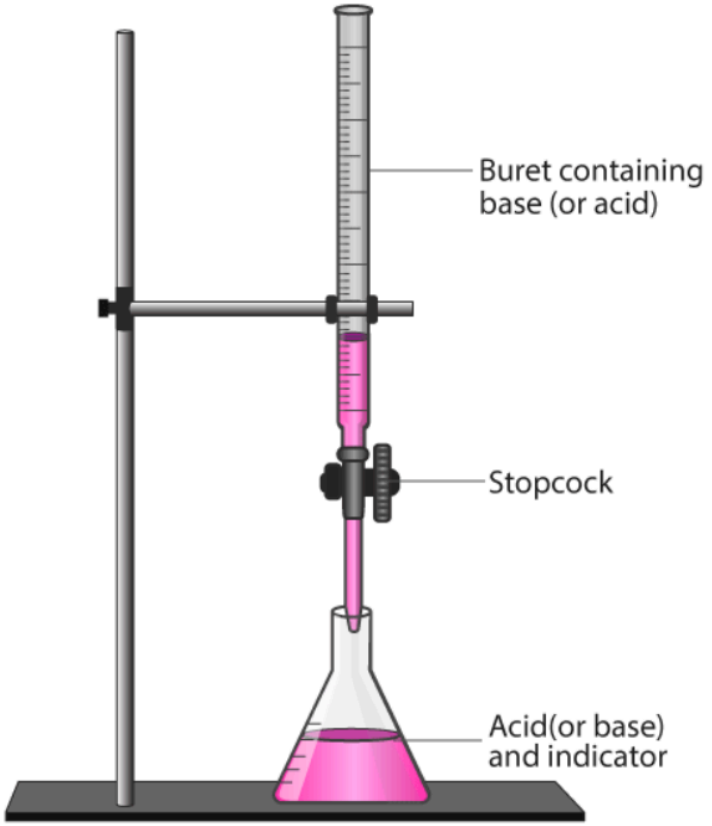
Acids & Bases



Unit Introduction

Acids and bases are everywhere in our daily lives. We should be able to recognize them, their dangers, their assets, and how they react with each other. By learning how they react with each other, we can use experimental methods to determine unknown concentrations.

Unit Priority Standards

- **SS.SCI.CHEM.1.2** - Simple Chemical Reactions
  HS-PS1-2.Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.
- **SS.SCI.CHEM.2.5** - Analyzing & Interpreting Data
  Analyzing data in 9–12 builds on K–8 experiences and progresses to introducing more detailed statistical analysis, the comparison of data sets for consistency, and the use of models to generate and analyze data.
- **SS.SCI.CHEM.2.6** - Mathematics & Computational Thinking
  Mathematical and computational thinking in 9- 12 builds on K-8 experiences and progresses to using algebraic thinking and analysis, a range of linear and nonlinear functions including trigonometric functions, exponentials and logarithms, and computational tools for statistical analysis to analyze, represent, and model data. Simple computational simulations are created and used based on mathematical models of basic assumptions.

Essential Question
1. How are acids and bases characterized and quantified, and how do they interact?
Enduring Understandings
1. Understanding how acids and bases react with each other, and the relationships between pH, pOH, and concentration help chemists determine unknown concentrations using titrations.
Essential Knowledge
1. Distinguishing between the characteristics and properties of acids and bases. 2. Identifying conjugate acid-base pairs 3. Reading the pH scale and understanding the relationships between pH, pOH, and concentration. 4. Calculations necessary to carry out dilutions. 5. Titration - experimental execution and calculations.
Essential Skills
1. Basic mathematical operations (multiplication, division, addition, subtraction) 2. Logarithmic calculations 3. Writing correct chemical formulas 4. Correctly balancing equations 5. Dimensional analysis

Unit Outline

Week 1	• Introduction to acids and bases • Strong vs. weak acids and bases • pH, pOH, and concentration calculations
Week 2	• Dilutions and titrations • Titration lab • Formative assessment
Week 3	• Unit Review • Summative Assessment

Assessment Details

Evidence	
I will check students' understanding throughout the unit by...	
Summative • Unit 6 Test (Rubric)	**Formative** • Check for understanding quizzes (not entered in PowerSchool) • Formative Quiz #1: Conjugate acid-base pairs, pH, pOH, and concentration calculations, dilutions, experimental determination of unknown concentrations of acids or bases with titrations (Rubric)