

# Liquid Volume

## Math Focus Points

- ◆ Understanding measures of liquid volume
- ◆ Estimating and measuring liquid volume
- ◆ Solving story problems involving liquid volume

## Vocabulary

**liquid volume**  
**milliliter (mL)**  
**liter (L)**

## Today's Plan

### 1 ACTIVITY Introducing Liquid Volume



- *Student Activity Book*, p. 35 or **C62, Units for Measuring Liquid Volume** Make copies. (as needed)
- Teaspoon; small plastic jar that holds at least 100 mL; marker; 1-liter plastic water bottle; pitcher of water (1 of each per group); eyedropper

### 2 ACTIVITY Measuring Liquid Volume



- 100-mL measuring cylinder; pitcher of water (per group)

### 3 ACTIVITY Story Problems About Liquid Volume



- *Student Activity Book*, p. 36 or **C63, Story Problems About Liquid Volume** Make copies. (as needed)

### 4 SESSION FOLLOW-UP Daily Practice

- *Student Activity Book*, p. 37 or **C64, Liquid Volume** Make copies. (as needed)

## Ten-Minute Math

**Practicing Place Value** Say “one hundred thirty-four” and ask students to write the number. Make sure students can read, write, and say this number correctly. Ask students to write the number in expanded form. Also, pose questions about rounding the number.

- What if we wanted to round 134 to the nearest ten? To the nearest hundred?

Ask students to solve these problems mentally, if possible:

- What is:  $134 + 30?$   $134 + 40?$   $134 + 50?$   $134 + 100?$   $134 + 200?$   
 $134 + 300?$

Write each answer on the board. Ask students to compare each sum with 134.

- Which places have the same digits? Which do not? Why?

If time remains, pose additional similar problems using these numbers: 289 and 227.

## Math Notes

- 1 Liquid Volume** Volume can also refer to the amount of space a solid object takes up. This Investigation focuses only on understanding and measuring liquid volume. Investigation 3 focused on the volume of solids.
- 2 Units of Liquid Volume** A milliliter is one thousandth of a liter. Students are given this relationship in the form of  $1,000 \text{ milliliters} = 1 \text{ liter}$  so they can better understand the relative sizes of the units. However, they are not expected to change measurements from one unit to another.



## 1

## ACTIVITY

## Introducing Liquid Volume

Give each group a teaspoon, a small jar, a marker, a liter bottle, and a pitcher of water.

Today we are going to learn about **liquid volume**. Liquid volume is the amount of space a liquid takes up. ①

Squeeze 4 or 5 drops of water from an eyedropper.

4 or 5 drops of water gives you about 1 **milliliter** of water. Your teaspoon holds about 5 milliliters of water. How could you figure out how many teaspoons you would need to put 100 milliliters of water into your jar?

**Students might say:**

“Count spoonfuls by 5s until we get to 100.”



“There are twenty 5s in 100, so measure out 20 teaspoons.”

Measure and pour 100 milliliters of water into your jar. With your marker, mark the level for 100 milliliters.

Now, measure and pour 100 milliliters of water into your bottle. Mark the level for 100 milliliters.

Compare the jar and the bottle. What do you notice?

**Students might say:**

“The water comes up higher in the jar.”

The jar and the bottle both contain 100 milliliters of water. They have the same volume of water. The shapes of the containers are different, but the volume of the water did not change. The water takes up the same amount of space.

We measured 100 milliliters of water. Milliliters are often used to measure smaller liquid volumes. Liquid volume can also be measured in **liters**. The bottle can hold 1 liter of liquid. There are 1,000 milliliters in 1 liter. ②

Write “1 liter = 1,000 milliliters” on the board.

How many times would you need to pour 100 milliliters in your bottle to make 1,000 milliliters? (10)

What other objects can you think of that might be able to hold 1 liter of liquid?

Students complete *Student Activity Book* page 35 or C62.

### ONGOING ASSESSMENT: Observing Students at Work

Students decide which measurement unit is more appropriate for the object pictured.

- Do students choose the appropriate measurement unit?

### DIFFERENTIATION: Supporting the Range of Learners

**Intervention** Students might have difficulty visualizing the size of objects when looking at pictures. Encourage students to describe the size of the real objects or find similarly-sized objects.

## 2 ACTIVITY Measuring Liquid Volume



Show students a 100-mL measuring cylinder and sketch one on the board.

Measuring cylinders are used to measure liquid volume. You pour liquid into the container, and then use the numbers to figure out the measurement. When it's full to this line [demonstrate], it holds 100 milliliters.

Comparing the markings on the measuring cylinder to a ruler can help some students make sense of how to “read” the measurements.

Give each group a measuring cylinder and a pitcher of water and explain the task. One by one, each member of the group takes a turn adding some water to the measuring cylinder (or pouring some back into the pitcher). The rest of the group determines the volume of the water in the cylinder. Circulate as students work, helping them understand how the numbers on the cylinder tell the volume of the water in the cylinder.

### ONGOING ASSESSMENT: Observing Students at Work

Students use measuring cylinders to find liquid volume.

- Do students accurately measure liquid volumes? Do students use the measuring cylinder correctly?

Name \_\_\_\_\_ Date \_\_\_\_\_

**Units for Measuring Liquid Volume**

Write whether you would use liters or milliliters to measure each object.

1. Fish tank  2. Juice box 

Circle the measurement that is more likely.

