

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 | • experiment | • theory |
| • observation | • manipulated variable | • scientific law |
| • hypothesis | • responding variable | |

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.

They developed 2 and 3 for working with chemicals.

Lavoisier helped make chemistry a science of 4.

A logical, 5 approach is the best way to solve a difficult problem. One logical approach to solving scientific problems is the 6. This method may begin with an observation, followed by 7, or a proposed explanation for what is observed. You can conduct an 8 to test a hypothesis. If a hypothesis meets the test of repeated experimentation, it may become a 9, which is a well-tested explanation for a broad set of observations.

A 10 is a concise statement that summarizes the results of many observations and experiments.

1. Alchemist
2. techniques
3. procedures
4. Matter
5. systematic
6. scientific method
7. Law
8. experiment
9. theory
10. law

Part B True-False

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

- NT 11. A theory can be easily proved.
- NT 12. Scientific laws explain observations.
- ST 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	Column B
<u>C</u> 14. scientific method	a. variable that one changes during an experiment
<u>B</u> 15. observation	b. information obtained through one's senses
<u>A</u> 16. manipulated variable	c. a logical approach to the solution of scientific problems
<u>C</u> 17. hypothesis	d. a means to test a hypothesis
<u>D</u> 18. experiment	e. a proposed explanation for an observation
<u>F</u> 19. responding variable	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.
observation
 - b. Earth is a giant magnet, which attracts iron objects.
Theory
 - c. An iron ball and a piece of wood are dropped from the same height.
experiment
 - d. The iron ball and wood fall at the same rate.
Law
 - 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?
Experiments and hypothesis

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