

## It's Elementary Trends Lab

Symbol	Atomic #	Atomic Mass	Melting Point (K)	Density (g/mL)	Electro-Negativity	First Ion. Energy (kJ/mol)	Atomic Radius (pm)
H	1	1.008	13.9	0.00007	2.1	1312	37
He	2	4.003	0.8	0.00018		2377	32
Li	3	6.941	453.5	0.54300	1	520	134
Be	4	9.012	1551	1.85000	1.5	899	90
B	5	10.81	2352	2.34000	2	801	82
C	6	12.01	3640	2.25000	2.5	1086	77
N	7	14.01	63.1	0.00125	3	1420	75
O	8	15.99	54.6	0.00143	3.5	1314	73
F	9	18.99	53.2	0.00170	4	1681	72
Ne	10	20.18	25	0.00090		2088	71
Na	11	22.99	370.8	0.97100	0.9	495	154
Mg	12	24.31	922	1.74000	1.2	735	130
Al	13	26.98	933	2.70000	1.5	580	118
Si	14	28.09	1683	2.33000	1.8	780	111
P	15	30.97	317.1	1.82000	2.1	1060	106
S	16	32.07	385.8	2.07000	2.5	1005	102
Cl	17	35.45	172	0.00321	3	1255	99
Ar	18	39.95	83.8	0.00178		1527	97
K	19	39.1	336.25	0.86000	0.8	419	196
Ca	20	40.08	1112	1.55000	1	590	174
Ga	31	69.72	302.8	5.90000	1.6	579	126
Ge	32	72.59	1220.4	5.32000	1.8	762	122
As	33	74.92	1090	5.73000	2	947	119
Se	34	78.96	490	4.79000	2.4	941	116
Br	35	79.9	265.8	3.12000	2.8	1140	114
Kr	36	83.8	116	0.00374		1356	110
Rb	37	85.47	311.9	1.53000	0.8	409	211
Sr	38	87.62	1042	2.54000	1	550	192
In	49	114.82	429.6	7.31000	1.7	558	144
Sn	50	118.69	505	7.31000	1.8	709	141
Sb	51	121.75	904	6.69000	1.9	834	138
Te	52	127.6	722.5	6.24000	2.1	869	135
I	53	126.9	386.5	4.93000	2.5	1008	133
Xe	54	131.3	161.2	0.00589		1176	131

## Periodic Table Trends Graphing Lab

**Purpose:** to make models of several important trends in the periodic table.

**Procedure:**

1. Obtain a data sheet (from your teacher), a calculator, poster paper and a periodic table.
2. Identify the largest value of your trend (column)— We will make a ratio to convert the values on your table into centimeters. The largest value will be represented by the length of your paper, minus 5 cm (to leave room for labels/titles on your graph).

3. Use the ratio below to solve for EACH of the other bar lengths

$$\frac{\text{Element Bar Length (cm)}}{30 \text{ cm (paper length)}} = \frac{\text{New Element Value (from chart)}}{?}$$

4. After calculating each bar length, create your bar graph IN PENCIL before adding color, titles and labels to your axis.
5. Attach a periodic table to the back of your poster and draw an arrow showing the direction of your trend.
6. Conduct research to explain the significance of this trend. Write a paragraph, in your own words, to explain what your trend means.
7. Listen to the presentations of all groups. Describe the trends and provide explanations for each trend in your analysis section.

**Data Table:**

Element Symbol	Property value	Calculation	Bar Length (cm)	Order (greatest - least)
H				
He				
Li				
Be				
B				
C				
N				
O				
F				
Ne				
Na				
Mg				
Al				
Si				
P				
S				
Cl				
Ar				
K				
Ca				
Ga				
Ge				
As				
Se				
Br				
Kr				
Rb				
Sr				
In				
Sn				
Sb				
Te				
I				
Xe				

## Analysis:

### Define **Atomic Mass**:

- This trend \_\_\_\_\_ across a period from L to R
- This trend \_\_\_\_\_ within a group from top to bottom
- The reason for this observed trend is: \_\_\_\_\_

### Definition of **Atomic Radius**:

- This trend \_\_\_\_\_ across a period from L to R
- This trend \_\_\_\_\_ within a group from top to bottom
- The reason for this observed trend is:

### Definition of **Ionization Energy**:

- This trend \_\_\_\_\_ across a period from L to R
- This trend \_\_\_\_\_ within a group from top to bottom
- The reason for this observed trend is:

### Definition of **Electronegativity**:

- This trend \_\_\_\_\_ across a period from L to R
- This trend \_\_\_\_\_ within a group from top to bottom
- The reason for this observed trend is:

### Definition of **Density**:

General description of density trend, if one exists. Relate this trend to your knowledge of states of matter. (Solids vs. liquids vs. gases).

### Definition of **Melting Point**:

General description of melting point trend, if one exists. Relate this trend to your knowledge of states of matter. (Solids vs. liquids vs. gases).