

# LAB 11: INERTIA

## QUESTION

How can inertia help you tear a piece of paper in three pieces in midair?

## SAFETY

Standard safety precautions apply.

## MATERIALS

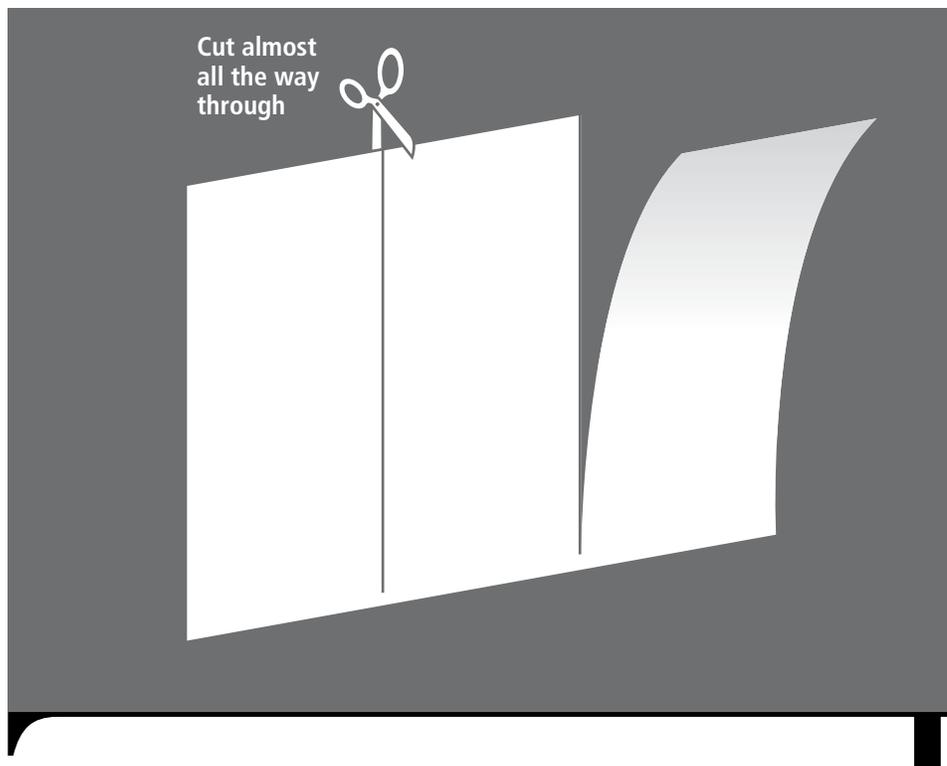
Sheet of paper, scissors, 3 washers, tape (Scotch or other)

## PROCEDURE

You may have seen a challenge in which a person is given a small piece of paper torn in two places and is challenged to tear it into three pieces with one pull. It is very difficult to do until you know more about a physics concept called *inertia*.

1. Cut out a rectangle of paper and put two cuts in it as shown in Figure 11.1. Cut out several more rectangles so that you can try different strategies.
2. Try to tear the rectangle into three pieces with one pull. Try pulling slowly, quickly, up, down, and any way that you think might help.
3. Tape the washers to the center piece and see if you can pull the paper in three by pulling it very quickly. If you do not get it the first time, add more washers and try again.

## Paper Challenge

**Post-Lab Questions**

1. Explain why adding the washers allowed you to pull the paper apart. In your explanation, use the words *mass*, *inertia*, and *rest*. Read the discussion below if you are unfamiliar with any of these terms.
2. Why is it that when a bug hits a car windshield, passengers cannot feel the impact?
3. Using the principles of inertia, explain why it is important to wear a seat belt when traveling in an automobile.

**Discussion**

To explain how this activity works, you must know a little more about inertia. Inertia is the property of matter that makes objects at rest difficult to move and objects in motion difficult to stop or change directions. The heavier an object is, the more inertia it has. Sometimes you will hear the term *inertia* used in everyday life to explain why a car slid off the road in a sharp turn.