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**GRADE 1 • MODULE 3****Ordering and Comparing Length Measurements as Numbers**

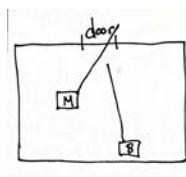
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## Grade 1 • Module 3

# Ordering and Comparing Length Measurements as Numbers

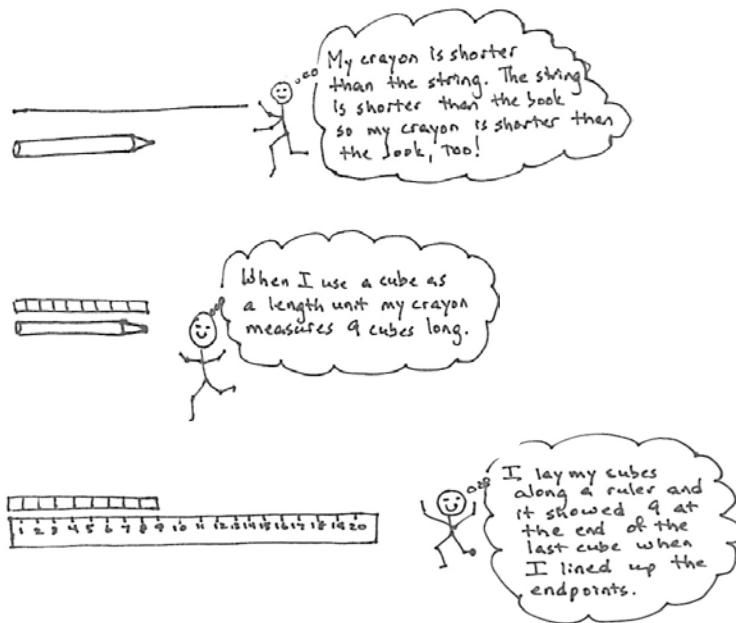
## OVERVIEW

The module opens in Topic A by extending students' kindergarten experiences with direct length comparison to indirect comparison whereby the length of one object is used to compare the lengths of two other objects (**1.MD.1**). "My string is longer than your book. Your book is longer than my pencil. That means my string is longer than my pencil!" In the topic's third lesson, students use the same transitivity, or indirect comparison, to compare short distances within the classroom in order to see what the shortest path to their classroom door is, which is helpful to know for lining up and emergencies. Students place one endpoint of a length of string at their desks and see if it reaches the door. After using the same piece of string from two students' desks, they make statements such as, "Maya's path is shorter than the string. Bailey's path is longer than the string. That means Bailey's path to the door is longer than Maya's path."



Topic B takes *longer than* and *shorter than* to a new level of precision by introducing the idea of a *length unit*. Centimeter cubes are laid alongside the length of an object as students learn that the total number of cubes laid end to end with no gaps or overlaps represents the length of that object (**1.MD.2**).

The progressions document expresses the research indicating the importance of teaching standard units to Grade 1 students *before* non-standard units. Thus, Grade 1 students learn about the centimeter before exploring non-standard units of measurement in this module. Simply lining the cubes up to the ruler allows students to see that they are using units which relate to a tool used around the world. One of the primary ways we recognize standard units is because they are ubiquitous, used on rulers at grandma's house in the Bronx, in school, and in local shops. Students ask and answer the question, "Why would we use a standard unit to measure?" The topic closes with students measuring and comparing sets of three items using centimeter cubes. They return to the statements of Topic A but now with more sophisticated insights, for example, "The pencil measures 10 centimeters. The crayon measures 6 centimeters. The book measures 20 centimeters. These are ordered from shortest to longest: the crayon, the pencil, the book. The book is longer than the pencil, and the pencil is longer than the crayon, so the book is longer than the crayon" (**1.MD.1**).



Topic C explores the usefulness of measuring with similar units. Students measure the same objects from Topic B using two different non-standard units together, toothpicks and small paper clips, to measure one object and answer the question, “Why do we measure with same-sized length units?” (**1.MD.2**). They realize that using iterations of the *same* unit will yield consistent measurement results. Similarly, students explore what it means to use a different unit of measurement from their classmates. It becomes obvious to students that if we want to have discussions about the lengths of objects together, we *must* measure with the same units. Students answer the question, “If Bailey uses paper clips and Maya uses toothpicks, and they both measure things in our classroom, will they be able to compare their measurements?” With this new understanding of consistent measurement, Topic C closes with students solving *compare with difference unknown* problems. Students answer such questions as, “How much longer is the pencil than the marker?” using standard units (**1.OA.1**).

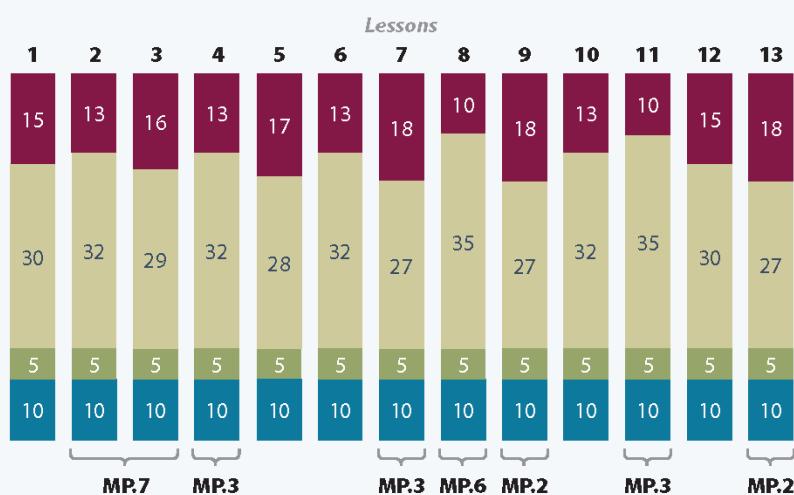
Topic D closes the module as students represent and interpret data (**1.MD.4**). They collect data about their classmates, and sort that information into three categories. Using same-sized pictures on squares, students represent this sorted data so that they can easily describe and compare the data. Students interpret information presented in the graphs by first determining the number of data points in a given category (e.g., “How many students like carrots the best?”), and then combining categories (e.g., “How many total students like carrots or broccoli the best?”). The module closes with students asking and answering varied questions about data sets, for example, “How many students were polled in all?” (*put together with result unknown*) and, “How many more students preferred broccoli to string beans?” (*compare with difference unknown*) (**1.OA.1**). The work with units representing data points are an application of their earlier work with length as they observe that each square can be lightly interpreted as a length unit, which helps them analyze the data.

## Distribution of Instructional Minutes



This diagram represents a suggested distribution of instructional minutes based on the emphasis of particular lesson components in different lessons throughout the module.

- █ Fluency Practice
- █ Concept Development
- █ Application Problems
- █ Student Debrief



MP = Mathematical Practice

## Focus Grade Level Standards

### Represent and solve problems involving addition and subtraction.<sup>1</sup>

- 1.OA.1** Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. (See Glossary, Table 1.)

### Measure lengths indirectly and by iterating length units.

- 1.MD.1** Order three objects by length; compare the lengths of two objects indirectly by using a third object.
- 1.MD.2** Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.*

### Represent and interpret data.

- 1.MD.4** Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

## Foundational Standards

- K.CC.5** Count to answer “how many?” questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.
- K.CC.6** Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies. (Include groups with up to ten objects.)
- K.CC.7** Compare two numbers between 1 and 10 presented as written numerals.
- K.MD.1** Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
- K.MD.2** Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. *For example, directly compare the heights of two children and describe one child as taller/shorter.*

<sup>1</sup> The balance of this cluster is addressed in Module 2.

## Focus Standards for Mathematical Practice

- MP.2** **Reason quantitatively and abstractly.** Students describe and compare lengths using *longer than* and *shorter than*, and numerically represent relationships among and between lengths. This takes place within the context of comparing sets within data collection as well as comparing objects with different length units. For example, students compare the number of peers who enjoy one hobby with the number of peers who enjoy a different hobby. Students also compare the length of one object, in centimeter cubes, with the length of a second object, in centimeter cubes.
- MP.3** **Construct viable arguments and critique the reasoning of others.** Students describe and explain their process of finding accurate length measurements and challenge each other to measure precisely.
- MP.6** **Attend to precision.** Students use measuring tools such as centimeter cubes precisely and explain precisely the cause of errors in using the tools.
- MP.7** **Look for and make use of structure.** Students use transitivity, indirect comparison, to compare multiple objects. "My string is longer than the pencil. My string is shorter than the book. That means my book is longer than my pencil." In this case, the students use the string as the structure to compare the book and the pencil.

## Overview of Module Topics and Lesson Objectives

Standards	Topics and Objectives		Days
<b>1.MD.1</b>	A	<b>Indirect Comparison in Length Measurement</b> Lesson 1: Compare length directly and consider importance of aligning endpoints. Lesson 2: Compare length using indirect comparison by finding objects <i>longer than</i> , <i>shorter than</i> , and <i>equal in length</i> to that of a string. Lesson 3: Order three lengths using indirect comparison.	3
<b>1.MD.1</b> <b>1.MD.2</b>	B	<b>Standard Length Units</b> Lesson 4: Express the length of an object using centimeter cubes as length units to measure with no gaps or overlaps. Lesson 5: Rename and measure with centimeter cubes, using their standard unit name of centimeters. Lesson 6: Order, measure, and compare the length of objects before and after measuring with centimeter cubes, solving <i>compare with difference unknown</i> word problems.	3



<b>Standards</b>	<b>Topics and Objectives</b>		<b>Days</b>
<b>1.OA.1</b> <b>1.MD.2</b>	C	<b>Non-Standard and Standard Length Units</b> Lesson 7: Measure the same objects from Topic B with different non-standard units simultaneously to see the need to measure with a consistent unit. Lesson 8: Understand the need to use the same units when comparing measurements with others. Lesson 9: Answer <i>compare with difference unknown</i> problems about lengths of two different objects measured in centimeters.	3
<b>1.OA.1</b> <b>1.MD.2</b> <b>1.MD.4</b>	D	<b>Data Interpretation</b> Lessons 10–11: Collect, sort, and organize data, then ask and answer questions about the number of data points. Lessons 12–13: Ask and answer varied word problem types about a data set with three categories.	4
		End-of-Module Assessment: Topics A–D (assessment $\frac{1}{2}$ day, return $\frac{1}{2}$ day, remediation or further applications 1 day)	2
<b>Total Number of Instructional Days</b>			<b>15</b>

## Terminology

### New or Recently Introduced Terms

- Centimeter (standard length unit within the metric system)
- Centimeter cube (pictured right)
- Length unit (measuring the length of an object with equal-sized units)



### Familiar Terms and Symbols<sup>2</sup>

- Less than
- Longer than
- More than
- Shorter than

<sup>2</sup> These are terms and symbols students have seen previously.

## Suggested Tools and Representations

- Centimeter cubes
- Centimeter rulers (simply for the purpose of naming the centimeter)
- String lengths of about 25 centimeters

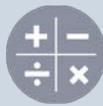
## Scaffolds<sup>3</sup>

The scaffolds integrated into *A Story of Units* give alternatives for how students access information as well as express and demonstrate their learning. Strategically placed margin notes are provided within each lesson elaborating on the use of specific scaffolds at applicable times. They address many needs presented by English language learners, students with disabilities, students performing above grade level, and students performing below grade level. Many of the suggestions are applicable to more than one population. The charts included in Module 1 provide a general overview of the lesson-aligned scaffolds, organized by Universal Design for Learning (UDL) principles. To read more about the approach to differentiated instruction in *A Story of Units*, please refer to “How to Implement *A Story of Units*.”

## Assessment Summary

Type	Administered	Format	Standards Addressed
End-of-Module Assessment Task	After Topic D	Constructed response with rubric	1.OA.1 1.MD.1 1.MD.2 1.MD.4

<sup>3</sup> Students with disabilities may require Braille, large print, audio, or special digital files. Please visit the website, [www.p12.nysed.gov/specialed/aim](http://www.p12.nysed.gov/specialed/aim), for specific information on how to obtain student materials that satisfy the National Instructional Materials Accessibility Standard (NIMAS) format.



## Topic A

# Indirect Comparison in Length Measurement

**1.MD.1**

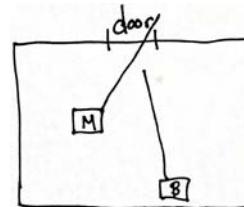
<b>Focus Standard:</b>	1.MD.1	Order three objects by length; compare the lengths of two objects indirectly by using a third object.
<b>Instructional Days:</b>	3	
<b>Coherence -Links from:</b>	GK-M3	Comparison of Length, Weight, Capacity, and Numbers to 10
<b>-Links to:</b>	G2-M2 G2-M7	Addition and Subtraction of Length Units Problem Solving with Length, Money, and Data

The module opens in Topic A by extending students' kindergarten experiences with direct length measurement to indirect measurement whereby the length of one object is used to compare that of two other objects (**1.MD.1**).

Students explore direct comparison in Lesson 1, comparing the length of two objects paying close attention to the endpoints of each to ensure accurate comparisons. Students draw on their kindergarten experiences as they use *longer than* and *shorter than* as they compare.

In Lesson 2, students begin to use indirect comparison (or transitivity) as they compare each item to one consistent item, such as a piece of string or a strip of construction paper of a specific length. Items are then compared to each other through the indirect comparison. For instance, if the crayon is shorter than the paper strip and the pencil is longer than the paper strip, we can say that the crayon is also shorter than the pencil. As a way to prove their conclusions from indirect comparisons, students use direct comparison to verify their claims.

Lesson 3 extends the use of indirect comparison to compare distances between objects that cannot be moved next to each other for direct comparison. Students use the same transitive process to compare short distances within the classroom in order to see what the shortest path to their classroom door is, which is helpful to know for lining up and emergencies. After measuring each path from their desks to the door with the same piece of string, students are able to make statements such as, "Maya's path is shorter than the string. Bailey's path is longer than the string. That means Bailey's path to the door is longer than Maya's path."



**A Teaching Sequence Towards Mastery of Indirect Comparison in Length Measurement**

**Objective 1:** Compare length directly and consider importance of aligning endpoints.  
**(Lesson 1)**

**Objective 2:** Compare length using indirect comparison by finding objects *longer than*, *shorter than*, and *equal in length* to that of a string.  
**(Lesson 2)**

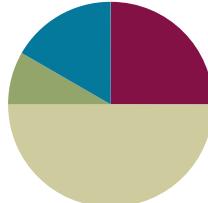
**Objective 3:** Order three lengths using indirect comparison.  
**(Lesson 3)**

## Lesson 1

**Objective:** Compare length directly and consider importance of aligning endpoints.

### Suggested Lesson Structure

Fluency Practice	(15 minutes)
Application Problem	(5 minutes)
Concept Development	(30 minutes)
Student Debrief	(10 minutes)
<b>Total Time</b>	<b>(60 minutes)</b>



### Fluency Practice (15 minutes)

- Speed Writing **1.NBT.1** (2 minutes)
- Tens and Ones **1.NBT.2** (3 minutes)
- Sprint: Subtracting Ones from Teen Numbers **1.OA.6** (10 minutes)

### Speed Writing (2 minutes)

Materials: (S) Personal white boards

Note: This review fluency provides students practice with writing numbers while reinforcing place value.

Tell students to write their numbers from 10 to as high as they can in one minute, while they whisper count the Say Ten way. Teachers may also want to instruct students to organize their numbers in a column, so that the patterns in the tens and ones columns become visible.

### Tens and Ones (3 minutes)

Materials: (T) 100-bead Rekenrek

Note: This activity addresses the grade level standard requiring students to understand that two-digit numbers represent amounts of tens and ones.

Practice decomposing numbers into tens and ones using the Rekenrek.

T: (Show 16 on the Rekenrek). How many tens do you see?

S: 1.

T: How many ones?

- S: 6.
- T: Say the number the Say Ten way.
- S: Ten 6.
- T: Good. 1 ten plus 6 ones is?
- S: 16.
- T: (Slide over 10 from the next row.) How many tens do you see?
- S: 2.
- T: How many ones?
- S: 6.
- T: Say the number the Say Ten way.
- S: 2 tens 6.
- T: Good. 2 tens plus 6 ones is?
- S: 26.

Slide over the next row and repeat. Continue with the following suggested sequence within 40: 15, 25, 35; 17, 27, 37; 19, 29, 39.

### Sprint: Subtracting Ones from Teen Numbers (10 minutes)

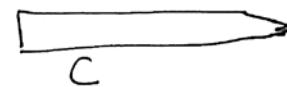
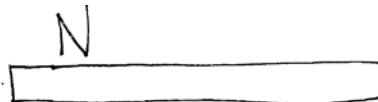
Materials: (S) Subtracting Ones from Teen Numbers Sprint

Note: This Sprint addresses the Grade 1 core fluency objective of adding and subtracting within 20.

### Application Problem (5 minutes)

Nigel and Corey each have new pencils that are the same length. Corey uses his pencil so much that he needs to sharpen it several times. Nigel doesn't use his at all. Nigel and Corey compare pencils. Whose pencil is longer? Draw a picture to show your thinking.

