

4th Grade – Physical Science: Energy and Waves

- Week 1
 - **Read literacy Article 2A: Do You Have the Energy for Downhill Mountain Biking** ([link](#)): Answer the questions to support understanding of stored and motion energy.
 - **Popcorn Energy** - Make a batch of popcorn and describe popcorn and 3 other types of food in your home in terms of stored and motion energy.
 - Beginning with the energy from the Sun, draw a diagram of the energy transfers and conversions that occur to make popcorn (light, heat, sound).
 - How does popcorn provide your body with energy?
 - **Table Tennis Potential—Division Story Problem:** The fourth-grade class at Shadow Brook School was working on a science unit on energy. Their teacher, Ms. Burling, took the class to the gym to discover the stored and motion energy of a table tennis game. That day, there were 20 students in class. The gym had 6 tables and a box of 15 balls.
 - How many tables did the class need to use if there were 4 students (2 teams of 2 students) at each table?
 - How many balls could be given to each table?
- Week 2
 - **Read literacy Article 3A: What Do a Wind-Up Toy, a Cell Phone, and a Doorbell Have in Common?** ([link](#)): Answer the questions to help understand energy transfer in context.
 - **Energy Use in Our Community** - Research which types of buildings in a community use the most energy and list the top 10. You will probably be surprised to learn that schools account for about 13 percent of energy use in most communities. Where do schools land in the top 10?
 - **Energy in Our Food** – List 10 types of food that eat on break. Do you notice a change in your energy depending on what foods you eat?
- Week 3
 - **Read literacy Article 4C: Should You Go Surfing During a Tsunami?** ([link](#)): Answer the questions to help further explore water waves.
 - **Concrete Poems** - A concrete poem is written in a special shape related to the theme of the poem. Write and submit a concrete poem about waves.



- **Making Sound Waves**

- Make a drum using a jar, balloon, and a rubber band. You can observe vibrations using grains of rice.
 - Cut a balloon vertically through the middle.
 - Stretch one-half of the cut balloon over the mouth of the jar.
 - Place the rubber band around the mouth of the jar to secure the balloon skin.
 - Place a few grains of rice on the skin so that when the drum is tapped (i.e., a force is applied) to produce sound, you observe the effects of the vibration.
- After you experience the model and create sounds, test the following questions:
 - What do you think would happen if you filled the jar with something? Would the sound it produces be the same?

- Week 4

- **Take Home Science Sheet** ([link](#)): **What's Energy Got to do With It?**
- **Read literacy Article 5A: Wacky Alternative Energy** ([link](#)): Answer the questions to help further explore alternative energy.
- **Geothermal Energy in Iceland** - Research the use of geothermal energy in Iceland, where 70 percent of the energy comes from geothermal sources. Answer the following
 - Why is Iceland in a good location to make use of geothermal energy?
 - How is geothermal energy used in Iceland?

- Week 5

- **Powered by Wind and Water** - Research real-life uses of wind and water energy. Examples could include learning about windmills in Holland and how they are used. Curious about hydroelectric power, look into the hydroelectric power plant at Niagara Falls, which has a long and fascinating history. Write a 1-page paper on your research.
- **Innovators in Science** – Pick a person below, research and write about why they can be called an "innovator in science."
 - Otis Boykin - <https://lemelson.mit.edu/resources/otis-boykin>
 - Easton LaChappelle - <https://www.bbc.com/future/article/20151026-a-teens-mind-controlled-arm-could-make-prosthetics-cheaper>
 - Nina Tandon - <https://www.businessinsider.com/nina-tdandon-of-epibone-grows-bones-from-stem-cells-2014-11>