

# FRANKLIN-SIMPSON HIGH SCHOOL

Course Name: Chemistry

Unit Name: Bonding I

Days: 11

## Quality Core Objectives:

Unit 11 Bonding I	
I.A.1. Scientific Inquiry	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
	g. Routinely make predictions and estimations
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
IV.B.3. Intermolecular Forces and Types of Bonds	a. Describe the characteristics of ionic and covalent bonding
	b. Explain ionic stability, recognize typical ionic configurations, and predict ionic configurations for elements (e.g., electron configurations, Lewis dot models)
	c. Describe the nature of the chemical bond with respect to valence electrons in bonding atoms
	d. Explain how ionic and covalent compounds differ
	e. Describe the unique features of bonding in carbon compounds
IV.B.4. Orbital Theory Applied to Bonding	a. Use Lewis dot diagrams to represent bonding in ionic and covalent compounds
	b. Draw Lewis structures for molecules and polyatomic ions, including those that must be represented by a set of resonance structures
	c. Use VSEPR theory to explain geometries of molecules and polyatomic ions
	d. Describe how orbital hybridization models relate to molecular geometry
	e. Describe the molecular orbital models for double bonds, triple bonds, and delocalized pi electrons

**Purpose of the Unit:** Students will be able to compare and contrast the characteristics of the two main types of bonding between atoms. Students will also be able to represent compounds with various visual representations (Lewis structures, electron configurations, VSEPR, resonance structures, etc.)

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

- identify elements as metals and non-metals
- identify valence electrons
- write electron configurations

**Daily Lesson Guide**

Day	Lesson Content and Objectives	Focus Questions	Critical Thinking (High Yield / Literacy /LTF/etc.)	Engagement	Assessment and/or Accommodations
1	<ul style="list-style-type: none"> <li>* Chemical Bonding</li> <li>* Ionic Bonding</li> </ul> IV.B.3.a, b, c, d IV.B.4.a	<ul style="list-style-type: none"> <li>* What holds compounds together?</li> <li>* Why do compounds form?</li> </ul>	<ul style="list-style-type: none"> <li>* Summarizing and Note taking</li> <li>* I Do-We Do-You Do for practice problems</li> </ul>	<ul style="list-style-type: none"> <li>* ACT Bell Ringer</li> <li>* Pre-test</li> <li>* Take notes/ model problems writing names and formulas</li> <li>* Book problems (formative)</li> <li>* Read about carbon allotropes</li> </ul>	<ul style="list-style-type: none"> <li>* Check/ evaluate the pre-test</li> <li>* Evaluate book problems and understanding of article on allotropes</li> </ul> Accommodations: prompting/ cueing, paraphrasing, reader, scribe, extended time, reduced assignment (as needed)
2	<ul style="list-style-type: none"> <li>* Properties of ionic compounds</li> <li>* Drawing ionic compounds</li> </ul> IV.B.3.a, b, c, d IV.B.4.a, b	<ul style="list-style-type: none"> <li>* What are the properties of ionic compounds and how can they be predicted?</li> <li>* What do ionic compounds look like?</li> </ul>	<ul style="list-style-type: none"> <li>* Summarizing and Note taking</li> <li>* Identifying similarities and differences</li> <li>* I Do-We Do-You Do for practice problems</li> </ul>	<ul style="list-style-type: none"> <li>* ACT Bell Ringer</li> <li>* Take notes/ model sample problems predicting properties</li> <li>* Agree/ disagree/ rationalize property statements (formative)</li> </ul>	<ul style="list-style-type: none"> <li>* Evaluate book problems</li> </ul> Accommodations: prompting/ cueing, paraphrasing, reader, scribe, extended time, reduced assignment (as needed)

3	<p>* Electron configurations of ions IV.B.3.b, c IV.B.4.a</p>	<p>* How can the electron configuration of an ion be used to predict behavior?</p>	<p>* Summarizing and Note taking * Non-linguistic representation * I Do-We Do-You Do for practice problems</p>	<p>* ACT Bell Ringer * Take notes/ model sample problems writing configurations * Practice writing electron configurations for ions (formative) * Students read MSDS sheet on a salt from the lab</p>	<p>* Evaluate book problems * Evaluate students' comprehension of MSDS sheet Accommodations: prompting/ cueing, paraphrasing, reader, scribe, extended time, reduced assignment (as needed)</p>
4	<p>* Laboratory: Formation of a Salt I.A.1.d. e. g I.A.3.d. g IV.B.3.a, d IV.B.4.a, b</p>	<p>* How can an ionic compound be synthesized?</p>	<p>* Synthesis * Application/ Analysis * Identifying similarities and differences * Learning with others * Authenticity * Novelty and Variety * Generating and testing hypotheses</p>	<p>* ACT Bell Ringer * Work in groups of 2-3 to complete the lab (summative) * Complete lab reports * Compare results</p>	<p>* Evaluate lab report Accommodations: Pair higher level students with lower level students, more guided instructions, prompting/ cueing, paraphrasing, reader, scribe, extended time, reduced assignment (as needed)</p>
5	<p>* Covalent bonding IV.B.3.a, b, c, d IV.B.4.a, b</p>	<p>* Why do covalent compounds form? * What are the characteristics of covalent compounds?</p>	<p>* Summarizing and Note taking * I Do-We Do-You Do for practice problems</p>	<p>* ACT Bell Ringer * Take notes/ model problems writing names and formulas * Book problems (formative)</p>	<p>* Evaluate book problems Accommodations: prompting/ cueing, paraphrasing, reader, scribe, extended time, reduced assignment (as needed)</p>