Note: In this Application Problem, students use their prior experiences to consider what happens to a pencil after repeated use, and then use that knowledge to compare a new with a used pencil. Students have the opportunity to draw to show their understanding of length and of the term *longer*. During the Debrief, students will discuss drawings in light of today's lesson, making statements such as, "Corey's pencil is shorter than Nigel's pencil. Nigel's pencil is longer than Corey's pencil."



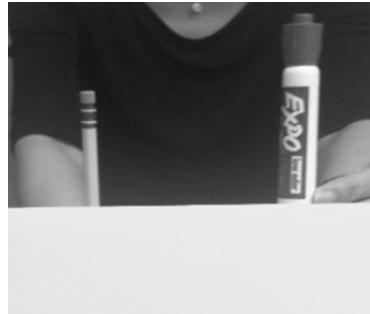
Nigel's pencil  
is longer.

## Concept Development (30 minutes)

**Materials:** (T) Folder, new crayon, pencil, dry erase marker, jumbo glue stick, *longer than* and *shorter than* sentence frames (S) Folders, 5 strips of paper (of varying lengths) per set of partners, various objects around the classroom

Have students sit in a meeting area in a semi-circle. The teacher props up a folder on the floor in front of her.

- T: (Place a dry erase marker and a pencil behind the folder, making the marker appear taller than the pencil.) Which of these items, the marker or the pencil, is longer?
- S: The marker!
- T: How do you know?
- S: The marker is taller. → The pencil is shorter.
- T: (Call up a student.) Please take away the folder and reveal what's behind the folder.
- S: (Takes away the folder.)
- T: (Keep the way the marker and the pencil were held.) Now, can you tell which one is longer? Turn and talk to your partner.
- S: The marker is longer because the top of it is taller. → The pencil is taller. Look at how much higher up the marker is in the air. → It's hard to tell.
- T: (Have both items stand on the floor, side by side.) Now, can you tell which one is longer?
- S: Yes! The pencil is longer!
- T: (Project the sentence frame with *longer*.) Use this sentence frame to say your answer.
- S: The pencil is longer than the marker.
- T: (Project the sentence frame with *shorter*.) Which is shorter? Use this sentence frame to say your answer.
- S: The marker is shorter than the pencil.
- T: Are you sure about your decision?
- S: Yes.
- T: Turn and talk to your partner about what I did differently to help you be sure that the pencil is longer than the marker.
- S: You put both things on the floor. → They started at the same place.
- T: So, what do we have to make sure to do when we compare two different objects to see which is longer?



### NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Highlight the critical vocabulary for your English language learners as you teach the lesson by showing an object as a visual as you say the words.

Vocabulary in this lesson that you will want to highlight is *shorter than*, *longer than*, and *endpoint*. Without understanding these words, English language learners will have difficulty with this module.



- S: You have to start at the same spot. That's the fair way to see which is longer.
- T: You're right. We have to pay close attention and make sure we line up the very end of each object, which we call the **endpoint**, so that we can compare which is longer or shorter accurately.
- T: Let's try it again. (Hold up the crayon in one hand in a fist and the jumbo glue stick in the other fist, making the crayon appear longer.) Which is longer? Turn and talk to your partner.
- S: The crayon. → No, we can't tell. We don't know if they are starting off from the same place.
- T: Good thinking! You can't be sure which is longer because I'm hiding the endpoints. Turn and talk to your partner about how you would arrange these items so we can figure out which is longer accurately.

Students discuss as the teacher circulates to choose a volunteer with the idea of aligning the endpoints.

- T: (Call up a student to demonstrate.) What did he do to make sure we can be accurate about which item is longer?
- S: He lined up the endpoints!
- T: Which is longer, the crayon or the glue stick? Use the sentence frame to say your answer.
- S: The glue stick is longer than the crayon.

Allow students to “fool” their friends with varying endpoints. Pass out the paper strips and folders. Partner A will hide behind the folder and select two paper strips. She will hold them up, and Partner B will guess which one is longer. Partner A can then reveal the actual lengths. They should discuss Partner B’s guess, and why it was accurate or inaccurate. After discussion, they can switch roles.

- T: Now that we know about endpoints, let’s practice lining things up! Go on a scavenger hunt. Find two items of different lengths, one longer or shorter than the other. You have one minute to bring those items to your table.

Students look around the room to find two items of different lengths.

- T: Show how you compare the length of your two items. Then make two statements to your partner using the sentence frames.
- T: I saw you making sure to line up your items. Now try this. Flip just one of your items and make it stand upside down. Does this change which item is longer or shorter?
- S: (Flip and compare.) No.
- T: Why not?
- S: Because it doesn’t matter if you have them standing the regular way or upside down, as long as you line up the endpoints.
- T: I observed so many students lining up their endpoints by making them stand from the table. Can you show a different way to line up the endpoints?



#### NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Students may need some extra practice understanding how to compare lengths of different objects accurately. Help them to understand the importance of their endpoint. Offer opportunities for student leadership as “teacher” for those students who understand the concept of an endpoint.

S: (Have students share the different ways in which they can align the endpoints.) You can lay them down, one on top of the other. Just make sure the endpoints are starting at the same line. → You can use the edge of the table and lay down the items so they both start from the same place.

If time allows, give students several one-minute periods to look for more objects and practice comparing lengths by aligning endpoints and make accurate statements.

### Problem Set (8 minutes)

Students should do their personal best to complete the Problem Set within the allotted 10 minutes. Some problems do not specify a method for solving. This is an intentional reduction of scaffolding that invokes MP.5, Use Appropriate Tools Strategically. Students should solve these problems using the RDW approach used for Application Problems.

For some classes, it may be appropriate to modify the assignment by specifying which problems students should work on first. With this option, let the careful sequencing of the problem set guide your selections so that problems continue to be scaffolded. Balance word problems with other problem types to ensure a range of practice. Assign incomplete problems for homework or at another time during the day.

### Student Debrief (10 minutes)

**Lesson Objective:** Compare length directly and consider importance of aligning endpoints.

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.

NYS COMMON CORE MATHEMATICS CURRICULUM 1•3

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

Write the words longer than or shorter than to make the sentences true.

1. Abby is shorter than Spot.

2. A is shorter than B.

3. The American flag hat is shorter than the chef hat.

4. The darker bat's wing span is longer than the lighter bat's wing span.

5. Guitar B is shorter than guitar A.

COMMON CORE | Lesson 1: Compare length directly and consider importance of aligning endpoints. Date: 6/24/13

engage<sup>ny</sup> 3.A.8

NYS COMMON CORE MATHEMATICS CURRICULUM 1•3

6. Pencil B is longer than Pencil A.

7. The dark bone is shorter than the light bone.

8. Circle true or false.  
The light bone is shorter than Pencil A.  True  False

9. Find 4 school supplies. Sketch them here in order from shortest to longest. Label each school supply.

eraser crayon marker book

COMMON CORE | Lesson 1: Compare length directly and consider importance of aligning endpoints. Date: 6/24/13

engage<sup>ny</sup> 3.A.9

- When we compare lengths of different objects, what do we need to do to make sure we are comparing accurately?
- When you compare two objects and see that one of them is longer, can you make an accurate statement about which is shorter without looking? How?
- I saw one student compare the length of two objects by standing both objects on the table instead of standing the objects on the floor. Will the student be able to compare them accurately? Why or why not?
- Look at the bats in Problem 4. Were the **endpoints** aligned? (No.) Could you still see which bat has the longer wingspan? How?
- Look at the pencils and bones from Problems 6 and 7. Compare a pencil to a bone and talk about how they are longer or shorter than one another and how you know.
- Look at your drawings from today's Application Problem. Does your drawing show an accurate way to compare the length of these two pencils? If not, re-draw your solution based on what you now know about endpoints.

### Exit Ticket (3 minutes)

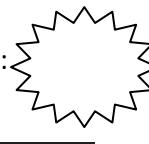
After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students' understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.

**A**

Name \_\_\_\_\_

Date \_\_\_\_\_

Number correct:



\*Write the missing number.

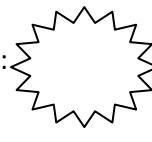
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2	$13 - 3 = \square$		17	$13 - 2 = \square$	
3	$3 - 2 = \square$		18	$14 - 3 = \square$	
4	$13 - 2 = \square$		19	$14 - 4 = \square$	
5	$4 - 2 = \square$		20	$14 - 10 = \square$	
6	$14 - 2 = \square$		21	$17 - 5 = \square$	
7	$4 - 3 = \square$		22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

**B**

Name \_\_\_\_\_

Date \_\_\_\_\_

Number correct:



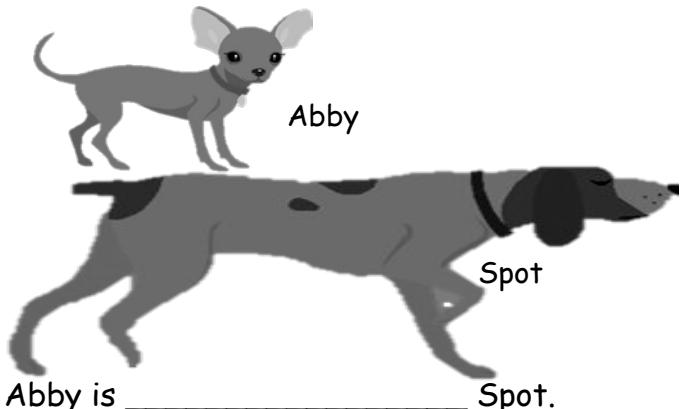
\*Write the missing number.

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

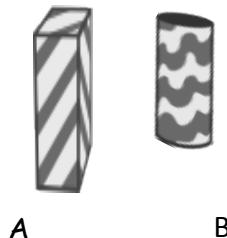
Name \_\_\_\_\_ Date \_\_\_\_\_

Write the words **longer than** or **shorter than** to make the sentences true.

1.



2.



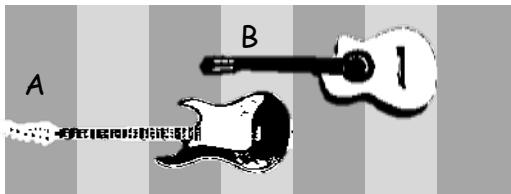
3.

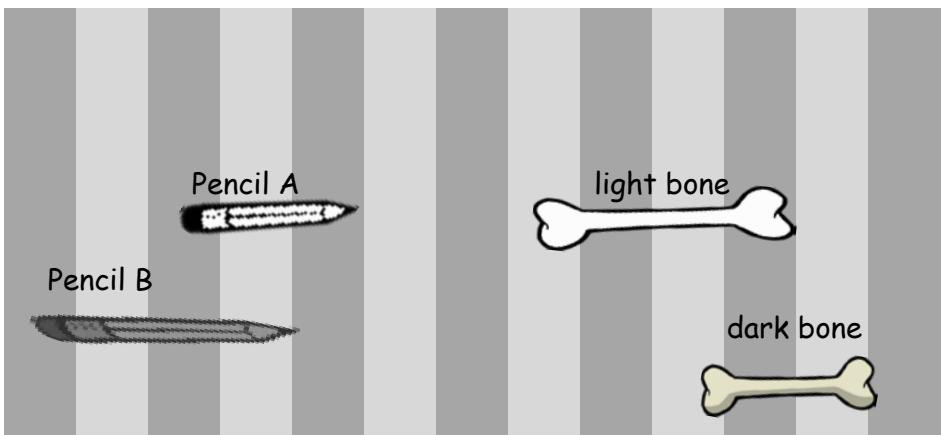


4.



5.





6. Pencil B is \_\_\_\_\_ Pencil A.

7. The dark bone is \_\_\_\_\_ the light bone.

8. Circle true or false.

The light bone is shorter than Pencil A. **True** or **False**

9. Find 3 school supplies. Draw them here in order from **shortest to longest**. Label each school supply.

A large, empty rectangular box intended for students to draw three school supplies (such as a pencil, a ruler, and a book) and arrange them from shortest to longest.

Name \_\_\_\_\_

Date \_\_\_\_\_

- Fill in the blanks.

A



B



C



Put the shoes in order from shortest to longest:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Shoe \_\_\_\_\_ is the longest.

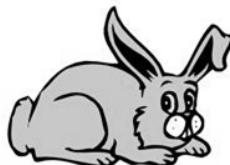
Shoe \_\_\_\_\_ is the shortest.

Name \_\_\_\_\_

Date \_\_\_\_\_

Follow the directions. Complete the sentences.

1. Circle the
- longer**
- rabbit.



Peter



Floppy

2. Circle the
- shorter**
- fruit.



A



B

\_\_\_\_\_ is longer than \_\_\_\_\_.

\_\_\_\_\_ is shorter than \_\_\_\_\_.

Write the words **longer than** or **shorter than** to make the sentence true.

3.

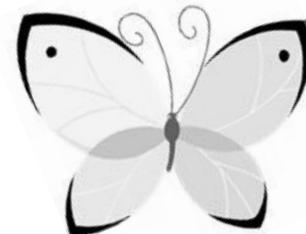


The glue

is \_\_\_\_\_

the ketchup.

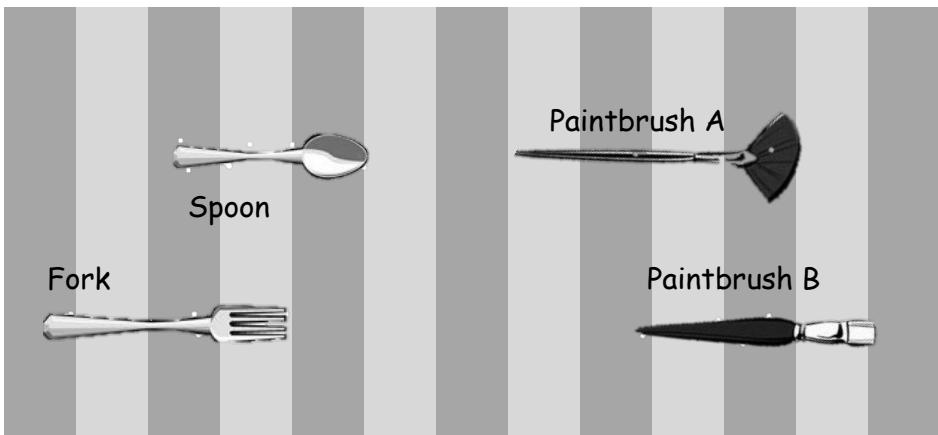
4.



The dragonfly's wing span

is \_\_\_\_\_

the butterfly's wing span.



5. Paintbrush A is \_\_\_\_\_ Paintbrush B.
6. The spoon is \_\_\_\_\_ the fork.
7. Circle true or false.

The spoon is shorter than Paintbrush B. **True** or **False**

8. Find 3 objects in your room. Draw them here in order from shortest to longest.  
Label each object.

The \_\_\_\_\_ is longer  
than the \_\_\_\_\_.

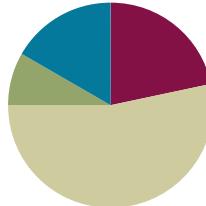
The \_\_\_\_\_ is shorter  
than the \_\_\_\_\_.

## Lesson 2

**Objective:** Compare length using indirect comparison by finding objects *longer than, shorter than, and equal in length to* that of a string.

### Suggested Lesson Structure

Fluency Practice	(13 minutes)
Application Problem	(5 minutes)
Concept Development	(32 minutes)
Student Debrief	(10 minutes)
<b>Total Time</b>	<b>(60 minutes)</b>



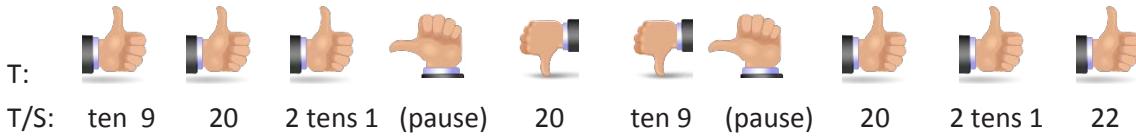
### Fluency Practice (13 minutes)

- Happy Counting **1.OA.5, 1.NBT.5** (3 minutes)
- Hide Zero Number Sentences **1.NBT.2, 1.NBT.4** (3 minutes)
- Addition with Cards **1.NBT.6** (7 minutes)

### Happy Counting (3 minutes)

Note: In the first two modules, students practice counting by ones, tens, twos, and fives, both the regular way and the Say Ten way. Reviewing these counting patterns within 40 prepares students for Module 4 while strengthening their understanding of place value and their ability to add and subtract.

Choose a counting pattern and range based on your students' skill level. If they are very proficient 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.



### Hide Zero Number Sentences (3 minutes)

Materials: (S) Hide Zero cards (from G1–M1–Lesson 38, with additional cards found at the end of this lesson)

Note: This fluency activity strengthens the understanding of place value and prepares students for Module 4.

