Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_ Group \_\_\_\_\_\_\_\_\_\_\_\_

Density Columns Lab

**TOPIC**: Density Columns

**PROBLEM**: How does the density of various liquids affect where they will settle when poured together into a test tube?

**PURPOSE**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**VARIABLE**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**DEPENDENT VARIABLE**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**CONSTANTS**:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**HYPOTHESIS**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**PROCEDURE**:

1. List the colors of the liquids in column # 1 on the data chart below.

2. Find the mass of one of the empty graduated cylinders. Record the results on each row in column # 3 on the data chart below.

3. Pour 20 mL each liquid into it’s own graduated cylinder.

4. Predict which one you think will be the densest. Find the mass of that liquid IN THE GRADUATED CYLINDER and record the data in column # 2 on the data chart.

5. Subtract the mass of the empty graduated cylinder (column # 3) from the mass of the liquid in the graduated cylinder (column # 2) and record the mass of the actual LIQUID ALONE in column # 4.

6. Do not calculate the density of the liquids just yet!

7. Repeat steps 4-6 for the liquid you think will be the second densest.

8. Repeat steps 4-6 for the liquid you think will be the least dense.

9. Pour the liquids into the test tube in the order you predicted, pouring the one you predicted would be the densest first, then the second densest, and the one you thought would be the least dense last.

10. On the data sheet, divide each mass (column # 4) by each volume (column # 5) to calculate the density (rounded to the nearest hundredth) for each liquid. If your predictions were correct, your test tube will show a pattern of colors. If your predictions were incorrect, the colors will not form a pattern.

11. Compare the density of each liquid to their placement in the test tube. If something doesn’t make sense, check over your calculations for errors.

12. Draw a diagram of what you see in your lab report booklet.

13. Pour the liquids from the test tube into the GARBAGE CAN.

14. Go back to your station, and fill the test tube half way with warm water, cover the top with your hand, and shake it several times.

15. Rinse the test tube with warm water, until the water runs clear and the test tube looks clean.

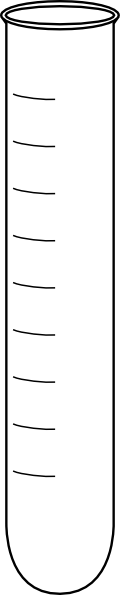
16. Dry the test tube, place it back in the drip can, and dry up the rest of your station.

17. Go back to your seat and work on written observations and the conclusion.

**DATA CHART**:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 |
| Color and Liquid Name | Mass of Liquid in Grad Cyl | Mass of Empty Grad Cyl | Mass of Liquid ALONE | Volume of Liquid | Density of Liquid |
|  | g | g | g | 20 ml | g/ml |
|  | g | g | g | 20 ml | g/ml |
|  | g | g | g | 20 ml | g/ml |

Draw a diagram of your density column below. Color your diagram with crayons or colored pencils, and label each liquid with it’s NAME and it’s DENSITY.



**SAMPLE CALCULATIONS:** (show the math for ONE of the three liquids)

**WRITTEN OBSERVATIONS and CONCLUSION:**

(write or type on separate sheets and staple it behind this sheet, with the written observations first, and the conclusion last)