



HOMEWOOD-FLOSSMOOR HIGH SCHOOL COURSE SCOPE & SEQUENCE

Semester 2 ø11 øø12

Department:

Science

Course: AP Chemistry

Instructor(s): Sheriff / Pavinato

The Homewood-Flossmoor High School Course Scope & Sequence provides parents and students with a semester-long overview of each class that we offer. An instructor may alter a course's scope & sequence as needed. Students are responsible for keeping track of due dates and other pertinent course information in their H-F Student Planners. Parents, please contact your child's teacher by telephone or e-mail to clarify any questions you may have about the scope & sequence of a particular course.

WEEK	INSTRUCTIONAL CONTENT	ACTIVITIES, READINGS, LABS, AND/OR ASSIGNMENTS	MAJOR ASSESSMENTS	AP Chemistry College Board Standards
WEEK #1 1/17 ø 1/20 No school: 1/16	<ol style="list-style-type: none"> 1. Reaction rate = Change in concentration as time passes 2. Sign of rate 3. Methods to measure rate (concentration, color change, pressure change) 4. Average rate vs. instantaneous rate 5. Rate constant (relationship between rate and concentrations of reactants) 	Read: 13.1 ø 13.5 Ch.13→ 1-3,6,8-10,15,17,18,19,21 Ch.13→ 27-30,35,37		3.4.1
WEEK #2 1/23ø 1/27	<ol style="list-style-type: none"> 6. Comparing rates with stoichiometry 7. Find rate law from experimental data (NOT STOICHIOMETRY) 8. Rate = $k[A]^x[B]^y$ í do calculations with rate law 9. Order of reaction 10. Relationship and calculations with time and concentration 11. Graphs of concentration vs. time (find rate constant from graph) 12. Half lives 	Ch.13→ 27-30,35,37 Ch.13→65,73,84,92,102,109 Lab ø Kinetics of CV Reaction		3.4.1 3.4.2



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WEEK #3 1/30 ó 2/3	13. Activation energy and activated complex 14. Collisions 15. Temperature dependence on rate constant 16. Reaction mechanism to deduce rate law 17. Catalysts and enzymes	Ch.13→65,73,84,92,102,109	Unit #9 ó Kinetics Test Chapter 13	3.4.3 3.4.4 3.4.5
WEEK #4 2/6 - 2/10	1. Definition of equilibrium 2. Graphs of concentration vs. time 3. Reversible reactions 4. Writing equilibrium constant expressions (solids & liquids not included) 5. Product or reactant favored? $K > 1$ or $K < 1$ 6. K_p and K_c 7. K_{eq} for: addition, multiplication, and reversal of reactions	Read: 14.1-14.5 Ch.14→ 2,6,8,10,13-15,18,19 Ch.14→ 22-24,28,31,31 Lab ó Determining K_{eq} for a reaction		3.3.1 3.3.2
WEEK #5 2/13 ó 2/17	8. $K = k_f/k_r$ 9. Use Q to predict direction of reaction 10. Use ICE to determine equilibrium concentrations 11. Factors that affect chemical equilibrium 12. Le Chatelier's Principle	Ch.14→ 37,40,41,44,46,47 Ch.14→ 51-54,58,71,84,88	Unit #10 ó Equilibrium Test ó Chapter 14	3.3.1 3.3.2
WEEK #6 2/21 ó 2/24 No School:2/20	1. Bronstad acids and bases (conjugates) 2. Ionization of water 3. $K_w = [H^+][OH^-] = 1.0 \times 10^{-14}$ 4. pH and pOH 5. Strong acids and bases	Read: 15.1-15.8, 15.10 Ch.15→ 4-6,10,12,15-19,22,23,25 Ch.15→ 31,33,37,39,41-43,48a,49,53a,54		3.3.2.2.1



