

Lab: Newton's First Law

CONCEPTUAL PHYSICS: UNIT 1

Background: On Christmas day in the year Galileo died, Isaac Newton was born. By age 24, he had developed his famous laws of motion. They replaced the Aristotelian ideas that dominated the thinking of the best minds for most of the previous 2000 years. This lab will investigate Newton's First Law, often called the Law of Inertia.

Procedure: Follow the directions carefully and return all materials when you are finished with each activity. Answer questions as you complete each section of this lab.

NEWTON'S FIRST LAW

Activity 1- Wacky Washers

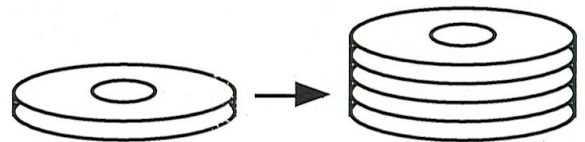


Materials needed: (per group)

- Metal washers (10)

Procedure:

1. To prepare for this experiment, stack 4 washers on top of the other so that you form a tower of washers. Place the stack of washers on top of your lab table so that you have a smooth, slick surface.



2. Aim one washer at the bottom of the stack of four washers and give it a good hard flick with your finger or hand. **What happens?**

3. Flick a stack of two washers into a stack of four washers. **What happens?**

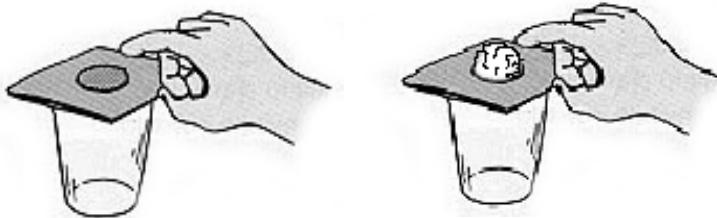
4. Flick a stack of four washers into a stack of four washers. **What happens?**

5. **Explain** you observations in terms of **Newton's first law**

Activity 2- Flick the Coin

Materials needed: (per group)

- Small Plastic cup
- Playing card
- Penny



1. Use a plastic drink cup that is about two-thirds full of water or sand to anchor it. Lay a flay Playing Card over the top of the cup
2. Place a penny on the card, centered over the cup.
3. With a quick flick of your finger, give the card a horizontal push. **What happens?**
4. Crumple up a small piece of paper to about the size of a marble. Place it on the card and flick the card away. **What happened compared to the penny?**
5. **Explain** you observations in terms of **Newton's first law**

Activity 3-Inertia and Tension

Materials needed: (per group)

- Short length of thread
- Mass (250-500 g)
- Meter stick

1. Secure a short length of thread to both ends of a weight and secure the top end to a meter stick suspended over the edge of your lab table.
2. Pull on the string slowly until the thread breaks. (CAUTION: Do not let the mass fall onto your foot!) **Where did the thread break? Above or below the suspended mass?**
3. Which property, **Mass** or **Weight** is important here?
4. Re-tie the tread to the mass. Now quickly snap the thread downward (AGAIN: What out for your feet!) **Where did the thread break? Above or below the suspended mass?**
5. Which property, **Mass** or **Weight** is important here?
6. **Explain** you observations in terms of **Newton's first law**.

