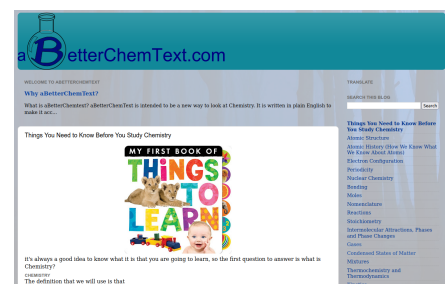


Jack Barrack Hebrew Academy
AP Chemistry
Summer Assignment
Mr. McAfoos

To the students:

I'm excited to work with you this coming year. I've picked 5 important topics to put into the assignment. Hopefully, you have done all of this and more, but a solid foundation of these topics will put us in a good place to start the year.

If you “sort-of” remember something, there are lots of resources out there to help you remember, but I recommend starting with ABetterChemText.blogspot.com. This is my text, which I've been working on for quite a few years. There is a table of contents on the right side and a search bar that will help you find anything.



Each section of this document includes three sections:

- 1) A brief description of what I think you should remember (and review) from first year chemistry.
- 2) A few sample problems for you to complete
- 3) Questions about a few other topics - just asking whether you've seen them without expectation. These questions are just for me to know how to approach certain topics. You do NOT need to worry about reviewing these “extra” ideas. We'll hit them in class.

Have a great summer and I look forward to meeting all of you in September.

Nomenclature and Reactions

You should remember:

- 1) Polyatomic ions
- 2) Ionic nomenclature
- 3) Covalent nomenclature
- 4) Balancing reactions
- 5) Completing reactions of various types

Some practice:

- 1) Write the formula for the following compounds
 - a) Sodium sulfate
 - b) Aluminum iodide
 - c) Iron II oxide
 - d) Iron III acetate

- 2) Write the formula for the following compounds
 - a) Dinitrogen pentoxide

 - b) Sulfur hexafluoride

- 3) Balance the following reactions
 - a) $\text{Ba}(\text{NO}_3)_2 + \text{K}_3\text{PO}_4 \rightarrow \text{KNO}_3 + \text{Ba}_3(\text{PO}_4)_2$

- 4) Complete and balance the following reactions
 - a) Combustion of $\text{C}_3\text{H}_7\text{OH}$

 - b) Iron III nitrate reacts with lithium hydroxide

 - c) Solid copper reacts with silver nitrate solution

 - d) Nitrogen triiodide decomposes

Other topics

Answer each of the following questions by circling Yes or No. I do NOT expect that you remember how to do all of these things. I only want to know if this year will be a reminder or an introduction.

- 1) Did you memorize the polyatomic ions in your first chemistry class? Yes / No

- 2) Did you learn how to write formulas for simple organic compounds? Yes / No

- 3) Did you learn how to predict the products of special case decompositions (carbonates, bicarbonates, chlorates, and hydroxide compounds)? Yes / No

- 4) Did you learn how to use a solubility table (or solubility rules) and an activity series?
Yes / No

Moles

You should remember:

- 1) How to determine molar mass
- 2) How to convert between moles and
 - a) Grams
 - b) molecules
- 3) How to use molarity
- 4) How to find the % composition

Some practice:

- 1) What is the molar mass of
 - a) $\text{Ca}(\text{NO}_3)_2$

 - b) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$

- 2) Solve the following problems:
 - a) What is the mass of 13.9 moles of table salt (NaCl)?

 - b) How many molecules are there in 9.32 moles of water?

 - c) How many grams of ethanol ($\text{C}_2\text{H}_5\text{OH}$) are there in 350.0 mL of a 1.75 M solution?

- 3) What is the percent composition of lithium acetate?

Other topics

Answer each of the following questions by circling Yes or No. I do NOT expect that you remember how to do all of these things. I only want to know if this year will be a reminder or an introduction.

- 1) Did you learn how to convert % composition into the empirical formula? Yes / No
- 2) Did you learn how to determine the molecular formula from the empirical formula and the molar mass? Yes / No

Gases

You should remember:

- 1) The 5 basic gas laws (what they relate...not the names)
- 2) How to solve combined gas law problems
- 3) How to solve a problem using the ideal gas law

Some Practice:

- 1) If a balloon has a volume of 13.9 liters at 1.077 atm, what will the volume be at 645 mm Hg?

- 2) If a balloon has a volume of 45.0 L at 23.6°C and 745 Torr, what will the volume be at -22.8°C and 0.446 atm?

- 3) How many grams of He would fit in a 5.00 L container at 1.77 atm and 298 K?

Other topics

Answer each of the following questions by circling Yes or No. I do NOT expect that you remember how to do all of these things. I only want to know if this year will be a reminder or an introduction.

- 1) Did you learn Dalton's Law? Yes / No
- 2) Did you learn about the vapor pressure of water? Yes / No
- 3) Did you learn about diffusion and effusion? Yes / No

Bonding

You should remember:

How to draw Lewis Dot Structures for simple molecules

Some Practice:

Draw the Lewis Dot Structure for the following 11 compounds and ions:

H_2O	CO_2	CH_4
C_2H_6	C_2H_4	C_2H_2
C_6H_{12} (in a ring)		NBr_3
		CH_2O
HCN	NH_4^{+1}	

Other topics

Answer each of the following questions by circling Yes or No. I do NOT expect that you remember how to do all of these things. I only want to know if this year will be a reminder or an introduction.

- 1) Did you learn about resonance Yes / No
- 2) Did you learn about octet rule violators Yes / No
- 3) Did you learn about VSEPR theory (shapes and structures) Yes / No