Show students a number from 10 to 40 with Hide Zero cards (e.g., 15). Students say an addition sentence with 10 as an addend (e.g.,  $10 + 5 = 15$ ). As students say the sentence, break apart the Hide Zero cards to model the equation. Alternate asking students to say the numbers the Say Ten way and the regular way.

Use the following suggested sequence: 15, 25, 35; 14, 24, 34; 16, 26, 36.

### Addition with Cards (7 minutes)

Materials: (S) 1 pack of numeral cards 0–10 (from G1–M1–Lesson 36) per pair, counters (if needed)

Note: This review fluency strengthens students' abilities to add within and across ten.

Students place the deck of cards face down between them. Each partner flips over two cards and adds their cards together. The partner with the greatest total keeps the cards played by both players that round. (E.g., Player A draws 4 and 5, and gives the total, 9. Player B draws 9 and 4, and gives the total, 13. Since  $9 < 13$ , Player B keeps the cards.) If the sums are equal, the cards are set aside and the winner of the next round keeps the cards from both rounds. The player with the most cards at the end of the game wins.

### Application Problem (5 minutes)

Jordan has 3 stuffed animals: a giraffe, a bear, and a monkey. The giraffe is longer than the monkey. The bear is shorter than the monkey. Sketch the animals from shortest to longest to show how tall each animal is.

Note: This problem directly relates to today's lesson, providing an opportunity to circulate and uncover a student's prior understanding and possible misconceptions. Student drawings should demonstrate the proper alignment of endpoints when they are sketching to show the comparison between the animals. Students may use the term *taller than* instead of *longer than* in their statement. Reinforce the connection between the two terms, that sometimes we describe length in terms of how tall something is when the length is a type of **height**, going from the ground straight up towards the sky.



### Concept Development (32 minutes)

Materials: (T) 2 feet of string, 9-cm long strip of paper, scissors, various classroom objects shorter and longer than the teacher's foot (e.g., board eraser, piece of  $9'' \times 12''$  construction paper,  $8\frac{1}{2}'' \times 11''$  paper on a bulletin board) (S) 1 foot of string, scissors, various classroom objects for measuring length, personal white boards with indirect comparison statements insert (template at the end of this lesson), 9-cm long strips of paper, pipe cleaners, or twist-ties for Problem Set

Have students place their personal white boards at their tables and sit in the meeting area in a semi-circle. Place the string and strip of paper on the floor near the teacher for students to see.

T: I'm looking to see if I can find any items that are longer than or shorter than my foot. Oh, I see it! I really want to compare the length of the paper on the bulletin board to my foot. (Walk over to the bulletin board, hoist up foot to try comparing.) Wow, I really want to compare, but it's not easy. What should I do? Talk with your partner to come up with a plan for how I can compare the length of my foot to the length of the paper on the bulletin board. (Answers may vary.)

- T: (If students do not mention using a string as a tool to measure the teacher's foot, direct their attention to the activity materials.) Wow, those were some great ideas. I wonder if using any of these items might also help me. I'm going to get some string and cut it so that it matches the length of my foot. A string is much easier to use than trying to put my foot against everything I want to compare it to!
- T: (Demonstrate measuring the foot with a string and cut.) So, this is the same length as...
- S: Your foot!
- T: Now, I can walk over to the bulletin board and see if the paper is longer or shorter than my foot. What do I need to do to make sure we have an accurate comparison?
- S: Line up the endpoints!
- T: (Align endpoints and measure.) Which is longer, the string or the paper?
- S: The paper.
- T: So, the paper is longer than the string, but the string is the same length as my foot. So, which is longer, my foot or the paper?
- S: The paper is longer than your foot.
- T: (Write on the board: *The paper is longer than my foot.*) I wonder if I can find something that's shorter than my foot. Oh, the white board eraser! Let's check. (Hold up the string.) This string is the same length as...
- S: Your foot.
- T: Can I use the string to see if my foot is longer or shorter than the eraser?
- S: Yes.
- T: I need to make sure...
- S: The endpoints line up!
- T: (Align endpoints and measure.) What do you see?
- S: The string is longer than the eraser. → That means your foot is longer than the eraser. → The eraser is shorter than your foot.
- T: (Write on the board: *The eraser is shorter than my foot.*) Great! The string was such an easy way to compare the length of my foot to the length of the other objects. Can we figure out which is longer, the paper or the eraser? Turn and talk to your partner and explain your thinking.
- S: The paper is longer than the eraser.
- T: We didn't compare the paper and the eraser by lining them up by their endpoints. How did you know which was longer?
- S: The paper was longer than your foot, but the eraser was shorter than your foot, so the paper has to

**MP.7**

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

Some of your students will benefit from extra practice when determining what objects are *longer than*, *shorter than*, or *equal in length*. These students may still be trying to comprehend the idea of an endpoint, so the extra practice will help secure their understanding of these terms.



#### NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Provide challenging extensions for students who are able to compare length indirectly with a string. Offer them a longer string to use with longer objects, and have them present their findings to the class. Alternately, students can use their foot length to compare two items that are both longer than their foot, or students can compare objects that are close in length.

be longer than the eraser!

- T: Let's check. (Bring the eraser to the paper on the bulletin board, line up the endpoints, and compare.) You are correct!
- T: (Write on the board: *The paper is longer than the eraser.*) Great thinking!
- T: (Hold up a piece of construction paper.) This piece of construction paper is longer than my foot. The paper from the board was longer than my foot, too. Can I tell which type of paper is longer now that I've compared both with my foot? Talk with your partner.
- S: (Discuss.) No, you can't tell. → They are both longer, so you don't know which one is the longest.  
→ You would have to have something that's in between the two sizes.
- T: That's right. Both the pieces of paper are longer than my foot, but I cannot tell if the construction paper is longer than the paper on the board.
- T: Now it's your turn. You'll go on a scavenger hunt to find three items, one that is longer than your foot, one that is shorter than your foot, and lastly, something that is about the same length as your foot. But you won't be able to use your foot to measure. Instead, I will give you a piece of string to use!

Demonstrate how students can work with their partners to measure and cut their piece of string to match their foot (or shoe). Allow five minutes for students to prepare their string and to look for their items. Have students then return to their seats to fill in their comparison statements on their personal white boards and share their findings with a partner. Have them repeat this process as time allows.

### 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.

Note: Students will be using a 9-cm long paper strip, pipe cleaner, or twist-tie, instead of a string, to measure each picture in the Problem Set. Explain to the students that the paper strip will be used in the same fashion as the string as a measuring tool. You might want to model measuring the first picture (baseball bat) using the paper strip. Also, as students will be using information from Page 1 to complete Page 2, prepare today's Problem Set on two separate pieces of paper to avoid having students flip over their paper.

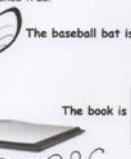
Students will need to take a paper strip home to complete the homework.

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 2 Problem Set 1•3

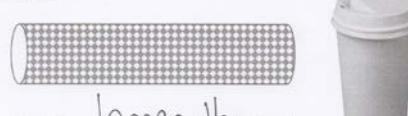
Name Maria Date \_\_\_\_\_

1. Use your paper strip provided by your teacher to measure each picture. Circle the words you need to make the sentence true.

 The baseball bat is longer than the book. longer than  
shorter than  
the same length as the paper strip.

 The baseball bat is longer than the book. longer than  
shorter than  
the same length as the paper strip.

2. Complete the sentences with longer than, shorter than or same length as, to make the sentences true.

a.  The tube is longer than the cup.

b.  The iron is shorter than the ironing board.

COMMON CORE | Lesson 2: Compare length using indirect comparison by finding objects longer than, shorter than, and equal in length to that of a string. Date: 4/24/12

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## Student Debrief (10 minutes)

**Lesson Objective:** Compare length using indirect comparison by finding objects *longer than*, *shorter than*, and *equal in length* to that of a string.

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 did we use to compare the length of different objects? (A string and a paper strip.) How were these tools helpful?
- How were you able to figure out the length of different objects when you didn't compare them side by side?
- The index card is longer than the string. The sticky note is shorter than the string. Which is longer, the index card or the sticky note?
- The marker is shorter than the string. The string is shorter than the crayon. Which is shorter, the marker or the crayon?
- The folder is longer than the string. The book is longer than the string. Which is longer, the folder or the book? (We can't tell.) Explain how you know this.
- How was using the paper strip in the Problem Set similar to or different from using the string? How did using the paper strip help you compare the objects in the pictures? Use an example from the Problem Set to explain your thinking.
- Look at the pictures from Page 1. Can we compare the baseball bat and the tube? Why, or why not?
- Look at Problem 2(a). How did you set up your paper strip when you measured the cup compared to the tube? Are you still measuring the length of each object? (Yes. It still tells us how long something is. We can measure length in different directions.)
- In the Application Problem today, we were comparing the length of three stuffed animals, which can also be considered their **height**. When we measure length from the ground towards the sky, we usually call that the height. Did any of you compare the length of two objects based on their height? Share your example.

NYS COMMON CORE MATHEMATICS CURRICULUM K+5

Use the measurements from the first page. Circle the word that would make the sentences true.

3. The golf club is (longer/shorter) than the cup.  
 4. The cup is (longer/shorter) than the ironing board.  
 5. The ironing board is (longer/shorter) than the book.  
 6. Order these objects from shortest to longest:  
 The cup, the tube and the paper strip.

the cup    the paper strip    the tube

Draw a picture to help you solve the measurement questions. Circle the word that would make the sentences true.

7. Sammy is taller than Dion.  
 Janell is taller than Sammy.  
 Dion is (taller than/shorter than) Janell.

8. Laura's necklace is longer than Mihal's necklace.  
 Laura's necklace is shorter than Sarai's necklace.  
 Sarai's necklace is (longer than/shorter than) Mihal's necklace.

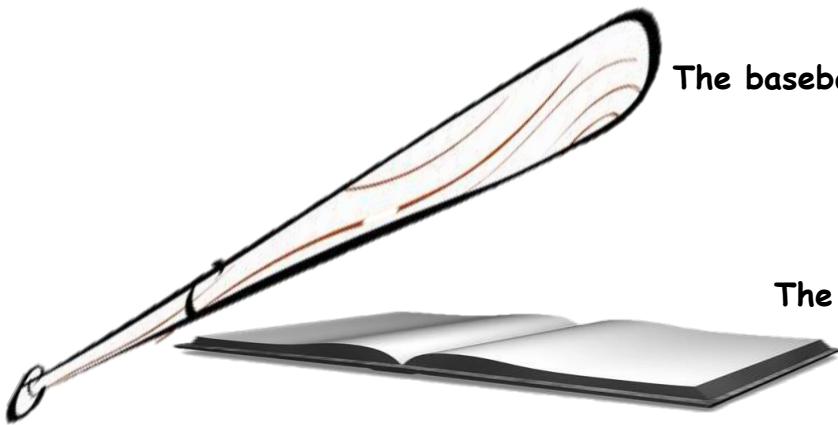
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**Exit Ticket (3 minutes)**

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.

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

1. Use the paper strip provided by your teacher to measure each picture. Circle the words you need to make the sentence true.



The baseball bat is

longer than  
shorter than  
the same length as

the paper strip.

The book is

longer than  
shorter than  
the same length as

the paper strip.

The baseball bat is \_\_\_\_\_ than the book.

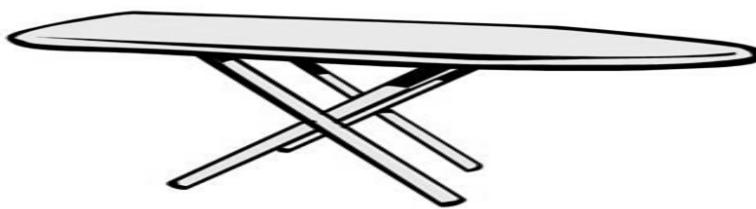
2. Complete the sentences with **longer than**, **shorter than**, or **same length as** to make the sentences true.

a.



The tube is \_\_\_\_\_ the cup.

b.



The iron is \_\_\_\_\_ the ironing board.

Use the measurements from the first page. Circle the word that would make the sentences true.

3. The baseball bat is (**longer**/**shorter**) than the cup.
4. The cup is (**longer**/**shorter**) than the ironing board.
5. The ironing board is (**longer**/**shorter**) than the book.
6. Order these objects from shortest to longest:  
the cup, the tube, and the paper strip.

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Draw a picture to help you solve the measurement questions. Circle the word that would make the sentences true.

7. Sammy is taller than Dion.  
Janell is taller than Sammy.  
Dion is (**taller than**/**shorter than**) Janell.
8. Laura's necklace is longer than Mihal's necklace.  
Laura's necklace is shorter than Sarai's necklace.  
Sarai's necklace is (**longer than**/**shorter than**) Mihal's necklace.

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Draw a picture to help you solve the measurement questions. Circle the word that would make the sentences true.

Tanya's doll is shorter than Aline's doll.

Mira's doll is taller than Aline's doll.

Tanya's doll is (**taller than**/**shorter than**) Mira's doll.

Name \_\_\_\_\_

Date \_\_\_\_\_

Use your paper strip to measure each picture. Circle the words you need to make the sentence true.

1.



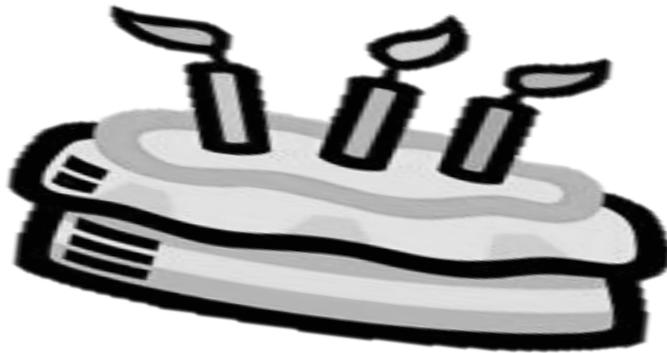
The sundae is longer than  
shorter than  
the same length as the paper.



The spoon is longer than  
shorter than  
the same length as the paper.

The spoon is \_\_\_\_\_ than the sundae.

2.



The balloon is \_\_\_\_\_ than the cake.

3.



The ball is shorter than the paper.

So, the shoe is \_\_\_\_\_ the ball.

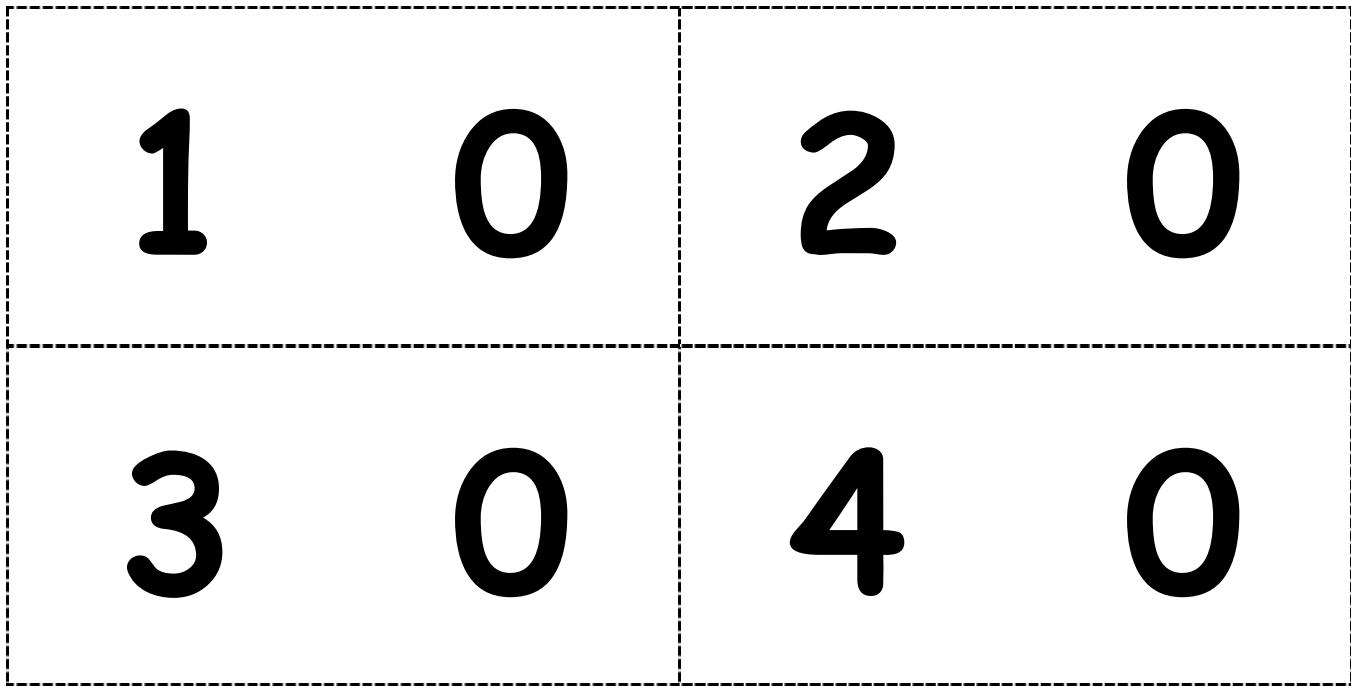
Use the measurements from the first page. Circle the word that would make the sentences true.

