

Topic: Simple Machines



Weight for It!
grade

Primary Audience: 3rd – 5th

Description: Explore how a balance works.

Keywords: Balance, Lever

Materials:

- 2 paper cups
- 1 ruler with a hole in the center
- 1 large paper clip
- 1 pencil
- Tape
- Small objects – like pebbles, marbles, etc.

Instructions:

1. Tape the cups to the ruler at equal distances from the center of the ruler. You may have to make “tabs” of tape on the lip of the cup and tape the tabs to the ruler.
2. Unbend the paper clip to form an “S” hook.
3. “Hook” the ruler onto one hook through the center hole and hook the other end to the pencil that is taped to a desk. You may have to twist the paper clip hook.
4. The balance should be hanging from the pencil and should be able to move freely.
5. Try to get the ruler to hang level by moving the cups as needed.
6. Once the balance hangs level, place one small object into each cup. Do the objects weigh the same? Do they have different weights? How can you tell?

Further Exploration:

Try to comparatively weigh an object against a known weight -- something that weighs a gram or an ounce. Predict if an object will weigh more or less than the known weight and test your hypothesis. Can you make an estimate of an object’s weight if it weighs between two known weights?

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You can even “weigh” a gas. Make carbon dioxide in a large container by mixing a small amount of baking soda and vinegar. Once the bubbling is complete, carefully pour the invisible carbon dioxide into one of the cups on the level balance. What happens to the balance? What is in the other cup? What can you conclude about the carbon dioxide?

What’s Going On?

Balances work by comparatively weighing objects. If one object is heavier than the other, the balance will tip down on the heavier side. If the objects weigh the same, the balance should be level. You can also weigh objects against a known weight, for instance an ounce. Try to see if small objects weigh more, less, or the same as the object that weighs an ounce. Scales work in this way.

Relevant Ohio Science Content Standards:

Physical Sciences: 3.4