

Chemistry – Matter & Measurement Practice

Name: _____

Date: _____ Period: _____

- Identify the following as either elements or compounds. Refer to the list of elements if necessary.
 - Carbon monoxide
 - Hydrogen
 - Iron
 - Titanium
 - Potash (Potassium carbonate)
 - Sodium bicarbonate
- A given compound can be decomposed into two other substances. Are the two substances both elements?
- Identify the following as either a physical or a chemical property:
 - Diamond is one of the hardest known substances
 - Carbon monoxide is a poisonous gas
 - Soap is slippery
 - Silver tarnishes
 - Carbon dioxide freezes at -78°C
 - Sulfur burns in air
- Identify the following as a physical or a chemical change:
 - The frying of an egg
 - The vaporization of dry ice
 - The boiling of water
 - The burning of gasoline
 - The breaking of glass
- A pure substance is a green solid. When heated, it gives off a colorless gas and leaves a brown, shiny solid that melts at 1083°C . The shiny solid cannot be decomposed to simpler substances, but the gas can. List all of the properties given and tell whether they are chemical or physical. Tell whether each substance is a compound or an element.
- A handful of sand has a mass of 208g and displaces a volume of 80.0mL. What is its density?
- Pumice is a volcanic rock that contains many trapped air bubbles. A 155-g sample is found to have a volume of 163mL. What is the density of pumice? What is the volume of a 4.56-kg sample? Will pumice float or sink in water? In ethyl alcohol (0.790g/mL)?
- A large nugget of a shiny metal is found in a mountain stream. It weighs 5.65 ounces (16 oz/lb). 25.0mL of water is placed in a graduated cylinder. When the nugget is placed in the cylinder, the water level reads 33.3mL. Did we find a nugget of gold (19.3g/mL)?
- Calculate the density of water in pounds per cubic foot (lbs/ft³).
- Identify the following as homogeneous or heterogeneous matter:
 - Gasoline
 - Dirt
 - Smog
 - Alcohol
 - A new nail
 - Vinegar
 - Aerosol spray
 - Air
- An alloy is made containing 8.75kg of magnesium in 148.21kg of aluminum. What is the percent by mass of magnesium? What mass of magnesium is in 375g of the alloy? What mass of the alloy can be made from 484kg of aluminum?

12. The actual length of a certain plank is 26.782in. Which of the following measurements is the most precise and which is the most accurate?

- a. 26.5in
- b. 26.8in
- c. 26.202in
- d. 26.98in

13. How many significant figures are in each of the following measurements?

- a. 7030g
- b. 4.0kg
- c. 4.01lbs
- d. 0.01ft
- e. 4002m
- f. 0.060hr
- g. 8200km
- h. 0.00705yd

14. Carry out the following calculations using the correct number of significant figures.

- a. $(157-112)(25.6)$
- b. $35.48 - 4 + 0.04$
- c. $(0.30)(22.42)/(0.03)$

15. A container holds 32.8qt of water. The following portions of water are then added to the container: 0.12qt, 3.7qt, and 1.266qt. What is the new volume of the water?

16. Using scientific notation, express the number 87,000,000 to 1, 2 and 3 significant digits.

17. Carry out the following operation. Assume that the number represent measurements so that the answer is expressed to the proper decimal place
 $(0.61 \times 10^{-6}) + (0.11 \times 10^{-4}) + (0.0232 \times 10^{-3})$

18. Write the proper prefix, unit, and symbol for each of the following:

- a. 10^{-3}L
- b. 10^{-9}J
- c. 10^{-6}g
- d. 10^2g
- e. 1/100 m
- f. 10^{-1}Pa

19. Which of the following are “exact” relationships?

- a. $12 = 1\text{doz.}$
- b. $1\text{gal} = 3.78\text{L}$
- c. $3\text{ft} = 1\text{yd}$
- d. $1.06\text{qt} = 1\text{L}$
- e. $2.54\text{cm} = 1\text{in}$
- f. $2.2\text{lb} = 1\text{kg}$

20. If an automobile gets 24.5mi/gal of gasoline and gasoline costs \$1.22/gal, what would it cost to drive 350km?

21. At what temperature are the Celsius and Fahrenheit scales numerically equal?

22. In Saudi Arabia, gasoline costs 47.7 halala per liter. If there are exactly 100 halalas in one riyal and one riyal exchanges for 27.0 cents, what is the cost in cents/gal?