

## Periodic Trends Webquest

### Part I.

1. Go to [www.chemicool.com](http://www.chemicool.com). Click on the following elements and fill in the chart provided.
2. Using the information from the first set of elements, predict what you think the second set might be. Don't cheat and look!!! Your predictions won't be graded!
3. Then answer the questions that follow.

Data Table for Periodic Trends Webquest

Element	Atomic Radius	Ionization Energy	Electronegativity
Lithium			
Beryllium			
Boron			
Sodium			
Magnesium			
Aluminum			
<b>Your Predictions</b>			
Carbon			
Silicon			
Nitrogen			
Phosphorus			

#### Atomic Radius Questions:

1. What appears to be the trend in atomic radius as you move from left to right in a row?
2. What appears to be the trend in atomic radius as you move down a column?
3. Predict the change in atomic radius of the next elements in a row (C, Si), then check those properties. Do they match your predictions?

4. Check the atomic radius of the next elements in the series (N, P). How do they fit the predicted pattern?

5. Is the pattern of atomic radius always true or generally true?

#### Ionization Energy Questions:

1. What appears to be the trend in ionization energy as you move from left to right in a row?
2. What appears to be the trend in ionization energy as you move down a column?
3. Predict the change in ionization energy of the next elements in a row (C, Si), then check those properties. Do they match your predictions?
4. Check the ionization energy of the next elements in the series (N, P). How do they fit the predicted pattern?
5. Is the pattern of ionization energy always true or generally true?

#### Electronegativity Questions:

1. What appears to be the trend in electronegativity as you move from left to right in a row?
2. What appears to be the trend in electronegativity as you move down a column?
3. Predict the change in electronegativity of the next elements in a row (C, Si), then check those properties. Do they match your predictions?
4. Check the electronegativity of the next elements in the series (N, P). How do they fit the predicted pattern?
5. Is the pattern of electronegativity always true or generally true?



## Virtual Lab: Determine the mystery elements by their properties.



**Background:** Elements are generally divided into 3 main groups- metals, nonmetals and metalloids. All elements has certain properties. For example, most **metals** are hard shiny solids. They are good conductors of electricity and heat. Metals are also malleable and ductile. Most **nonmetals** are gases at room temperature. Solid nonmetals are dull and neither malleable or ductile. Nonmetals are poor conductors on electricity and heat. Some elements have properties of both metals and nonmetals. These elements are called **metalloids or semi-metals**.

**Problems:** In this virtual lab you will test mystery elements to discover their properties. You will use what you know about the properties of these elements to determine what they are. 1) Compare and contrast the properties of the elements. 2) Identify elements based on their properties.

**Hypothesis:** Which test (property ) is most helpful for determining the mystery element? **Density, Flame Color, Melting Point, Boiling Point** Do you need to perform more than one test to determine the mystery element and why?

### Procedure:

1. Go to: [http://www.glencoe.com/sites/common\\_assets/science/virtual\\_labs/E21/E21.html](http://www.glencoe.com/sites/common_assets/science/virtual_labs/E21/E21.html)
2. Click the Video button. Watch the video to find out how substances are tested to determine their properties.
3. Select a mystery element test tube. Click and drag the test tube into a testing box.
4. Select and conduct each of the available tests on the mystery element and record your results in the table.
5. Compare the data you collected and determine the mystery elements.

### Data Table:

Mystery element Number	Density	Flame Color	Melting Point	Melting Point Temperature	Boiling Point	Boiling Point Temperature	Element Name
1							
2							
3							
4							
5							
6							
7							
8							

Do a search on the following. Elements on the internet and write down their properties.

Element	State at room temperature (solid, liquid, gas)	Metal, Nonmetal, or metalloid	Reactivity (high, low, not reactive)	Mass	Density	Color	Melting Point	Boiling Point
Hydrogen								
Mercury								
Carbon								
Silicon								
Neon								
Potassium								

### Questions:

1. Summarize the process you used to identify the mystery elements.
2. How do scientific tests help determine the properties of substances?
3. Why are some mystery elements easier to identify than others?

### Short Conclusion: