

Cambridge AS Level (AICE) Chemistry Summer Assignment

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Why take AICE Chemistry?

I am so glad you have decided to take **AICE Chemistry**! This course is designed to give you a more complete experience of chemistry that will prepare you for both the AICE Chemistry exam in the Spring of next year; and for General Chemistry and Organic Chemistry in college. The only way to complete all the topics in this course is to move at a ***fairly rapid pace***. Therefore, it is ***critical*** for all students to complete the Summer Assignment and stay sharp! You have probably decided to take this course for several reasons, but here are some of the reasons why this course is beneficial:

- The most obvious answer is that students who successfully pass the AICE Chemistry Exams (AS-level) next May AND June are eligible to receive college credit at most colleges and universities in the United States. This can represent a considerable savings in time and money.
- Some students, regardless of whether or not they pass the AICE Chemistry Exam, elect, or are required, to take General Chemistry in college anyway. For most students, freshman college chemistry is an ***extremely difficult*** course. Students who have taken AICE Chemistry **do exceedingly better** than those who don't. If you are planning on majoring in ANY science, engineering, veterinary, nursing or other medical field, you will be required take several college chemistry courses; AICE Chemistry will prepare you very well for these courses.
- AICE Chemistry will teach you to think at higher levels. You will be encouraged and taught how to analyze deeply, synthesize concepts and evaluate approaches to problems, often in new situations, sometimes even deriving your own techniques from your own knowledge base. This is exactly the type of thinking you will be expected to use in college-level courses.
- You will find it can be easier to learn Chemistry at Pasco High School over the course of **one year**, rather than in college (over 12 weeks) large in part due to the smaller class sizes and individual time and tutoring that I can offer you. Freshman college chemistry is usually taught in large lecture halls (up to 250 students) where individual assistance is both difficult to find and expensive to attain.

The Commitment

Taking a course such as AICE Chemistry *may be* very different than courses you have taken in the past. It will involve a level of work and commitment that you may not have experienced before. There is a very specific amount of material that must be covered for the AICE Test. We absolutely **must be ready** for the AICE Tests in May AND June. (***Seniors, YES, you must COME BACK in JUNE to take your Exams.***) You must accept the fact that you will have a significant workload outside of class and will need to get help on assignments. In addition, it is the expected that you have mastered

all of the concepts taught in *preAICE* Chemistry; **very little time will be spent reviewing or RE-teaching these concepts.**

Please complete the Summer Assignment that follows. We will have a test on this material the first week of class... yes, seriously – the FIRST week of class. Students who do not complete this assignment and keep their skills sets “fresh” should expect to struggle during certain units in AICE Chemistry. Some of the material is review from preAICE Chemistry or Chemistry Honors. Some of the material will be **new** and may seem strange.

Keep this packet handy, and take it with you into situations this summer where you are likely to find yourself with periods of free time (beach time?) Learn/review *a little at a time*. There are also some excellent reviews online / YouTube.

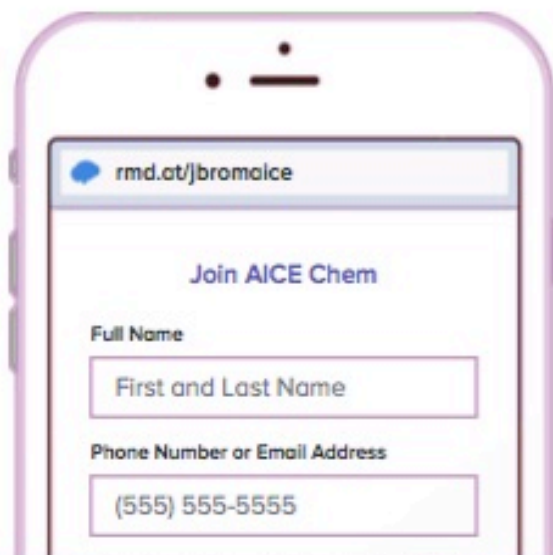
I will be readily available during the summer. Use the e-mail above to contact me. I will do my best to respond within a day or two. Also, you can sign up for **REMIND** for our Course for next year already! (BTW... REMIND doesn't help unless you actually read the texts...)

A If you have a smartphone, get push notifications.

On your iPhone or Android phone, open your web browser and go to the following link:

rmd.at/jbromaice

Follow the instructions to sign up for Remind. You'll be prompted to download the mobile app.



B If you don't have a smartphone, get text notifications.

Text the message @jbromaice to the number 81010.

If you're having trouble with 81010, try texting @jbromaice to (772) 200-2854.

* Standard text message rates apply.



Don't have a mobile phone? Go to rmd.at/jbromaice on a desktop computer to sign up for email notifications.

