



Curiosity Guide #701

Conservation of Mass

Accompanies Curious Crew, Season 7, Episode 1 (#701)

Design a Simple Balance

STEM Challenge

Description

Can you create a balance that will measure mass? Have fun! Go!

Materials

- Wire coat hangers
- Cups
- Plastic plates
- String
- Hole punch
- Wood dowel
- Scrap wood
- Wood screws
- Binder clips
- Film canisters or old pill bottles
- Sand or salt
- Markers
- Nickels
- Pennies
- Aluminum foil
- Scissors
- Plastic balance parts
- Round block
- Hot glue
- Tape

- Objects to measure mass
- Digital scale or triple beam balance

Procedure

- 1) Use the available materials to make a balance.
- 2) Consider how the beam will be supported.
- 3) Can the beam be calibrated or adjusted so that the balance will be level when empty?
- 4) Do you want to have a suspended system from above or below?
- 5) Set the digital scale to grams and measure out quantities of sand or salt to fill film canisters to make masses of 10, 25, and 50 grams.
- 6) Cut small pieces of aluminum foil, fold them, and use the digital scale to make 1- and 5-gram masses.
- 7) Place the object to measure on one side of the balance and use the known masses on the other side to find the total mass.

My Results

Explanation

Balances are used to find an unknown mass compared to known masses. Establishing known masses in grams using the digital scale is a way to account for total mass. Sand in film cannisters is a good reference. Coins are also a good reference because a nickel has a mass of 5 grams and a penny minted after 1982 is 2.5 grams. The balance is not intended to measure weight, which is a measurement of the gravitational pull on an object, but instead measures mass, or the amount of matter in an object. Use the homemade balance and referent masses to find the mass of different household objects.

Add to your knowledge. The Law of Conservation of Mass was discovered by a French chemist named Antoine Lavoisier in 1789. Lavoisier ran many different experiments with chemical reactions, all inside a sealed jar. Because the jar was a closed system, Lavoisier could measure the total mass before, during, and after the reaction. The mass was always the same! Lavoisier realized that the matter wasn't created or destroyed, but that the particles were rearranging. Great job Antoine!

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