



Curiosity Guide #406

Torque

Accompanies Curious Crew, Season 4, Episode 6 (#406)

Torque Tray Game

Investigation #3

Description

Don't let the tray come tumbling down!

Materials

- Wide-mouth bottle filled with sand
- Rubber ball
- Tray with raised edge
- Rocks of various sizes
- A friend

Procedure

1. Spread the rocks out on the tray so that there is close to an equal number on both sides.
2. Place the rubber ball on top of the bottle.
3. Carefully balance the tray of rocks on top of the bottle.
4. Challenge a friend to remove one or two rocks at a time without causing the tray to fall.
5. Take turns removing the rocks.
6. Whoever causes the tray to fall loses.
7. What strategies did you think about to keep the tray balanced?

My Results

Explanation

When the tray is balanced, the tray is in rotational equilibrium. However, each time a rock is removed, the total weight on the opposite side has the potential of applying torque to the system. Torque is a force that causes an object to rotate. In this case, the tray rotates on top of the rubber ball. When taking off the rocks, you must think about the different masses of the rocks and where they are positioned on the tray. A lighter rock further away from the center could be removed at the same time as a larger rock closer to the center and still keep the system balanced. Torque is determined by the weight of the mass that is acting on the tray and how far away the mass is from the center support.

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