

### PERIODIC TABLE BASICS:

- **Dmitri Mendeleev** –
- **Periodic Law** –
- The **PERIODS** are the \_\_\_\_\_ of the periodic table.
- The **GROUPS** (columns) on the Periodic Table are also called \_\_\_\_\_ because they \_\_\_\_\_.
  - The nice thing about the *group number* is that it is the \_\_\_\_\_ as *the number of valence electrons*.
  - The “main group” elements are also called the \_\_\_\_\_.
- **VALENCE ELECTRONS:** electrons in the outermost \_\_\_\_\_ & \_\_\_\_\_ orbitals. Look for highest energy level #!
  - Label the number of valence electrons on your periodic table.
- **Properties of METALS**
  - Metals are good \_\_\_\_\_ of heat and electricity.
  - Metals are \_\_\_\_\_, meaning they can be pounded into thin sheets. They are also \_\_\_\_\_, meaning they can be drawn into wires.
  - Metals have \_\_\_\_\_ and \_\_\_\_\_.
  - Metals are more metallic as you go \_\_\_\_\_ the groups.
  - Metals get less metallic as you go \_\_\_\_\_ the periods.
- **Group I** – Known as the \_\_\_\_\_.
  - Have \_\_\_\_\_ valence electron(s)
  - Never \_\_\_\_\_ because they are too reactive
  - Reactivity of these elements \_\_\_\_\_ down the group.
- **Group II** – Known as the \_\_\_\_\_.
  - Have \_\_\_\_\_ valence electron(s).
  - Never found pure in nature because they are too reactive; but they are \_\_\_\_\_ reactive than alkali metals.
  - “Alkaline” means \_\_\_\_\_.
- **The f Block** – Known as the \_\_\_\_\_. Also called the *rare earth metals*.
- **The d Block** – Known as the \_\_\_\_\_.
- **Properties of METALLOIDS**
  - Have properties of \_\_\_\_\_.
  - Are \_\_\_\_\_ of electricity, meaning they are insulators at room temperature and conductors when heated
- **Properties of NONMETALS**
  - \_\_\_\_\_ conductors of heat and electricity
  - Brittle and dull
  - Many are \_\_\_\_\_ at room temperature.
- **Group VII** – Known as the \_\_\_\_\_.
  - Have \_\_\_\_\_ valence electron(s).
  - \_\_\_\_\_ found pure in nature; they are too reactive.
  - They are \_\_\_\_\_ molecules.
    - List the elements that are DIATOMIC:

- **Group VIII** – Known as the \_\_\_\_\_ (or *inert gases*).
  - Have \_\_\_\_ valence electron(s), except for helium, which only has 2.
  - \_\_\_\_\_ found pure in nature; they are chemically \_\_\_\_\_.
  - Since they are also \_\_\_\_\_ and \_\_\_\_\_, they were amongst the last of the natural elements to be discovered.
- **OCTET RULE (Ion formation):** Atoms LOVE to get \_\_\_\_\_, like the noble gases. They can do this by losing or gaining electrons until they reach a full shell.
  - \_\_\_\_\_ typically \_\_\_\_\_ electrons. They become positive ions called **CATIONS**.
  - \_\_\_\_\_ typically \_\_\_\_\_ electrons. They become negative ions called **ANIONS**.
  - List the ion charges on your periodic table.
- **LEWIS DOT STRUCTURES**
  - \_\_\_\_\_ electrons are represented with \_\_\_\_\_.
  - To write a dot structure determine the number of \_\_\_\_\_ and draw them around the \_\_\_\_\_. Put one electron on each side before \_\_\_\_\_.
  - Draw the representative dot structures on your periodic table.

NAME **THE ELEMENT THAT IS...** (Note: there is *ONLY ONE* correct answer)

- |                                      |                                   |
|--------------------------------------|-----------------------------------|
| 1. The period 4 alkali metal         | 5. The Group IV nonmetal          |
| 2. The period 1 noble gas            | 6. The Group V metal              |
| 3. The period 2 alkaline earth metal | 7. The period 3 halogen           |
| 4. The period 4 metalloid            | 8. The most reactive alkali metal |

NAME **AN ELEMENT THAT...** (Note: there is *MORE THAN ONE* correct answer)

- Has the same properties as neon
- Is a metal from the most reactive group
- Is chemically unreactive
- Forms a diatomic molecule (bonds to itself)
- Is from the most reactive nonmetal group
- Is from a family that contains metals, metalloids, and nonmetals
- Is a reactive metal that is a bit *less* reactive than an alkali metal

COMPLETE THE FOLLOWING STATEMENTS... (Note: circle your answers)

- Metal atoms gain / lose electrons when they ionize.
- When a nonmetal atom ionizes, it gains / loses electrons / protons to form a positive / negative ion called a(n) cation / anion.
- The chemical properties of elements are determined primarily by the protons / neutrons / electrons.
- Nonmetal atoms have more / fewer valence electrons than metal atoms.

COMPLETE THE TABLE... (Note: use the example as a guide)

Element	Valence Electrons	Lewis Dot Structure	Lose or Gain Electrons?	Cation or Anion?	Ion Charge
Aluminum	3	•Al•	Lose 3	Cation	+3
Potassium					
Oxygen					
Bromine					
Boron					
Sulfur					
Rubidium					
Magnesium					

