



Do not Write on this lab...

Science
Liquid Rainbow Density Lab

Objective: *Different amounts of salt have been added to each colored liquid, making each one of a different density. Your objective is to secretly determine the proper density order of the five colored liquids before any other group. Your team must do this using as few moves as possible by employing critical thinking, problem solving, prediction, and your knowledge of what density is. Your final product will be a test tube filled with all five different colored liquids, each of a different density, separated into the proper order from bottom to top.*

Materials: Plastic straw, six test tubes for liquids, one beaker for waste, test tube rack.

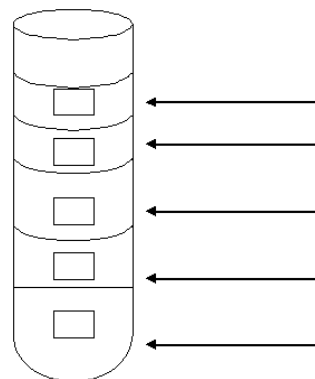
Directions: Read this entire lab first, then go back and do the lab in the order outlined below.

- Procedure:**
- Answer the questions below in your lab book, then...
 - Get your instructor's initials, then...
 - Send a representative from your team to pick up all materials listed above.
 - Send another representative back up to fill each test tube $\frac{3}{4}$ full with one of the 5 liquids.
 - Figure out the correct order of liquids and put all 5 liquids in the empty test tube at once so they form 5 different colored layers.
 - Do this by holding your thumb over the straw and "picking up" each liquid.
 - Gently drizzle the liquid down the side of the test tube. Do the same with another color, being careful not to plop it onto the first liquid, thereby mixing them.
 - If the second liquid you pick up is less dense than the first it will "float on top" of the first, if not, it will sink into the first liquid below, thereby mixing them. Record your data.
 - You want the second liquid to be less dense, so as it doesn't mix with the first.

Rules: You may not share your results with any other team; hide your work from view.

Pre-lab Questions

- What is the definition of density?
- What are the two measured parameters of density?
- What are the units of density?
- What two science instruments would you need to measure density?
- What is the density of pure water?
- Will the most dense liquid of the five be at the bottom or top of the straw?
- If two liquids mix does that invalidate the resulting liquid and should you then throw them away?
- Discuss your problem-solving method with your partner. Can you describe your method verbally?
- Go to your instructor for his initials and explain to him the method you will use to solve the problem before any other group. Get instructor's initials in lab book now...



Post-lab Questions

- Write the correct color order of the liquids from bottom to top.
- Explain what method you used to determine which of two liquids is most dense.
- Once you determined the density order of the first two liquids, what method did you use for the rest?

Vocabulary: *Density, mass, volume, graduated cylinder, balance scale, grams, milliliters, cm^3 prediction.*