

Matter—Properties and Changes

Section 3.1 Properties of Matter

In your textbook, read about physical properties and chemical properties of matter.

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

chemical
density

mass
properties

physical
substance

Matter is anything with **(1)** _____ and volume. A **(2)** _____ is a form of matter with a uniform and unchanging composition. Substances have specific, unchanging **(3)** _____ that can be observed. Substances have both physical and chemical properties. **(4)** _____ properties can be observed without changing a substance's chemical composition. Color, hardness, and **(5)** _____ are examples. Other properties cannot be observed without changing the composition of a substance. These are called **(6)** _____ properties. An example is the tendency of iron to form rust when exposed to air.

Label each property as either *physical* or *chemical*.

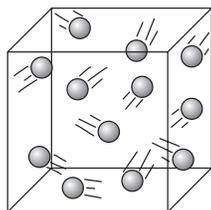
- _____ 7. Chemical formula H_2O
- _____ 8. Forms green carbonate when exposed to moist air
- _____ 9. Remains unchanged when in the presence of nitrogen
- _____ 10. Colorless
- _____ 11. Solid at normal temperatures and pressures
- _____ 12. Ability to combine with another substance
- _____ 13. Melting point
- _____ 14. Liquid at normal temperatures and pressures
- _____ 15. Boiling point is $100^{\circ}C$
- _____ 16. Conducts electricity
- _____ 17. Density is $\frac{1g}{cm^3}$

Section 3.1 *continued*

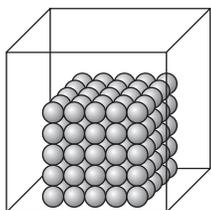
In your textbook, read about states of matter.

Label each drawing with one of these words: *solid*, *liquid*, *gas*.

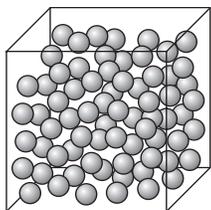
18.



19.



20.



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

- _____ 21. All matter that we encounter in everyday life exists in one of three physical forms.
- _____ 22. A solid has definite shape and volume.
- _____ 23. A liquid has a definite shape and takes on the volume of its container.
- _____ 24. A gas has both the shape and the volume of its container.
- _____ 25. The particles in a gas cannot be compressed into a smaller volume.
- _____ 26. Liquids tend to contract when heated.
- _____ 27. The particles in a solid are spaced far apart.
- _____ 28. The words *gas* and *vapor* can be used interchangeably.

Section 3.2 Changes in Matter

In your textbook, read about physical change and chemical change.

What kinds of changes do these words indicate? Write each word under the correct heading. Use each word only once.

boil	crumple	crush	explode
burn	ferment	freeze	grind
condense	melt	oxidize	rot
corrode	rust	tarnish	vaporize

Physical Change

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____

Chemical Change

9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____

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

Column A

- _____ 17. The new substances that are formed in a chemical reaction
- _____ 18. A chemical reaction that involves one or more substances changing into new substances
- _____ 19. Shows the relationship between the reactants and products in a chemical reaction
- _____ 20. States that mass is neither created nor destroyed in any process
- _____ 21. The starting substances in a chemical reaction

Column B

- a. chemical change
- b. reactants
- c. products
- d. chemical equation
- e. law of conservation of mass

Answer the following question. Write an equation showing conservation of mass of reactants and products.

22. In a laboratory, 178.8 g of water is separated into hydrogen gas and oxygen gas. The hydrogen gas has a mass of 20.0 g. What is the mass of the oxygen gas produced?
