

An Object at rest is....

A.) not moving

B.) moving



# 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 known 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:

- Place a quarter on an index card over a cup.
  - What two forces are acting on the coin?  
**Explain:** 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.
- 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?  
**Explain:** Ask students to explain their reasoning. The more mass an object has, the more the resistance to move (more time or more force required).
- 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 known 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.