




SCIENCE 8 – STATES OF MATTER WORKSHEET

NAME: KEY

Vocabulary			
Contracts	Kinetic molecular theory	Move around quickly	State of matter
Expands	Mass	Slide past each other	Vibrate
Easter	Matter	Slower	Volume

Use your notes from pages 1 – 2 and the terms in the vocabulary box to fill in the blanks for the following nine questions. You will not need to use every term.

- 1) Mass is the amount of matter that makes up something.
 - 2) Volume is the amount of space that a material takes up.
 - 3) Anything that has mass and volume is called Matter.
 - 4) When you add energy to matter, the particles move faster and the matter expands.
 - 5) Particles in a solid are packed so close together they can only vibrate.
 - 6) Particles in a liquid can slide past each other.
 - 7) Particles in a gas can move around quickly.
 - 8) When you remove energy from particles they move slowly and the matter contracts.
 - 9) The kinetic molecular theory explains how particles act when their spacing and movement change.
- 10) Match each **Term** on the left with the best **Descriptor** on the right. Each **Descriptor** may be used only once

Term		Descriptor					
<u>C</u>	Mass	A.	Anything that has mass and volume				
<u>D</u>	Solid	B.	Amount of space an object takes up				
<u>E</u>	Gas	C.	Amount of matter in an object				
<u>A</u>	Matter	D.		E.		F.	
<u>F</u>	Liquid						
<u>B</u>	Volume						

11) Complete the following table to describe three states of matter. The table has been partially completed to help you.

	Solid	Liquid	Gas
Shape	definite shape	Not fixed; takes the shape of the container	no definite shape
Volume	Fixed volume	definite volume	no definite volume
Spaces between particles	small space	medium space, particles slide over each other	lots of space
Movement of particles	vibrating	slide over each other	Can move freely and quickly in all directions in the container

12) Use your knowledge of the kinetic molecular theory to explain the following statements:

- (a) Solids have a definite shape because particles are close together
- (b) Liquids and gases flow because particles can move around each other
- (c) Ice cubes form in the freezer because temp causes particles to slow down
- (d) Ice cream melts quickly on a hot day because temp causes particles to speed up.
- (e) Gases do not have a definite shape because lots of space btwn particles

SCIENCE 8 – DENSITY CALCULATIONS WORKSHEET

NAME: _____

- 1) A student measures the mass of an 8 cm^3 block of brown sugar to be 12.9 g. What is the density of the brown sugar?

$$\frac{\text{mass}}{\text{volume}} = \frac{12.9}{8} = 1.61 \frac{\text{g}}{\text{cm}^3}$$

- 2) A chef fills a 50 mL container with 43.5 g of cooking oil. What is the density of the oil?

$$0.87 \frac{\text{g}}{\text{mL}}$$

- 3) Calculate the mass of a liquid with a density of 2.5 g/mL and a volume of 15 mL.

$$37.5 \text{ g}$$

- 4) Calculate the volume of a liquid with a density of 5.45 g/mL and a mass of 65 g.

$$\cancel{12.05 \text{ mL}} \quad 11.93 \text{ mL}$$

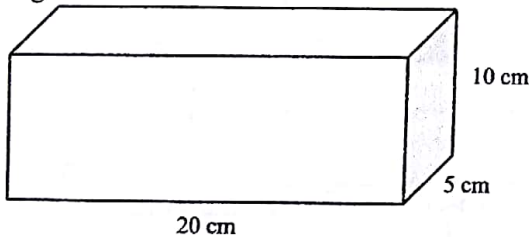
- 5) A machine shop worker records the mass of an aluminum cube as 176 g. If one side of the cube measures 4 cm, what is the density of the aluminum?

$$2.75 \frac{\text{g}}{\text{cm}^3}$$

- 6) A teacher performing a demonstration finds that a piece of cork displaces 23.5 mL of water. The piece of cork has a mass of 5.7 g. What is the density of the cork?

$$0.24 \frac{\text{g}}{\text{mL}}$$

- 7) A carver begins work on the following block of granite that weighs 2700 g. What is the density of the granite?



