A Wild Ride! Week 2: Grades K-2

Day	Topics	Related Standards
1	Exploring Properties of Matter & Motion	**Plan and carry out investigations** which demonstrate how equal forces can balance objects and how unequal forces can push, pull, or twist objects, making them change their speed, direction, or shape.
2	Investigating Force & Motion	
3	My Wild Ride: Ask and Imagine	
4	My Wild Ride: Plan and Create	
5	My Wild Ride: Improve	

A Wild Ride! Week 2

Day 1: Exploring Properties of Matter and Motion

Teacher/Parent Background

In science, the "stuff" that everything is made of is called matter. You can use your senses to detect matter. You can feel the shape and roughness of a rock. You can taste the juice of an orange. You can smell popcorn. You can see a crowd at a ball game. The characteristics of matter that we can observe with our senses are called properties. No two substances have exactly the same set of properties. The properties of matter can help us determine which type of matter to use.

Overview

In this activity, young learners will use their senses of touch and sight to explore the various properties (characteristics) of different types of matter. They will then

use their observations to make decisions about which type of matter would work best during a roller coaster engineering design challenge.

Related Standards

- **Plan and carry out investigations** which demonstrate how equal forces can balance objects and how unequal forces can push, pull, or twist objects, making them change their speed, direction, or shape.

Key Terms

- matter - the "stuff" that everything is made of
- properties - characteristics of a substance
- senses - touch, taste, hear, smell, see
- motion - a change in the position of an object

Materials List

- a variety of 3D objects which can roll or slide when placed at the top of a ramp (coins, rubber balls, marbles, Legos, blocks, empty containers, boxes, etc.)
- ramp (cardboard, wood or plastic)
- paper/pencil (optional)

Activity Description

1. Place a variety of 3D objects around the floor/table.
2. Prompt the student to begin exploring the physical properties of each object, focusing on properties he/she can experience through his/her senses of touch and sight. The student can physically sort the items by their properties or describe which objects fit the provided criteria.
    - Which objects are hard?
    - Which objects are soft?
    - Which objects are round?
    - Which objects have corners or edges?
    - Which objects are _____ (insert color)?
    - Which objects are heavy?
    - Which objects are light?
    - Which objects are large?
    - Which objects are small?
3. Once the student has made observations on the properties of each of the provided objects, encourage him/her to explore how each object moves.
    - Which objects can you blow across the floor/a table?
        - Use the floor or a table depending on the size of the object. Safety first!

    - How do they move - rolling or sliding?
    - Which object moves (rolls) the easiest?
    - Which object moves (slides) the easiest?
4. Next, set up a ramp. Ask the student to predict how each object will move down the ramp.
    - Set up a prediction chart on paper or sort objects on the floor/table prior to testing.
    - Encourage the student to share his/her reasoning for each prediction.
        - Example: I think the (object) will slide down the ramp because _____.

Objects We Predict Will Roll	Objects We Predict Will Slide

5. Once predictions are complete, test each object one at a time by putting each object at the top of the ramp and watching the resulting motion.
    - Some objects may require a push to move down the ramp. You can still record whether the push resulted in the object sliding or rolling down the ramp.
6. Guide recording of results.
7. Discuss the results.
    - Did the object do what you predicted?
    - What properties(shape) did the objects have that rolled?
    - What properties (shape) did the objects have that slid?

Closure

The student will discover that a round, or nearly round, shape is necessary for rolling. To assess how shape can predict motion, ask the student to:

- draw a picture of(or point out and describe) one object in the room that would roll down the ramp and one that would slide down.
    - Prompt him/her to explain his/her thinking.
- select one or more objects from those provided that could roll along a roller coaster track.
    - Prompt him/her to explain his/her reasoning.

Explain that later in the week, he/she will be designing and building a

rollercoaster. He/she will need to select an object to use as the coaster that will roll along the track. This activity will assist him/her in making a selection.

Extension

Explore ways to get the objects that would not move down the ramp without a push to do so without applying a push. Try different types of ramps (i.e., different materials for the ramp or varying the height of the ramp).