Honors Chemistry Summer Assignment

For help or for clarification on this material, email me (Mrs. Sharon) at ksharon@stfrancishs.org. You'll need to get a copy of the textbook (Chemistry: Matter and Change (ISBN 0078664187) in order to complete the homework.

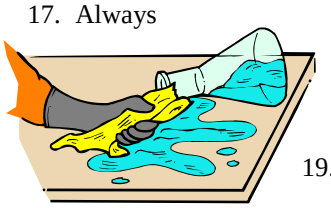
Summary of Summer Assignment:

1. Complete this packet. You should memorize required information and complete reading, notes, and homework problems.
2. ***Read & sign and have your parents read & sign an electronic copy of the "Safety Handout". (There will be a copy of this on the Welcome page of the Honors Chemistry PowerSchool). This must be turned in to the Honors Chemistry dropbox by the end of the day on the first day of class!***
3. Take the Safety Quiz on Haiku. You must earn 85% to participate in labs. You may retake it as many times as needed to pass. This MUST be done BEFORE the first day of class. I will make it available the last week before school begins. If you will not have access to the internet that last week, notify me ahead of time so I can make it available earlier.

Science Laboratory Safety Rules

1. Protective goggles are required to prevent splashing and spattering in your eyes. You will not be permitted in the laboratory without them.
2. You must notify the instructor when wearing contact lenses in the laboratory.
3. Some sort of laboratory apron or coat is required to protect you and your clothing.
4. Prepare a safe laboratory environment by ensuring all bags and backpacks are off the floor and chairs are pushed in.
5. No running, shouting, shoving, or fooling around is permitted in the lab.
6. Your apparel should be appropriate for laboratory work. Long hanging necklaces, bulky jewelry, and excessive and bulky clothing should not be worn. Feet should be <u>fully</u> covered.
7. Long hair must be secured away from your face and lab materials, especially chemicals and burners.
8. You should know the location of and how and when to use the fire extinguisher, eye wash, fire blanket, exits, shower, and gas shut off.
9. NEVER taste chemicals. Touching of chemicals should be avoided unless told otherwise by your teacher.
10. <u>Never</u> return unused reagents (chemicals) to stock bottles.
11. Dispose of all waste materials in designated waste containers.
12. Be VERY cautious when testing for odors. Fan the odors to your nose.
13. Never aim the opening of a test tube or flask at yourself or anyone else.

14. Use fume hoods whenever irritating fumes are involved. Adequate ventilation is important for safety.
15. Never leave anything unattended while it is being heated or reacting rapidly. Do not leave Bunsen burners burning or hot plates heating while not in use. Do not leave gas jets on while not in use. Do not use burners when they are not needed.
16. A clean lab is a safe lab. Return materials to the proper place and keep your work area clean at all times.
17. Always concentrate on what you are doing and report any accident to the teacher <u>at once</u>.



18. NEVER WORK ALONE IN THE LABORATORY. You should only work in the laboratory while under the supervision of your teacher.
19. No food, drinks or chewing gum may be brought into the lab (unless authorized by the teacher).
20. You should know and understand the dangers and hazards of each experiment before you start the experiment. Read all instructions for a lab <u>before</u> you start work.
21. Follow all written and verbal instructions for each lab.
22. You should not mix chemicals together unless you have been instructed to do so by your teacher or the instructions of the experiment.
23. Hot items should be handled with gloves or tongs.
24. Flammable liquids should be used in small amounts.
25. When lighting a Bunsen burner, light the match first then turn on the gas.

26. Avoid using cracked or broken glassware as it can chip further or break and cause injury.

27. Dispose of broken glassware in the proper container. Do not put broken glassware into the trash can.

28. Do not throw trash in the sinks.

29. When cleaning glassware, turn on the water first, then place the glassware under the faucet.

30. When obtaining reagents that have a similar appearance, properly label glassware to avoid confusion, cross-contamination or unwanted reactions.

A safe laboratory makes chemistry FUN!

