

Name: _____

Graphing Periodic Trends

The Periodic Table is arranged according to 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. These patterns can be discovered by examining the changes in properties of elements on the Periodic Table. The properties that will be examined in this lesson are: atomic size, ionic radius, electronegativity, and ionization energy.

Procedure: Using the data provided complete the following graphs

- Graph 1
 - For elements 1-36 make a graph of atomic radius as a function of atomic number. Plot atomic number on the X-axis and the atomic radius on the Y-axis. **Use a colored pen or pencil to draw a vertical line that represents the beginning of each period.**
- Graph 2
 - For elements 1-36, make a graph of the ionization energy. Plot atomic number on the X-axis and ionization energy on the Y-axis. **Use a colored pen or pencil to draw a vertical line that represents the beginning of each period.**
- Graph 3
 - For elements 1-36, make a graph of the ionic radius. Plot atomic number on the X-axis and the ionic size on the Y-axis. **Use a colored pen or pencil to draw a vertical line that represents the beginning of each period.**
- Graph 4
 - For elements 1-36, make a graph of the electronegativity. Plot atomic number on the X-axis and the electronegativity on the Y-axis. **Use a colored pen or pencil to draw a vertical line that represents the beginning of each period.**

Questions

Please answer all questions. Write complete sentences to receive full credit.

1. Based on your graphs, what is the trend in atomic radius across a period? Down a family?

2. Based on your graphs, what is the trend in ionization energy across a period? Down a family?

3. Based on your graphs, what is the trend in electron affinity across a period? Down a family?

4. Based on your graphs, what is the trend in electronegativity across a period? Down a family?

Data Table

Element Symbol	Atomic #	Atomic Radius (pm)	Ionization Energy (kJ/mol)	Electronegativity * (Pauling Scale)	Ionic Radius* (pm)
H	1	53	1311	2.20	
He	2	31	2371		
Li	3	167	520	0.98	60
Be	4	112	899	1.57	31
B	5	87	800	2.04	20
C	6	67	1086	2.55	15
N	7	56	1402	3.04	171
O	8	48	1313	3.44	140
F	9	42	1680	3.98	136
Ne	10	36	2080		
Na	11	190	496	0.93	95
Mg	12	145	737	1.31	65
Al	13	118	577	1.61	50
Si	14	111	786	1.90	41
P	15	98	1011	2.19	212
S	16	88	999	2.58	184
Cl	17	79	1251	3.16	181
Ar	18	71	1520		
K	19	243	419	0.82	133
Ca	20	194	590	1.00	99
Sc	21	184	633	1.36	106
Ti	22	176	659	1.54	96
V	23	171	651	1.63	88
Cr	24	166	653	1.66	81
Mn	25	161	717	1.55	75
Fe	26	156	762	1.83	74
Co	27	152	760	1.88	72
Ni	28	149	737	1.91	72
Cu	29	145	745	1.90	96
Zn	30	142	906	1.65	88
Ga	31	136	579	1.81	62
Ge	32	125	762	2.01	53
As	33	114	944	2.18	222
Se	34	103	941	2.55	198
Br	35	94	1139	2.96	195
Kr	36	88	1350	3.00	



