Rainbow Lab

**Roles:**

**Materials Collector/Measurer = collects all materials needed for lab and returns them when finished**

**Data Recorder = records all data observed in lab and shares with groups after procedure is completed**

**Procedure Reader = responsible for carefully reading procedure to group and making sure that everyone is doing the experiment correctly!**

**Experimenter = takes instruction from the Procedure Reader and performs the experiment (with the help of other group members)**

**\*\*If in a 3-person group, 1 person may have 2 roles\*\***

LAB #1

**Purpose:**

1. To practice measuring chemicals with a graduated cylinder
2. To practice using the metric system
3. To test precision and ability to follow directions
4. To practice lab safety procedures

**Procedure:**

**Procedure – Part 1:**

 1. Label 6 test tubes in order: **A, B, C, D, E,** and **F.**

 2. Place them in order in the test tube rack.

3. Fill one beaker **half full** with water. Use this to ***rinse*** your graduated cylinder, pipettes, and test tubes. (You will use this to rinse between colors to make sure the colors don’t mix while measuring)

 4. The second empty beaker is for contaminated waste water.

\*\*Use the **large graduated cylinder** to measure the following:

 5. Into test tube **A**, measure **25 mL of RED** liquid. (Use a pipette to measure)

 6. Into test tube **C**, measure **17 mL of YELLOW** liquid. (Use a pipette to measure)

 7. Into test tube **E**, measure **21 mL of BLUE** liquid. (Use a pipette to measure)

**Procedure – Part 2:**

\*\*Use the **small graduated cylinder** to measure the following:

1. From test tube **C**, measure 4 mL and pour into test tube **D**. (Rinse pipette & cylinder)

 2. From test tube **E**, measure 7 mL and pour into test tube **D**. Swirl or stir. (Rinse pipette & cylinder)

 3. From test tube **E**, measure 4 mL and pour into test tube **F**. (Rinse pipette & cylinder)

 4. From test tube **A**, measure 7 mL and pour into test tube **F**. Swirl or stir. (Rinse pipette & cylinder)

 5. From test tube **A**, measure 8 mL and pour into test tube **B**. (Rinse pipette & cylinder)

 6. From test tube **C**, measure 3 mL and pour into test tube **B**. Swirl or stir. (Rinse pipette & cylinder)

7. **SAVE** your results!!! Record the color of each liquid in your chart. **Measure** the contents of each test tube (be precise!) and record how many ml were found in each test tube. (Pour each tube into a graduated cylinder and record how much liquid is present). Record this amount in the third column of your data table.

8. Rinse all equipment, put it back into your bin and wipe down your table.

9. Share data

10. Complete your Technical Drawings

**Data Table:**

(create the data table below in your notebooks)

|  |  |  |
| --- | --- | --- |
| **Test Tube** | **Color of Liquid** | **Amount of Liquid (mL)** |
| **A** |  |  |
| **B** |  |  |
| **C** |  |  |
| **D** |  |  |
| **E** |  |  |
| **F** |  |  |
|  | **Total liquid in test tubes A – F** | **mL** |

**Technical Drawings:**

* Draw what your test tubes looked like before mixing the colors and after mixing the colors.
* You should label the lab equipment as well!
* COLOR!!
* You should have 2 drawings when you are finished…1 for what your setup looked like after Part 1, 1 drawing for what you setup looked like for Part 2

**Conclusion:**

***Copy and answer*** the following:

1. **TOTAL** mL of liquid at the *end of the lab*: \_\_\_\_\_\_\_\_\_\_\_\_\_ mL

(look at your data table)

1. Total mL you SHOULD have: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mL

(hint: what did you start with??)

**Answer the following questions in your notebook as your conclusion:**

1. Name all the colors you *created*.
2. How many mL of liquid were in each test tube at the START of the lab (Include ALL test tubes A – F)?
3. Why is it important to follow directions EXACTLY?
4. What would have happened if your measurement were not correct?
5. Look at your hands. Do you have any stains on them? Were there any spills on your table, notebooks, etc? If so, those stains represent chemicals that would be on your skin right now! How would you avoid this happening next time?
6. What are some reasons why you may have more or less liquid than when you started?
7. What did you learn about measurements, following directions, etc? (2 – 3 sentences)

**LAB #2**

**Purpose:**

To find the volume of irregular objects using water displacement

**Procedure:**

1. Add 20 mL of water to the graduated cylinder. Record this amount in the chart.
2. Add 3 marbles to the cylinder and measure the volume. Record this amount in the chart.
3. Find the difference between the two measurements and record in the chart. The difference between the two measurements will be the volume of the 3 marbles.

**Data Table**

(Copy the table below into your notebook)

|  |  |  |  |
| --- | --- | --- | --- |
| **Volume of water before adding marbles (mL)** | **Volume of water after adding marbles (mL)** | **Difference in volume****(mL)** | **Volume of 3 marbles****(mL)** |
|  |  |  |  |

LAB #3

 (cut and paste entire lab #2 sheet into notebook – see Mrs. M for a lab sheet)

**LAB #3**

**Purpose:**

To use a mathematical formula to find the volume of a box.

**Procedure:**

1. Measure the box below in CENTIMETERS. Round to the tenth spot (example: 3.4 cm).
2. Use the formula below to find the volume of the box

**Calculations:**

**VOLUME = Length x Width x Height**

 \_\_\_\_\_\_\_\_\_\_ x \_\_\_\_\_\_\_\_\_ x \_\_\_\_\_\_\_\_\_ = \_\_\_\_\_\_\_\_\_cm3

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