$$V = 10 \cdot 20 \cdot 5 = 1000 \text{ cm}^3$$

$$2.7 \frac{\text{g}}{\text{cm}^3}$$

- 8) A piece of PVC plumbing pipe displaces 60 mL when placed into a container of water. If the pipe has a mass of 78 g, what is the density of PVC?

$$1.3 \frac{\text{g}}{\text{mL}}$$

- 9) A solid magnesium flare has a mass of 1300 g and a volume of 743 cm^3 . What is the density of the magnesium?

$$1.75 \frac{\text{g}}{\text{cm}^3}$$

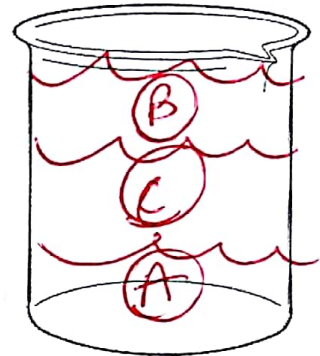
10) A graduated cylinder has a mass of 50 g when empty. When 30 mL of water is added, the graduated cylinder has a mass of 120 g. If a rock is added to the graduated cylinder, the water level rises to 75 mL and the total mass is now 250 g. What is the density of the rock?

$$\frac{m}{V} = \frac{130g}{45mL} = 2.89 \frac{g}{mL}$$

11) A student performs an experiment with three unknown fluids and obtains the following measurements:

Fluid A: $m = 2060 \text{ g}, V = 2000 \text{ mL} = 1.03g/mL$
 Fluid B: $m = 672 \text{ g}, V = 850 \text{ mL} = 0.79 \frac{g}{mL}$
 Fluid C: $m = 990 \text{ g}, V = 1100 \text{ mL} = 0.9 \frac{g}{mL}$

Draw how the fluids would be layered if they were combined in a beaker.



12) Use your density skills to find the identity of the following mystery objects.

Table of Densities			
Solids	Density g/cm^3	Solids	Density g/cm^3
Marble	2.56	Copper	8.92
Quartz	2.64	Gold	19.32
Diamond	3.52	Platinum	21.4



While digging in the backyard, you find an old coin. Its mass is 26.76 g and its volume is 3 cm^3 .

$$\frac{26.76}{3} = 8.92 \frac{g}{cm^3}$$

What is the coin made of? Copper



You think you have found a diamond. Its mass is 5.28 g and its volume is 2 cm^3 .

$$\frac{5.28}{2} = 2.64 \frac{g}{cm^3}$$

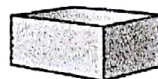
What did you find? Quartz



You find a ring with a mass of 107 g. You fill a graduated cylinder up with 10 mL of water and put the ring into the cylinder. The water rises up to the 15 mL mark.

$$\frac{107}{5} = 21.4 \frac{g}{mL}$$

What is the ring made of? Platinum



There is a block on your desk that acts as a paperweight. Its measurements are 3 cm by 4 cm by 6 cm. The block has a mass of 184.32 g.

$$3 \cdot 4 \cdot 6 = 72 \text{ cm}^3$$

$$\frac{184.32g}{72 \text{ cm}^3} = 2.56 \frac{g}{cm^3}$$

What is the block made of? marble

Name _____
Period _____

Physical and Chemical Properties Worksheet

Classify the following properties as either chemical or physical by checking the appropriate column.

	Physical property	Chemical property
Blue color	✓	
Density	✓	
Flammability		✓
Dissolves in water	✓	
Boils at 100 degrees	✓	
Scratches glass	✓	
Sour taste	✓	
Rusting		✓
Exploding fireworks		✓
Melting point	✓	
Reacts with H ₂ O to form gas		✓
Reacts with something to form H ₂ O		✓
Hardness	✓	
Boiling point	✓	
Luster (shine)	✓	
Odor	✓	

Identify each of the following as an example of a physical property or a chemical property.

