

# Density Column Lesson Plan

**Teacher**

**Date**

**School**

**SLE # PS.5.6.5:** Construct a density column

using a minimum of four different liquids, PS.5.6.6: Use a density column to test the density of various solid objects, NS.1.6.2: Identify and define components of experimental design used to produce empirical evidence, NS.1.6.5: Communicate results and conclusions from scientific inquiry

## **Objectives:**

**Content:** I will be able to construct a density column using a minimum of four different liquids.

I will be able to use a density column to test the density of various solid objects.

I will identify and define components of experimental design to produce empirical evidence.

I will communicate results and conclusions from scientific inquiry.

**Language:** I will use the terms density, density column, predict, compare, observe, hypothesis, variables, conclusion, and inquiry while working with my group.

**Assessment:** Students will be assessed based on their completed activity sheet and questions.

**Technology/Materials:** 50 mL or 100 mL graduated cylinders (1 per group of 2-3 students), various liquids (water, rubbing alcohol, maple syrup, molasses, etc), various objects (beans, gram cubes, paper clips, modeling clay, etc), paper towels, plastic cups (to distribute liquids, the small bathroom sized are the best), science trays, plastic spoons, activity sheet, pencil, pictures of BP Gulf Oil Spill or Exxon Valdez spill (optional)

**Vocabulary:** density, density column, predict, compare, observe, hypothesis, variables, conclusion, inquiry

**Bloom's:** X Remembering X Understanding  Applying X Analyzing X Evaluation X Creating

**Questions:** Explain what density is. Explain what is happening right now with the BP oil spill.

Where is all the oil situated? Tell me why the oil is not mixing with the water. Predict what would happen if someone tried to mix oil and water together. Predict what would happen if you were to put liquids with different densities together. Would they mix? Explain your reasoning.

**High Yield Strategies:** X Identifying similarities & Differences X Summarizing & Note Taking X Cooperative Learning

X Reinforcing Effort & Providing Recognition X Setting Objectives & Providing Feedback X Generating & Testing Hypotheses

X Cues, Questions & Advanced Organizers X Homework & Practice X Nonlinguistic Representations

## **Instructional Strategies:**

**Engagement:** Activate prior knowledge by asking questions above. If needed, show the pictures of the oil spills to give students an image of what is happening or has occurred. Show the students the different liquids that they will be using in their density columns. Distribute the activity sheets to the students.

**NOTE:** I suggest pouring a small amount of each liquid into a plastic cup and setting up trays with the cups of liquids and the different objects before the lesson. This will allow you to distribute the materials more easily and allow you to have more time to assist students during the activity.

Ask the students to predict how the liquids will settle in their graduated cylinders and then draw the levels on their activity sheet.

**Exploration:** Allow the students some time to create their density columns. Remind them to pour the liquids in SLOWLY and that it does not matter which order they pour them into the graduated cylinder. When they are done, instruct the students to complete the 2<sup>nd</sup> drawing of their column BEFORE moving on to Part 2 of their activity. In Part 2, the students will complete

their data table of where the objects will settle in the cylinder. They will need to make predictions BEFORE putting the objects into the liquids, and then will need to complete the data table with their results.

**Explanation:** Throughout the activity, walk throughout the room asking students about their predictions and their thoughts about why the liquids and/or objects settled the way they did. Ask students to explain anything that may have affected their results (ie pouring too fast, shaking the column, etc).

**Elaboration:** Allow students to choose different liquids or objects to test at a later time.

**Intervention Strategies:** Model pouring/dropping as needed, short instructions, walk throughout the room to assist students.

**Accommodations & Modifications (IEPs)** See individual IEPs, shortened assignment

**Evaluation:** Allow students to share the results from their density columns to determine if all columns were the same or if there was some variance in the results.

**Closure:** Have the students complete the questions on their data sheet. Allow the students to journal about the activity and ways that they would change the activity or something that they would do differently the next time.

**Homework:** Complete any portions of the data sheet that is not completed.