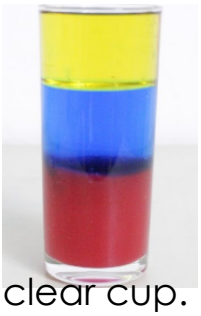
December/January STEM Challenge
Liquid "Candy Cane" Layers



Challenge: Can you successfully layer at least 3 different liquids in a clear cup.

Materials:

- many different liquids
  **(suggestions are: baby oil, vegetable oil, milk, water, dish soap, honey, rubbing alcohol, vinegar, light corn syrup, maple syrup)
- Food coloring to color the liquids
- Liquid dropper/pipette or straws
- Spoons
- Small clear cup or vial
- Paper towel
- Pencil

Prediction: Make a prediction as to the order the liquids your chose will layer

Procedure:

- Choose liquids that you would like to layer
- Use food coloring if you wish to give clear liquids a color. (colors will make the layers easier to see)
- Use droppers or straws to slowly drop approx. 1 oz. of liquid into a clear cup
- Choose a 2nd liquid and slowly drop approx. 1 oz. of liquid into a clear cup
- Wait patiently to see if the liquids you chose are layering. If your liquids are not making a layer then try again. Keep investigating until you can find at least 3 liquids that will create layers. Repeat these steps until you are able to layer at least 3 liquids.

**** Teacher demonstration**: At some point you might want to stop students and demonstrate layering liquids. You could demonstrate for them how colored water will layer above dish soap. You can also share with them a liquid density chart and talk with them about density.

****What's going on here?** The science secret here is **density**. Density is a measure of how much mass is contained in a given unit volume. If mass is a measure of how much "stuff" there is in an object or liquid, density is a measure of how tightly that "stuff" is packed together. Lighter liquids (like water or rubbing alcohol) are less dense or have less "stuff" packed into them than heavier liquids (like honey or corn syrup). Lighter liquids will "float" on top of liquids that are denser.

Refection:

- ✓ Draw or take a picture of your Liquid Candy Cane Layer. Make sure to include labels.
- ✓ Explain why you created your layers the way you did and the revisions you made.
- ✓ Explain how you were able to layer the liquids that you chose
- ✓ Teachers please submit a list of students who participated by email to the **STEM Resource Center** stem@gstboces.org
- ✓ **Teachers- Please make sure that your list has your name, school district, grade level and return address included.**
- ✓ **This challenge is Due: January 31, 2019**

Liquid Layers

Name_____ Grade Level _____

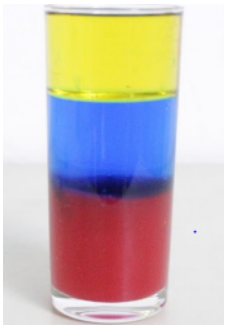
Challenge: Can you layer at least 3 different liquids? Can you get one liquid to "float" on top of another liquid?

Prediction: What do you think might happen?

_____

_____

Materials:



- A combination of different liquids
- A small clear cup or vial
- A dropper/pipette/spoon

Observations: Draw and Label what you see when you layer liquids

Trial 1	Trail 2	Trial 3

What happens liquids are layered in the same cup?

What did you see?

_____

_____

What did you notice?

_____

_____

_____

Why do you think this happened?

_____

_____

_____

Some liquids are denser than others.

Use this Density Chart to help you explain why some liquids "float" on top of other liquids.

Liquid	Density
Rubbing Alcohol	0.79
Baby oil	0.83
Vegetable oil	0.92
water	1.00
milk	1.03
Dawn Dish soap	1.06
Honey	1.42
vinegar	1.00
Light corn syrup	1.33
Maple syrup	1.37

Liquid Layers

Name_____ Grade Level _____

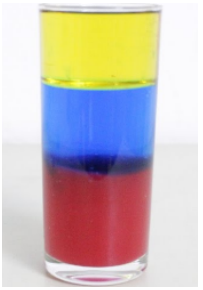
Challenge: Can you layer at least 3 different liquids? Can you get one liquid to "float" on top of another liquid?

Prediction: What do you think might happen when liquids are put in the same cup?

Observations: Draw pictures and use labels to show what happened when you layered liquids

Trial 1	Trail 2	Trial 3

What happens liquids are layered in the same cup?



What did you see?

Why do you think this happened?