



### Whirlie Bird

**PROBLEM:** How does the length of a paper whirlie bird's wings affect how long it stays in flight?

#### GATHER INFORMATION:

Objects fall to the ground at the same rate because gravity is the same for all objects. An object can be slowed down by **fluid friction** or **air resistance**. When you drop a piece of paper that is flat and one that is crumpled, which piece of paper will hit the ground first? You'll find that the crumpled paper will get to the ground faster because of what is called **air resistance**, a type of friction.

**Air resistance** happens between the surface of a falling object and the air that surrounds it. The flat piece of paper will experience more air resistance which is the reason why it will take longer to reach the ground.

**HYPOTHESIS:** Do you think the whirlie bird with the shortest wingspan will stay in the air the longest or shortest? Why do you think this?

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**MATERIALS:** stop watch, whirlie bird pattern, ruler, paper clip, and scissors

#### PROCEDURES:

1. Cut out the patterns for whirlie birds and fold along the dotted lines.
2. One person should be in charge of dropping the whirlie bird from the same height for each trial
3. One person will time how long each whirlie bird stays in the air.
4. Drop the whirlie bird with the 7 cm wings and time how long it takes to hit the ground. Repeat this step two more times.
5. Then cut 1cm off of each wing.
6. Drop the whirlie bird with the 6 cm wings and time how long it takes to hit the ground. Repeat this step two more times.
7. Then cut 1cm off of each wing.
8. Drop the whirlie bird with the 5 cm wings and time how long it takes to hit the ground. Repeat this step two more times.
9. Find the average of each whirlie bird by adding up the three trials and dividing the sum by 3.
10. Graph the average.

COLLECT DATA AND OBSERVATIONS

### Flight Time of Whirlie Birds

| Whirlie Bird Wing Lengths | Trial 1 Time in seconds | Trial 2 Time in seconds | Trial 3 Time in seconds | Average |
|---------------------------|-------------------------|-------------------------|-------------------------|---------|
| 7cm                       |                         |                         |                         |         |
| 6cm                       |                         |                         |                         |         |
| 5cm                       |                         |                         |                         |         |

ANALYZE DATA

### Flight Time of Whirlie Birds



## Whirlie Birds Tested

### CONCLUSIONS

Which whirlie bird stayed in flight the longest? \_\_\_\_\_

Which whirlie bird stayed in flight the shortest? \_\_\_\_\_

What was your hypothesis? Explain whether you were correct or not.

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Which whirlie bird experienced more air resistance or fluid friction?

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What other patterns do you see in your graph or data chart?

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