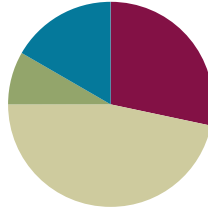


## Lesson 5

**Objective:** Rename and measure with centimeter cubes, using their standard unit name of centimeters.

### Suggested Lesson Structure

■ Fluency Practice	(17 minutes)
■ Application Problem	(5 minutes)
■ Concept Development	(28 minutes)
■ Student Debrief	(10 minutes)
<b>Total Time</b>	<b>(60 minutes)</b>



### Fluency Practice (17 minutes)

- Race and Roll Subtraction **1.OA.6** (4 minutes)
- Happy Counting **1.OA.5, 1.NBT.5** (3 minutes)
- Sprint: Subtraction Within 20 **1.OA.6** (10 minutes)

### Race and Roll Subtraction (4 minutes)

Materials: (S) 1 die per set of partners

Note: This fluency activity reviews the grade level standard of subtracting within 20.

All students start at 20. Partners take turns rolling the die and saying a number sentence to subtract the number rolled from the total. (For example, Partner A rolls 3 and says, “ $20 - 3 = 17$ .” Partner B rolls 2 and says, “ $17 - 2 = 15$ .”) They continue rapidly rolling and saying number sentences until they reach 0. If they roll a number greater than the number they are subtracting from (minuend), they re-roll or forfeit their turn. Partners stand when they reach 0. (For example, if partners are at 1 and roll 4, they would take turns rolling until one of them rolls a 1. They would then say, “ $1 - 1 = 0$ ,” and both partners would stand.) Repeat the game as time permits.

### Happy Counting (3 minutes)

Note: Practice with counting forward and backward by tens and ones strengthens students’ understanding of place value. Counting by twos and fives builds students’ ability to count on or back and strengthens addition and subtraction skills.

Repeat the Happy Counting activity from G1–M3–Lesson 2. Choose a counting pattern and range based on your students’ skill level. If they are very proficient with counting by ones, twos, fives, and tens up to 40, start at 40 and quickly go up to 80. If they are proficient between 40 and 80, Happy Count between 80 and 120.

To really reinforce place value, try alternating between counting the regular way and the Say Ten way.

### Sprint: Subtraction Within 20 (10 minutes)

Materials: (S) Subtraction Within 20 Sprint

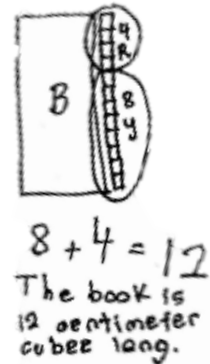
Note: This Sprint addresses the Grade 1 standard of subtracting within 20.

### Application Problem (5 minutes)

Amy used centimeter cubes to measure the length of her book. She used 8 yellow centimeter cubes and 4 red centimeter cubes. How many centimeter cubes long was her book?

Remind students to use the RDW process. After reading (or listening to) the problem, they must be sure to draw, write a number sentence, and write a statement that answers the question.

Note: This problem uses the context of measurement while enabling students to review their processes for adding single digits whose sum is a teen number. Take note of the strategies students are using independently. Are they making ten first? Are they counting on? Are they counting all after drawing the picture? During the Debrief, students will have the opportunity to connect, or rename, the unit length of centimeter cube to the more common unit length of centimeter.



### Concept Development (28 minutes)

Materials: (T) Projector, centimeter cubes, string, scissors, centimeter ruler (S) Per pair: bag with at least 12 centimeter cubes (from G1–M3–Lesson 4), centimeter ruler, pair of dice

Have student sit in the meeting area in a semi-circle.

- T: Will you help me solve a problem? My mom is travelling to different countries, and she wants to get me a bracelet from Korea, Brazil, and France. The problem is, she wants to make sure they fit, but the bracelets are over there and my wrist is here! What can she do? Is there any way we can help her? Talk to your partner.
- S: We could measure your wrist with centimeter cubes! → That seems hard though, her wrist isn't straight. → We could measure your wrist with a string then!
- T: I love all of your ideas about the different tools we can use. I knew I could rely on you for some great problem solving! Which will be easier to use first, the string or the centimeter cubes?
- S: The string, because it can wrap around your wrist.
- T: (Wrap a string around a wrist.) I'll pretend that the string is the bracelet. I'm going to leave a little room so it's not so tight. (Cut.)
- T: (Project the string on the board.) How can we figure out how long this string is? Turn and talk to your partner about how we can measure accurately.