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	ionize completely (calculate pH) 6. The big 6 strong acids			
WEEK #7 2/27 ó 3/3	7. Weak acids and bases (calculate pH) 8. Acid and base ionization constant (K_a and K_b) 9. ICE calculations using K_a and K_b 10. Percent ionization 11. $K_a K_b = K_w$ 12. Diprotic and triprotic acids	Read 16.1-16.5 Ch.15 → 60,64,65,67,74-77,79 Ch.16 → 2,5,7,9,10,12,14,15,20		3.3.2.2.1
WEEK #8 3/7 - 3/9 No School:3/5, 3/6	13. Salt hydrolysis (write reactions and find pH) 14. Oxides (acid or base) 15. Common ion effect (Le Chatlier)	Ch.16 → 23,25,26,28,30,31,33,34,38 Lab ó Salt Hydrolysis		3.3.2.2.3
WEEK #9 3/12 ó 3/16	16. Buffer solutions and their pH (Henderson-Hasselbach equation) 17. Acid-base titrations (strong and weak) 18. Reactions of acids and bases 19. Graphs of titrations 20. Equivalence point 21. Indicators	Lab ó Weak Acid Titration Lab ó K_a of an indicator	Unit #11 Test ó Acids and Bases ó Chapters 15& 16	3.3.2
WEEK #10 3/19 ó 3/23 End of 3 rd Quarter	1. Solubility equilibrium 2. Solubility guidelines (4.2) 3. Writing K_{sp} expression 4. Use Q to predict if a precipitation reaction will occur 5. Definition of molar	Read: 16.6-16.11 Ch.16 → 40,41,45,47,49-51,53,54 Ch.16 → 55,59,61,63,64,76,81,87		3.3.2.2.2



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	solubility (mol/L) and solubility (g/L) SATURATED			
WEEK #11 4/2 ó 4/5 No school 4/6	6. Calculate solubility from K_{sp} and vice versa 7. Common ion effect 8. Dependence of solubility on pH 9. Complex ions and solubility 10. Qualitative analysis	Lab ó Determine K_{sp} for an Ionic Compound	Unit #12 Test ó K_{sp} & Solubility Remainder of Ch. 16	3.3.2
WEEK #12 4/9 ó 4/13	1. Redox reactions (revisited) 2. Balancing redox reactions (revisited) 3. Electrochemical cells (parts and diagram) 4. Oxidation/reduction half reactions 5. Activity series 6. Cell voltage (emf) 7. Standard reduction potentials	Read: 19.1 ó 19.5, 19.8 Ch.19→ 1,2,4,5,11,16,17 Ch.19→ 23,28,46,47,51,54		3.1.3.1 3.1.3.2 3.1.3.3
WEEK #13 4/16 ó 4/20	8. Predicting half reactions from standard reduction potentials 9. Understand and use a standard reduction potential chart 10. Effect of concentration on cell voltage 11. Batteries 12. Electrolysis (calculations with current, time, and mass of substance produced) 13. Relationship between E_{cell} and K_{eq}	Ch.19→65,70a-c,72,73 Lab ó Voltaic Cell investigation	Unit #13 Test ó Electrochemistry Ch. 19	3.1.3.3



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WEEK #14 4/23 ó 4/27 PSAE & ECRA testing 4/24, 4/25	<ol style="list-style-type: none"> 1. 1st law of thermodynamics 2. Spontaneous vs. non-spontaneous 3. Entropy (increasing or decreasing during a reaction) 4. 2nd law of thermodynamics 5. Determine standard entropy of reaction 6. System vs. surroundings 7. 3rd law of thermodynamics 8. Gibbs free energy (calculate from entropy/enthalpy) (spontaneous?) 9. Calculate Gibbs free energy of a rxn from free energy of formation 10. Temperature affect on spontaneicity 11. Relationship between free energy and equilibrium constant 12. Relationship between free energy and cell voltage 	Read: Ch. 18.1-18.6 Ch.18→ 2,5,9,11,13,14 Ch.18→ 15,17,19,20,23,26 Ch.18→ 42,44,51,58,66	Unit #14 Test ó Thermodynamics Chapter 18	3.5.1 3.5.3 3.5.2 3.5.4
WEEK #15 4/30 ó 5/4	AP Exam Review Week	Practice AP Tests		
WEEK #16 5/7 ó 5/11	Week of AP Exam			
WEEK #17 5/14 ó 5/18	<ol style="list-style-type: none"> 1. Final project introduction 2. Groups take a deeper look into 	Lab ó Silver Bottle Group presentation collaboration		



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	AP chem. topic and present	time.		
WEEK #18 5/21 ó 5/25 SeniorsøLast Day: 5/24		Group collaboration and presentations		
WEEK #19 5/28 ó 6/1 Final Exams 5/29ó 5/31				