Student Guide

Questions 1–23 (SG pp. 448–452)

1. Yes
2. No
3. Answers will vary.
4.* A sample class data table follows (Figure 1 from lesson).

To the Nearest Meter

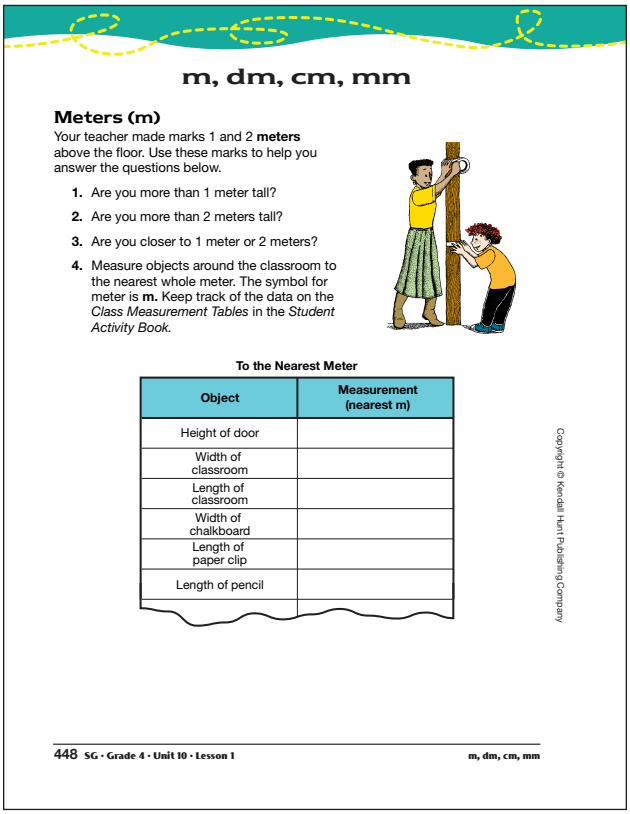
Object	Measurement (nearest m)
Height of door	2 m
Width of classroom	8 m
Length of classroom	14 m
Width of chalkboard	5 m
Length of paper clip	0 m
Length of pencil	0 m

5. A measurement of 0 m tells you the object is less than 0.5 m long. Centimeters or decimeters are more appropriate units.
6. Two possible answers: a pencil and the diameter of a nickel.
7. Two possible answers: The length of a room and the height of a building.
8.* 10 skinnies
9. 10 dm = 1 m; 5 dm = $\frac{1}{2}$ m
10. $\frac{1}{10}$, tenth
11. A sample class data table follows.

To the Nearest Decimeter

Object	Measurement (nearest dm)
Height of door	22 dm
Width of classroom	84 dm
Length of classroom	137 dm
Width of chalkboard	49 dm
Length of paper clip	0 dm
Length of pencil	1 dm

12. The paper clip is less than 0.5 dm long. Centimeters would give a better measure.
13. Two possible answers: The width of a desk and the length of your arm. (Note: Decimeters are not commonly used in the United States.)



m, dm, cm, mm

Meters (m)

Your teacher made marks 1 and 2 **meters** above the floor. Use these marks to help you answer the questions below.

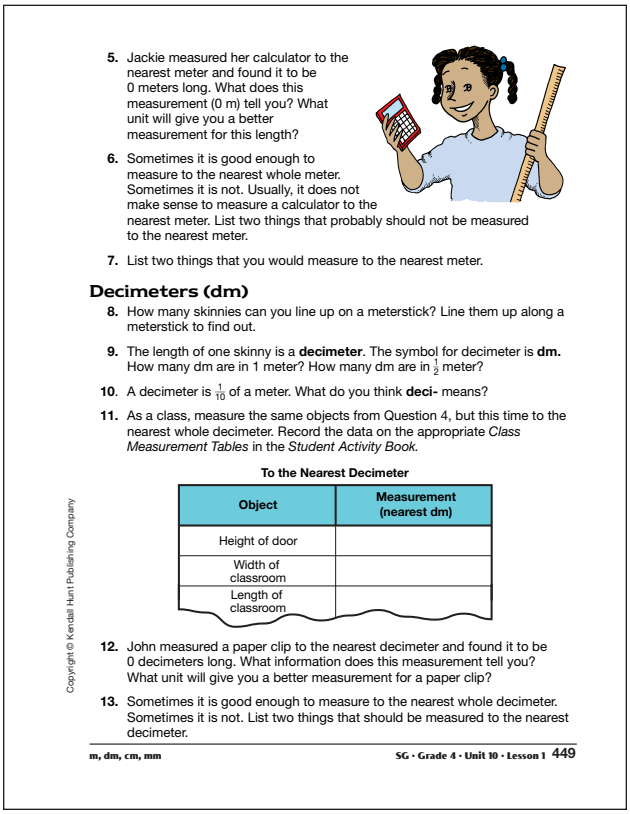
1. Are you more than 1 meter tall?
2. Are you more than 2 meters tall?
3. Are you closer to 1 meter or 2 meters?
4. Measure objects around the classroom to the nearest whole meter. The symbol for meter is **m.** Keep track of the data on the *Class Measurement Tables* in the *Student Activity Book.*

