

Measuring Liquid Volume

In this lab, you will use a graduated cylinder to measure and transfer precise amounts of liquids. Remember that to accurately measure liquids in a graduated cylinder, you should first place the graduated cylinder flat on the lab table. Then, at eye level, read the volume of the liquid at the bottom of the meniscus, which is the curved surface of the liquid.

OBJECTIVES

Measure accurately different volumes of liquids with a graduated cylinder.

Transfer exact amounts of liquids from a graduated cylinder to a test tube.

MATERIALS

- beakers, filled with colored liquid (3)
- funnel, small
- graduated cylinder, 10 mL
- marker
- tape, masking
- test-tube rack
- test tubes, large (6)

SAFETY INFORMATION



Using Scientific Methods

ASK A QUESTION

1. Will each mixture of colored liquids produce the same new color each time that mixture is made?

FORM A HYPOTHESIS

2. Write a hypothesis that is a possible answer to the question above. Explain your reasoning.

TEST THE HYPOTHESIS

3. Using the masking tape and marker, label the test tubes “A,” “B,” “C,” “D,” “E,” and “F.” Place them in the test-tube rack.

Measuring Liquid Volume *continued*

4. Make a data table as shown below.

Data Table				
Test tube	Initial color	Initial volume	Final color	Final volume
A				
B				
C				
D				
E				
F				

- Using the graduated cylinder and the funnel, pour 14 mL of the red liquid into test tube A. (To do this, first measure out 10 mL of the liquid in the graduated cylinder, and pour it into the test tube. Then, measure an additional 4 mL of liquid in the graduated cylinder, and add this liquid to the test tube.)
- Use the graduated cylinder and funnel in steps 7–11 to transfer liquids. Rinse them out after you transfer each liquid.
- Measure 13 mL of the yellow liquid, and pour it into test tube C.
- Measure 13 mL of the blue liquid, and pour it into test tube E. Record the initial color and the volume of the liquid in each test tube.
- Transfer 4 mL of liquid from test tube C into test tube D. Transfer 7 mL of liquid from test tube E into test tube D.
- Measure 4 mL of blue liquid out of the beaker, and pour it into test tube F. Measure 7 mL of red liquid from the beaker, and pour it into test tube F.
- Transfer 8 mL of liquid from test tube A into test tube B. Transfer 3 mL of liquid from test tube C into test tube B.

ANALYZE THE RESULTS

- Analyzing Data** Record your final color observations in your data table.
- Examining Data** What is the final volume of all of the liquids? Use the graduated cylinder to measure the volume of liquid in each test tube. Record the volumes in your data table.

Measuring Liquid Volume *continued*

14. Organizing Data Record your final color observations and final volumes in a table of class data prepared by your teacher.

DRAW CONCLUSIONS

15. Interpreting Information Did all of your classmates report the same colors? Does this result support the hypothesis you made in step 2? Explain.

16. Evaluating Methods Why should you not fill the graduated cylinder to the top?

BIG IDEA QUESTION

17. Evaluating Methods How do the results of your class demonstrate the importance of conducting careful investigations so as to get valid results?