6	<ul style="list-style-type: none"> <li>* Properties of covalent bonds</li> <li>* Drawing covalent compounds</li> <li>IV.B.3.a, b, c, d</li> <li>IV.B.4.a, b</li> </ul>	<ul style="list-style-type: none"> <li>* What are the properties of covalent compounds?</li> <li>* How can the properties be predicted?</li> </ul>	<ul style="list-style-type: none"> <li>* Summarizing and Note taking</li> <li>* Identifying similarities and differences</li> <li>* I Do-We Do-You Do for practice problems</li> </ul>	<ul style="list-style-type: none"> <li>* ACT Bell Ringer</li> <li>* Take notes/ model problems writing names and formulas</li> <li>* Book problems (formative)</li> </ul>	<ul style="list-style-type: none"> <li>* Evaluate book problems</li> <li>Accommodations: prompting/ cueing, paraphrasing, reader, scribe, extended time, reduced assignment (as needed)</li> </ul>
7	<ul style="list-style-type: none"> <li>* VSEPR theory</li> <li>IV.B.3.b</li> <li>IV.B.4.a, c</li> </ul>	<ul style="list-style-type: none"> <li>* How do electrons space themselves out in a compound?</li> </ul>	<ul style="list-style-type: none"> <li>* Summarizing and Note taking</li> <li>* Non-linguistic representation</li> <li>* I Do-We Do-You Do for practice problems</li> </ul>	<ul style="list-style-type: none"> <li>* ACT Bell Ringer</li> <li>* Take notes/ model problems w/ names &amp; formulas</li> <li>* Book problems (formative)</li> </ul>	<ul style="list-style-type: none"> <li>* Evaluate book problems</li> <li>Accommodations: prompting/ cueing, paraphrasing, reader, scribe, extended time, reduced assignment (as needed)</li> </ul>
8	<ul style="list-style-type: none"> <li>* VSEPR theory</li> <li>* Molecular geometry</li> <li>IV.B.3.b</li> <li>IV.B.4.a, c, e</li> </ul>	<ul style="list-style-type: none"> <li>* What determines the 3 dimensional shape of a compound?</li> <li>* How do you predict the shape of a compound?</li> </ul>	<ul style="list-style-type: none"> <li>* Summarizing and Note taking</li> <li>* Non-linguistic representation</li> <li>* I Do-We Do-You Do for practice problems</li> </ul>	<ul style="list-style-type: none"> <li>* ACT Bell Ringer</li> <li>* Take notes/ model problems writing names and formulas</li> <li>* Model 3D shapes with balloons</li> <li>* Book problems (formative)</li> </ul>	<ul style="list-style-type: none"> <li>* Evaluate book problems</li> <li>Accommodations: prompting/ cueing, paraphrasing, reader, scribe, extended time, reduced assignment (as needed)</li> </ul>
9	<ul style="list-style-type: none"> <li>* Hybridization</li> <li>IV.B.3.b</li> <li>IV.B.4.a, c, d, d</li> </ul>	<ul style="list-style-type: none"> <li>* What happens within a compound when there are s, p, d, and f orbitals present?</li> <li>* What do double and triple bonds look like?</li> </ul>	<ul style="list-style-type: none"> <li>* Summarizing and Note taking</li> <li>* Non-linguistic representation</li> <li>* I Do-We Do-You Do for practice problems</li> </ul>	<ul style="list-style-type: none"> <li>* ACT Bell Ringer</li> <li>* Take notes/ model problems writing names and formulas</li> <li>* Book problems (formative)</li> </ul>	<ul style="list-style-type: none"> <li>* Evaluate book problems</li> <li>Accommodations: prompting/ cueing, paraphrasing, reader, scribe, extended time, reduced assignment (as needed)</li> </ul>

10	<ul style="list-style-type: none"> <li>* Review</li> <li>I.A.1.d, e, g</li> <li>I.A.3.d, g</li> <li>IV.B.3.a, b, c, d, e</li> <li>IV.B.4.a, b, c, d, e</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>Accommodations: prompting/ cueing, extended time, paraphrasing, reader, use of formula sheet (as needed)</li> </ul>
11	<ul style="list-style-type: none"> <li>* Exam</li> <li>I.A.1.d, e, g</li> <li>I.A.3.d, g</li> <li>IV.B.3.a, b, c, d, e</li> <li>IV.B.4.a, b, c, d, e</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>Accommodations: prompting and cueing, extended time, paraphrasing, reader, limited choices, use of formula sheet (as needed)</li> </ul>