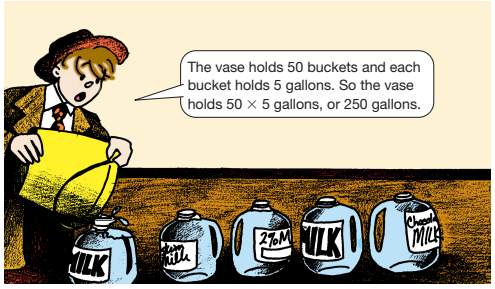
Measuring Volume of Containers

Discuss

In the story, *Elixir of Youth*, Sam and Tess use a bucket and gallon jugs to find the volume of the vase.



Copyright © Kendall Hunt Publishing Company

Volume is a measurement of size. It is the amount of space that an object takes up. If the object is a container, like a box or a bottle, then the volume is the amount of space inside it.

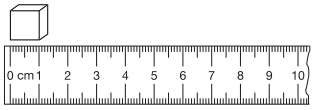
1. Sam and Tess measured the volume of containers at the museum to solve a mystery. What are other times when we think about the volume of containers?
2. What tools can you use to measure the volume of containers?

Complete the *Converting Standard Volume Units* pages in the *Student Activity Book* to practice solving problems with volume using standard units of measure.

***Student Guide* - Page 400**

Metric Units of Volume

A common metric unit of volume is the cubic centimeter. A **cubic centimeter (cc)** is the volume of a cube that is 1 centimeter long on each side.



A **milliliter (1ml)** is another metric unit of volume. It is the same as 1 cubic centimeter.

1 cubic centimeter = 1 milliliter

A liter (l) is a metric unit used to measure the volume of large objects. One liter holds 1000 milliliters. It also holds 1000 cubic centimeters.

1 liter = 1000 cubic centimeters

1 liter = 1000 milliliters

Copyright © Kendall Hunt Publishing Company

3. **A.** 150 cubic centimeters = _____ milliliters
   B. 4 liters = _____ cubic centimeters
   C. 3 liters = _____ milliliters
   D. 75 milliliters = _____ cubic centimeters

***Student Guide* - Page 401**

Student Guide

Measuring Volume of Containers (SG pp. 400–404) Questions 1–8

1.* Possible responses: When you order different-sized drinks from a restaurant; when you put gas in a car; when you measure in baking or cooking; when you buy products in different-sized containers.

2.* Possible responses: measuring cups, teaspoons, tablespoons, quarts, gallons, and liters

3. **A.** 150 milliliters
   B. 4000 cubic centimeters
   C. 3000 milliliters
   D. 75 cubic centimeters

Copyright © Kendall Hunt Publishing Company

***Answers and/or discussion are included in the lesson.**

4.* 146 cubic centimeters

5.* Possible response: Since there are spaces between the cubes in the container the volume will be greater when you measure with water.

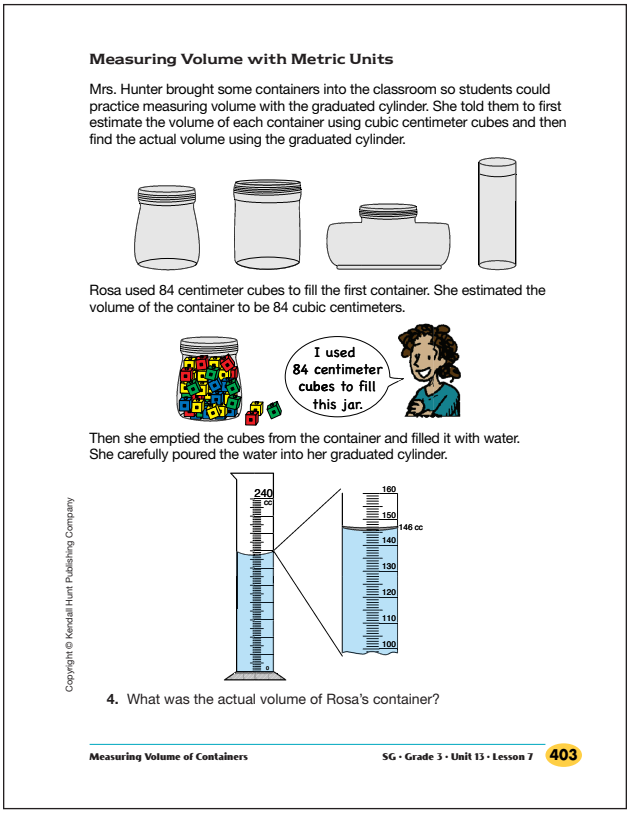
6. A.*258 cubic centimeters

   B. Possible response: Luis needed to fill the graduated cylinder more than once because the volume of the container was more than 100 cubic centimeters. He filled it once and wrote down 100 cc, then he filled it a second time and added another 100 cc, finally he filled it a third time and the water came to 56 cc, so he added another 56 cc.

   100 cc + 100 cc + 58 cc = 258 cc

7. Answers will vary depending on the containers used. Encourage students to share their results with the class.

8. Possible response: Using water and a graduated cylinder is much more accurate because when you use just the cubes there is a lot of space left in the container. When you use water, all the space is taken by the water, so it is more accurate.



Measuring Volume with Metric Units

Mrs. Hunter brought some containers into the classroom so students could practice measuring volume with the graduated cylinder. She told them to first estimate the volume of each container using cubic centimeter cubes and then find the actual volume using the graduated cylinder.

Rosa used 84 centimeter cubes to fill the first container. She estimated the volume of the container to be 84 cubic centimeters.

I used 84 centimeter cubes to fill this jar.

