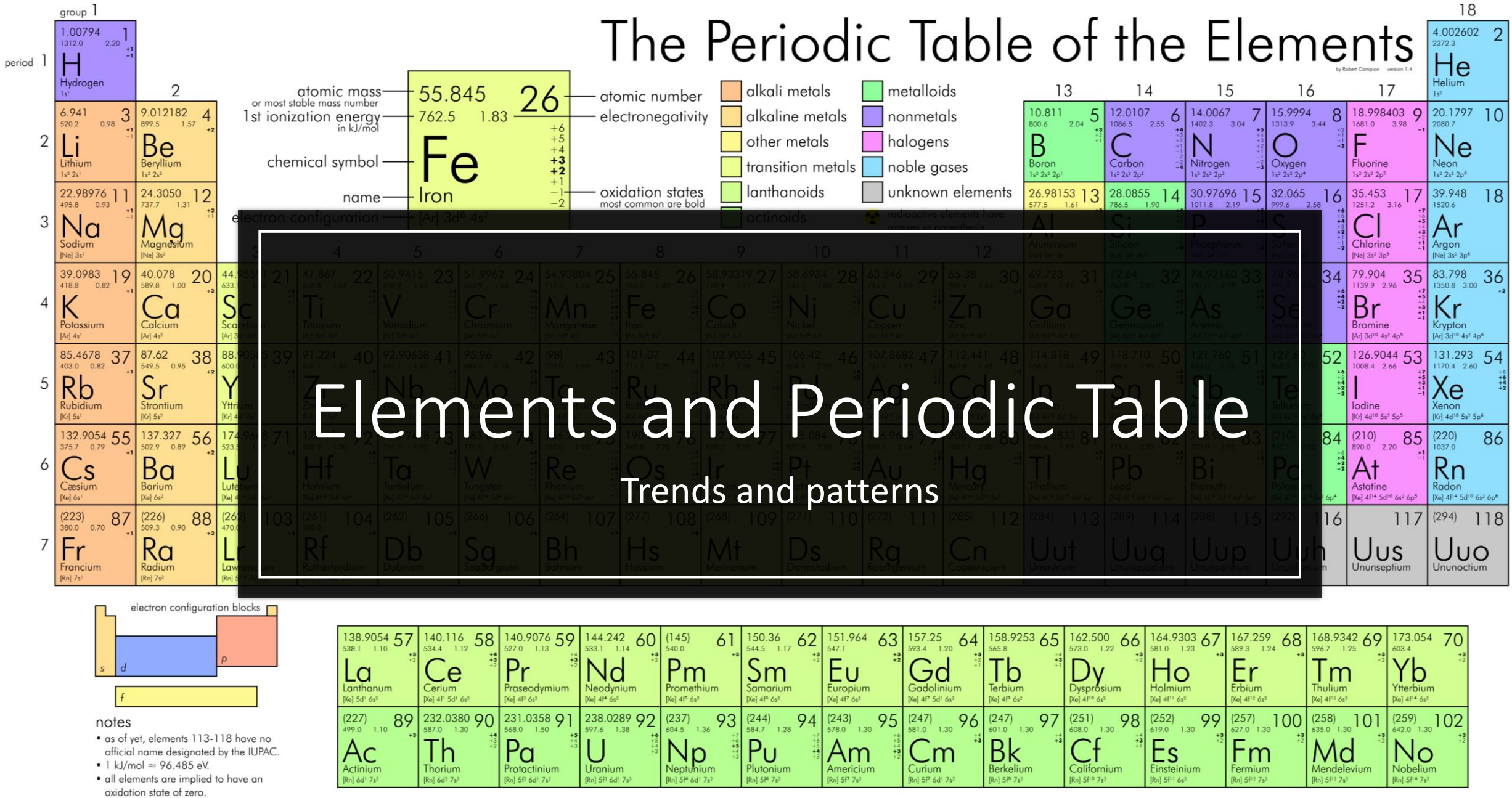

The Periodic Table of the Elements
Elements and Periodic Table
Trends and patterns

Review

Elements have:

