

Plant Test Detectives

Identify questions, hypotheses, and variables in an investigation.

6.1.a.ii "asking questions and defining problems develop hypotheses and identify independent and dependent variables"

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline Maya's testable question, circle her hypothesis, and write IV beside the factor she changes and DV beside what she measures.

Sunlight and Bean Plants

- ① During a school garden project, Maya noticed that some bean plants grew taller than others. She wondered whether the amount of sunlight changed plant growth. Her testable question was, "How does the number of hours of sunlight each day affect the height of bean plants after three weeks?" A testable question names something that can be changed or measured. Maya chose one clear factor to change so she could look for a pattern instead of guessing from many differences at once.
- ② Before planting, Maya wrote a hypothesis: "If bean plants receive more hours of sunlight each day, then they will be taller after three weeks." A hypothesis is a testable prediction that connects a possible cause to an expected result. The independent variable is the factor the investigator changes on purpose. In Maya's investigation, it was daily sunlight hours. The dependent variable is what the investigator measures or observes in response. Maya measured each plant's height in centimeters at the end of the three weeks.
- ③ To make the comparison fair, Maya kept other conditions the same. Each plant received the same kind of bean seed, pot size, soil, water amount, and growing time. These conditions were not the independent variable because she did not change them from group to group. After collecting heights, Maya could compare the groups and decide whether her evidence supported her hypothesis. If the results did not match her prediction, that would not mean the investigation failed. It would mean Maya should revise her hypothesis or ask a new question.

2 ANSWER WITH EVIDENCE Use the passage

1 What testable question did Maya ask?

2 What was Maya's hypothesis?

3 What was the independent variable? Explain why it was the independent variable.

4 What was the dependent variable, and how did Maya measure it?

3 YOUR TURN Your own words

Plan a simple investigation about dissolving a sugar cube in water. Write a testable question, an If...then hypothesis, and name the independent and dependent variables.

PART 1 • READ AND MARK

Underline Maya's testable question, circle her hypothesis, and write IV beside the factor she changes and DV beside what she measures. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What testable question did Maya ask?	How does the number of hours of sunlight each day affect the height of bean plants after three weeks?
2	What was Maya's hypothesis?	If bean plants receive more hours of sunlight each day, then they will be taller after three weeks.
3	What was the independent variable? Explain why it was the independent variable.	The independent variable was the number of daily sunlight hours because Maya changed it on purpose.
4	What was the dependent variable, and how did Maya measure it?	The dependent variable was plant height. Maya measured each plant's height in centimeters after three weeks.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Question: How does water temperature affect the time needed for a sugar cube to dissolve? Hypothesis: If water is warmer, then a sugar cube will dissolve in less time. Independent variable: water temperature. Dependent variable: time needed for the sugar cube to dissolve.

Accept equivalent testable questions and hypotheses that connect water temperature to dissolving time. The independent variable must be water temperature, and the dependent variable must be the time for the sugar cube to dissolve.