Chemical Engineering

Day 5

Lesson Overview

The purpose of this lesson is to introduce students to Chemical Engineering and allow the students to gain a basic understanding of the field. Students will be learning about density, chemical reactions, and chemical mixing and applying their knowledge to construct a homemade Lava Lamp using the materials provided.

Lesson Objectives

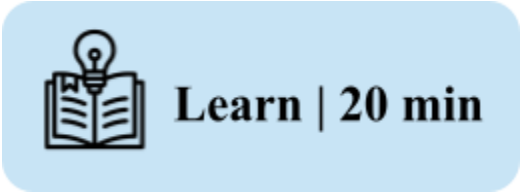
By the end of this lesson, students will be able to:

- Understand what Chemical Engineers do in the real world
- Gain a strong understanding of the concept of density, how to calculate it, and how it can be applied
- Understand how their homemade Lava Lamp works and explain the Chemistry powering the lamp

Vocabulary

1. **Density:** How light or heavy an object is compared to the volume it takes up. Calculated by the formula: Density = Mass/Volume
    a. Students will learn how different densities interact with each other
2. **Chemical Reaction:** A reaction that produces a new substance or chemical. The reaction students will tackle creates Carbon Dioxide
3. **Chemical Mixing:** Students will learn that water and oil do not mix because they are different molecules. Similar molecules mix well.

Lesson Plan

Chemical Engineering Presentation 	**Objective**: Provide an introduction to engineering, the common goal of engineering (solving problems to make the world a better place), and brief overview of engineering fields. **Materials**: PowerPoint Presentation ("Day 1 - Intro to Engineering.pptx")

Complete WORKSHEET 	**Objective**: Students work individually to calculate the densities of Water, Vegetable Oil, and Carbon Dioxide using this worksheet. The data is already provided, so all students have to do is plug in numbers. **Goal:** Students will analyze data and better understand why their Lava Lamp works.
CONSTRUCT LAVA LAMP 	**Objective**: All materials needed will be provided by the instructors. Students will fill up their bottles roughly 75% with oil and 25% with water, before adding in some food coloring. Specific instructions will be provided the day of
REFLECTION 	A typical reaction cycle lasts only 5-10 minutes, afterwards, another tablet will have to be dropped in. Students will be provided one additional Alka-Seltzer tablet to take home with them. **Reflection**: • Why does the Lava Lamp work? • Were there any unexpected problems building the Lamp? • Did any of the results surprise you?

Additional Resources:
Alka-Seltzer Tablet purchase link or another link
Inspiration/Similar Project Idea