Protons- Positive charge

Electrons- Negative charge

Neutrons- No charge

Protons and neutrons give the element its mass

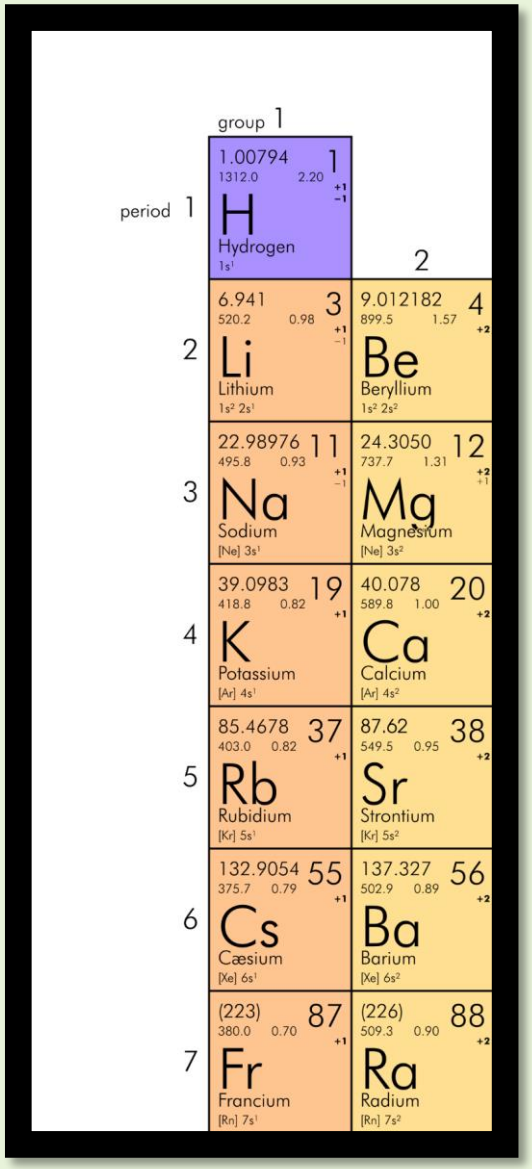
Protons, Neutrons, Electrons

Oxygen- atomic number 8, mass 16

Hydrogen- atomic number 1, mass 1

Chlorine- atomic number 17, mass 35

Xenon- atomic number 54, mass 131



Patterns of Periodic Table

- Broken into groups and periods
  - Groups
    - Vertical
    - 18 columns, 8 groups
    - Based on valence electrons
  - Periods
    - horizontal
    - 7 total
    - Each period has 1 more outer shell of electrons

How are elements formed?

- The atom is formed with protons and neutrons
  - This gives the element its atomic number
  - Based on weight
- The electrons are in outer shells moving around the atom
  - The first shell can have 2
  - The rest can have up to 8 depending on number of electrons
- Number of protons and electrons is equal

Group 1: Alkali Metals

They each have 1 electron in their outer shell.

This allows them to form bonds easily but also makes them highly reactive especially with the halogen group.

They have a soft, metal appearance and low melting points.

Group 2: Alkaline Earth Metals

They have 2 electrons in their outer shell.

They also form bonds easily and generally exist as compounds.

Their most common bonds are formed with the Oxygen group of elements.

Group 7: Halogens

They have 7 electrons in their outer shell.

They like to form bonds with elements from the Alkali group.

These elements can either be metal or non-metal.

They exist in diatomic forms, Br_2 and O_2.

Group 8: Noble Gasses

They have a full outer shell of electrons, so they are stable on their own.

Helium is also considered part of this group because even though it only has 2 electrons its shell is full.

Neon is a very popular element in this group it can be found in signs, under normal conditions they all exist as gases.

Their melting points are lower than other groups, but because their shell is full their ionization energy is higher.

Transition Metals

They are found in the middle of periodic table.

They are all metal and have different values of electrons in their outer shell.

Orbitals

Boron- atomic number 5

Calcium- atomic number 20

Phosphorus- atomic number 15

Argon- atomic number 18

Helium- atomic number 2

Examples

Reorder the monsters from earlier now that we have learned the patterns of the periodic table.