To the Nearest Meter

Object	Measurement (nearest m)
Height of door	
Width of classroom	
Length of classroom	
Width of chalkboard	
Length of paper clip	
Length of pencil	

448 SG • Grade 4 • Unit 10 • Lesson 1 m, dm, cm, mm

***Student Guide* - Page 448**



5. Jackie measured her calculator to the nearest meter and found it to be 0 meters long. What does this measurement (0 m) tell you? What unit will give you a better measurement for this length?
6. Sometimes it is good enough to measure to the nearest whole meter. Sometimes it is not. Usually, it does not make sense to measure a calculator to the nearest meter. List two things that probably should not be measured to the nearest meter.
7. List two things that you would measure to the nearest meter.

Decimeters (dm)

8. How many skinnies can you line up on a meterstick? Line them up along a meterstick to find out.
9. The length of one skinny is a **decimeter**. The symbol for decimeter is **dm.** How many dm are in 1 meter? How many dm are in $\frac{1}{2}$ meter?
10. A decimeter is $\frac{1}{10}$ of a meter. What do you think **deci-** means?
11. As a class, measure the same objects from Question 4, but this time to the nearest whole decimeter. Record the data on the appropriate *Class Measurement Tables* in the *Student Activity Book.*

To the Nearest Decimeter

Object	Measurement (nearest dm)
Height of door	
Width of classroom	
Length of classroom	

12. John measured a paper clip to the nearest decimeter and found it to be 0 decimeters long. What information does this measurement tell you? What unit will give you a better measurement for a paper clip?
13. Sometimes it is good enough to measure to the nearest whole decimeter. Sometimes it is not. List two things that should be measured to the nearest decimeter.

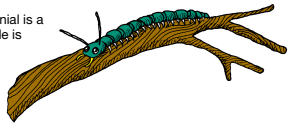
m, dm, cm, mm SG • Grade 4 • Unit 10 • Lesson 1 449

***Student Guide* - Page 449**

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

Centimeters (cm)

A **cent**ury is 100 years; a **cent**ennial is a 100-year anniversary; a **cent**ipede is said to have 100 legs. What do you think **cent-** means?



A **cent**imeter is $\frac{1}{100}$ of a meter and a **cent** is $\frac{1}{100}$ of a dollar. In other words, there are 100 centimeters in a meter and 100 cents in a dollar.

14. How many bits can you line up along a meterstick? How did you decide?
15. How long is a bit?
16. As a class, measure the same objects from Question 4. This time measure to the nearest whole centimeter. Record the data on the appropriate *Class Measurement Table* in the *Student Activity Book*.
17. List two things it makes sense to measure to the nearest whole centimeter. List two things it does not make sense to measure in centimeters.
18. Find an object that measures less than 1 centimeter.

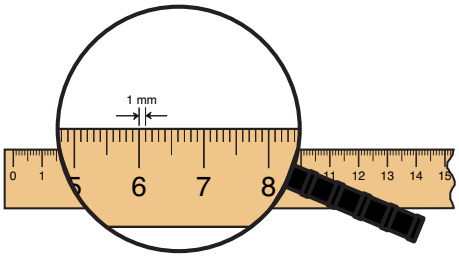
To the Nearest Centimeter

Object	Measurement (nearest cm)
Height of door	
Width of classroom	
Length of classroom	
Width of chalkboard	
Length of paper clip	
Length of pencil	

***Student Guide* - Page 450**

Millimeters (mm)

If you look at a meterstick very carefully, you will see little spaces between short lines. Each one of these spaces is a millimeter.



