

# Density Rainbow

## Overview

Density is a concept that is often difficult to verbalize but easy to demonstrate. Almost everyone will agree that a stone is heavier than a block of wood the same size. But when asked what makes the stone heavier? (The stone has a higher density.) Liquids have the same property. Some liquids are more dense than others. We will use this fact to make a colorful density rainbow. Each liquid will be colored and then placed in the jar from the densest on the bottom to the least dense on top.

## Questions to Answer

- What is density and how is it measured?
- Do different liquids and solids have different densities?

## Objectives

- Describe what density is and how it is measured.
- Demonstrate the ability to measure the density liquids and rank order based on their densities.

## Materials

- Spring scale
- Paper, plastic or styrofoam cups
- Tall wide mouthed jar (olive jar)
- Food coloring
- Water
- Vegetable oil

- Honey
- Karo syrup
- Long handled spoon
- A variety of small objects (preferably ones that don't float)

## Preparation

- Add food coloring to the four liquids listed above. You will probably want to do an example density jar in advance to figure out which colors work the best.
- Adjust the volumes of liquids given to each group so that each layer in the jar is about 1/2 inch.

## Part I: Comparing the density of various liquids

1. Set out as many cups as you have liquids and fill each cup with the same amount of liquid.
2. Weigh the liquid in each cup with the spring balance.
  - a. Which liquid weighed the most (Had the highest density)?  

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  - b. Which liquid weighed the least (Had the lowest density)?  

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3. List the liquids from lowest to the highest density

## Part II: Start building the rainbow

1. Take the jar and slowly pour in the liquid with the highest density
2. Take the jar and add the liquid with the next highest density
3. Keep working down the list by adding the liquid with the next lower density.

## Questions

What would happen if we didn't carefully add the liquids? (Try it)

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What might happen if we didn't add the liquids in the correct order? (Try it)

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What is density? (Hint: Why did we weigh the liquids?)

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