- S: Use centimeter cubes. → Line up the endpoints. → Don't leave any gaps between the cubes. → Don't overlap the cubes.
- T: These are important rules for measuring accurately. Let's count and see how many centimeter cubes long the string is as I lay down each cube.
- S: 1 cube, 2 cubes, ...18 cubes!
- T: (Project a centimeter ruler.) Here's a tool that my mom is able to use to measure the length of the bracelet. She said every store, no matter what country she's in, uses the centimeter ruler to measure their bracelets. In fact, no matter where you live in the world, people use these tools to measure the length of any items. This tool is called a...
- S: Ruler!
- T: When have you seen a ruler used before? Turn and talk to your partner.
- S: We used it to draw straight lines in kindergarten. → I used it to learn my counting numbers with my aunt. → My grandpa uses it to measure the picture frames he makes.
- T: (Project the centimeter ruler.) What do you notice on the ruler?
- S: There are numbers going in order. → There are longer lines next to each number. There are some shorter lines too.
- T: Let's see how the ruler compares to our centimeter cubes that we used to measure my wrist. I'm going to lay these 18 centimeter cubes alongside the ruler, so I need to line up the cube to the endpoint of the ruler. Here's 1 centimeter cube. (Lay down 1 cube.) What do you notice?
- S: The other end of the centimeter cube lines up with the 1 on the ruler!
- T: When something reaches this line (point to 1 cm mark on the ruler), we say that it is **1 centimeter** long. So, how long is this centimeter cube?
- S: 1 centimeter!
- T: (Lay down the second cube.) What do you notice now?
- S: The end of the second centimeter cube lines up with the 2 on the ruler!
- T: How many centimeters long are these 2 cubes together?
- S: 2 centimeters!
- T: (Repeat for third and fourth cube.) If I lay down the next centimeter cube, with what number will it line up?
- S: 5! That's 5 centimeters.
- T: (Continue with all cubes, eliciting responses and checking them by laying down cubes.) How many centimeters long are all of these centimeter cubes?
- S: 18 centimeters!
- T: When we are measuring with centimeter cubes, we are using the same length unit as the people who use rulers! With this ruler, we are measuring in centimeters. That's the length unit, so we have a special name for this ruler. We call it the **centimeter ruler**. So, did we solve the problem? What should I tell my



#### A NOTE ON MULTIPLE MEANS OF REPRESENTATION:

Students may continue to use a ruler if they don't demonstrate an understanding of the relationship between a centimeter and centimeter cubes.



Centimeter Ruler

mom about buying the right length bracelet?

S: Yes! Tell her to buy bracelets that are 18 centimeters long! She can use the ruler to measure 18 centimeters.

T: Thank you for helping me solve this problem! I will write to her and let her know! From now on, when we measure we can say that the length of the item is “\_\_\_ centimeters” instead of saying “\_\_\_ centimeter cubes.” Now, you get to see for sure if 1 centimeter cube is 1 centimeter long, 3 centimeter cubes are 3 centimeters long, and 6 centimeter cubes are...

S: 6 centimeters long.

Distribute a bag to each pair of students. Have students practice laying down their centimeter cubes alongside the centimeter ruler and renaming *centimeter cubes* to *centimeters* by following these steps:

1. Roll the dice (e.g., 2 and 5).
2. Partner 1 lays down the centimeter cubes alongside the ruler to show the number from the first die (gets to 2 centimeters on the ruler by laying down 2 centimeter cubes). He says, “I measured to 2 centimeters.”
3. Partner 2 adds more centimeter cubes alongside the ruler based on the second die (gets to 7 centimeters on the ruler by laying down 5 centimeter cubes). She says, “Now, we measured to 7 centimeters.”
4. Say the addition sentence that tells how long your row of cubes is. (2 cm + 5 cm = 7 cm.)

