

Elemental Fundamentals

The foundation of Chemistry, our daily lives and the world as we know it.

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Honors Chemistry

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Unit 1

Station 8 | Student Choice

DATE

September 19, 2021

WHAT IS THE PERIODIC TABLE OF ELEMENTS AND WHAT DOES IT DISPLAY?

The periodic table is a tabular display of the chemical elements that make up our world.

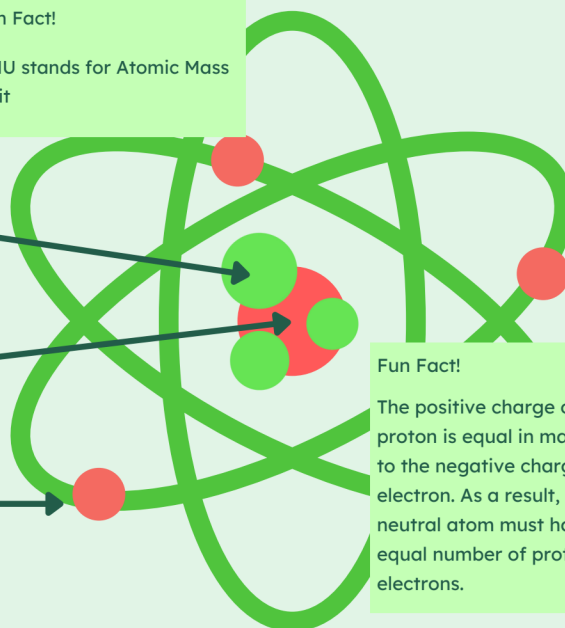
lithium ← Element Name
 3 ← Atomic Number
 Li ← Element Symbol
 6.941 ← Average Atomic Mass (the mass it has in the universe)

COMPONENTS OF AN ATOM AND THEIR CHARACTERISTICS

Elementary Particle	Relative charge	Mass	Location
Proton p^{+}	Positive Charge +1	1.007276 amu ~1	In the positively charged nucleus
Neutron n^0	Neutral No charge 0	1.008664 amu ~1 <small>Slightly bigger than a proton</small>	In the positively charged nucleus
Electron e^{-}	Negative Charge -1	0.00055 amu ~0	Orbits in the shell(s) surrounding the nucleus

Fun Fact!

AMU stands for Atomic Mass Unit



Fun Fact!

The positive charge on a proton is equal in magnitude to the negative charge on an electron. As a result, a neutral atom must have an equal number of protons and electrons.

PARTICULARLY, PROTONS

Protons are very special! We use this elementary particle to identify the elements on the table.

of protons:

- Determine the type of element
- Is the atomic number

PROTONS IN ACTION

lithium
 3
 Li
 6.941

The atomic number is 3, therefore there are 3 protons. This also means all elements with 3 protons are Lithium!

the periodic table is organized by Atomic number!
 (Not atomic mass)

PARTS OF THE PERIODIC TABLE

PERIODIC TABLE OF ELEMENTS

Legend:

- Alkali Metals (Orange)
- Alkaline Earth Metals (Green)
- Lanthanoids (Yellow)
- Actinoids (Red)
- Transition Metals (Blue)
- Post-transition Metals (Light Blue)
- Metalloids (Light Green)
- Other Nonmetals (Light Yellow)
- Halogens (Light Orange)
- Noble Gases (Light Purple)

Groups: vertical columns

Periods: horizontal rows

Mass of isotope with longest half-life in parenthesis if elements has no stable isotopes

La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

This line can guide you through the table!

To the left of the line are metals with the accepting of hydrogen, the right are non-metals and everything touching the line (except alkaline) are metalloids

Categories!

Metals: Shiny, malleable, great conductors

non-metals: not shiny, brittle, poor conductors

metalloids: in between!

WHY DO WE CARE?

The periodic table of elements is used in all fields of science. Earth science? Need to know a metal? Check the table! Physics? what is that element!? Check the table! Of course there's chemistry. Use that table!

Everything you touch originates from that table, it even plays a big role in understanding nutrition, pollution and natural phenomena. The world itself started with distorted versions of our elementary particles!

Knowing how the world works starts with understanding it on a molecular level.

QUESTIONS TO CONSIDER

What is the periodic table of elements and what information does it contain?

What are the components of an atom and how can you remember their characteristics?

What is the significance of protons?

Why is it so important to know the parts of the periodic table? What tools can you use to remember them?