Then she emptied the cubes from the container and filled it with water. She carefully poured the water into her graduated cylinder.

240 cc

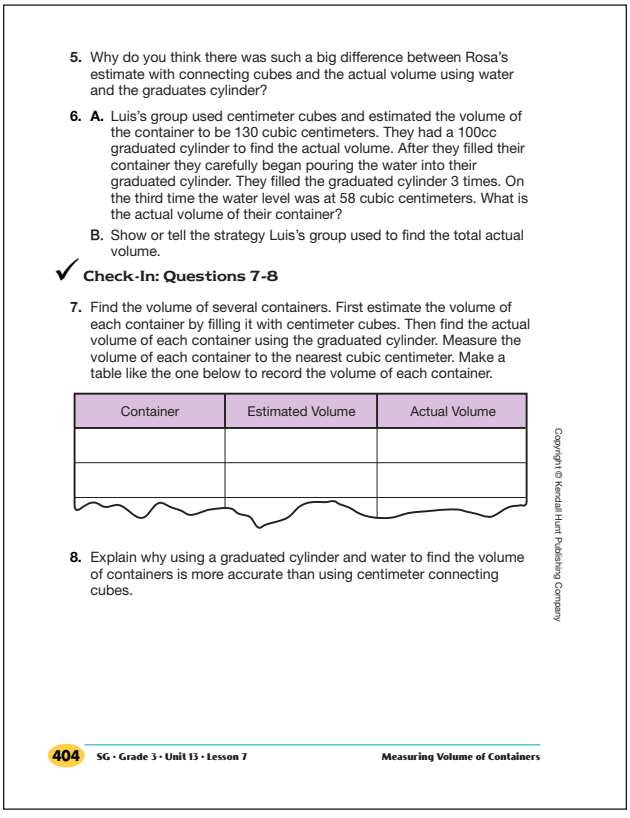
160
150
146 cc
140
130
120
110
100

4. What was the actual volume of Rosa's container?

Copyright © Kendall Hunt Publishing Company

Measuring Volume of Containers SG • Grade 3 • Unit 13 • Lesson 7 403

***Student Guide* - Page 403**



5. Why do you think there was such a big difference between Rosa's estimate with connecting cubes and the actual volume using water and the graduates cylinder?

6. A. Luis's group used centimeter cubes and estimated the volume of the container to be 130 cubic centimeters. They had a 100cc graduated cylinder to find the actual volume. After they filled their container they carefully began pouring the water into their graduated cylinder. They filled the graduated cylinder 3 times. On the third time the water level was at 58 cubic centimeters. What is the actual volume of their container?

   B. Show or tell the strategy Luis's group used to find the total actual volume.

✓ **Check-In: Questions 7-8**

7. Find the volume of several containers. First estimate the volume of each container by filling it with centimeter cubes. Then find the actual volume of each container using the graduated cylinder. Measure the volume of each container to the nearest cubic centimeter. Make a table like the one below to record the volume of each container.

Container	Estimated Volume	Actual Volume

8. Explain why using a graduated cylinder and water to find the volume of containers is more accurate than using centimeter connecting cubes.

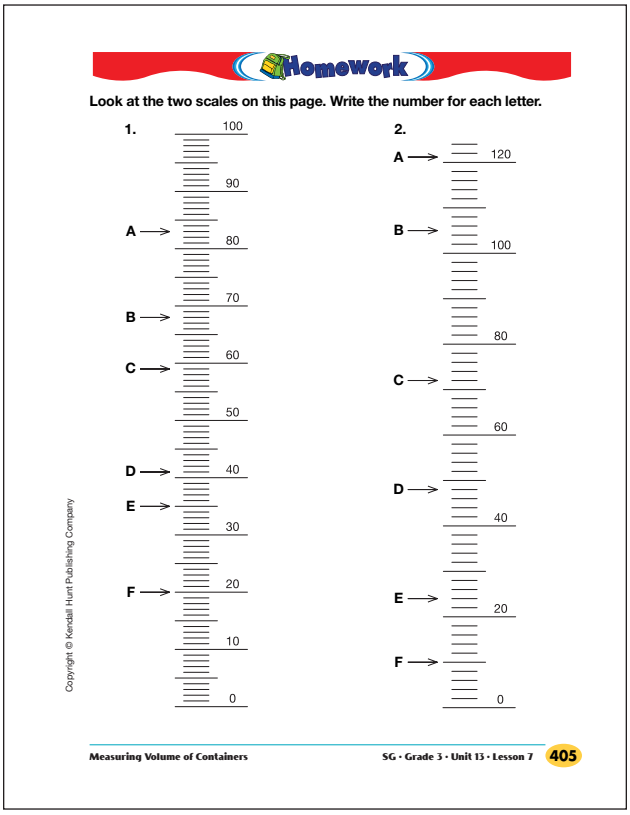
Copyright © Kendall Hunt Publishing Company

404 SG • Grade 3 • Unit 13 • Lesson 7 Measuring Volume of Containers

***Student Guide* - Page 404**

Copyright © Kendall Hunt Publishing Company

***Answers and/or discussion are included in the lesson.**



***Student Guide* - Page 405**

Homework (SG p. 405)
Questions 1–2

1. **A.** 83 cubic centimeters
   B. 68 cubic centimeters
   C. 59 cubic centimeters
   D. 41 cubic centimeters
   E. 35 cubic centimeters
   F. 20 cubic centimeters
2. **A.** 121 cubic centimeters
   B. 105 cubic centimeters
   C. 72 cubic centimeters
   D. 48 cubic centimeters
   E. 24 cubic centimeters
   F. 10 cubic centimeters

Copyright © Kendall Hunt Publishing Company