|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Element | # of Protons | # of Electrons | # of Valence Electrons | Oxidation Number |
| Sodium |  |  |  |  |
| Chlorine |  |  |  |  |
| Beryllium |  |  |  |  |
| Fluorine |  |  |  |  |
| Lithium |  |  |  |  |
| Oxygen |  |  |  |  |
| Phosphorus |  |  |  |  |

Follow your teacher’s directions to complete each ionic bond. (1) Potassium + Fluorine

(2) Magnesium + Iodine

(4) Sodium + Chlorine

(5) Calcium + Chlorine

(6) Aluminum + Chlorine

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Element | # of Protons | # of Electrons | # of Valence Electrons | Oxidation Number |
| Sodium | 11 | 11 -> 10 | 1 | 1+ |
| Chlorine | 17 | 17 -> 18 | 7 | 1- |
| Beryllium | 4 | 4 -> 2 | 2 | 2+ |
| Fluorine | 9 | 9 -> 10 | 7 | 1- |
| Lithium | 3 | 3 -> 2 | 1 | 1+ |
| Oxygen | 8 | 8 -> 10 | 6 | 2- |
| Phosphorus | 15 | 15 -> 18 | 5 | 3- |

NOTE: I have the students use a red pen/pencil to change the # of electrons to the amount it would be if the valence electrons were removed or added. They can see the difference between the number of protons (+) and electrons (-), which relates to the charge or oxidation number. If the ion has more protons (+), it would be a positive ion. If it has more electrons (-), it would be a negative ion.

Follow your teacher’s directions to complete each ionic bond.

(1) Potassium + Fluorine

Step 3



Step 2

1- Write the symbols for each element.



2 - Use Fruity Pebbles (or other cereal/candy with more than one color) to create the Lewis structure for each.

3 - Draw an arrow (or more if needed) to show the

K F

Step 1



transfer of electrons and move the cereal to the new location.

4 - Determine the charge for each ion and write the formula.

5 - Make sure the sum of the oxidation numbers is zero and write the chemical formula.

6 - Have the students use a pencil or crayon to draw the electrons as they remove the pieces of cereal.

K1+F1- KF

K would have a charge of

1+ since it lost an electron

Fluorine would have a charge of 1- since it gained an electron.

(2) Magnesium + Iodine



Mg I I



Mg2+ I 1-

2

MgI2

Mg would have a charge of 2+

since it lost two electrons.

Each I ion would have a charge of

1- since each gained an electron. A subscript “2” is used to show that two ions were used in the bond.

Students will start with one magnesium and one iodine atom. Since the oxidation numbers must

equal zero, they will need to add another iodine atom.

Na O



1+ 2-

Na 2 O

Each Na ion would have a charge of 1+ since each lost an electron. A subscript “2” is used to show that two ions were used in the

Na2O

Na Students will start with one sodium and one

oxygen atom. Since the oxidation numbers must

equal zero, they will need to add another sodium atom.

bond.

The O ion would have a charge of

2- since it gained two electrons.

(4) Sodium + Chlorine

Na Cl



Na1+Cl1-

NaCl

Na would have a charge of

1+ since it lost an electron

Cl would have a charge of

1- since it gained an electron.

(5) Calcium + Chlorine

Ca Cl



Ca 2+Cl 1-

2

Ca would have a charge of 2+

since it lost two electrons.

Each Cl ion would have a charge of 1- since each gained

Cl CaCl2



an electron. A subscript “2” is used to show that two ions were used in the bond.

(6) Aluminum + Chlorine



Al Cl



Cl Cl



3+ 1-

Al Cl 3

AlCl3

The Al ion would have a charge of 3+

since it lost three electrons.

Each Cl ion would have a charge of

1- since each gained an electron. A subscript “3” is used to show

that three ions were used in the bond.