

# Krug Chemistry – Deep Run Daily Planning Guide

Date of Lesson: Q2 Day 11 – Crystallization Labs

<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 metallic crystals form?</b></li> <li>• <b>How do ionic crystals form?</b></li> <li>• <b>How do covalent crystals form?</b></li> <li>• <b>How do the crystals look different?</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> Metal crystals form when metal ions form a crystal lattice. The more the delocalized electrons, the stronger the strength of the crystal lattice. Ionic crystals form when cations are attracted to anions and form a crystal lattice in which each atom is attracted to 4 other atoms. Covalent crystals form by sharing electrons and bonding with other nearby atoms.	
<b>*Why is it important?</b> Understanding how bonds form and how crystals are different will help chemists identify the type of substance and predict boiling point, melting point, and other chemical and physical properties.	
<b>*How will I know I've learned it?</b> I will be able to sketch the macroscopic view of crystal formation. I will be able to identify the type of crystal based on the structure of the bonds.	
<b><a href="#">Differentiation strategies:</a></b>  <b>Crystallization Labs</b> <ul style="list-style-type: none"> <li>• Borax Crystals</li> <li>• Cu and AgNO<sub>3</sub> – silver crystals</li> <li>• Salt vs Sugar Crystals</li> <li>• Chemistry of Candy Canes</li> </ul> <b>Unit 5 Test Review</b>	
<b>Accommodations and/or modifications are being met for students with IEP's/504's.</b>  Small group activities; frequent checks for understanding; materials available on Schoology	

**Daily Plan/Sequence of Instruction:**

Teacher will set up stations for each type of crystal growth. Students will rotate through the stations and record sketches and observations in their lab notebooks. It helps to use a x2 or x4 Stereoscope (<https://www.flinnsci.com/products/biology/microscopes--slides/flinn-economy-stereoscopes/>). Teacher will ask students to explain similarities and differences. Teacher will show the following YouTube videos to explain how crystals form:

- <https://www.youtube.com/watch?v=5vSBjS99Ozs> – Bozeman Ionic Solids
- <https://www.youtube.com/watch?v=PU9rzTjLyb4> – Bozeman Covalent Network Solids

**Unit 5 Test Review** will be due on the day of the Unit 5 Test. Students have 2 attempts to get their highest score.

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

**Crystallization Labs** – (formative)

**Unit 5 Test Review** – (summative)

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

**Yes** - students, who recorded sketches and observations in their lab notebooks, received a 100% participation grade; and students scored 80% or higher on Unit 5 Test Review

**No**, remediation required to proceed – students, who were off task and did not record observations will receive a failing grade; parent/guardian will be notified; students will be allowed to copy notebook information from other students for a 65% passing score; teacher will offer test review session morning of test

**Teacher reflection:** The copper and silver nitrate reaction happens quickly. Students need to pay attention and look through the stereoscope to observe crystal formation. If Borax crystals do not form quickly check the concentration and water temperature. Salt and sugar crystals can be formed quickly using a Bunsen burner and evaporation techniques.

For fun, try to make the crystal trees or buy the kits. Here are some links to kits:

[https://www.amep.com/index.php?route=product/product&product\\_id=6239&search=crystal+tree](https://www.amep.com/index.php?route=product/product&product_id=6239&search=crystal+tree)

<https://www.teachersource.com/product/magic-crystal-tree/chemistry-kits>

<https://www.orientaltrading.com/magic-growing-trees-a2-13718418.fltr>

Or make your own trees! <https://www.youtube.com/watch?v=r9PmRXQPhU0>