

Introduction to Chemistry

Section 1.1 The Stories of Two Chemicals

In your textbook, read about the ozone layer.

Use each of the terms below just once to complete the passage.

atmosphere

oxygen gas

ozone

ozone hole

stratosphere

troposphere

ultraviolet radiation

Earth's **(1)** _____ is made up of several layers. The air we breathe makes up the lowest level. This layer is called the **(2)** _____. The next layer up is called the **(3)** _____. This level contains a protective **(4)** _____ layer.

Ozone forms when **(5)** _____ is struck by ultraviolet radiation in the upper part of the stratosphere. The ozone forms a layer around Earth, which absorbs **(6)** _____. Without ozone, you are more likely to get a sunburn or possibly skin cancer. The thinning of the ozone layer, called the **(7)** _____, is worrisome because without ozone all organisms on Earth are subject to harm from too much radiation.

In your textbook, read about chlorofluorocarbons.

For each statement below, write *true* or *false*.

- _____ **8.** CFC is another name for a chlorofluorocarbon.
- _____ **9.** CFCs are made up of carbon, fluorine, and cesium.
- _____ **10.** All CFCs are synthetic chemicals.
- _____ **11.** CFCs usually react readily with other chemicals.
- _____ **12.** CFCs were developed as replacements for toxic refrigerants.

CHAPTER 1 STUDY GUIDE FOR CONTENT MASTERY

Section 1.2 Chemistry and Matter

In your textbook, read about chemistry and matter.

Define each term.

1. chemistry

2. matter

3. mass

Write each term below under the correct heading. Use each term only once.

| | | | | | |
|-------|----------------|------------|------------|----------|------------|
| air | magnetic field | car | feeling | heat | human body |
| light | radio | radio wave | flashlight | textbook | thought |

Made of Matter

Not Made of Matter

4. _____

10. _____

5. _____

11. _____

6. _____

12. _____

7. _____

13. _____

8. _____

14. _____

9. _____

15. _____

For each statement below, write *true* or *false*.

- _____ 16. The mass of an object can vary with the object's location.
- _____ 17. A mass measurement includes the effect of Earth's gravitational pull on the object being measured.
- _____ 18. Scientists measure the amount of matter in terms of mass.
- _____ 19. Subtle differences in weight exist at different locations on Earth.
- _____ 20. Your mass on the Moon would be smaller than your mass on Earth.

Section 1.2 *continued*

Identify each branch of chemistry described.

21. The study of the matter and processes of living things

22. The study of carbon-containing chemicals

23. The study of the components and composition of substances

24. The study of matter that does not contain organic chemicals

25. The study of the behavior and changes of matter and the related energy changes

For each branch of chemistry in Column A, write the letter of the item in Column B that pertains to that branch.

Column A

Column B

_____ **26.** Organic chemistry

a. reaction mechanisms

_____ **27.** Physical chemistry

b. minerals

_____ **28.** Biochemistry

c. plastics

_____ **29.** Analytical chemistry

d. metabolism

_____ **30.** Inorganic chemistry

e. quality control

Answer the following questions.

31. Compare the macroscopic world with the submicroscopic world.

32. Why are chemists interested in the submicroscopic description of matter?

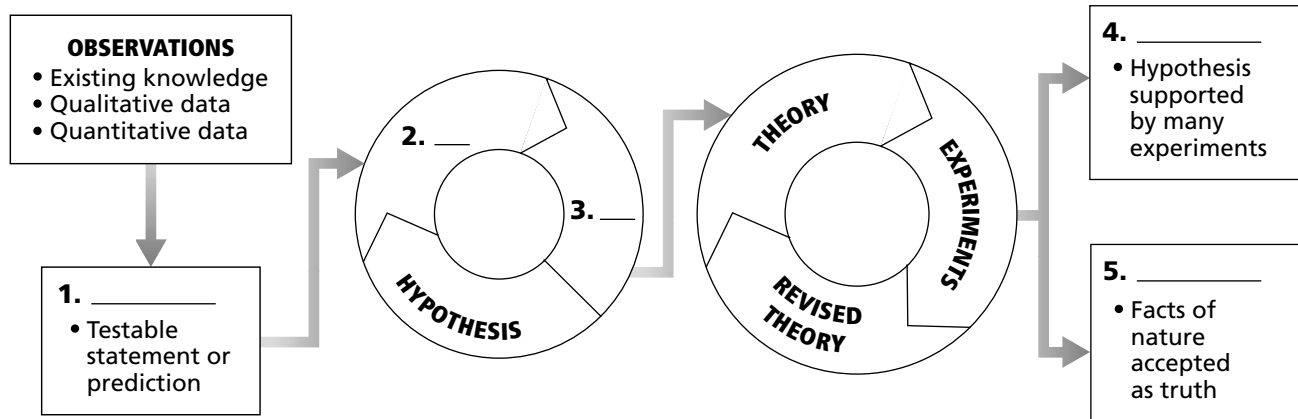
CHAPTER 1 STUDY GUIDE FOR CONTENT MASTERY

