



# GRADE 4 SUPPLEMENT

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## Set D2 Measurement: Capacity in U.S. Customary Units

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### Skills & Concepts

- ★ estimate and measure capacity in U.S. customary units
- ★ carry out simple conversions within a system of measurement, such as cups to quarts

**Bridges in Mathematics Grade 4 Supplement**

**Set D2** Measurement: Capacity In U.S. Customary Units

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*Bridges in Mathematics* is a standards-based K–5 curriculum that provides a unique blend of concept development and skills practice in the context of problem solving. It incorporates the Number Corner, a collection of daily skill-building activities for students.

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# Set D2 ★ Activity 1



## ACTIVITY

### Estimate, Order & Measure Ounces Cups & Quarts

#### Overview

Students estimate the capacity of 6 different containers, ordering them from least to greatest capacity. Then they determine the actual capacities to check their estimates. This activity is designed for use by student pairs during Work Places or other work periods.

#### Skills & Concepts

- ★ estimate and measure capacity in U.S. customary units
- ★ Carry out simple conversions within a system of measurement, such as cups to quarts

#### You'll need

- ★ Estimate, Order & Measure Instructions (page D2.3, run 1 copy)
- ★ Estimate, Order & Measure Record Sheet (page D2.4, run a class set)
- ★ 6 plastic containers (see Advance Preparation)
- ★ quart container (see Advance Preparation)
- ★ 1-cup liquid measuring cup from the Number Corner
- ★ pitcher to hold about 2 quarts of water
- ★ cafeteria tray
- ★ towel

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**Advance Preparation** Gather 6 plastic containers of varying capacity (e.g., margarine, yogurt, peanut butter, cream cheese containers, kids' cups from restaurants, and so on). If any of these are already marked with their capacity, black it out with a permanent marker. Run a strip of masking tape up the side of one of the quart containers that came with your Number Corner materials. Mark the tape at 1-cup intervals up to 4 cups. Place the containers, quart container, measuring cup, and pitcher of water on a cafeteria tray. Set up the tray, towel, activity instructions, and record sheets in a location somewhere in the classroom where pairs of students can work independently over the next few weeks as time allows.

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#### Instructions for Estimate, Order & Measure: Ounces, Cups & Quarts

1. Explain that you've set up some materials to give students practice estimating and measuring capacity in customary units. Review the terms *cup* and *quart* with the class, and remind students that there are 4 cups in a quart. Then take a close look at the measuring cup with them. One side of the cup is marked milliliters. The other is marked in customary units: fractions of a cup and fluid ounces. Hand the cup to a volunteer and ask her to tell the class how many ounce markings there are on the customary side.

**Activity 1** Estimate, Order & Measure Ounces, Cups & Quarts (cont.)

**Daria** *The marks are kind of hard to see, but there are 8 of them. They don't show all the numbers, though. Just 2, 4, 6, and 8, with the word "Oz" at the top.*

**Teacher** *Right. Oz is an abbreviation for ounces.*

2. Explain that in the customary system of measurement, people weigh things in ounces, but they also measure capacity in *fluid ounces*. There are 8 fluid ounces in a cup. How many fluid ounces are there in 2 cups? (16) What about a quart? (32) If there are 8 ounces in a cup, what part of a cup is 1 ounce? ( $\frac{1}{8}$  of a cup) What about 4 ounces? ( $\frac{1}{2}$  a cup)

3. Show students a copy of the Estimate, Order & Measure Ounces instructions and record sheet. Review the instructions with the class, and model the procedure of estimating and measuring as needed. Let students know where to find the materials and explain that they'll be working in pairs to do this activity. Explain how they'll know when it's their turn, and establish any ground rules for using the materials, turning in their work, and so on.

NAME \_\_\_\_\_

DATE \_\_\_\_\_

# Estimate, Order & Measure Instructions

## This activity will need

- ★ Estimate, Order & Measure Instructions
- ★ Estimate, Order & Measure Record Sheet
- ★ 6 plastic containers labeled with letters A–F
- ★ pitcher
- ★ 1-cup measuring cup
- ★ 1-quart container
- ★ towel

## Instructions for Estimate, Order & Measure Ounces, Cups & Quarts

- 1** Record your name and the date at the top of a record sheet. Choose a partner to work with. You'll both fill out your own record sheets for this Activity.
- 2** Look at the 6 containers. Put them in the order you think they belong, from smallest to largest. Record your predictions.
- 3** Go to the sink with your partner and carefully measure 1–2 quarts of water into the pitcher.
- 4** Estimate the capacity of Container A. Remember that there are 8 fluid ounces in a cup and 4 cups in a quart. It's okay if you use more than one unit. For example, if it looks like the container holds between 2 and 3 cups, you might estimate 2 cups, 4 ounces. Record your estimate.
- 5** Use the water, the measuring cup, and the quart container to find out how much water Container A actually holds (to the nearest ounce). Record the actual capacity.
- 7** Continue estimating and finding the capacity for the other 5 containers. Use what you know about the capacity of the first container to help make your estimates.
- 8** When you've found out how much each container actually holds, put them in order from smallest to largest, and record their actual ranking.
- 9** Clean up. After you finish the activity, return all the water to the pitcher and empty the pitcher in the sink. Wipe down the table surface and clear any spills on the floor. Mix up the 6 containers so they're out of order and ready for the next pair of students.

