

Lab: Gravity and Air Resistance Lab and Discussion

Purpose of this Lab

In this lab, you will conduct an experiment to test the effect of parachute size on the rate at which a “skydiver” falls through the air. Specifically, you will compare the terminal speed of an object with three different parachute sizes. You will do this by constructing three parachutes. One will be 10 inches by 10 inches, one will be 20 inches by 20 inches, and the third one will be 30 inches by 30 inches. You will attach an egg to each parachute. You will then drop each egg and its parachute from a given height and observe which egg reaches the ground first. You will describe your results in terms of gravity and air resistance.

Hypothesis

Record your best “educated guess” about what will happen in the experiment. Give your reasons and outline any assumptions that lead you to this hypothesis.

Materials

You will need the following materials for this lab.

Lightweight plastic garbage can liners
Scissors
Ruler
3 sandwich bags
12 20-inch lengths of light string
3 uncooked eggs
A stopwatch or timer

Experimental Design

List the procedures you used to complete this lab in order.

1. From a lightweight plastic kitchen garbage-can liner, cut out three squares. Make one square 10" x 10", a second square 20" x 20", and a third square 30" x 30".
2. Make a parachute out of each square by tying a piece of string to each corner of the square. You can do this by making small holes in the corners of the parachutes and tying the strings through the holes. Then attach the other ends of the strings to a plastic sandwich bag in the same way. The sandwich bags will become a sort of container for your eggs, so attach the strings such that the bags are open and the open end faces the top of the parachute.
3. Place an egg in each of the sandwich bags.
4. With your eggs in hand, stand on top of something about 10 feet high. Flatten out the first parachute so it is square and parallel to the ground. Drop the egg and its parachute from a height of about 10 feet. Be sure to be safe when you do this and you probably want to do it outside to avoid any messes indoors. If your environment does not permit you to do the experiment outdoors, line a hard-surfaced floor with newspaper or garbage can liners to minimize the mess of the broken eggs. Use the timer to record the amount of time in seconds that it takes the egg to reach the ground. Repeat steps 1-4 for each egg.

Observations/Data

Record the observations and/or data you collected here.

Analysis

Analyze the data you collected in the lab. Discuss your results in terms of gravity and air resistance. Discuss how the two forces act on each egg and how air resistance varied for each egg.

Conclusion

After conducting the experiment, how would you now explain the problem(s) or answer the question(s) raised in the purpose of the lab. Be sure to base your answer on the data you collected. Consider whether your conclusion is the only explanation for the data you collected, or if there could be alternate explanations.

Discussion Summary

Please **summarize** how you responded to the discussion and the comments made to your post here.