Note: If time permits, provide an opportunity for students to measure their own bracelet or watch size. Students loop string around their wrist, cut it, and use centimeter cubes to determine the length. An ELA connection could include having students write home to their families about the size of their wrists, just as the teacher communicated with his family.

**Problem Set (10 minutes)**

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. For some classes, it may be appropriate to modify the assignment by specifying which problems they work on first. Some problems do not specify a method for solving. Students solve these problems using the RDW approach used for Application Problems.


**NOTES ON MULTIPLE MEANS OF REPRESENTATION:**


Students with disabilities may need some assistance lining up and measuring with centimeter cubes. Model how to use them one on one and then help with a few measurements.


NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 5 Problem Set 1•3

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

1. Circle the objects that are measured correctly.




A)  3 centimeters long

B)  5 centimeters long

 4 centimeters long

2. Measure the paperclip (B) with your cubes.  
The paperclip is 3 centimeter cubes long.  
Check your cubes along your ruler. How long is the paperclip in centimeters?  
The paperclip is 3 centimeters long.  
Be ready to explain why these are the same or different during the debrief!

Use centimeter cubes to measure the pictures from left to right.  
Write a statement about the length of each picture in centimeters.

3. The hamburger picture is 4 centimeters long.  
4. The hotdog picture is 6 centimeters long.  
5. The bread picture is 5 centimeters long.

COMMON CORE Lesson 5: Rename and measure with centimeter cubes, using its standard unit name of centimeters. Date: 6/24/13 engageNY 3.8.8

### Student Debrief (10 minutes)

**Lesson Objective:** Rename and measure with centimeter cubes, using their standard unit name of centimeters.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

You may choose to use any combination of the questions below to lead the discussion.

- What is the new length unit we used to measure length accurately? (**Centimeters.**)
- How can you prove to another first grader that 1 centimeter cube is the same as 1 centimeter?
- How are centimeter cubes similar and different compared to the centimeters on a centimeter ruler?
- Do you think centimeter rulers in Asia or Europe, or anywhere else, look the same as centimeter rulers here?
- Why do you think people all over the world use centimeters as a length unit? Why is it important that we all use the same length unit, like centimeters?
- Look at Problem 2. Explain why your measurements are the same or different.
- How did you solve today’s Application Problem? Tell your partner your answer using the new length unit as if we used a ruler to measure the length of Amy’s book.

Be sure to send the bag of cubes home for students to complete their homework.

### Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students’ understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.

Use centimeter cubes to measure the objects below. Fill in the length of each object.

The eraser is about 5 centimeters long.

The hair clip is about 4 centimeters long.

The key is about 5 centimeters long.

The marker is about 7 centimeters long.

The pen is about 8 centimeters long.

6. The eraser is longer than ~~the hair clip~~ but it is shorter than the pen.

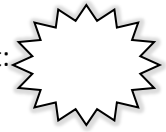
Circle the word that makes the second sentence true.

7. If a paper clip is shorter than the key, then the marker is longer/shorter than the paper clip.

COMMON CORE Lesson 5: Rename and measure with centimeter cubes, using its standard unit name of centimeters. engage<sup>ny</sup> 3.B.10

A

Number correct:



Name \_\_\_\_\_

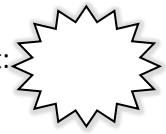
Date \_\_\_\_\_

\*Write the missing number.

1	$17 - 1 = \square$		16	$19 - 9 = \square$	
2	$15 - 1 = \square$		17	$18 - 9 = \square$	
3	$19 - 1 = \square$		18	$11 - 9 = \square$	
4	$15 - 2 = \square$		19	$16 - 5 = \square$	
5	$17 - 2 = \square$		20	$15 - 5 = \square$	
6	$18 - 2 = \square$		21	$14 - 5 = \square$	
7	$18 - 3 = \square$		22	$12 - 5 = \square$	
8	$18 - 5 = \square$		23	$12 - 6 = \square$	
9	$17 - 5 = \square$		24	$14 - \square = 11$	
10	$19 - 5 = \square$		25	$14 - \square = 10$	
11	$17 - 7 = \square$		26	$14 - \square = 9$	
12	$18 - 7 = \square$		27	$15 - \square = 9$	
13	$19 - 7 = \square$		28	$\square - 7 = 9$	
14	$19 - 2 = \square$		29	$19 - 5 = 16 - \square$	
15	$19 - 7 = \square$		30	$15 - 8 = \square - 9$	

**B**

Number correct:



Name \_\_\_\_\_

Date \_\_\_\_\_

\*Write the missing number.

