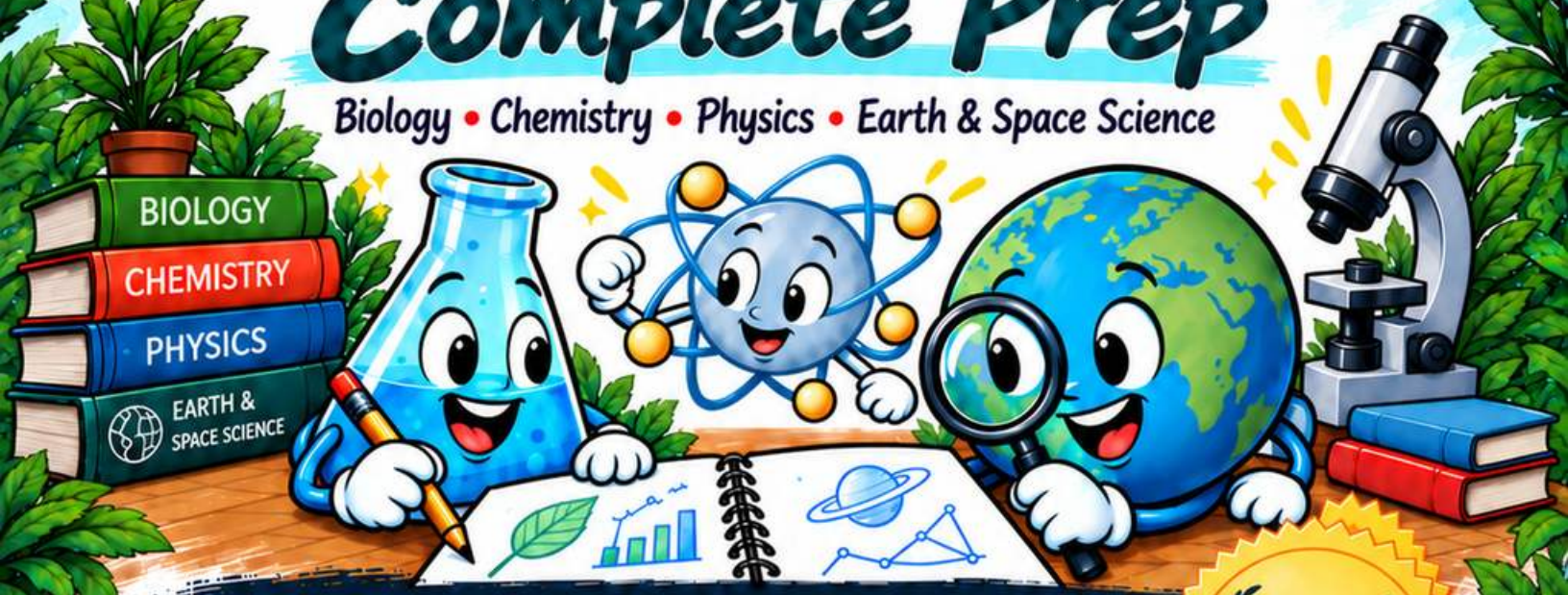
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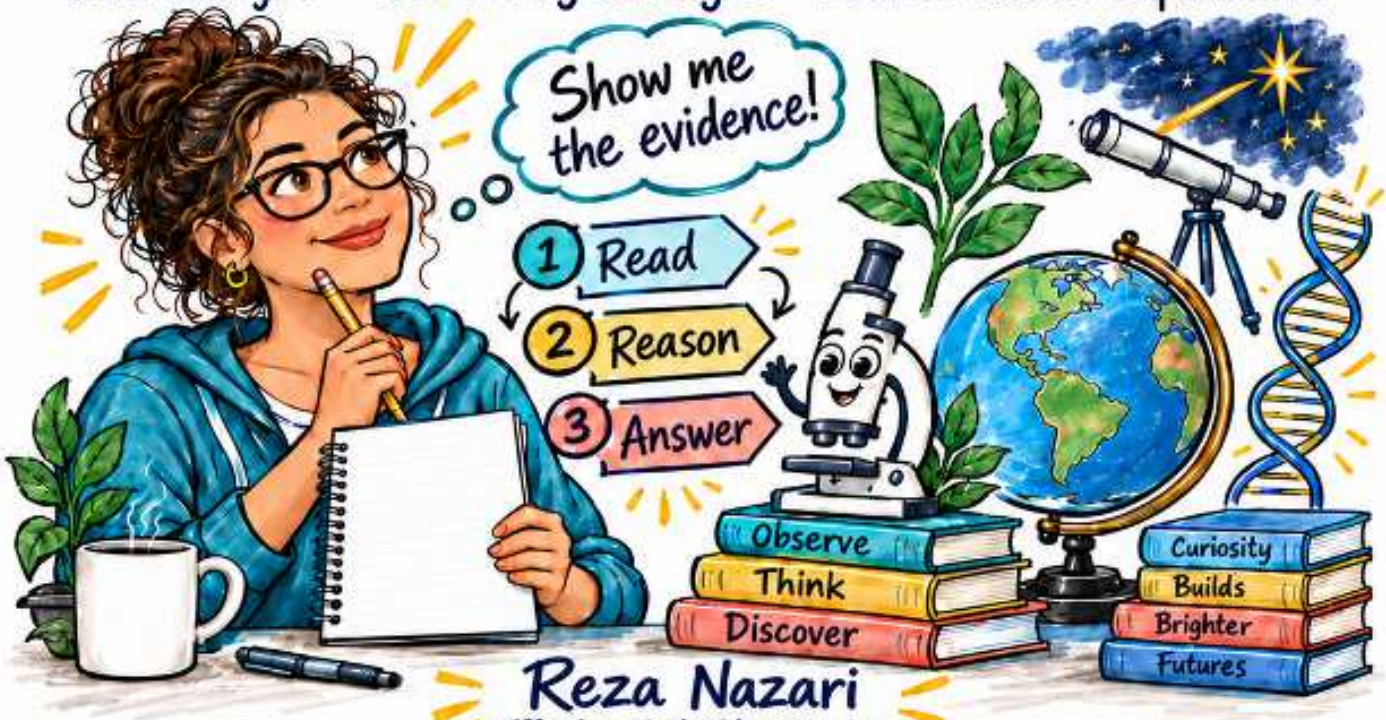
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2027 edition

