

Light Test Detectives

Identify questions, variables, hypotheses, and a practical design response.

LS.1.a “asking questions and defining problems ask questions and develop hypotheses to determine relationships between independent and dependent variables offer simple solutions to design problems”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Circle the testable question, underline the hypothesis, and write IV beside the factor changed and DV beside the result measured, so you can trace how the class tested a relationship.

Finding the Best Light Schedule

- ① Ms. Chen’s class noticed that basil seedlings near a sunny window were taller than seedlings on a back counter. They turned this observation into a testable question: How does the number of hours of light each day affect basil seedling height after two weeks? The class chose light hours as the independent variable, the factor they would change. Seedling height was the dependent variable, the result they would measure. They predicted that seedlings receiving more light would grow taller, if water, soil, pot size, and seed type stayed the same.
- ② To test the hypothesis, the class placed equal-sized seedlings in four groups. Each group received either two, four, six, or eight hours of lamp light daily. Every plant received the same measured amount of water, the same soil, and the same room temperature. After two weeks, the class measured each seedling from the soil surface to its highest leaf. The six-hour group had the greatest average height. The eight-hour group was shorter, showing that more light did not always produce more growth under these conditions.
- ③ The results helped the class define a design problem. Their classroom shelf had no window light, but the seedlings needed a regular amount of light. The class proposed a simple solution: place a lamp above the shelf and connect it to a timer set for six hours each day. A timer could give plants a consistent schedule when no one was in the room. Before using the design, students would test several seedlings and compare their heights with seedlings that received another light schedule. They would check that the lamp did not overheat the leaves.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What testable question did the class ask about the basil seedlings?

2 Identify the independent variable and the dependent variable in the class's investigation.

3 What was the class's hypothesis? Name two factors they planned to keep the same.

4 How did the eight-hour group's result change what the class could conclude about light and growth?

3 YOUR TURN _____ Your own words

Choose a problem involving a living thing at school or home. In 5 to 7 sentences, state a testable question, name an independent and dependent variable, write a hypothesis, and offer a simple design solution.

PART 1 • READ AND MARK

Circle the testable question, underline the hypothesis, and write IV beside the factor changed and DV beside the result measured, so you can trace how the class tested a relationship. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What testable question did the class ask about the basil seedlings?	How does the number of hours of light each day affect basil seedling height after two weeks?
2	Identify the independent variable and the dependent variable in the class's investigation.	Independent variable: hours of light each day. Dependent variable: basil seedling height after two weeks.
3	What was the class's hypothesis? Name two factors they planned to keep the same.	They predicted that seedlings receiving more light would grow taller. They planned to keep water, soil, pot size, and seed type the same. Any two are acceptable.
4	How did the eight-hour group's result change what the class could conclude about light and growth?	The eight-hour group was shorter than the six-hour group, so more light did not always produce more growth under these conditions.

PART 3 • YOUR TURN (SAMPLE ANSWER)

The problem is algae covering the rocks in a classroom aquarium. My question is, how do daily light hours affect the percentage of a rock covered by algae after one week? The independent variable is daily light hours, and the dependent variable is the percentage of the rock covered by algae. I hypothesize that tanks with fewer light hours will have less algae coverage, if the water and feeding stay the same. A simple solution is a timer that limits the aquarium light to a tested number of hours each day.

Accept equivalent wording for the passage answers when students correctly identify the changed factor, measured result, evidence, and design purpose. For Your Turn, accept reasonable, testable relationships and solutions that match the stated problem.