Name _____ Date _____ Class _____

CHAPTER 1 STUDY GUIDE FOR CONTENT MASTERY

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.

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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.

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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?

_____

_____

_____

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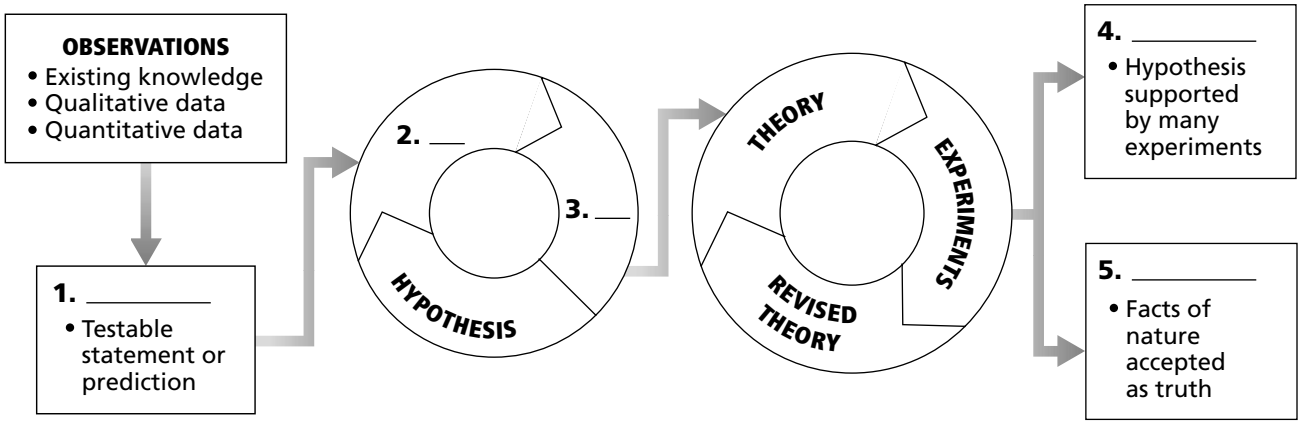
Section 1.3 Scientific Methods

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

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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.
- **b.** changes from one lab group to another.
- **c.** is affected by the dependent variable.
- **d.** is not allowed to change during an experiment.

12. A control is a
- **a.** variable that changes during an experiment.
- **b.** standard for comparison.
- **c.** type of dependent variable.
- **d.** type of experiment.

13. A hypothesis is a(n)
- **a.** set of controlled observations.
- **b.** explanation supported by many experiments.
- **c.** tentative explanation of observations.
- **d.** law describing a relationship in nature.

14. A theory is a(n)
- **a.** set of controlled observations.
- **b.** explanation supported by many experiments.
- **c.** tentative explanation of observations.
- **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.

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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?

_____

_____

_____

_____

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