

ACT Science Study Pack

Quick Review · Data Practice · Flashcards

10 questions · suggested time: 10 minutes

How to use this pack. Start with the review, complete the practice before reading the key, then cut out or cover the flashcard answers for self-testing. These are original, unofficial practice materials. ACT is a registered trademark of ACT Education Corp.; no endorsement is implied.

Quick Review

Interpretation of Data. Read the title, axes, units, and legend before comparing values. Notice whether a pattern rises, falls, levels off, or has an exception.

Scientific Investigation. Identify what the researchers changed, what they measured, and what they kept constant. A controlled comparison helps isolate a possible cause.

Evidence and Models. Distinguish an observation from an explanation. Choose the claim supported by the displayed evidence, not the one that merely sounds scientifically familiar.

Pacing. Go to the figure or experiment named in the question. Read only the relevant values carefully, then return to the answer choices.

Original Data Practice: Study: Seedling Growth

Researchers grew the same type of seedling for 14 days. All groups received 12 hours of light and the same soil. The table shows the average height for each watering schedule.

Water per day	Day 7 height (cm)	Day 14 height (cm)
20 mL	4.2	7.1
40 mL	5.8	10.4
60 mL	5.9	10.5

Focused Practice

Answer using the study information and table above.

- Which group had the greatest average height on Day 14?
 - 20 mL
 - 40 mL
 - 60 mL
 - The heights were equal
- Between which watering schedules was the Day 14 height difference smallest?
 - 20 and 40 mL
 - 20 and 60 mL
 - 40 and 60 mL
 - All pairs were equal

3. What is the best supported conclusion from the table?
- A. Height increased as water rose from 20 to 40 mL, then changed very little at 60 mL.
B. More water always caused a large height increase.
C. The 20 mL group grew tallest.
D. Light duration changed between groups.
4. Which variable was measured?
- A. Hours of light
B. Soil type
C. Average seedling height
D. Water amount
5. Why were the soil and light conditions kept the same?
- A. To make the watering schedules easier to read
B. To reduce other differences that could affect growth
C. To make the seedlings receive no water
D. To prove that all seedlings were identical
6. A second trial finds that 60 mL seedlings have much shorter roots than the 40 mL seedlings. What should researchers do next?
- A. Ignore the second trial
B. Repeat and investigate whether excess water affects roots
C. Change the table labels
D. Conclude that light caused the difference
7. Which statement is an observation rather than an explanation?
- A. The 40 mL seedlings averaged 10.4 cm on Day 14.
B. Extra water improved nutrient absorption.
C. The seedlings grew taller because of a hormone.
D. The soil became healthier.
8. If a graph were made from the table, what would its horizontal axis most reasonably show?
- A. Water per day
B. Height in centimeters
C. Number of leaves
D. Hours of sunlight
9. Which new group would best help clarify whether the nearly equal 40 mL and 60 mL results reflect a plateau?
- A. A 5 mL group only
B. A 45 mL group and a 50 mL group
C. A group with different soil and light
D. A group measured only on Day 1
10. The conclusion that seedlings need exactly 40 mL per day is
- A. supported, because 40 mL had the greatest height
B. not supported, because 40 and 60 mL were nearly equal and only three amounts were tested
C. supported, because the table proves all plants respond alike
D. not supported, because no height was measured

Answer Key and Explanations

1. **C.** The table lists 10.5 cm for 60 mL, slightly above 10.4 cm for 40 mL.
2. **C.** The difference between 10.4 and 10.5 is 0.1 cm, the smallest pairwise difference.
3. **A.** The recorded heights rise from 20 to 40 mL and are nearly the same at 40 and 60 mL.
4. **C.** Height is the measured outcome shown in the table; water amount is the condition varied.
5. **B.** Keeping other conditions constant makes it easier to interpret the effect of the watering schedule.
6. **B.** The unexpected result deserves a repeated, targeted investigation before drawing a conclusion.
7. **A.** The value is directly recorded. The remaining choices propose causes not measured in this table.
8. **A.** Water amount is the condition varied, so it belongs on the horizontal axis in a simple comparison graph.
9. **B.** Additional water amounts near 40–60 mL would show whether height levels off in that interval.
10. **B.** The data do not identify a unique optimum, and the study tested only three watering levels.

Flashcards

Cover the right column, answer aloud, and then check. For print-and-cut use, trim along the rules.

Front / term	Back / meaning
Independent variable	The condition the researcher deliberately changes.
Dependent variable	The outcome the researcher measures.
Controlled variable	A condition kept the same to make comparisons fairer.
Control group	A comparison group used to interpret the effect of a tested condition.
Trend	A general pattern across measured values.
Outlier	A value that differs noticeably from the overall pattern.
Observation	A recorded result or description based on what was measured.
Inference	A conclusion drawn from observations and reasoning.
Model	A simplified representation used to explain or predict a system.
Claim-evidence link	The way specific results support or fail to support a conclusion.
Axis label	The description and units that tell what a graph displays.
Repeated trial	A repeat measurement that can reveal whether a result is consistent.