

## Clustering Criteria Handout

Choose one or more of the following criteria to create your own clustering system for the elements. Keep in mind that there is no right or wrong answer, as long as you can justify your choices.

1. Atomic Mass:
  - Group elements based on their atomic mass. Consider similarities and differences in mass among the elements.
2. Reactivity:
  - Cluster elements based on their reactivity. Consider whether they are highly reactive, moderately reactive, or non-reactive.
3. State at Room Temperature:
  - Group elements based on their state at room temperature. Consider whether they are solids, liquids, or gases under normal conditions.
4. Electronegativity:
  - Cluster elements based on their electronegativity. Consider their ability to attract electrons in a chemical bond.
5. Valence Electrons:
  - Group elements based on the number of valence electrons they possess. Consider the similarities and differences in the outermost electron configuration.
6. Chemical Family:
  - Cluster elements based on their chemical family or group. Consider elements belonging to alkali metals, alkaline earth metals, halogens, noble gases, transition metals, etc.
7. Period:
  - Group elements based on the period or row they belong to in the periodic table. Consider the similarities and trends across elements in the same period.
8. Metallicity:
  - Cluster elements based on their metallicity. Consider whether they are metals, nonmetals, or metalloids.
9. Atomic Radius:
  - Group elements based on their atomic radius. Consider the size of the atoms and trends across the periodic table.
10. Ionization Energy:
  - Cluster elements based on their ionization energy. Consider the energy required to remove an electron from an atom.

### Instructions

1. Choose one or more criteria from the list provided.
2. Discuss within your group and decide how you will use the chosen criteria to cluster the elements.
3. Write the names of elements on individual index cards or sticky notes.
4. Place the index cards or sticky notes on a large poster board or classroom wall to form clusters based on your chosen criteria.
5. Be prepared to explain your reasoning behind element placement within clusters during the group discussion.

Remember, there is no single correct way to cluster the elements. Have fun exploring and justifying your choices!