2. Simple Machines

Subject: Physics

Objective: To demonstrate that simple machines can be found everywhere.

Logistics: These experiments are best conducted with the entire class together.

Materials:

2 x 4
wheel
claw hammer
crowbar
axle with 6 inch wheel
inclined plane
25-pound weight
nails
dowel
wheeled cart
large graph paper

Procedure:

Step 1: Use 2 x 4 to lift 25-lb. weight. Shift fulcrum to illustrate mechanical advantage.

Step 2: Attach wheel to end of 2 x 4 to produce a quasi-wheel barrow.

Step 3: Pre-position nails in 2 x 4 and have students pull nails using hammer and then crowbar.

Step 4: Use 6-inch wheel and axle to lift 25-lb. weight.

Step 5: Enlarge the diameter of the wheel by inserting the dowel into the edge of the wheel to increase the mechanical advantage. Students find that they can lift the weight with one finger. The wheel is a lever going in a circle.

Step 6: Place weight in wheeled cart and draw cart up inclined plane at different angles.

Step 7: Measure and graph amount of weight needed to pull cart to top of the plane.

Vocabulary: *force, simple machine, inclined plane, lever, wheel, axle*

What they Learn: Simple machines enable a person to increase muscle force. Complex machines are all made of one or more simple machines.