\_\_\_\_\_\_NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_PERIOD\_\_\_\_\_\_DATE\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**GRAPHING PERIODIC TRENDS**

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.

We will graph the following information according to the steps described below so that we can analyze the patterns.

**Graph 1 – Atomic Mass as a function of Atomic Number**

1. **Complete the table below** by filling in the atomic number and average atomic mass for each element listed.
2. Create a graph of the average atomic mass as a function of atomic number. Plot atomic number on the X axis and average atomic mass on the Y axis. Remember to label the axes!
3. Use a colored pen, pencil or highlighter to **trace over** the element’s period (horizontal row on the periodic table). For example: use GREEN to **trace** for all of the elements in row 1, then use YELLOW to **trace** for all of the elements in row 2, then use ORANGE to **trace** for all the elements in row 3, then use BLUE to **trace** for all the elements in row 4.



|  |  |  |
| --- | --- | --- |
| Symbol | Atomic Number | Atomic mass |
| H |  |  |
| He |  |  |
| Li |  |  |
| Be |  |  |
| B |  |  |
| C |  | Atomic  Mass |
| N |  |  |
| O |  |  |
| F |  |  |
| Ne |  |  |
| Na |  |  |
| Mg |  |  |
| Al |  |  |
| Si |  |  |
| P |  |  |
| S |  |  |
| Cl |  |  |
| Ar |  |  |
| K |  |  |
| Ca |  | Atomic Number |

1. Describe the trend in average atomic mass as the atomic number increases across a period.

The atomic mass \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (increases or decreases) as the atomic number increases across a period.

1. Describe the trend in average atomic mass as the atomic number increases down a group.

**Graph 2 – Atomic Radius as a function of Atomic Number**

1. Create a graph of the atomic radius as a function of atomic number. Plot atomic number on the X axis and atomic radius on the Y axis. Remember to label the axes!
2. Use a colored pen, pencil or highlighter to **trace over** the element’s period (horizontal row on the periodic table). For example: use GREEN to **trace** for all of the elements in row 1, then use YELLOW to **trace** for all of the elements in row 2, then use ORANGE to **trace** for all the elements in row 3, then use BLUE to **trace** for all the elements in row 4.



|  |  |  |
| --- | --- | --- |
| Symbol | Atomic Number | Atomic Radius |
| H | 1 | 0.37 |
| He | 2 | 0.50 |
| Li | 3 | 1.23 |
| Be | 4 | 0.89 |
| B | 5 | 0.80 |
| C | 6 | 0.77  Atomic radius |
| N | 7 | 0.70 |
| O | 8 | 0.66 |
| F | 9 | 0.64 |
| Ne | 10 | 0.67 |
| Na | 11 | 1.57 |
| Mg | 12 | 1.36 |
| Al | 13 | 1.25 |
| Si | 14 | 1.17 |
| P | 15 | 1.10 |
| S | 16 | 1.04 |
| Cl | 17 | 0.99 |
| Ar | 18 | 0.98 |
| K | 19 | 2.03  Atomic number |
| Ca | 20 | 1.74 |

1. What is atomic radius?

2. Describe the trend in atomic radius as the atomic number increases across a period.

3. Describe the trend in atomic radius as the atomic number increases down a group.