Name _____ Class ~~3~~ 6 Date _____

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.
b. in the middle layer.
c. in the lightest colored 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.
b. physical change.
c. chemical property.
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
b. meters or centimeters
c. liters or milliliters
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
b. change in the state (phase) of matter
c. foaming or bubbling
d. production of heat or light

D **6. What chemical property is responsible for iron rusting (rusting is also known as oxidation)?**
a. flammability
b. conductivity
c. nonflammability
d. reactivity with oxygen

A **7. Which physical property of matter describes the relationship between mass and volume?**
a. density
b. ductility
c. reactivity
d. weight

A **8. Malleability is an example of a**
a. physical property.
b. physical compound.
c. chemical property.
d. chemical change.

C **9. Flammability is a**
a. physical property.
b. physical compound.
c. chemical property.
d. chemical change.

A **10. Density is an example of a**
a. physical property.
b. physical compound.
c. chemical property.
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
b. molecule
c. solution
d. viscosity

Name _____ Class _____ Date _____

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

D 12. a change of matter from one form to another without a change in chemical properties

N 13. a *property of* matter that describes a substance's ability to participate in *chemical reactions*

A 14. a measure of the amount of matter in an object

L 15. a substance that cannot be separated or broken down into simpler substances by chemical means

B 16. anything that has mass and takes up space

F 17. the ability of one substance to dissolve in another at a given temperature and pressure

M 18. the ratio of the mass of a substance to the volume of the substance

H 19. in a solution, the substance that dissolves in the solvent (the stuff that gets *dissolved)*

O 20. the process by which one or more substances *change to produce one or more different substances*

K 21. a force of attraction between objects that is due to their masses

E 22. a characteristic of a substance that does not involve a chemical change, such as density, color, or hardness

C 23. 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

G 24. a homogeneous (evenly mixed) mixture throughout which two or more substances are uniformly dispersed

J 25. a measure of the size of a body or region in three-dimensional space (how much space an object takes up)

I 26. in a solution, the substance in which the solute dissolves (the stuff does the *dissolving)*

a. mass
b. matter
c. molecule
d. physical change
e. physical properties
f. solubility
g. solution
h. solute
i. solvent
j. volume
k. gravity
l. element
m. density
n. chemical property
o. chemical change

STATES of Matter – and differing properties

28. GAS / GASES **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**

Name _____ Class _____ Date _____

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 (g/cm^3)	SUBSTANCE	DENSITY (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 **31. What substance has a density more than 13 times greater than water?**
a. ice
b. silver
c. aluminum
d. mercury

A **32. 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 **33. What is the density of oak wood?**
a. 85 g/cm^3
b. 5.02 g/cm^3
c. 0.85 g/cm^3
d. 0.93 g/cm^3

B **34. What is the densest *solid* shown in the table?**
a. mercury
b. silver
c. zinc
d. pyrite

A **35. A cube has a density of 2.7 g/cm^3. What substance is the cube made of?**
a. aluminum
b. ice
c. pyrite
d. wood

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*: $2.75^3 = 20.797$

$2.75 \times 2.75 \times 2.75$

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

(do not include legs or eyes in your calculations)

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

6th

NAME: _____ Grade: _____

Physical Reactions

The first way matter can change is through a **physical reaction (or physical change)**. A physical reaction causes the matter to shift shape or state. For example, if you crush a cardboard box, only the shape changes. It has the same molecules, and is still a cardboard box, even if it is flat. This is a physical reaction. Another kind of physical reaction is an ice cube melting. As it melts, the ice changes from a solid to a liquid state. Even though it is no longer frozen, the matter is still water. That makes it a physical change.

Physical changes are usually caused by some form of motion or pressure, or a change in temperature. When water boils and turns into steam, it is undergoing a physical change caused by a change in temperature. When wool is spun into thread, the physical change is caused by a motion. A sheet of metal is the result of powerful pressure machines that flatten the steel.

When trying to determine if a change is a physical reaction or not, as yourself: *Is this change reversible?* In other words, can you go backwards or change the matter into its original form. For most physical reactions, the answer is 'Yes.' The cardboard box can be straightened out, and water can be frozen once again into ice. Steam can condense and return to its liquid state of water, and wool thread can be taken apart. However, not all physical reactions are easily reversed.

Chemical Reactions

The second way matter can change is through a **chemical reaction.** Chemical changes occur when two or more substances combine and react to each other. In a chemical reaction, matter doesn't just change form as it does in a physical reaction. Chemical reactions cause the *molecules* of matter to change. This is more than a change in shape or state. Most of the time, an entirely new kind of matter is created.

When trying to determine if a change is a chemical reaction, it helps to look at what was produced as a result of the change. If the reaction creates energy like light or heat, or if a gas or solid is produced, the change is a chemical reaction. Other signs of a chemical reaction include an odor or change in color. Copyright 2008 LessonSnips www.lessonsnips.com

Another way to identify a chemical reaction is to examine whether or not the change can be reversed. Unlike physical reactions, chemical reactions cannot be performed backwards to produce the original parts. For example, after those brownies come out of the oven, it is impossible to separate the oil, eggs, flour, and other ingredients ever again. They have been chemically changed into a new substance.

1. **Give two ways a chemical reaction is different from a physical reaction. Use the space below:**

Be Generous

a. Physical - change in state shape - Not change in chemical make up

b. Chemical - changes to a different chemical structure

2. **Two colors of paint are mixed together and cannot be separated.**
   a. **Is this a physical or chemical change?**

No Physical B

   b. **Why?** The molecules and chemical compounds do not change

Identify the following reactions by writing a C if the change is chemical and a P if it is physical.

3. P A bowl of cereal and milk
4. C Mixing baking soda and vinegar
5. C Detergent removing a stain
6. C Lighting a match
7. C Roasting a marshmallow
8. P Crushing aluminum cans
9. C Fireworks
10. P Shredding paper
11. P Using hot glue
12. C Digesting food