

# Follow-Up Questions

## Paper Helicopters and the Methods of Science

1. In the helicopter experiment, which treatment did we use as our **control**? \_\_\_\_\_

Why do scientists like to use a **control group** in an experiment? \_\_\_\_\_

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2. We changed two things in the helicopter experiment: 1) the **design** of the helicopter (the length and width of the blades), and 2) the \_\_\_\_\_ of the copter (by using paperclips).

3. There are two types of **VARIABLES** that scientists look at when designing experiments; they are the **independent variables** and the **dependent variables**. You observed that different helicopter designs with and without paperclips had different descent times. The variables that *we changed*, like the blade design or weight, are called \_\_\_\_\_ **variables**.

When we measured how fast the copter descended we were measuring the \_\_\_\_\_ **variable**.

4. Describe why scientists prefer to use the **metric system** of measurement. \_\_\_\_\_

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5. Look at the **bar graph** (*see back page*) that summarizes the results from several 5<sup>th</sup> grade classes.

What design fell the fastest? \_\_\_\_\_ Slowest? \_\_\_\_\_

What conclusions can you draw about the effect of the four copter blade **designs** (*independent variable*) on how fast the copters descended (*dependent variable*)?

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What conclusions can you draw about the effect of the **weight** of the helicopter (*an independent variable*) on how fast the copters descended (*dependent variable*)?

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6. Compare **data** from your group to the **averages** represented in the **bar graph** below. For example, if your group had the “**Ash**” **design** then you would compare your results to the three Ash bars on the graph. You must first calculate your group’s **Average Descent Time** for the control, 1 paper clip, and 2 paper clips designs. (*Most groups of 4 students with 4 drops each should have a total of 16 drops for each weight category*).

Weight	Sum of all drops (measured in seconds)	Number of drops	Average time for my group’s design	Average time from graph for the same design
Control	sec		sec	sec
1 clip	sec		sec	sec
2 clips	sec		sec	sec

Did your group’s copter design fall faster, slower, or the same as the average times in the graph?

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Graph your group’s results for your copter design on top of the completed bar graph (below) that illustrates your school’s Descent Time Averages.

7. What is the importance of having **repeated trials** (in this case repeated copter drops) in an experiment? \_\_\_\_\_

**Helicopter descent times**