3. Drinking glass  250 milliliters or 250 liters

4. Bath tub  115 milliliters or 115 liters

5. Pot of soup  6 milliliters or 6 liters

6. Teaspoon  5 milliliters or 5 liters

Session 4A.1 Unit 9 35

▲ Student Activity Book, Unit 9, p. 35; Resource Masters, C62



### 3 ACTIVITY

## Story Problems About Liquid Volume

15 MIN INDIVIDUALS CLASS

Read Problem 1 from *Student Activity Book* page 36 or C63 aloud.

**A juice carton has 600 milliliters of juice in it. Philip poured 250 milliliters of juice into a glass. How much juice is left in the juice carton?**

Ask students to retell the story and help you write an equation that shows what the problem is asking.

Write “ $600 - 250 = \underline{\quad}$ ” and “ $250 + \underline{\quad} = 600$ ” on the board. Ask students to solve the problem and then discuss their strategies.

**When we solve problems about liquid volume, we need to make sure to include units in the answer. Since the problem was about milliliters of milk, our answer is 350 milliliters.**

Students complete *Student Activity Book* page 36 or C63.

### ONGOING ASSESSMENT: Observing Students at Work

Students solve story problems involving liquid volume.

- How do students solve the problems?
- Do students label their answers with the correct units?

### DIFFERENTIATION: Supporting the Range of Learners

**Extension** Students who answer the word problems correctly can be challenged to write their own word problems based on changes in liquid volume that occur in everyday life, such as drinking juice or spilling a liquid.

### 4 SESSION FOLLOW-UP

## Daily Practice

**Daily Practice:** For reinforcement of this unit’s content, have students complete *Student Activity Book* page 37 or C64.

Name \_\_\_\_\_ Date \_\_\_\_\_

**Solids and Boxes**

### Story Problems About Liquid Volume

Solve each problem. Show your work. Be sure to include the units in your answer.

1. A juice carton has 600 milliliters of juice in it. Philip poured 250 milliliters of juice into a glass. How much juice is left in the carton?
2. One morning, a gas station sold 590 liters of regular gas and 370 liters of super gas. How much gas did the gas station sell that morning?
3. Dwayne drank 200 milliliters of milk. Then he poured 150 milliliters of milk onto his cereal. How much milk did Dwayne use?
4. A water tank had 180 liters of water in it. After it rained overnight, there were 205 liters of water in it. How much water was added to the tank?

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▲ Student Activity Book, Unit 9, p. 36; Resource Masters, C63

Name \_\_\_\_\_ Date \_\_\_\_\_

**Solids and Boxes**

**Daily Practice**

### Liquid Volume

Write whether you would use liters or milliliters to measure each object.

1. Ladle \_\_\_\_\_
2. Pail \_\_\_\_\_
3. Washer \_\_\_\_\_

Circle the measurement that is more likely.

4. Milk jug 4 milliliters or 4 liters
5. Eye dropper 5 milliliters or 5 liters
6. Wading pool 120 milliliters or 120 liters

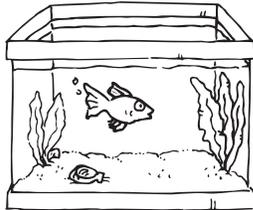
37 Unit 9 Session 4A.1

▲ Student Activity Book, Unit 9, p. 37; Resource Masters, C64

# Units for Measuring Liquid Volume

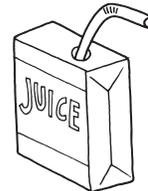
Write whether you would use liters or milliliters to measure each object.

**1.** Fish tank



\_\_\_\_\_

**2.** Juice box



\_\_\_\_\_

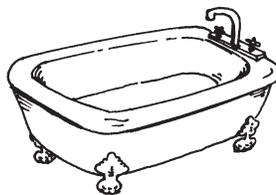
Circle the measurement that is more likely.

**3.** Drinking glass



250 milliliters or 250 liters

**4.** Bathtub



115 milliliters or 115 liters

**5.** Pot of soup



6 milliliters or 6 liters

**6.** Teaspoon

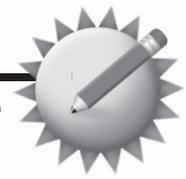


5 milliliters or 5 liters

# Story Problems About Liquid Volume

Solve each problem. Show your work. Be sure to include the units in your answer.

- 1.** A juice carton has 600 milliliters of juice in it. Philip poured 250 milliliters of juice into a glass. How much juice is left in the carton?
- 2.** One morning, a gas station sold 590 liters of regular gas and 370 liters of super gas. How much gas did the gas station sell that morning?
- 3.** Dwayne drank 200 milliliters of milk. Then he poured 150 milliliters of milk onto his cereal. How much milk did Dwayne use?
- 4.** A water tank had 180 liters of water in it. After it rained overnight, there were 205 liters of water in it. How much water was added to the tank?



# Liquid Volume

Write whether you would use liters or milliliters to measure each object.

**NOTE** Students choose appropriate units of liquid volume.

**1.** Ladle



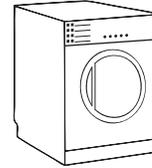
\_\_\_\_\_

**2.** Pail



\_\_\_\_\_

**3.** Washer



\_\_\_\_\_

Circle the measurement that is more likely.

**4.** Milk jug



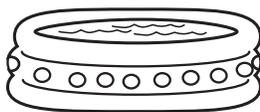
4 milliliters or 4 liters

**5.** Eye dropper



5 milliliters or 5 liters

**6.** Wading pool



120 milliliters or 120 liters