

KEY 5.3 Representative Groups
Honors Integrated Science
Student **Notes**

Name: _____ Date: _____

5.3 Representative Groups	
Key Ideas	Notes
Why is hydrogen placed on the left side of the table?	Hydrogen's location is related to its electron configuration, not its properties.
Why do elements in a group have similar properties ?	Elements in a group have similar properties because they have the same number of valence electrons.
	<i>Valence electrons</i> An electron that is in the highest occupied energy level of an atom. Valence electrons play a key role in chemical reactions. The properties of elements vary across a period because the number of valence electrons increases from left to right.
What are some properties of the A groups in the periodic table?	Elements in a group have similar properties because of their valence electrons, however, the properties are not identical because the valence electrons are in different energy levels.
	<i>Alkali metals</i> • Located in group 1A • 1 single valence • Forms a +1 charge • Extremely reactive • Found in nature only in compounds • The most reactive metals
	<i>Alkaline earth metals</i> • Located in group 2A • 2 valence electrons

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- **Forms a +2 charge**
- **Harder and stronger than group 1A metals**
- **Higher melting point than group 1A metals**
- **Less reactive than alkali metals**
- **Differences in reactivity among the alkaline earth metals are shown by the ways they react with water.**

Boron Family

- **Located in group 3A/13**
- **3 valence electrons**
- **Forms a +3 charge**
- **Less reactive than groups 1 and 2 metals**
- **Aluminum is the most abundant metal in Earth's crust**

Carbon Family

- **Located in group 4A/14**
- **4 valence electrons**
- **Mixed group contains one nonmetal, two metalloids, and two metals**
- **The metallic nature of this group increases as you go down**
- **Except for water, most of the compound in your body contain carbon**
- **Biological functions and life reactions are controlled by carbon compounds**
- **Silicon is the second most abundant element in Earth's crust**

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Nitrogen Family

- **Located in group 5A/15**
- **5 valence electrons**
- **Mixed group contains two nonmetals, two metalloids, and one metal**
- **The group has a wide range of physical properties**
- **Besides nitrogen, fertilizers often contain phosphorus**

Oxygen Family

- **Located in group 6A/16**
- **6 valence electrons**
- **Group contains three nonmetals and two metalloids**
- **Oxygen is the most abundant element in Earth's crust.**
- **Complex forms of life need oxygen to stay alive**
- **Ozone is another form of oxygen that absorbs harmful radiation emitted by the sun**
- **Sulfur was one of the first elements discovered**

Halogens

- **Located in group 7a/17**
- **7 valence electrons**
- **The halogens include two gases (fluorine and chlorine), one liquid (bromine), and one solid (iodine)**
- **Despite their physical differences, the halogens have similar properties**

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- **Most reactive nonmetals**

Noble Gases

- Located in group 8A/18
- 8 valence electrons (except helium which has 2 electrons)
- The noble gases are colorless and odorless and extremely unreactive
- When electric current passes through the noble gases, they emit different colors.