Section 1.3 Scientific Methods

In your textbook, read about a systematic approach that scientists use.

Use the words below to complete the concept map. Write your answers in the spaces below the concept map.

conclusions experiments hypothesis scientific law theory



1. _____
2. _____
3. _____
4. _____
5. _____

For each item in Column A, write the letter of the matching item in Column B.

- | Column A | Column B |
|---|-------------------------|
| _____ 6. Refers to physical characteristics such as color, odor, or shape | a. observation |
| _____ 7. Refers to mass, volume, and temperature measurements | b. qualitative data |
| _____ 8. A variable controlled by the experimenter | c. quantitative data |
| _____ 9. The act of gathering information | d. independent variable |
| _____ 10. Changes in value based on the value of the controlled variable | e. dependent variable |

Section 1.3 *continued*

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

- 11.** A constant is a factor that
- | | |
|--|--|
| a. changes during an experiment. | c. is affected by the dependent variable. |
| b. changes from one lab group to another. | d. is not allowed to change during an experiment. |
- 12.** A control is a
- | | |
|---|---------------------------------------|
| a. variable that changes during an experiment. | c. type of dependent variable. |
| b. standard for comparison. | d. type of experiment. |
- 13.** A hypothesis is a(n)
- | | |
|--|--|
| a. set of controlled observations. | c. tentative explanation of observations. |
| b. explanation supported by many experiments. | d. law describing a relationship in nature. |
- 14.** A theory is a(n)
- | | |
|--|--|
| a. set of controlled observations. | c. tentative explanation of observations. |
| b. explanation supported by many experiments. | d. law describing a relationship in nature. |
- 15.** A model is a(n)
- | |
|--|
| a. visual, verbal, and/or mathematical explanation of how things occur. |
| b. explanation that is supported by many experiments. |
| c. description of a relationship in nature. |
| d. tentative explanation about what has been observed. |

In the space at the left, write the word or phrase in parentheses that correctly completes the statement.

- _____ **16.** Molina and Rowland used a (model, scientific method) to learn about CFCs in the atmosphere.
- _____ **17.** Their hypothesis was that CFCs break down in the stratosphere due to interactions with (ultraviolet light, oxygen).
- _____ **18.** Molina and Rowland thought that these interactions produced a chemical that could break down (chlorine, ozone).
- _____ **19.** To test their (data, hypothesis), Molina and Rowland examined interactions that occur in the stratosphere.
- _____ **20.** Based on their data, Molina and Rowland developed a (hypothesis, model) that explained how CFCs destroy ozone.
- _____ **21.** Molina and Rowland concluded that (chlorine, radiation) formed by the breakdown of CFCs in the stratosphere reacts with ozone and destroys it.

Section 1.4 Scientific Research

In your textbook, read about types of scientific investigations.

For each description below, write *A* for applied research or *P* for pure research.

- _____ 1. Is undertaken to solve a specific problem
- _____ 2. Seeks to gain knowledge for the sake of knowledge itself
- _____ 3. Is used to find CFC replacements
- _____ 4. Was conducted by Molina and Rowland

In your textbook, read about students in the laboratory and the benefits of chemistry.

Answer the following questions.

5. When should you read the label on a chemical container?

6. What do scientists usually do when a scientific problem first arises?

7. What kinds of clothing should not be worn in the lab?

8. What is technology?

9. Which type of research would you be more interested in working in—pure research or applied research? Why?