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The task tells you which evidence to find. Background details can be correct without answering that task.

A common wrong turn is to answer a nearby question instead of the one in the passage. A passage may describe why a plant wilted, while the item asks which measurement would best test the explanation. Retelling the passage does not name the measurement. A quick paraphrase helps: "I need the measure that would tell whether the roots lack water."

ACT-Style Question

Let the task verb choose the work

A pond's dissolved oxygen concentration was measured as 4 mg/L at 6 a.m. and 9 mg/L at noon, and it rose throughout the morning. Which value is the best *prediction* for 9 a.m.?

A. 3 mg/L
B. 7 mg/L
C. 10 mg/L
D. 13 mg/L

Predict asks for a value that fits the stated trend, not an exact calculation. Because 9 a.m. falls between 6 a.m. and noon and the concentration rose the whole time, the 9 a.m. value must lie between 4 and 9 mg/L. Only **B** does. A is below the starting value, C is above the noon value, and D adds the two readings. Translate the stem into a short task before looking at choices: identify, compare, infer, predict, or calculate. Often the trend alone eliminates three choices.

A last check for tempting choices

Wrong choices tend to use one of a few shortcuts. One repeats a true detail but does not answer the task. One swaps the groups. One uses a correct number with the wrong unit. Another makes a broad claim from a small study. You can test each option against the stimulus: point to the evidence it needs. If that evidence is missing, set the option aside.

This check is especially useful when two choices sound reasonable. The question asks for the best supported answer, not every statement that could be true in real life. Stay with the study in front of you. A familiar science fact does not replace the given evidence.

Check yourself

Before choosing, ask: What is the question asking me to find? Which sentence, label, or value answers that task? Did I keep the units and group names attached to the evidence?

Follow one shared passage to the right evidence

For a viewpoint passage, first make a short model map: what does each scientist say causes the result? Then use the question to choose the comparison. You do not need every detail yet. Decide whether you are looking for a value, a change, or an explanation.

ACT-Style Question

An annotated route through shared evidence

Setup. Matching seedling groups receive equal daily light doses. Temperature is uniform around each stem. Scientist 1 predicts bending toward one-sided light. Scientist 2 predicts bending toward the warmer side, regardless of light direction.

Light direction	Height gain (mm)	Bend toward light (°)
Overhead	8	1
One side	8	12

Which result favors Scientist 1 over Scientist 2 under these conditions?