19. There are 1000 **millimeters** in a meter. What do you think **milli-** means?
20. How many millimeters are in a centimeter?
21. How many millimeters are in a decimeter? How did you decide?
22. People generally use millimeters to measure very short lengths. Give an example of when it would make sense to measure in millimeters.

Measuring with Metersticks, Skinnies, and Bits

John measured the length of the chalkboard in his classroom. First, he used two metersticks. He saw that less than half of a third meterstick would fit. John said, "To the nearest whole meter, this length is 2 meters."

***Student Guide* - Page 451**

14. 100 bits; explanations will vary. Without actually lining up the bits, a student can reason that there are 10 bits in a skinny and 10 skinnies in a meterstick: $10 \times 10 = 100$ bits.
15. 1 cm
16. A sample class data table follows.

To the Nearest Centimeter

Object	Measurement (nearest m)
Height of door	223 cm
Width of classroom	838 cm
Length of classroom	1372 cm
Width of chalkboard	487 cm
Length of paper clip	3 cm
Length of pencil	14 cm

17.* Two possible answers to measure in cm: a calculator and an eraser. Two possible answers not to measure in cm: distance from school to home and length of side of school building.
18. A possible answer: The thickness of a pencil lead.
19. $\frac{1}{1000}$, thousandth
20. 10 mm = 1 cm
21. 100 mm = 1 dm; explanations will vary. Students could reason that they see 10mm in one cm on a ruler, and there are 10 cm in one dm. $10 \times 10 = 100$mm in a dm.
22.* A possible answer: The thickness of a dime.

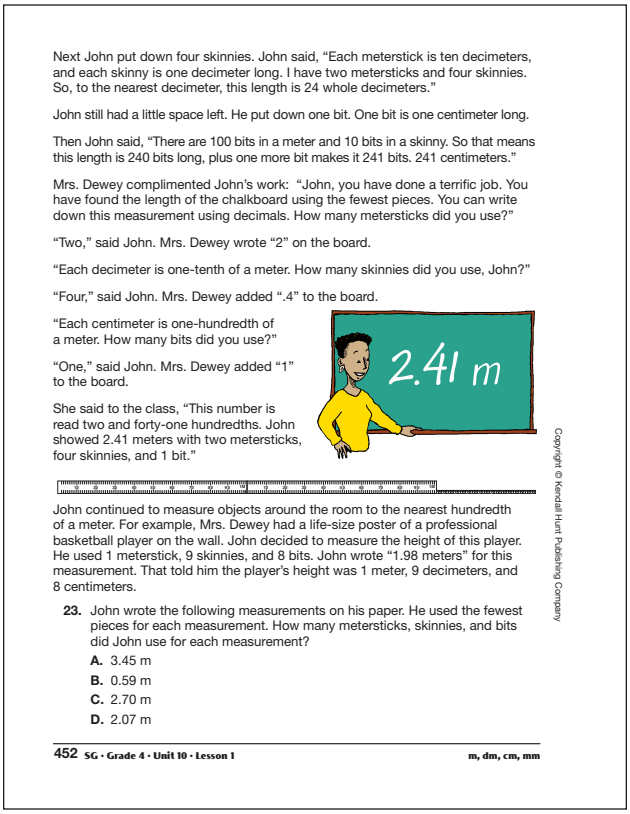
***Answers and/or discussion are included in the lesson.**

23. A. 3 metersticks, 4 skinnies, 5 bits
B. 5 skinnies, 9 bits
C. 2 metersticks, 7 skinnies
D. 2 metersticks, 7 bits

Homework (SG p. 453)

Questions 1–3

1. Answers will vary.
2. **A–C.** Answers will vary.
3. Answers will vary.



Next John put down four skinnies. John said, "Each meterstick is ten decimeters, and each skinny is one decimeter long. I have two metersticks and four skinnies. So, to the nearest decimeter, this length is 24 whole decimeters."

John still had a little space left. He put down one bit. One bit is one centimeter long.

Then John said, "There are 100 bits in a meter and 10 bits in a skinny. So that means this length is 240 bits long, plus one more bit makes it 241 bits. 241 centimeters."

Mrs. Dewey complimented John's work: "John, you have done a terrific job. You have found the length of the chalkboard using the fewest pieces. You can write down this measurement using decimals. How many metersticks did you use?"

