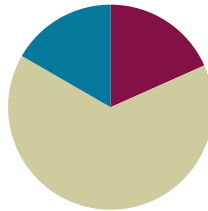


## Lesson 16

**Objective:** Measure various objects using inch rulers and yardsticks.

### Suggested Lesson Structure

■ Fluency Practice	(11 minutes)
■ Concept Development	(39 minutes)
■ Student Debrief	(10 minutes)
<b>Total Time</b>	<b>(60 minutes)</b>



### Fluency Practice (11 minutes)

- Sprint: Adding and Subtracting by 3 **2.OA.2** (9 minutes)
- Subtraction Fact Flash Cards **2.OA.2** (2 minutes)

### Sprint: Adding and Subtracting by 3 (9 minutes)

Materials: (S) Adding and Subtracting by 3 Sprint

Note: Students practice adding and subtracting by 3 to gain mastery of the sums and differences within 20.

### Subtraction Fact Flash Cards (2 minutes)

Materials: (T) Subtraction fact flash cards set 2 (Lesson 14 Fluency Template)

Note: This is a teacher-directed, whole-class activity. By practicing subtraction facts, students gain mastery of differences within 20.

### Concept Development (39 minutes)

Materials: (S) 12-inch ruler, yardstick, Recording Sheets

Note: In this lesson, the Recording Sheets serve as the Problem Set. Students will need to refer to these Recording Sheets in Lesson 17.

This Concept Development is designed for students to work in centers, rotating approximately every six minutes. Each group should have roughly five students. To prepare for the lesson, make one copy of the Recording Sheet set per student. Print the Recording Sheets single-sided so that students can work on the back if necessary. Post the directions at each center.

Note that the Application Problem has been omitted from this lesson. Instead, four out of five centers include a word problem related to the measurement task. Students may not have time to solve the word problem at every center, but they should complete at least two out of the four.

### Center 1: Measure and Compare Shin Lengths

Materials: (S) 12-inch rulers, yardsticks, Center 1 Recording Sheet

Students measure the length of group members' shins and record on a table. Observe how students go about this task. Do they use the most efficient measuring tool? Do they consistently measure from the same points on each person (top of foot to bottom of knee)?

### Center 2: Compare Lengths to a Yardstick

Materials: (S) Book, yardstick, Center 2 Recording Sheet

Note: This center is best located near a desk and classroom door, since students will be measuring these objects.

Students first estimate how three classroom objects compare to a yardstick and then use a yardstick to measure the objects. The yardstick can be used to measure in different units: inches, feet, or yards. Keep a watchful eye to support students as they navigate the choice of units.

### Center 3: Choose the Units to Measure Objects

Materials: (S) 12-inch ruler, yardstick, Center 3 Recording Sheet

MP.5

At this center, students select the most appropriate unit to measure an object. Encourage students to choose objects with significantly different lengths so that they can gain experience measuring in inches, feet, and yards. Observe how students measure. Are they using a measuring tool that fits with their chosen object? Is it the most efficient measuring unit for the object?

### Center 4: Find Benchmarks

Materials: (S) 12-inch ruler, yardstick, Center 4 Recording Sheet

Students identify objects for each of three benchmark lengths: inch, foot, and yard. Through a trial and error process, students develop a more precise understanding of the benchmark length.

### Center 5: Choose a Tool to Measure

Materials: (S) 12-inch ruler, yardstick, Center 5 Recording Sheet, textbook, pencil, pink eraser

Note: This center is best located near a rug and chalkboard or white board.



#### NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Introduce English language learners to all the centers that have been created so that they know what is expected of them at each center. Clarify what they are being asked to measure, e.g., *shin*, and clarify the measuring units they will be using at each center, e.g., inches, feet, and yards.



#### NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Challenge students working above grade level by asking them to help write measurement word problems to exchange with other students and solve. This will extend their learning of the content and also assess their content learning.

Students practice selecting the most efficient measuring tool for a given object. Help students remember that every length of the yardstick measures 3 feet when they calculate the length of the rug and chalkboard. (A common misconception is to count each iteration of the yardstick as 1 unit when measuring in feet.)

