Models and Designs Storyline

Big idea: Models are used to explain how systems work and how they are constructed. Engineers use scientific knowledge to design and build useful things.

1. Black Boxes
   - A model is a representation or explanation of a system or interaction that cannot be observed directly.
   - Scientists develop models to explain how systems work.
   - Conceptual models can be communicated through words and drawings.

2. Humdingers
   - Scientists construct physical models to demonstrate how something works or how it is constructed.
   - Scientists collaborate to find solutions to problems.
   - Electric devices need a complete circuit in order to work.
   - Levers are used to move objects.

3. Go-Carts
   - The way something is put together is its design.
   - Gravity and friction are forces that affect motion.
   - A ramp is an inclined plane. It allows you to move an object with less force.
   - Simple machines help people do work. The six types are: levers, wheels and axles, pulleys, inclined planes, wedges, & screws.
   - Using scientific principles and knowledge to design useful products is the work of engineers.

4. Cart Tricks
   - Systems can be designed to perform specific functions.
   - Application of science for the benefit of people is called technology and is the work of engineers.
   - Problem solving involves designing, testing, evaluating, and redesigning based on evidence from testing.
   - A variable is anything you can change in a design that might affect the performance of the product.