

Welcome to AP Chemistry,

This is a 2nd year chemistry course. As such, there are items you are responsible for knowing before taking this class. Each of the items listed below are things taught in our first year chemistry class. Your summer assignment is focused on being able to answer questions on each of these topics. Use your textbook and/or notes from last year to review the topics you are less confident about. I will also be available on select days in August to help with the questions you may have. The summer assignment is completely online. E-mail Mr Brierly (bbrierly@orangeusd.org) for the sign up form. The assignment will have several different parts, some of which will not be available until later in the summer so that you have to space out your studying over summer. There are 2 intro assignments worth 10 points each (based on completion) that are just to get you familiar with how to use the online interface and to know metric units. The 3 main assignments will be worth 20 points each. All assignments are due before the first day of class. There will be a 35 question quiz on the first day of school that is based on the summer assignment material. The following rubric will be used for grading of the summer assignments:

- 20 points - 85% and above
- 18 points - 75-84%
- 16 points - 65-74%
- 14 points - 58-64%
- 12 points - 50-57 %
- 10 points - Below 50%

Things to know:

- How to identify an element by its atomic number, atomic mass or electron configuration
- If an element is a metal or a non-metal and the charge the ion will become
- The types of bonds elements form and how to name the compounds they form
- Be able to write a chemical formula, a chemical equation and how to balance an equation
 - This also includes Net-ionic equations and solubility rules
 - This includes how to predict products that should form
- Know how to draw lewis dot structures and predict basic shapes of molecules (we'll learn the more complicated shapes throughout the year)
- Know the periodic trends and why they follow the patterns they do
- Know the intermolecular forces and how they influence boiling/melting points
- How to determine sig figs and use sig figs in calculations
- Stoichiometry
- Gases
 - Kinetic Molecular theory, ideal gas law, combined gas law, Dalton's Law of Partial Pressures, Mole fractions
- Phase diagrams
- Heat Curve
- $q = mC\Delta T$ and $q = n\Delta H$
- Know how to measure concentration and calculate concentration
- Know how to write equilibrium expressions and calculate the values of the constant
- Know how to predict shifts in equilibrium (Le Chatelier's Principle)
- Know the various definitions of an acid and bases
- Know how to calculate pH/pOH and also $[H^+]$ and $[OH^-]$
- Know how to do a titration calculation
- Know how to write a rate law expression and calculate the orders
- Be very familiar with the following list of common polyatomic ions and their charges.

Symbol	Name	Symbol	Name
BO_3^{3-}	borate	H_3O^+	hydronium
BrO_3^-	bromate	Hg_2^{2+}	mercury (I)
$\text{C}_2\text{H}_3\text{O}_2^-$	acetate	MnO_4^-	permanganate
$\text{C}_2\text{O}_4^{2-}$	oxalate	N_3^-	azide
ClO^-	hypochlorite	NH_2^-	amide
ClO_2^-	chlorite	NH_4^+	ammonium
ClO_3^-	chlorate	NO_2^-	nitrite
ClO_4^-	perchlorate	NO_3^-	nitrate
CN^-	cyanide	OH^-	hydroxide
CO_3^{2-}	carbonate	O_2^{2-}	peroxide
CrO_4^{2-}	chromate	PO_3^{3-}	phosphite
$\text{Cr}_2\text{O}_7^{2-}$	dichromate	PO_4^{3-}	phosphate
HCO_3^-	bicarbonate	SCN^-	thiocyanate
HC_2O_4^-	hydrogen oxalate	SO_3^{2-}	sulfite
HPO_4^{2-}	hydrogen phosphate	SO_4^{2-}	sulfate
H_2PO_4^-	biphosphate	$\text{S}_2\text{O}_3^{2-}$	thiosulfate
HSO_3^-	bisulfite	SeO_4^{2-}	selenate
HSO_4^-	bisulfate	SiO_3^{2-}	silicate
IO_3^-	iodate	VO_3^-	vanadate