Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_ NOTES

**Chemistry Notes: The Periodic Table**

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| **Every element has its own unique symbol.** | * For some elements the symbol is simply the \_\_\_\_\_\_\_ letter of the element’s \_\_\_\_\_\_\_\_.   + Examples: Hydrogen = \_\_\_\_\_\_, Sulfur = \_\_\_\_\_\_, Carbon = \_\_\_\_\_\_ * Symbols for other elements use the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ plus one other \_\_\_\_\_\_\_\_\_\_\_\_ of the element’s name. The first letter is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ letter is not.   + Examples: Aluminum = \_\_\_\_\_\_, Platinum = \_\_\_\_\_\_, cadmium = \_\_\_\_\_\_ * The \_\_\_\_\_\_\_\_\_\_\_\_\_\_ of some symbols are not as obvious. Some elements have symbols that refer to the element’s name in \_\_\_\_\_\_\_\_\_\_\_\_\_\_.   + Examples: gold = \_\_\_\_\_\_, lead = \_\_\_\_\_\_, copper = \_\_\_\_\_\_ | |
| **Who is the “Father of the Periodic Table?”** | * Mendeleev was the first scientist to notice the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ between the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   + Arranged his periodic table by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   + Said properties of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ elements could be predicted by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of elements around the missing element   + Predicted \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (Al) * It was later discovered that the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ nature of the elements was associated with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, not atomic mass   + Periodic means \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
| **What is the Periodic Table?** | * Column (up and down)= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   + \_\_\_\_\_\_\_\_ columns on the Periodic Table * Row (side to side)= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   + \_\_\_\_\_\_ rows on the Periodic Table | |
| **What does the information in the box tell me?** | Atomic Number = # of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Elemental \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Atomic \_\_\_\_\_\_\_\_\_ = ­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the atom  1  H  1.008  \*if you \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, you get Atomic mass \_\_\_\_\_\_\_\_ (# of protons plus \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) | |
| **Types of Elements: What are Metals?** | * On the \_\_\_\_\_\_\_\_\_\_ side of the periodic table * Properties:   + Good conductors of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_   + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in appearance (metallic!)   + Malleable: able to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or re-shaped   + Ductile: able to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ into wire or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ very thin (think: Aluminum foil)   + These are general properties; individual properties of metals will \_\_\_\_\_ Some will be better \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than others! | |
| **Types of Elements:  What are Nonmetals?** | * Elements on the\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ side of the periodic table. * Properties are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ those of metals.   + Usually \_\_\_\_\_\_\_\_\_\_\_ conductors of heat and electricity   + \_\_\_\_\_\_\_\_ shiny, malleable, or ductile * Most are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
| **Types of Elements: What are Metalloids?** | * Found \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the “stair-step line” (see next slide) * Have properties of both \_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ * Most common metalloid is \_\_\_\_\_\_\_\_\_\_\_\_\_\_, which is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ most common element in the Earth’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. | |
| **Where are Metals, Non-Metals, and Metalloids on the Periodic Table?** | * blank periodic table with metalloid line.bmpOnly \_\_\_\_\_\_\_\_\_\_\_\_\_\_ on the left (metal) side * Metals are to the \_\_\_\_\_\_\_\_\_\_ of the stair- step | * Nonmetals are on the \_\_\_\_\_\_\_\_\_\_\_ of the stair-step * Metalloids \_\_\_\_\_\_\_\_\_ the stair-step |
| **What are Valence Electrons and Reactivity?** | * Valence electrons are the electrons \_\_\_\_\_\_\_\_\_\_\_\_\_\_ from the nucleus. Atoms have \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ numbers of valence electrons. * Reactivity: how likely an atom is to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (react) with other atoms. Some elements are \_\_\_\_\_\_\_\_\_ reactive, while others almost \_\_\_\_\_\_\_\_\_\_\_\_ react. | |
| **What are the groups/families on the Periodic Table?** | * Elements on the periodic table can be grouped into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (or groups) based on their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ properties.   + We call them “families” because the elements in each family are “\_\_\_\_\_\_\_\_\_\_\_\_.” * Each family has a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to differentiate it from the other families in the periodic table. * Elements in each family\_\_\_\_\_\_\_\_\_\_\_\_ differently with other elements. | |
| **Group 1: the Alkali Metals** | * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is NOT part of this family!!! * Most \_\_\_\_\_\_\_\_\_\_\_\_\_ metals on the PT   + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: how likely an atom is to interact with other atoms * Rarely found \_\_\_\_\_\_\_\_\_ (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) in nature * Form \_\_\_\_\_\_\_\_\_ with a charge of \_\_\_\_\_\_, have 1 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ * Soft and \_\_\_\_\_\_\_\_\_\_\_\_\_\_, shiny * *Very* reactive, esp. with \_\_\_\_\_\_\_\_\_\_\_\_\_ * Conduct\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
| **Group 2: the Alkaline Earth Metals** | * Still quite \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ * Form ions with a charge of \_\_\_\_\_\_\_\_, have \_\_\_\_\_\_ valence electrons * White, silvery, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ * Conduct \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
| **Groups 3-12: Transition Metals** | * Found \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in nature * Form ions with a charge of usually \_\_\_\_\_\_\_ but varies—usually \_\_\_\_\_\_\_ valence electrons * Almost all are \_\_\_\_\_\_\_\_\_ at room temp (except \_\_\_\_\_\_\_\_\_\_\_\_\_, Hg, is a \_\_\_\_\_\_\_\_\_\_\_) * Good \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of heat and electricity. | |
| **Group 13: Boron Family** | * + Named after the \_\_\_\_\_\_\_\_\_\_\_\_ element in the group (at the \_\_\_\_\_\_\_\_ of the column), \_\_\_\_\_\_\_\_\_\_\_\_   + Form ions with a charge of \_\_\_\_\_\_, have \_\_\_\_\_\_ valence electrons | |
| **Group 14: The Carbon Family** | * Contains elements that can form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bonds (\_\_\_\_\_\_\_\_\_\_\_\_ and silicon) * Form ions with a charge of \_\_\_\_\_\_ or \_\_\_\_\_\_, have \_\_\_\_\_\_ valence electrons | |
| **Group 15: the Nitrogen Family** | * + Form ions with a charge of \_\_\_\_\_\_\_, have ­­­­\_\_\_\_\_\_\_ valence electrons | |
| **Group 16: The Oxygen Family** | * Also known as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ * Form ions with a charge of \_\_\_\_\_\_, have \_\_\_\_\_\_\_ valence electrons | |
| **Group 17: the Halogens** | * Most \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ * Form ions with a charge of \_\_\_\_\_\_, have \_\_\_\_\_\_\_ valence electrons | |
| **Group 18: The Noble Gases (Inert Gases)** | * \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ * Do not form \_\_\_\_\_\_\_\_\_\_\_! Charge is ­­­­­\_\_\_\_\_, have either \_\_\_\_ or \_\_\_\_valence electrons * All are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
| **Rare Earth Metals** | * Some are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ * The rare earths are silver, silvery-white, or gray \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. * Conduct \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ * Called: Lanthanides and Actinides | |
| **What are some trends in the periodic table?** | * Atomic size \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ as you move from left to right across the table. Atomic size \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ as you move from top to bottom of the table. * The density of an element \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from top to bottom. The element \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ has the highest known density. * The most reactive elements are groups \_\_\_\_\_\_ and \_\_\_\_\_\_\_. The least reactive elements are in group \_\_\_\_\_\_\_\_\_. | |