### Student Debrief (10 minutes)

**Lesson Objective:** Measure various objects using inch rulers and yardsticks.

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

Invite students to review their solutions for the Recording Sheet. 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 Recording Sheet and process the lesson.

Any combination of the questions below may be used to lead the discussion.

- When you used the 12-inch ruler, how did you label your measurement? (1 foot, 3 inches.) When you used the yardstick, did you have to use two unit labels? Explain why or why not.
- Choose one of the word problems you completed during the centers. Explain your solution path to your partner.
- At Center 4, were the objects you chose close to the benchmark lengths? Were the things you chose for a foot, 12 inches long? For the yard, 3 feet long?
- If you didn't have a 12-inch ruler or a yardstick, could you think of a way to measure an object? Would you know about how many inches or feet that object was? Talk to your partner.
- How do you decide which unit to use when measuring?

### Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help with assessing students' understanding of the concepts that were presented in today's lesson and planning more effectively for future lessons. The questions may be read aloud to the students.

## A

Number Correct: \_\_\_\_\_

## Adding and Subtracting by 3

1.	$0 + 3 =$	
2.	$3 + 3 =$	
3.	$6 + 3 =$	
4.	$9 + 3 =$	
5.	$12 + 3 =$	
6.	$15 + 3 =$	
7.	$18 + 3 =$	
8.	$21 + 3 =$	
9.	$24 + 3 =$	
10.	$27 + 3 =$	
11.	$30 - 3 =$	
12.	$27 - 3 =$	
13.	$24 - 3 =$	
14.	$21 - 3 =$	
15.	$18 - 3 =$	
16.	$15 - 3 =$	
17.	$12 - 3 =$	
18.	$9 - 3 =$	
19.	$6 - 3 =$	
20.	$3 - 3 =$	
21.	$3 + 0 =$	
22.	$3 + 3 =$	

23.	$6 + 3 =$	
24.	$9 + 3 =$	
25.	$12 + 3 =$	
26.	$15 + 3 =$	
27.	$18 + 3 =$	
28.	$21 + 3 =$	
29.	$24 + 3 =$	
30.	$27 + 3 =$	
31.	$0 + 33 =$	
32.	$33 + 33 =$	
33.	$66 + 33 =$	
34.	$33 + 66 =$	
35.	$99 - 33 =$	
36.	$66 - 33 =$	
37.	$999 - 333 =$	
38.	$33 - 33 =$	
39.	$33 + 0 =$	
40.	$30 + 3 =$	
41.	$33 + 3 =$	
42.	$36 + 3 =$	
43.	$63 + 33 =$	
44.	$63 + 36 =$	

## B

Number Correct: \_\_\_\_\_

Improvement: \_\_\_\_\_

## Adding and Subtracting by 3

1.	$3 + 0 =$	
2.	$3 + 3 =$	
3.	$3 + 6 =$	
4.	$3 + 9 =$	
5.	$3 + 12 =$	
6.	$3 + 15 =$	
7.	$3 + 18 =$	
8.	$3 + 21 =$	
9.	$3 + 24 =$	
10.	$3 + 27 =$	
11.	$30 - 3 =$	
12.	$27 - 3 =$	
13.	$24 - 3 =$	
14.	$21 - 3 =$	
15.	$18 - 3 =$	
16.	$15 - 3 =$	
17.	$12 - 3 =$	
18.	$9 - 3 =$	
19.	$6 - 3 =$	
20.	$3 - 3 =$	
21.	$0 + 3 =$	
22.	$3 + 3 =$	

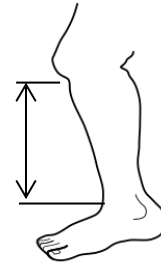
23.	$6 + 3 =$	
24.	$9 + 3 =$	
25.	$12 + 3 =$	
26.	$15 + 3 =$	
27.	$18 + 3 =$	
28.	$21 + 3 =$	
29.	$24 + 3 =$	
30.	$27 + 3 =$	
31.	$0 + 33 =$	
32.	$33 + 33 =$	
33.	$33 + 66 =$	
34.	$66 + 33 =$	
35.	$99 - 33 =$	
36.	$66 - 33 =$	
37.	$999 - 333 =$	
38.	$33 - 33 =$	
39.	$33 + 0 =$	
40.	$30 + 3 =$	
41.	$33 + 3 =$	
42.	$36 + 3 =$	
43.	$36 + 33 =$	
44.	$36 + 63 =$	

**Center 1: Measure and Compare Shin Lengths**

Choose a measuring unit to measure the shins of everyone in your group.  
Measure from the top of the foot to the bottom of the knee.