4. The spoon is (**longer/shorter**) than the cake.
  5. The balloon is (**longer/shorter**) than the sundae.
  6. The shoe is (**longer/shorter**) than the balloon.
  7. Order these objects from shortest to longest:  
the cake, the spoon, and the paper.
- 
- 
- 

Draw a picture to help you solve the measurement questions. Circle the word that would make the sentences true.

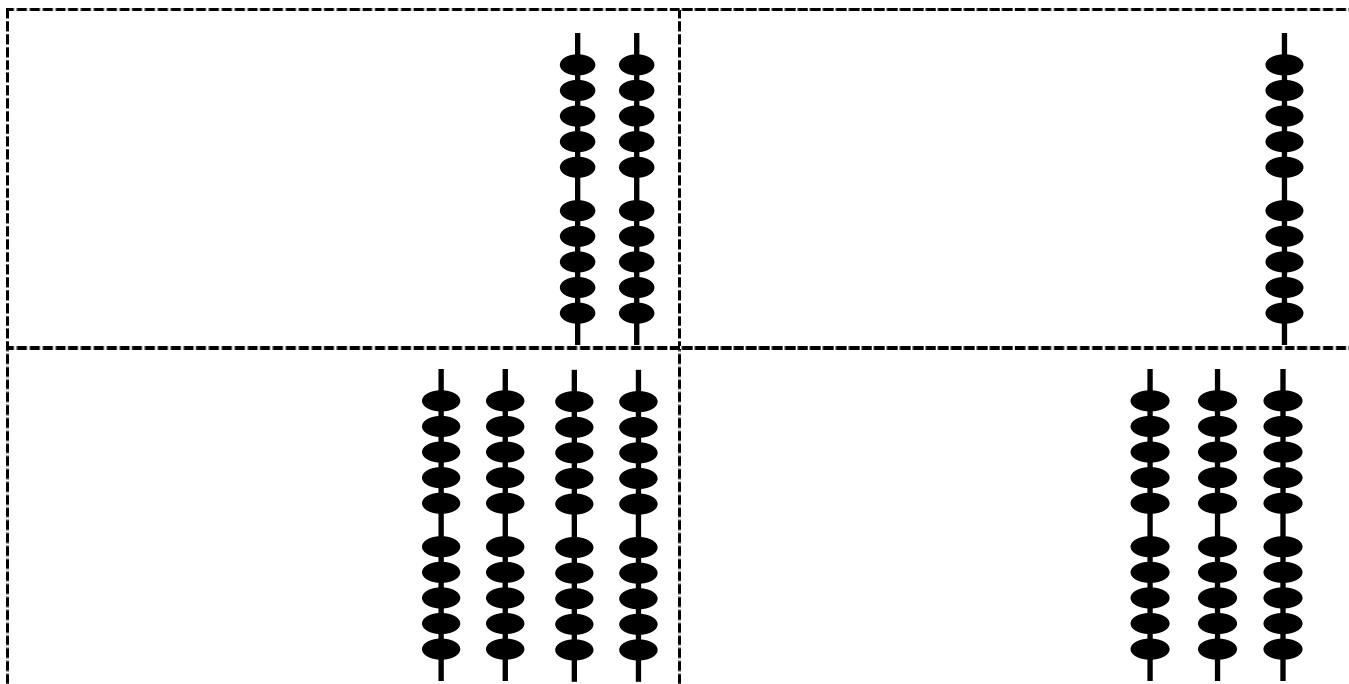
8. Marni's hair is shorter than Wesley's hair.  
Marni's hair is longer than Bita's hair.  
Bita's hair is (**longer/shorter**) than Wesley's hair.
9. Elliott is shorter than Brady.  
Sinclair is shorter than Elliott.  
Brady is (**longer/shorter**) than Sinclair.

Copy double-sided.



Copy double-sided.

5 groups



If \_\_\_\_\_ is longer than  
(classroom object)  
my foot and

\_\_\_\_\_ is shorter than my  
(classroom object)  
foot, then

\_\_\_\_\_ is longer than  
(classroom object)

\_\_\_\_\_.

(classroom object)

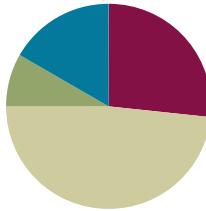
My foot is about the same  
length as \_\_\_\_\_.  
(classroom object)

## Lesson 3

**Objective:** Order three lengths using indirect comparison.

### Suggested Lesson Structure

Fluency Practice	(16 minutes)
Application Problem	(5 minutes)
Concept Development	(29 minutes)
Student Debrief	(10 minutes)
<b>Total Time</b>	<b>(60 minutes)</b>



### Fluency Practice (16 minutes)

- Beep Counting **1.NBT.1** (3 minutes)
- Rekenrek Addition and Subtraction **1.OA.6, 1.NBT.5** (3 minutes)
- Sprint: Adding and Subtracting Teen Numbers and Ones **1.OA.6** (10 minutes)

### Beep Counting (3 minutes)

Note: This fluency activity strengthens students' ability to understand number relationships and recognize counting patterns.

Say a series of three or more numbers but replace one of the numbers with the word *beep* (e.g., 15, 16, *beep*). When signaled, students say the number that was replaced by the word *beep* in the sequence. Scaffold number sequences, beginning with easy sequences and moving to more complex ones. Be sure to include forward and backward number sequences and to change the sequential placement of the beep.

Suggested sequence: 15, 16, *beep*; 25, 26, *beep*; 35, 36, *beep*; 12, 11, *beep*; 22, 21, *beep*; 32, 31, *beep*; 8, *beep*, 10; 18, *beep*, 20; 38, *beep*, 40; *beep*, 9, 8; *beep*, 19, 18; *beep*, 29, 28. After practicing beep counting by ones, try beep counting by tens, twos, or fives.

### Rekenrek Addition and Subtraction (3 minutes)

Materials: (T) 20-bead or 100-bead Rekenrek

Note: This fluency reviews the grade level standard of addition and subtraction within 20.

- T: (Show 14 on the Rekenrek.) Say the number.  
 S: 14.  
 T: Say it the Say Ten way.

- S: Ten 4.  
 T: What will my number be if I take out ten?  
 S: 4.  
 T: Let's check. (Take out 10.) Yes!

Follow the paradigm to review the following problem types: adding a ten to some ones (e.g.,  $4 + 10$ ), subtracting a ten from a teen number (e.g.,  $16 - 10$ ), adding some ones to a teen number (e.g.,  $13 + 3$ ), subtracting some ones from a teen number (e.g.,  $17 - 4$ ).

### Sprint: Adding and Subtracting Teen Numbers and Ones (10 minutes)

Materials: (S) Adding and Subtracting Teen Numbers and Ones Sprint

Note: This Sprint addresses the Grade 1 core fluency objective of adding and subtracting within 10 and builds the connection between addition and subtraction within 10 to addition and subtraction with teen numbers.

### Application Problem (5 minutes)

Draw a picture to match each of these two sentences:

The book is longer than the index card. The book is shorter than the folder.

Which is longer, the index card or the folder? Write a statement comparing the two objects. Use your drawings to help you answer the question.

Note: This problem applies students' understanding of indirect comparison from Lesson 2. In today's lesson, students will continue to work with indirect comparisons, focusing on comparing distances.

### Concept Development (29 minutes)

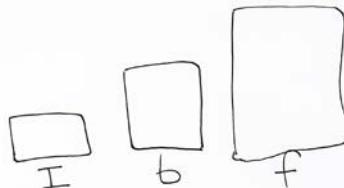
Materials: (T) Masking tape (two colors, if possible), piece of string or yarn approximately 6–10 feet long (depending on dimensions of the classroom—the string should reach from the door to the middle of the classroom), projector, City Blocks grid (S) Personal white boards with City Blocks grid insert

Note: Before math class, choose a spot in the middle of the classroom that diagonally faces the door. From this point, create two paths to the door using different colored masking tape for each path on the floor. One path (the red path) should be shorter (and less circuitous) than the other (the blue path). If the classroom floor has tiles, use their lines to guide the paths. If not, use a string to measure the length of each later in the lesson, or mark the tape with length units in black marker to denote unit lengths without referring to them as such.



#### A NOTE ON MULTIPLE MEANS FOR ACTION AND EXPRESSION:

When using words your English language learners may not be familiar with, be sure to illustrate your meaning by using real objects or show pictures as you are speaking.



The folder is longer than the index card.

Invite students to gather in the meeting area.

T: (Project the City Blocks grid.) Mary and Anne are trying to figure out whose path to the park is longer. Here is a map showing Mary's path and Anne's path from their house to the park. How can we figure out which path is longer?

S: Look and see which one seems longer. → Count the boxes from one endpoint to the other. → Measure the paths with a string and compare. → Count each line on the path.

T: Yes! These lines are like city blocks. When you trace from one line to the other line, that's a city block. So, we can count how many city blocks they need to walk in order to get to the park. We don't want to count the squares, because we need to trace the path which is made up of *lines*, not squares.

T: I'm going to trace Mary's path with my marker so I don't lose track. Count the city blocks with me.

S/T: 1, 2, 3, .... (Count until the tracing reaches the park.)

T: How many city blocks long is Mary's path?

S: 11 city blocks long.

T: (Write the number and unit next to Mary's path.)

T: It's your turn to count the city blocks on Anne's path by tracing it with your marker.

S: (Trace each city block and count as the teacher circulates.)

T: How many city blocks long is Anne's path?

S: Nine city blocks long.

T: Help me count as I trace Anne's.

T: (Trace and write the number and unit.) Whose path is longer? Mary's or Anne's?

S: Mary's path.

T: If a new girl, Beth, moves into the neighborhood and walks a longer path to get to the park than Mary, whose path is longer, Beth's or Anne's? Turn and talk to your partner about how you know.

**MP.7**

S: Beth's path will be longer than Anne's because you said Beth's path is longer than Mary's, and we figured out that Mary's path is longer than Anne's. So, Beth's path has to be longer than Anne's.

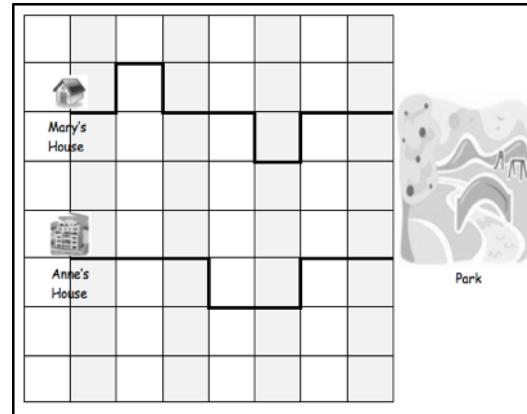
T: Order the paths from longest to shortest on your personal white board.

S: (Write Beth, Mary, Anne.)

T: Great job comparing the lengths of different paths from the map! Let's try the same thing in our classroom. I'm trying to figure out a path to the door to line up for recess. Should we be finding the longest path to the door or the shortest path to the door, and why? Talk to your partner.

S: The shortest path, because it will help you get to recess sooner!

T: Good thinking. So, let's do some comparing with the paths I've created in the classroom. What do you notice about these two paths?



Mary's and Anne's paths on the  
City Blocks grid



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

If students have trouble tracing and counting the distance of the paths, guide them to write numbers on the blocks of the paths as they count.

- S: The red one seems longer. It looks like it's making a lot of turns. → The blue one seems shorter because I see a lot more of the red color on the floor.
- T: How can we check which is shorter or longer precisely?
- S: (Replies vary depending on how your room is set up for this component.) Count the lines just like we counted the city blocks. → We can use a string, just like we did to measure yesterday. → Our floor has squares. We can count those lines.
- T: Let's check by counting the tile lines just like we counted the city blocks. (Choose two student volunteers to either step on each line or trace each line as the class counts to figure out the length of each path. Adjust this as necessary according to how your room is set up for the activity.)
- T: Which is longer?
- S: The blue path.
- T: Good job! Do you think there's a shorter way to get to the door than these two paths? Turn and talk to your partner.
- S: Yes. Don't make any turns. Just go straight to the door!
- T: You are right! (Walk over to and stand where the two paths start. Place a string on the starting point and hold it. Choose a student to take the other end of the string and walk straight to the door.) Here's the straight line for the shortest path you have suggested. (Cut the string that measures this straight path.)
- T: How can we make sure this is the shortest path compared to the other?
- S: Put the string on the other paths and check.
- T: (Have students help hold down the string at every corner as you measure the red path. Stop when the string runs out.)
- T: Which path is longer? The straight path or this red path? How can you tell?
- S: The red path. It keeps going but the string ran out. → The shortest path is the straight line! If we could just fly over the desks.
- MP.7** T: So, if the red path is longer than the string that measures the straight path, which is longer, the straight path or the blue path? Turn and talk to your partner.
- S: The blue path is longer, because the blue path is longer than the red path, and the red path is longer than the straight path.
- T: Excellent job on figuring out the shortest path to the door. Now we've got the quickest way to line up for recess!

### 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.

## Student Debrief (10 minutes)

**Lesson Objective:** Order three lengths using indirect comparison.

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.

In addition, this is a great place to show the strategy of marking the line segments as they are counted. This strategy could help students with tracking issues.

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

- Look at the City Blocks grid. Think back to the shortest path we made to the door from the middle of the classroom. Draw the shortest path from Anne's house to the park. What does the path look like? Explain why this path is the shortest path.
- Can you think of other tools that can help you measure the shortest distance between the middle of the classroom to the door? How does using a string help measure different paths?
- Can you think of an example where the shortest path that you could take to the door would not be a straight line? (One or more desks might be in the way, etc.)
- Explain to your partner how to solve Problem 4.
- Explain to your partner how to solve Problem 6.
- How was solving Problems 3 and 5 similar?
- Look at today's Application Problem. Order the items from longest to shortest.

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 3 | 1•3

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

1. In a playroom, Lulu cut a piece of string that measured the distance from the doll house to the park. She took the same string and tried to measure the distance between the park and the store but she ran out of string!

Which is the longer path? Circle your answer.

**the doll house to the park**  
**the park to the store**

Use the picture to answer the questions about the rectangles.

1. What is the shortest rectangle? B

2. If rectangle A is longer than rectangle C, then the longest rectangle is A.

3. Order the rectangles from shortest to longest: B    C    A

COMMON CORE | Lesson 3: Date: Order 3 lengths using indirect comparison: "if  $x$  is longer than  $y$  and  $y$  is longer than  $z$ , then  $x$  is longer than  $z$ ".  
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engage<sup>ny</sup> 3.A.8

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 3 | 1•3

Use the picture to answer the questions about the students' paths to school.

Caitlyn's path  
Toby's path  
Joe's path  
School

1. How long is Caitlyn's path to school? 10

2. How long is Toby's path to school? 12

3. Joe's path is shorter than Caitlyn's. Draw Joe's path.

Circle the correct word to make the statement true.

4. Toby's path is longer/shorter than Joe's path.

5. Who took the shortest path to school? Joe

6. Order the paths from shortest to longest.  
Joey    Caitlyn    Tobys

COMMON CORE | Lesson 3: Date: Order 3 lengths using indirect comparison: "if  $x$  is longer than  $y$  and  $y$  is longer than  $z$ , then  $x$  is longer than  $z$ ".  
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engage<sup>ny</sup> 3.A.8

**Exit Ticket (3 minutes)**

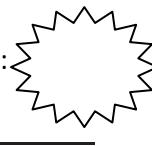
After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help you assess the students' understanding of the concepts that were presented in the lesson today and plan more effectively for future lessons. You may read the questions aloud to the students.

**A**

Name \_\_\_\_\_

Date \_\_\_\_\_

Number correct:



\*Write the missing number. Pay attention to the + and - signs.

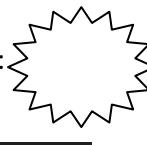
1	$5 + 2 = \square$		16	$13 + 6 = \square$	
2	$15 + 2 = \square$		17	$3 + 16 = \square$	
3	$2 + 5 = \square$		18	$19 - 2 = \square$	
4	$12 + 5 = \square$		19	$19 - 7 = \square$	
5	$7 - 2 = \square$		20	$4 + 15 = \square$	
6	$17 - 2 = \square$		21	$14 + 5 = \square$	
7	$7 - 5 = \square$		22	$18 - 6 =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

**B**

Name \_\_\_\_\_

Date \_\_\_\_\_

Number correct:



\*Write the missing number. Pay attention to the + and - signs.

