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Interactive Periodic Table Interactivity

This interactivity can be found in your digital course.

How do we choose the materials we use? Aluminum for beverage cans, helium for birthday balloons, copper for wires (and coins), silicon for microchips and ceramics—different substances have characteristic properties that inspire us to use them in different ways. As you study chemistry, the periodic table will become a useful tool for identifying and predicting properties. What properties identify an element?

Record Data and Observations

Part 1: Elements Around You

1. Which element accounts for 23 percent of a human's total body mass?

_____

2. Which of the most abundant elements in Earth's crust are nonmetals?

_____

3. What do the most abundant elements in Earth's atmosphere have in common?

_____

_____

Part 2: Iron and Oxygen

4. Describe a chemical property of oxygen that you observed.

_____

_____

5. Describe a chemical property of iron that you observed.

_____

_____

6. How do the physical properties of rust compare with the physical properties of iron and oxygen?

_____

_____

_____

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Part 3: Sodium and Chlorine

7. Describe one physical property and one chemical property of sodium that you observed.

8. Chlorine and oxygen are both gases at room temperature. What are some characteristic properties of chlorine that distinguish it from oxygen?

9. Four properties of sodium chloride (NaCl) are listed below. Describe one more that is based on your own experience with using table salt.

Solid at room temperature

Melting point = 801°C

Boiling point = 1413°C

Density = 2.17 g/cm^3

Analyze and Interpret Data

1. Construct an Explanation The elements sodium and chlorine react to form sodium chloride. Does sodium chloride retain any of the characteristic properties of either sodium or chlorine? Explain your answer.

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2. **Obtain Information** Identify two physical properties that could help you distinguish the four metals listed in the table. Label the last two columns of the table with the properties you have selected. Then use the interactive periodic table to obtain the relevant physical property data for each element.

Physical Properties of Four Metals					
Element	**Symbol**	**State**	**Color**		
Aluminum	Al	Solid	Silvery white		
Magnesium	Mg	Solid	Silvery white		
Nickel	Ni	Solid	Silver		
Platinum	Zn	Solid	Silver		

3. **Evaluate Information** Sodium is an example of an alkali metal. The alkali metals are found in the leftmost column of the periodic table, known as Group 1. Use the interactive periodic table to explore the properties of the following alkali metals: lithium (Li), sodium (Na), potassium (K), rubidium (Rb), and cesium (Cs). The animations demonstrate a chemical property common to alkali metals: they react with water. How does the reactivity vary among this group of elements? Why might patterns like this be useful to scientists?

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Conclude

1. **Apply Scientific Reasoning** Describe how you could use physical or chemical properties to determine whether or not a sample of a substance is pure.

2. **Construct an Explanation** How do characteristic properties help you determine whether a chemical change or a physical change has occurred?