



**E-Labs Newton's First Law**  
**Pre-lab Lesson Plan (two 45-50 minute class periods)**

**I. Introduction**

The material contained within this lesson plan is meant to be used as preparation for the Newton's First Law e-Lab. As part of this pre-lab lesson, students will

- A. Be able to state Newton's First Law and explain how a force is needed to change an objects motion.
- B. Identify examples of inertia, and how the amount an object has is proportional to an objects mass.
- C. Explain how Newton's First Law of Motion allows us to predict motion.

**II. Objective:**

Students will gain an understanding of Newton's first law of motion: an object at rest will remain at rest unless acted on by a force. An object in motion continues in motion with the same speed and in the same direction unless acted upon by a force. This law is often called, "The Law of Inertia".

**III. Key Vocabulary:**

- Air Resistance- the upward force of air exerted on a falling object.
- Balanced- forces that are equal in size but opposite in direction; these forces result in no change in motion.
- Force- a push or pull exerted on an object; they can be balanced or unbalanced.
- Friction- a force between two surfaces that opposes motion; it depends on the type of surfaces and force between two surfaces.
- Gravity – an attraction force between all masses proportional to the mass of the objects and the distance between them.
- Inertia- the characteristic of an object to resist change in motion.
- Mass- the measure of the amount of matter in an object; the more mass an object has, the more inertia it has.
- Unbalanced- forces that are not equal in size and/or direction; these forces result in a change in motion.

**IV. Materials:**

- Index card
- Small glass or beaker
- Penny
- Computer access (one per student preferred but one computer with projector can be used to complete the lesson)
- Newton's First Law PowerPoint
- Newton's First Law Note Worksheet
- Newton's First Law Video

## **V. Lesson Sequence:**

### **A. Engage and Explore**

1. Inform the students that today they are all going to learn about Newton's first law of motion: an object at rest will stay at rest unless acted on by an outside force.
2. To capture students attention, conduct the Penny Card Flick Investigation:
  1. Place an index card on top of the small glass.
  2. Place the penny on top of the index card.
  3. From the side flick the index card off of the glass. Make sure that the card is flicked parallel to the desk.
3. Ask students to observe what happen: that the card moves in the direction of the push and the penny falls into the glass. Have them explain why they think this may have happened.

### **B. Explain and Elaborate**

4. Give each student a Newton's First Law Note Worksheet. If each student is able to use a computer, have them read through the Newton's First Law PowerPoint while filling out the note worksheet. If computers are limited, you can have them work in small groups, or you can project the PowerPoint to the class and have them fill out the notes together.
5. As a class, discuss and answer the comprehension check questions on the last slide.

### **C. Evaluate**

6. Show students the Newton's First Law video and discuss the questions posed throughout. You may want to pause the video occasionally to allow students time to answer the questions.