"Two," said John. Mrs. Dewey wrote "2" on the board.

"Each decimeter is one-tenth of a meter. How many skinnies did you use, John?"

"Four," said John. Mrs. Dewey added ".4" to the board.

"Each centimeter is one-hundredth of a meter. How many bits did you use?"

"One," said John. Mrs. Dewey added "1" to the board.

She said to the class, "This number is read two and forty-one hundredths. John showed 2.41 meters with two metersticks, four skinnies, and 1 bit."

John continued to measure objects around the room to the nearest hundredth of a meter. For example, Mrs. Dewey had a life-size poster of a professional basketball player on the wall. John decided to measure the height of this player. He used 1 meterstick, 9 skinnies, and 8 bits. John wrote "1.98 meters" for this measurement. That told him the player's height was 1 meter, 9 decimeters, and 8 centimeters.

23. John wrote the following measurements on his paper. He used the fewest pieces for each measurement. How many metersticks, skinnies, and bits did John use for each measurement?

A. 3.45 m
B. 0.59 m
C. 2.70 m
D. 2.07 m

***Student Guide* - Page 452**

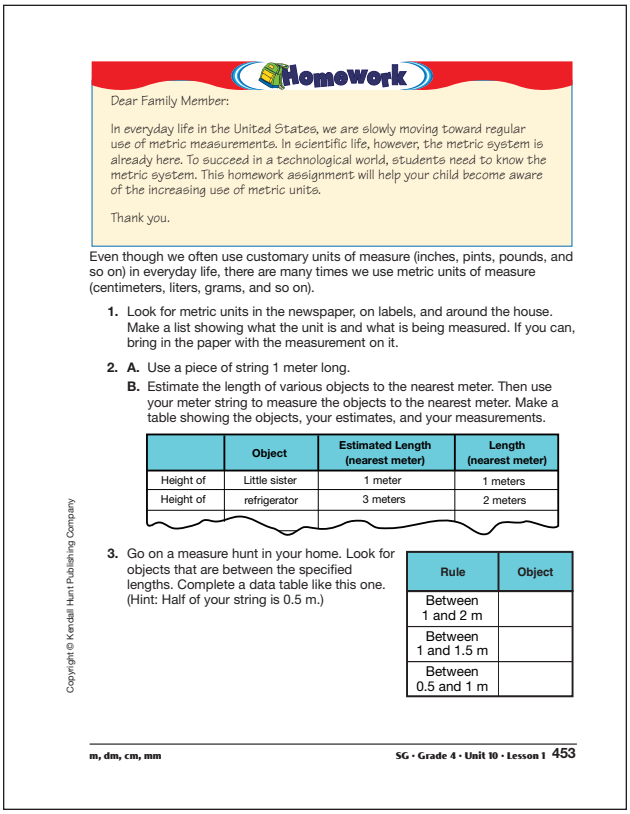
Student Activity Book

Class Measurement Tables (SAB p. 399)

See Questions 4, 11, and 16 in the *Student Guide* Answer Key.

Measure Hunt (SAB pp. 401–402)

Answers will vary.



Homework

Dear Family Member:

In everyday life in the United States, we are slowly moving toward regular use of metric measurements. In scientific life, however, the metric system is already here. To succeed in a technological world, students need to know the metric system. This homework assignment will help your child become aware of the increasing use of metric units.

Thank you.

Even though we often use customary units of measure (inches, pints, pounds, and so on) in everyday life, there are many times we use metric units of measure (centimeters, liters, grams, and so on).

1. Look for metric units in the newspaper, on labels, and around the house. Make a list showing what the unit is and what is being measured. If you can, bring in the paper with the measurement on it.
2. **A.** Use a piece of string 1 meter long.
   B. Estimate the length of various objects to the nearest meter. Then use your meter string to measure the objects to the nearest meter. Make a table showing the objects, your estimates, and your measurements.

	Object	Estimated Length (nearest meter)	Length (nearest meter)
Height of	Little sister	1 meter	1 meters
Height of	refrigerator	3 meters	2 meters

3. Go on a measure hunt in your home. Look for objects that are between the specified lengths. Complete a data table like this one. (Hint: Half of your string is 0.5 m.)

Rule	Object
Between 1 and 2 m	
Between 1 and 1.5 m	
Between 0.5 and 1 m	

***Student Guide* - Page 453**