Science Class Safety Agreement (Sign an electronic version of this).

All students will be required to pass with a score of at least 85%, a laboratory safety test before being allowed to participate in lab activities.

Students will be removed from the science activity area by the teacher if:

A. Their personal appearance or dress is such that they cause injury to themselves or to other students.

B. They are behaving in such a manner that they can cause injury to themselves or to other students.

C. They are not following the prescribed safety rules for the science activity area or the particular science activity being conducted.

D. They are going beyond the limits of the science activity into areas that may lead to an unsafe situation.

E. They have not completed the pre-experiment activities that will allow them to work safely in the laboratory situation.

There will be a test on this information during the first week of the school year. It will be worth approximately half the points of the other tests. The assignments listed below will be due the 2nd day of class. You will need the book, Chemistry: Matter and Change (ISBN 0078664187), to complete these assignments.

If you need assistance or clarification about this information, email me, Mrs. Sharon, at (ksharon@stfrancishs.org). I will check my email occasionally during the summer.

Chapter 1 Assignments

1. **Read chapter 1**
2. **Define, and KNOW listed words/terms:** matter, mass, weight, qualitative data, quantitative data, independent and dependent variables, and control
3. **Answer problems:** 36, 39; standardized test practice 1-4

Chapter 2 Assignments

1. **Read Section 2.1.**
2. **Define and KNOW listed words:** base unit, derived unit, meter, density
3. **Memorize SI base units and SI prefixes listed in the tables below.**
4. **Answer problems:** 6 & 10

SI (Le Systeme International d'Unites) system of measurement

A. 7 base units – memorize these for now:

length	*meter*	*m*
mass	*kilogram*	*kg*
time	*second*	*s*
thermodynamic temp	*kelvin*	*K*
amount of substance	*mole*	*mol*

B. Important prefixes – prefixes can be added to base units to obtain units of convenient sizes for larger/ smaller sizes - memorize these as shown in the LAST column of this table:

prefix	***symbol***	***meaning***	***multiplier***	***multiplier***	***Using meters as an ex. unit, determine the appropriate relationships…****
		Greater than 1			
mega	*M*	*million*	1×10^{6}	*1 000 000*	*$1Mm = 10^{6}$ m (I did this one for you)*
kilo	*k*	*thousand*	1×10^{3}	*1 000*	*____ km = ____ m*
		Less than 1			
centi	*c*	*hundredth*	1×10^{-2}	*0.01*	*____ cm = ____ m*
milli	*m*	*thousandth*	1×10^{-3}	*0.001*	*____ mm = ____ m*
micro	*μ*	*millionth*	1×10^{-6}	*0.000 001*	*____μm = _____ m*
nano	*n*	*billionth*	1×10^{-9}	*0.000 000 001*	*10^{9} nm = 1 m (I did this one for you)*

*This is a more useful way to memorize the information.

5. **Read section 2.2**
6. **Define the term and KNOW:** scientific notation

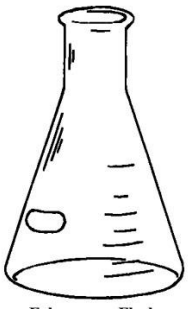
7. **Take notes on converting numbers larger than 1 and smaller than 1 into scientific notation, adding and subtracting using scientific notation, and multiplying and dividing using scientific notation.**
8. **Answer problems:** 12-13, 14-16 (do these **without** a calculator, keeping the numbers in scientific notation while doing the calculations, b/c that is how you will perform the calculations when I test you on this material), and 22 & 24.
9. **Define and KNOW the terms:** conversion factor and dimensional analysis. (Skim this section but I will help with the method in class after school starts).
10. **Read section 2.3**
11. **Define and KNOW:** accuracy, precision, and percent error.
12. **Answer problems:** 29 & 30
13. **Memorize rules for counting significant figures on pg 39.**
14. **Answer problems:** 31 & 32
15. **Ignore section titled, "Rounding Off Numbers" which includes the subsections "Rules for rounding numbers", "Addition and subtraction", and "Multiplication and division".**
16. **Do problems:** 72-78 (do not use calculator for 77 & 78), and 81-82. (You may also do the standardized test practice problems 1, 3-6 for extra practice if you'd like – the standardized test practice problems are optional).
17. **Memorize the laboratory apparatus on the handout.**
18. **Memorize the common ions and their charges listed below:**

