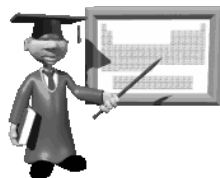


## Periodic Trends & the Periodic Table



## Periodic Table

- Periodic Table – arrangement of elements in order of increasing \_\_\_\_\_ with elements having similar properties in \_\_\_\_\_
  - \_\_\_\_\_ – vertical columns
  - \_\_\_\_\_ – horizontal rows

## Group Names

<u>Group</u>	<u>Name</u>
1A	_____
2A	_____
3A	_____
4A	_____
5A	_____
6A	_____
7A	_____
8A	_____

## Groups

- \_\_\_\_\_ elements – group A elements
- \_\_\_\_\_ elements – group B elements

## Groups

- The group tell you the number of \_\_\_\_\_ that the element has
- Valence electrons are electrons in the outermost \_\_\_\_\_ of the atom
- All group 1A elements have 1 valence electron. Likewise, all group 8A elements have 8 valence electrons.

## Characteristics

- Elements in the same group exhibit similar chemical characteristics due to the fact that they all have the same number of \_\_\_\_\_.
- The most stable number of valence electrons is \_\_\_\_\_
- This is called an \_\_\_\_\_

## Charges

- Every element wants 8 valence electrons to become stable. They will gain or lose valence electrons to form an octet

## Physical States and Classes of the Elements

- The majority of the elements are \_\_\_\_\_.
- They occupy the entire left side and center of the periodic table.
- \_\_\_\_\_ occupy the upper-right-hand corner.
- \_\_\_\_\_ are located along the boundary between metals and nonmetals

## Metals

- **Metals** are elements that have \_\_\_\_\_, conduct heat and electricity, and usually bend without breaking.

## Transition Metals

- The elements in the middle of the periodic table are called the **transition elements**.
- All transition elements are \_\_\_\_\_.
- Many transition metals can have more than one \_\_\_\_\_.

## Inner Transition Metals

- The first series of inner transition elements is called the \_\_\_\_\_.
- The second series of inner transition elements, the \_\_\_\_\_.

## Non Metals

- Most **nonmetals** don't conduct electricity, are much poorer conductors of heat than metals, and are \_\_\_\_\_ when solid.
- Many are \_\_\_\_\_ at room temperature; those that are solids lack the luster of metals.

## Properties of Metals and Nonmetals

Properties of Metals and Nonmetals	
Metals	Nonmetals
Bright metallic luster	Non-lustrous, various colors
Solids are easily deformed	Solids may be hard or soft, usually brittle
Good conductors of heat and electricity	Poor conductors of heat and electricity
Loosely held valence electrons	Tightly held valence electrons

## Metalloids

- **Metalloids** have some chemical and physical properties of metals and other properties of nonmetals.
- In the periodic table, the metalloids lie along the border between metals and nonmetals.
- B, Si, Ge, As, Sb, Te, Po, At

## Electron Dot Structures

- An electron dot structure consists of the elemental symbol surrounded by dots which represent valence electrons

## Examples

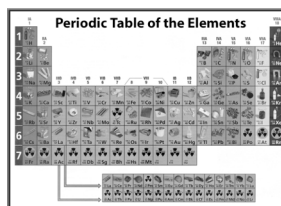
- Draw the electron dot structure for Na
- Draw the electron dot structure for Al
- Draw the electron dot structure for Br

## Periodic Trends

- Periodic Trends are trends that occur \_\_\_\_\_ the periodic table and \_\_\_\_\_ the periodic table

## Atomic Radius

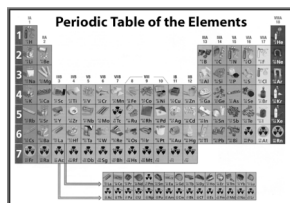
- **Atomic Radius** – size of the atom



A standard periodic table of elements with atomic numbers and symbols. The title "Periodic Table of the Elements" is centered at the top.

## Ionization Energy

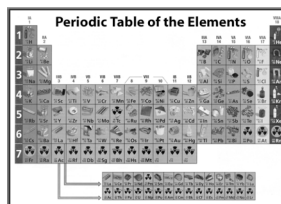
- **Ionization energy** – the ability to pull off 1 electron



A standard periodic table of elements with atomic numbers and symbols. The title "Periodic Table of the Elements" is centered at the top.

## Electro negativity

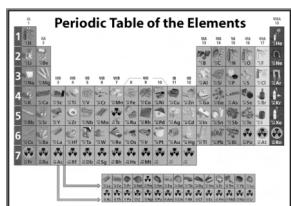
- **Electro negativity** – the ability of an atom to attract another atom



A standard periodic table of elements with atomic numbers and symbols. The title "Periodic Table of the Elements" is centered at the top.

## Metallic Character

- **Metallic character** – how much like a metal the element is



A standard periodic table of elements with the title "Periodic Table of the Elements" at the top. The table shows the arrangement of elements from Hydrogen (1) to Oganesson (118), with the lanthanide and actinide series shown below the main table.

## Ionic Radius

- When you talk about ionic radius, you are comparing an \_\_\_\_\_ and its \_\_\_\_\_
- When an atom has a \_\_\_\_\_ charge, you have \_\_\_\_\_ electrons
- Which makes it \_\_\_\_\_
- For example, which will be larger:
- Cl or Cl<sup>-1</sup>

## Ionic Radius

- When an atom has a \_\_\_\_\_ charge, you have \_\_\_\_\_ electrons
- Which makes it \_\_\_\_\_
- For example, which will be larger:
- Na or Na<sup>+1</sup>