A. Both groups gain 8 mm.

B. One-sided light produces a 12° bend despite uniform temperature.

C. The overhead group receives less light.

D. The one-sided group starts taller.

B. The task is to distinguish models, so locate the bend column and the temperature condition. The one-sided group bends 12° toward light while no warmer side is present. That fits Scientist 1's prediction and challenges Scientist 2's stated temperature-gradient mechanism. The equal 8-mm gains answer a growth question instead. Equal doses rule out C, and starting heights are not supplied. Your evidence route is *task* → *model prediction* → *bend column* + *temperature sentence*. For a height-change question, the route would end at the other column.



Chapter Skill Practice

8 questions

Chapter 1: Read the task before you read every detail

Directions: Choose one answer for each question. Work without a calculator.

Answers and explanations: page 282.

1. A report states: "Leaves release water vapor through small pores. During dry conditions, many plants close these pores, reducing water loss. Closed pores also limit entry of carbon dioxide, a reactant in photosynthesis." Which statement supports the claim that closing pores has a cost for photosynthesis?

A. Leaves have small pores.
B. Closed pores limit carbon dioxide entry.
C. Many plants experience dry conditions.
D. Closing pores reduces water loss.

2. A technician reports that a metal sample is malleable: it can be pressed into a thin sheet without breaking. Which observation would support that description?

A. The sample dissolves in water.
B. The sample breaks into powder under a press.
C. The sample attracts iron filings.
D. The sample flattens under a press and stays in one piece.

3. Workers pack identical cold containers in 1 cm, 2 cm, or 3 cm of the same foam. They measure the temperature increase after one hour in the same room. Which question can this procedure answer?

A. How does foam thickness affect warming over one hour?
B. Which foam material is strongest?
C. How does room temperature affect warming?
D. How does container size affect warming?

4. After a storm, a stream is brown and visibility through the water is 8 cm. A resident proposes that runoff carried soil into the stream. Which statement is an observation rather than an explanation?

A. Runoff carried soil into the stream.
B. Upstream farming caused the brown color.
C. Visibility through the water is 8 cm.
D. The storm loosened soil on nearby slopes.

5. Source 1: In matching pans kept under the same conditions, a covered pan lost 4 g of water in 20 minutes; an uncovered pan lost 18 g. Source 2: Water molecules escaping from a liquid surface form vapor. Both pans had the same starting water mass and temperature. Which conclusion uses both sources?

A. The cover increased evaporation by 14 g.
B. The cover had no effect on the mass lost as vapor.
C. The uncovered pan lost 18 g more than the covered pan.
D. The cover reduced the mass of water escaping as vapor.

6. A field note says a bat detector recorded 24 calls at dusk and 7 at noon during one day. The detector cannot distinguish individual bats. Which conclusion is supported?

A. Exactly 24 bats flew at dusk.
B. The detector recorded more calls at dusk than at noon.
C. Bats always avoid flying at noon.
D. Each bat made exactly one call.

7. Students measure how long equal masses of salt take to dissolve in water at 15°C and 35°C. Each trial uses 100 mL of water and the same stirring rate. A question asks which temperature gives the shorter mean dissolving time. Which information should a student compare first?

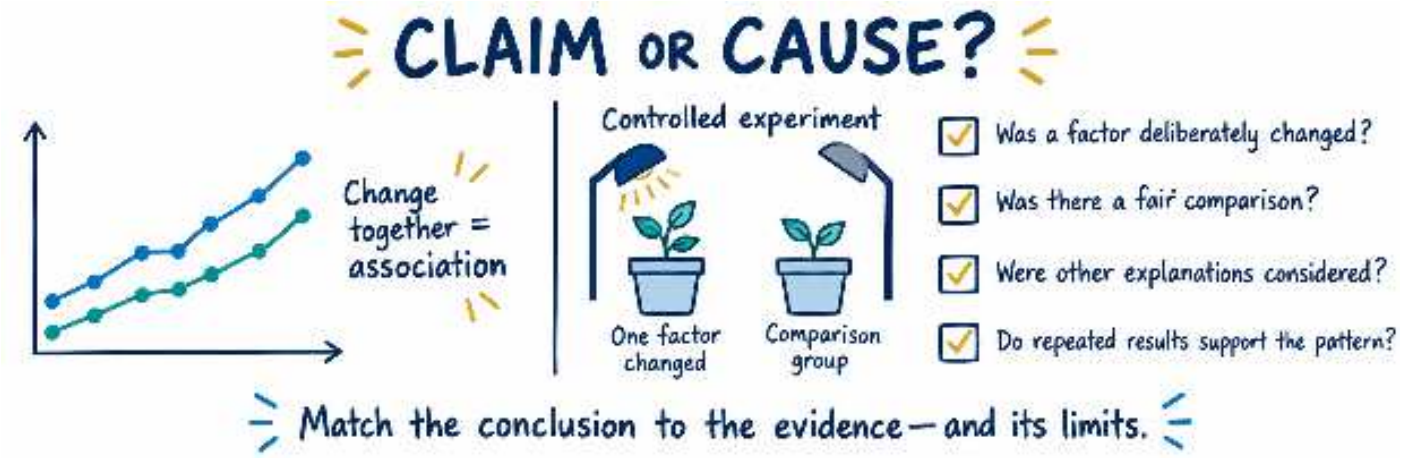
A. The volume of water used in each trial
B. The room temperature before the trials
C. The mean dissolving time at each water temperature
D. The mass of salt left in its storage container