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

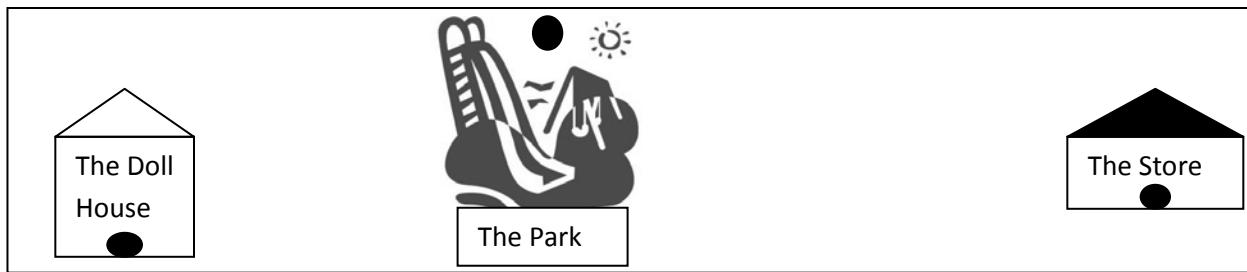
Name \_\_\_\_\_ Date \_\_\_\_\_

1. In a playroom, LuLu cut a piece of string that measured the distance from the doll house to the park. She took the same string and tried to measure the distance between the park and the store, but she ran out of string!

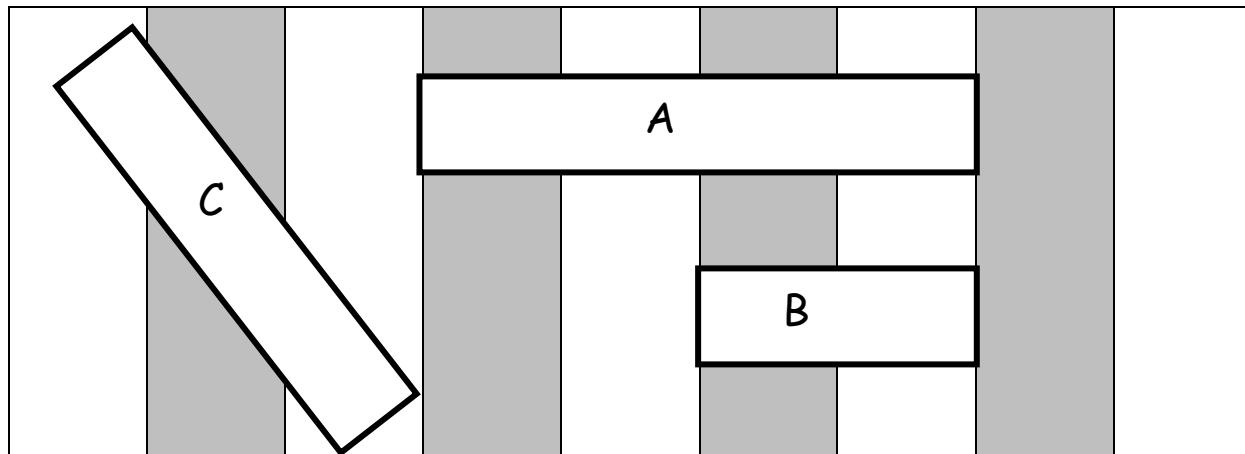
Which is the longer path? Circle your answer.

**the doll house to the park**

**the park to the store**



Use the picture to answer the questions about the rectangles.

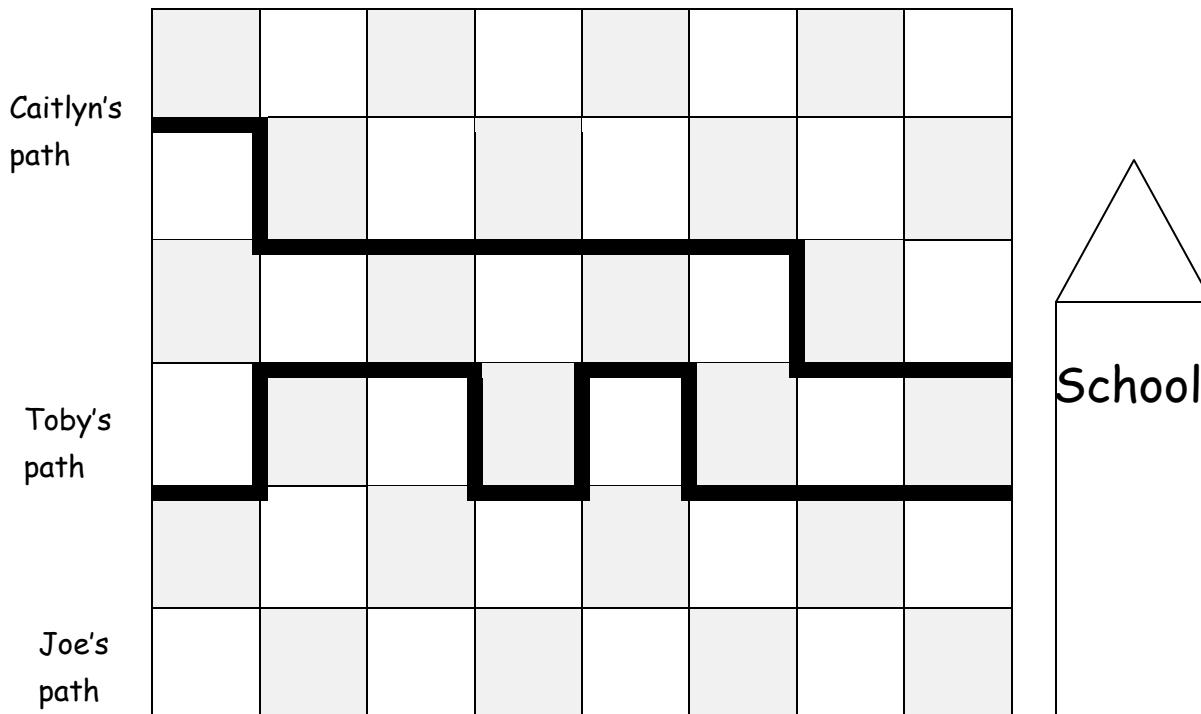


1. Which is the shortest rectangle? \_\_\_\_\_

2. If Rectangle A is longer than Rectangle C, the longest rectangle is \_\_\_\_\_.

3. Order the rectangles from shortest to longest:

Use the picture to answer the questions about the students' paths to school.



1. How long is Caitlyn's path to school? \_\_\_\_\_ blocks

2. How long is Toby's path to school? \_\_\_\_\_ blocks

3. Joe's path is shorter than Caitlyn's. Draw Joe's path.

Circle the correct word to make the statement true.

4. Toby's path is longer/shorter than Joe's path.

5. Who took the shortest path to school? \_\_\_\_\_

6. Order the paths from shortest to longest:

\_\_\_\_\_

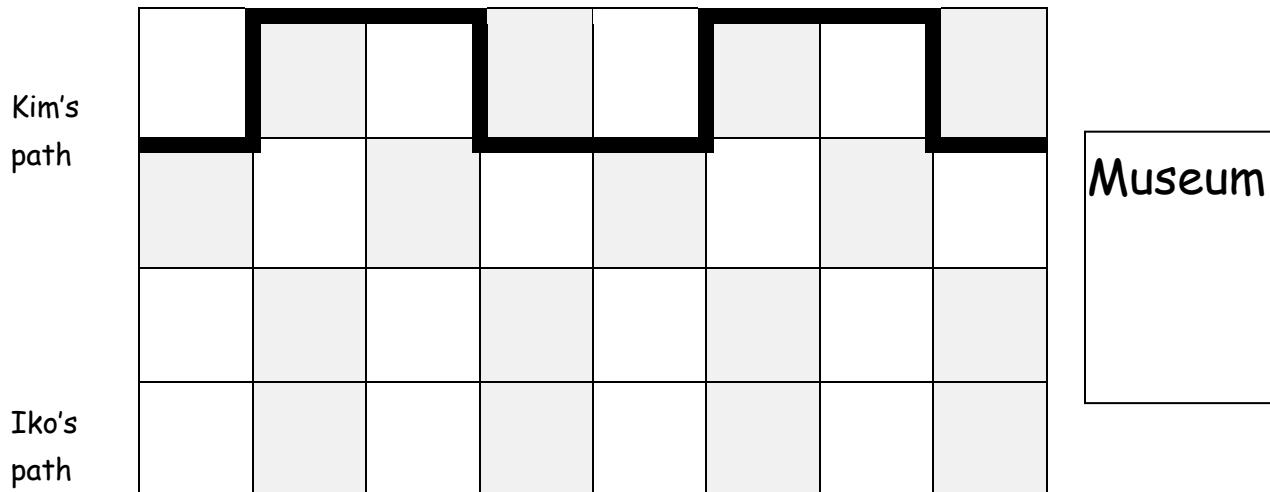
\_\_\_\_\_

\_\_\_\_\_

Name \_\_\_\_\_

Date \_\_\_\_\_

Use the picture to answer the questions about the students' paths to the museum.



1. How long is Kim's path to the museum? \_\_\_\_\_ blocks
2. Iko's path is shorter than Kim's path. Draw Iko's path.

Circle the correct word to make the statement true.

3. Kim's path is **longer**/**shorter** than Iko's path.

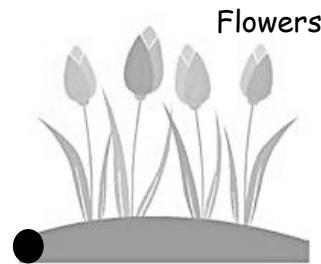
How long is Iko's path?

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

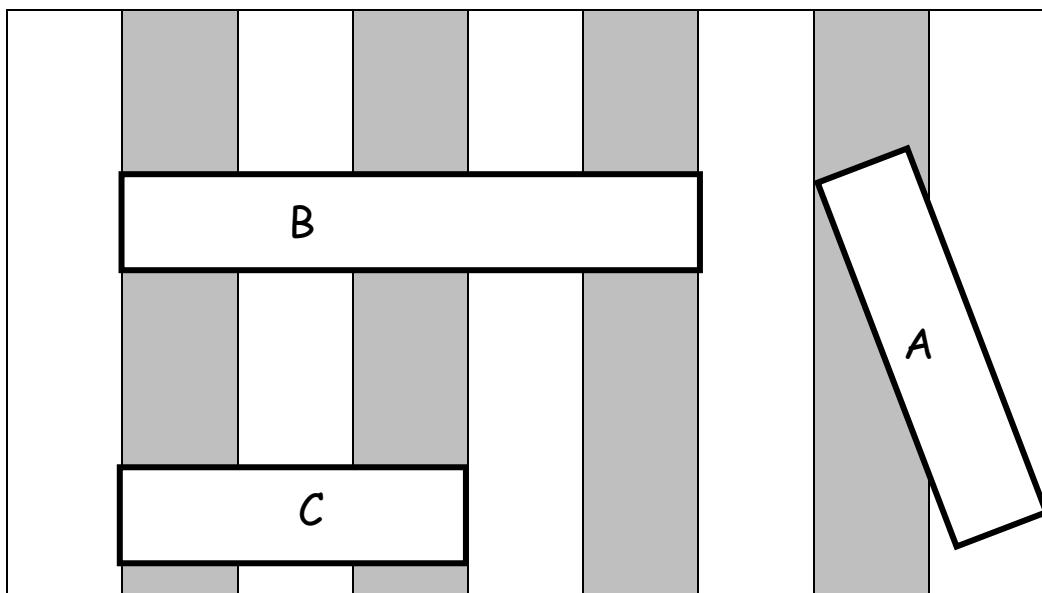
1. The string that measures the path from the garden to the tree is longer than the path between the tree and the flowers. Circle the shorter path.

**the path between the garden and the tree**

**the path between the tree and the flowers**



Use the picture to answer the questions about the rectangles.



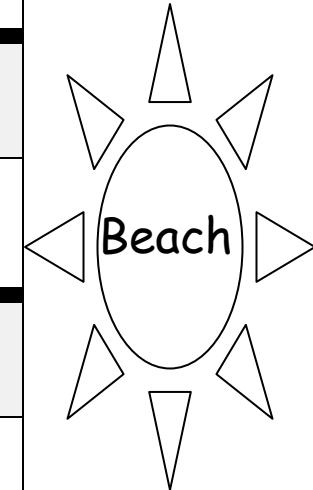
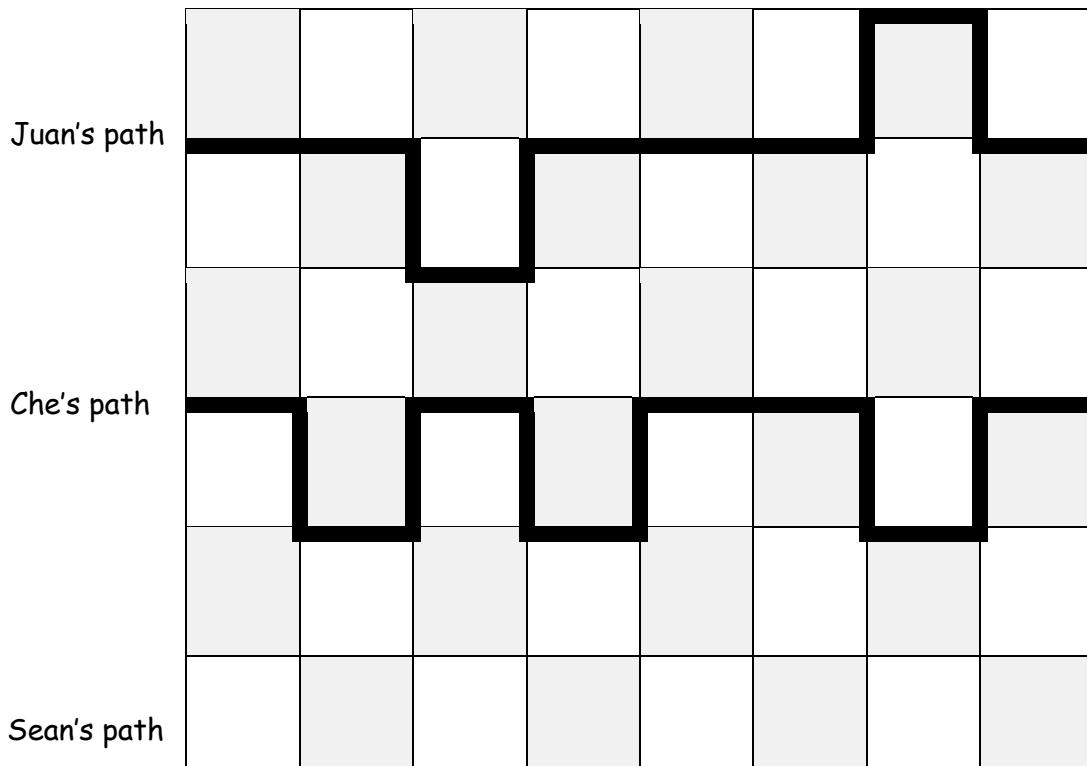
2. Which is the longest rectangle? \_\_\_\_\_

3. If Rectangle A is longer than Rectangle C, the shortest rectangle is  
\_\_\_\_\_.

4. Order the rectangles from shortest to longest:

\_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_

Use the picture to answer the questions about the children's paths to the beach.



5. How long is Juan's path to the beach? \_\_\_\_\_ blocks

6. How long is Che's path to the beach? \_\_\_\_\_ blocks

7. Juan's path is longer than Sean's path. Draw Sean's path.

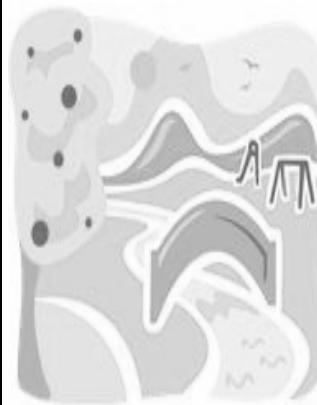
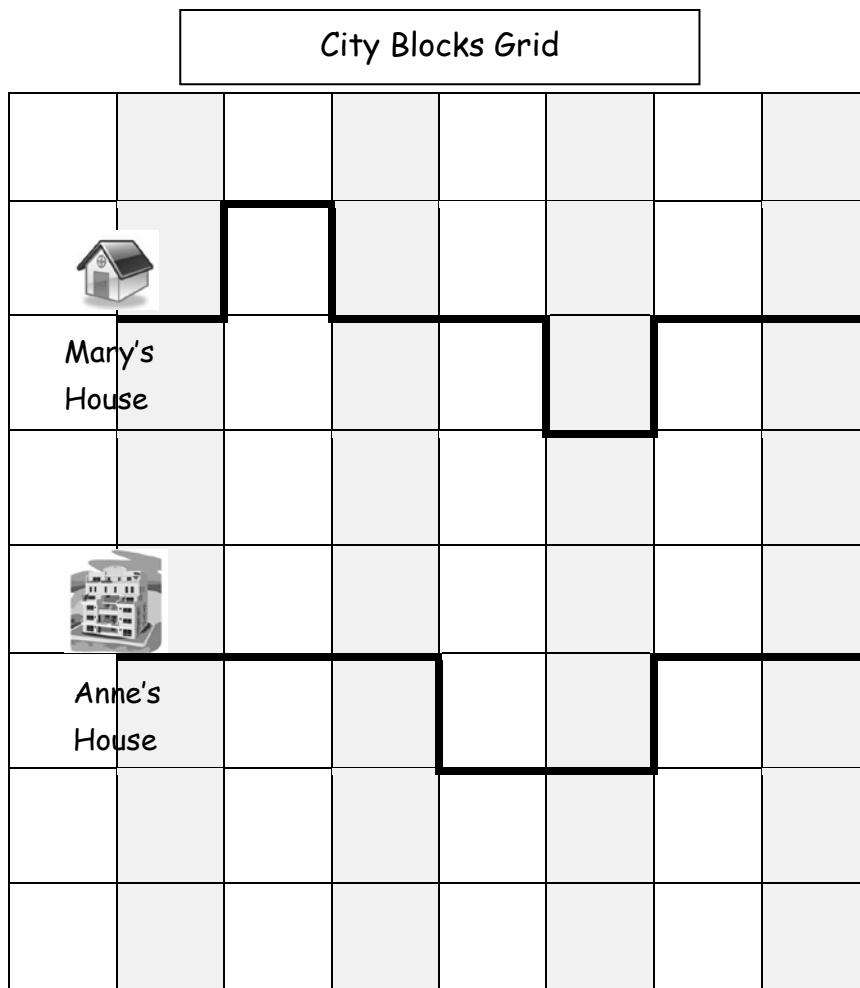
Circle the correct word to make the statement true.

