

Helicopter Test Plan

Trace the change, measurement, and controls in a fair investigation.

5.1.b.ii "planning and carrying out investigations identify independent variable, dependent variables, and constants"

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline the factor Jada changes, circle what she measures, and number three conditions she keeps the same. These marks will show how her plan tests one change fairly.

Jada's Paper Helicopters

- ① When scientists plan a fair investigation, they choose one factor to change on purpose. This is the independent variable. They measure or observe what happens. This is the dependent variable. Other conditions should stay the same. These constants help scientists decide whether the planned change, rather than another difference, caused the result in their test.
- ② Jada wondered whether a paper helicopter's blade length changes how long it stays in the air. She made helicopters from the same kind of paper. Each had the same body length, paper clip, and fold pattern. She prepared sets with blades that were 4, 6, or 8 centimeters long. No other part of a helicopter was planned to differ.
- ③ For each blade length, Jada dropped three helicopters from a 2-meter mark in a quiet school hallway. A partner used the same stopwatch to record seconds from release until each helicopter touched the floor. They released every helicopter without a push. Jada compared the three times for each blade length and found an average, so one unusual drop would not control her conclusion.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What is the independent variable in Jada's investigation?

2 What is the dependent variable in Jada's investigation?

3 Name three constants Jada kept the same.

4 Why would it be harder to reach a conclusion if Jada changed both blade length and paper type?

3 YOUR TURN _____ Your own words

Plan a fair test about something you can measure. Write 4 to 6 sentences that name the independent variable, dependent variable, and three constants, and tell how you will repeat the test.

PART 1 • READ AND MARK

Underline the factor Jada changes, circle what she measures, and number three conditions she keeps the same. These marks will show how her plan tests one change fairly. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What is the independent variable in Jada's investigation?	The paper helicopter's blade length.
2	What is the dependent variable in Jada's investigation?	The time, in seconds, from release until the helicopter touched the floor.
3	Name three constants Jada kept the same.	Answers include paper type, body length, paper clip, fold pattern, release height, stopwatch, hallway, and release method.
4	Why would it be harder to reach a conclusion if Jada changed both blade length and paper type?	She could not tell whether blade length or paper type caused a difference in falling time.

PART 3 • YOUR TURN (SAMPLE ANSWER)

I will test whether water temperature changes the time needed for one sugar cube to dissolve. The independent variable is water temperature, and the dependent variable is dissolving time in seconds. I will keep the cup size, water amount, sugar cube size, and stirring method the same. I will test each temperature three times and compare the average time.

For Question 3, accept any three conditions stated in the passage that Jada held constant. For the open response, accept a reasonable measurable test when the student correctly identifies one changed factor, one measured outcome, at least three constants, and repeated trials.