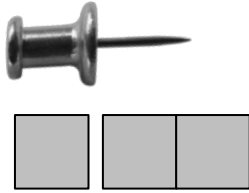
1	$16 - 1 = \square$		16	$19 - 9 = \square$	
2	$14 - 1 = \square$		17	$18 - 9 = \square$	
3	$18 - 1 = \square$		18	$12 - 9 = \square$	
4	$19 - 2 = \square$		19	$19 - 8 = \square$	
5	$17 - 2 = \square$		20	$18 - 8 = \square$	
6	$15 - 2 = \square$		21	$17 - 8 = \square$	
7	$15 - 3 = \square$		22	$14 - 5 = \square$	
8	$17 - 5 = \square$		23	$13 - 5 = \square$	
9	$19 - 5 = \square$		24	$12 - \square = 7$	
10	$16 - 5 = \square$		25	$16 - \square = 10$	
11	$16 - 6 = \square$		26	$16 - \square = 9$	
12	$19 - 6 = \square$		27	$17 - \square = 9$	
13	$17 - 6 = \square$		28	$\square - 7 = 9$	
14	$17 - 1 = \square$		29	$19 - 4 = 17 - \square$	
15	$17 - 6 = \square$		30	$16 - 8 = \square - 9$	

Name \_\_\_\_\_

Date \_\_\_\_\_

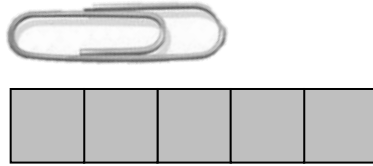
1. Circle the objects that are measured correctly.

A



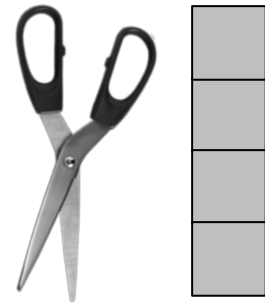
3 centimeters long

B



5 centimeters long

C



4 centimeters long

2. Measure the paperclip (B) with your cubes.

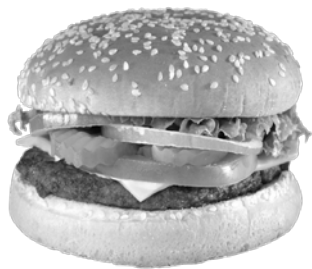
The paperclip is \_\_\_\_\_ centimeter cubes long.

Check your cubes along your ruler. How long is the paperclip in centimeters?

The paperclip is \_\_\_\_\_ centimeters long.

Be ready to explain why these are the same or different during the Debrief!

Use centimeter cubes to measure the pictures from left to right.  
Write a statement about the length of each picture in centimeters.




3. The hamburger picture is \_\_\_\_\_ centimeters long.


4. The hotdog picture is \_\_\_\_\_ centimeters long.

5. The bread picture is \_\_\_\_\_ centimeters long.


Use centimeter cubes to measure the objects below. Fill in the length of each object.



The eraser is about \_\_\_\_\_ centimeters long.



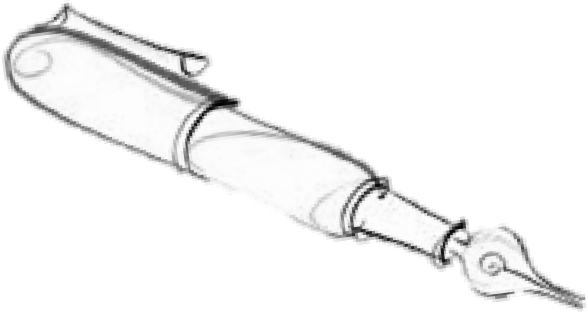
The hair clip is about \_\_\_\_\_ centimeters long.



