

Cause and Effect Detectives

Turn observations into testable science ideas.

4.1.a.ii "asking questions and defining problems develop hypotheses as cause-and-effect relations"

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline the observations that led Maya to ask a question. Circle the cause and number the effect in Maya's hypothesis with 1.

Worms After Rain

- ① After a rainy week, Maya noticed more earthworms on the sidewalk near the school garden. On a dry week, she saw fewer worms there. She wondered, "Does wet soil cause more earthworms to come to the surface?" This question named one possible cause, wet soil, and one possible effect, worms at the surface. Maya wrote the problem: Why do worm numbers change after rain?
- ② To investigate, Maya planned two clear boxes with the same kind and amount of soil. She would add water to one box until the soil was damp and leave the other box dry. She would place the same number of earthworms in each box and count how many worms were at the surface after ten minutes. Keeping most conditions the same would help her compare soil moisture fairly.
- ③ Maya's hypothesis was: If soil is wetter, then more earthworms will be at the surface because wet soil may affect where they move. This is a cause-and-effect idea. The cause is soil moisture, and the effect is the number of worms at the surface. Her counts could support or not support the hypothesis. One test cannot prove it true, but it can give useful evidence.

2 ANSWER WITH EVIDENCE Use the passage

1 What two observations made Maya ask a question about earthworms?

2 What problem did Maya write?

3 In Maya's hypothesis, what is the cause and what is the effect?

4 How would Maya test her hypothesis, and why would she use the same number of worms in both boxes?

3 YOUR TURN Your own words

Choose something you could observe at school or at home. Write one science question or problem, then write an If...then...because hypothesis that names a possible cause and effect.

PART 1 • READ AND MARK

Underline the observations that led Maya to ask a question. Circle the cause and number the effect in Maya's hypothesis with 1. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What two observations made Maya ask a question about earthworms?	She saw more earthworms after a rainy week and fewer earthworms during a dry week.
2	What problem did Maya write?	Why do worm numbers change after rain?
3	In Maya's hypothesis, what is the cause and what is the effect?	The cause is wetter soil, or soil moisture. The effect is the number of earthworms at the surface.
4	How would Maya test her hypothesis, and why would she use the same number of worms in both boxes?	She would compare worms at the surface in one damp-soil box and one dry-soil box after ten minutes. Using the same number of worms helps make the comparison fair.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Question: Does the amount of sunlight cause bean plants to grow different heights? Hypothesis: If a bean plant gets more sunlight, then it may grow taller because sunlight helps plants make food.

Accept reasonable, observable questions or problems and hypotheses that clearly connect one possible cause to one predicted effect. The hypothesis does not need to be true, but it must be testable.