

WHAT IS CHEMISTRY?

- <https://www.youtube.com/watch?v=NcnWqz8kafo>
- Chemistry is the study of matter and the changes it can undergo. (American Chemical Society)

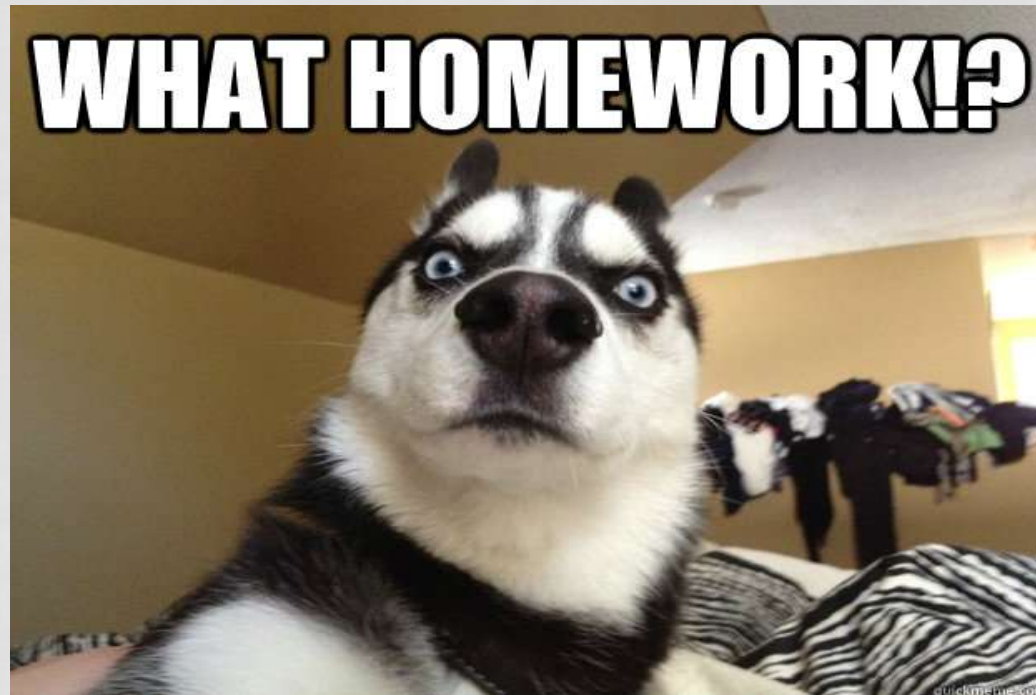
HONORS CHEMISTRY

READY... SET... GO!



SUMMER HOMEWORK

- Questions?
- Pass Forward... It will be returned to you tomorrow.



SYLLABUS: HIGHLIGHTS

- Place this in your Binder. There is also a copy posted on the back “no name” board.

SCHOOL WIDE SHARED EXPECTATIONS

- Respectful
- Responsible
- Present
- Kind

SCHOOL WIDE NON-NEGOTIABLES

- **Cell Phones:** We provide all the tech you need, put yours away.
- **In Class and On Time.**
- **Respect:** Represent yourself in a positive way by using appropriate language, listening to others and treating others as you would like to be treated.
- **Community:** We are all part of the THS community. Do your part to help everyone feel safe and a valued part of our school.
- **Ready to Learn:** Participate in your learning and make your best effort. Be willing to ask for help and accept help that is offered to you.

EXPECTATIONS

- Be Here!



- Assignments are completed on time
- Be prepared for assessments the first time



EXPECTATIONS CONTINUED ...

- Come to class prepared and ready to learn
- Participate in discussions



EXPECTATIONS CONTINUED ...

- Absolutely NO Cell Phones



SUGGESTED MATERIALS

- Small 3 ring Binder or Folder
- Composition Notebook for notes (Not Assignments)
- Loose leaf paper (you will have to turn in paper (not notebook))
- Scientific Calculator (**absolutely mandatory!!**)
- Pens/Pencils (Obviously)
- Motivation

UW CHEM 110

- Registration materials coming soon
- ALEKS program will start in November or December. Cost is approximately \$35 (Mandatory for UW Credit)

AGENDA/CALENDAR

- Place this in the front of your binder!
- Subject to Change!!

PERIODIC TABLE, ELEMENTS LIST & IONS

- Place these at the front of your binder. We will be testing on both elements and ions soon.

