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| **Teacher:** Ms. Bennet, Ms. Blair, Ms. Cruz, Dr. Jeffery, Ms. Moore, Ms. Pardom, Ms. Pedrazine, Ms. Silvas, Ms. Ybarra |
| **Date: October 22,2015** |
| **Subject / grade level: Science /3rd Grade & 4th Grade** |
| **Materials:**  Student Journal Handouts  Quick Write Handouts  Wind up toys  Mirrors  Laser pointers  Tone generators  Operation Game  Snap circuit activity board  Computers  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  Vocabulary cards  Station tents with rules and procedures |
| **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 (5 minutes)**     1. Ask questions about their knowledge of energy:    1. What is energy? (the power to do work)    2. What gives you energy to move? (eating food & drinking water)    3. 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 on forms of energy using United Streaming.  · United Streaming: Types of Energy or <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: 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 one of your lab sheet.**     **2.** **Sound Energy: The students will be using tone generators and rice to see the sound energy in vibrations. The students will be able to adjust the tone generators and see how the rice moves as the tone generator is set to high and low.**  **Directions A (Tone Generator):**   1. **Plug adapter into speaker.** 2. **Turn on the machine.** 3. **Turn the volume on low, then high. Record your results.** 4. **Turn the pitch on low, then high (for 1 second). Record your results.** 5. **Turn machine off.** 6. **Unplug the adapter from speaker.**   **Directions B (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. **Adjust the volume.** 6. **Record your results.**   **3.** **Light Energy: The students will use a flashlight to explore light energy. 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: 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: The 3rd grade students will use a battery, wires, and light bulb to explore electrical energy. The 4th grade students will be able to explore electrical energy by using the snap circuit activity board.**  **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. **Try to complete the circuit by lighting the bulb!** 3. **Record your results of how you were able to light the bulb.**   **Directions A (4th Grade - Snap Circuit Kit):**   1. **Flip the switch to turn the circuit board ON.** 2. **Observe what happens. Record your results.** 3. **Turn OFF the circuit board.** 4. **Remove one of the #2 connectors. Turn the circuit board ON.** 5. **Observe what happens. Record your results.** 6. **Turn off the circuit board.** 7. **Replace the #2 connector.** |
| **EXPLANATION (7-10 minutes)**   1. **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**  **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 Operation?** * **What types of energy are used in this game?** * **Can you point to me which part of this game is demonstrating electrical energy? (sound, and light)** * **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 heat energy or mechanical energy into the game? How?**   **The students will be able to explore the game to explain the different forms of energy.** |
| **ELABORATION (7-10 minutes)**  **Card Sort Activity:**  · **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 (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.** |