Krug Chemistry – Deep Run Daily Planning Guide

Date of Lesson: Q3 Day 1 – Balancing Equations CER

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

- **How is mass conserved in chemical reactions?**
- **What patterns can be seen in chemical reactions?**
- **How can identifying the reactants enable chemists to predict the products?**

State SOL	Unpacking the Standards (Video explanation shown at 3:18)
CH.3	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 f) **reaction types can be predicted and classified**.
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?** The Law of Mass Conservation means the number of atoms in the reactants must equal the number of atoms in the products. Patterns in the type of reactions enable chemists to predict the products.

***Why is it important?** The Law of Mass Conservation means that the number of atoms must be balanced on both sides of the chemical equation.

***How will I know I've learned it?** I will identify the types of reactions, balance the number of atoms on both sides of the chemical equation, and predict the products.

Differentiation strategies:

PhET Balancing Equations Simulation

AMTA – Rearranging Atoms CER

Balancing Equations Worksheets

Balancing Combustion Reactions Notes

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 investigate the **PhET Balancing Equations Simulation**. (https://phet.colorado.edu/en/simulation/balancing-chemical-equations) Next students work in groups to complete the **AMTA – Rearranging Atoms** practice problems. Teacher will assign a different problem to each group to put on their whiteboard. Teacher will lead CER discussion as to what the particle diagrams should look like. For example, if a chemical equation requires 2 moles of iron did the students draw 2 separate atoms of iron or did they try to draw a diatomic molecule. Iron is NOT diatomic. In other words, the teacher should explain the difference between **2 Fe** and **Fe_2** in chemical formulas. Teacher will use the remaining AMTA worksheet questions to guide the CER discussion. Students will take turns explaining their findings. Finally, teacher will use the first 6 practice problems as a guide on the **Balancing Equations Worksheet**. Students will be asked to identify the nature of the reactants and products, identify the types of reactants, and then the teacher will show some tips for balancing equations. Students will complete the rest of the worksheet for homework.

Tips for Balancing Equations:

- Keep polyatomic ions together if they exist on both sides of the equation.
- If one side has water than the other side has hydroxide, rewrite water as H(OH).
- DO NOT use H(OH) for combustion reactions!!!
- See 4 easy steps for Balancing Combustion Reactions document.
- For Neutralization and Double Replacement, draw arrows to put the outsides together and insides together.
- For single replacement, the oxidation number of the element will determine which ion it replaces.

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

PhET Balancing Equations Simulation - (formative)

AMTA – Rearranging Atoms CER – (formative)

Balancing Equations Worksheets – (summative)

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

Yes - students scored 80% or higher on the Balancing Equations worksheet

No, remediation required to proceed – tutoring will be available during One Lunch

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