** More info to come!

INTENSIVE/EXTENSIVE PROPERTIES

- Intensive: depends on the **type** of matter in a sample. (ex: density, color, hardness)
- Extensive: depends on the **amount** of matter in a sample. (ex: mass, weight, volume)

SOLIDS/LIQUIDS/GASES

- Solids: orderly, fidgety molecules, definite volume, definite shape
- Liquids: slow moving molecules, definite volume, indefinite shape
- Gases: spaced out, fast moving molecules, indefinite volume, indefinite shape



→ Cat = Liquid?

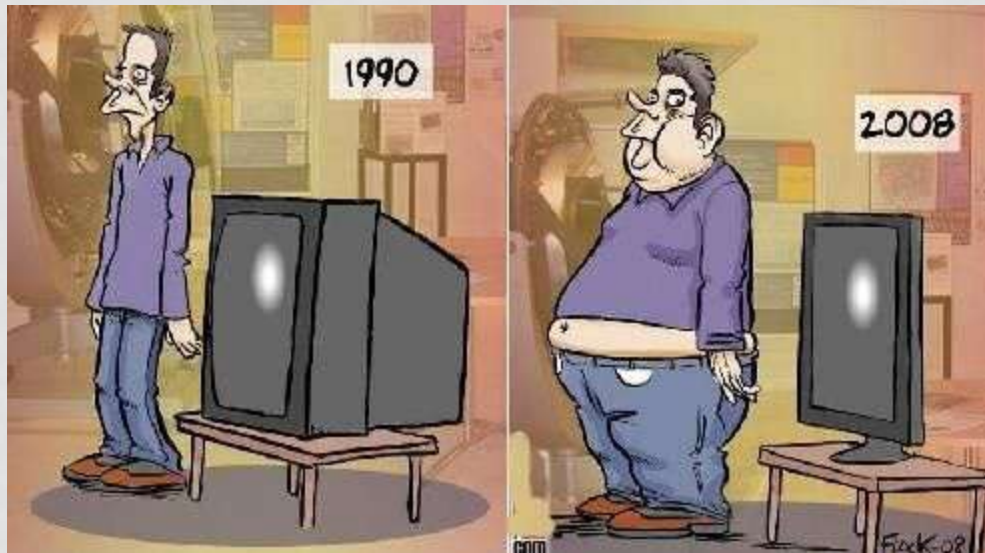
RECOGNIZING CHEMICAL CHANGES

3 Clues that a chemical reaction has taken place:

- Production of a gas
- Formation of a precipitate
- **Change** in color

CONSERVATION OF MASS

- Mass can not be created or destroyed.
- Demonstrated in a balanced chemical reaction:



SUBATOMIC PARTICLES: PROTONS

- Positively Charged
- Determine the identity of an element
- Located in the nucleus of an atom
- A Baryon - Composed of 2 up quarks and 1 down quark

SUBATOMIC PARTICLES: NEUTRONS

- No Charge – Neutral
- Relatively same size as Proton
- Located in the nucleus of an atom
- A Baryon - Composed of 1 up quark and 2 down quarks

SUBATOMIC PARTICLES: ELECTRONS

- Negatively Charged
- Determine the properties of an element
- Located in the Orbitals of an atom
- About $1/1836$ size of a proton and neutron

SUBATOMIC PARTICLES: QUARKS

- Up Quarks = $+2/3$
- Down Quarks = $-1/3$

ATOMIC NUMBER

- Number of Protons in an atom
- Number of electrons in a neutral atom

ATOMIC MASS

- The mass of the nucleus of an atom
- Protons + Neutrons = Atomic Mass

AVERAGE ATOMIC MASS

- Atomic mass of an element is a weighted average mass of the atoms in a naturally occurring sample of the element.

SUMMER HOMEWORK

- Look over assignment, chance to ask questions as needed.

METALS/NONMETALS/METALLOIDS

Metals, Nonmetals, and Metalloids

H																	He																												
Li	Be											B	C	N	O	F	Ne																												
Na	Mg											Al	Si	P	S	Cl	Ar																												
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr																												
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe																												
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn																												
Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Uub	—	Uuq	—	—	—	—																												
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: red;">Ce</td><td style="background-color: red;">Pr</td><td style="background-color: red;">Nd</td><td style="background-color: red;">Pm</td><td style="background-color: red;">Sm</td><td style="background-color: red;">Eu</td><td style="background-color: red;">Gd</td><td style="background-color: red;">Tb</td><td style="background-color: red;">Dy</td><td style="background-color: red;">Ho</td><td style="background-color: red;">Er</td><td style="background-color: red;">Tm</td><td style="background-color: red;">Yb</td><td style="background-color: red;">Lu</td> </tr> <tr> <td style="background-color: red;">Th</td><td style="background-color: red;">Pa</td><td style="background-color: red;">U</td><td style="background-color: red;">Np</td><td style="background-color: red;">Pu</td><td style="background-color: red;">Am</td><td style="background-color: red;">Cm</td><td style="background-color: red;">Bk</td><td style="background-color: red;">Cf</td><td style="background-color: red;">Es</td><td style="background-color: red;">Fm</td><td style="background-color: red;">Md</td><td style="background-color: red;">No</td><td style="background-color: red;">Lr</td> </tr> </table>																		Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu																																
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metals

