

Introduction to Density

Learning Target: *I can explain how the composition of an object determines its density.*

DO NOW:

Kepa's younger sister, Barbara, loves to play in her bath tub at home. While in the tub, Kepa hands Barbara a rubber ducky and a marble to play with. When Barbara throws her toys in the water Kepa notices that the rubber ducky floats on top of the water and the marble sinks to the bottom of the tub. What is it that makes this occur? Explain.



EXPLORE:

<https://www.youtube.com/watch?v=4wyPPIjNdK8>

In a minute we will look at a can of coke and a can of diet coke put in a container of water. Below please write a claim of what you think might happen when these cans are put in the container of water. Take a minute before showing the experiment to share what students think will occur.



CLAIM: _____

Draw a visual model of what is happening inside the coke cans that allows this occurrence.

Diet Coke	Coke

Density

A measurement that compares the amount of matter an object has to its volume.

EXPERIMENT:

Background: We're about to explore a lab in which we will be able to see how varying density levels react in water.

Goal: The goal of this experiment is to be able to explain how it is possible for different densities to lay on top of each other in a graduated cylinder.

*Note: This experiment requires close attention to detail and precision work

Materials:

1. 4 cups with equal amounts of water
2. 1 graduated cylinder (empty)
3. 4 colors of food coloring
4. Sugar
5. Water dropper

Procedures:

Step 1	Cup A - Do not add any sugar Cup B - Add two spoonful of sugar Cup C - Add three spoonfuls of sugar Cup D - Add four spoonfuls of sugar
Step 2	Add 3 drops of food coloring in each cup <i>NOTE - Each cup should be a different color!</i>
Step 3	Cup D - pour it into the empty graduated cylinder Cup C - take the dropper and transfer water into graduated cylinder Cup B - take the dropper and transfer water into graduated cylinder Cup A - take the dropper and transfer water into graduated cylinder

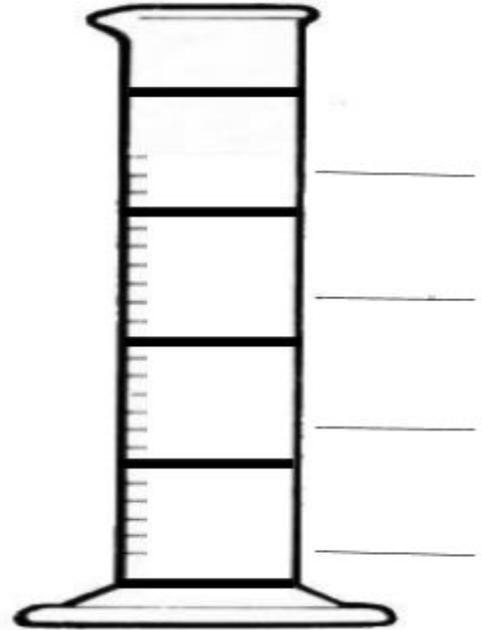
Observations:

1. What happened when you added the different colored liquids to the graduated cylinder?

2. Did your observations surprise you? Why or why not?

Draw a Conclusion:

1. In the graduated cylinder to the right, complete the following two tasks:
 - i. Label each layer of liquid in your graduated cylinder with the appropriate color (write your answer on the line to the right)
 - ii. Draw molecules in each layer of liquid to represent the different molecular make-up of each layer.



2. How are the two experiments similar and how are they different? Why?

3. Based on your observations from this experiment and the exploration of the coke cans, what have you learned about density?

4. If I were to rearrange the order of the cups pouring into the graduated cylinder, would we have seen the same result? Why or Why not?
