

Review - Section 1A

Part 1: Definitions

1) Physical Property: a property of a substance you can observe without changing what the substance is.

2) Chemical Property: a property of a substance you observe by changing what the substance is.

3) Physical Change: A change in the appearance in a substance that does not change what the substance is.

4) Chemical Change: A change in the makeup of a substance that transforms it into a new substance

5) Atom: The smallest form of an element that retains the chemical properties of that element.

6) Molecule: Two or more atoms chemically bonded together

7) Element: A substance made of one of the 118 building blocks of matter that cannot be broken into smaller materials

8) Compound: A combination of 2 or more different elements bonded together.

9) Chemical Symbol: One or two letter symbol that represents an element.

10) Chemical Formula: Combination of symbols and numbers that tell how many of each element are in a compound.

Part 2: Identifying Chemical & Physical Properties

1) Identify the following as chemical or physical properties:

Copper has a reddish brown color.	Physical
Propane burns readily.	Chemical
Carbon dioxide gas extinguishes a candle flame.	Chemical
Honey pours more slowly than water.	Physical
Metal wire can be bent.	Physical
Ice floats in water.	Physical
Paper is flammable.	Chemical
Sugar is soluble in water.	Physical

2) Classify each as a chemical or a physical change:

Observation	Type of Change	Evidence of type of change
A candle burns.	Chemical	Burning indicates a chemical change.
An opened carbonated beverage fizzes.	Physical	Gas is dissolved in soda. Dissolving and undissolving are physical changes
Hair curls as a result of a "perm."	Chemical	Chemicals are added to curl the hair
As shoes wear out, holes appear in the soles	Physical	Soles are physically worn down or tore apart into smaller pieces
A cut apple left out in the air turns brown	Chemical	Rotting is a chemical process

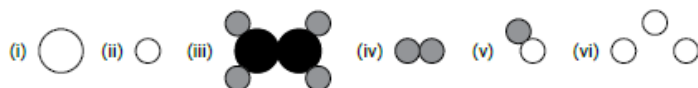
Flashlight batteries lose their "charge" after extended use.	Chemical	Electricity created by a chemical reaction
Dry cleaning removes oils from clothing.	Physical	Dissolving of oils by another solvent that is not water.
Italian salad dressing separates into layers over time.	Physical	Density allows for the separation of materials

Part 3: Small Structures

1) Classify each of these substances as an element or a compound.

CO	HCl	NaHCO ₃	I ₂	Co	Mg	NO
Compound	Compound	Compound	Element	Element	Element	Compound

Look at these models.



2a) Which represent elements?

I, II, IV and VI

2b) Which represent compounds?

III and V

3) What two pieces of information does a chemical formula provide?

The elements within a compound and how many of each element are in the compound.

4) Name the elements and list the number of each atom in the following formulas for substances:

phosphoric acid, H ₃ PO ₄ (used in soft drinks and fertilizers)	3 hydrogen, 1 phosphorus and 4 oxygens
sodium hydroxide, NaOH (found in some drain cleaners)	1 each of sodium, oxygen and hydrogen
sulfur dioxide, SO ₂ (a by-product of coal combustion)	1 sulfur and 2 oxygen
chlorophyll, C ₅₅ H ₇₂ O ₅ N ₄ Mg (molecule needed for photosynthesis in plants)	55 carbons, 72 hydrogens, 5 oxygens, 4 nitrogens and 1 magnesium

Part 4: Types of Elements

1) Classify each property as characteristic of metals or nonmetals:

shiny in appearance	Metal
does not react with acids	Nonmetal
shatters easily	Nonmetal
electrically conductive	Metal

2) List the names and symbols of two elements that are metalloids.

Silicon (Si) and Germanium (Ge)

3) What would you expect to happen if you tapped a sample of nickel with a hammer?

It should bend but not break because it is a metal.

4) List two properties that make nonmetals unsuitable for electric wiring.

It doesn't conduct and will break easily

5) List three properties that make metals suitable for coins.

Hard, won't break easily, fairly unreactive

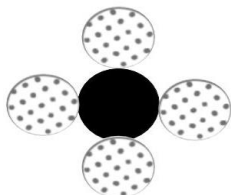
Part 5: Models and Equations:



1) Draw a molecular-level model of oxygen (O_2).



2) Draw a molecular-level model of carbon tetrachloride (CCl_4), a toxic compound once used in the production of refrigerants.



3) Write the formula of the compound below.



4) Translate these written descriptions and drawings into chemical equations:

a) One molecule of methane (CH_4) reacts with two molecules of oxygen (O_2) to form one molecule of carbon dioxide (CO_2) and two molecules of water (H_2O).



b) One molecule of copper (II) carbonate ($CuCO_3$) can be heated to form one molecule of carbon dioxide (CO_2) and one molecule of copper (II) oxide (CuO).



c) One atom of magnesium reacts with two molecules of hydrochloric acid (HCl) to form one molecule of magnesium chloride ($MgCl_2$) and one molecule of hydrogen (H_2).

