Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Homeroom:\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_ **3.10**

**Reactivity and Bonding (SPI.9.9)**

|  |  |
| --- | --- |
| ***Key Point*** | ***Notes*** |
| **Chemical Bonds** | * **Chemical bonds** are the forces of attraction that hold atoms together
* When atoms interact to form a bond, only their outer \_\_\_\_\_\_\_\_\_\_\_ come in contact
* Bonds are formed by transferring electrons (losing or gaining them) (IONIC BONDS) or by sharing electrons (COVALENT BONDS)
 |
| **The Octet Rule** | * The octet rule states that atoms of elements tend to gain or lose \_\_\_\_\_\_\_\_\_ in order to possess \_\_\_\_\_\_\_ valence electrons (or a stable full energy level).
* If an atom has 3 or less valence electrons, it will \_\_\_\_\_\_ these electrons.
* If an atom has 4 or more valence electrons, it is going to \_\_\_\_\_\_\_ electrons until it has a full energy level.
* **Elements that are \_\_\_\_\_\_\_\_\_ to fulfilling their octet (becoming stable with 8 valence electrons) are the most** \_\_\_\_\_\_\_\_\_\_**with other elements**

**EIGHT IS GREAT!!!** |
| **Reactivity of Specific Groups** | * *Alkali metals (group 1):* are \_\_\_\_\_\_\_ reactive
* *Alkaline earth metals (group 2):* very reactive
* *Halogens (group 17):* highly reactive, likely to react with a alkali metals
* *Noble/Inert gases (group 18):* \_\_\_\_\_\_ react with ANYONE! They are the least reactive because they \_\_\_\_\_\_\_\_\_\_ have eight valence electrons. They are noble, inert!
 |
| **Trend in Reactivity** | * Elements that are more \_\_\_\_\_\_\_\_\_ are more likely to form compounds (through the creation of chemical \_\_\_\_\_\_ with other atoms)
* This means that they will more readily chemically combined with another element to form a completely *new substance*

    |
| **So What?!** |  |

 **“I Own This” (Independent Practice):**

1. What *element* is the most reactive element on the periodic table? How do you know?
2. Which *group* is the *least reactive*? Why?
3. Which groups are the *most reactive*? Why?

*Place the following elements in order of increasing reactivity.*

4. B, Be, F

5. Cl, S, P, Ar

*Circle the letter of the correct answer in the following multiple-choice questions (questions #6-7).* ***Only use the periodic table above!***

6. Which of the following is the most reactive?

a. Helium (He)

 b. Argon (Ar)

 c. Radon (Rn)

 d. Hydrogen (H)

7. Which of the following would most likely form a compound with hydrogen?

a. Chlorine (Cl)

 b. Calcium (Ca)

 c. Neon (Ne)

 d. Lithium (Li)

*8. Use the remainder of your class time to work on your “Hard Work” RAFT!*

☐ Create a key to help you determine an element’s reactivity and number of valence electrons

 ☐ How do you calculate the number of valence electrons?

 ☐ How do you draw a Lewis dot structure?

☐ Give an example element of a Lewis dot structure

☐ Write a minimum of **one paragraph** explaining *reactivity*. (Include a detailed explanation of the Octet Rule)

☐ Explain the theory of the Octet Rule or “eight is great”

☐ What elements are highly reactive? Why?

 ☐ Discuss how reactivity plays a role in bonding

**“Own This Even Further” (Early Finisher):**

Work on your “Hard Work” RAFT!!