8. Che's path is **longer**/**shorter** Sean's path.

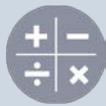
9. Who took the shortest path to the beach? \_\_\_\_\_

10. Order the paths from shortest to longest:

\_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_



Park



## Topic B

# Standard Length Units

**1.MD.1, 1.MD.2**

<b>Focus Standard:</b>	1.MD.1	Order three objects by length; compare the lengths of two objects indirectly by using a third object.
	1.MD.2	Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. <i>Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.</i>
<b>Instructional Days:</b>	3	
<b>Coherence -Links from:</b>	GK-M3	Comparison of Length, Weight, Capacity, and Numbers to 10
<b>-Links to:</b>	G2-M2	Addition and Subtraction of Length Units
	G2-M7	Problem Solving with Length, Money, and Data

Topic B adds a new level of precision to measurement by introducing the idea of a length unit. In Lesson 4, centimeter cubes are laid alongside the length of objects as students learn that the total number of cubes laid end to end with no gaps or overlaps is the length measure of that object. The objects being measured by students include many of the same objects measured in Topic A so that students can add greater precision to their measurements as they specify the number of units equal to the length of the objects being compared. For example, the length of the crayon can now be described not only as shorter than the paper strip, but more precisely as 9 centimeter cubes (**1.MD.2**).

In Lesson 5, students lay those same centimeter cubes alongside a ruler, recognizing the meaning of the numbers on the ruler as describing the number of centimeter length units up to that number. The centimeter then connects students to their world, as they come to realize that the centimeter unit is used by first grade students in Brazil, by the restaurant owner across the street, and even by their families. Students explore the question, “Why would we use a standard unit to measure?” As the use of rulers to measure is a Grade 2 standard, students in Grade 1 simply *rename* their centimeter cube as a centimeter, as they continue to use the cubes to measure objects. The progressions document suggests that students engage in standard unit measurement in order to develop a solid understanding of why and how to measure, rather than measuring using a plethora of nonstandard measurement units.<sup>1</sup>

<sup>1</sup> See the K–5 Geometric Measurement progression.

The topic closes with Lesson 6, where students measure and compare sets of three items with centimeter cubes, returning to the transitive statements of Topic A but with more sophisticated insights: “The pencil measures 10 centimeters. The crayon measures 6 centimeters. The book measures 20 centimeters. In order from shortest to longest is the crayon, the pencil, the book. The book is longer than the pencil, and the pencil is longer than the crayon” (**1.MD.1**). Students finally solve *compare with difference unknown* word problems, determining how much longer a given object is than another.

#### A Teaching Sequence Towards Mastery of Standard Length Units

**Objective 1:** Express the length of an object using centimeter cubes as length units to measure with no gaps or overlaps.

(Lesson 4)

**Objective 2:** Rename and measure with centimeter cubes, using their standard unit name of centimeters.

(Lesson 5)

**Objective 3:** Order, measure, and compare the length of objects before and after measuring with centimeter cubes, solving *compare with difference unknown* word problems.

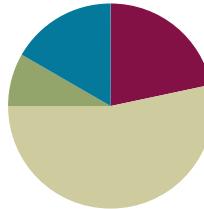
(Lesson 6)

## Lesson 4

**Objective:** Express the length of an object using centimeter cubes as length units to measure with no gaps or overlaps.

### Suggested Lesson Structure

Fluency Practice	(13 minutes)
Application Problem	(5 minutes)
Concept Development	(32 minutes)
Student Debrief	(10 minutes)
<b>Total Time</b>	<b>(60 minutes)</b>



### Fluency Practice (13 minutes)

- Race and Roll Addition **1.OA.6** (4 minutes)
- Speed Writing by Twos **1.OA.5** (3 minutes)
- Subtraction Within 20 **1.OA.6** (6 minutes)

### Race and Roll Addition (4 minutes)

Materials: (S) 1 die per set of partners

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

All students start at 0. Partners take turns rolling a die, then saying a number sentence adding the number rolled to the total. (For example, Partner A rolls 6 and says, “0 + 6 = 6.” Partner B rolls 3 and says, “6 + 3 = 9.”) They continue rapidly rolling and saying number sentences until they get to 20, without going over. Partners stand when they reach 20. (For example, if partners are at 18 and roll 5, they take turns rolling until one of them rolls 2 or both of them roll 1. Then, they both stand.)

### Speed Writing by Twos (3 minutes)

Materials: (S) Personal white boards, timer

Note: This fluency activity provides students practice with writing numbers while reinforcing adding 2.

Time students as they count by twos on their boards from 0 to 40 as fast as they can. Students stand and hold up their boards when they get to 40. If their counting sequence is correct, say, “Erase and count again!” To add excitement to the game, give the class a point each time a student gets to 40 and see how many points the class can earn in two minutes.

Record the points to use as a motivator the next time students speed write by twos.

### Subtraction Within 20 (6 minutes)

Materials: (T) Hide Zero cards (S) Personal white boards

Note: This review fluency helps strengthen students' understanding of the take from ten and take from the ones subtraction strategies, as well as their ability to recognize appropriate strategies based on problem types.

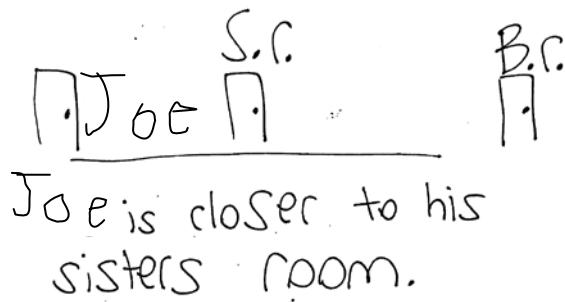
- T: (Show 14 with Hide Zero cards.) How can I take 14 apart to help me subtract?  
 S: 10 and 4.  
 T: I want to subtract 2 from 14. Write a number sentence to show whether I should subtract 2 from the 4 or the 10.  
 S: (Write  $4 - 2 = 2$ .)  
 T: Why wouldn't I take from my 10?  
 S: You don't need to because you have enough ones.  
 T: Yes! It's much easier to just subtract from my ones! Since  $4 - 2 = 2$ ,  $14 - 2$  is what? Write the subtraction sentence.  
 S: (Write  $14 - 2 = 12$ .)  
 T: (Replace the 4 Hide Zero card with a 2.) Yes!

Repeat with  $14 - 5$ , eliciting that you need to take from ten because there are not enough ones. Repeat with similar problems.

### Application Problem (5 minutes)

Joe ran a string from his room to his sister's room to measure the distance between them. When he tried to use the same string to measure the distance from his room to his brother's room, the string didn't reach! Which room was closer to Joe's room, his sister's or his brother's?

Note: This problem directly applies students' learning from Lesson 3, as students use indirect comparison to compare distances. For many students, such problems can be challenging to visualize on the first read. After reading, encourage students to draw a picture to show each part before answering the question. Reread the problem, pausing long enough for students to draw a picture of the comparison of the string and Joe's sister's room before moving on to read the next sentence. Pictures may vary in many ways. As long as the picture demonstrates that Joe's sister's room is closer than Joe's brother's room, any formation can provide an appropriate representation.



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

Challenge students who finish early to try drawing a different way to show their answer or create their own related problem.

## Concept Development (32 minutes)

**Materials:** (T) Projector, new crayon (9 cm), unsharpened pencil (19 cm), small glue stick (8 cm), dry erase marker (12 cm), centimeter cubes (S) Bag with 20 centimeter cubes; bag with a new crayon, unsharpened pencil, small glue stick, dry erase marker, jumbo popsicle stick (15 cm), and small paper clip (3 cm); recording sheet

**Note:** Student bags will contain items that will be used throughout Topic B, although not all items in the bag will be used during today's lesson. Please collect the bags at the end of the lesson and keep them in a safe place for future use. Also, collect the bag with centimeter cubes. These will be sent home each day for use during homework for Lessons 4, 5, and 6.

Have students sit at the meeting area in a semi-circle.

T: (Hold up a new crayon.) How can we find out the length of this crayon? Turn and talk to your partner.

S: Use a string. → Use a ruler.

T: (Project centimeter cubes lined up in a column.) Let's find out how long this crayon is using these **centimeter cubes**. What do you notice about the centimeter cubes?

S: They are all exactly the same size. → They have the same length.

T: Since they have the same length, we can figure out how many centimeter cubes long this crayon is. Count with me as I lay down each centimeter cube to match the crayon. (Lay out the first centimeter cube without aligning it to the crayon's endpoint.)

T/S: 1 centimeter cube.

T: Am I off to a good start?

S: No! You have to line up the endpoints. The edge of the centimeter cube is not starting at the same place as the end of the crayon.

T: You are right! Who can come and start us off on the right foot?

S: (Aligns endpoints.) 1 centimeter cube!

T: Now that our endpoints line up, I can continue to see how many centimeter cubes long this crayon is. (Lay down 3 more centimeter cubes correctly.)

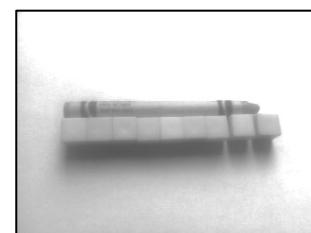
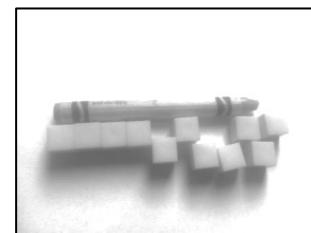
**MP.3** T/S: 2 centimeter cubes! 3 centimeter cubes! 4 centimeter cubes!

T: (Partly overlap the rest of the centimeter cubes by creating an uneven, almost stacked look as pictured to the right.)

T/S: 5 centimeter cubes, 6 centimeter cubes, ...11 centimeter cubes!

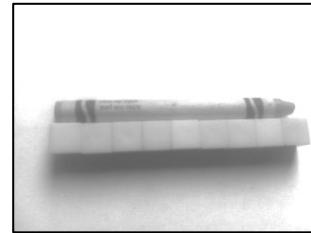
T: Great. The end of this eleventh centimeter cube lines up with the end of the crayon. So, the crayon is as long as 11 centimeter cubes. Do you agree? Turn and talk to your partner.

S: The centimeter cubes were not laid out correctly. Some parts of the centimeter cubes are under others. Some of them overlap!



MP.3

- T: You are right. That is not an accurate way to measure this crayon. Let me fix it. (Fix some but leave a gap between two centimeter cubes.) Okay, so there are no overlaps. Is this correct?
- S: No, there's a space between the centimeter cubes. That's not an accurate way to measure. We can't have any spaces between the centimeter cubes.
- T: You are right! The crayon isn't broken with a space in the middle, so the centimeter cubes have to be all connected, without overlaps or gaps. Who would like to come up and fix the centimeter cubes? (Choose a student.)
- S: (Lays out 9 centimeter cubes correctly.)
- T: Are the centimeter cubes laid out correctly? Are we ready to count and find out how many centimeter cubes long this crayon is?
- S: Yes! (Count as teacher points to each centimeter cube.) 1 centimeter cube, 2 centimeter cubes, ...9 centimeter cubes!
- T: How many centimeter cubes long is the crayon?
- S: 9 centimeter cubes long!
- T: Every centimeter cube is exactly the same length, so we can use them as **length units**. Let's try measuring the pencil with our length units. (Hold up the pencil and the crayon.) What is our length unit called?
- S: A centimeter cube.
- T: Compared to the crayon, do you think it will take more or fewer of these length units to measure the pencil? Turn and talk to your partner.
- S: The colored pencil will need more centimeter cubes because it is longer than the crayon.



Distribute the bags of measuring materials and recording sheets and have students practice measuring and recording the length of each object from the bag. Students work with their partners as they check each other's work for accuracy. Circulate to provide support for struggling students. If time allows, choose other objects to measure. Long objects can be measured by combining their centimeter cubes.

Note: Use the term *about* to describe the length of an object that is not exactly a certain number of centimeter cubes long. For example, if the colored pencil is closer to 4 centimeter cubes long than 5, say it is *about* 4 centimeter cubes long.

### A NOTE ON MULTIPLE MEANS OF ENGAGEMENT:

The abstract term *about* may be difficult for English language learners to understand. As you teach the lesson and use the word *about* show a visual representation of the objects whenever you can.

NYS COMMON CORE MATHEMATICS CURRICULUM 1•3

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

Measure the length of each object with your cubes. Complete the statements below.

1. The pencil is 3 centimeter cubes long.
2. The pan is 5 centimeter cubes long.
3. The shoe is 4 centimeter cubes long.
4. The bottle is 5 centimeter cubes long.
5. The paintbrush is 4 centimeter cubes long.
6. The bag is 4 centimeter cubes long.
7. The ant is 3 centimeter cubes long.
8. The cupcake is 2 centimeter cubes long.

COMMON CORE | Lesson 4: Express the length of an object using centimeter cubes as length units to measure with no gaps or overlaps. 3.B.8

## 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.

For this Problem Set, all objects will be measured horizontally unless otherwise noted by a vertical line next to the object.

## Student Debrief (10 minutes)

**Lesson Objective:** Express the length of an object using centimeter cubes as length units to measure with no gaps or overlaps.

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.

- A **length unit** is what we use to measure how long something is. When we measure we have to be careful that all of the length units we're using are the same size. What length unit did we measure with today? (**Centimeter cubes.**)
- How is measuring with our new length unit different than measuring with a string, as we did yesterday?
- What are the ways in which we need to use the centimeter cubes to accurately measure the length of an object. (Align endpoint, with no gaps or overlaps.) Explain why these are important.
- Look at Problem 10. What mistake might someone make in this question? (They might measure the flower and the vase together.)
- Look at Problem 11. How would you fix the example showing the incorrect way of measuring? Use your own centimeter cubes to correct the length of the smaller bat.
- Can you use the word *tall* to describe the length of an object? Which objects in the Problem Set could be described as being a certain number of centimeter cubes tall?
- Look at your Application Problem. What was Joe using as his tool to compare length? Use your hands to show me the length you imagined for his string. Explain your thinking.

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

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 4 Problem Set 1•3

9. The cow sticker is 6 centimeter cubes long.

10. The vase is 3 centimeter cubes long.

11. Circle the picture that shows the correct way to measure.

3 centimeter cubes

5 centimeter cubes

How would you fix the picture that shows an incorrect measurement?  
*I have to make sure the end points line up.*

COMMON CORE | Lesson 4: Express the length of an object using centimeter cubes as length units to measure with no gaps or overlaps. Date: 7/24/13

engage<sup>ny</sup> 3.B.11

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**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.

Name \_\_\_\_\_

Date \_\_\_\_\_

Classroom Object	Length Using Centimeter Cubes
glue stick 	_____ centimeter cubes long
dry erase marker 	_____ centimeter cubes long
popsicle stick 	_____ centimeter cubes long
paper clip 	_____ centimeter cubes long
	_____ centimeter cubes long
	_____ centimeter cubes long
	_____ centimeter cubes long

Name \_\_\_\_\_

Date \_\_\_\_\_

Measure the length of each object's picture with your cubes. Complete the statements below.

1. The pencil is \_\_\_\_\_ centimeter cubes long.



2. The pan is \_\_\_\_\_ centimeter cubes long.



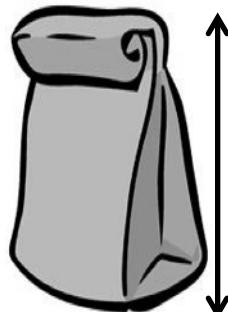
3. The shoe is \_\_\_\_\_ centimeter cubes long.



