CALCULATIONS AND GRAPHS:

Graph 1

For elements 3-20 make a graph of atomic radius as a function of atomic number. Plot atomic number on the X axis and atomic radius on the Y axis.

After creating the graph, use a colored pen or pencil to draw a vertical line that represents that beginning of each period (horizontal row on the periodic table).

Graph 2

For elements in Group 1 (Alkali metals), make a graph of atomic radius as a function of atomic number. Make a second line on this same graph that will represent Group 2 (Alkaline Earth Metals). Use a periodic table to determine which elements are members of Group 1 and which elements are members of Group 2.

Graph 3

For elements 3-20, make a graph of the energy required to remove the easiest electron (first ionization energy) as a function of atomic number. Plot atomic number on the X axis and energy required on the Y axis.

After creating the graph, use a colored pen or pencil to draw a vertical line that represents that beginning of each period (horizontal row on the periodic table).

Graph 4

For elements of Group 1 (Alkali metals), make a graph of the energy required to remove the easiest electron (first ionization energy) as a function of atomic number. On the same graph make a second line to represent Group 2 (Alkaline Earth Metals). Use a periodic table to determine which elements are members of Group 1 and which elements are members of Group 2.

QUESTIONS FOR DISCUSSION:

1. What happens to the atomic radius as the atomic number increases across a period? Down a group?

2. What happens to the energy needed to remove an electron as the atomic number increases across a period? Down a group?

3. Why does atomic radius change as it does?

4. Why does the energy required to remove an electron change as it does?

GRAPHING PERIODIC TRENDS

PRE-LAB DISCUSSION:
The Periodic Table is arranged according to the Periodic Law. The Periodic Law states that when elements are arranged in order of increasing atomic number, their physical and chemical properties show a periodic pattern. Students can discover these patterns by examining the changes in properties of elements on the Periodic Table. The properties that will be examined in this lesson are: atomic radius AND first ionization energy

PURPOSE:
To understand trends of the periodic table and practice methods of graphing.

PROCEDURE:
Graph the following information according to the steps described.

Symbol	Atomic Number	Atomic Radius (Picometers)	First Ionization (Energy-Joules)
Li	3	1.23	124
Be	4	0.89	215
B	5	0.80	191
C	6	0.77	260
N	7	0.70	335
O	8	0.66	314
F	9	0.64	402
Ne	10	0.67	497
Na	11	1.57	119
Mg	12	1.36	176
Al	13	1.25	138
Si	14	1.17	188
P	15	1.10	242
S	16	1.04	239
Cl	17	0.99	299
Ar	18	0.98	363
K	19	2.03	100
Ca	20	1.74	141
Rb	37	2.16	96
Sr	38	1.91	131
Cs	55	2.35	90
Ba	56	1.98	120