Chemical Reaction

Unit Introduction

In quarter 3, we are going to cover all the different types of chemical reactions and their characteristics. You will learn to calculate the amount of products that you would get after a certain reaction occurs. We will then learn how measurements can be applied in a chemical reaction to determine the mass relationships in moles of products formed from a given amount of reactants. Quarter 3's research paper will also give you a great chance to apply what you have learned in chemical reactions to put together your project to present at the end of the quarter.

Unit Priority Standards

- **Periodic Law HS-PS1-1** Students are able to use the periodic table to predict the distinguishing properties of elements to write chemical formulas of covalent and ionic compounds.

- **Law of Conservation of Mass HS-PS1-7** Students are able to communicate the law of conservation of mass of a chemical reaction to do stoichiometric calculations
- **Chemical Reactions HS-PS1-2** Students are able to explain the outcome of a simple chemical reaction based on the outermost electron states of atoms and its trends in the periodic table.
- **Chemical Reactions HS-PS1-7** Students are able to use mathematical representations to show conservation of mass is applied from chemical equations showing the balancing of atoms and molecules.

Unit Transfer Goals

- The ability to engage in scientific inquiry and define real-world problems.
- Design and conduct an authentic scientific investigation in order to collect and analyse data and draw meaningful conclusions.
- -The ability to approach a complex problem using logical steps and mathematical reasoning and skills.

Unit Essential questions
1. How do the chemical reactions that take place in our body serve our bodily functions to maintain homeostasis? 2. How does a chemical engineer (use chemical reactions to) produce desired yields using chemistry?

Acquisition of Knowledge Skill	
Students will know…	*Students will be skilled at…*I can…
1. Naming and predicting formulas 2. Different type of reactions 3. Conservation of mass	1. Predicting product 2. Converting between different units 3. Predicting the yield of the product. 4. Applying the conservation of mass

Unit Plan

Week 1: 2/3-2/4	**Chemical reaction**
Learning Target(s):	-Students understand the basics of a chemical reaction and know how to correctly balance it. -Students are able to predict the products of a chemical reaction and can distinguish the specific type of reaction
Acquired Knowledge:	Chemical Reaction : Balancing equation, Different types of chemical reaction
Skills, Activities,	Balancing Equation worksheet, Type of reaction activities
Week 2: 2/7-2/11	**Chemical reaction**
Learning Target(s):	-Students know how to write complete ionic and net ionic equations for chemical reactions in aqueous solution. -Students can identify the activity series of both metals and nonmetals -Students are able to predict whether reactions in aqueous solution will produce a precipitate, water, or a gas
Acquired Knowledge:	Chemical Reaction : Complete ionic equation, Activity Series (Single replacement)
Skills, Activities,	Complete ionic equation worksheet, Net ionic equation worksheet
Week 3: 2/14-2/18	**Stoichiometry**
Learning Target(s):	-Students understand mole to mass relationship in a balanced chemical equation -Students understand steps of stoichiometry and are able to apply it to real life problems -Apply their learning through conducting the experiments
Acquired Knowledge:	Different types of reaction, predicting product Limiting reactant, percent yield
Skills,	Calculating percent yield worksheet, Stoichiometry lab (Limiting reactant)

Activities,	
Week 4: 2/21-2/25	**Stoichiometry/Limiting reactant**
Learning Target(s):	-Students understand idea of limiting reactant and are able to tell which substance is limiting reactant -Students understand what are the theoretical yield of chemical reaction and how to calculate the percent yield for a chemical reaction
Acquired Knowledge:	Percent yield, Predicting amount of product
Skills, Activities,	Stoichiometry lab (Limiting reactant)

Assessment Details

Evidence	
Evaluative Criteria	*Students will show their learning by...*
• Project	Performance Task(s): **Project Rubric** For Quater 3, your group will select a theme topic related to real life reactions approved by the teacher and there can only be one theme chosen per class so the group that selects a specific theme first will get to research on that theme. Once your group has selected a theme and approved, you will apply learned concepts and do extensive research. Your research and gathered information must tie in to the concepts of your selected theme and it will be about the different types of reactions (synthesis, decomposition, SR, DR, A/B) involved and how those reactions affect the system as a whole.
• Lab report	**HS Lab report rubric**
• Unit Quiz	Once a chapter is finished, students will be assessed based on the

	contents that we covered in class.

Rubrics **(based upon priority standards)**

Stated on the Description of Assessment

Extended Learning Opportunities

Website Description	Website
PhET Simulations:	**https://phet.colorado.edu/en/simulations/category/chemistry**
Khan Academy:	**https://www.khanacademy.org/science/chemistry**
Albert (For challenge)	**https://www.albert.io/home**