The key is about \_\_\_\_\_ centimeters long.



The marker is about \_\_\_\_\_ centimeters long.



The pen is about \_\_\_\_\_ centimeters long.

6. The eraser is longer than the \_\_\_\_\_ but it is shorter than the \_\_\_\_\_.

Circle the word that makes the second sentence true.

7. If a paper clip is shorter than the key, then the marker is **longer/shorter** than the paper clip.

Name \_\_\_\_\_

Date \_\_\_\_\_

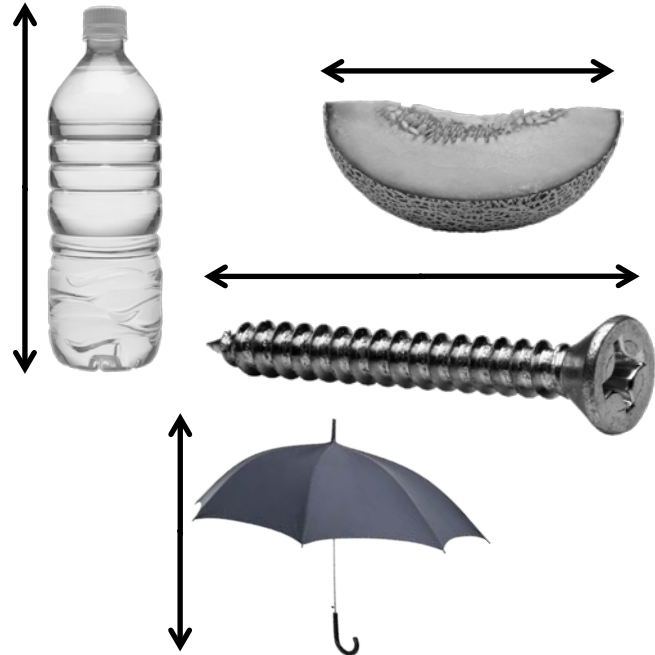
Use the centimeter cubes to measure the items and complete the sentences.

1. The water bottle is about \_\_\_\_\_ centimeters tall.

2. The melon is about \_\_\_\_\_ centimeters long.

3. The screw is about \_\_\_\_\_ centimeters long.

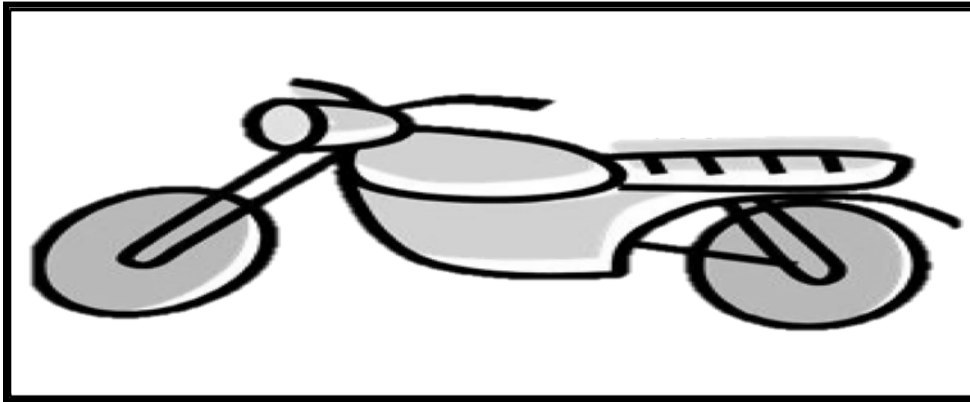
4. The umbrella is about \_\_\_\_\_ centimeters tall.



