



Curiosity Guide #202

Levers

Accompanies Curious Crew, Season 2, Episode 2 (#202)

Second-Class Ride

Investigation #6

Description

How easily can you lift a friend? Investigate how a Class 2 lever works.

Materials

- Long board, 2 inches by 6 inches by 12 feet
- Block of wood
- Wheelbarrow
- 2 friends

Procedure

- 1) Place a small block of wood under one end of the board. This creates a small gap so you can grasp the board with your hands.
- 2) Have one friend stand on the opposite end of the board to hold it still.
- 3) Have the second friend sit in the middle of the board.
- 4) Grasp the end of the blocked-up board. Carefully lift the board and friend into the air.
- 5) Move the sitting friend closer to the standing friend and lift again.
- 6) Discuss the following questions: Was the second trial easier? Did the person rise as high in the air as in the first trial? Why?
- 7) Other things to try: Swap places. Do you get similar results? See if a child can lift an adult.

My Results

Explanation

This is an example of a second-class lever. In Class 2 levers, the fulcrum is on one end. The load is centered on the beam or arm. The effort arm is lifted on the other end. A wheelbarrow, a person's jaw, and a bottle opener are examples of Class 2 levers.

The fulcrum in this experiment is the end of the board on which the second friend is standing. Moving the sitting friend closer to the fulcrum lengthens the effort arm and increases the mechanical advantage. The person lifting can then lift more weight. However, the load that is being lifted will rise up a smaller amount.

Wheelbarrows are second class levers. The fulcrum is the front wheel. When you lift up on the handles, the weight of the load is distributed between the handles and the wheel. If there is too much weight in the back, the wheelbarrow may be too heavy to lift! When you are loading a wheelbarrow, it is important to keep the weight near the front so the wheel carries more of the load than your arms do. Then you'll be able to move really heavy things-- Rocks, dirt, or even a friend!

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