

FRANKLIN-SIMPSON HIGH SCHOOL

Course Name: Pre-AP Biology

Unit Name: Basics of Chemistry

Objectives:

Unit 3: Basics of Chemistry	
A.5. Biochemistry	a. Identify subatomic particles, and describe how they are arranged in atoms
	b. Describe the difference between ions and atoms and the importance of ions in biological processes
	c. Compare the types of bonding between atoms to form molecules
	f. Explain the fundamental principles of the pH scale and the consequences of having the different concentrations of hydrogen and hydroxide ions
	h. Describe the function of enzymes, including how enzyme-substrate specificity works, in biochemical reactions
	i. Define and explain the unique properties of water that are essential to living organisms

Purpose of the Unit:

To discuss the structure of matter and the ways in which the components of matter interact with each other.

Prerequisites:

Basic middle schools science background is a perk, but not necessary.

Daily Lesson Guide

Day	Lesson Content and Daily Focus Questions	Tasks/Procedures		Engagement	Assessment and/or Accommodations
		Knowledge or Comprehension Activities	Critical Thinking (High Yield / Literacy /LTF/etc.)		
1	<p>What are the components of atoms?</p> <p>What are the similarities and differences between atoms, ions, and isotopes?</p> <p>A.5.a; A.5.b</p> <p>I – Bell ringer (5 min) II – Test Results Discussion (5 min) III – Guided notes and practice (25 min) IV – PNE problems (15 min) V – Marker board assessment (5 min)</p>	<ol style="list-style-type: none"> 1. ACT Like Bell ringer (QC question from last test, most missed questions) 2. Proton, Neutron, & Electron (PNE) problems 	<ol style="list-style-type: none"> 1. Guided Note taking 	<ol style="list-style-type: none"> 1. PNE problem sheet in groups (working with others) 2. Marker board assessment (novelty, variety) 	<ol style="list-style-type: none"> 1. Marker board assessment of PNE problems at end of class.
2	<p>How do atoms combine to form compounds?</p> <p>What are the similarities and differences between types of chemical bonds?</p>	<ol style="list-style-type: none"> 1. ACT bell ringer 2. PNE on marker boards 3. Compare & Contrast organizer 	<ol style="list-style-type: none"> 1. 'Pre-reading' of packet 2. Compare & contrast organizer w/questions 	<ol style="list-style-type: none"> 1. Compare and contrast organizer (working with others) 	<ol style="list-style-type: none"> 1. Marker board assessment 2. Organizer questions

	<p>A.5.c</p> <p>I – ACT bell ringer (5 min) II – Marker Board assessment of PNE (10 min) III - ‘Pre-Reading’ & annotation of chemical bonding packet with students IV – Compare & Contrast reading organizer/questions</p>				
3	<p>How do atoms combine to form compounds?</p> <p>What are the similarities and differences between types of chemical bonds?</p> <p>A.5.c</p> <p>I – ACT bell ringer (5 min) II – Clicker Quiz over last 2 days (20 min) III – How should I answer a constructed response (10 min) IV – Chemical Compounds/Bonds Constructed response with resources (20 min)</p>	<p>1. ACT bell ringer</p>	<p>1. Constructed Response</p>	<p>1. Constructed Response (solving problems without an obvious answer, Choice)</p>	<p>1. Clicker Quiz 2. Constructed Response Questions</p>

4	<p>What are the properties of water and why do they matter for life?</p> <p>a.5.i</p> <p>I – ACT Bell ringer (5 min) II – Water Demo III – Water Organizer via lecture IV – Water Organizer via YouTube V – Water organizer via textbook VI – Clicker to measure knowledge</p>	<ol style="list-style-type: none"> 1. ACT bell ringer 2. Clicker Quiz 	<ol style="list-style-type: none"> 1. Advanced Organizer for note taking 	<ol style="list-style-type: none"> 1. Discrepant Event (Novelty and variety) 2. YouTube video (Novelty & Variety) 	<ol style="list-style-type: none"> 1. Organizers 2. Clicker Question
5	<p>What are the properties of water and why do they matter for life?</p> <p>a.5.i</p> <p>I – ACT Bell ringer (5 min) II – Mr. Thomas’s Wonderful Water Wonders III – Debrief</p>	<ol style="list-style-type: none"> 1. Lab Notebook – Identifying properties 	<ol style="list-style-type: none"> 1. Lab note book – advanced organizer, non linguistic representation, explanation writing 	<ol style="list-style-type: none"> 1. Water Wonders Challenges (Novelty and variety, Working with others) 	<ol style="list-style-type: none"> 1. Lab notebooks 2. Oral Quizzing
	<p>What are acids and bases, and how do they relate to living things?</p>	<ol style="list-style-type: none"> 1. ACT bell ringer 2. AJB packet 	<ol style="list-style-type: none"> 1. AJB summary writing 	<ol style="list-style-type: none"> 1. AJB (novelty & variety) 	<ol style="list-style-type: none"> 1. AJB summary

6	<p>a.5.f</p> <p>I – ACT bell ringer (5 min) II – pH reading (5 min) III – Alien Juice Bar (AJB) web quest (http://scienceview.berkeley.edu/showcase/flash/juicebar.html)</p>				
7	<p>What are enzymes & how do they affect the chemistry of living things?</p> <p>A.5.h</p> <p>I – ACT Bell ringer II – Guided notes III - Toothpickase</p>	<ol style="list-style-type: none"> 1. ACT Bell Ringer 2. 'Toothpickase' debriefing questions 	<ol style="list-style-type: none"> 1. Guided Notes 	<ol style="list-style-type: none"> 1. 'Toothpickase' (working with others, novelty & variety) 	<ol style="list-style-type: none"> 1. Debriefing Questions
8	<p>What are enzymes & how do they affect the chemistry of living things?</p> <p>A.5.h</p> <p>I – ACT Bell ringer II – Guided notes III – Metabolic Pathway enzyme simulation</p>	<ol style="list-style-type: none"> 1. ACT bell ringer 2. Enzyme Simulation Questions 	<ol style="list-style-type: none"> 1. Guided Notes 2. Enzyme Lab (non-linguistic representation of a metabolic pathway) 	<ol style="list-style-type: none"> 1. Lab (working with others) 	<ol style="list-style-type: none"> 1. Debriefing Questions
9	<p>What have I learned about</p>	<ol style="list-style-type: none"> 1. Test Review 			

	chemistry in living things? A.5.a; A.5.b; A.5.c; A.4.f;A.5.h; A.5.i I – ACT Bell Ringer II – Test Review				
10	What have I learned about chemistry in living things? A.5.a; A.5.b; A.5.c; A.4.f;A.5.h; A.5.i EXAM				FINAL EXAM