

Lab Skills & Chemistry (Cont'd)

1. List the 6 steps of the scientific method.
 - i. Question
 - ii. Research
 - iii. Hypothesis
 - iv. Experiment
 - v. Analysis
 - vi. Conclusion

2. You plant two apple trees in your backyard. They get the same amount of rain and sunlight. You give special fertilizer to only one of the apple trees to see if it helps it grow faster.
 - What is the independent variable?
Use of fertilizer

 - What is the dependent variable?
Height of the apple tree

 - What are two controls in this experiment?
Amount of rain and sunlight

 - Write a hypothesis for this experiment
If... I give the fertilizer to my apple tree

Then ... it will grow taller

3. Identify the following as true or false.

F You may eat and drink during a lab as long as you keep the food clean.

T Goggles must be kept in place until *everybody* has finished the lab.

F The teacher appreciates your imaginative additions to the lab; feel free to improvise.

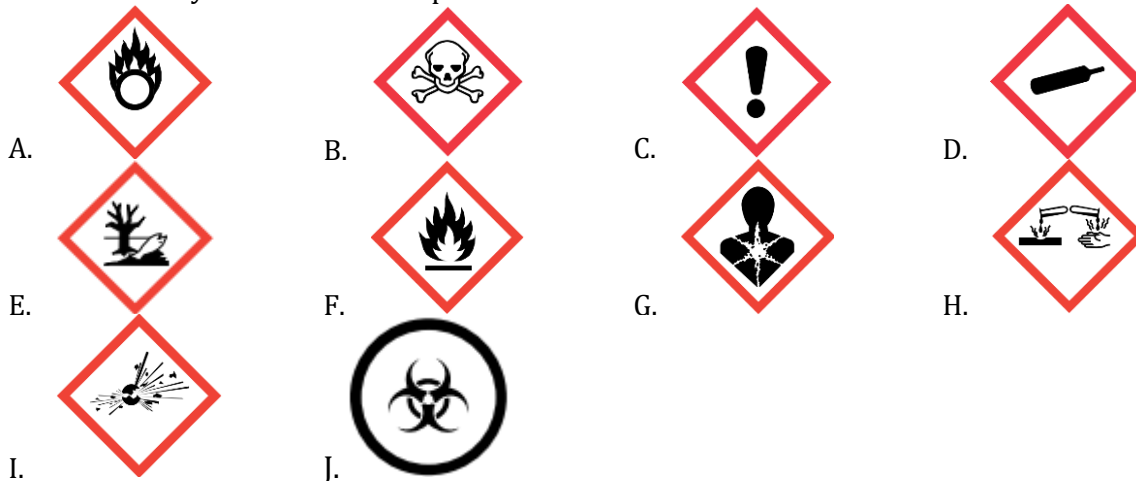
F If a chemical gets in your eye, you must rinse your eye under the *faucet in the sink*.

T/F Most people will not be calm enough to remember to stop, drop and roll if their clothing is on fire.

F Always cut toward *yourself* when using a knife or razor blade.

T Your hands *cannot* be wet if you are handling electrical cords.

4. Match the WHMIS symbol to the description.



- D** Gas under pressure
- F** Fire hazard that may burst into flames in air or water
- A** React chemically to oxidize combustible materials
- B** If inhaled, contacts the skin, or swallowed may be fatal, toxic or harmful
- G** May cause or suspected to cause serious health effects after acute or repeated exposure to the substance
- C** May cause acute toxicity, skin corrosion, serious eye damage/irritations, respiratory or skin sensitization, or target specific organ toxicity
- H** For corrosive damage to metals, eyes, skin
- I** For explosive or reactive hazards
- J** For organisms or toxins that can cause disease in people or animals.
- E** May cause damage to the aquatic environment.

5. Classify the following as an element, compound, heterogeneous mixture, or homogeneous mixture

- a. Granola **Heterogeneous mixture**
- b. Coffee **Homogeneous mixture**
- c. Sodium chloride **Compound**
- d. Steel **Homogeneous mixture**
- e. $C_{12}O_{22}H_{11}$ **Compound**
- f. Silver **Element**
- g. Water **Compound**
- h. Zinc **Element**

6. Classify the following as a physical or a chemical change

- a. Crushing a can: **Physical change**
- b. Burning a log: **Chemical change**
- c. Mixing cake batter: **Physical change**
- d. Baking a cake: **Chemical change**

7. Complete the following table:

Element Name	Element Symbol (charge)	Number of Protons	Number of Electrons	Number of Neutrons
Potassium ion	K^+	19	18	20
Sulfur ion	S^{2-}	16	18	16
Xenon atom	Xe	54	54	77
Magnesium ion	Mg^{2+}	12	10	12
Barium ion	Ba^{2+}	56	54	81
Fluorine ion	F^-	9	10	10

8. Write the names of these compounds. Indicate if it is ionic or covalent (I or C).

- a. $CsBr$ Cesium bromide (Ionic)
- b. $CuCl_2$ Copper (II) chloride (Ionic)
- c. $Cr_2(CO_3)_3$ Chromium (III) carbonate (Ionic)
- d. P_4Cl_7 Tetraphosphorus heptachloride (Covalent)
- e. $FeCl_3$ Iron (III) chloride (Ionic)
- f. $GaAs$ Gallium arsenide (Ionic)
- g. Ag_2S Silver sulfide (Ionic)
- h. P_4S_9 Tetraphosphorus nonasulfide (Covalent)
- i. $V_3(PO_4)_4$ Vanadium (IV) phosphate (Ionic)
- j. $SeBr_3$ Selenium tribromide (Covalent)
- k. $Ga_2(SO_4)_3$ Gallium sulfate (Ionic)
- l. CO_2 Carbon dioxide (Covalent)
- m. CaS Calcium sulfide (Ionic)
- n. $FeSO_3$ Iron (II) sulfite (Ionic)
- o. S_2N_3 Disulfur trinitride (Covalent)

9. Write the formulas of these compounds. Indicate if it is ionic or covalent (I or C).

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|------------------------------|------------------------------|------------|
| a. Aluminum fluoride | AlF_3 | (Ionic) |
| b. Chromium (IV) oxide | CrO_2 | (Ionic) |
| c. Triphosphorus monobromide | P_3Br | (Covalent) |
| d. Sulfur tetraiodide | SI_4 | (Covalent) |
| e. Lead (IV) hydroxide | $\text{Pb}(\text{OH})_4$ | (Ionic) |
| f. Lithium arsenide | Li_3As | (Ionic) |
| g. Tetrasulfur octaiodide | S_4I_8 | (Covalent) |
| h. Ammonium sulfate | $(\text{NH}_4)_2\text{SO}_4$ | (Ionic) |
| i. Cadmium iodide | CdI_2 | (Ionic) |
| j. Actinium oxide | Ac_2O_3 | (Ionic) |
| k. Trisulfur penta iodide | S_3I_5 | (Covalent) |
| l. Aluminum astatide | AlAt_3 | (Ionic) |
| m. Nickel (III) cyanide | $\text{Ni}(\text{CN})_3$ | (Ionic) |
| n. Platinum (IV) phosphate | $\text{Pt}_3(\text{PO}_4)_4$ | (Ionic) |
| o. Nitrogen decachloride | NCl_{10} | (Covalent) |