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CHAPTER 1 STUDY GUIDE FOR CONTENT MASTERY

The Nature of Science

SECTION 1.1 *Earth Science*

In your textbook, read about the scope of Earth science.
Use the terms below to identify of the major area of Earth science that studies each subject. Each term can be used more than once.

astronomy **meteorology** **geology** **oceanography**

_____ **1.** Physical and chemical properties of the oceans

_____ **2.** Objects beyond Earth's atmosphere

_____ **3.** Materials that make up Earth

_____ **4.** Forces and processes that produce weather

_____ **5.** Earth's neighbors, distant stars, and other cosmic bodies

_____ **6.** Rocks, glacial movements, and clues to Earth's history

_____ **7.** Creatures that inhabit salty water

_____ **8.** Blanket of air that surrounds Earth

Circle the letter of the choice that best completes the statement or answers the question.

9. What subspecialty of Earth science studies patterns of weather over a long period of time?
a. geochemistry **b.** climatology **c.** tectonics **d.** paleontology

10. Hydrology is the study of which of the following?
a. habitats of organisms
b. effects of internal processes on Earth's surface
c. water flow on and below Earth's surface
d. how the moon and stars affect people's lives

11. What subspecialty of Earth science studies ancient environments?
a. paleontology **b.** ecology **c.** tectonics **d.** hydrology

12. Which of the following might an ecologist study?
a. earthquakes and mountain building
b. the remains of organisms that once lived on Earth
c. the kinds of matter in the universe
d. how organisms interact with each other and their environments

13. In what field do scientists study the processes that change Earth's composition?
a. climatology **b.** hydrology **c.** geochemistry **d.** paleontology

SECTION 1.1 *Earth Science, continued*

In your textbook, read about Earth's systems and Earth science in your everyday life.
For each statement below, write *true* or *false*.

_____ **14.** Earth's lithosphere is the rigid outer shell of the planet.

_____ **15.** The water in Earth's oceans, seas, lakes, rivers, and glaciers makes up the atmosphere.

_____ **16.** The blanket of gases that surround Earth is the atmosphere.

_____ **17.** The asthenosphere is the partially molten layer of Earth's core.

_____ **18.** The atmosphere contains about 78 percent oxygen.

_____ **19.** About three-fourths of all freshwater on Earth is contained in glaciers.

_____ **20.** The hemisphere includes all organisms on Earth as well as the environments in which they live.

_____ **21.** The atmosphere, biosphere, hydrosphere, and lithosphere are interdependent systems.

Answer the following questions.

22. How does continental crust differ from oceanic crust?

23. Describe three ways the atmosphere helps support life on Earth.

24. What is technology?

25. Name three products first developed for use in space that people now use in their everyday lives.

SECTION 1.2 *Methods of Scientists*

In your textbook, read about the nature of scientific investigations.
For each item in Column A, write the letter of the matching item in Column B.

Column A		Column B
_____	**1.** Suggested explanation for an observation	**a.** independent variable
_____	**2.** Organized procedure that involves making measurements and observations	**b.** constant
_____	**3.** Factor in an experiment that can be manipulated by the experimenter	**c.** hypothesis
_____	**4.** Factor in an experiment that can change if other factors are changed	**d.** dependent variable
_____	**5.** Factor that does not change during an experiment	**e.** control
_____	**6.** Standard for comparison that shows that the results of an experiment are actually due to the condition being tested	**f.** experiment

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

fire extinguisher **laboratory glassware** **loose clothing** **safety goggles** **spill**

Wear **(7)** _____ and a safety apron during any activity or experiment in a science lab. Tie back long hair and **(8)** _____ before you begin any investigation. Never use **(9)** _____ as food or drink containers. Know the location and proper use of the **(10)** _____, safety shower, fire blanket, first aid kit, and fire alarm. Report any **(11)** _____, accident, or injury to your teacher immediately.

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Chapter 1

STUDY GUIDE

Text Pages 12–18

Solving Problems

In the blank, write the letter of the term or phrase that best completes each statement.

_____ **1.** The first step in any problem-solving strategy is to _____ .
a. collect information about the problem **b.** identify the problem

_____ **2.** The method used by scientists for solving problems is known as the _____ .
a. control **b.** scientific method

_____ **3.** A prediction about a problem that can be tested is a _____ .
a. hypothesis **b.** conclusion

_____ **4.** A _____ is a standard for comparison in an experiment.
a. variable **b.** control

_____ **5.** An explanation backed by results obtained from repeated tests or experiments is a _____ .
a. theory **b.** variable

_____ **6.** A process that uses certain skills to solve problems is called _____ .
a. theory **b.** critical thinking

_____ **7.** A _____ is a changeable factor in an experiment.
a. variable **b.** control

_____ **8.** The best experiments test only one _____ at a time.
a. variable **b.** control

_____ **9.** If a conclusion does not support a hypothesis, the _____ .
a. experiment did not work properly **b.** hypothesis should be revised

_____ **10.** If a hypothesis is supported by new data gathered over a period of time, it may become a _____ .
a. control **b.** theory

_____ **11.** Making lists, drawing graphs, making a model, and eliminating possibilities are all _____ for solving problems.
a. strategies **b.** variables

_____ **12.** If a hypothesis has been backed by results from repeated tests or experiments, it becomes a _____ .
a. variable **b.** theory

Chapter 2

STUDY GUIDE

Text Pages 32–37

• Atoms

Circle the term in parentheses that makes each statement correct.