8. A graph records a cooling sample's temperature every minute from 0 to 12 minutes. A question asks how much the temperature decreased between minutes 4 and 9. Which readings are needed to answer that question?

A. The temperatures at minutes 4 and 9
B. The temperatures at minutes 0 and 12
C. The temperatures at minutes 0 and 9
D. The temperatures at minutes 4 and 12

ACT-Style Question (continued)

The measurements for both daylight and plant height rose, but the plants also got older as time passed. Because the study did not compare different light levels at the same time, it cannot isolate daylight as the cause. **B** stays with the observed association. The other choices claim more than this study tested. When two variables change together, look for a comparison that rules out other explanations before choosing a causal claim.



Observation, inference, and prediction

An **observation** describes something detected or measured: "the liquid turned cloudy" or "the temperature fell 4 degrees." An **inference** is a conclusion drawn from evidence, sometimes an explanation: "a solid may have formed" or "the sample lost heat to the room." A **prediction** says what may happen under a stated condition.

Questions often ask you to distinguish these statements. Look for interpretation words such as "because," "caused," or "must have." Those words may signal an inference. A number read directly from a graph is an observation, though estimating between marks still depends on the graph's scale.

Hypotheses, theories, and laws

A hypothesis is a testable explanation or prediction. A scientific theory is a broad explanation supported by many lines of evidence, such as cell theory or the theory of evolution. A scientific law describes a relationship that holds consistently, often in mathematical form, without explaining why it occurs. A theory does not become a law after enough evidence. They do different jobs.

A model is a useful representation of a system. A food-web diagram shows feeding relationships. A globe models Earth's shape and the positions of continents. Every model leaves something out. When a question asks about a model's limits, ask what it simplifies and whether that missing detail matters to the claim.

Watch for overreach

Words such as "proves," "always," and "all" make a broad claim. Check whether the study actually covered every case. One failed trial does not prove that an effect never occurs. One successful trial does not prove that it works under every condition.



State what this study supports. Avoid extending a conclusion to untested conditions, outcomes, or populations.

