



Curiosity Guide #502

Simple Machines: Wedge

Accompanies Curious Crew, Season 5, Episode 2 (#502)

Uplifting Wedge

Investigation #1

Description

How do you lift an adult off the floor? Very carefully!

Materials

- Long, wide wood board
- Wooden wedge
- Sledge hammer
- Adult
- Safety goggles

Procedure

- 1) Place the large board on the floor.
- 2) Ask an adult to stand on one end.
- 3) Place the point of the wedge on the floor against the end of the board where the adult is standing.
- 4) Put on safety goggles
- 5) Carefully tap the end of the wedge with the sledge hammer.
- 6) Did the wedge slide under the board?
- 7) Try tapping the wedge several more times.
- 8) Could you lift the adult off the floor?

My Results

Explanation

A wedge is a simple machine that increases a person's mechanical advantage to do work. Wedges are made by placing two or more inclined planes together to form a sharp point. Lifting the adult and board off the floor would be too difficult without a mechanical advantage. To calculate the mechanical advantage, you can measure the length of the inclined plane on the wedge and divide that number by the width of the end of the wedge. The resulting number equals the mechanical advantage of the wedge. Here's an example. If the tool's plane is 6 inches, and its width is 2 inches, the mechanical advantage is 3. Pushing the wedge all the way in would lift the board and adult 2 inches off the ground, and any force applied to the sledgehammer would be multiplied three times. The longer the taper of the wedge, the slower the lift, but the easier the job becomes. Other examples of lifting wedges are the tines on forklifts or even the tines on a fork.

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