

Solve Math Problems

Objective Choose the correct unit of measurement to describe the length of an object.

30 minutes



Teach this lesson:

- **After** students complete the textbook chapter on measurement
- **Before** students complete the activity on page 52 of the student worktext

You need these materials:

- classroom objects
- grade-level math textbook
- Worksheet 13
- extra paper for writing
- Transparency 26

EXTENSION AND ENRICHMENT

10 minutes



Have students measure three classroom objects in inches and centimeters. Then ask them to measure the same objects using the length of their index finger. Lead a discussion about why measuring using a body part, as people did in ancient Egypt, is neither exact nor accurate. Have students infer why we have standards of measurement, their value and importance.

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Objective Choose the correct unit of measurement to describe the length of an object.

Learn to Solve Problems

Problem Lisa wants to measure her bedroom. Which customary units of length could she use?

	Think	Write
Step 1:	Read the problem, circle what you have to measure. Circle the unit of measurement.	I will circle <u>bedroom</u> . The problem says <u>customary units</u> , so I will circle that.
Step 2:	Make a list of the units of length in the customary system.	inches, feet, yards, and miles
Step 3:	Think of the size of what you have to measure. Choose the best unit to solve the problem.	A bedroom is too large for inches. The bedroom is too small for miles. I should use feet or yards to solve the problem.



Practice Solving Math Problems

Directions Use the information in the chart to answer the questions.

Object or Distance	Customary Units	Metric Units
piece of paper	1 foot	25 centimeters
baseball bat	1 yard	1 meter
20-minute walk	1 mile	$\frac{1}{2}$ kilometer

- 1 Ali wants to measure the length of an eraser. Which metric unit of length should he use? centimeter
- 2 Jose wants to measure the length of the gym. Which customary unit of length should he use? foot or yard
- 3 Chung wants to measure how wide a door is. What object can she use? baseball bat
- 4 Kim walks 20 minutes to get from her house to school. About how far does she walk? about 1 mile Her teacher walks half a kilometer from his house to school. About how long does he walk? 20 minutes
- 5 How would you measure the length of a baseball field? Choose a unit and a system of measurement. Explain your answer in a complete sentence. Use a separate sheet of paper. *Answers will vary.*

A Introduce

Read aloud the Lesson Objective with students. Have pairs of students list all the units of measurement they remember from the previous lesson and share their list with the class. Write the units on the board, in separate columns for customary and metric units.

Have students review the chart from the previous lesson on page 52 of the student worktext. Ask: *If we want to measure the distance between my desk and the door, what unit should we use? (feet, yards, decimeters, meters) Why would we not use miles or kilometers? (The distance is not great enough.)*

Brainstorm a list of objects and places so students can choose how to measure length, width, and distance using both systems of measurement. Ask why it is important to know how to measure in customary and metric forms. Elicit from students how they can use this skill in their lives, such as to find out how tall they are.

Tell students that now they are going to solve problems where they have to choose the appropriate or correct unit of measurement.

B Teach and Learn

Write this problem on the board and read it aloud: *Javier wants to measure how long his foot is. Which customary unit of length should he use?*

Highlighted words and phrases may affect student comprehension.

Have students open the student worktext to page 52 and look at Learn to Solve Problems. Tell students that the numbered steps will help them find the information they need to solve the problem.

Guide students in the process of thinking how to choose the correct unit to measure length or distance.

Think Aloud

Write Step 1 and read it aloud. Say: *First, I'll read the problem. Read the problem aloud. Say: Javier wants to measure how long his foot is. Which customary unit of length should he use? I know he wants to measure how long his foot is. That's important, so I will circle foot. The problem says customary unit of length. That's important, too. I will circle customary unit. Circle the appropriate phrases in the problem on the board.*

Write Step 2 and read it aloud. Say: *Next, I have to think about the customary units of length. I will make a list. I remember feet, inches, miles, and . . . yards. Inches are the smallest, and miles are the biggest. Let's see, I think yards are longer than feet. So if I put the list in order, it is: inches, feet, yards, miles. Write the list on the board.*


BP 1 Write Step 3 and read it aloud. Say: *Now I have to think about the size of the object Javier is going to measure. A foot is not very big. Which unit of length is best for measuring something that's not very big? I know I can't use miles. I'll cross that off the list. Demonstrate crossing off each word on the list as you say it. Say: Maybe I should use feet, because I'm going to measure a foot. But the customary unit foot is like a 12-inch ruler, and Javier's foot is probably smaller than that. So I'll cross off foot. A yard is bigger than a foot, so I'll cross that off, too. Point to the remaining word in the list. (inch) Say: Javier should use inches to measure his foot.*

Have students look at the chart on the top of student worktext page 52. Tell them that this chart shows the same steps that you just explained. Read the problem aloud with students.

Have students form pairs. Ask them to read the problem again silently. Then have one student read the Step 1 box in the *Think* column. The second student should read the corresponding box in the *Write* column. Call

on pairs to answer the question in the problem using a complete sentence. (*Lisa should use feet or yards to measure her bedroom.*) If any pairs got the answer wrong, match them with pairs that got it right. Have the second pair use the steps in the student worktext to explain how they solved the problem.

Pick two word problems from students' grade-level math textbook involving choosing appropriate units of length (either customary or metric). Write these problems on the board. Have students use the steps in Learn to Solve Problems on page 52 of their student worktext to solve the problems.

 **Use Transparency 26 to introduce and discuss the concept of using objects or time as benchmarks to calculate length and distance.**


Say: *Sometimes it is useful to know about how long something is. Then I can use the length of that thing to figure out about how long other things are.*

Read the chart aloud. Then ask students to discuss what they think about using objects as benchmarks.

Say: *Who can think of another object and its length in inches and centimeters that we can add to our chart? Invite volunteers to name objects and their lengths to use as benchmarks. Add them to the chart.*

Repeat the process with objects that can be measured in feet and decimeters, yards and meters, and distances that can be measured in miles and kilometers.

Review and Practice

 **Use Worksheet 13 to review different lengths and customary and metric units.** Allow students to work with a partner to complete the worksheet. Circulate around the room as they work on the problems. Make sure students understand that benchmarks are not exact measurements. They are a way to help us remember how big the different units of length are.

BP 1 Ask simple questions and model using step-by-step strategies to solve the problems on the worksheet. Encourage students to do the same and to restate the problems in their own words to their partners.

Read aloud the directions for Practice Solving Math Problems on page 52 of the student worktext. Remind students to use the chart as a guide. Then check students' progress as they complete the activity.

D Assess and Intervene

How well can students use different units of measurement? Can students choose the appropriate unit of measurement to solve the problems, based on Practice Solving Math Problems on page 52? Use the rubric to identify students who need extra support through additional help and the Intervention activity.

Intermediate

- Chooses appropriate units for at least 3 questions.
- Explanation includes an appropriate unit, but sentence may be incomplete and explanation may lack details.

Example of a sentence a student might write: *I use meter to measure baseball field because baseball bat is right size.*

Advanced

- Chooses appropriate units for all 4 questions.
- Explanation includes an appropriate unit.

Example of a sentence a student might write: *I use yard to measure baseball field because yard is bigger than foot and smaller than mile.*

INTERVENTION

10 minutes



For students who have difficulty understanding how to choose the appropriate unit of measurement, have them make two four-column charts, one for each measurement system. Help them list the units of length as column headings on each chart. Then ask them to practice measuring classroom objects in both systems. Have them list the object and the measurement in the appropriate column. Once they fully comprehend how to use both systems, ask them to look for objects they could use as benchmarks and record them at the bottom of each column.