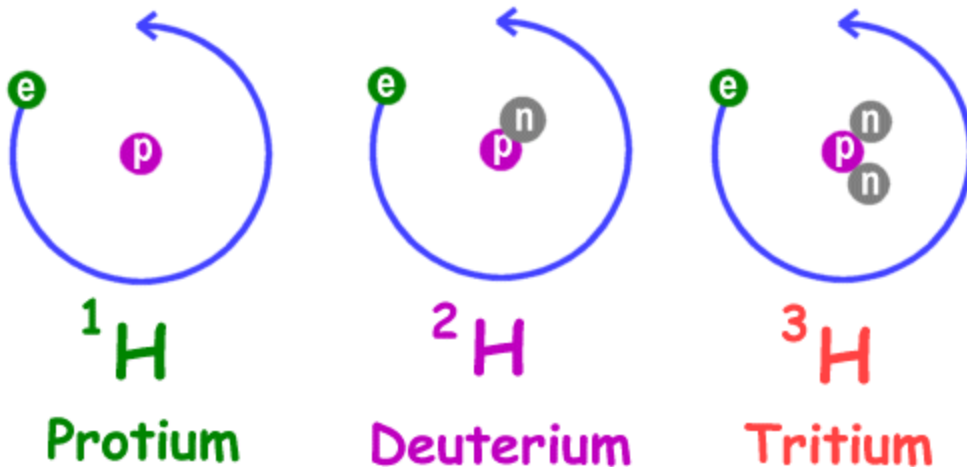
metalloids

nonmetals

ISOTOPES

- 2 elements of the same atom with the same number of protons but different number of neutrons

Three Isotopes of Hydrogen



Isotoprah



One of two or more Oprahs having the same social security number but different mass numbers

SIG FIG RULES

1. All non-zeroes are significant
2. All zeroes to the right of a decimal AND to the right of a non zero are significant
3. All Zeroes sandwiched between 2 significant figures are significant

EXAMPLES

- 5,489
- 5008
- 5890
- 580.0
- 54.0008
- 54.0080
- 5800

BELL WORK

- How many sig figs in the following numbers?
- 320.0
- 4100
- 71.0
- 89.00000

SIG FIGS MULTIPLICATION/DIVISION

- Your answer can only have as many significant figures as your measurement with the least amount of significant figures.
- Example: $320\text{g} \times 5\text{g} = 1600\text{g} = 2000\text{g}$

SIG FIGS ADDITION/SUBTRACTION

- You can only have as many places AFTER the decimal as your measurement with the LEAST amount of places after the decimal.

$$650.3\text{g} + 499\text{g} = 1149.3\text{g} = 1149$$

SIG FIGS ROUNDING

Round each to 3 significant figures:

- 5,489 = 5490
- 5008 = 5010
- 5890 = 5890
- 580.0 = 5.80×10^2
- 54.0008 = 54.0
- 54.0080 = 54.0
- 5800 = 5.80×10^3

DENSITY

- Density = Mass \div Volume
- g/ml = g \div ml or g/cm³ = g \div cm³
- Example: A 4.3 g object has a volume of 2.51 cm³.
What is the object's density?
 $4.3\text{g} \div 2.51\text{cm}^3 = 1.71 \text{g/cm}^3 = 1.7\text{g/cm}^3$

CONVERSIONS

- You must memorize these:
 - Kilo = 1000 times bigger than base unit
 - Deci = 10 times smaller than base unit
 - Centi = 100 times smaller than base unit
 - Milli = 1000 times smaller than base unit

DIMENSIONAL ANALYSIS

- 1. What do you want?
- 2. What do you have?
- 3. How are you going to get there?
 - Examples on board

QUIZ #1 PREP

- Make sure you have access to a book... you can share with your table partner if you wish.

TEST

- Intensive and Extensive properties
- Heterogenous vs Homogeneous
- Accurate vs Precise
- Conversions between Celsius and Kelvin
- Metals/NonMetals/Metalloids
- Groups vs Periods
- Valence Electrons
- Charges
- Ionic Compounds
- Diatomic Molecules
- Cations vs Anions
- Sig Digs
- Balancing
- Percent Error
- DA
- Average Atomic Mass