Michael Amendola and Daniel Smith
AP Chemistry

Unit 08 -- Acids and Bases

Activities/Assignments: Go to your Google Classroom for direct links to activities and assignments.
Mr.Amendola's google site Google Classroom Playposit Curriculum: Brief Detailed

Unit Learning Objectives/ Goals	By the end of this unit students should be able to: • Calculate the values of pH and pOH, based on Kw and the concentration of all species present in a neutral solution of water. • Calculate pH and pOH based on concentrations of all species in a solution of a strong acid or a strong base • Explain the relationship among pH, pOH, and concentrations of all species in a solution of a monoprotic weak acid or weak base. • Explain the relationship among the concentrations of major species in a mixture of weak and strong acids and bases. • Explain results from the titration of a mono- or polyprotic acid or base solution, in relation to the properties of the solution and its components. • Explain the relationship between the strength of an acid or base and the structure of the molecule or ion. • Explain the relationship between the predominant form of a weak acid or base in solution at a given pH and the pKa of the conjugate acid or the pKb of the conjugate base. • Explain the relationship between the ability of a buffer to stabilize pH and the reactions that occur when an acid or a base is added to a buffered solution. • Identify the pH of a buffer solution based on the identity and concentrations of the conjugate acid-base pair used to create the buffer. • Explain the relationship between the buffer capacity of a solution and the relative concentrations of the conjugate acid and conjugate base components of the solution.

Performance Task- what skills are we working towards?	• This unit builds on the content about chemical equilibrium studied in Unit 7. Chemical equilibrium plays an important role in acid-base chemistry and solubility. The proton-exchange reactions of acid-base chemistry are reversible reactions that reach equilibrium quickly, and much of acid-base chemistry can be understood by applying the principles of chemical equilibrium. Most acid-base reactions have either large or small values of K, which means qualitative conclusions regarding equilibrium state can often be drawn without extensive computations. The dissolution of a solid in a solvent can also be understood by applying the principles of chemical equilibrium because it is a reversible reaction that often reaches equilibrium quickly. In the final unit, the equilibrium constant is related to temperature and the difference in Gibbs free energy between the reactants and products. • Identify an appropriate theory, definition, or mathematical relationship to solve a problem. • Identify an appropriate theory, definition, or mathematical relationship to solve a problem. • Explain the relationship between variables • Calculate, estimate, or predict an unknown quantity from known quantities by selecting and following a logical computational pathway and attending to precision (e.g., performing dimensional analysis and attending to significant figures). • Identify information presented graphically to solve a problem. • Support a claim with evidence from representations or models at the particulate level, such as the structure of atoms and/or molecules • Make observations or collect data from representations of laboratory setups or results, while attending to precision where appropriate. • Provide reasoning to justify a claim using chemical principles or laws, or using mathematical justification. • Calculate, estimate, or predict an unknown quantity from known quantities by selecting and following a logical computational pathway and attending to precision (e.g., performing dimensional analysis and attending to significant figures). • Explain how potential sources of experimental error may affect the experimental results.
Unit Activities	

Day 1	Objectives • Calculate the values of pH and pOH, based on Kw and the concentration of all species present in a neutral solution of water. • Calculate pH and pOH based on concentrations of all species in a solution of a strong acid or a strong base Activities • Introduction to acid/base reactions. Conjugate acid/base pairs will be reviewed and the pH scale will be discussed. pH calculations will be introduced. Assignments • Watch 3 optional AP classroom videos 8.1-8.2 • Complete AP formative MCQ 8.1-8.2 on ap classroom • Webassign 8.1-3 due Day 3 at 11:59pm
Day 2	Objectives • Explain the relationship among pH, pOH, and concentrations of all species in a solution of a monoprotic weak acid or weak base. • Explain the relationship among the concentrations of major species in a mixture of weak and strong acids and bases. Activities • Direct instruction on pH and pOH for weak acids and bases. Some ICE problems for weak acids and bases will be examined. • Students will have some opportunity to practice. Assignments • Watch 3 optional AP classroom videos on 8.3 • Complete AP formative MCQ 8.3 • Webassign 8.1-3 due day 3
Day 3	Objectives • Explain results from the titration of a mono- or polyprotic acid or base solution, in relation to the properties of the solution and its components.

	Activities • Introduction to acid base titrations. General curve shapes will be discussed. Calculations of pH during strong-strong Acid-Base Titrations will be explored. Assignments • Watch 1 Playposit 8.7 Due before class • Complete AP formative MCQ 8.7 on ap classroom Due before class • Webassign 8.1-3 day 3 at 11:59pm • Webassign 8.5 due day 5 at 11:59pm
Day 4	Objectives • Explain results from the titration of a mono- or polyprotic acid or base solution, in relation to the properties of the solution and its components. Activities • Explain how buffering occurs during weak acid-weak base titrations. • Continue to practice acid base titrations. Assignments • Optional watch 3 AP classroom 8.4 • Complete AP formative MCQ 8.4 • Webassign 8.5 due day 5 • Webassign 8.6 due day 6 • Webassign 8.4, 8.7-8.10 due day 8 at 11:59pm
Day 5	Activities • Q&A 8.4+7-Acid-Base Reactions and Buffers , Titrations continued Assignments • Watch 3 Playposits 8.8-10 Due before class • Complete AP formative MCQ 8.8-10 Due before class • Webassign 8.5 due day 5 at 11:59pm • Webassign 8.6 due day 6 • Webassign 8.4, 8.7-8.10 due day 8 at 11:59pm
Day 6	Activities • Q&A 8.8-10-Properties of Buffers, Henderson-Hasselbach, Buffer Capacity Assignments

	• Watch 2 Playposits 8.6 Due Wed 3/24 before class • Complete AP formative MCQ 8.6 Due before class • Webassign 8.6 due today • Webassign 8.4, 8.7-8.10 due day 8 at 11:59pm
Day 7	Activities • Q&A 8.6-Molecular Structure of Acids and Bases Assignments • Webassign 8.4, 8.7-8.10 due day 8 at 11:59pm • Webassign 8.6 due day8 at 11:59pm
Day 8	Activities • Q&A Unit 8 Assignments • Webassign 8.4, 8.7-8.10 due day 8 at 11:59pm
Day 9	Activities • Test Unit 8 Assignments • Watch 2 Playposits 9.1-2 Due Wed 3/31 before class • Complete AP formative MCQ 9.1-2 • Webassign 9.X due X 4/X at 11:59pm