5th Grade – Physical Science: Properties of Matter

- Week 1
  - **Take Home Science Sheet (link): Make More Comparisons.**
  - **Practice Displacement -** 10 mL of water has a volume equal to 10 cubic centimeters, or 10 cm^3. Using that simple conversion, you can find the volume of any shape of submersible object by measuring the displacement of water.
    - Practice finding volume using displacement at home of 5 different objects (but using only objects approved by a supervising adult).
- Week 2
  - **Read literacy Article 2C: The Life of a Snowman (link):** Answer the questions to help understand the concepts of evaporation and review state changes
  - **Ice Cream -** For a fun experience changing a liquid to a solid, make single portions of ice cream in plastic bags.
    - Place one-half cup half-and-half, one-quarter teaspoon vanilla, and about one tablespoon sugar in a durable, sandwich-size, zip-top bag. Press most of the air out of the bag and zip it closed securely. Place that bag inside a gallon-size zip-top bag with two cups of ice cubes (about one tray) and six tablespoons salt. Shake and gently toss the bag for 5–10 minutes. Tips: Play music to add fun and make the time pass more quickly. Wear gloves or mittens. Caution students against handling the bags too roughly and spoiling their snack!
- Week 3
  - **Read literacy Article 3A: Crime Scene Forensics (link):** Answer the questions to help introduce the importance of recognizing physical properties.
  - **Ice Oddity -** Water defies the expectation that the solid form of a substance is more dense than its liquid form. While the particles are locked in place, making ice rigid, ice floats in liquid water, demonstrating that the solid is less dense than the liquid form.
    - Observe ice floating in water and then research and write a paragraph that explains why ice floats in water and how this behavior differs from that of the liquid and solid states of most other substances.

        - **Liquid Layering -** Build a more elaborate density model by increasing the number of liquid layers. Use a variety of materials, in this order, honey, corn syrup, 100% pure maple syrup, whole milk, dish soap, water, vegetable oil, and rubbing alcohol. The water and the rubbing alcohol can be colored with food coloring for contrast. Add a few solids of varying densities to sink, float, or suspend in the different liquid layers. Select items such as a metal bolt, a die, a grape, plastic and metal beads, or a table tennis ball.
- Week 4
    - **Read literacy Article 4B: A Sweet but Unusual Experiment (link):** Answer the questions to help further explore the concepts of mixtures.
    - **Temperature and Solutions**
        - Design an experiment with saturation in sugar-water and saltwater solutions. Include cups, measuring spoons, water (tap, warm, and room temperature), salt, sugar, ice, thermometers, and stopwatches. Make predictions about how temperature affects the quantity of each solid that will dissolve in an amount of water and the rate at which it dissolves. Create a table in which to record your data and a graph in which to display it.
    - **Make Lemonade -** Lemonade is a simple solution of water, sugar, and lemon juice (often served as a mixture with ice).
        - Design the best-tasting lemonade. Develop recipes and we will hold a contest to select the class favorite when we return. When we return, we will have a discussion about whether it matters in what order the ingredients are mixed. (For example, if sugar is added after the ice, it takes longer for the sugar to dissolve in the cold lemon-water.)
- Week 5
    - **Read literacy Article 5B: The Great Popcorn Debate (link):** Answer the questions to help further explore physical and chemical changes.
    - **Measuring Liquids Story Problem -** Solve the following word problem: Andy used a large graduated cylinder to make a mixture of juice and then divided the mixture evenly among himself and three friends. He added 260 mL of grape juice, 200 mL of orange juice and 140 mL of apple juice.
        - Graph the milliliters of different juices on a line plot to determine the total amount of juice in the mixture. Then determine how many milliliters of the mixture each person received.

- **Water in an Emergency -** Read *Survivor Kid: A Practical Guide to Wilderness Survival* by Denise Long or similar titles. Work on your own to research the literature and use text features to find more information about making a filter or finding clean drinking water in the wilderness. Prepare an illustrated report about getting water in the wilderness and other things that are needed for survival.
- **Innovators in Science –** Pick a person below, research and write about why they can be called an "innovator in science."
    - Stephanie Kwolek - http://www.women-inventors.com/Stephanie-Kwolek.asp
    - Deepika Kurup - http://www.rsc.org/diversity/175-faces/all-faces/deepika-kurup/
    - Shawn Urbanski - https://www.fs.usda.gov/rmrs/people/surbanski