### SAMPLE LAB WRITE UP FOR EXPERIMENT

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<th>Name:_______________________________</th>
<th>Date:_________________________</th>
<th>Class:_____________________________</th>
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#### I. TITLE (underline in colored pencil)

SEVEN LAYER DENSITY COLUMN

#### II. PURPOSE/PROBLEM (what do you hope to accomplish)

To observe the density of different liquids.

#### III. HYPOTHESIS (most logical outcome of the experiment)

If honey, corn syrup, dish soap, water, vegetable oil, rubbing alcohol and lamp oil are combined in a tube, then honey will be the densest and therefore be at the bottom of the tube while the rubbing alcohol is the least dense so this should be at the top.

#### IV. MATERIALS (what is needed for the experiment, a shopping list of items)

- Light corn syrup
- Water
- Vegetable oil
- Dawn dish soap (blue)
- Rubbing alcohol
- Lamp oil (red)
- Honey
- Glass cylinder
- Food coloring
- Food baster
- Seven plastic cups
- Scale

#### V. PROCEDURES (numbered listed of step-by-step instructions)

1. Measure 8 ounces of each type of liquid into the several plastic cups.
2. The amount of each liquid used will depend on the size of the glass cylinder so adjust accordingly.
3. Color the corn syrup and the rubbing alcohol with a few drops of food coloring to create a more dramatic effect in the column.
4. Put the liquids into the column in the following order:
   - Honey
   - Corn syrup
   - Dish soap
   - Water
   - Vegetable oil
   - Rubbing alcohol
   - Lamp oil
5. Start the column by pouring the honey into the cylinder. Pour the liquids carefully into the center of the cylinder; making sure the honey does not touch the sides of the cylinder while pouring.
6. Allow each layer to settle before adding the next one.
7. The key is to pour slowly, evenly and carefully.
8. Pour the corn syrup in the middle of the cylinder, avoiding the sides.
9. Repeat the same procedure with the dish soap. Pour the soap directly into the middle of the layer of corn syrup.
10. Using the food coloring, add a couple drops of color to the water.
11. Using a food baster, the water should slowly trickle down the sides of the cylinder to avoid mixing with the liquid below.
12. Wash the food baster with soap and water.
13. Use the food baster again for the vegetable oil in the next layer.
14. Let the vegetable oil trickle down to form the next layer.
15. Wash the food baster with soap and water.
16. Make sure the rubbing alcohol is colored with the food coloring so that this layer is not confused with other layers.
17. Use the food baster and the inside wall of the cylinder to add the next layer.
18. Again, rinse the food baster with soap and water.
19. Use the food baster to draw up the lamp oil. Caution – lamp oil is flammable!
20. Lamp oil also has low surface tension and will easily leak out of the food baster. Keep a finger over the tip to keep the oil from leaking out of the baster.
21. Slowly add the lamp oil down the side of the cylinder.
22. Wash the food baster with soap and water one last time.

- Independent Variable: Density
- Dependent Variable: Layer/Level in the Cylinder

<table>
<thead>
<tr>
<th>VI. COLLECTION OF DATA/RESULTS (this is how you collected your results – tally marks, pictures, notes, charts, etc. Then put this information into graphs that are large enough to show the class.)</th>
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</thead>
<tbody>
<tr>
<td>VII. CONCLUSION (summarize the experiment, like you would summarize a story – include the data to determine if the hypothesis was supported or not supported)</td>
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<tr>
<td>Material</td>
</tr>
<tr>
<td>Rubbing alcohol</td>
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<tr>
<td>Lamp oil (refined kerosene)</td>
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<tr>
<td>Baby oil</td>
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<tr>
<td>Vegetable oil</td>
</tr>
<tr>
<td>Ice cube</td>
</tr>
<tr>
<td>Water</td>
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<tr>
<td>Milk</td>
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<tr>
<td>Dawn dish soap</td>
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<tr>
<td>Light corn syrup</td>
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<tr>
<td>Maple syrup</td>
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<td>Honey</td>
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Density is a measure of how much mass is contained in a given unit (Density = Mass divided by volume). Seven different liquids were put into a cylinder to see how the densities of these items stacked up against each other. Each liquid’s density was looked up and charted and then the experiment was conducted. The layers created a type of density 7-layer burrito. The hypothesis was partially supported with the data because the honey was indeed at the bottom of the column with a density of 1.42 and visually the bottom layer. However, the top layer hypothesis was not supported as visually the top layer was lamp oil and according to the density chart rubbing alcohol has the least amount of density.
Upon considering the data and observations of this investigation, the results could be due to the fact that the rubbing is colored and could be a higher concentration that the one quoted on the chart. This could account for the error but is only speculation and further investigations would be needed to prove this theory.

The science here is density. Density is a measure of how much mass is contained in a given unit (Density = Mass divided by volume). If mass is a measure of how much “stuff” (atoms) there is in an object or liquid, density is a measure of how tightly that “Stuff” (atoms) 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).

Every liquid has a density number associated with it. Water for example, has a density of 1.0 g/cm$^3$ (grams per cubic centimeter – another way to say this is g/mL, which is grams per milliliter)