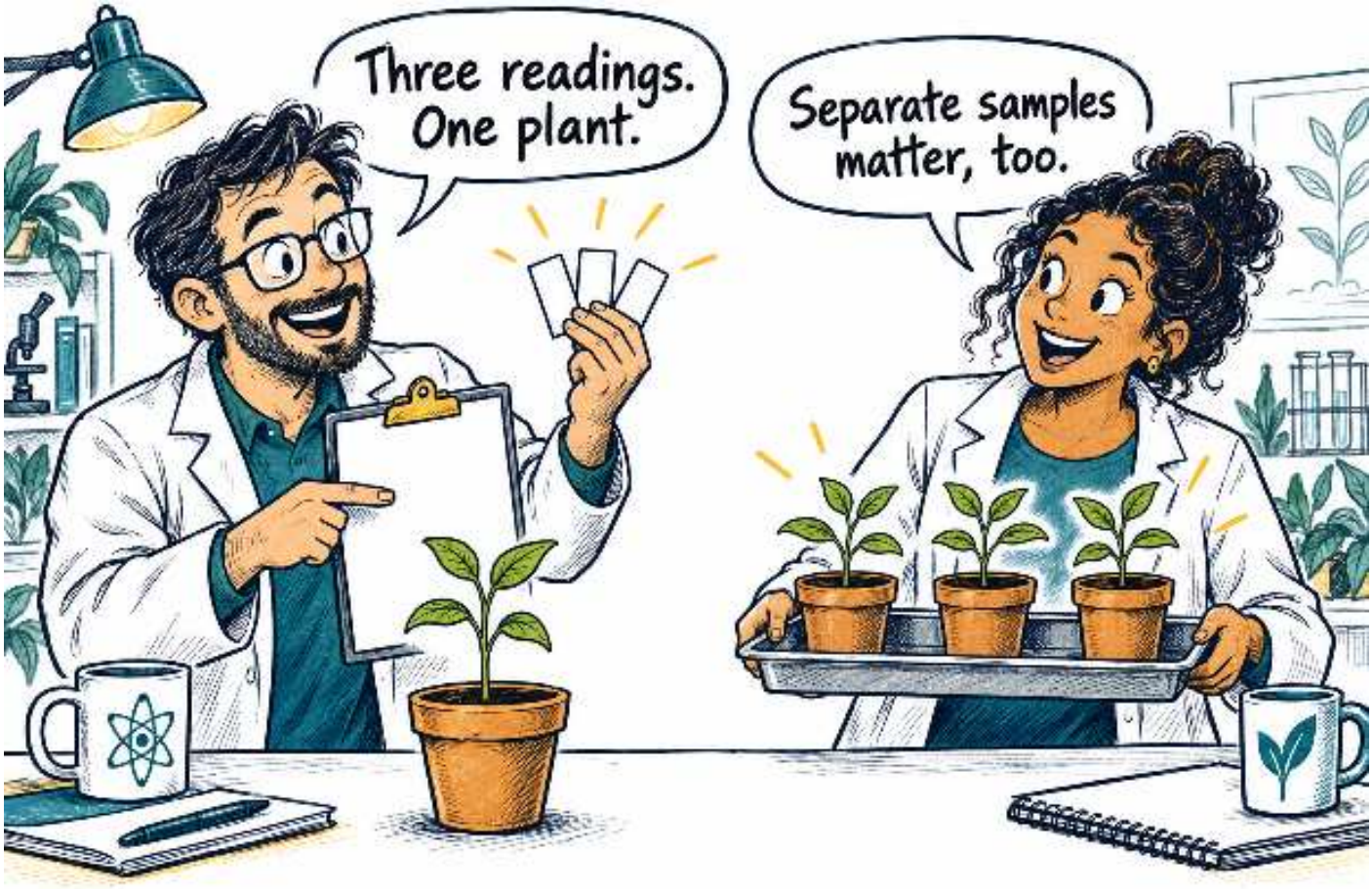
Reliability, validity, and accuracy

A measurement is reliable when repeated measurements under similar conditions give similar results. It is accurate when it is close to a true or accepted value. A study or measurement is valid when it actually measures what the investigation claims to measure. A bathroom scale that gives nearly the same reading each time but is miscalibrated can be reliable yet inaccurate. A survey that claims to measure total exercise but counts only gym visits has a validity problem because it leaves out walking, cycling, physical work, and other activity.

When results disagree, check the method before deciding that one group must be wrong. Did they use the same units? Was the outcome defined the same way? Was the sample similar? Did one study measure after two days and another after two months? Differences in method can explain differences in findings. A medicine may help at one dose but cause side effects at a higher dose; the best conclusion accounts for both results.

Replication adds confidence

One study can be careful and still land on an unusual result. Repeating an investigation with new samples, settings, and researchers shows whether the finding holds up. Replication is not the same as rerunning the same measurement until the desired answer appears. The method should be clear enough for another group to try.



Several readings of one sample are not several independent samples. Match the kind of repetition to the question being studied.

Evidence can come from different sources. A lab experiment may show a cause under controlled conditions. Field observations may show whether the relationship appears in a natural setting. A model may connect several results and generate a prediction. Agreement among independent lines of evidence makes an explanation stronger.

Scientists revise explanations when stronger evidence arrives. That does not mean every idea is equally supported. An explanation earns confidence when it fits observations, survives attempts to test it, and makes useful predictions. A question asking which theory is best supported expects you to compare the evidence, not count how many times a claim is repeated.

When results vary

Science results are not always identical from trial to trial. Living organisms differ. Instruments have limits. Conditions shift slightly. A mean can summarize repeated trials, while a range shows the spread from lowest to highest. If two groups' ranges overlap, that may be a reason to be cautious, but the test may not ask you to perform a formal statistical test.

A result can challenge a claim without identifying the exact reason it failed. If a treatment group improves less than a comparison group under the tested conditions, the result does not support a benefit from that treatment in this study. It may not show whether the dose, timing, sample, or another feature explains the difference.