



## Lesson 2: The Periodic Table and Atomic Structure

The Elements

Data Booklet.pdf

Element – cannot be broken down to other substances

- 94 naturally occurring and 24 synthetic

Metal – good conductor of heat and electricity

*left of staircase*

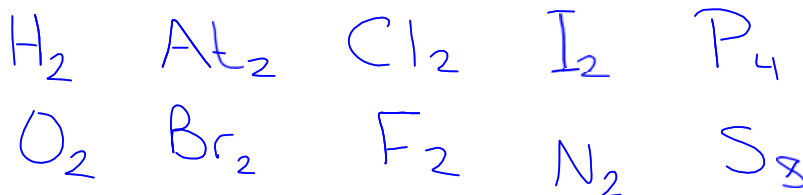
- Malleable (sheets) or ductile (pulled into wire)
- Most silver or grey and shiny
- Most solids, expect mercury
- Some highly reactive with air and water
- Some are inert (unreactive), except with highly corrosive acids

Examples; *Copper, Aluminium, Magnesium, Gold, etc.*

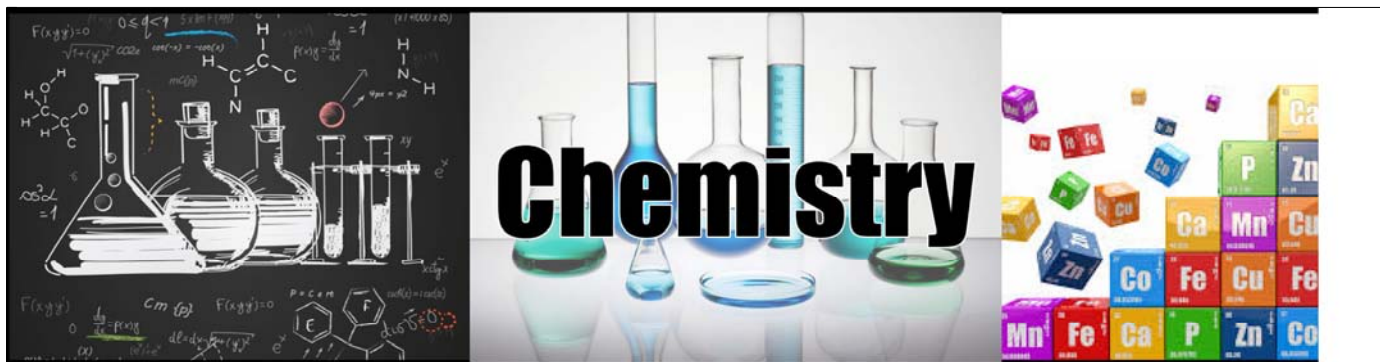
Non-Metal - only 17

*right of staircase*

- Do not resemble metals but do resemble one another
- Variation in the colour, reactivity, state
- 11 are gases, 5 solids, and 1 liquid
- About half exist as interconnected atoms called molecules. Some are called diatomic
- Oxygen,  $O_2$ , Neon is not



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Metalloids – intermediate between metals and non-metals

- Silicon, boron, arsenic, germanium, antimony, tellurium, polonium, astatine

The Periodic Table

- Metals on the left and non-metal on the right
- In between is the metalloids
- Hydrogen is a non-metal, but is with the metals because it acts like a metal in reactions

Atomic Number

- Number of protons in an element
- Increases on the periodic table

$$\# \text{ protons} = \# \text{ electrons}$$

$$\# \text{ neutrons} = \text{atomic mass} - \text{atomic}\#$$

Mass Number

- Atoms that have different numbers of neutrons than protons are called isotopes
- Atomic molar mass is the average mass of the elements isotopes (atoms of the same element that have different numbers of neutrons)

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Period- horizontal line (row)

- Numbered from 1 to 7

Group – vertical line (column)

- Numbered from 1 to 18 (sometimes with roman numerals)

Group 1: Alkali Metals

- Soft shiny and silver
- Very reactive with water

Group 2: Alkaline Earth metals

- Shiny and silver, not as soft as group 1

Group 18: Noble Gases

- Very unreactive

Group 17: Halogens

- Poisonous and react with alkali metals to form salts