

Evidence to Explanation

Trace how observations, reasoning, and models work together in an investigation.

SC.8.N.1.6 "Understand that scientific investigations involve the collection of relevant empirical evidence, the use of logical reasoning, and the application of imagination in devising hypotheses, predictions..."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline the empirical evidence, circle each hypothesis, explanation, model, or prediction, and draw an arrow from each circled idea to the evidence it uses or proposes to test.

Why Do Pill Bugs Gather?

- ① During a schoolyard investigation, Maya's team asked why pill bugs gathered under some objects but not others. They placed equal-sized pieces of damp paper and dry paper in opposite halves of a tray. Ten pill bugs began in the center. The team kept the tray dark, used the same kind of paper, and waited ten minutes. They repeated the test three times, recording how many pill bugs were on each side after every trial in notebooks.
- ② Across the trials, more pill bugs were found on the damp paper. This empirical evidence supported the team's hypothesis that pill bugs prefer moist places. The result did not prove that moisture was the only cause. The damp side might also have had a slightly cooler surface. To reason fairly, the team proposed testing temperature separately while keeping moisture the same. They would collect new counts before deciding whether temperature changed the bugs' choices as well.
- ③ Next, Maya used imagination to build a model, a simple representation used to explain evidence. She pictured each pill bug sensing moisture as it moved across the tray. Her model predicted that, if both sides were equally dark and warm, more pill bugs would move toward the moist side over time. A model is useful when it leads to a testable prediction. If new evidence disagrees with the prediction, scientists revise the hypothesis or model.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What empirical evidence did Maya's team collect during the investigation?

2 What conclusion did the evidence support, and why did the team avoid treating it as final proof?

3 How would testing temperature separately help the team use logical reasoning?

4 State Maya's model-based prediction about what would happen if both sides were equally dark and warm.

3 YOUR TURN _____ Your own words

A student notices that ice cubes melt faster on a metal tray than on a wooden tray. Write 4 to 6 sentences that describe relevant evidence to collect, a hypothesis, a prediction, and an explanation or model. Include at least one condition the student should keep the same.

PART 1 • READ AND MARK

Underline the empirical evidence, circle each hypothesis, explanation, model, or prediction, and draw an arrow from each circled idea to the evidence it uses or proposes to test. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What empirical evidence did Maya's team collect during the investigation?	They recorded how many pill bugs were on the damp and dry paper after each of three trials.
2	What conclusion did the evidence support, and why did the team avoid treating it as final proof?	The evidence supported the hypothesis that pill bugs prefer moist places. The team recognized that the damp side might also have been cooler, so moisture might not have been the only cause.
3	How would testing temperature separately help the team use logical reasoning?	It would help them determine whether temperature changed the pill bugs' choices while moisture stayed the same.
4	State Maya's model-based prediction about what would happen if both sides were equally dark and warm.	More pill bugs would move toward the moist side over time.

PART 3 • YOUR TURN (SAMPLE ANSWER)

I would place equal-sized ice cubes on a metal tray and a wooden tray in the same room. I would measure the time each cube takes to melt and repeat the test three times. My hypothesis is that ice melts faster on metal because metal transfers thermal energy to the ice more quickly. I predict that the melting times on metal will be shorter. This explanation is a model that I would revise if the repeated times did not support it.

Accept equivalent descriptions of the recorded pill bug counts, the moisture hypothesis, the possible temperature factor, and the model-based prediction. For Part 3, accept varied testable hypotheses and models if the response includes relevant evidence, a prediction, and at least one controlled condition.