

## Mini-Lab #1 - Pass the Water Lab

### Purpose:

The purpose of this activity is to investigate the concept of inertia and to extend it to a discussion of automobile safety practices.

### Observations:

#### 1. State Newton's First Law of Motion:

#### 2. Define inertia:

**Materials:** Cup, Water, Space

### Procedure:

1. Acquire a cup and fill it to the rim with water.
2. Find a wide, flat area which can be used to move around in; Senior Quad, Football Field, etc.
3. Hold the cup of water level, and walk about in the area. As you walk, make careful observations of the water and of your tendency to be more or less careful of spilling it at various locations. If you spill a significant amount of water at any time, then refill the water to the rim. Your walking should include the various types of motion:
  - **A.** Walk with a **constant speed** in a straight line for at least 20 feet.
  - **B.** After walking for a given distance in a straight line, make an **abrupt** right-hand turn; repeat this procedure for an **abrupt** left-hand turn.
  - **C.** After walking some given distance in a straight line at a moderate speed, **abruptly** stop.

### Analyze and Conclude:

1. Record your observations for the following types of motion **A**, **B**, and **C**. In your observations, comment on what the water did during the motion and comment on your tendency to be more or less careful when you made the particular motion. Your descriptions should be clear.
2. Explain how your observations in this lab demonstrate Newton's law of inertia. Be **specific** and use **examples**. Do a *bang-up job!*

### Extension:

There are a variety of phenomenon which occurs in an automobile which illustrate in some manner Newton's law of inertia. Identify and describe **at least two** phenomena which **illustrate** Newton's law of inertia. Use specifics to clearly **explain** how the phenomena which you describe illustrate Newton's first law.

## Mini-Lab #2 – Penny on your Elbow Lab

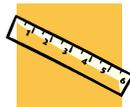


### Procedure

1. Hold your right hand next to your right ear with palm up.
2. Place a penny on your elbow.
3. Quickly straighten your arm and catch the penny in your hand.
4. Next, begin to add more pennies to your elbow and see how many you can catch.

### Analyze and Conclude:

1. Observe and explain what happens to the penny(s).
2. Explain what you observed using Newton's 1<sup>st</sup> Law of Motion.
3. Draw a diagram of your experimental set-up. Use arrows to indicate the results.
4. Create and illustrate a simple experiment using Newton's 1<sup>st</sup> Law of Motion. Use arrows to indicate the results.



## Mini-Lab #3 – Meter Stick vs. Ruler Lab

### Procedure

1. Balance a meter stick on one hand and the ruler on the other hand.

### Analyze and Conclude:

1. Which is easier to balance? Explain using Newton's 1<sup>st</sup> Law of Motion.
2. Illustrate your experimental set-up. Use arrows to indicate the balanced and unbalanced Forces.