

## A Graphical Comparison

In this activity, you will explore the trends of atomic radius vs. atomic number and ionization energy vs. atomic number. Using the table of values below, construct two graphs using Graphical Analysis showing the property vs. atomic number. Allow the program to connect the points in a dot-to-dot manner. Do NOT use the regression line or best fit curve keys on these graphs.

As an alternate graph, you could put the two graphs on one by using the GA program and ADDING A NEW DATA SET with the second set of data. If you do this, you will have to double-click on the graph after both sets of data have been entered. Then, click on AXES OPTIONS and click on the + sign next to the second data set. Open it up and click the second axis in that set. (The checked box should agree with Data Set 1.) Close this window.

Element Symbol	Atomic Number	Atomic Radius (Angstroms)	Ionization Energy (Volts)
H	1	0.79	13.6
He	2	0.49	24.587
Li	3	2.05	5.392
Be	4	1.4	9.322
B	5	1.17	8.298
C	6	0.91	11.26
N	7	0.75	14.534
O	8	0.65	13.618
F	9	0.57	17.422
Ne	10	0.51	21.564
Na	11	2.23	5.139
Mg	12	1.72	7.646
Al	13	1.82	5.986
Si	14	1.46	8.151
P	15	1.23	10.486
S	16	1.09	10.36
Cl	17	0.97	12.967

Ar	18	0.88	15.759
K	19	2.77	4.341
Ca	20	2.23	6.113
Ga	31	1.81	5.999
Ge	32	1.52	7.899
As	33	1.33	9.81
Se	34	1.22	9.752
Br	35	1.12	11.914
Kr	36	1.03	13.999
Rb	37	2.98	4.177
Sr	38	2.45	5.695
In	49	2.00	5.786
Sn	50	1.72	7.344
Sb	51	1.53	8.641
Te	52	1.42	9.009
I	53	1.32	10.451
Xe	54	1.24	12.13

Questions:

1. Looking carefully at the data, what elements have been left out? Why do you think they have been omitted?
2. Describe the general trends in atomic radius for a period and for a group.
3. Describe the general trends in ionization energy for a period and for a group.
4. Place the one graph on top of the other and describe the differences in trends for the two properties.
5. Why is there a dip in ionization energies between the elements Be and B, between Mg and Al, and between Ca and Ga? (Think electron distributions!)

Right click your graph(s) and copy and paste it into your word processing document. Answer the questions above on the same document. Submit the document to the dropbox titled LAB: A GRAPHICAL COMPARISON.