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## Notes: By Nota

### Nota

Nota, is a simple script to manage notes. It manages all my class notes which are markdown files and compiles them to PDF versions. This is so people can see my notes and I can share them easier. Not only that but the PDF version makes for easier reading, while the markdown versions are easy to edit and easy to search for items. Hope you enjoy!

## Topic: Significant Figures

### Rules

1. 1m = 10cm : Definitions (Infinitely Significant)
2. 3.94 : Nonzero Numbers (Significant)
3. 0.00034 : Leading Zeros (Never Significant)
4. 3.0094 : Captive Zeros (Significant)
5. Trailing Zeros:
  - 2.00 : Has Decimal (Significant)
  - 300 : No Decimal (Not Significant)

### Addition / Subtraction

$$2.004 + 6.9 = 8.9$$

$$6.900 - 2.004 = 4.9$$

The answer must have the same number of digits to the right of the decimal as the number with the fewest digits to the right of the decimal point.

## Multiplication / Division

$$6.9 * 2.004 \approx 14$$

$$2.004/6.9 \approx 0.29$$

The answer must have no more sig. figs. than are in the measurement with the fewest number

## Rounding (3 Sig. Figs.)

1.  $6.789 \rightarrow 6.79$ 
  - If the last sig. fig. is followed by a  $>5$ , round up
2.  $6.321 \rightarrow 6.2$ 
  - If the last sig. fig. is followed by a  $<5$ , round down
3.  $6.55\bar{X} \rightarrow 6.56$ 
  - If last sig. fig. is followed by a 5 with additional values, round up
4.  $16.55 \rightarrow 16.6$ 
  - If last sig. fig. is odd and followed by only a 5, round up
5.  $16.45 \rightarrow 16.4$ 
  - If last sig. fig. is even and followed by only a 5, round down

## Topic: Elements

### Week 1

- Li: Lithium
- Be: Beryllium
- H: Hydrogen
- O: Oxygen
- N: Nitrogen
- F: Fluorine
- Na: Sodium
- Ne: Neon
- He: Helium
- B: Boron

### Week 2

- Mg: Magnesium
- Al: Aluminum
- Si: Silicon
- P: Phosphorus
- S: Sulfur
- Cl: Chlorine
- Ar: Argon
- K: Potassium
- Ca: Calcium
- Ba: Barium

- Pu: Plutonium

### Week 3

- Ti: Titanium
- Cr: Chromium
- Mn: Manganese
- Fe: Iron
- Ra: Radium
- Rn: Radon
- Co: Cobalt
- Ni: Nickel
- Cu: Copper
- Zn: Zinc
- Br: Bromine

### Week 4

- Kr: Krypton
- Ag: Silver
- Cd: Cadmium
- Pt: Platinum
- Au: Gold
- Hg: Mercury
- Sn: Tin
- Pb: Lead
- I: Iodine
- Xe: Xenon
- U: Uranium

## Topic: Laws

### Law: Law of Conservation of Mass

- Description: Mass is neither destroyed or created during chemical reactions or physical changes

### Law of Definite Proportions

- Description: A chemical compound contains the same elements in exactly the ratio by mass regardless of the size, sample, or source of the compound.

### Law of Multiple Proportions

- Description: If two or more different compounds are composed of the same two elements, then the ratio of the second element combined with a certain mass of the first element is always the ratio of small whole #s
- Ex.
  - Carbon & Oxygen:  $CO$  or  $CO_2$

## Protons

- The number of protons in an atom's nucleus determines the atom's identity
- (Atomic Number, Z):
  - Atomic Number: # of protons & indirectly electrons
  - Z: Atomic mass
- Nuclear Force: Short-range proton-proton, neutron-neutron, and proton-neutron forces that hold the nuclear particle together. Can be referred as "Strong force".

## Isotopes

- Description: Atom of the same element that differ in mass.
- They have the same number of protons but different number of neutrons
- Atomic Number: Number of protons
- Number of protons determines identity
- Number of neutrons determines mass  $\rightarrow$  mass = protons + neutrons
- Revision to Dalton's Theory:
  - Although isotopes differ in mass they do not significantly differ in their chemical properties

## Mass

- Description: Mass is the total amount of protons and neutrons in the nucleus of the isotope
- Ex.
  - 2 protons + 2 neutrons = 4  $\rightarrow$  Mass Number of Helium - 4

## Misc.

- Nuclide: Particular kind of atom containing a definite number of protons and neutrons
- Mass #, A: Total # of nucleons (particles that make up the nucleus  $\rightarrow$  protons and neutrons)