Forces & Motion with Simple Machines

Summary

The students will be able to sort simple machines according to an applied force --push or a pull.

Main Core Tie

Science - 3rd Grade

Standard 3 Objective 1

Materials

Several kitchen tools such as, melon baller, spatula, pancake turner, pizza cutter, potato peeler, can opener, wooden spoon, jar with lid, etc.

- *Simple Machines & Work Recording Sheet* (pdf)

2 Wooden rulers/ 2 heavy books/ desktop
Stack of books/1 tube sock with ½ cup rice/ strong rubber band
Nail/bolt/hammer/ block of wood
Large screw/ 9" square of paper/ pencil/ tape/ marker/
Pulley/ string/ scale
Book: *The 3 Pigs & the Scientific Wolf*, by Mary Fetzner; ISBN: 978-1-880505-78-6
Book: *The Ice Cream Cone Coot and the Other Rare Birds*, by Arnold Lobel; ISBN-13: 978-0819304438

- *Simple Machine Cards* (pdf)
- *Examples of Levers, Examples of Inclined Planes, Examples of Wedges, Examples of Pulleys, Examples of Screws, and Examples of Wheel and Axles* (pdf)
- *Pushes & Pulls with Simple Machines Recording Sheet* (pdf)
- *Pushes & Pulls with Simple Machine Cards* (pdf)

White art paper, 9" x 12" -- 1 per student

Background for Teachers

Simple machines are a part of learning about forces and motion. Students do not have to be tested on the names of the different simple machines; however, they should learn that simple machines help make "work" easier. There are six simple machines:

the lever
the inclined plane
the wedge
the screw
the wheel and axle
the pulley

Simple machines have few or no moving parts. These machines use energy to work. Combining two or more simple machines results in a compound machine.

This unit on forces and motion can be more focused using and enduring understanding and essential questions. They are as follows:

Enduring Understanding: Forces cause changes in the speed or direction of the motion of an object. The greater the force, the greater the change in speed or direction.

Essential Questions:

What is a force?

How are the forces of pushing and pulling the same? How are they different?

What forces do simple machines have on other objects? (We will focus on this one for the lesson.)
What kinds of forces help move objects?
What effect does "weight" have on objects?
What happens when objects of different weights collide?
How do forces apply when playing different kinds of sports?
How would your life be different without forces?

Intended Learning Outcomes

1. Use science process and thinking skills.
2. Communicate effectively using science language and reasoning.

Instructional Procedures

Extensions

Give students opportunities to create their own list of simple machines that would use a push or a pull or both.

Play charades with different types of activities, and have students determine whether that activity would use a push, pull or both.

Give each student a kitchen tool/ simple machine. Students should trace the simple machine on 9" x 12" white art paper and create their own "bird" including naming the bird. This art activity stems from reading the book *Ice Cream Cone Coot and Other Rare Birds.* Read the story, *The 3 Pigs and the Scientific Wolf* by Mary Fetzner. Have students summarize the story and give examples of simple machines the wolf used to try to capture the three little pigs. Other activities are included at the back of the story.

Family Connections:

Assignments to do with Parents:

Have students make a list of simple machines they find at home.

Have students determine which simple machine they would be.

Give students opportunities to play outside games, determine what simple machines were used if any, and decide what pushes or pulls are used to play the games.

Assessment Plan

Formative assessment includes observation, teacher asking questions, and reading what students recorded about simple machines in science journals.

Observation of students sorting *Simple Machine Cards: Examples of Levers, Examples of Inclined Planes, Examples of Wedges, Examples of Pulleys, Examples of Screws, and Examples of Wheel*

- *Pushes & Pulls with Simple Machines Recording Sheet*
- *Simple Machines and Work Recording Sheet*

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