



Rainbow Jar - Liquid Density

This activity helps fulfill the following badge requirements:

- Brownies: Home Scientist – Step 3

Materials

- A clear dry container (mason jar, glass)
- Honey
- Light corn syrup
- Olive oil/Vegetable oil
- Rubbing alcohol/fingernail polish remover
- Water
- Food Coloring
- A dropper or straw

Introduction

Everything is made of molecules, including liquids. Molecules are the smallest bits of things that are still the thing. Example: You could divide a glass of water into small parts until you have individual small bits of water, molecules. If you divide a water molecule you would have 2 hydrogen and 1 oxygen atoms and it would no longer be water. The more molecules together the denser the item.

Take a look at these two containers, which one is heavier? Why?



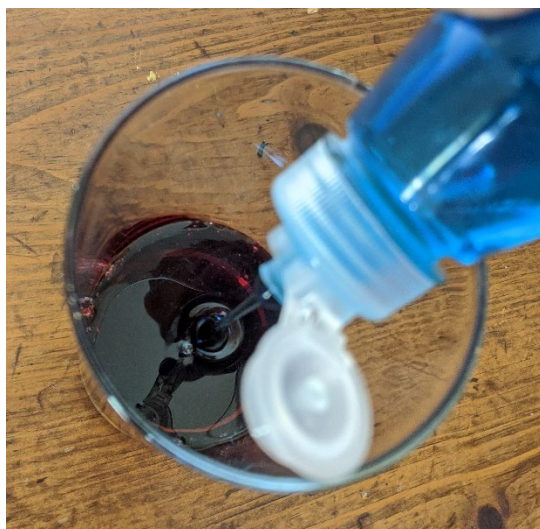
The one filled with marbles is heavier, because there are more marbles in it. The marbles are like the molecules in the liquids you will be using in this demonstration. The liquids with more molecules are denser and should stay toward the bottom of your container.

Activity: Rainbow Jar



Step 1: (left) Start with the honey, you will pour the honey in the middle of the jar, be careful not to let the honey touch the sides of the jar. Let that settle until the top is level, you will be doing this after each step.

Step 2: (right) Add coloring to the light corn syrup in a separate container before adding it to the rainbow jar. Just like with the honey be careful not to get it on the sides while you pour it in the middle.



Step 3: (left) Add the dish soap, pouring in the middle and I bet you can guess, don't let it touch the sides of the jar.

Step 4: (right) Add color to the tap water in a separate clean container, pour the colored water in the middle of the jar, being careful not to get it on the sides.



Step 5: (left) The oil is next and yes you are right you are going to pour it in the middle of the jar, not touching the sides. This needs to be a fairly thick layer of oil, double the other layers. This layer needs to be thick the next step will be easier.

Step 6: (right) Last step, the rubbing alcohol, you will need to add the color in a separate container and mix it really well. The food coloring will sink to the bottom since it is denser than the alcohol. Now adding the alcohol, **BIG CHANGE**, you will NOT be pouring it in the middle, you are going to drop it slowly along the sides of the jar. You are doing this so it doesn't drop through the layer of oil into the water beneath, this is why you made an extra thick layer of oil.





Step 7: Hold it up to a light or a light behind it so you can see the rainbow. Admire the beauty of science!