

# Krug Chemistry – Deep Run Daily Planning Guide

Date of Lesson: Q2 Day 7– Valence, Oxidation, and Nomenclature

<b>Topic /Big Questions: (<a href="#">Question Stems</a> &amp; <a href="#">Question Creation Chart</a>)</b> <ul style="list-style-type: none"> <li>• <b>How do atoms form chemical bonds?</b></li> <li>• <b>What is the difference between a molecule and a compound?</b></li> <li>• <b>How is ionic bonding different than covalent bonding?</b></li> <li>• <b>How are chemical formulas written?</b></li> <li>• <b>What is chemical nomenclature?</b></li> </ul>	
<b><a href="#">State SOL</a></b>  CH1  CH 3	<b>Unpacking the Standards (<a href="#">Video explanation shown at 3:18</a>)</b>  CH.1 The student will demonstrate an understanding of scientific and engineering practices by f) obtaining, evaluating, and communicating information  CH.3 The student will investigate and understand that atoms are conserved in chemical reactions. Knowledge of chemical properties of the elements can be used to describe and predict chemical interactions. Key ideas include <ul style="list-style-type: none"> <li>a) <b>chemical formulas</b> are models used to represent the number of each type of atom in a substance;</li> <li>b) substances are named based on the <b>number of atoms</b> and the <b>type of interactions</b> between atoms;</li> <li>c) balanced chemical equations model rearrangement of atoms in chemical reactions;</li> <li>d) atoms bond based on <b>electron interactions</b>;</li> <li>e) molecular geometry is predictive of <b>physical and chemical properties</b>; and</li> <li>f) reaction types can be predicted and classified.</li> </ul>
<b>Visible Learning (For the three items with asterisks*, think from a student perspective. Use simple language)</b>	
<b>*What am I learning today?</b> The number of valence electrons determines the type of bonding. Oxidation numbers represent the number of valence electrons gained or lost during ionic bonding. The rules of chemical nomenclature are based on the type of bond and number of atoms.	
<b>*Why is it important?</b> The type of atom and number of valence electrons will determine the type of bond. Understand how bond occur will enable chemists to predict products in chemical reactions.	
<b>*How will I know I've learned it?</b> I will understand that ionic bonds occur when a metal atom transfers an electron to a nonmetal atom. This creates a positive cation (metal) and a negative anion (nonmetal). I will understand that covalent bonds occur when nonmetals share electrons. Due to sharing, multiple bonding proportions are available. Using chemical nomenclature will enable me to communicate with other chemists.	
<b><a href="#">Differentiation strategies:</a></b>  <b>Valence and Oxidation Worksheet</b>  <b>Lewis Dot Worksheet</b>  <b>Intro to Chemical Bonding Worksheet</b>  <b>Lattice Energy and Coulomb's Law</b>  <b>Diatomic Elements and Polyatomic Ions</b>	

**Accommodations and/or modifications are being met for students with IEP's/504's.**

Small group activities; frequent checks for understanding; materials available on Schoology

**Daily Plan/Sequence of Instruction:**

Students will complete the **Valence and Oxidation Worksheet** for a warm up activity. Teacher will ask students to identify the number of valence electrons for random elements. Teacher will remind students that valence electrons come from "s" and "p" orbitals and explain that Lewis dots represent the number of valence electrons for a given atom. Students will complete the **Lewis Dot worksheet** for practice. Teacher will use the **Intro to Chemical Bonding** worksheet to explain how to use Lewis dots to show the process of ionic and covalent bonding. Teacher will explain significance of **Lattice Energy and Coulomb's Law**. Students will practice the **Diatomic Elements and Polyatomic Ions** for the quiz next class.

**Assessments (List all [formative](#)/[summative](#) assessments used to check for understanding during this lesson. Summative assessments may occur during a different class period.):**

**Valence and Oxidation Worksheet** – (summative)

**Lewis Dot Worksheet** – (summative)

**Intro to Chemical Bonding** – (formative)

**Lattice Energy and Coulomb's Law** – (formative)

After assessing today's lesson are you and your students comfortable moving forward with your next objective?

**Yes** - students identified valence, oxidation number, and Lewis Dots; students understand how to use Lewis dots to form bonds; students understand that ratio of ions for ionic bonding

**No**, remediation required to proceed – students can come to One Lunch for help. We will review these concepts in more detail over the next several days.

**Teacher reflection:** Even though the difference between ionic and covalent bonding seems easy enough to understand, students often get them backwards. Even honors students get the facts mixed up. For example, a student may know that a metal transfers an electron, but they often think this makes it more negative instead of more positive. Students struggle to think of losing something as a positive thing. Teachers need to emphasize that the atom is losing a negative particle so it makes the atom more positive.