Title: **The Path to the Periodic Table: Building the Periodic Table**

**Purpose:** You will learn how the elements are grouped in the periodic table and what kinds of information you can obtain by reading the periodic table.

**Pre-Sort Questions:**

1. What is an element? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. How many different kinds of atom is any element made of? \_\_\_\_\_\_\_

3. What is the atomic mass of an element? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. What is the atomic number of an element? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. How many atoms of each element are present in molecules of the following compounds?

a. HCl H: \_\_\_ Cl: \_\_\_\_

b. H2O H: \_\_\_ O: \_\_\_\_

Please read the procedure paragraph on the class copies to complete part 1.

**Post-sort Questions:**

1. How many groups of elements are in your table? \_\_\_\_\_\_\_

2. What criteria did you use to choose which group an element belongs to?

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3. Is there a trend in atomic mass going across your table? Is there a trend in atomic mass going from top to bottom?

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4. Are there any exceptions to these trends? If so, which elements break the trend? Why did you arrange these elements the way you did?

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5. Are there any holes or gaps in your arrangement? Where are they? What do you think these gaps might mean?

Notes:

Extension Questions

1. After you prepared your periodic tables, your teacher gave you additional sets of cards to fit into your tables. How did your table change each time you added new elements to your table?

2. How is your table similar to a modern periodic table? How is yours different?

3. How do we explain today the fact that tellurium comes before iodine in the periodic table, even though tellurium has a higher atomic mass than iodine?

4. Mendeleev predicted the existence of gallium and germanium because of the holes in his periodic table. Why do you think Mendeleev did not predict the existence of the noble gases?

5. Look at a modern periodic table. Suppose two new elements were discovered with the atomic numbers 120 and 121. Where in the periodic table do you think we would place these new elements?

6. Suppose a new element X is discovered. It forms a compound with chlorine, and the formula of this compound is XCl4. What group or family do you think this element would belong to?

7. Find the element barium (Ba) on a modern periodic table. What group or family is barium in? What do you think the formula of a compound of barium and chlorine would be?