

PART C: PERIODIC TABLE TRENDS

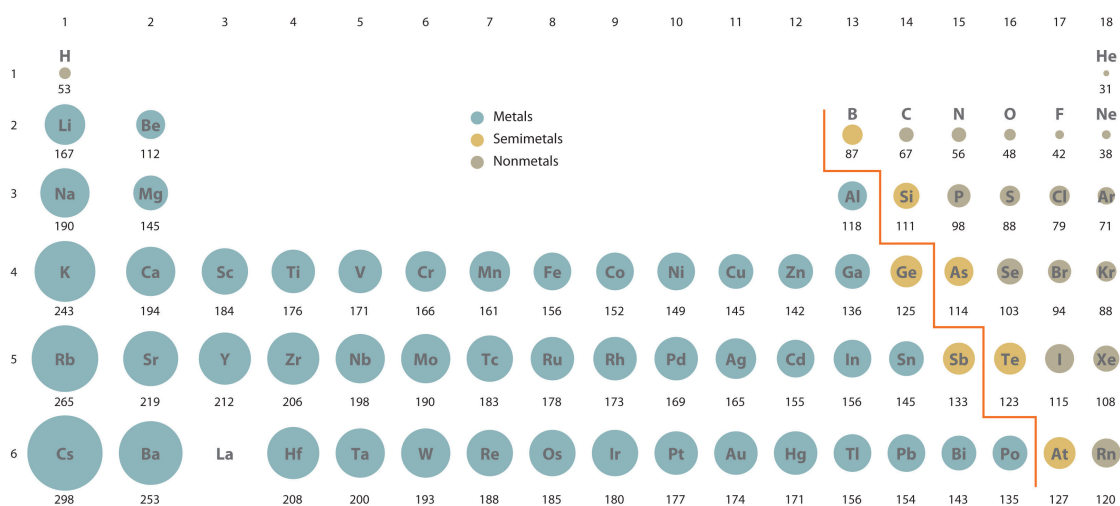
In chemistry the term _____ refers to a regular pattern in the properties of elements based on their atomic structure.

This is the pattern that Mendeleev predicted. When the pattern repeated, he began a new _____.

The periodic table is a powerful tool for analyzing trends in _____ and _____.

ATOMIC SIZE TRENDS:

Observe the sizes of the atoms in each group and period shown in the diagram below. Do you see a pattern?



1. Atomic size _____ moving DOWN a group/column.

- as you move **down** a _____, elements have atoms with _____ energy _____.
- the _____ the number of electron shells, the _____ away from the nucleus the **valence electrons** are _____.
- if the electrons are farther away, the atom is _____.

2. Atomic size _____ moving LEFT to RIGHT across a period/row.

- elements have _____ numbers of electrons in their _____ shells as you move LEFT to RIGHT.
- as the number of electrons increases, so does the number of _____ in the nucleus.
- the attraction between the n _____ valence electrons and the p _____ nucleus is **very strong**.
- with each electron added, the outer shell is pulled _____ to the nucleus and the atomic size _____.

REACTIVITY TRENDS:

Compare what happens when **potassium (A)** and **sodium (B)** are added to water:



You can see that the reaction is _____ vigorous and violent in 'A', water + potassium.

Why is this the case?

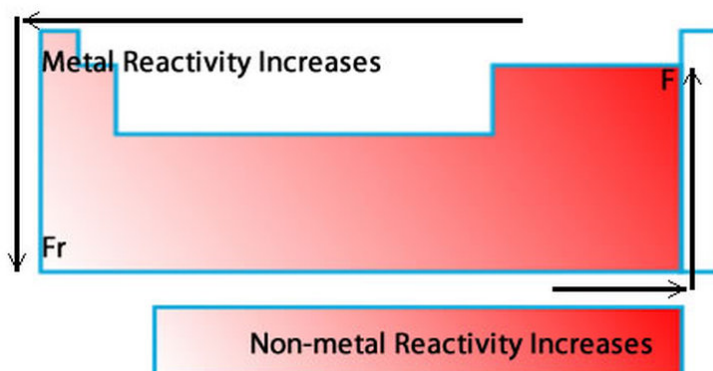
What is **similar** about potassium and sodium? _____

What is **different** about potassium and sodium? _____

- Because _____ valence electrons are farther away from the nucleus than the electrons in a _____ atom, the attraction to the nucleus is _____.
- Electrons further from the nucleus require _____ energy (*are easier*) to remove.
- The adding and removing of electrons is what is involved in c_____ r_____.
- This is why we would say that _____ is **more reactive** than _____.

This pattern repeats throughout the periodic table with the **exception of the noble gases**.

- the noble gases have a FULL valence shell, they are stable and _____



1. Explain why atoms get larger down a group on the periodic table:
2. Explain why atoms get smaller from LEFT to RIGHT across a periodic table:
3. Why is an alkali metal MORE reactive than an alkaline-earth metal in the same period?