

INcredible 8-LIQUID TOWER!

GRADES 6-10



CAN YOU MAKE RANDOM OBJECTS
BECOME SUSPENDED IN A DENSITY
LIQUID TOWER?

Dr. Nicole Grimes

WWW.DRNICOLEGRIMES.COM

8-LIQUID TOWER

MATERIALS:

8 Liquids:

Honey, Corn Syrup, Maple Syrup, Whole Milk, Dish Soap, Water, Vegetable Oil, & Rubbing Alcohol

Food Coloring

Turkey Baster

8 plastic cups

Tall Clear Cylindrical Vase or Glass

Varied Objects (Your Choice!):

Metal bolt or nut, Board game die, Raisin, Safety pin,

Wood Block, Plastic beads, Plastic soda cap,

Ping-Pong™ ball



8-LIQUID TOWER

DIRECTIONS:

1. Pour **equal** amounts of each liquid in the cups. Line the cups up in the order you'll add them into the container.
2. Add a few drops of food coloring to the water and the rubbing alcohol for contrast so they stand out in the finished column.
3. Start your column by pouring the honey into the cylinder. (It's very important to *slowly* layer the honey, corn syrup, and maple syrup into the center of the cylinder - don't let them touch the sides!) It's okay if the liquids mix a little as you are pouring. The layers will slowly even themselves out.



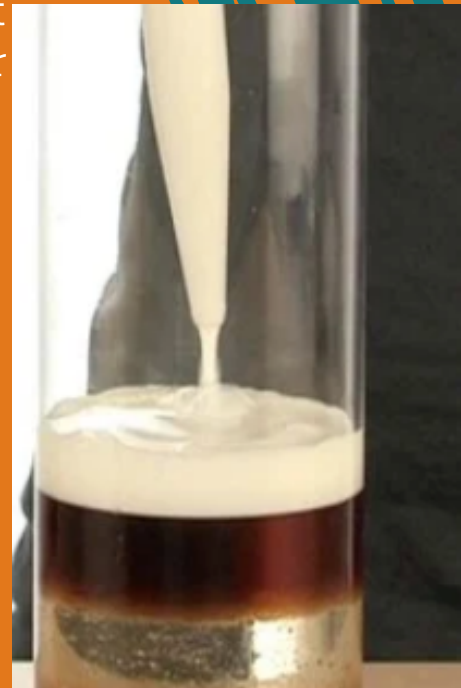
*Start with
the honey!*



8-LIQUID TOWER

4. Use the turkey baster to carefully layer the milk and the dish soap. Again, don't let the liquids touch the sides of the container and add them s-l-o-w-l-y and carefully, a dribble at a time.

Starting with the water, hold the tip of the baster against the side of the container close to the layer of dish soap. Squeeze gently so the water flows down the side of the container and onto the dish soap. Move the baster upward as needed. Layer the vegetable oil, the rubbing alcohol, and the lamp oil in the same way. Allow the layers to settle and separate even more before moving on to the next step.



THIS IS THE ORDER
TO ADD EACH LIQUID!



Dr. Nicole Grimes

WWW.DRNICOLEGRIMES.COM

8-LIQUID TOWER

5. Release the objects of your choice one at a time into the tower so they “slide” as gently as possible through the liquids and fall along the side of the container. Release them at different spots around the container to avoid causing too much turbulence in the same location in the liquids. This helps put the objects toward the outside of the container so you can see them on “their” layer.

Start with the bolt and then release lighter objects like the game dice, the plastic beads, and the soda bottle cap etc. *Let the upper layers settle completely between each release. Be patient!*

6. You should have a beautiful density tower now! Well done!



Dr. Nicole Grimes

WWW.DRNICOLEGRIMES.COM

How does it Work?

The amount of matter packed into a certain amount of space is called the **density** of the material. The liquids that weigh more (a higher density) will sink below the liquids that weigh less (a lower density).

Density differences cause objects to “float” in liquids that are already stacked on top of each other. The metal bolt is more dense than all of the liquids in the column and therefore sinks directly to the bottom. Less dense objects will float on individual layers up the column. For instance, the plastic beads are more dense than the vegetable oil and everything above it but less dense than the water and everything below it. This makes the beads settle on top of the water. The Ping-Pong ball is the least dense of it all and floats on top.



Dr. Nicole Grimes

WWW.DRNICOLEGRIMES.COM