

Warm-Up: The Study of Biology

Read the passage below, which covers topics from your textbook. Answer the questions that follow.

When scientists have made many observations and collected existing data, they suggest a possible explanation for what they have seen and recorded. This explanation, called a **hypothesis**, is a statement that both explains their observations and data and can be tested. Hypothesizing is a very important step in scientific investigations. A statement is testable if evidence can be collected that either supports or disproves it. A hypothesis may be shown to be wrong, but it can never be proved true beyond all doubt. It can only be supported by evidence. At any time, new data might indicate that a previously accepted hypothesis does not hold true in all instances. Scientists often must refine and revise their original hypotheses—or even discard them—as they uncover new evidence.

To test a hypothesis, scientists make a prediction that logically follows from the hypothesis. A **prediction** is a statement made in advance that states the results that will be obtained from testing a hypothesis, if the hypothesis is true. A prediction most often takes the form of an “if-then” statement. A hypothesis is often tested by carrying out an **experiment**. Experimenting is the process of testing a hypothesis and its predictions by gathering data under controlled conditions.

Read each question and write your answer in the space provided.

SKILL: Vocabulary Development

1. What key vocabulary terms are contained in this passage?

2. Give the meaning of these terms.

Match each phase of the scientific method with the statement that describes it. In the space provided, write the letter corresponding to the correct phase.

- A. experiment
- B. hypothesis
- C. prediction

3. _____ often an “if-then” statement
4. _____ possible explanation for observations and data
5. _____ conducted under controlled conditions
6. _____ can be tested
7. _____ states what will likely occur through testing
8. _____ can never be proven true beyond all doubt
9. _____ tests the other two phases
10. _____ often revised as new evidence is gathered

SKILL: Sequencing Information

One reading skill is the ability to sequence information, or to logically place items or events in the order in which they occur.

11. Sequence the statements below to show the steps in the process used in scientific investigations. Write “1” on the line in front of the first step, “2” on the line in front of the second step, and so on.

- _____ a. Make a prediction.
- _____ b. Carry out an experiment.
- _____ c. Make observations and collect existing data.
- _____ d. Adjust or accept the hypothesis.
- _____ e. Form a hypothesis.

Circle the letter of the phrase that best completes the statement.

12. A hypothesis currently held to be true
- a. has been supported by experimentation.
 - b. may be revised or discarded in the future.
 - c. will never change.
 - d. Both (a) and (b)