

Evidence in Questions

Identify questions that can be answered with observations and measurements.

PS.1.a.i “asking questions and defining problems ask questions that require empirical evidence to answer”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each question that can be answered by collecting measurements or observations, and circle words that name evidence to collect or conditions to keep similar.

Testing Melting Trays

- ① A student notices that an ice cube on a metal tray seems to melt faster than one on a wooden board. The observation leads to a testable question: “How does tray material affect the time needed for an ice cube to melt?” This question can be answered with empirical evidence, meaning observations or measurements collected during an investigation. The student can compare melting times while keeping the size of each ice cube, the room temperature, and the starting location as similar as possible.
- ② Some questions sound scientific but cannot be settled by evidence alone. “Which tray is the best choice for a lunchroom?” depends on cost, safety, and other priorities. In contrast, “Which tray material produces the shortest average melting time under the same conditions?” calls for measurements. The student could place equal-sized ice cubes on several materials, use a timer, and record when each cube has melted. Repeating the trial helps show whether a result is consistent rather than caused by one unusual cube or condition.
- ③ Before collecting evidence, the student plans what to change, what to measure, and what to keep similar. For the tray investigation, material is changed, melting time is measured, and cube size and room temperature are kept similar. A question such as “Does a blue tray melt ice faster than a red tray?” is not useful unless color is the factor being tested and other conditions are controlled. Careful questions point to evidence someone can collect, compare, and use to support a conclusion.

2 ANSWER WITH EVIDENCE Use the passage

1 Why cannot evidence alone answer the question about the best tray for a lunchroom?

2 Why can the question about the tray material with the shortest average melting time be answered with empirical evidence?

3 For the tray investigation, what is changed, what is measured, and name two conditions kept similar.

4 Why is comparing a blue tray with a red tray not useful unless color is the factor being tested?

3 YOUR TURN Your own words

Choose an everyday physical science situation involving motion, sound, heat, light, or materials. Write one question that requires empirical evidence to answer, then state what you would change, what you would measure or observe, and two conditions you would keep similar.

PART 1 • READ AND MARK

Underline each question that can be answered by collecting measurements or observations, and circle words that name evidence to collect or conditions to keep similar. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Why cannot evidence alone answer the question about the best tray for a lunchroom?	It depends on priorities such as cost and safety, not only on measurements.
2	Why can the question about the tray material with the shortest average melting time be answered with empirical evidence?	A student can measure and compare ice-cube melting times under the same conditions.
3	For the tray investigation, what is changed, what is measured, and name two conditions kept similar.	Tray material is changed. Melting time is measured. Ice-cube size and room temperature are kept similar.
4	Why is comparing a blue tray with a red tray not useful unless color is the factor being tested?	The comparison is useful only if color is the intended changed factor and other conditions are controlled.

PART 3 • YOUR TURN (SAMPLE ANSWER)

How does the height of a ramp affect the time a toy car takes to reach the floor? I would change ramp height, measure travel time with a timer, and keep the car, ramp surface, release point, and distance the same.

Accept student questions that can be investigated through observations or measurements and that identify a measurable outcome. Accept reasonable controls that could keep the comparison fair.