

# Planning fair tests and reading data

Grade 6 science (Year 7 · Class 6) · Lab

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

Does the length of the wings change how a paper helicopter falls? In this lab you run a fair test, repeat each measurement three times, calculate means and draw a graph to support a conclusion.

**Level:** Grade 6 science (Year 7 · Class 6) · **Curriculum:** SEP 3-4

## Aim

To find out whether the length of the wings of a paper helicopter changes how long it takes to fall 2.0 m.

## Equipment

- Paper cut into identical strips (same paper type and width)
- Scissors, ruler and paper clips of the same size
- Stopwatch
- Metre rule or tape fixed to a wall
- Pencil and notebook

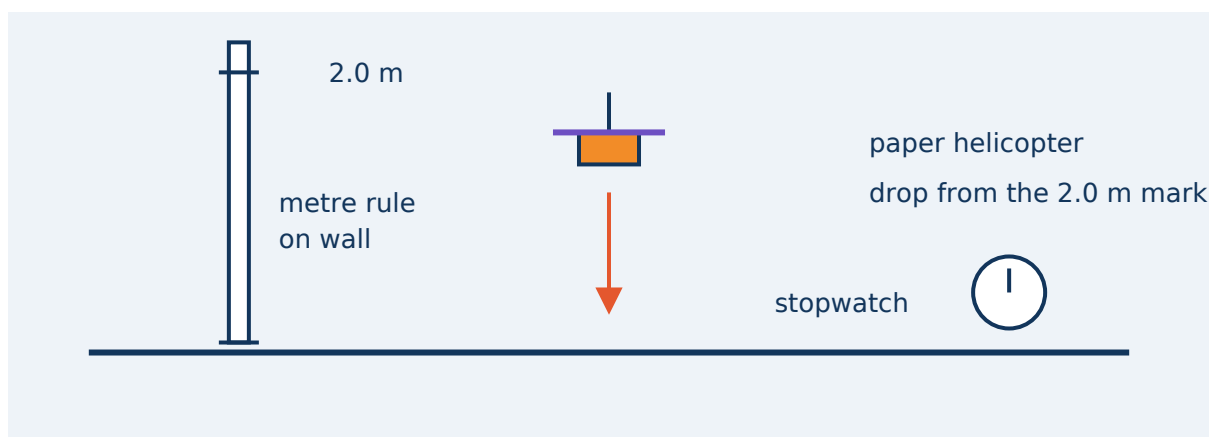
## Safety

### Safety

Scissors are sharp: cut away from your body. Do not stand on a chair to drop the helicopter; use a marked height on a wall that you can reach safely, or ask an adult to hold a ladder.

## Method

1. Make four helicopters with wing lengths of 4 cm, 6 cm, 8 cm and 10 cm. Fold the wings in opposite directions and add one paper clip to the bottom.
2. Mark a height of 2.0 m on the wall.
3. Drop the first helicopter from the mark and time it to the floor. Repeat three times.
4. Repeat for each wing length. Keep everything else the same.
5. Calculate the mean time for each wing length.



*Set-up: drop each helicopter from the same height and time the fall.*

## Results

| Wing length (cm) | Trial 1 (s) | Trial 2 (s) | Trial 3 (s) | Mean (s) |
|------------------|-------------|-------------|-------------|----------|
| 4                | 1.5         | 1.6         | 1.5         | 1.53     |
| 6                | 1.9         | 2.0         | 1.9         | 1.93     |
| 8                | 2.4         | 2.3         | 2.5         | 2.40     |
| 10               | 2.7         | 2.9         | 2.8         | 2.80     |

## Analysis questions

### Question 1 Variables

1. Name the independent variable, the dependent variable and three controlled variables.

### Question 2 Check a mean

1. Show how the mean for 6 cm wings was calculated.

### Question 3 Draw the chart

1. Describe how to draw a bar chart or line graph for the mean times. Say what goes on each axis and a suitable scale.

### Question 4 Pattern

1. Describe the pattern shown by the means.

### Question 5 Hypothesis

1. Write a hypothesis that this lab could test and say whether the results support it.

### **Question 6 Reliability**

1. Explain why three trials were made. Which wing length has the biggest range in its trials?

### **Question 7 Prediction**

1. Use the pattern to predict the time for 12 cm wings and say how confident you are.

### **Question 8 Improve the lab**

1. Suggest two improvements that would make the results more accurate.