PAPER HELICOPTER LAB

NAME

CLASS / DATE

01 QUESTION

How does the length of a paper helicopter's rotor blades change how long it takes to fall?

02 PREDICT BEFORE YOU MEASURE

HOW MIGHT LONGER ROTOR BLADES RELATE TO MEAN FALL TIME?

○ increase ○ decrease ○ show no clear pattern yet

A prediction is not a result; compare the three individual flights for every design.

03 VARIABLES

I CHANGE (INDEPENDENT)	I MEASURE (DEPENDENT)

I KEEP THE SAME (CONTROLLED) · CHANGED: ROTOR BLADE LENGTH. MEASURED: FALL TIME.
KEEP PAPER, BODY, FOLDS, CLIP MASS, RELEASE HEIGHT AND RELEASE METHOD THE SAME.

04 MATERIALS

- ☐ Three matching paper templates
- ☐ Scissors and centimeter ruler
- ☐ Equal paper clips
- ☐ Tenths stopwatch or slow-motion camera
- ☐ One low release mark reachable by an adult standing on the floor
- ☐ Clear marked landing zone

05 PROCEDURE

SAFETY Use one low mark an adult can reach while standing on the floor; lower it if needed. An adult releases from that mark. Never use a ladder, stairs, chair, desk, balcony, railing or raised platform. Keep people and fragile objects outside the clear landing zone. Use scissors while seated at a clear table, with blades pointed away from the body. Paper clips are small parts; keep them away from young children and collect them after testing.

1 **BUILD THREE ROTORS** Cut 3, 6 and 9 cm blades from the same paper template. Keep body length and width the same. ☐

2 **FOLD AND CLIP** Fold the two blades in opposite directions and add one equal paper clip to each base. ☐

3 **MARK ONE SAFE HEIGHT** Choose one low mark an adult can reach while standing on the floor; lower it if needed. The adult releases and everyone stays outside the clear landing area. ☐

4 **DROP AND TIME** The adult releases rotor-side up without a push or twist. Start timing at release and stop at the same landing point. Repeat three times per design. ☐

5 **AVERAGE AND GRAPH** Calculate each mean fall time and plot the means against blade length. Keep all trial values for comparison. ☐

DATA AND EXPLANATION

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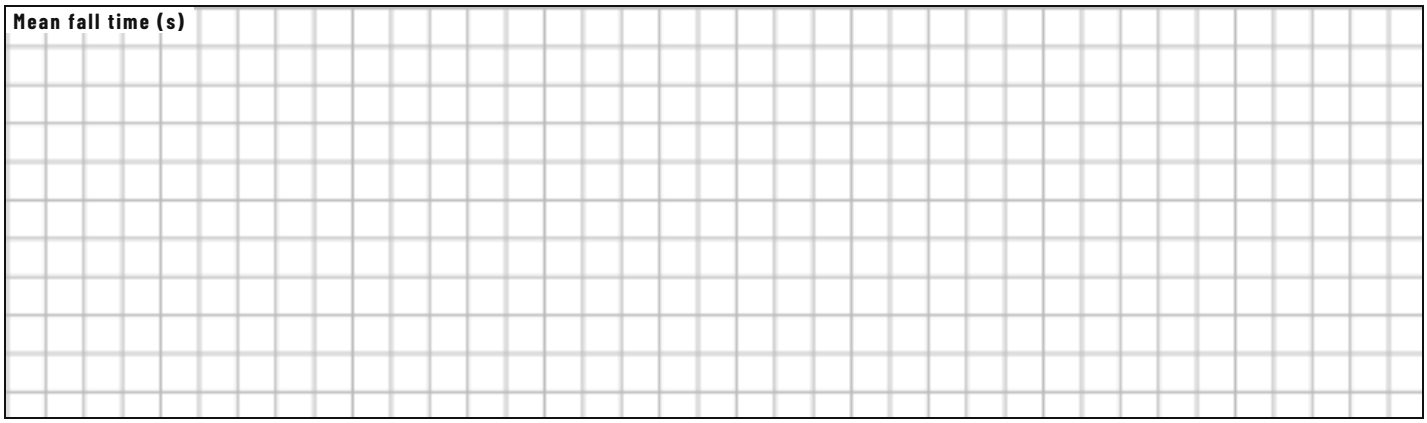
06 RECORD YOUR OBSERVATIONS

ROTOR BLADE LENGTH (CM)	TRIAL 1 (S)	TRIAL 2 (S)	TRIAL 3 (S)	MEAN (S)
Short · 3				
Medium · 6				
Long · 9				

Mean fall time = (Trial 1 + Trial 2 + Trial 3) ÷ 3.

SHOW ONE CALCULATION

07 ROTOR LENGTH AND MEAN FALL TIME



Plot the table's Mean for each rotor length. Show units; compare the three trial values when explaining spread.

X: Rotor blade length (cm)

08 EXPLAIN IT WITH EVIDENCE

CLAIM

EVIDENCE

REASONING

Reasoning must use: rotor length · trial · mean · fall time · drag

09 THINK FURTHER

Which single feature could you change next while holding the drop height, body, paper and release method constant?