

Superhero Energy Explorations

Teacher: Ms. Dion, Ms. Erben, Ms. Gallegos, Ms. Gonzalez, Dr. Jeffery, Ms. Hernandez, Ms. Moore, Ms. Phillips, Ms. Prestero, Ms. Taylor

Date: November 11th, 2016

Subject / grade level: Science /3rd Grade & 4th Grade

Location: room 207B at Henry B. Gonzalez Convention Center

Materials:

Student Journal Handouts
Wind up toys
Water Speakers
Operation Game
Hot and Cold water
Food coloring (red and blue)
Hot plate and kettles to heat water
Cups and bowls for water
Batteries
Wires
Light bulb
Card Sort cards
Timers
Station tents
Circle Map

TEKS: 3.6 Force, Motion, and Energy. The student knows that forces cause change and that energy exists in many forms. The student is expected to:

(A) explore different forms of energy including mechanical, light, sound, and heat/thermal in everyday life.

4.6 Force Motion, and Energy. The student knows that energy exists in many forms and can be observed in cycles patterns, and systems. The student is expected to:

(A) differentiate among forms of energy, including mechanical, sound, electrical, light, and heat/thermal

ENGAGEMENT (Kim) (5 minutes)

1. Ask questions about their knowledge of energy:

Superhero Energy Explorations

- a. What is energy? (the power to do work)
- b. What gives you energy to move? (eating food & drinking water)
- c. How do the lights in the room turn on? (electricity)
- d. Where do you see examples of energy in your own life? Have students share in small groups. (driving a car, running a race, playing sports)

2. The teacher will capture the student's interest by showing a video, 'Where Does Energy Come From?'

https://www.youtube.com/watch?v=aUa7I7D_myU- . The teacher asks the students to listen for three types of energy while they watch the video.

EXPLORATION

1. The students will explore 5 different stations consisting of the 5 forms of energy. They will use a guided activity sheet to record their observations at each station.

Station Rotations (5 minutes at each station for a total of 30 minutes with transitions)

1. **Mechanical Energy (Angela and Erin):** The students will play with windup toys to explore mechanical energy.

Directions:

1. Wind up the toy, place it on a flat surface, and watch it move.
2. Complete section A below. (predict what the inside of the toy looks like)
3. Now look at the inside of the toy.
4. Complete section B below. (draw what the toy actually looks like)

2. **Sound Energy (Amanda and Adriane):**

(Water Speakers):

- 1) Plug in the water speakers.
- 2) Press 'Play' on the phone.
- 3) Adjust the volume on the phone.
- 4) Play a fast song.
- 5) Play a slow song.
- 6) Record your results.

3. **Light Energy (Robyn and Katie):** The students will use a flashlight to

Superhero Energy Explorations

explore light energy. The flashlight has the Batman symbol on it. Adjust the distance from the construction and use your flashlight to make three different shapes appear on the desk.

Directions:

- 1) Turn on flashlight.
- 2) Hold the flashlight close to the construction paper. Record your results.
- 3) Hold the flashlight at eye level. Record your results.
- 4) Tilt the flashlight at an angle. Record your results.

4. Thermal/Heat Energy (Kim and Maria): The students will explore heat energy by using food color and water. The students will put droplets of cold and hot water to see the distribution of the energy by looking at the food color in the hot water bowl and the cold water bowl.

Directions:

- 1) Place 6 drops of blue food coloring in the cold water. Record your observations.
- 2) Put 6 drops of red food coloring in the hot water. Record your observations.

5. Electrical Energy (Monique and Tonya): The students will use a battery, wires, and light bulb to explore electrical energy.

Directions A (3rd Grade - Lighting the Bulb):

1. Open the ziploc bag that contains your electrical kit. You should have 1 battery, 1 wire (foil), and 1 light bulb in your kit.
2. Draw a prediction of how you can arrange the materials to light the bulb.
3. Try to complete the circuit by lighting the bulb!
4. Record your results of how you were able to light the bulb.

Superhero Energy Explorations

EXPLANATION (7-10 minutes)

- I. Students will explain their findings from the lab stations activity to the entire class. The teacher will allow students from each table to share their findings.

II. Operation Game (Robyn)

The teacher will show the students the operation game. She will ask the students questions about the game, and connect the new knowledge to their previous knowledge and experiences. She will ask:

- How many of you have played the game Operation?
- What types of energy are used in this game?
- Can you point to me which part of this game is demonstrating electrical energy? (buzzer)
- Can you tell me another time you have noticed electrical, sound, or light energy? (connecting to schemata)
- Light energy: How do you see light energy demonstrated in the operation game? Where is another place you have seen light energy?
- Sound energy: Have you ever heard your voice or someone else's voice echo on walls? (sound energy traveling explanation)
- Heat and/or mechanical energy: Do you see a way that you could add another form of energy into the game?
- Why do you think there is a piece of plastic at the end of the tweezers? Tell a buddy.

The students will be able to explore the game to explain the different forms of energy.

Superhero Energy Explorations

ELABORATION (7-10 minutes)

Card Sort Activity (Monique):

The students will be playing a card sorting game consisting of the names of the forms of energy, definitions, and pictures to represent the forms of energy.

Answers for Clip Art Pictures:

Sound Energy: Radio, thunder, talking (radio could be electrical also)

Electrical Energy: Static, Lightning, Battery

Mechanical Energy: Chewing, frog hopping, Car

Light Energy: Candle, Glow Stick

Thermal/Heat Energy: Fire, Toe Warmers, Heater

EVALUATION (Angela) (7-10 minutes)

Circle Map (Handout)

After the students have gone through the forms of energy STEM lesson they will demonstrate they have achieved the lesson objective by completing a circle map including the five different types of energy. The students will write down the examples of the different forms of energy observed in today's lesson.

Explain the new knowledge they received during the lesson.