Common Ions and their Charges:

H^+	Hydrogen	NO_2^-	Nitrite
Ag^+	Silver	NO_3^-	Nitrate
Zn^{2+}	Zinc	SO_3^{2-}	Sulfite
Pb^{4+}	Lead(IV)	SO_4^{2-}	Sulfate
Pb^{2+}	Lead(II)	HSO_4^-	Hydrogen sulfate
Fe^{3+}	Iron(III)	OH^-	Hydroxide
Fe^{2+}	Iron(II)	CN^-	Cyanide
Cu^{2+}	Copper(II)	PO_4^{3-}	Phosphate
Cu^+	Copper(I)	HPO_4^{2-}	Hydrogen phosphate
Co^{3+}	Cobalt(III)	SCN^-	Thiocyanate
Co^{2+}	Cobalt(II)	CO_3^{2-}	Carbonate
Sn^{4+}	Tin(IV)	$CH_3CO_2^-$	Acetate
Sn^{2+}	Tin(II)	MnO_4^-	Permanganate
NH_4^+	Ammonium	HCO_3^-	Hydrogen carbonate or bicarbonate
		ClO^-	Hypochlorite
		ClO_2^-	Chlorite
		ClO_3^-	Chlorate
		ClO_4^-	Perchlorate
		$Cr_2O_7^{2-}$	Dichromate
		CrO_4^{2-}	Chromate
		O_2^{2-}	Peroxide

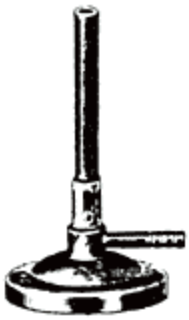
* Notice the patterns between similar ions! This can help you as you memorize them. For instance, nitrite and nitrate are almost identical; they have the same types of elements present and the same charge. Nitrate just has one more oxygen than nitrite. I just memorize the –ate version of each ion (the most common version) and then remember to remove an O if I am making the –ite version instead. This isn't the complete story as you can see with hypochlorite and perchlorate, but it can be helpful. ☺
** all ion names must be spelled correctly on tests b/c small difference can change into new ion!!

Common laboratory equipment:

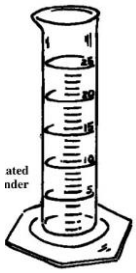


Erlenmeyer Flask

test tube holder

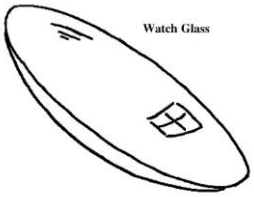


Bunsen burner

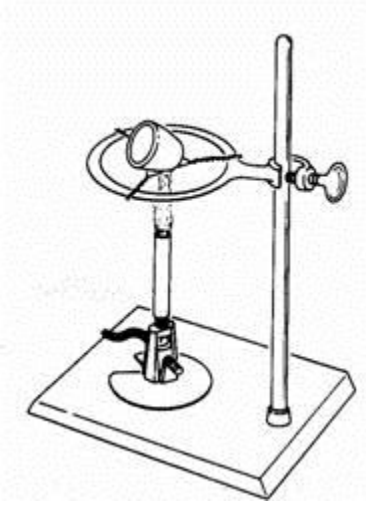


graduated cylinder

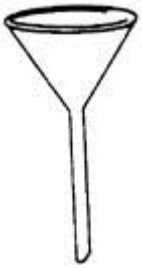
beaker



watch glass



ring stand (base and metal stick); iron ring (ring clamped to metal stick); crucible; clay triangle (almost hidden – just see wires); bunsen burner



long stem funnel

test tubes

Wash bottle

Plastic pipet