NAME \_\_\_\_\_

DATE \_\_\_\_\_

## Estimate, Order & Measure Record Sheet

Put the containers in the order you think they belong, from smallest to largest. Record your predictions. Then do the second part of the sheet. After you find out how much water each container holds, fill in the second row on this chart to show their actual order.

	1st smallest	2nd	3rd	4th	5th	6th largest
<b>Estimate</b>						
<b>Actual Rank</b>						

Container	Your estimate (to the nearest ounce)	Actual Measurement (to the nearest ounce)
<b>A</b>		
<b>B</b>		
<b>C</b>		
<b>D</b>		
<b>E</b>		
<b>F</b>		

## Set D2 ★ Activity 2



### ACTIVITY

## Which Container Is Best?

### Overview

Students estimate which beverage containers are most likely to hold certain amounts of water. Then they test their ideas to find the best containers for several different situations. This activity is designed for use by student pairs during Work Places or other work periods.

### Skills & Concepts

- ★ estimate and measure capacity in U.S. customary units
- ★ carry out simple conversions within a system of measurement, such as cups to quarts

### You'll need

- ★ Which Container Is Best? Record Sheet (pages D2.6 and D2.7, run a class set)
- ★ an assortment of 8 or more beverage containers (see Advance Preparation)
- ★ 1-cup liquid measuring cup (see Advanced Preparation)
- ★ pitcher to hold about 2 quarts of water
- ★ cafeteria tray
- ★ towel

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**Advance Preparation** Gather 8 or more beverage containers of varying capacity (e.g., pop can, water bottles of various sizes, small children's cup, drink containers from restaurants including an extra large or "biggie" size, and so on). Label each container with an alphabet letter. Place the containers, measuring cup, and pitcher of water on a cafeteria tray. Set up the tray, towel, and record sheets in a location somewhere in the classroom where pairs of students can work independently over the next few weeks as time allows.

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### Instructions for Which Container Is Best? (Customary Version)

1. Explain that you've set up some materials to give students more practice estimating and measuring capacity in customary units. Show them a copy of the Which Container Is Best? Record Sheet. Review the instructions on the sheet with the class, and model the procedure of estimating and measuring as needed.
2. Let students know where to find the materials and explain that they'll be working in pairs to do this activity. Explain how they'll know when it's their turn, and establish any ground rules for using the materials, turning in their work, and so on.



### INDEPENDENT WORKSHEET

See Set D2 Independent Worksheet 1 for more practice estimating and measuring capacity in customary units.

NAME \_\_\_\_\_

DATE \_\_\_\_\_

# Which Container Is Best? Record Sheet page 1 of 2

## Directions

**a** Record your name and the date at the top of the record sheet. Choose a partner to work with. You'll both fill out your own record sheets for this activity.

**b** For each problem below:

- estimate and record which containers would probably hold the amount of water needed. (It's okay if you choose more than one container that might work.)
- test your estimates using the liquid measuring cup.
- decide which beverage container actually works best.
- record your recommendation.

**c** Clean up. After you finish the activity, return all the water to the pitcher. Wipe down the table surface and clean up any spills on the floor.

## Problems

Nicholas needs to bring some water for several different activities this week. Help him select the best container for each activity

**1** For a field trip on Tuesday, Nicholas needs to bring about 2 cups of water to drink.

**a** Estimate: Which of the containers look like they would hold about 2 cups?

**b** Use the liquid measuring cup to help you find the drink container that would work best for the field trip.

**c** Container \_\_\_\_\_ holds about 2 cups.

**2** For soccer practice on Thursday, Nicholas needs to bring about 3 cups of water to drink.

**a** Estimate: Which of the containers look like they would hold about 3 cups? Are there any two containers that look like they would hold 3 cups combined?

**b** Use the liquid measuring cup to help you find the drink container (or pair of containers) that would work best for soccer practice.

**c** Container(s) \_\_\_\_\_ hold(s) about 3 cups.

## Which Container Is Best? Record Sheet page 2 of 2

**3** For his soccer game on Saturday, Nicholas needs to bring about a quart of water to drink.

**a** Estimate: Which of the containers look like they would hold about 1 quart? Are there any combinations of 2 or more containers that might hold 1 quart?

**b** Use the liquid measuring cup to help you find the drink container (or combination of containers) that would work best for the soccer game.

**c** Container(s) \_\_\_\_\_ hold(s) about 1 quart.



### CHALLENGE

**4** On the way home from soccer games, Nicholas always buys a 64-fluid-ounce soda. How many cups of soda is he drinking in a month if there are 4 Saturdays in a month and he has a soccer game every Saturday? How many gallons?



NAME \_\_\_\_\_

DATE \_\_\_\_\_

## Set D2 ★ Independent Worksheet 1



### INDEPENDENT WORKSHEET

#### Just Enough Juice

Teresa is helping to plan a party for her 4th grade class. Her mom has agreed to provide the juice. Her class has 28 students.

**1** Estimate how many gallons of juice Teresa needs to bring if each child drinks about one cup.

**2** If each child drinks one cup of juice, exactly how much juice is needed? You may use measuring tools (1 cup and gallon containers) from your classroom to help you, if needed. Show your work.

**3** If each child drinks one cup of juice, how many gallons of juice does Teresa need to bring? How much juice will be left over? Show your work.

(Continued on back.)

## Independent Worksheet 1 Just Enough Juice (cont.)



### CHALLENGE

**4** If half of the class drinks a full cup of juice, a quarter of the students each have  $\frac{1}{2}$  cup of juice, and a quarter of the students don't drink any, will there be enough for everyone if Teresa only brings one gallon? Show your work.