# Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Hour: \_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_

# Chemistry: *Chemical Bonding Activity*

**Introduction**

*When atoms bond together to form ionic compounds, they will not combine with just any other atom. For example, two atoms that will never form an ionic bond are a sodium atom (Na) and a potassium atom (K). This is because both Na1+ and K1+ are cations, or positively-charged ions. In order for two atoms to form an ionic bond, one must be a cation (+ charge) and the other must be an anion (- charge). Remember,* ***opposite******charges******attract*** *each other and* ***similar******charges******repel*** *each other. Opposite charges can bond to each other, and similar charges cannot.*

*In this activity, you will get some practice in learning how atoms form ionic bonds. Listen carefully as the teacher explains the procedure, then begin.*

**Activity**

1. potassium and bromine

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ion Name** | **Ion Symbol** | **Anion/Cation** | **How Many?** | **Chemical Formula** |
|  |  |  |  |  |
|  |  |  |  |

1. potassium and oxygen

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ion Name** | **Ion Symbol** | **Anion/Cation** | **How Many?** | **Chemical Formula** |
|  |  |  |  |  |
|  |  |  |  |

1. magnesium and bromine

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ion Name** | **Ion Symbol** | **Anion/Cation** | **How Many?** | **Chemical Formula** |
|  |  |  |  |  |
|  |  |  |  |

1. aluminum and nitrogen

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ion Name** | **Ion Symbol** | **Anion/Cation** | **How Many?** | **Chemical Formula** |
|  |  |  |  |  |
|  |  |  |  |

1. lead (IV) and nitrogen

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| --- | --- | --- | --- | --- |
| **Ion Name** | **Ion Symbol** | **Anion/Cation** | **How Many?** | **Chemical Formula** |
|  |  |  |  |  |
|  |  |  |  |

1. copper (II) and hydroxide ion

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| --- | --- | --- | --- | --- |
| **Ion Name** | **Ion Symbol** | **Anion/Cation** | **How Many?** | **Chemical Formula** |
|  |  |  |  |  |
|  |  |  |  |

1. ammonium ion and nitrate ion

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ion Name** | **Ion Symbol** | **Anion/Cation** | **How Many?** | **Chemical Formula** |
|  |  |  |  |  |
|  |  |  |  |

1. calcium and phosphate ion

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ion Name** | **Ion Symbol** | **Anion/Cation** | **How Many?** | **Chemical Formula** |
|  |  |  |  |  |
|  |  |  |  |

1. ammonium ion and phosphate ion

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ion Name** | **Ion Symbol** | **Anion/Cation** | **How Many?** | **Chemical Formula** |
|  |  |  |  |  |
|  |  |  |  |

1. aluminum and oxygen

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ion Name** | **Ion Symbol** | **Anion/Cation** | **How Many?** | **Chemical Formula** |
|  |  |  |  |  |
|  |  |  |  |

11 and 12. Make two compounds of iron and oxygen.

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| --- | --- | --- | --- | --- |
| **Ion Name** | **Ion Symbol** | **Anion/Cation** | **How Many?** | **Chemical Formula** |
|  |  |  |  |  |
|  |  |  |  |

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| --- | --- | --- | --- | --- |
| **Ion Name** | **Ion Symbol** | **Anion/Cation** | **How Many?** | **Chemical Formula** |
|  |  |  |  |  |
|  |  |  |  |

13 and 14. Make two compounds of lead and sulfur.

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| --- | --- | --- | --- | --- |
| **Ion Name** | **Ion Symbol** | **Anion/Cation** | **How Many?** | **Chemical Formula** |
|  |  |  |  |  |
|  |  |  |  |

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| --- | --- | --- | --- | --- |
| **Ion Name** | **Ion Symbol** | **Anion/Cation** | **How Many?** | **Chemical Formula** |
|  |  |  |  |  |
|  |  |  |  |

15 and 16. Make two compounds of copper and oxygen.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ion Name** | **Ion Symbol** | **Anion/Cation** | **How Many?** | **Chemical Formula** |
|  |  |  |  |  |
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|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Ion Name** | **Ion Symbol** | **Anion/Cation** | **How Many?** | **Chemical Formula** |
|  |  |  |  |  |
|  |  |  |  |

*Use the pieces to make one molecule (technically, the term should be “formula unit,” since these are ionic compounds) of any five of the compounds and get your teacher’s initials.*

**Chemical Formula of Compound Teacher’s Initials**

1.

2.

3.

4.

5.

**Questions**

1. What was the overall charge on all of the molecules (formula units) that you constructed?
2. Compare your pieces with the Periodic Table and answer these questions.
3. Do nonmetals form anions or cations?
4. Do metals form anions or cations?
5. What is the charge for all of the elements in Group 1?
6. What is the charge for all of the elements in Group 2?
7. What is the charge for all of the elements in Group 17?
8. Do cation pieces fit with other cation pieces?
9. Do anion pieces fit with other anion pieces?
10. What type of elements (metals, metalloids, or nonmetals) form ionic bonds with metals?
11. What type of elements (metals, metalloids, or nonmetals) form ionic bonds with nonmetals?
12. Write the chemical formula that results when the following pairs of ions combine to form an ionic bond.
13. Sr2+ and O2-
14. Mn4+ and O2-
15. Li1+ and Cl1-
16. Cs1+ and S2-