# Chapters 1 & 2
## Study Guide

Name: _____

Date: _____ Per: _____

***DIRECTIONS:* Fill in the blank(s).**

1. _____ is anything that has mass & occupies space.
2. The variable manipulated in an experiment by the researcher is called the _____ variable.
3. The variable measured by a researcher in an experiment is called the _____ variable.
4. The standard for comparison in an experiment is called the _____ group.
5. Complete the table:

| SI System of Measures | | | | | | |
|---|---|---|---|---|---|---|
| SI Measurement | Unit | Symbol | | SI Prefix | Symbol | Meaning |
| Length | | | | kilo- | | |
| | kilogram | | | | h | |
| | | A | | | | 10 |
| Amount | | | | deci- | | |
| | second | | | | c | |
| | | cd | | | | $1/1000^{th}$ |
| Temperature | | | | | | |

6. The boiling point of water at sea level is _____ K or _____ °C.
7. The freezing point of water at sea level is _____ K or _____ °C.
8. The point at which matter stops moving is called _____. It is equal to _____ K or _____ °C.
9. Convert the following:

   a. 300. K to °C _____ b. 35.0 °C to K _____ c. 82 °C to K _____

10. Contrast accuracy and precision: _____

    _____

11. List the five steps of the scientific method.

    i. _____ iv. _____

    ii. _____ v. _____

    iii. _____

12. Convert the following:

    a. 156.3 mL to _____ L c. 0.3461 km to _____ dm e. 9.15 m to _____ mm

    b. 0.0031 kg to _____ g d. 34 223 m to _____ km f. 0.331 mL to _____ dL

13. How many significant digits are present in each of the following?

    a. 0.0031mL _____ c. 2300 dm _____ e. 707.12 km _____

    b. 3.400 N _____ d. 0.722 m _____ f. 230. L _____

# Chapters 1 & 2
## Study Guide

Name: _____

Date: _____ Per: _____

14. Write the following in scientific notation:

a. 0.00031 _____ c. 2300 _____

b. 3400000 _____ d. 0.0047600 _____

15. Write the following in standard (expanded) notation:

a. $3.12 \times 10^{6}$ _____ c. $7.6 \times 10^{-5}$ _____

b. $5.201 \times 10^{7}$ _____ d. $3.100 \times 10^{7}$ _____

16. A _____ property is one which does not change the identity of a sample of matter as it is observed and includes such examples as: _____ _____. A property observed as a substance is undergoes permanent changes into another substance is called a _____ property and includes such examples as: _____ _____. This second type of property is observed during a _____ _____.

17. Fill in the table below.

| State of Matter | Description | Definite Shape | Definite Volume | Indefinite Shape | Indefinite Volume |
|---|---|---|---|---|---|
| Solid | Slow moving particles held in rigid structure. | | | | |
| Gas | | | | X | X |
| Liquid | | | | | |
| | Superheated gas in which particles become charged. | | | | |

18. Label each change as being either physical (P) or chemical (C).

a. Breaking glass _____ d. Burning gasoline _____ g. Boiling water _____

b. Condensing water _____ e. Melting metal _____ h. Heating plastic _____

c. Lighting a match _____ f. Freezing water _____ i. Cooking a steak _____

19. Define "element": _____ _____

a. Give <u>three</u> examples of elemental formulas: _____

b. Give <u>two</u> examples of polyatomic elemental formulas: _____

20. Define "compound": _____ _____

a. Give <u>two</u> examples of compound formulas: _____

21. Label each of the following as either an atomic formula (formula of an element) (A) or a compound formula (C).

a. MgO _____ d. NO _____ g. $H_2O$ _____

b. He _____ e. Co _____ h. $Sn_3N_4$ _____

c. CO _____ f. No _____ i. Sn _____

# Chapters 1 & 2
## Study Guide

Name: _____

Date: _____ Per: _____

22. Identify each sample of matter as a compound(C), element(E), heterogeneous mixture(H), or homogeneous mixture(M).

a. Milk _____ e. A 14K gold ring _____ i. Concrete _____

b. Table salt _____ f. Italian dressing _____ j. Cola _____

c. Sea water _____ g. Pure water _____ k. Air _____

d. Gold _____ h. Coffee _____ l. Sugar _____

*23.* ***DIRECTIONS:*** *Circle the correct response.*

a. ( Crystalline / Amorphous ) solids have a repeating crystalline structure and melt directly when heated.

b. ( Crystalline / Amorphous ) solids become flexible before melting.

c. ( Condensation / Evaporation ) is a change of phase that occurs when liquids change to a gas at a temperature below the boiling point of the liquid.

d. ( Sublimation / Deposition ) is a change of phase that occurs when solids change directly to a gas.

e. Boiling point is an example of a ( physical / chemical ) property.

f. Reactivity with water is an example of a ( physical / chemical ) property.

g. ( Physical / Chemical ) changes always involve a change in the chemical identity of a substance.

h. ( Homogeneous / Heterogeneous ) mixtures are uniformly mixed particles that cannot be separated through filtration.

i. ( Homogeneous / Heterogeneous ) mixtures are also referred to as solutions.

j. Salt dissolved in water is an example of a ( homogeneous / heterogeneous) mixture.

k. In a solution the (solvent / solute) is the dissolving agent and the ( solvent / solute ) is the substance dissolved.

l. The combination of oil and vinegar is a ( homogeneous / heterogeneous ) mixture.

24. Identify the appropriate method of separating the mixture (crystallization(C), distillation(D), filtration(F), chromatography(G)).

a. Salt from water _____ c. Sand from water _____

b. Alcohol from water _____ d. Red dye from black ink _____

25. Vertical columns of the periodic table are called _____ or _____. Elements are placed in the same vertical column because they have similar _____. The rows of the periodic table are referred to as _____.

*26.* ***DIRECTIONS:*** *Complete the following table:*

| | Location on the Periodic Table | Properties | Examples |
|---|---|---|---|
| Metals | | | |
| Non-Metals | | | |
| Semi-Metals | | | |

# Chapters 1 & 2
## Study Guide

Name: _____

Date: _____ Per: _____

***DIRECTIONS:*** *Complete the calculations in the space provided.*

27. If a 37.50 g weight is placed in a graduated cylinder with 41.0 mL of water and the water level goes up to 44.3 mL, what is the density of the weight?

28. A 3.75 g object with a density of 2.380 g/mL is placed in a graduated cylinder containing 20.50 mL of water. What is the final volume of the graduated cylinder after the object has sunk?

29. A graduated cylinder contains 30.00 mL of water. An object with a volume of 12.00 $cm^3$ is placed in the graduated cylinder and floats with only a portion of the object beneath the surface. If the water level in the graduated cylinder has increased to 34.50 mL, what is the density of the object?

30. A calculation indicates that a reaction should produce 1.87 g of product. After carrying out the experiment, only 1.650 g of product have been collected. Calculate the percent error.