1. Silver tarnishes when it comes in contact with hydrogen sulfide in the air.

Chemical

2. A banana is yellow.

Physical

3. A sheet of copper can be pounded into a bowl.

physical

4. Barium melts at 725 C.

Physical

5. Gasoline is flammable.

Chemical

6. A diamond is the hardest natural substance.

physical

7. Helium does not react with any other element.

chemical

8. A bar of lead is more easily bent than is a bar of aluminum of the same size.

Physical

9. Potassium metal is kept submerged in oil to prevent contact with oxygen or water.

Chemical

10. An apple will turn brown if left in oxygen.

Chemical

11. Diamond dust can be used to cut or grind most other materials.

Physical

12. Acid in tomato sauce can corrode aluminum foil.

Chemical

13. Rocks containing carbonates can be identified because they fizz when hydrochloric acid is applied.

chemical

14. A piece of charcoal, which is mostly the substance carbon, glows red, gives off heat, and becomes a gray ash. when lit

Chemical

Name: _____
 Hour: _____ Date: _____

Chemistry: Properties

Recall that *physical properties* can be observed without producing new substances. *Chemical properties* describe how a substance interacts with other substances to produce new substances. *Extensive properties* depend upon the amount of matter in the sample; *intensive properties* do not.

Directions, Part 1: Classify each of the properties listed below as extensive or intensive. Then classify each property as physical or chemical. Write the word out to earn full credit.

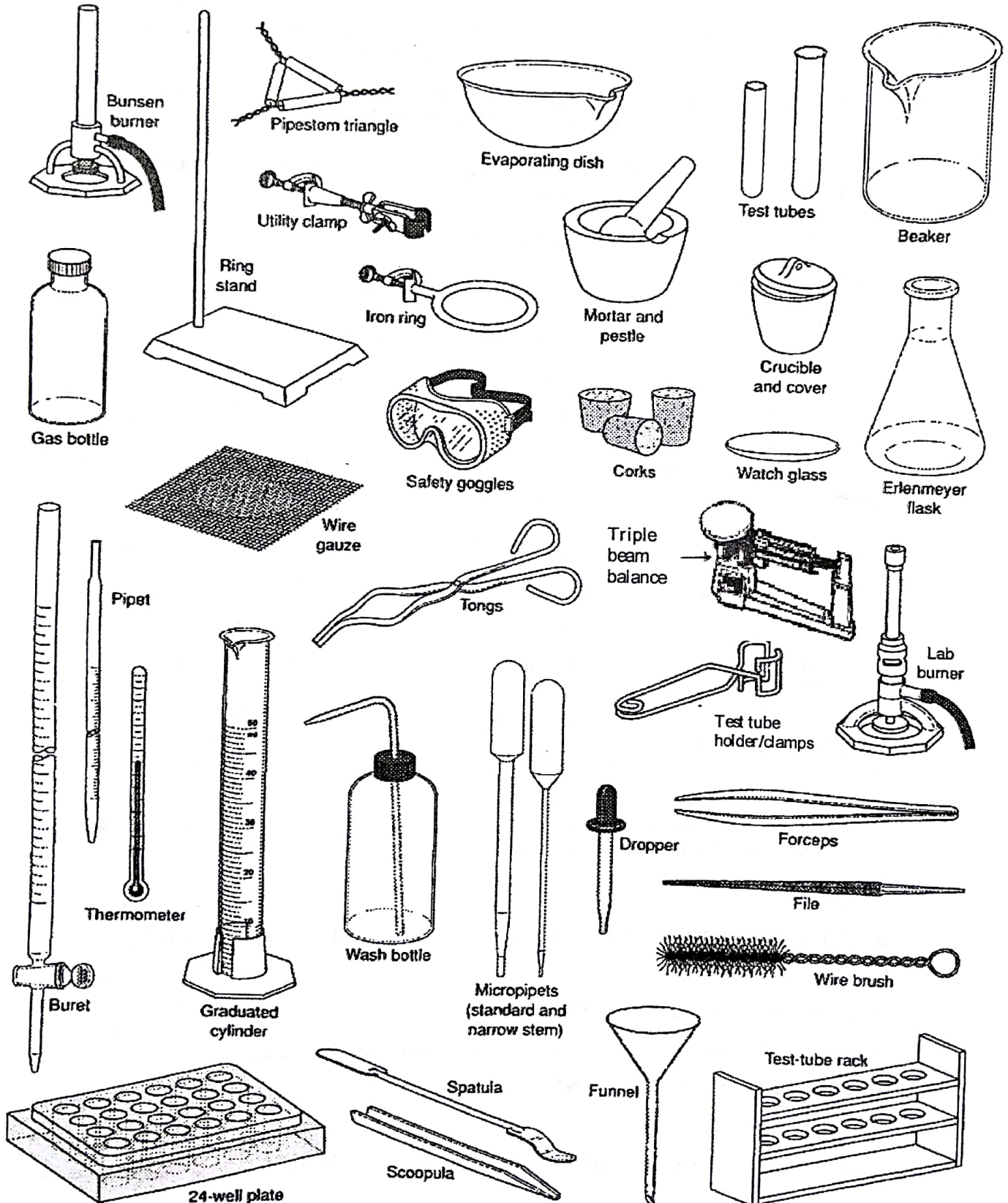
Property	Extensive or Intensive Property	Physical or Chemical Property
color	Intensive	Physical
combustibility	intensive	Chemical
hardness	Intensive	Physical
density	Intensive	Physical
mass	extensive	Physical
melting point	intensive	Physical
ductility	intensive	Physical
volume	extensive	Physical
reactivity with acid	intensive	chemical
odor	intensive	Physical
weight	extensive	Physical
malleability	intensive	Physical
tendency to corrode	intensive	chemical

