Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



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**The Whirlybird Lab**

**1. State the Problem:** How does mass affect the time taken for a whirlybird to fall?

**2. Gather Information: (1 points)**

Length: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Width: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Materials:

Scissors

Whirlybird cut out

Stopwatch

4 Large paper clips

 4 Small paper clips

**3. Hypothesis: (Make a prediction) (1 points)**

**4. Test the Hypothesis** **(5 points)** 🡪 Procedure:

1) Cut out the whirlybird and fold the wings along the dotted lines.

2) Hold the whirlybird as far above the floor as you can, release it, and measure the time it takes to reach the floor. Record your time in the chart below.

3) Repeat your experiment exactly, two more times.

4) Add a paperclip to the whirlybird and measure the new time taken for each of three drops.

5) Continue adding paperclips, one at a time, until you have completed the chart.

6) For each set of drops, find the average time taken for the whirlybird to fall.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Number of **LARGE** Clips | Drop Time Trial 1 (s) | Drop Time Trial 2 (s) | Drop Time Trial 3 (s) | Average Drop Time (s) |
| 0 |  |  |  |  |
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| 3 |  |  |  |  |
| 4 |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Number of **SMALL** Clips | Drop Time Trial 1 (s) | Drop Time Trial 2 (s) | Drop Time Trial 3 (s) | Average Drop Time (s) |
| 0 |  |  |  |  |
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| 3 |  |  |  |  |
| 4 |  |  |  |  |

**5. Analyze Data: (8 points)**

1. State the independent variable in this experiment. (1/2 point)
2. State the dependent variable in this experiment. (1/2 point)

3) State **two** controlled variables in this experiment. (1point)

4) On a piece of graph paper, use your data to plot time (s) versus number of paperclips (2 pts) for both large and small paperclips. Make sure to Label both axes (1pt) and include a title for your graph (1 pt). **Attach the graph paper to this lab.** (4 points total)

 5) Did small or large paperclips cause your whirlybird to fall faster? (1 point)

 6) What amount of paperclips caused it to fall the fastest? (1 point)

**6. Draw Conclusions: (3 points)**

1) What conclusions can you draw based on your answers to #5 and #6 above? (1 point)

2) Was your hypothesis correct? If it wasn’t, write a new hypothesis to support your findings. (1 point)

3) If you were going to take this experiment to the next step, how could you change it to add to your data? (1 point)

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**Homework: (10 points total)**

1. Instead of using paperclips, how else could you test the whirlybird fall time?. (1 pt)

2. What is your hypothesis for your new whirlybird lab?

3. What would your controlled variable(s) be? (1 pt)

4. What would be your independent variable? (1 pt)

5. What would be your dependent variable? (1 pt)