

DATASHEET

5 STUDENT WORKSHEET

Volumania!

You have learned how to measure the volume of a solid object that has square or rectangular sides. But there are lots of objects in the world that have irregular shapes. In this lab activity, you'll learn some ways to find the volume of objects that have irregular shapes.

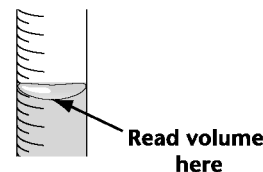
MATERIALS

- graduated cylinder
- water
- various small objects supplied by your teacher

Part A: Finding the Volume of Small Objects

Procedure

1. Fill a graduated cylinder half full with water. Read the volume of the water, and record it in the table below. Be sure to look at the surface of the water at eye level and to read the volume at the bottom of the meniscus, as shown below.



2. Carefully slide one of the objects into the tilted graduated cylinder.
3. Read the new volume, and record it in the data table.
4. Subtract the old volume from the new volume. The resulting amount is equal to the volume of the solid object. Record the volume of the solid object in the data table.
5. Use the same method to find the volume of the other objects. Record your results in the data table.

Volume Calculation Chart

Name of object	Starting volume (mL)	Ending volume (mL)	Volume of object (cm ³)

Copyright © by Holt, Rinehart and Winston. All rights reserved.

Volumania! continued

Analysis

6. What changes do you have to make to the volumes you determine in order to express them correctly?

7. Do the heaviest objects always have the largest volumes? Why or why not?

MATERIALS

- bottom half of a 2 L plastic bottle or similar container
- water
- aluminum pie pan
- paper towels
- funnel
- graduated cylinder



Part B: Finding the Volume of Your Hand

Procedure

Refer to the figure at the top of page 521 in your textbook.

8. Completely fill the container with water. Put the container in the center of the pie pan. Be sure not to spill any of the water into the pie pan.
9. Make a fist and put your right hand into the container up to your wrist.
10. Remove your hand and let the excess water drip into the container, not the pie pan. Dry your hand with a paper towel.
11. Use the funnel to pour the overflow water into the graduated cylinder. Measure the volume. This is the volume of your hand. Record the volume in the appropriate space below. (Remember to use the correct unit of volume for a solid object.)
12. Repeat this procedure with your left hand.

Volume of right hand	
Volume of left hand	

Copyright © by Holt, Rinehart and Winston. All rights reserved.

Volumania! continued

Analysis

- 13.** Was the volume the same for both of your hands? If not, were you surprised?

What might account for a person's hands having different volumes?

- 14.** Would it have made a difference if you had placed your open hand into the container instead of your fist? Explain your reasoning.

- 15.** Compare the volume of your right hand with the volume of your classmates' right hands. In your ScienceLog, create a class graph of right-hand volumes. What is the average right-hand volume for your class?

Going Further

Design an experiment to determine the volume of a person's body. In your plans, be sure to include the materials needed for the experiment and the procedures that must be followed. Include a sketch that shows how your materials and methods would be used in this experiment.

Using an encyclopedia, the Internet, or other reference materials, find out how the volumes of very large samples of matter—such as an entire planet—are determined.