Name: _____ **Grade & Section:** _____

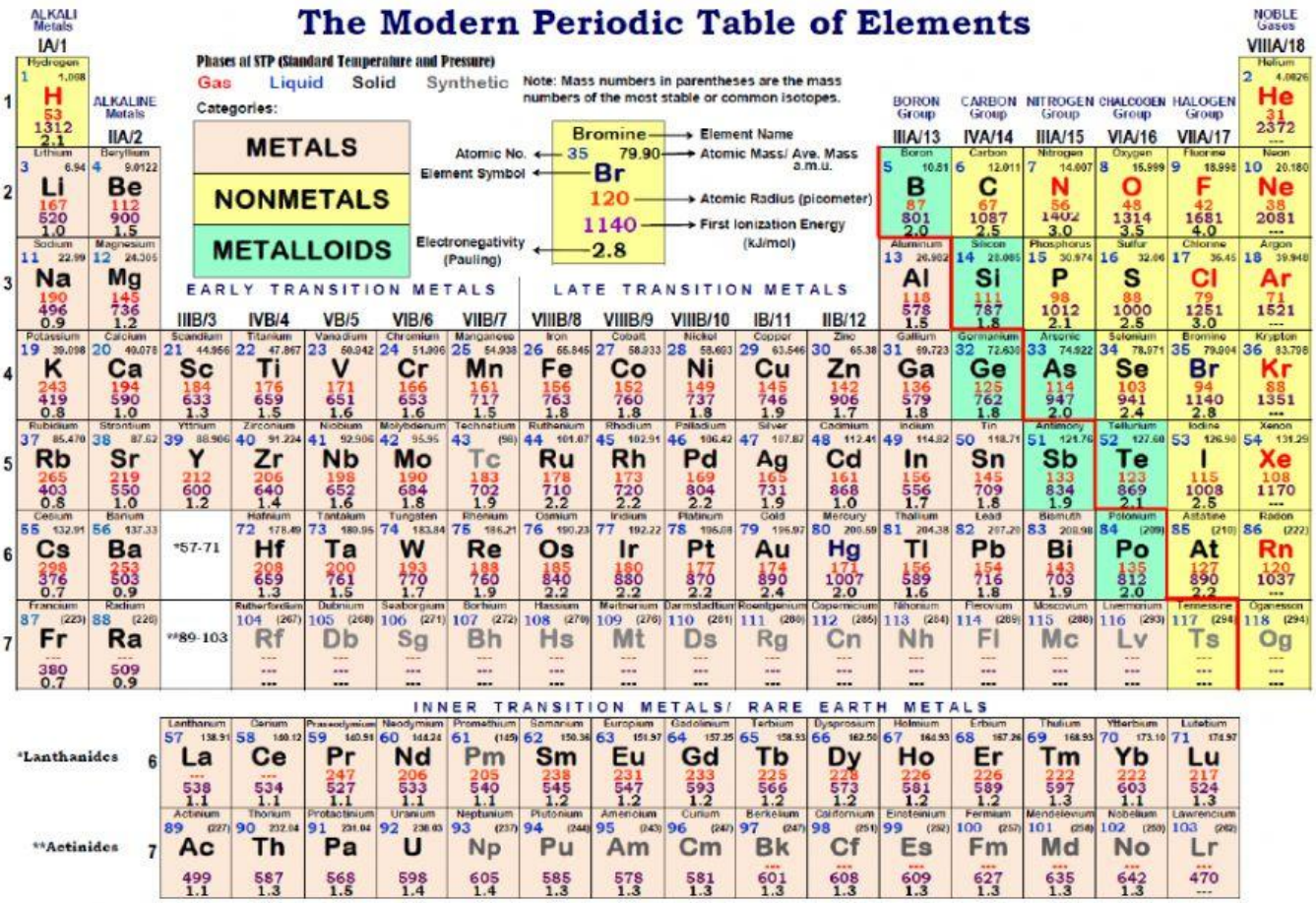
Metals, Nonmetals, and Metalloids

Metal is an element that is typically hard, shiny, **malleable, and ductile**, with good electrical and **thermal conductivity**. At normal temperatures, **metals** are usually solids. Mercury, on the other hand, is an exception. They produce cations, and their oxidation numbers are almost always positive. Ionic compounds are formed when metals have very low electronegative values. They are found in **s, p, d, and f blocks**.

Nonmetals have a dull appearance, not malleable or ductile like metals. They're fragile. Nonmetals are weak electrical and thermal conductors. Nonmetals have a lower density than metals. The majority of nonmetals are gases. There are, however, liquids and solids. The outermost **s and p orbitals** of these elements have a large number of electrons. They don't have any or only a few free electrons. The melting points of nonmetals are quite low. By gaining electrons, they tend to create **anions**. They join together to produce covalent compounds. A nonmetal's oxidation number can be either positive or negative. Nonmetals have a high electronegativity.

Metalloids are elements having a low degree of metallic behavior. Metallic and nonmetal characteristics can be found in metalloids. Metalloids can have a dull appearance. Metalloids can conduct heat and electricity, despite not being strong thermal and electrical conductors. Metalloids are mostly used in the manufacture of semiconductors. At room temperature, all metalloids are solids. Metalloids have a density that is halfway between metals and nonmetals. They're fragile. Metalloids are found in the periodic table's **p block**. These elements are found in the periodic table between metals and nonmetals.

Use this Periodic Table of Elements to classify the given elements below.



LIVEWORKSHEETS

A. Differentiate Metals, Nonmetals, and Metalloids by completing the table below. Choose your answers from the choices given in column 2.

Point of Comparison	Choices	Metals	Nonmetals	Metalloids
1. Degree of Metallic property	•Less or None •Low •Highest			
2. Position in the Periodic table	•Left side of the zigzag line •Along the zigzag line •Right side of the zigzag line			
3. Location in the s, p, d, f blocks	•p block •s and p blocks •s, p, d, f blocks			
4. Luster	•Shiny or dull •Dull •Shiny			
5. Malleable and ductile	•Yes •No •Sometimes			
6. Thermal and electrical conductivity	•Very low •High •Good			
7. Electronegativity	•Very low •Intermediate •Very high			

A. Classify the following elements into **Metal, Nonmetal, and Metalloid.**

1. Carbon (C)- _____
2. Iodine (I)- _____
3. Boron (B)- _____
4. Calcium (Ca)- _____
5. Sulfur (S)- _____
6. Mercury (Hg)- _____
7. Antimony (Sb)- _____
8. Tellurium (Te)- _____
9. Silver (Ag)- _____
10. Neon (Ne)- _____

LIVEWORKSHEETS

B. Tell whether the following characteristics/properties is for **Metal, Nonmetal, and Metalloid**.

1. If a substance can be pulled into thin wires and is a dull tan color, what is it?

   _____

2. If you have a copper-colored material that you can hammer into the shape of a coin what do you have? _____

3. What do you have if you find something that does not reflect light well, keeps you warm, and tears easily when? _____

4. You were given an unknown element which conducted some heat and electricity, had a shiny luster, and broke easily. What was given to you?

   _____

5. You have observed the physical properties of elements that were given to you to classify. The element was dull, brittle, and did not conduct heat. What would its classification be?

   _____

C. What group of elements has:

1. valence electrons of less than 4? _____
2. valence electrons of more than 4? _____
3. low electronegativity? _____
4. high electronegativity? _____
5. low ionization energy? _____
6. high ionization energy? _____

/Malord1971

LIVEWORKSHEETS