4. The bottle is \_\_\_\_\_ centimeter cubes long.



5. The paintbrush is \_\_\_\_\_ centimeter cubes long.



6. The bag is \_\_\_\_\_ centimeter cubes long.

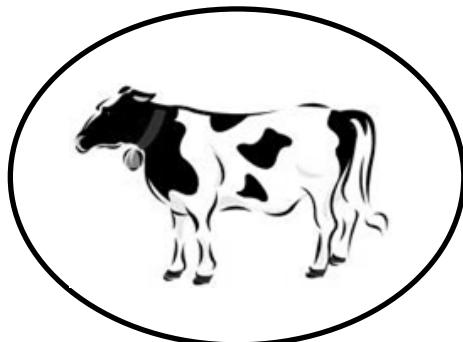


7. The ant is \_\_\_\_\_ centimeter cubes long.



8. The cupcake is \_\_\_\_\_ centimeter cubes long.

9.



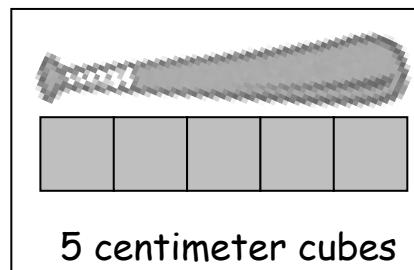
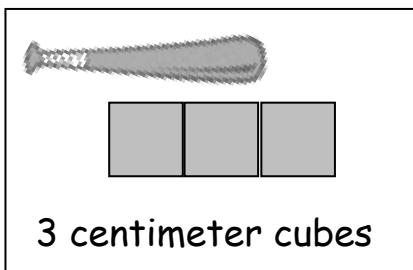
The cow sticker is \_\_\_\_\_ centimeter cubes long.

10.



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

11. Circle the picture that shows the correct way to measure.



How would you fix the picture that shows an incorrect measurement?

---

---

Name \_\_\_\_\_

Date \_\_\_\_\_

1.



The picture frame is about \_\_\_\_\_ centimeter cubes long.

2.



The boy's crutch is about \_\_\_\_\_ centimeter cubes long.



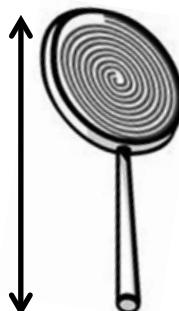
Name \_\_\_\_\_

Date \_\_\_\_\_

Measure the length of each object's picture with your cubes.

Complete the statements below.

1. The lollipop is \_\_\_\_\_ centimeter cubes long.



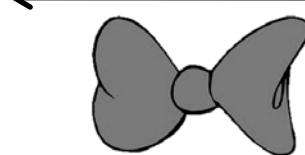
2. The stamp is \_\_\_\_\_ centimeter cubes long.



3. The purse is \_\_\_\_\_ centimeter cubes long.



4. The candle is \_\_\_\_\_ centimeter cubes long.



5. The bow is \_\_\_\_\_ centimeter cubes long.



6. The cookie is \_\_\_\_\_ centimeter cubes long.



7. The mug is \_\_\_\_\_ centimeter cubes long.



8. The ketchup is about \_\_\_\_\_ centimeter cubes long.

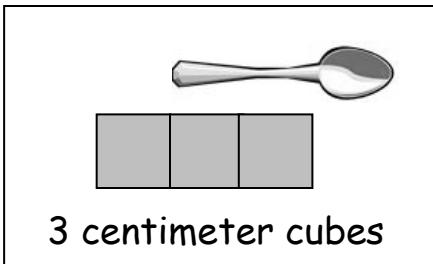


9. The envelope is about \_\_\_\_\_ centimeter cubes long.

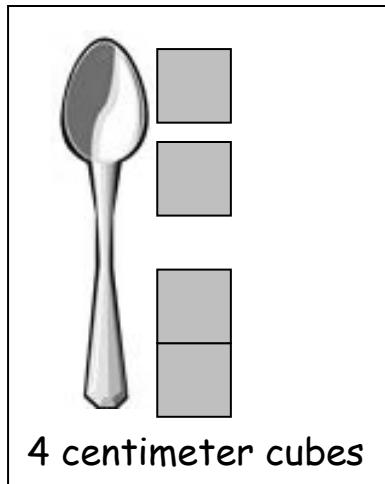


10. Circle the picture that shows the correct way to measure.

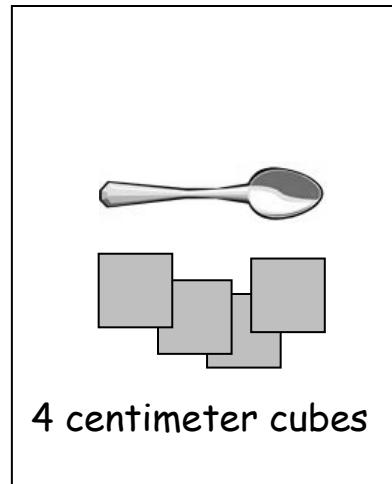
A



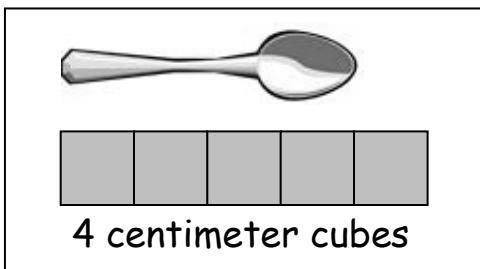
B



C



D



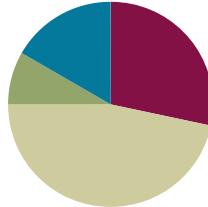
Explain what is wrong with the measurements for the pictures you did NOT circle.

## 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

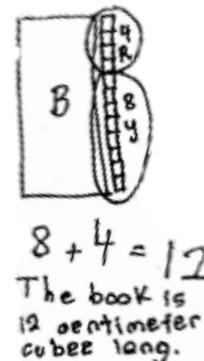
Note: This Sprint addresses the Grade 1 standard of subtracting within 20.

### 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. ( $2 \text{ cm} + 5 \text{ cm} = 7 \text{ cm}$ .)

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.  
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engage<sup>ny</sup> 3.B.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.

NYS COMMON CORE MATHEMATICS CURRICULUM

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

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

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

Circle the word that makes the second sentence true.

COMMON CORE | Lesson 5: Rename and measure with centimeter cubes, using its standard unit name of centimeters.

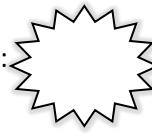
engage<sup>ny</sup> 3.B.10

**A**

Name \_\_\_\_\_

Date \_\_\_\_\_

Number correct:



\*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



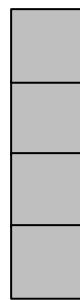
3 centimeters long

B



5 centimeters long

C



4 centimeters long

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

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

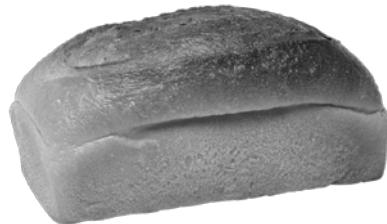
Check your cubes along your ruler. How long is the paperclip in centimeters?

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.



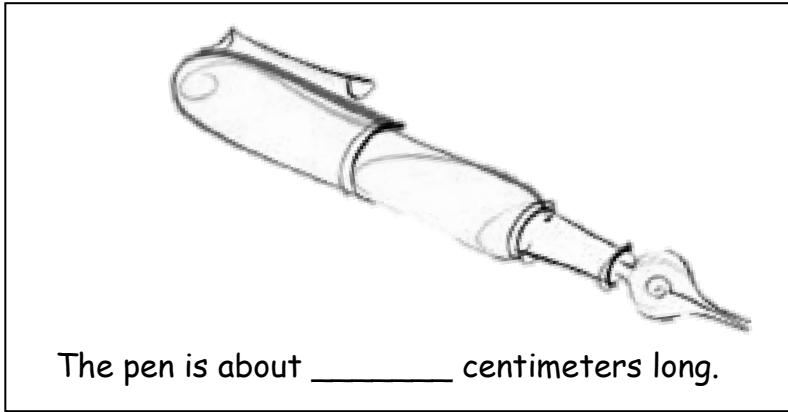
The hair clip is about \_\_\_\_\_ centimeters long.



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 \_\_\_\_\_

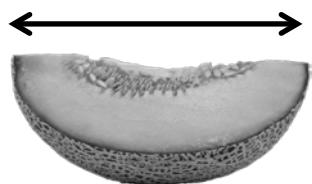
Date \_\_\_\_\_

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.

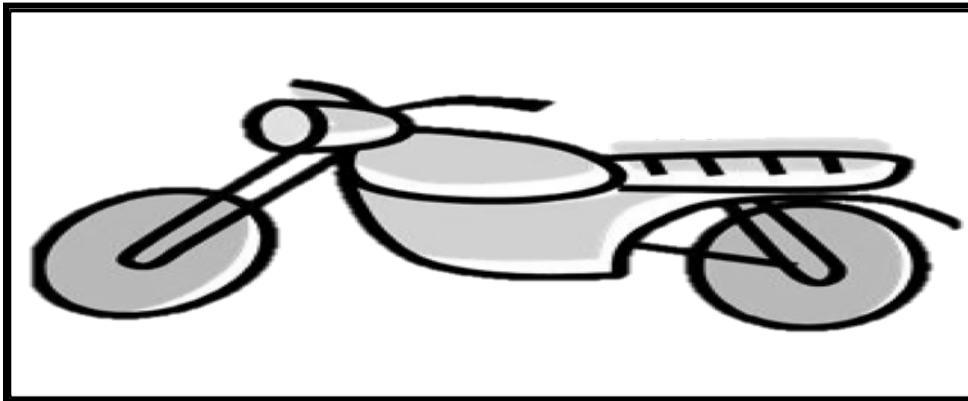


4. The umbrella is about \_\_\_\_\_ centimeters tall.



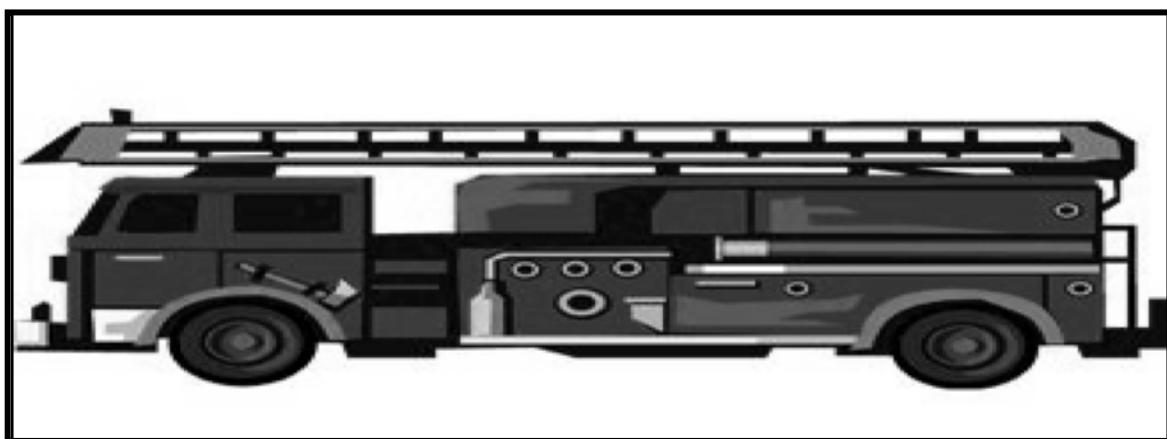
Name \_\_\_\_\_ Date \_\_\_\_\_

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

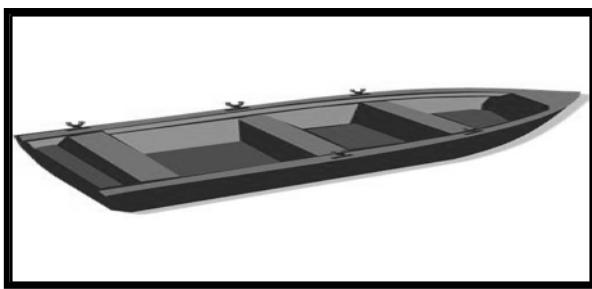


The motorcycle sticker is \_\_\_\_\_ centimeters long.

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.

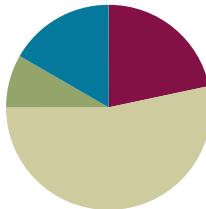
1. The airplane sticker is longer than the \_\_\_\_\_ sticker.
  
2. The row boat sticker is longer than the \_\_\_\_\_ sticker and shorter than the \_\_\_\_\_ sticker.
  
3. The motorcycle sticker is shorter than the \_\_\_\_\_ sticker and longer than the \_\_\_\_\_ sticker.
  
4. If Justin gets a new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

## Lesson 6

**Objective:** Order, measure, and compare the length of objects before and after measuring with centimeter cubes, solving *compare with difference unknown* word problems.

### Suggested Lesson Structure

Fluency Practice	(13 minutes)
Application Problem	(5 minutes)
Concept Development	(32 minutes)
Student Debrief	(10 minutes)
<b>Total Time</b>	<b>(60 minutes)</b>



### Fluency Practice (13 minutes)

- Addition with Cards **1.OA.6** (7 minutes)
- Speed Writing by Twos **1.OA.5** (3 minutes)
- Cold Call: Number Sentence Swap **1.OA.4** (3 minutes)

### Addition with Cards (7 minutes)

Materials: (S) 1 pack of numeral cards 0–10 per set of partners (from G1–M1–Lesson 36), counters (if needed)

Note: This review fluency strengthens students' abilities to add within and across ten.

Students place the deck of cards face down between them. Each partner flips over two cards and adds their cards together. The partner with the greatest total keeps the cards played by both players that round. (E.g., Player A draws 4 and 5, and gives the total, 9. Player B draws 9 and 4, and gives the total, 13. Since  $9 < 13$ , Player B keeps the cards.) If the sums are equal, the cards are set aside and the winner of the next round keeps the cards from both rounds. The player with the most cards at the end of the game wins.

### Speed Writing by Twos (3 minutes)

Materials: (S) Personal white boards, timer

Note: This fluency activity provides students practice with writing numbers while reinforcing adding 2.

Time students as they count by twos on their boards from 0 to 40 as fast as they can. Students stand and hold up their boards when they get to 40. If their counting sequence is correct, say, "Erase and count again!"

To add excitement to the game, give the class a point each time a student gets to 40 and see how many points the class can earn in two minutes. Record the points and compare the score with the last time students speed wrote by twos. Keep a record of points scored each time this activity is done to help students recognize and celebrate improvement.

### Cold Call: Number Sentence Swap (3 minutes)

Note: This fluency activity reviews the grade level standard of understanding subtraction as an unknown addend and prepares students for *difference unknown* problem types in this lesson.

In Cold Call, the teacher asks a question, pauses to provide thinking time, and then randomly calls on a student or group of students to answer. This game helps motivate all students to mentally solve the problem so they will be ready if they are chosen to answer.

- T:  $4 + \text{what number} = 5?$  (Pause.) Kira?  
 S: (Only Kira answers.) 1.  
 T: Good. So,  $14 + \text{what number} = 15?$  (Pause to provide thinking time.) Marcus?  
 S: (Only Marcus answers.)

Continue with the following suggested sequence:  $5 + \square = 7$ ,  $15 + \square = 17$ ,  $4 + \square = 8$ ,  $14 + \square = 18$ .

### Application Problem (5 minutes)

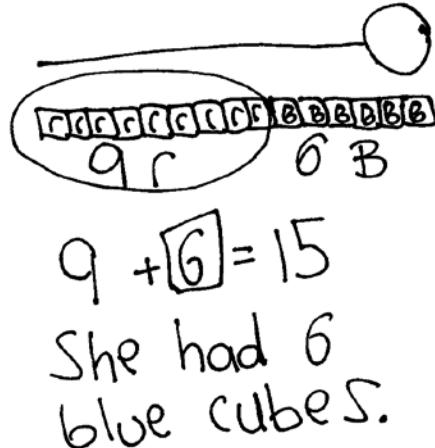
Julia's lollipop is 15 centimeters long. She measured the lollipop with 9 red centimeter cubes and some blue centimeter cubes. How many blue centimeter cubes did she use? Remember to use the RDW process.

Note: This problem enables students to continue working with *take apart with difference unknown* problem types within the context of measurement. During the Debrief, students will compare the length of Julia's lollipop with another item from the lesson to determine how much longer the lollipop is compared to that item.



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

When playing games where you are randomly calling on students to answer, adjust wait time for certain students. Some may also benefit from being told the question you are going to ask them during the game so that they are not put on the spot in front of their peers unprepared.



## Concept Development (32 minutes)

**Materials:** (T) Projector, unsharpened pencil (19 cm), new crayon (9 cm), small paper clip (3 cm), dry erase marker (12 cm), jumbo popsicle stick (15 cm), new colored pencil (17 cm), centimeter cubes  
 (S) Bag with centimeter cubes, bag with various classroom objects from Lesson 4, personal white board

Gather students in the meeting area.

