# FRANKLIN-SIMPSON HIGH SCHOOL

**Course Name:** AP Chemistry **Unit Name:** **Solutions** **Days: 8**

**AP Chemistry Objectives:**

**II. States of Matter (20%)**

**C. Solutions**

**1. Types of solutions and factors affecting solubility**

**2. Methods of expressing concentration (use of normalities is not tested)**

**3. Raoult's law and colligative properties (nonvolatile solutes); osmosis**

**4. Nonideal behavior (qualitative aspects)**

**V. Laboratory (5–10%)**

**The differences between college chemistry and the usual secondary school chemistry course are especially evident in the laboratory work. The AP Chemistry Exam includes some questions based on experiences and skills students acquire in the laboratory:**

- **making observations of chemical reactions and substances**
- **recording data**
- **calculating and interpreting results based on the quantitative data obtained**
- **communicating effectively the results of experimental work**

**Purpose of the Unit:**

In this unit, students will review concentration units (molarity, molality, % by mass, % by volume, mole fraction, etc.) as well as the basics of colligative properties. Then, students will use concentration to quantify the colligative properties and apply it to solution chemistry. This is the last unit of review from first year chemistry before students will begin a cumulative review to prepare them for the upcoming AP exam.

**Prerequisites:**

Students will need an understanding of:

- Concentration units
- Colligative properties

**Daily Lesson Guide**

| Day | Lesson Content and Objectives | Focus Questions | Critical Thinking (High Yield / Literacy /LTF/etc.) | Engagement | Assessment and/or Accommodations |
|---|---|---|---|---|---|
| **1** | **Concentration Units & Henry's Law<br>II.C.2, 3** | *** What are the different units of concentrations?<br>* How does Henry's law apply to solutions?** | *** Summarizing and note taking<br>* I Do – We Do – You Do<br>* Analysis/ Application<br>* Learning with others** | *** ACT bell ringer<br>* Take notes on modeled notes<br>* Solve problems within notes solo and in small groups (formative)** | *** Evaluate student sample problems for understanding** |
| **2** | **Colligative Properties & Raoult's Law<br>II.C.2, 3** | *** What are the colligative properties?<br>* How can the colligative properties be quantified?<br>* How does Raoult's law apply to solutions?** | *** Summarizing and note taking<br>* I Do – We Do – You Do<br>* Analysis/ Application<br>* Learning with others** | *** ACT bell ringer<br>* Take notes on modeled notes<br>* Solve problems within notes solo and in small groups (formative)** | *** Evaluate student sample problems for understanding** |

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| **3-4** | **Laboratory: AP required lab 04: Determination of Molar Mass by Freezing Point Depression<br>II.C.1, 2, 3, 4<br>V.** | *** How can I experimentally determine: the molar mass by finding the freezing point depression of a solution?** | *** Learning with Others<br>* Generating and testing Hypotheses<br>* Authenticity<br>* Novelty and Variety<br>* Analysis/ Applications/ Synthesis** | *** ACT bell ringer<br>* Work in small lab groups to solve a lab problem<br>* Use data collected to calculate the molar mass (summative)** | *** Evaluate lab reports<br>* Students can check themselves by verifying their results among other lab groups** |
| **5-6** | **Solutions FRQs and MC questions<br>II.C.1, 2, 3, 4<br>V.** | *** How will I be tested over solutions on the AP Chemistry Exam?<br>* How does everything I just learned fit together with what I already know?** | *** Learning with others<br>* Choice<br>* Clickers** | *** ACT bell ringer<br>* Work independently, then in small groups, then as whole class to solve and grade FRQ's with AP rubrics<br>* Use clickers and Turning Point to answers MC Questions from retired AP exams (summative)** | *** Evaluate student responses and provide immediate feedback on FRQ's and MC's with rubrics and keys** |
| **7-8** | **Unit Exam<br>II.C.1, 2, 3, 4<br>V.** | *** Can I use my knowledge to take an AP-like exam covering solutions?** | *** Evaluation<br>* Analysis<br>* Application<br>* Synthesis<br>* Authenticity** | *** ACT bell ringer<br>* Solve retired AP Chemistry MC and FR Questions<br>* Graded by AP standards and rubrics (summative)** | *** Evaluate exam** |