Name \_\_\_\_\_

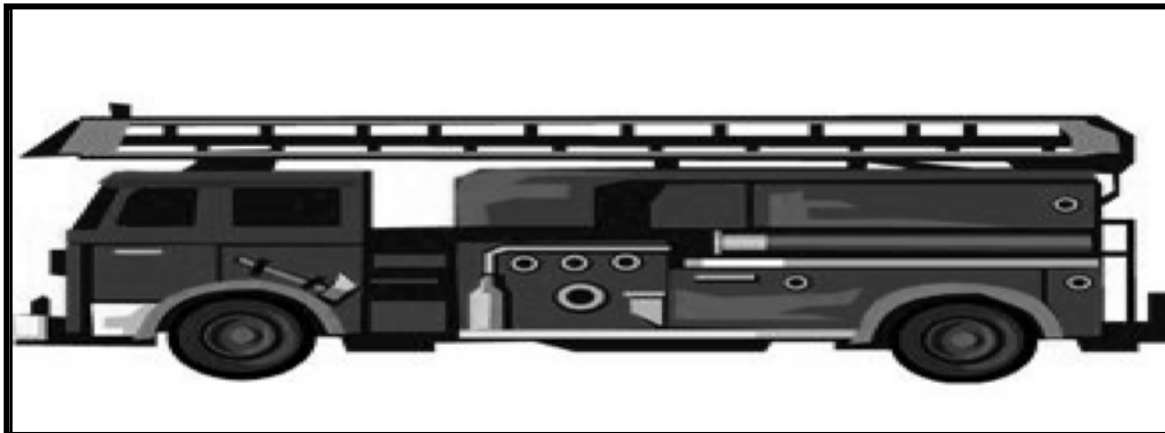
Date \_\_\_\_\_

Justin collects transportation stickers. Use the centimeter cubes from your teacher to measure Justin's stickers. Complete the sentences about Justin's stickers.

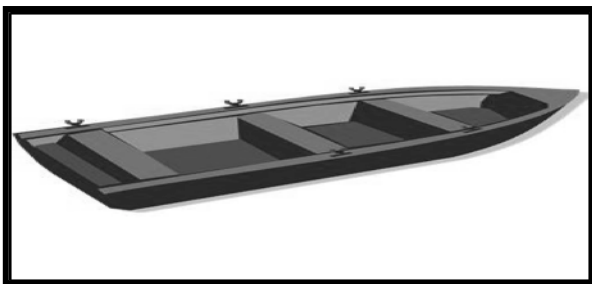


The motorcycle sticker is \_\_\_\_\_ centimeters long.

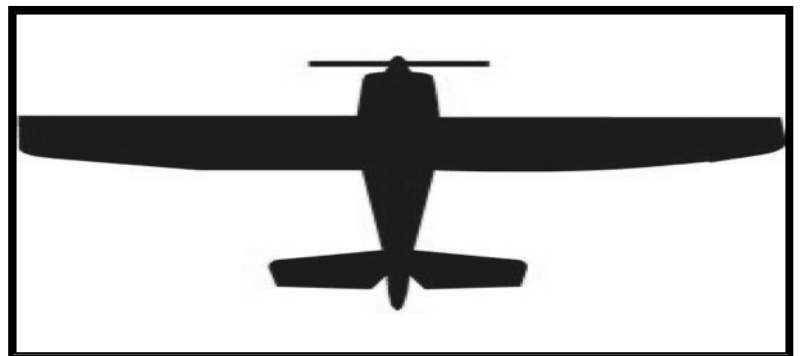
The car sticker is \_\_\_\_\_ centimeters long.



The fire truck sticker is \_\_\_\_\_ centimeters long.



The row boat sticker is \_\_\_\_\_ centimeters long.



The airplane sticker is \_\_\_\_\_ centimeters long.

Use the stickers' measurements to list the stickers of the row boat, the airplane, and the fire truck from longest to shortest. You can use drawings or names to list the stickers.

Longest



Shortest

Fill in the blanks to make the statements true. There may be more than one correct answer.

1. The airplane sticker is longer than the \_\_\_\_\_ sticker.
2. The row boat sticker is longer than the \_\_\_\_\_ sticker and shorter than the \_\_\_\_\_ sticker.
3. The motorcycle sticker is shorter than the \_\_\_\_\_ sticker and longer than the \_\_\_\_\_ sticker.
4. If Justin gets a new sticker that is longer than the row boat, it will also be longer than which of his other stickers? \_\_\_\_\_