

## Rainbow Lab

### Objectives :

- to develop skills measuring chemicals with a graduated cylinder.
- to practice using the metric system.
- to test precision and ability to follow directions.
- to practice lab safety procedures.

### Procedure:

#### Part 1:

1. Label 6 test tubes in order : A, B, C, D, E & F.
2. Fill a beaker half full with water. Use this to rinse your graduated cylinder and test tubes.
3. Use your sink for contaminated water waste.
4. Into test tube A, measure 25 mL of RED liquid.
5. Into test tube C, measure 17 mL of YELLOW liquid.
6. Into test tube E, measure 21 mL of BLUE liquid.

#### Part 2:

1. From test tube C, measure 4 mL and pour into test tube D.
2. From test tube E, measure 7 mL and pour into test tube D. Swirl.
3. From test tube E, measure 4 mL and pour into test tube F.
4. From test tube A, measure 7 mL and pour into test tube F. Swirl.
5. From test tube A, measure 8 mL and pour into test tube B.
6. From test tube C, measure 3 mL and pour into test tube B. Swirl.
7. Save your results. Measure the contents of each test tube and record how many mL were found in each test tube.
8. Answer questions.
9. When you are completely finished pour the “chemicals” into the chemical morgue.

**Data : Table 1 Test Tube Results (set up your own table using this as a model)**

Test Tube	Color of Liquid	Amount of Liquid (mL)
A		
B		
C		
D		
E		
F		
	Total liquid Test Tubes A-F	mL

**Analysis/Results:**

1. Name the colors that you created.
2. How many mL of liquid were in each test tube at the **start** of this lab?
3. Why is it important to follow directions **exactly**?
4. What would have happened if your measurements were not correct?
5. Look at your hands. Do you have any stains on your hands? If so, those stains represent **chemicals** that would be on your skin **right now**!
6. How many mL of liquid did you have at the end of the lab? How many should you have? What are some reasons why you may have more or less than when you started?

**Conclusion:**

2-3 sentences on what you learned.

# Rainbow Lab

## Teacher Notes

### Materials :

- Time Period : 1 1/2 - 2 - 45 minute classes
- Food coloring : red, yellow, blue (**ratio = 5 drops / 100 mL water**)
- large plastic trays, one per group of 4 students or per 2 students (cafeteria trays work well...)

### Each pair of students/group will have the following on their trays:

- 6 test tubes
- test tube rack
- 1 or 2 pipettes
- 50 or 100 mL beaker (or larger) with Red liquid
- 50 or 100 mL beaker (or larger) with Blue liquid
- 50 or 100 mL beaker (or larger) with Yellow liquid
- 1 beaker of clean water
- 1 empty beaker
- 2 - 25 mL graduated cylinders
- 2 - 10 mL graduated cylinders
- 1 wax pencil
- goggles
- apron

### Results:

Test Tube	Color of Liquid	Amount of Liquid (mL)
<b>A</b>	Red	10
<b>B</b>	Orange	11
<b>C</b>	Yellow	10
<b>D</b>	Green	11
<b>E</b>	Blue	10
<b>F</b>	Purple	11
	<b>Total liquid Test Tubes A-F</b>	<b>mL</b>

**TIP:** make sure the students rinse out the graduated cylinders and test tubes to avoid contamination between measurements.

At the end of the lab, if all 6 test tubes look near level, you know that they were careful in their measurements!

This is a great lab! The kids love it! Use it right before you do chemical reactions or as a first day of school activity as a practice so that when the students do use *REAL* chemicals, they have a feel for the equipment and the safety procedures that need to be followed.

When done, students should have 63 mL of liquid. Spillage, incorrect measurements and excess water from rinsing are factors to change the total.

You may be able to complete this lab in one class period for high school. Be sure to have plenty of test tubes and racks to save the results until the next day. Also, very important..... be sure to place a stopper over the test tubes if they are to stay overnight, because some of the water can evaporate.

Set up a chemical morgue in the classroom for the students to pour the “chemicals” in at the end of the lab. This will help the students to become accustomed with not just pouring chemicals down the sink.