

Unit 1 - Measurement & Math

- 1 ● Accuracy & precision (given lab data)
- 1 ● Density calculations
- 1 ● Number of SFs in a measurement
- 1 ● Percent Error
- 1 ● Answers rounded to correct # of SFs

accuracy- how close to correct/actual answer
precision- how close measurements are to each other

$$D = \frac{m}{V}$$

leading = never
sandwiched = always
trailing = only if decimal
pt. is written

$$\% \text{ Error} = \frac{|\text{actual} - \text{experimental}|}{\text{actual}} \times 100$$

Unit 2 - Matter & Change

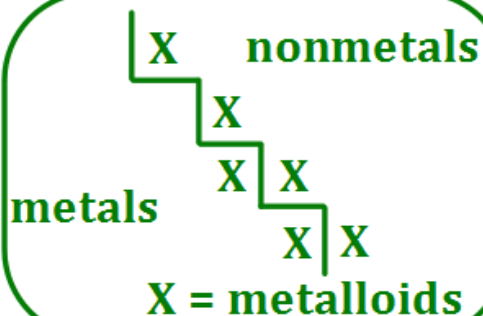
- 4 ● Chemical vs. physical properties, changes
- 2 ● Compounds vs. elements
- 1 ● Location & properties of metals, nonmetals, metalloids
- 2 ● Mixtures vs. pure substances
- 4 ● Periods & groups (definitions, names, locations)

PERIOD

chemical = new substance made

G
R
O
U
P

alkali metals = group 1
alkaline earth metals = group 2
halogens = group 17
noble gases = group 18




Unit 3 - Atoms

- 2 ● Determining # of p^+ , n^0 , e^-
- 3 ● Grams \leftrightarrow moles \leftrightarrow molecules conversions
- 2 ● Isotope (definition, calculate avg. atomic mass)
- 2 ● Mass # & atomic #
- 1 ● Results of gold foil experiment
- 1 ● Thomson's discovery
- 1 ● Points of Dalton's theory

atomic # = # of p^+
mass # = $p^+ + n^0$

positive nucleus,
most is empty space

1 mole = 
 6.022×10^{23} mcs =
 [# from PT] grams

conservation of matter,
CO vs. CO_2 =
 "multiple proportions"

electron

Unit 4 - Electrons

- 1 ● Aufbau principle
- 1 ● Shapes of orbitals
- 2 ● Electron configurations
- 3 ● Dot diagrams, valence e^- , HOEL
- 2 ● EM spectrum (wavelength, frequency, energy)
- 1 ● Energy calculations in the hydrogen atom
- 2 ● Ground state vs. excited state (definitions, energy)
- 1 ● Lowest to highest orbitals, sublevels, energy levels

electrons are lazy - lowest energy possible

radio \leftrightarrow gamma
 long λ short λ
 low ν high ν
 low E high E

top diagram on
 p. 8 of Reference
 Tables

s = sphere; p = dumbbell

$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^3$

lowest
 energy

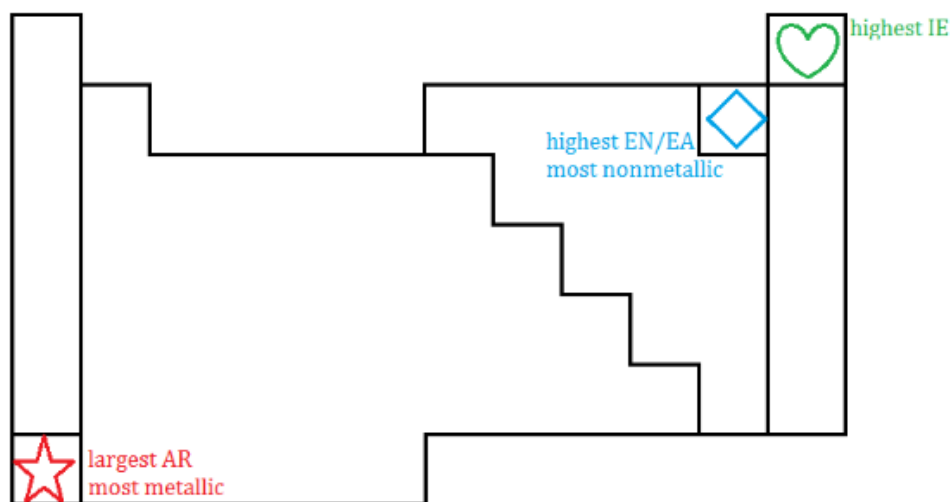
HOEL = 4
 valence e^- = 5

highest
 energy

Unit 5 - Periodic Table

- 1 ● History of Periodic Table (Mendeleev)
 - 5 ● Main group elements (chart near beginning of Unit 5)
 - 3 ● Periodic law
 - 5 ● Periodic trends (atomic radius, ionization energy, electronegativity, metallic & nonmetallic character)
-

Elements in the same group have similar properties - because they have the same # & arrangement of valence electrons.



Unit 6 - Bonding

4 ● Ionic vs. covalent bonding

2 ● Shapes of molecules

1 ● Why atoms bond together

1 ● Molecular polarity

2 ● Properties of ionic vs. molecular substances (see chart in Unit 6)

1 ● IM Forces

to achieve a configuration like a noble gas - this makes it more stable

<u>Ionic</u>	<u>vs.</u>	<u>Covalent Bonding</u>
*exchange or transfer electrons		*share electrons
*metal & nonmetal		*polar - 2 diff. nonmetals (unequal) nonpolar - 2 of same nonmetal

AB₂ = linear
AB₂E, AB₂E₂ = bent
AB₃ = trigonal planar
AB₃E = trigonal pyramid
AB₄ = tetrahedral

nonpolar molecule if
-no lone prs. on central
AND
-same surrounding element

Unit 7 - Chemical Formulas

3 ● Empirical & molecular formulas (difference, calculate)

4 ● Nomenclature

1 ● Oxidation #s

2 ● Percent composition

empirical = simplest
C₆H₁₂O₆ --> CH₂O
molecular empirical

If given % of each element,
work backwards from answers.

Try to work backwards from the answers if you are given a formula and asked for the name.

$$\frac{\text{mass of element}}{\text{mass of entire cmpd}} \times 100$$