used outdoors (leaving cars running while parked...), students can be more aware at home of ways they could save energy and be more environmentally friendly</li></ul>
<b>Student objectives (outcomes):</b> <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"><li>• Observe how humans are wasting energy both indoors and outdoors by carrying out an investigation/scavenger hunt, working both individually and as a group</li><li>• Analyze the ways in which energy is being wasted and apply that knowledge to figure out ways that we can reduce the amount of energy that is being used</li><li>• Plan and design a device in a way that uses what they have learned about energy so far in order to build their design with the least amount of energy</li></ul>	

## Timeline of Activities for the Day

*\*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.*

*\*Identify by **highlighting in blue** the portion of the lesson you team wants video-recorded each week. This should be ~45 mins*

9:30-9:40 Review of expectations/ intro

9:40- 10:40 Wasted Energy Scavenger Hunt (inside and outside)-

10:40- 11:10 Snack/ bathroom break

**11:10-11:40 Building bottle device- small groups (each group will have their own groups)**

**11:40-12:00 We will be going outside to test items and then facilitate a discussion about this activity**

## 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**

- Review the definition of energy in students' words→ What is energy? What are some of the things that we have discussed over the past two weeks that use energy?
- Review the sources of energy→ What are some of the natural sources of energy we talked about last week? How did we see these sources use energy? What do you think are other sources of energy?

### **EXPLORE**

- **Wasted Energy Scavenger Hunt**→ We will split the students up into two groups. One group will be led by \_\_\_\_\_ and \_\_\_\_\_ and the other group will be led by \_\_\_\_\_ and \_\_\_\_\_
  - **Part One**→ Students will explore around the inside of the School of Education building and find ways that energy is being wasted
    - For example→ lights being left on with nobody in the room, computers on after you're done using them
  - **Part Two**→ Students will take the investigation outside and find ways that energy is being wasted in areas near the School of Education
    - For example→ cars on just sitting (stop light, waiting for somebody, etc.), lights being left on outside
  - Students will record their findings on paper using a clipboard provided by the teachers so that they will be more prepared for the discussion later in the activity

- One group will begin their investigation inside and the other group will begin outside. After about halfway through the scavenger hunt, we will come back together as an entire class and discuss what students were finding. After this discussion, we will switch (whoever was inside will go outside and whoever was outside will go inside). We will let the students know that our goal is to see if anything can be found that was not discussed previously. After their second part of the scavenger hunt, we will once again come back together as a whole class and discuss the additional things that were observed. What are some of the things in which you discovered are wasting energy? How did you know that energy was being wasted? Why do you think that?
  - Each team will get a point for each of their observations

### **EXPLAIN**

- In between each of the rounds, the teams will **discuss** their findings on what was wasting energy, as stated above
  - After students list things, teachers will ask questions
    - What happens when \_\_\_\_\_ (for example, the light is left on)
    - How do you know that \_\_\_\_\_ is wasting energy?
    - Is it helpful to us that \_\_\_\_\_ (for example, that the light was left on) Why or why not?

### **ELABORATING/EXTENDING Understanding**

- What do you think are ways that we can save energy based on what you observed during the scavenger hunt?
- How do you think you can save energy at school? At home? In the community? In the world?

### **ENGAGE**

- Review what energy can do, emphasis placed on the fact that energy can move things
  - This is based on what we observed/learned last week when they were creating their pinwheels and boats. When they blew on their pinwheels, it caused the pinwheel to spin. When they were running outside, the wind caught the pinwheels allowing it to spin faster. If we were able to test our boats in the Jordan River, they would have observed the water using a force, causing the boat to move.
  - **Discussion Questions**→ What uses energy? Lights? Cars? Pinwheels? How do you know those are using energy? What will cause the bottle cars to move? Wind? Gravity? Will it be easier for the car to move if you're on a flat surface or a hill?
- Have students brainstorm what materials will work best for certain purposes → buttons or bottle caps for wheels, paper clips/ rubber bands to hold things together. What

shape will work best for wheels? What will work best to connect the wheels to the bottle? What's one reason the car might not work/ roll?

- Teachers can guide this discussion, but we would like to see them explore with the materials first before we simply tell them what materials would be best for wheels, to connect materials together...

### **EXPLORE**

- Break the students into pairs
- Each pair will receive a bottle as well as the other materials
  - The goal of this to to have the students create a device in which the bottle can move using the least amount of energy
- Once the teams have made their energy-saving device, we will take them outside to present their devices and demonstrate/explain how it moves

### **EXPLAIN**

- After students present their devices, it is time for discussion
  - What did you think about when designing your device? How did you decide to build it?
  - How does your device save energy? What evidence shows that this is the case?
  - How can you see the amount of energy being used in your device?
  - What is the source of energy used to move your bottle?

### **ELABORATING/ EXTENDING Understanding**

- Now that you have seen what other people have done, would you want to go back and change what you made? If yes, how would you change it? If no, why not? What's a way that you could better your car?

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

### **Performance Task(s):**

- Create a device in which the bottle can move using the least amount of energy

### **Other Evidence:**

- During the scavenger hunt discussions, teachers can assess student understanding based on what students are observing about wasted energy sources→ are they applying their knowledge of what energy is to find wasted energy? Are they finding ways that they could save energy? (ex: turning off the lights, energy saving modes)

- During the discussions, teachers will be able to assess the students' understanding on why a car worked or didn't work.

**Materials + Quantity:**

- Printer paper (24 pieces)
- Pens/ writing utensils (24)
- Clipboards or something to write on as they are walking (24)
- Empty water bottles with tops still on (12)
- Popsicle sticks
- Paper towel tubes
- Buttons
- Straws
- Masking Tape
- Rocks
- Pennies
- Play dough
- Paper clips
- Balloons
- Rubber bands

**Required Accommodations/Modifications:**

- If the weather is not permitting, we will stick to an indoor only scavenger hunt with two groups. Each group will see how many things they can find that uses energy, and we will come back as a group to see which team found the most.
- If the students finish with the scavenger hunt before the hour is up, we can add this extra time on to creating their energy-efficient devices.

**Additional Modifications for Individual Students:**