I. STOICHIOMETRY (there's no escaping it!) Round your answers to two decimal places, please.

1) **Write** the molecular formula and **draw** the **displayed, structural, skeletal** formula for butane.

2) Write the **balanced** chemical equation for the **complete** combustion of butane; include state of matter symbols.

a) What volume of carbon dioxide gas will be produced from 50 g of butane? (1 mol gas = 24 dm³)

b) How many grams of butane will produce 50 g of water?

c) What volume (in dm³) of CO₂ is produced from the combustion of 250 g of butane?

d) What mass of water is produced when 30 g of oxygen is consumed during the combustion of butane?

Molar Concentration

a) What is the concentration when 57.68 g of H₂SO₄ is dissolved in 1 dm³ of water?

b) What is the concentration when 35.76 g of ammonium carbonate is dissolved in 500 mL of water?

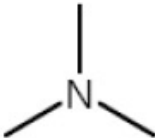
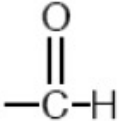
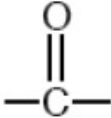
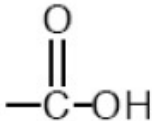
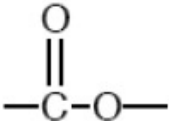
c) What mass of HCl must be dissolved in 250 cm³ of water to make a 2.0 mol dm⁻³ solution?

II. Chemical Reactions: Write the complete BALANCED chemical equation for the following reaction descriptions. *Include state symbols. If they are unfamiliar to you, research them. They are important!*

1. the thermal decomposition of magnesium carbonate
2. the thermal decomposition of calcium nitrate
3. the neutralization of nitric acid with sodium hydroxide
4. addition of silver nitrate to ammonium chloride
5. electrolysis of lead (II) bromide
6. synthesis of sodium chloride from its component elements
7. addition of magnesium to sulfuric acid
8. synthesis of phosphorus trichloride from its component elements
9. the Haber Process
10. the Contact Process
11. manufacture of ethanol (aerobic)

III. ORGANIC CHEMISTRY

- 1) Visit http://www.visionlearning.com/library/module_viewer.php?mid=60
(Google VisionLearning.com – search *Carbon Chemistry*)
- 2) **READ** the module and **COMPLETE** the quiz – **print it out and ATTACH IT.**
- 3) **RESEARCH** the organic functional groups listed below; research to identify common compounds made from these chemicals. For example, most *perfumes* contain *esters*. Do some informal research by visiting **SEVERAL** websites, blogs and association websites until you are fairly familiar with these functional groups.
- 4) **CREATE A SIMPLE BUT USEFUL and BEAUTIFUL POSTER BOARD** identifying each functional group, featuring **JUST ONE** example of a compound containing that functional group **AND IT'S USE.** (bigger than 8x11 piece of paper but smaller than a science project, please)

<u>Functional Group</u>	<u>Class of Compound</u>
-OH	alcohol
	amine
	aldehyde
	ketone
	carboxylic acid
	ester

FEEL FREE to...

Use magazine clippings, free-hand drawings, clip art or other types of illustrations to add to your poster to help you remember the structure of each functional group. **USE COLOR AND SHOW YOUR WORK ETHIC** by making your poster **AESTHETICALLY PLEASING!**

And finally...

IV. "WEIGHT TRAINING"

... well not exactly... remember in 4th grade when you had to memorize your multiplication facts? Memorizing these multiplication facts helped you to do higher-level math faster because you didn't have to pick up a calculator or count on your fingers to get an answer. While you can always "Ask Siri" or "Google it", memorizing facts STILL has relevance in your life (despite your best attempts to convince yourself that it doesn't!) Memorizing facts keeps your brain "in shape". You have to train your brain to *memorize*.

Much like wrestlers, martial artists and other athletes do weight training before a match or game, this summer, you are going to do **CHEMISTRY "WEIGHT TRAINING"**.

Please visit QUIZLET (*online*) and Search for the following sets (or click the link).

1) "Mrs. Bromley Element SYMBOLS" https://quizlet.com/_eynlf

Actually, you should already know these!!

2) "Mrs. Bromley Polyatomic Ions & Common Acids" https://quizlet.com/_1fhj43

FIRST, memorize the [spelling of](#) the NAME of the polyatomic ion. NEXT, [reverse](#) the set and memorize the [formula](#) AND [charge](#) of each polyatomic ion.

3) "Mrs. Bromley Organic Prefixes, Alkyl Groups & Molecules" https://quizlet.com/_3btmmn

You need to know all the prefixes through hex- (6); the formula of each molecule and alkyl group; and the name of each molecule.

You can also JOIN the AICE Chemistry "Class Group" on QUIZLET by clicking the link below...

<https://quizlet.com/join/jEcP9qHv8>

I suspect a QUIZ on these sets might be in your future... ☺