I chose to measure using \_\_\_\_\_.

Record the results in the table below. Include the units.



Name	Length of Shin

What is the difference in length between the longest and shortest shins? Write a number sentence and statement to show the difference between the two lengths.

**Center 2: Compare Lengths to a Yardstick**

Fill in your estimate for each object using the words *more than*, *less than*, or *about the same length as*. Then, measure each object with a yardstick and record the measurement on the chart.

- The length of a book is \_\_\_\_\_ the yardstick.
- The height of the door is \_\_\_\_\_ the yardstick.
- The length of a student desk is \_\_\_\_\_ the yardstick.

Object	Measurement
Length of book	
Height of door	
Length of student desk	

What is the length of 4 student desks pushed together with no gaps in between? Use the RDW process to solve on the back of this paper.

**Center 3: Choose the Units to Measure Objects**

Name 4 objects in the classroom. Circle which unit you would use to measure each item, and record the measurement in the chart.

Object	Length of the Object
	inches/feet/yards
	inches/feet/yards
	inches/feet/yards
	inches/feet/yards

Billy measures his pencil. He tells his teacher it is 7 feet long. Use the back of this paper to explain how you know that Billy is incorrect and how he can change his answer to be correct.

**Center 4: Find Benchmarks**

Look around the room to find 2 or 3 objects for each benchmark length. Write each object in the chart and record the exact length.

Objects that are about an inch.	Objects that are about a foot.	Objects that are about a yard.
1. _____ inches	1. _____ inches	1. _____ inches
2. _____ inches	2. _____ inches	2. _____ inches
3. _____ inches	3. _____ inches	3. _____ inches

**Center 5: Choose a Tool to Measure**

Circle the tool used to measure each object. Then, measure and record the length in the chart. Circle the unit.

Object	Measurement Tool	Measurement
Length of the rug	12-inch ruler / yardstick	_____ inches/feet
Textbook	12-inch ruler / yardstick	_____ inches/feet
Pencil	12-inch ruler / yardstick	_____ inches/feet
Length of the chalkboard	12-inch ruler / yardstick	_____ inches/feet
Pink eraser	12-inch ruler / yardstick	_____ inches/feet

Sera's jump rope is the length of 6 textbooks. On the back of this paper, make a tape diagram to show the length of Sera's jump rope. Then, write a repeated addition sentence using the textbook measurement from the chart to find the length of Sera's jump rope.



Name \_\_\_\_\_

Date \_\_\_\_\_

Circle the unit that would best measure each object.

Marker	inch / foot / yard
Height of a car	inch / foot / yard
Birthday card	inch / foot / yard
Soccer field	inch / foot / yard
Length of a computer screen	inch / foot / yard
Height of a bunk bed	inch / foot / yard

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Circle the unit that would best measure each object.

Height of a door	inch / foot / yard
Textbook	inch / foot / yard
Pencil	inch / foot / yard
Length of a car	inch / foot / yard
Length of your street	inch / foot / yard
Paint brush	inch / foot / yard

2. Circle the correct estimate for each object.

- a. The height of a flagpole is more than / less than / about the same as the length of a yardstick.
- b. The width of a door is more than / less than / about the same as the length of a yardstick.
- c. The length of a laptop computer is more than / less than / about the same as the length of a 12-inch ruler.
- d. The length of a cellphone is more than / less than / about the same as the length of a 12-inch ruler.

3. Name 3 objects in your classroom. Decide which unit you would use to measure that object. Record it in the chart in a full statement.

Object	Unit
a.	I would use _____ to measure the length of _____.
b.	
c.	

4. Name 3 objects in your home. Decide which unit you would use to measure that object. Record it in the chart in a full statement.

Object	Unit
a.	I would use _____ to measure the length of _____.
b.	
c.	