

## 1.3

## THINKING LIKE A SCIENTIST

## Section Review

## Objectives

- Explain how alchemy laid the groundwork for chemistry
- Describe how Lavoisier transformed chemistry
- Identify three steps in the scientific method
- Explain why collaboration and communication are important in science

## Vocabulary

- scientific method
- observation
- hypothesis
- experiment
- manipulated variable
- responding variable
- theory
- scientific law

## Part A Completion

Use this completion exercise to check your understanding of the concepts and terms that are introduced in this section. Each blank can be completed with a term, short phrase, or number.

- Before there were chemists, 1 were studying matter. **1.** \_\_\_\_\_
- They developed 2 and 3 for working with chemicals. **2.** \_\_\_\_\_
- Lavoisier helped make chemistry a science of 4. **3.** \_\_\_\_\_
- A logical, 5 approach is the best way to solve a difficult **4.** \_\_\_\_\_
- problem. One logical approach to solving scientific problems is the **5.** \_\_\_\_\_
6. This method may begin with an observation, followed **6.** \_\_\_\_\_
- by 7, or a proposed explanation for what is observed. You can **7.** \_\_\_\_\_
- conduct an 8 to test a hypothesis. If a hypothesis meets **8.** \_\_\_\_\_
- the test of repeated experimentation, it may become a 9, **9.** \_\_\_\_\_
- which is a well-tested explanation for a broad set of observations. **10.** \_\_\_\_\_
- A 10 is a concise statement that summarizes the results  
of many observations and experiments.

## Part B True-False

Classify each of these statements as always true, AT; sometimes true, ST; or never true, NT.

- \_\_\_\_\_ 11. A theory can be easily proved.
- \_\_\_\_\_ 12. Scientific laws explain observations.
- \_\_\_\_\_ 13. A well-planned experiment will disprove a hypothesis.

## Part C Matching

Match each description in Column B to the correct term in Column A.

### Column A

- \_\_\_\_\_ 14. scientific method
- \_\_\_\_\_ 15. observation
- \_\_\_\_\_ 16. manipulated variable
- \_\_\_\_\_ 17. hypothesis
- \_\_\_\_\_ 18. experiment
- \_\_\_\_\_ 19. responding variable

### Column B

- a. variable that one changes during an experiment
- b. information obtained through one's senses
- c. a logical approach to the solution of scientific problems
- d. a means to test a hypothesis
- e. a proposed explanation for an observation
- f. variable that is observed during an experiment

## Part D Questions and Problems

Answer the following questions in the space provided.

20. Classify each step in the following application of the scientific method as an observation, a hypothesis, an experiment, or a scientific law.

a. An iron ball falls to the ground when you drop it.

\_\_\_\_\_

b. Earth is a giant magnet, which attracts iron objects.

\_\_\_\_\_

c. An iron ball and a piece of wood are dropped from the same height.

\_\_\_\_\_

d. The iron ball and wood fall at the same rate.

\_\_\_\_\_

e. Gravity attracts every object in the universe to every other object.

\_\_\_\_\_

21. What two processes practiced by scientists increase the likelihood of a successful outcome in science?

\_\_\_\_\_