

Objects at Rest

Leading questions:

- What does it mean for something to be "at rest"?
- How long will a stationary object remain at rest?
- What two things would make a difference in making a resting object move?

What to do:

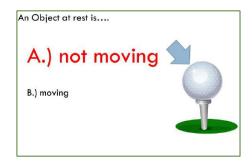
- 1. Place a quarter on an index card over a cup.
 - What two forces are acting on the coin?
 - Flick the card out and explain the results.
- 2. Bend your arm back like you're going to touch your ear, so that you can rest a quarter on your forearm.
 - Jerk your arm down and try to catch the quarter.
 - What happens if you stack multiple quarters together?
 - Can you explain any difference?
- 3. Stack several cups with index cards between them. Flick out a card so that a cup falls into the cup below it.
 - Is it easier with a taller or shorter tower?
 - Is it easier to start at the bottom or the top?
 - Why do you think it makes a difference?

Summary:

If an object has mass, then it has a property know as inertia. Inertia is the resistance a mass has to a change in position or motion. This is the basis of Newton's First Law

What about an object affects its inertia?





Objects at Rest (Guide)

Leading questions:

What does it mean for something to be "at rest"?

How long will a stationary object remain at rest?

Explain: An object will remain at rest (or in constant motion) until a force causes it to move

What two things would make a difference in making a resting object move?
Explain: Its mass (greater mass takes more force); and how much force is applied

What to do:

4. Place a quarter on an index card over a cup.

What two forces are acting on the coin?
<u>Explain</u>: The forces are gravity (downward) and the push of the card (upward)

Flick the card out and explain the results.

Explain: The force of gravity pulls the coin down. It comes to rest when the cup pushed up.

- 5. Bend your arm back like you're going to touch your ear, so that you can rest a quarter on your forearm.
 - Jerk your arm down and try to catch the quarter.
 - What happens if you stack multiple quarters together?
 - Can you explain any difference?

<u>Explain</u>: Ask students to explain their reasoning. The more mass an object has, the more the resistance to move (more time or more force required).

- 6. Stack several cups with index cards between them. Flick out a card so that a cup falls into the cup below it.
 - Is it easier with a taller or shorter tower?
 - Is it easier to start at the bottom or the top?
 - Why do you think it makes a difference?

Explain: Similar to the coins above, the greater the mass, the more resistance to change position. It should be easier to remove a card from lower in the stack.

Summary:

If an object has mass, then it has a property know as inertia. Inertia is the resistance a mass has to a change in position or motion. This is the basis of Newton's First Law

What about an object affects its inertia?
Explain: Inertia is related to the mass of the object.

