

## Density of Liquids

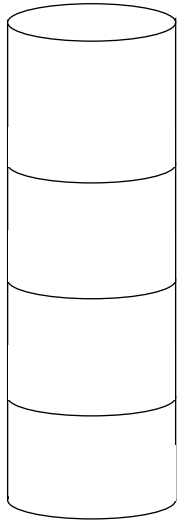
***How does density affect how water, vegetable oil, and dish soap layers in a container?***

Prediction: How do you think the liquids will layer when poured in a container?

**Materials:**

50 mL of each liquid: water, vegetable oil, and dish soap  
 tall, clear cylindrical container  
 graduated cylinder  
 scale that measures in grams

Prediction



**Procedure:**

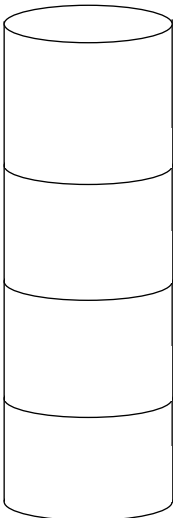
1. Place the graduated cylinder on the scale and press tare.
2. Add 50 mL water to the graduated cylinder and record the mass of the water.
3. Record the volume of the water.
4. Calculate the density of the water.
5. Repeat steps 1-4 for the dish soap and oil.

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

$$1 \text{ mL} = 1 \text{ cm}^3$$

|   | Water                    | Dish Soap                | Oil                      |
|---|--------------------------|--------------------------|--------------------------|
| A) Mass of liquid (g)                           | 50.0                     | 50.7                     | 45.1                     |
| B) Volume of liquid (mL)                        | 50                       | 50                       | 50                       |
| Density of liquid (g/cm <sup>3</sup> )<br>(A÷B) | _____ ÷ _____ =<br>_____ | _____ ÷ _____ =<br>_____ | _____ ÷ _____ =<br>_____ |

Observed



How do the densities you calculated explain the order of the liquids?

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## Changing the Density of Water

1. What did the carrot do when you dropped it into the water?   sank    floated

The carrot is    more dense    less dense    than water.

2. What did the carrot do when added salt to the water?    sank    floated

The carrot is    more dense    less dense    than saltwater.

3. Does adding salt change the density of the water?    Yes    No

4. How do you know?

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5. What would you expect if you placed equal volumes of water and saltwater on opposite ends of a balance?

mass of the water is more than saltwater

mass of the saltwater is more than water

6. How does warm and cold water layer?

cold water on top of warm water

warm water of top of cold water

7. Warm water is    more dense    less dense    than cold water.