Krug Chemistry – Deep Run Daily Planning Guide

Date of Lesson: Q2 Day 20 – Percent Composition, Empirical Formulas, and Molecular Formulas

Topic /Big Questions: (Question Stems & Question Creation Chart)

- **What is the mass of each element in a compound?**
- **What is the total mass of a compound?**
- **What is the percent of each element in the compound?**
- **What is the law of multiple proportions?**
- **What is the difference between an empirical formula and a molecular formula?**
- **How can empirical and molecular formulas be calculated?**
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State SOL	Unpacking the Standards (Video explanation shown at 3:18)
CH.4	CH.4 The student will investigate and understand that molar relationships compare and predict chemical quantities. Key ideas include a) Avogadro's principle is the basis for molar relationships; and b) stoichiometry mathematically describes quantities in **chemical composition** and in chemical reactions

Visible Learning (For the three items with asterisks*, think from a student perspective. Use simple language)

***What am I learning today?** Empirical and molecular formulas are used to show the chemical composition of a compound. Both of these are useful in determining the formula of a substance based on the mass of the elements of an unknown substance. The percent composition reflects the amount of each element within the compound.

***Why is it important?** Chemists use empirical formulas and molar masses to determine the composition of unknown substances.

***How will I know I've learned it?** I will be able to determine the empirical and molecular formulas of a compound given masses of elements that compose it and conduct an investigation to determine the percent composition and/or the empirical formula of a substance

Differentiation strategies:

Percent Composition Activity (can use beans, M & Ms, or Skittles)

Percent Composition, Empirical Formula and Molecular Formula PowerPoint

Percent Composition and Molar Mass Worksheet

Empirical and Molecular Formula Worksheet

Empirical Formula Lab

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 be given Fun Size bags of **M & Ms**. Each student will be told to count the amount of each color of M & M's and determine the percent of that color. Teacher will explain that this same process is used to determine the percent of elements in a compound. Teacher will show **Percent Composition, Empirical Formula and Molecular Formula PowerPoint** and explain the steps in calculating each concept. Students will begin working on the **Percent Composition and Molar Mass Worksheet** and the **Empirical and Molecular Formula Worksheet.** Teacher will offer assistance as needed. Students will take turns doing the first part of the **Empirical Formula Lab**. Teacher will boil off most of the acid in a fume hood (approx. 2 hours). Students will complete the remaining steps during the 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.):

M & M's Lab – (formative)

Percent Composition and Molar Mass Worksheet – (summative)

Empirical and Molecular Formula Worksheet – (summative)

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

Yes - students can calculate percent composition, molar mass, empirical formula, and molecular formula

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.