

# Periodic Table Structure Info Sheet

Periods (rows) →

Mendeleev – Organized PT based on atomic masses & properties (almost right...)

Groups (columns) ↑

Moseley – Organized PT based on atomic numbers (the way we do it now!)

Three classes of elements: Metals, non-metals, metalloids/semi-metals

Periodic table showing element symbols, atomic numbers, and names. The table is color-coded to show three classes of elements: Metals (blue), Non-metals (orange), and Metalloids/Semi-metals (green).

Use this link to color code each class of element on the periodic table to the left.  
<https://tinyurl.com/46a3armf>



Make a key here:

- metals
- non-metals
- metalloids/semi-metals

Some videos about the structure & creation of the periodic table

- <https://tinyurl.com/n4o9dns>
- <https://tinyurl.com/y7jtlkbw>
- <https://tinyurl.com/abq96op>
- <https://tinyurl.com/q2z47cl>

## Metal Properties:

Chemical Prop.	Physical Prop.
Few electrons in VALENCE shell (outer shell)	Ductile Malleable
Lose electrons easily	Good conductors
POSITIVE charge like Ca <sup>2+</sup>	Shiny
Make Cations	Solid at room temp

## Non-metal Properties:

Chemical Prop.	Physical Prop.
Almost full, or totally full valence shell	NOT Ductile NOT malleable
Tend to gain electrons	BAD conductors
NEGATIVE charge like N <sup>3-</sup>	Mostly solid
Make ANIONS	Some are gas at room temp

## Semi-metal Properties:

Chemical Prop.	Physical Prop.
Most have half full valence shell	Have properties of metals AND non-metals
Make anions OR cations depending on their environment	No way to know which properties of each

## Things in the same period have:

Increasing atomic # and mass L→R  
 Same number of energy levels  
 Period 1 has 1 level  
 Period 2 has 2 levels etc...

## Things in the same group have:

Increasing atomic # and mass ↓  
 Same number of valence electrons  
 Exceptions: d and f block  
 Similar physical and chemical properties  
 b/c they have same # of valence e<sup>s</sup>

## Valence Electrons:

Outer electrons  
 Matches the "A" column number  
 1A has 1 v.e<sup>-</sup>, 2A has 2v.e<sup>-</sup>, etc.  
 d and f blocks don't follow rules

## Shielding and Z<sub>eff</sub>:

Outer electrons have trouble "seeing" the protons in the nucleus – the nucleus is "shielded" by the electrons. You can calculate how much "shielding" there is by calculating the "Effective Nuclear Charge"

$$Z_{\text{eff}} = Z - S$$

*Z<sub>eff</sub>* = effective nuclear charge

*Z* = atomic #

*S* = all non-valence electrons

TURN OVER AND COLOR CODE THE BACK TOO! USE THE SAME LINK AS THE TOP.

# Periodic Table Structure Info Sheet

## The Periodic Table of the Elements

- Alkali metals
- Alkaline earth metals
- Transition metals
- Rare earth metals
- Metalloids (semi-metals)
- Other metals
- Non-metals
- Halogens
- Noble Gases

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*lanthanides	57 La 138.91	58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm (145)	62 Sm 150.36	63 Eu 151.97	64 Gd 157.25	65 Tb 158.93	66 Dy 162.50	67 Ho 164.93	68 Er 167.26	69 Tm 168.93	70 Yb 173.04
**actinides	89 Ac (227)	90 Th 232.04	91 Pa 231.04	92 U 238.03	93 Np (237)	94 Pu (244)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (251)	99 Es (252)	100 Fm (257)	101 Md (258)	102 No (259)