

# FRANKLIN-SIMPSON HIGH SCHOOL

**Course Name:** AP Chemistry

**Unit Name:** Atomic Structure

**Days:** 10

## **AP Chemistry Objectives:**

### **I. Structure of Matter (20%)**

#### **A. Atomic theory and atomic structure**

- 1. Evidence for the atomic theory**
- 2. Atomic masses; determination by chemical and physical means**
- 3. Atomic number and mass number; isotopes**
- 4. Electron energy levels: atomic spectra, quantum numbers, atomic orbitals**
- 5. Periodic relationships including, for example, atomic radii, ionization energies, electron affinities, oxidation states**

#### **B. Chemical bonding**

##### **2. Molecular models**

- a. Lewis structures**
- b. Valence bond: hybridization of orbitals, resonance, sigma and pi bonds**
- c. VSEPR**

- 3. Geometry of molecules and ions, structural isomerism of simple organic molecules and coordination complexes; dipole moments of molecules; relation of properties to structure**

### **IV. Descriptive Chemistry (10–15%)**

Knowledge of specific facts of chemistry is essential for an understanding of principles and concepts. These descriptive facts, including the chemistry involved in environmental and societal issues, should not be isolated from the principles being studied but should be taught throughout the course to illustrate and illuminate the principles. The following areas should be covered:

- 2. Relationships in the periodic table: horizontal, vertical and diagonal with examples from alkali metals, alkaline earth metals, halogens, and the first series of transition elements**

**Purpose of the Unit:**

Students have just completed the “Big 4” topics that make up the majority of the AP Chemistry exam. This unit begins the remaining topics that have been previously covered in first-year, pre-AP Chemistry. Atomic structure will look at what makes up an atom, how we know what we know about the atom, and how we represent the atom. We also take an in-depth look at the periodic trends students are already familiar with and expand our understanding to rationalize why the trends are what they are.

**Prerequisites:**

Students will need an understanding of:

- Contributors of the atomic model
- Electron configurations
- Atomic structure
- Periodic trends

**Daily Lesson Guide**

Day	Lesson Content and Objectives	Focus Questions	Critical Thinking (High Yield / Literacy /LTF/etc.)	Engagement	Assessment and/or Accommodations
1-2	Atomic Theory I.A.1, 2, 3, 4, 5	* What are the theories associated with the development of the atomic model?	* Summarizing and note taking * I Do – We Do – You Do * Analysis/ Application * Learning with others	* ACT bell ringer * Take notes on modeled notes * Solve problems within notes solo and in small groups (formative)	* Evaluate student sample problems for understanding

3-4	Quantum Numbers, Electron Configurations & Orbital Notation I.A.1, 2, 3, 4, 5	* How are electrons represented in atomic models?	* Summarizing and note taking * I Do – We Do – You Do * Analysis/ Application * Learning with others	* ACT bell ringer * Take notes on modeled notes * Solve problems within notes solo and in small groups (formative)	* Evaluate student sample problems for understanding
5-6	Periodic Trends (Including the Do's and Don'ts Handout) I.B.2, 3 IV.2	* What are the periodic trends and how do I justify them on a FRQ?	* Summarizing and note taking * I Do – We Do – You Do * Analysis/ Application * Learning with others	* ACT bell ringer * Take notes on modeled notes * Solve problems within notes solo and in small groups (formative)	* Evaluate student sample problems for understanding
7-8	Atomic Structure & Periodicity FRQs and MC questions I.A.1, 2, 3, 4, 5 I.B.2, 3 IV.2	* How will I be tested over atomic structure on the AP Chemistry Exam? * How does everything I just learned fit together with what I already know?	* Learning with others * Choice * Clickers	* ACT bell ringer * Work independently, then in small groups, then as whole class to solve and grade FRQ's with AP rubrics * 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

<b>9-10</b>	<b>Unit Exam</b> <b>I.A.1, 2, 3, 4, 5</b> <b>I.B.2, 3</b> <b>IV.2</b>	<b>* Can I use my</b> <b>knowledge to take an</b> <b>AP-like exam covering</b> <b>atomic structure?</b>	<b>* Evaluation</b> <b>* Analysis</b> <b>* Application</b> <b>* Synthesis</b> <b>* Authenticity</b>	<b>* ACT bell ringer</b> <b>* Solve retired AP</b> <b>Chemistry MC and</b> <b>FR Questions</b> <b>* Graded by AP</b> <b>standards and</b> <b>rubrics (summative)</b>	<b>* Evaluate exam</b>
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