

Matter and Atomic Structure

SECTION 3.1 *What are elements?*

In your textbook, read about elements and atomic structure.

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

atom electrons element neutrons nucleus protons

A(n) **(1)** _____ is a substance that cannot be broken down into simpler substances. A(n) **(2)** _____ is the smallest particle of matter having all that element's characteristics. It is made up of smaller particles. The **(3)** _____ is made up of protons and neutrons. Small particles that have mass and positive electrical charges are **(4)** _____. Particles that have about the same mass as protons, but that are electrically neutral are **(5)** _____. Surrounding the nucleus of an atom are tiny particles called **(6)** _____, which have little mass, but have negative electrical charges that are exactly the same magnitude as the positive charges of protons.

In your textbook, read about atomic structure and isotopes.

Complete each statement.

- The number of protons in an atom's nucleus is the _____.
- When atoms of the same element have different mass numbers, they are known as _____ of that element.
- The spontaneous process through which unstable nuclei emit radiation is called _____.
- A(n) _____ represents the area in an atom where an electron is most likely to be found.
- The outermost electrons of an atom are called _____.
- The combined number of protons and neutrons is the _____.
- The _____ is the average of the mass numbers of the isotopes of an element.

SECTION 3.1 *What are elements?, continued*

In your textbook, read about electrons in energy levels and isotopes.

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

14. How many electrons can be held in the innermost energy level of atoms?
a. 2 b. 8 c. 18 d. 32
15. How many electrons can the fourth energy level hold?
a. 2 b. 8 c. 18 d. 32
16. Many elements are mixtures of
a. oxygen. b. electrons. c. neutrons. d. isotopes.
17. The chemical behavior of different elements is determined by the
a. number of electrons in the innermost energy level.
b. number of electrons in the middle energy level.
c. number of electrons in the outermost energy level.
d. total number of electrons in all of the energy levels.
18. How many electrons can an atom's third energy level hold?
a. 2 b. 8 c. 18 d. 32
19. Elements with a full outermost energy level are
a. unlikely to combine chemically with other elements.
b. likely to combine chemically with other elements.
c. likely to combine with inert elements.
d. likely to combine with many elements at one time.
20. The identity of an element is defined by its number of
a. electrons.
b. protons.
c. neutrons.
d. isotopes.
21. How many electrons can an atom's second energy level hold?
a. 2 b. 8 c. 18 d. 32

SECTION 3.3 States of Matter

In your textbook, read about the cycles of matter and the different states of matter.

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

- _____ 1. Most solids have a crystalline structure in which the particles are arranged in regular geometric patterns.
- _____ 2. Hot, highly ionized, electrically conducting gas is called plasma.
- _____ 3. The change of state from solid to gas without an intermediate liquid state is called evaporation.
- _____ 4. A glass is a solid that consists of densely packed atoms arranged at random.
- _____ 5. The change from a solid to a liquid is called condensation.
- _____ 6. The process of changing from a liquid to a gas is called sublimation.
- _____ 7. There are only three states of matter in the universe.
- _____ 8. Matter cannot be created or destroyed.

In your textbook, read about the states of matter.

Complete the table by filling in the missing information.

The States of Matter

State of Matter	Definition of State	Example
9.	Hot, highly ionized, electrically conducting gases	Lightning, neon sign, the Sun, other stars
10. Liquid		
11.	Made of densely packed particles arranged in a definite pattern; has both a definite shape and volume	
12.		Helium

