Density Rainbows

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Recommended Citation
What You Need:
- Clear glass container
- Food Coloring
- Food baster
- Honey
- Light Karo Syrup
- Dawn Dish Soap
- Water
- Vegetable Oil
- Rubbing Alcohol

Steps:
1. Pour equal amounts (amount is container dependent) of the following liquids in order:
   a. Honey (Gold)
   b. Light Karo Syrup (dyed red)
   c. Dawn Dish Soap (Blue)
   *It is important that these 3 layers do not touch the sides of the containers and are poured SLOWLY in the center of the container
   *let each layer settle before applying the next layer

2. Using a baster, trickle equal amounts (same as above) down the side of the container:
   a. Water
   b. Vegetable Oil (dyed bright yellow)
   c. Rubbing Alcohol (dyed green)
   *Be sure to trickle the liquids slowly

3. To test the density of a solid object, drop the following into the container one at a time:
   a. Screw
   b. Corn kernel
   c. Bead
   d. Ping Pong Ball

Why This Works:
Density is defined as the amount of mass (m) in a specific volume (v), D=m/v. Density can apply to solids (like rocks, tables, and books), liquids (like water and oil), or gas (like oxygen or carbon dioxide). The density is determined by its mass. Mass is how much stuff there is in the volume, which is different than weight which involves gravity. Mass is determined by the number of atoms (stuff) inside a set volume. The more atoms, the greater the density. Two liquids can contain the same amount of volume, but the one with more atoms is going to have a larger mass (and a larger density!). Atoms makeup everything, they makeup all things! When atoms are added together, they make molecules (like water!). Denser liquids (those with more atoms) will fall to the bottom and the lighter liquids (those with less atoms) will float on top. Even when mixed, the differences in density will prevent the liquids from permanently mixing and with time will separate into layers again. The density of solids and volumes, follow the same rules. A solid that is less dense then water (like a ping pong ball) will float, while a solid that has a higher density then water (like a screw) will sink. The density values collected in the above table are calculated by number of grams (mass) per milliliter (volume).

This activity was adapted from: https://sciencing.com/explain-density-elementary-students-7706125.html
This document was created by Michelle Valkanas

<table>
<thead>
<tr>
<th>Material</th>
<th>Density</th>
<th>Color in Column</th>
</tr>
</thead>
<tbody>
<tr>
<td>Honey</td>
<td>1.36</td>
<td>Gold</td>
</tr>
<tr>
<td>Light Karo Syrup</td>
<td>1.33</td>
<td>Red</td>
</tr>
<tr>
<td>Dawn Dish Soap</td>
<td>1.06</td>
<td>Blue</td>
</tr>
<tr>
<td>Water</td>
<td>1.00</td>
<td>Colorless</td>
</tr>
<tr>
<td>Vegetable Oil</td>
<td>0.91</td>
<td>Yellow</td>
</tr>
<tr>
<td>Rubbing Alcohol</td>
<td>0.87</td>
<td>Green</td>
</tr>
</tbody>
</table>

Water Molecule (3 atoms)