Directions, Part 2: Some measurements or descriptions of properties are listed below. Write which property is being described in each case. Select properties that are listed in the table from Part 1.

- | | |
|--|-------------------------------|
| A. 15 dm ³ | A. <u>volume</u> |
| B. can easily be hammered into sheets | B. <u>malleability</u> |
| C. 2.8 g/cm ³ | C. <u>density</u> |
| D. burns when heated in the presence of O ₂ | D. <u>combustibility</u> |
| E. shiny metal forms a chalky white layer on its surface | E. <u>tendency to corrode</u> |
| F. can be scratched by a diamond | F. <u>hardness</u> |
| G. 500°C | G. <u>melting point</u> |
| H. can easily be drawn into a wire | H. <u>ductility</u> |

Name _____ Date _____ Table# _____

Directions: A number of items that may be used in the laboratory are shown below. Study this page and decide what the items may be used for. Use the names of the equipment shown to answer the questions included.



Name _____ Date _____ Table# _____

Lab Equipment

Name each piece of equipment that would be useful for each of the following tasks:

1. Holding 100mL of water (ebkare) Beaker
2. Measuring 27 mL of liquid (daudgtear ldnreiy) graduated cylinder
3. Measuring exactly 43mL of an acid (rtube) buret
4. Massing out 120 g of sodium chloride (acbnela) balance
5. Suspending glassware over the Bunsen burner (rwei zeagu) wire gauze
6. Used to pour liquids into containers with small openings or to hold filter paper (unfenl) funnel
7. Mixing a small amount of chemicals together (lewl letpa) well plate
8. Heating contents in a test tube (estt ubet smalcp) test tube clamps
9. Holding many test tubes filled with chemicals (estt ubet karc) test tube rack
10. Used to clean the inside of test tubes or graduated cylinders (iwer srbuh) wire brush
11. Keeping liquid contents in a beaker from splattering (tahcw sgasl) watch glass
12. A narrow-mouthed container used to transport, heat or store substances, often used when a stopper is required (ymerereel kslaf) Erlenmeyer flask
13. Heating contents in the lab (nuesnb bneurr) Bunsen Burner
14. Transport a hot beaker (gntos) tongs
15. Protects the eyes from flying objects or chemical splashes (ggloges) goggles
16. Used to grind chemicals to powder (tmraor nda stlepe) mortar & pestle