3rd Grade – Physical Science: Forces

- Week 1
  - **Read literacy Article 2C: The Sport of Curling (link):** Answer the questions to help understand how friction affects motion.
  - **Friction Forces—Story Problems -** Answer the questions.
    - Tripp, Cindy, Reed, and Diane were working on an engineering project to show the concept of friction. They built two motorized vehicles with rubber tires. Vehicle A was tested on a smooth, linoleum surface. Vehicle B was tested on a rough, carpeted surface.
      - Both vehicles traveled the same distance, but Vehicle A traveled for 30 seconds while Vehicle B traveled for 40 seconds. How much longer was Vehicle B in motion than Vehicle A?
      - Convert the seconds that each vehicle traveled into minutes by dividing and creating a fraction and a decimal.
      - Even though both cars traveled the same distance, explain which vehicle was more affected by friction and why.
- Week 2
  - **Read literacy Article 3B: Clowning Around (link):** Answer the questions to help understand how mass and force affect speed.
  - **How Many Grams? - Complete the following story problem:**
    When experimenting with forces at the science center, Kevin, Cameron, and Tana planned a physics experiment using toy cars. They gathered three toy cars that were identical in size and mass. Tana found three washers in an envelope. One washer had "1 gram" etched into it. Tana placed that washer on a green car. A second washer had "6 grams" etched into it. Cameron placed that washer on a red car. The third washer had no etching. Kevin placed this washer on a purple car. Kevin, Tana, and Cameron raced their cars on a track. The purple car moved three times faster than the green car. The red car moved twice as fast as the purple car. **What was the mass of the washer on the purple car?**
    - Hint 1: The purple car moved 3 times as fast as the green car, which had a 1-gram washer.
      - *1 g x 3 g = 3 grams*
    - Hint 2: The purple car moved at half the speed of the red car, which had a 6-gram washer.
      - *6g ÷ 2g = 3 grams*

- Week 3
    - **Gravity Is a Mystery -** Read *Gravity Is a Mystery (Let's-Read-and-Find-Out Science 2)* by Franklyn M. Branley.
        - Write a report on how the graphics and illustrations help you understand concepts such as gravity and inertia. Next, draw and label a diagram explaining a concept from the book.
    - **Take Home Science Sheet (link): What's the charge?**
    - **Read literacy Article 4C: Amazing Roller Coasters (link):** Answer the questions to help understand magnets.
- Week 4
    - **Inventors and Inventions –** Pick one title of each of the following books. Explore the text and choose one new fact about the book to write a one-page report on.
        - *Gravity* by Jason Chin
        - *Pull: The Magnetism Files* by Adam Rankin
        - *Friction* by Matt Mullins
    - **F = ma -** Sir Isaac Newton is remembered and honored for formulating the three laws of motion. The unit by which we measure force—the newton—was named in Newton's honor. It is abbreviated as N. *F* stands for force (in Newtons), the *m* stands for mass (in kilograms), and the *a* stands for the rate of acceleration (in meters per second squared, or SI).
        - Use the formula F = ma to calculate answers to the following questions.
            - An object's mass is 6 kilograms, and its acceleration is 4 SI. What is its force?
            - An object's mass is 10 kilograms, and its acceleration is 7 SI. What is its force?
            - An object's mass is 3 kilograms, and its acceleration is 9 SI. What is its force?
- Week 5
    - **Balloon Racers -** Search for a video of a "Balloon Racer" competition, a humorous exercise based on Sir Isaac Newton's third law of motion.
        - Design and build a racer at home and bring them to class for the competition when we return.
    - **Innovators in Science –** Pick a person below, research and write about why they can be called an "innovator in science."
        - **Ron Toomer -** https://www.britannica.com/biography/Ron-Toomer
        - **Pedro Flores -** http://ucifilam.blogspot.com/2009/11/inventor-of-flores-yo-yo-philippine.html
        - **Lonnie G Jackson -** https://www.biography.com/inventor/lonnie-g-johnson