

## Assessment

**Introduction to Matter and Chemistry****MULTIPLE CHOICE**Write the letter of the correct answer in the space provided.

- A 1. In a graduated cylinder containing several liquid layers, the least dense liquid is found  
a. floating at the top. c. in the lightest colored layer.  
b. in the middle layer. d. settled on the bottom.
- C 2. The following is true for all physical changes  
a. New forms of matter are created in a physical change.  
b. New amounts of chemical compounds are produced  
c. The chemical make-up (composition) of matter does not change  
d. The change is always extremely easily reversible.
- B 3. Melting crayons is an example of a  
a. physical property. c. chemical property.  
b. physical change. d. chemical change.
- C 4. Which of the following units would be best for describing the volume of mercury (liquid) used in an experiment?  
a. grams or kilograms c. liters or milliliters  
b. meters or centimeters d. newtons
- B 5. Which of the following events is NOT a common sign that a chemical change has taken place?  
a. change in color or odor c. foaming or bubbling  
b. change in the state (phase) of matter d. production of heat or light
- D 6. What chemical property is responsible for iron rusting (rusting is also known as oxidation)?  
a. flammability c. nonflammability  
b. conductivity d. reactivity with oxygen
- A 7. Which physical property of matter describes the relationship between mass and volume?  
a. density c. reactivity  
b. ductility d. weight
- A 8. Malleability is an example of a  
a. physical property. c. chemical property.  
b. physical compound. d. chemical change.
- C 9. Flammability is a  
a. physical property. c. chemical property.  
b. physical compound. d. chemical change.
- A 10. Density is an example of a  
a. physical property. c. chemical property.  
b. physical compound. d. chemical change.
- B 11. A group of atoms that are held together by chemical forces; this is the smallest unit of matter that can exist by itself and retain all of a substance's chemical properties (think of the "smallest bit of water")  
a. subatomic particle c. solution  
b. molecule d. viscosity

ONE IS USED TWICE

**MATCHING**

Match the correct description with the correct term. Write the letter in the space provided.

- F 12. The tendency of an object to resist being moved or, if the object is moving, to resist a change in speed or direction until an outside force acts on the object
- G 13. The process in which an electric current is used to produce a chemical reaction, such as the decomposition of water.
- B 14. In a solution, the substance in which the solute dissolves (the stuff that does the *dissolving*)
- F 15. This is the tendency of a substance to resist changes in its motion.
- D 16. A homogeneous (equally mixed) mixture throughout which two or more substances are uniformly dispersed.
- C 17. In a solution, the substance that dissolves in the solvent (the stuff that gets *dissolved*)
- E 18. An atom, radical, or molecule that has gained or lost one or more electrons and has a negative or positive charge
- H 19. The resistance of a gas or liquid to flow
- J 20. Charles' law states that for a fixed amount of gas at a constant \_\_\_\_\_, the \_\_\_\_\_ of the gas increases as the \_\_\_\_\_ of the gas increases and the volume of the gas decreases as the temperature of the gas decreases
- A 21. The ability of one substance to dissolve in another at a given temperature and pressure; expressed in terms of the amount of solute that will dissolve in a given amount of solvent to produce a saturated solution.
- I 22. Boyle's law states that for a fixed amount of gas at a constant \_\_\_\_\_, the \_\_\_\_\_ of the gas increases as the \_\_\_\_\_ of the gas decreases and the volume of the gas decreases as the pressure of the gas increases

- a. solubility
- b. solvent
- c. solute
- d. solution
- e. ion
- f. inertia *used twice*
- g. electrolysis
- h. viscosity
- i. temperature; volume, pressure
- j. pressure; volume, temperature

Calculate the density of a solid cube that has dimensions of 2.75cm for length, width, and height, and a mass of 104.40 g. (Remember,  $d=m/v$ . You need to calculate the density using the information given. *Show your work below or on a separate page:*



$$2.75^3 = 20.797$$

$$\frac{104.40}{20.797} = 5.019 \approx 5.02 \text{ g/cm}^3$$

(do not include legs or eyes in your calculations)

Use the "Table of Density for Some Common Materials" to identify what it is: Pyrite



Chapter Check In *continued*

## MULTIPLE CHOICE

The table below shows the density of some common substances (remember,  $d=m/v$ ). Use the table to answer questions 21 through 25.

SUBSTANCE	DENSITY ( $\text{g/cm}^3$ )	SUBSTANCE	DENSITY ( $\text{g/cm}^3$ )
Aluminum (solid)	2.7	Ice (solid)	0.93
Pyrite (solid)	5.02	Water (liquid)	1.00
Mercury (liquid)	13.55	Zinc (solid)	7.13
Silver (solid)	10.50	Wood (oak)	0.85

D 23. What substance has a density more than 13 times greater than water?

- a. ice  
b. silver  
c. aluminum  
d. mercury

A 24. Why will ice float on top of liquid water?

- a. Ice has a lower density than water.  
b. Ice has a higher density than water.  
c. Ice is a solid.  
d. Ice is colder than water.

C 25. What is the density of oak wood?

- a.  $85 \text{ g/cm}^3$   
b.  $5.02 \text{ g/cm}^3$   
c.  $0.85 \text{ g/cm}^3$   
d.  $0.93 \text{ g/cm}^3$

B 26. What is the densest *solid* shown in the table?

- a. mercury  
b. silver  
c. zinc  
d. pyrite

A 27. A cube has a density of  $2.7 \text{ g/cm}^3$ . What substance is the cube made of?

- a. aluminum  
b. ice  
c. pyrite  
d. wood

STATES of Matter – and differing properties,

28. Gases/GAS do not have a definite volume or shape

29. Solid have a fixed shape and volume

30. Liquid have a fixed volume but no definite shape

## Fill in the Blank (VOCABULARY)

Complete each statement on the line at the left. Points will not be taken off for spelling as long as your answer can be determined.

30. Surfactant a material that can greatly reduce the surface tension of water when used in very low concentrations
31. electrical conductivity or Conductivity (electrical) a measure of how well a material conducts, or accommodates, the movement of an electric charge
32. Compound a substance made up of atoms of two or more different elements joined by chemical bonds
33. element a substance that cannot be separated or broken down into simpler substances by chemical means; all atoms of an element have the same atomic number
34. acid any compound that increases the number of hydronium ions (water and hydrogen ions together, forming  $H_3O^+$ ) when dissolved in water; acids turn blue litmus paper red and react with bases and some metals to form salts
35. Base any compound that increases the number of hydroxide ions when dissolved in water; bases turn red litmus paper blue
36. Molecule a group of atoms that are held together by chemical forces; a molecule is the smallest unit of matter that can exist by itself and retain all of a substance's chemical properties
37. malleability the ability of a substance to be hammered or beaten into a sheet
38. reactivity the capacity of a substance to combine chemically with another substance
39. reactivity with oxygen the capacity of a substance to combine chemically with oxygen
40. flammability the ease at which something will burn or ignite, causing fire or combustion
41. Surface tension a property of the surface of a liquid that allows it to resist an external force
42. thermal conductivity or conductivity (thermal) the property of a material's ability to **conduct heat**
43. Melting point the temperature and pressure at which a solid becomes a liquid
44. freezing point the temperature at which a solid and liquid are in equilibrium at 1 atm pressure; the temperature at which a liquid substance freezes
45. proton the subatomic particle that gives an element its atomic number (for example, a hydrogen atom has one of these)