Name:_____

# Introduction to the Periodic Table

*Investigating Periodic Trends*

**Learning Target**
Explain how chemists began to organize the known elements.

Most chemistry textbooks report a wealth of numerical data to identify periodic trends in the properties of elements. Ionization energies, atomic radii, electronegativity, and electron affinities are dutifully tabulated and graphed, but what do all the numbers mean?

The modern periodic table is based on **periodic law**. This law states that, physical and chemical properties of elements are a function of their atomic numbers. By using Periodic Law, we can find a variety of trends in both physical and chemical properties.

Within each **group**, all the elements in that column will be exactly the same in some way and must also share some feature that changes regularly as you move down the group. Similarly, within each **period**, all the elements in the row must be exactly the same as you move across the period and must also share some feature that changes regularly as you move across the row.

You will be given 18 cards which you will use to construct an “alien periodic table”. You will need to arrange the alien pictures in some logical pattern so that they form an organized regular 4x5 block. Two of the cards are missing, once you determine the correct trends for each column and row you will need to illustrate what you believe the missing two alien cards look like.

**Analysis Questions**

1. What is the modern periodic table based on?

2. What properties are represented in the periodic table?

3. What is a *group* on the periodic table?

4. What is a *period* on the periodic table?

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5. What property or properties does each period have in common on your alien periodic table?

| | |
|---|---|
| **Period 1** | |
| **Period 2** | |
| **Period 3** | |
| **Period 4** | |
| **Period 5** | |

6. What property or properties does each group have in common on your alien periodic table?

| | |
|---|---|
| **Group 1** | |
| **Group 2** | |
| **Group 3** | |
| **Group 4** | |

7. What does your missing alien cards look like?

| **Missing Card #1** | **Missing Card #2** |
|---|---|
| | |

**When you have completed your drawings check them with Ms. Schmidly**

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8. Were your drawings correct?

9. Now look at the periodic table of elements, what trends do you see in the different periods and groups? (You should discuss trends in atomic number, atomic mass number, and electronegativity).

10. Draw arrows to represent the trends you described in number 9. Use different colors to represent the different properties.

**Periodic Table of the Elements**