

# FRANKLIN-SIMPSON HIGH SCHOOL

**Course Name:** Pre – AP Chemistry    **Unit Name:** Qualitative Aspects of Acids and Bases    **Days:** 7

## Quality Core Objectives:

Unit 17 Qualitative Aspects of Acids and Bases	
I.A.1. Scientific Inquiry	c. Collect, organize, and analyze data accurately and use techniques and equipment appropriately
	d. Interpret results and draw conclusions, revising hypotheses as necessary and/or formulating additional questions or explanations
	e. Write and speak effectively to present and explain scientific results, using appropriate terminology and graphics
	f. Safely use laboratory equipment and techniques when conducting scientific investigations
I.A.3. Science in Practice	d. Explain why all scientific knowledge is subject to change as new evidence becomes available to the scientific community
	g. Compare the scientific definitions of fact, law, and theory, and give examples of each in chemistry
V.C.1. Acid/Base Theories	a. Describe the nature and interactions of acids and bases
	b. Describe the hydronium ion and the concept of amphoterism
	c. Describe Arrhenius and Brønsted-Lowry acids and bases; identify conjugate acids and bases in reactions
	d. Relate solvent interaction to the formation of acidic and basic solutions
	f. Describe characteristics of strong and weak acids and bases, and identify common examples of both
V.C.2. Acid/Base Constants and pH; Titration; Buffers	a. Write and balance a simple equation for a neutralization reaction

**Purpose of the Unit:** Students will be able to discuss the qualitative properties of acids and bases. They will understand that there are multiple definitions, each with unique benefits, for acids and bases and for some substances they can act as both an acid and a base depending on the environment. Students will also be able to classify acids and bases based on their relative strengths. Students should be able to predict the acidic/ basic character of a solution based on the solute and describe the products of a neutralization reaction.

**Prerequisites:** Students should be able to:

- Predict the products of a double replacement reaction
- Write a net-ionic equation
- Demonstrate a basic understanding of acids and bases
- Draw Lewis structures
- Name common acids and bases

**Daily Lesson Guide**

Day	Lesson Content and Objectives	Focus Questions	Critical Thinking (High Yield / Literacy /LTF/etc.)	Engagement	Assessment and/or Accommodations
1	<p>* Intro to acids and bases</p> <p>* Hydronium and hydroxide ions with amphoterism</p> <p>* Neutralization reactions</p> <p>V.C.1.a, b</p> <p>V.C.2.a</p>	<p>* What are acids and bases?</p> <p>* What determines acidic/ basic behavior?</p> <p>* What types of reactions are they involved in?</p>	<p>* Summarizing and note taking</p> <p>* Evaluation/ analysis</p> <p>* Nonlinguistic representation</p>	<p>* Pre – test</p> <p>* ACT bell ringer</p> <p>* Model notes</p> <p>* Work sample problems together (formative)</p> <p>* 3-2-1 exit slip (formative)</p>	<p>* Evaluate pre- test</p> <p>* Evaluate sample problems and exit slip for understanding</p> <p>Enrichment: Less guidance in note taking, more independence in practice, more challenging examples in formative</p>

