

# Density Column Project

*Anyone can stack blocks, boxes, or books, but only those with a steady hand and a little understanding of chemistry can stack liquids. What if you could stack seven different liquids in seven different layers?*

*Think of it as a science burrito!*

## How does it work?

The same amount of two different liquids will have different weights because they have different masses. The liquids that weigh more (have a higher density) will sink below the liquids that weigh less (have a lower density).

To test this, you might want to set up a scale and measure each of the liquids that you poured into your column. Make sure that you measure the weights of equal portions of each liquid. You should find that the weights of the liquids correspond to each different layer of liquid. For example, the honey will weigh more than the milk. By weighing these liquids, you will find that density and weight are closely related.

*\*\*\* NOTE: The numbers in the table are based on data from manufacturers for each item. Since each manufacturer has its secret formula, the densities may vary from brand to brand. \*\*\**

The table shows the densities of the liquids used in the column as well as other common liquids (measured in g/cm<sup>3</sup> or g/mL).

Density is basically how much "stuff" is smashed into a particular area... or a comparison between an object's mass and volume.

Remember the all-important equation: Density = Mass divided by Volume. Based on this equation, if the mass of something increases but the volume stays the same, the density has to go up. Likewise, if the mass decreases but the volume stays the same, the density has to go down. Lighter liquids (like water or rubbing alcohol) are less dense than heavy liquids (like honey or syrup) and so float on top of the more dense layers.

Material	Density
Rubbing Alcohol	.79
Lamp Oil	.80
Baby Oil	.83
Vegetable Oil	.92
Ice Cube	.92
Water	1.00
Milk	1.03
Dawn Dish Soap	1.06
Light Corn Syrup	1.33
Maple Syrup	1.37
Honey	1.42

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## PROCESS

1. Obtain a clear plastic container such as a water bottle.
2. Choose three to seven different liquids. Try to find liquids of different colors.
  - a. < 3 liquids = 0 points
  - b. 4-5 liquids = 15 points
  - c. 6-7 liquids = 25 points
3. Measure equal amounts of each liquid.
4. CAREFULLY pour liquids into the container
5. Observer what happens. You may need to let it sit overnight.
6. Draw and color a picture of your density column. (25 points)
7. Write a summary paragraph about your project. (50 points)
  - a. What is density? Answer in your own words! (10 points)
  - b. What substances did you use? (5 points)
  - c. Why did the liquids form layers? (15 points)
  - d. What would happen if you shook the container?(5 points)
  - e. Would the layers still be there? Why or why not? (15 points)

Name \_\_\_\_\_

Score \_\_\_\_\_