

Simple Machines Demonstration

Simple machines make work easier in a lot of different ways! Discover the science of simple machines in this fun, engaging demonstration.

Highlights from the demonstration:

Learn about levers

When using a lever, there is always a load, a fulcrum and a force. This type of simple machine can do amazing things simply by moving the fulcrum.

Examples of levers

Several levers are discussed during the demo that we interact with everyday.

Wheel and axle

A wheel and axle is used to make work easier. Discover how helpful it is when you face off in a battle of 'strength' against your students!

Inclined plane

The inclined plane is simply a ramp, but illustrates how we use simple machines everyday.

Pulleys

Pulleys are also used daily to redirect forces so that heavy loads can be lifted. Two types of pulleys are discussed- single pulleys and block and tackle.

Content Standards Alignment:

Ohio Content Standards Alignment

Grades 3-5

Physical Sciences: C

Scientific Inquiry: A, B, C

Grades 6-8

Physical Sciences: B

Scientific Inquiry: A, B

Michigan Curriculum Framework Alignment

Science

Strand I. Constructing New Scientific Knowledge

Standard I.I Constructing New Scientific Knowledge

Strand IV. Using Scientific Knowledge in Physical Science

Standard IV.3. Forces and Motion

Post Activity:

Balance a Ruler:

What you need:

12-inch ruler

Pencil

Four erasers or four other objects of equal weight

What to do:

1. Balance a ruler on a pencil like a seesaw.
2. Place two erasers (Eraser 1 and 2) an equal distance from the pencil on each side of the ruler.
3. Observe what happens. Record how far from the pencil your erasers are.
4. Now try moving Eraser 1 closer to the pencil. Where do you need to move Eraser 2 to get it to balance again? Record these distances.
5. Return Eraser 1 and 2 to their original position an equal distance from the pencil.
6. Place a third eraser (Eraser 3) on top of Eraser 1. How can you get your ruler to balance again, if you only move Eraser 2? Record these distances.
7. Experiment with different weights and distances to see if you can balance the ruler. Can you write a general rule about the relationship between the weight of the erasers and their distance from the pencil on the ruler? *Good words to use include fulcrum, effort, load and lever.*

What's the science?

You can think of this experiment as a teeter-totter on the playground. If two people of equal weight are placed on opposite sides of the teeter-totter and sit an equal distance from the center (fulcrum), then the teeter-totter will balance perfectly. However, if an adult who is twice as heavy replaces one of the children, then the child on the opposite side will have to move further from the fulcrum in order to balance the teeter-totter.

Work is equal to force over distance. If we increase the distance of the object from the fulcrum, we can reduce the force. Conversely, if we increase the force, we can reduce the distance from the fulcrum. This is called mechanical advantage.