2	<ul style="list-style-type: none"> <li>* Arrhenius definition</li> <li>* Bronsted-Lowry definition with conjugate acids-bases</li> <li>* Lewis definition</li> </ul> <p>V.C.1.c</p>	<ul style="list-style-type: none"> <li>* What are the definitions of acids and bases?</li> <li>* How are they alike/ different?</li> </ul>	<ul style="list-style-type: none"> <li>* Summarizing and note taking</li> <li>* Identifying similarities and differences</li> <li>* Nonlinguistic representation</li> <li>* Evaluation/ Analysis</li> <li>* Advanced organizers</li> </ul>	<ul style="list-style-type: none"> <li>* ACT bell ringer</li> <li>* Model notes</li> <li>* Work sample problems together, alone (formative)</li> <li>* Venn diagram for comparisons</li> </ul>	<ul style="list-style-type: none"> <li>* Evaluate sample problems and Venn diagram for understanding</li> </ul> <p>Enrichment: Less guidance in note taking, more independence in practice, more challenging examples in formative</p>
3	<ul style="list-style-type: none"> <li>* Strong and weak acids and bases</li> <li>* Formation of acidic and basic solutions from salts</li> </ul> <p>V.C.1.d, f</p>	<ul style="list-style-type: none"> <li>* Will salts form acidic or basic solutions?</li> </ul>	<ul style="list-style-type: none"> <li>* Summarizing and note taking</li> <li>* Analysis</li> <li>* Identifying similarities and differences</li> <li>* Advanced organizers</li> <li>* Demo of antacids + stomach acid</li> </ul>	<ul style="list-style-type: none"> <li>* ACT bell ringer</li> <li>* Model notes</li> <li>* Work sample problems and complete organizer (formative)</li> <li>* Article on how antacids work</li> </ul>	<ul style="list-style-type: none"> <li>* Evaluate sample problems and classification organizer</li> <li>* Evaluate students' understanding of article</li> </ul> <p>Enrichment: Less guidance in note taking, more independence in practice, more challenging examples in formative</p>
4-5	<ul style="list-style-type: none"> <li>* Laboratory: Qualitative analysis of acid-base reactions with SA+SB, WA+SB, SA+WB, and WA+WB</li> </ul> <p>I.A.1.c, d, e, f I.A.3.d, g V.C.1.a, b, c, d, f V.C.2.a</p>	<ul style="list-style-type: none"> <li>* How can I use what I know to predict the outcome of acid-base neutralization reactions?</li> </ul>	<ul style="list-style-type: none"> <li>* Synthesis</li> <li>* Application/ Analysis</li> <li>* Identifying similarities and differences</li> <li>* Learning with others</li> <li>* Authenticity</li> <li>* Novelty and Variety</li> <li>* Generating and testing hypotheses</li> </ul>	<ul style="list-style-type: none"> <li>* ACT bell ringer</li> <li>* Conduct lab according to procedures provided (summative)</li> </ul>	<ul style="list-style-type: none"> <li>* Evaluate lab report</li> </ul> <p>Enrichment: Student development of lab procedures with less guidance</p>

6	<ul style="list-style-type: none"> <li>* Review</li> <li>I.A.1.c, d, e, f</li> <li>I.A.3.d, g</li> <li>V.C.1.a, b, c, d, f</li> <li>V.C.2.a</li> </ul>	<ul style="list-style-type: none"> <li>* What can I do to be better prepared for the exam?</li> </ul>	<ul style="list-style-type: none"> <li>* Use clickers to test students' knowledge and clarify and misconceptions before the exam with immediate feedback.</li> </ul>	<ul style="list-style-type: none"> <li>* ACT bell ringer</li> <li>* Use clickers to review with exam like questions (summative)</li> </ul>	<ul style="list-style-type: none"> <li>* Students participate in review</li> <li>Enrichment: Less time to solve problems and limited use of aides</li> </ul>
7	<ul style="list-style-type: none"> <li>* Exam</li> <li>I.A.1.c, d, e, f</li> <li>I.A.3.d, g</li> <li>V.C.1.a, b, c, d, f</li> <li>V.C.2.a</li> </ul>	<ul style="list-style-type: none"> <li>* Can I demonstrate my knowledge on the exam?</li> </ul>	<ul style="list-style-type: none"> <li>* Evaluation</li> <li>* Analysis</li> <li>* Application</li> <li>* Synthesis</li> </ul>	<ul style="list-style-type: none"> <li>* ACT bell ringer</li> <li>* Students take exam (summative)</li> </ul>	<ul style="list-style-type: none"> <li>* Evaluate exam</li> <li>Enrichment: No use of supports with exemption of periodic table, periodic table only has element symbols, not names</li> </ul>