Inquiry Lab: Periodic Table

Step-by-Step Guide to Completion

Step 1: Read the Background Information and Directions

**Directions and Background information:** The periodic table can be a very useful tool for predicting different characteristics of elements. The properties change in a predictable way according to the atomic number (the number of protons in the nucleus). Rows, or periods, represent elements in order of increasing atomic number. There are seven rows on the periodic table. Atomic mass increases as you go left to right. As you go across the periodic table from left to right, elements go from being metals to metalloids to nonmetals. Columns (also families or groups) represent elements with similar properties. As you go from top to bottom, the atomic number increases. Atomic mass also increases as you go down the column. Elements in each family have similar characteristics. Except for hydrogen, elements in Group 1 are all metals that react violently with water. These are called the Alkali Metals. Group 17 elements are very reactive. These elements only need one more electron in their valence level to be complete. They are called the Halogens. Group 18 elements are nonreactive. This is because their valence shell is full. They are called the Noble Gases. More to know: ✓ Metals are shiny, malleable, ductile, readily conduct heat and electricity, and are generally solids at room temperature. ✓ Nonmetals are dull, come in many colors, can be solid, liquid or gas, hard and brittle, tend to break, not malleable or ductile, and are poor conductors of heat and electricity. ✓ Metalloids separate metals from nonmetals. They can exhibit some properties of metals and nonmetals. They are solids, generally dull, and malleable.

**Step 2: Procedure**

Create a key for the metals, metalloids and nonmetals. Use the key to shade the sections of the periodic table on the next page. Metals Metalloids Nonmetals 2. Cut out the sections, then use the pattern of the atomic numbers to assemble the periodic table in the right arrangement on the Periodic Table Assembly page. Glue the sections down. Hints: Hydrogen (H) is in group 1, but helium (He) is in group 18!

**Step 3: Who am I?**

Read the following clues to try to identify the element from a complete periodic table.

1. I am a metal. I am in the Carbon family and row 5. I have 50 protons. I am widely used in food packaging. Who am I? \_\_\_\_\_\_\_\_\_\_\_

2. I am a nonmetal. I am in the Oxygen family and row 3. I have 6 valence electrons. I am yellow and have a stinky smell. Who am I? \_\_\_\_\_\_\_\_\_\_

3. I am a metalloid. I am in the Nitrogen family and row 4. I have an atomic mass of 74.92. I can be used as a poison. Who am I? \_\_\_\_\_\_\_\_

4. I am a gas. I am in the Noble Gas family and row 1. I have only 2 valence electrons. I glow red-orange when in an electric field. I can also be found in the Sun. Who am I? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

It’s your turn. Write a clue about an element. Exchange papers and have another student try to solve your puzzle

**Step 4: Conclusion**

Conclusion: How can you use the arrangement of the periodic table to predict properties and classify elements?

Claim:

Evidence:

Reasoning:

Reflections:

1. Why are groups important in the periodic table?

2. What is strange about the placement of hydrogen in the periodic table