1. Protons are particles (outside, in) the nucleus of an atom.
2. Electrons are atomic particles with a (positive, negative) charge.
3. An example of matter is (air, heat).
4. The building blocks of matter are (atoms, compounds).
5. (Neutrons, Protons) are particles in the atom's nucleus that have no electric charge.
6. The atomic particles outside of the atom's nucleus are (electrons, protons).
7. Substances made up of only one kind of atom are called (isotopes, elements).
8. Isotopes are atoms of the same element that have different numbers of (neutrons. protons).
9. Negatively charged particles that move around the atom's nucleus are (neutrons, electrons).
10. Two atoms of the same element that have different (mass numbers, atomic numbers) are isotopes of the element.
11. A difference in the (mass number, atomic number) of atoms means the atoms are of different elements.
12. The nucleus of an atom has a (positive, negative) charge.
13. Carbon-14 is an (isotope. element) of carbon.
14. The mass number of an atom with 12 protons and 12 neutrons is (12, 24).
15. The atomic number of an atom is equal to the number of (protons. neutrons) in its nucleus.
16. In atoms with equal numbers of electrons and protons, there is (a positive, no) electric charge.
17. Anything that takes up space and has mass is (matter, an element).
18. A model of an atom is (larger, smaller) than the actual atom.
19. The nucleus of an atom is made up of neutrons and (electrons, protons).
20. Isotopes enable scientists to determine the (age, size) of ancient objects.

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Chapter 2

STUDY GUIDE

Text Pages 38–43

Combinations of Atoms

Use the words in the box to complete the statements. You will use the words more than once.

molecule	compound	chemical properties	ions	mixture

1. The components of a _____ can be separated by physical means.

2. The _____ of an element determine how the element will change when it reacts with another element.

3. A _____ is a substance that has different properties from the elements in it.

4. Combined atoms form a _____ .

5. Electrically charged atoms are _____ .

6. Table salt is an example of a _____ .

7. An example of a _____ is salt water.

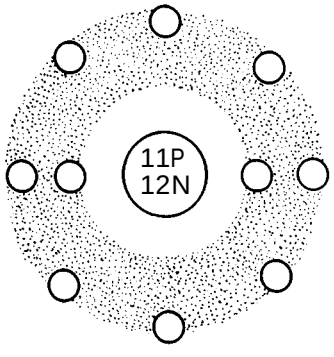
8. Table salt is formed when the _____ of sodium and chlorine combine.

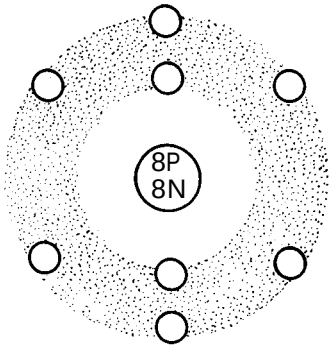
9. Iron rusts when it comes in contact with water because of its _____ .

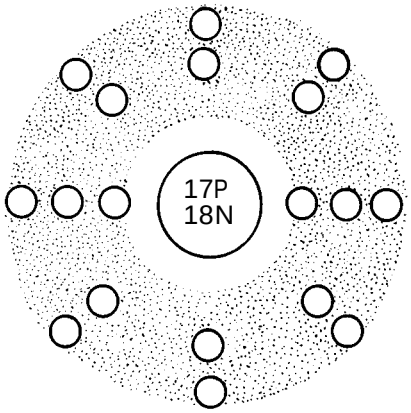
10. The atoms of hydrogen and oxygen combine to form a _____ of the compound water.

Identify the two atoms that are ions. Label the negatively charged ion with a minus sign. Label the positively charged ion with a plus sign.

11 protons 12 neutrons 10 electrons	8 protons 8 neutrons 8 electrons	17 protons 18 neutrons 18 electrons
_____	_____	_____







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Chapter 2

STUDY GUIDE

Text Pages 44–53

• Matter

Change the italicized word in each statement to make the statement correct.

1. The *size* of an object determines whether it will float in water. _____

2. Orange juice and milk are both *solids*. _____

3. Stars are made up of matter in the *gaseous* state. _____

4. An object's density is equal to its mass divided by its *length*. _____

5. Matter with atoms in a fixed position in relation to one another is in the *liquid* state. _____

6. Density and state of matter are *chemical* properties. _____

7. *Hydrogen* is the only substance that occurs naturally on Earth as a gas, a liquid, and a solid.

8. The *physical* properties of a liquid do not change when it becomes a gas. _____

9. *Liquids* fill their entire container regardless of the container's size or shape. _____

10. On Earth the *solid* state of matter is least common. _____