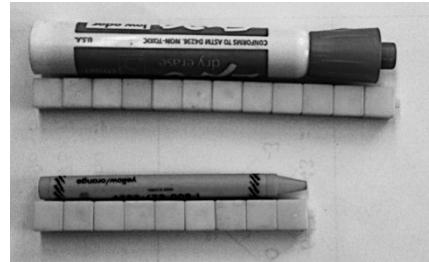
- T: (Project dry erase marker, crayon, and new colored pencil in a disorganized way.) Without measuring, can you order these three objects from shortest to longest?
- S: It's hard to tell which is longer or shorter. → They seem too similar. We couldn't tell for sure. → Let's straighten them out and line up the endpoints. → We should use our centimeter cubes to be sure.
- T: (Align the endpoints of each object, keeping the order.) Now can you order the objects from shortest to longest? Share your thoughts with your partner.
- S: (Discuss.) The objects from shortest to longest are the crayon, the dry erase marker, and the colored pencil.
- T: (Adjust the order as stated by students.) Yes, that's correct!
- T: What can we do to describe their length more precisely? How can we tell how long each item is?
- S: We can measure them!
- T: Take these items out of your bag and let's measure each item using centimeter cubes. Write down how long each item is on your personal white board.
- S: (Measure items and record lengths.)
- T: What is the length of each item?
- S: (Share measurements. Record the length next to each object.)
- T: (Touch each object while describing its length.) The colored pencil, which is 17 centimeters, is longer than the dry erase marker, which is 12 centimeters. The dry erase marker is longer than the crayon, which is only 9 centimeters. What can you say about the colored pencil compared to the crayon?
- S: The colored pencil is longer than the crayon!
- T: Look at the measurements under each object in order from shortest to longest. What do you notice? Talk with your partner. (Circulate and listen.)
- S: (Discuss.) The numbers get larger. → The measurements are larger.
- T: Let's compare the number of cubes we used to measure the marker and the crayon more closely. (Align the two objects' endpoints, and use centimeter cubes to show their length, as shown below.) Remind me, which object is longer?



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

When students turn and talk with a partner they are hearing different ways their peers are thinking about measurement. Hearing others talk about measurement more than once will help your English language learner students understand and acquire language around this topic.

- S: The marker.
- T: How many centimeter cubes did you use to measure the marker?
- S: 12 cubes.
- T: How many centimeter cubes did you use to measure the crayon?
- S: 9 cubes.
- T: How many more cubes did you need to use to measure the marker compared to the crayon? If you need to, put your rows of cubes right next to each other, so you can see the extra cubes you used more easily.
- S: (Adjust rows of cubes as necessary to compare.) Three more centimeter cubes.
- T: How did you know? Talk with your partner about your thinking. Think about the number sentence that would match what you did.
- S: I lined them up and counted on the extras. Ninnnne, 10, 11, 12. That's 3 more cubes. → I thought, "9 plus the mystery number gives me 12." Then from 9, I counted on to get to 12. → I took away 9 from 12 and got 3.
- T: (Elicit and write number sentence corresponding to each student response.) You are right! Let's try some more.



Repeat the process with a new pencil, a paper clip, and a popsicle stick. After comparing the length of two rows of cubes for two of the objects and identifying the difference, encourage students to write the number sentences and the number statement on their personal white boards.

**Note:** Comparing centimeter cubes is a natural opportunity to concretely experience the compare with *difference unknown* problem type. Lesson 9 will be dedicated to focusing attention to this objective. Make note of the particular challenges students may be facing and use these specific examples to help shape the concept development work during Lesson 9.

### 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.

NYS COMMON CORE MATHEMATICS CURRICULUM

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

1. Order the bugs from longest to shortest by writing the animal names on the lines. Use centimeter cubes to check your answer. Write the length of each bug in the space below the pictures.

The bugs from longest to shortest are: caterpillar fly bee

Fly	Caterpillar	Bee
5 centimeters	7 centimeters	4 centimeters

2. Order the objects below from shortest (1) to longest (3) by writing the number next to the object name. Use your centimeter cubes to check your answer and complete the sentences.

The noise maker: <u>3</u>	
The balloon: <u>2</u>	
The present: <u>1</u>	

The present is about 5 centimeters long.  
The noise maker is about 8 centimeters long.  
The balloon is about 4 centimeters long.  
The noise maker is about 3 centimeters longer than the present.

COMMON CORE Lesson 6: Order, measure, and compare the length of objects before and after measuring with centimeter cubes; solving compare with difference unknown word problems. Date: 4/15/13

engage<sup>ny</sup> 3.B.6

## Student Debrief (10 minutes)

**Lesson Objective:** Order, measure, and compare the length of objects before and after measuring with centimeter cubes, solving *compare with difference unknown* word problems.

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 did we do to figure out precisely how much longer or shorter one object was than another today?
- Can you think of a time when it would be helpful or important to say that something is longer by an exact amount rather than just saying it is longer or shorter?
- Turn and talk to your partner about how you solved Problem 3. How are your strategies similar and/or different?
- How was solving Problem 5 different from solving Problems 3 and 4? Explain your thinking.
- Look at your Application Problem. How much longer is Julia's lollipop than the new crayon? Talk with a partner to discuss how you know.

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.

NYS COMMON CORE MATHEMATICS CURRICULUM      LESSON 6 | 1•3

Use your centimeter cubes to model each length and answer the question.

3. Peter's toy T-Rex is 11 centimeters tall, and his toy Velociraptor is 6 centimeters tall. How much taller is the T-Rex than the Velociraptor?

T-Rex is 5 centimeters taller.

4. Miguel's pencil rolled 17 centimeters and Sonya's pencil rolled 9 centimeters. How much less did Sonya's pencil roll than Miguel's?

Sonya's pencil rolled 8 centimeters less.

5. Tania makes a cube tower that is 3 centimeters taller than Vince's tower. If Vince's tower is 9 centimeters tall, how tall is Tania's tower?

Her tower is 12 centimeters.

COMMON CORE | Lesson 6: Order, measure, and compare the length of objects before and after measuring with centimeter cubes, solving *compare with difference unknown* word problems.  
Date: 6/14/13

engage<sup>ny</sup> 3.B.7  
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Name \_\_\_\_\_ Date \_\_\_\_\_

1. Order the bugs from longest to shortest by writing the animal names on the lines. Use centimeter cubes to check your answer. Write the length of each bug in the space below the pictures.

The bugs from longest to shortest are

---

---

---

Fly



Caterpillar



Bee



\_\_\_\_\_ centimeters

\_\_\_\_\_ centimeters

\_\_\_\_\_ centimeters

2. Order the objects below from shortest (1) to longest (3) by writing the number next to the object name. Use your centimeter cubes to check your answer and complete the sentences.



The noise maker: \_\_\_\_\_

The balloon: \_\_\_\_\_

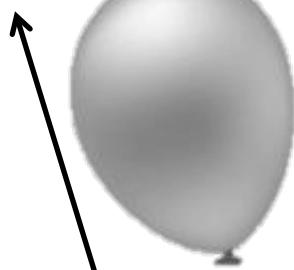
The present: \_\_\_\_\_

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

The noise maker is about \_\_\_\_\_ centimeters long.

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

The noise maker is about \_\_\_\_\_ centimeters longer than the present.



1•3

Use your centimeter cubes to model each length and answer the question. Write a statement for your answer.

- Peter's toy T-rex is 11 centimeters tall, and his toy velociraptor is 6 centimeters tall. How much taller is the T-rex than the velociraptor?
  - Miguel's pencil rolled 17 centimeters and Sonya's pencil rolled 9 centimeters. How much less did Sonya's pencil roll than Miguel's?
  - Tania makes a cube tower that is 3 centimeters taller than Vince's tower. If Vince's tower is 9 centimeters tall, how tall is Tania's tower?

Name \_\_\_\_\_

Date \_\_\_\_\_

Read the measurements of the tool pictures.

The wrench is 8 centimeters long.



The screwdriver is 12 centimeters long.



The hammer is 9 centimeters long.



Order the pictures of the tools from shortest to longest.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

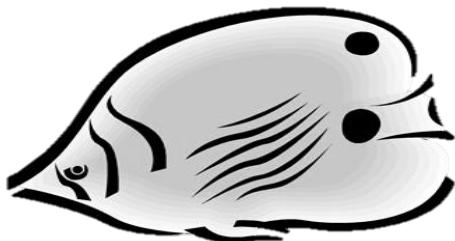
Diana bought her dad a new tool that was 6 centimeters longer than the screwdriver. Use your centimeter cubes to find out how long the new tool is. Draw a picture and complete the statement.

The new tool is \_\_\_\_\_ centimeters long.

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

Natasha's teacher wants her to put the fish in order from longest to shortest. Measure each fish with the centimeter cubes that your teacher gave you. Then, use the letters to put the fish in order from longest to shortest.

A



\_\_\_\_\_ centimeters.

B



\_\_\_\_\_ centimeters.

D



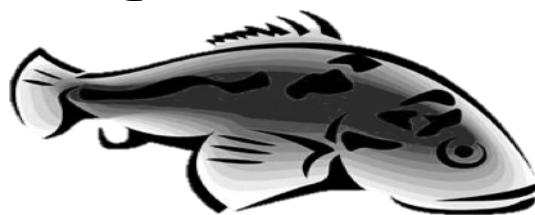
\_\_\_\_\_ centimeters

C



\_\_\_\_\_ centimeters.

E



\_\_\_\_\_ centimeters.

Order Fish A, B, and C from longest to shortest.

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Use the fish measurements to complete the sentences.

Fish A is longer than Fish \_\_\_\_\_ and shorter than Fish \_\_\_\_\_.

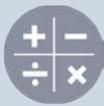
Fish C is shorter than Fish \_\_\_\_\_ and longer than Fish \_\_\_\_\_.

Fish \_\_\_\_\_ is the shortest fish.

If Natasha gets a new fish that is shorter than Fish A, list the fish that the new fish is also shorter than.

Use your centimeter cubes to model each length and answer the question.

- Henry gets a new pencil that is 19 centimeters long. He sharpens the pencil several times. If the pencil is now 9 centimeters long, how much shorter is the pencil now than when it was new?
- Malik and Jared threw baseballs at the park. Malik threw his baseball 6 centimeters less than Jared threw his baseball. If Jared threw his baseball 17 centimeters, how far did Malik throw his baseball?



## Topic C

# Non-Standard and Standard Length Units

**1.OA.1, 1.MD.2**

<b>Focus Standard:</b>	1.OA.1	Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. (See Glossary, Table 1.)
	1.MD.2	Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. <i>Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.</i>
<b>Instructional Days:</b>	3	
<b>Coherence -Links from:</b>	GK-M3	Comparison of Length, Weight, Capacity, and Numbers to 10
-Links to:	G2-M2	Addition and Subtraction of Length Units
	G2-M7	Problem Solving with Length, Money, and Data

Topic C gives students a chance to explore the usefulness of measuring with similar units. The topic opens with Lesson 7, where students measure the same objects from Topic B using two different non-standard length units simultaneously, such as toothpicks and small paper clips (**1.MD.2**). They then use small paper clips and large paper clips, two non-standard units that happen to be the same object but at different lengths. Each time they measure one object using both units and receive inconsistent measurement results. Students then begin to ask the question, “Why do we measure with same-sized length units?” As they explore why it is so important to use the same-sized length unit, they realize that doing so yields consistent measurement results.

In Lesson 8, students explore what happens when they use a different unit of measurement from that of their classmates. As students measure the same objects with different non-standard length units, they realize that in order to have discussions about the lengths of objects together, they *must* measure with the same units. Students answer the question, “If Bailey uses paper clips and Maya uses toothpicks, and they both measure things in our classroom, will they be able to compare their measurements?” With this new understanding of consistent measurement, Lesson 9 closes the topic, with students solving *compare with difference unknown*

problems using centimeters. Students explore and solve problems such as, “How much longer is the pencil than the marker?” (**1.OA.1**). Revisiting the centimeter here helps students recognize the value of having a consistent way to communicate about various measurements.

### A Teaching Sequence Towards Mastery of Non-Standard and Standard Length Units

**Objective 1:** Measure the same objects from Topic B with different non-standard units simultaneously to see the need to measure with a consistent unit.  
(Lesson 7)

**Objective 2:** Understand the need to use the same units when comparing measurements with others.  
(Lesson 8)

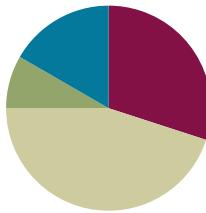
**Objective 3:** Answer *compare with difference unknown* problems about lengths of two different objects measured in centimeters.  
(Lesson 9)

## Lesson 7

**Objective:** Measure the same objects from Topic B with different non-standard units simultaneously to see the need to measure with a consistent unit.

### Suggested Lesson Structure

Fluency Practice	(18 minutes)
Application Problem	(5 minutes)
Concept Development	(27 minutes)
Student Debrief	(10 minutes)
<b>Total Time</b>	<b>(60 minutes)</b>



### Fluency Practice (18 minutes)

- Beep Counting **1.NBT.1** (2 minutes)
- Addition Strategies Review **1.OA.6** (6 minutes)
- Sprint: Addition Within 20 **1.OA.6** (10 minutes)

### Beep Counting (2 minutes)

Note: This fluency activity strengthens students' ability to understand number relationships and recognize counting patterns. If students are proficient with beep counting by ones, consider beep counting by tens (**1.NBT.5**), or challenge students with practicing Grade 2 standards of counting by twos or fives (**2.NBT.2**).

Say a series of three or more numbers but replace one of the numbers with the word *beep* (e.g., 15, 16, *beep*). When signaled, students say the number that was replaced by the word *beep* in the sequence. Scaffold number sequences, beginning with easy sequences and moving to more complex ones. Be sure to include forward and backward number sequences and to change the sequential placement of the *beep*.

Suggested sequence: 15, 16, *beep*; 25, 26, *beep*; 35, 36, *beep*; 12, 11, *beep*; 22, 21, *beep*; 32, 31, *beep*; 8, *beep*, 10; 18, *beep*, 20; 38, *beep*, 40; *beep*, 9, 8; *beep*, 19, 18; *beep*, 29, 28; etc.

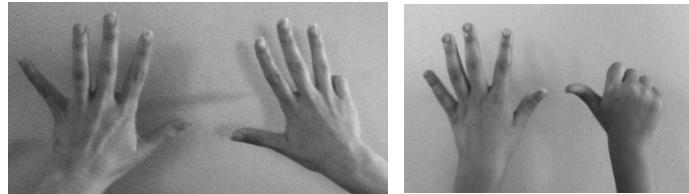
## Addition Strategies Review (6 minutes)

Materials: (T) Hide Zero cards

Note: This review fluency helps strengthen students' understanding of the make ten and add the ones addition strategies, as well as their ability to recognize appropriate strategies based on the number of tens and ones in both addends.

Divide students into partners. Lay out your Hide Zero cards so they are easy to access. Show 9 and 6 with your cards.

T: Partner A, show me 9 on your Magic Counting Sticks. Partner B, show me 6. If I want to solve  $9 + 6$ , how can I make a ten?



S: Take one from the 6 and add 1 to 9.



T: Yes. Show me! (Exchange the 9 and 6 cards for 10 and 5 as students adjust their fingers.) We changed  $9 + 6$  into an easier problem. Say our new addition sentence with the solution.



S:  $10 + 5 = 15$ .

T: (Put the Hide Zero cards together to show 15.) Say it the Say Ten way.

S: Ten 5.

T: (Show 13 with Hide Zero cards.) Partner A, show the ones. Partner B, show the tens. (Break apart the Hide Zero cards as students hold up their fingers.) If we want to add 2, should we make a ten to help us?



S: No. We already have a ten!

T: Should we add 2 to our 3 or our 10?

S: Our 3.

T: Yes! Partner A, show me  $3 + 2$ . (Exchange the 3 card for a 5 card.) What is the answer?



S: 5.

T: So, Partner B, what is  $13 + 2$ ?

S: 15.

T: Say it the Say Ten way.

S: Ten 5.

## Sprint: Addition Within 20 (10 minutes)

Materials: (S) Addition Within 20 Sprint

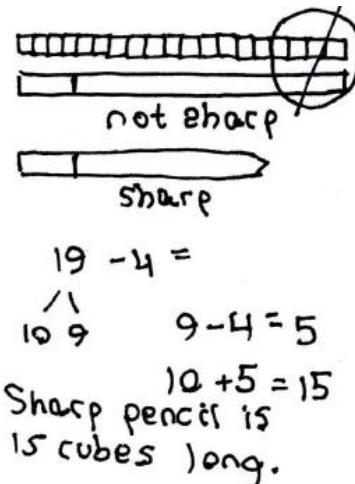
Note: This Sprint addresses the Grade 1 standard of adding and subtracting within 20.

## Application Problem (5 minutes)

When Corey measures his new pencil, he uses 19 centimeter cubes. After he sharpens it, he needs 4 fewer centimeter cubes. How long is Corey's pencil after he sharpens it? Use centimeter cubes to solve the problem. Write a number sentence and a statement to answer the question.

Note: As students build measurements with centimeter cubes, they continue to connect their experiences of addition and subtraction with concrete problem situations. As students work, encourage them to talk through the problem sentence by sentence, placing the centimeter cubes in front of them to build the story.

During the Debrief, connect the students' concrete experience with the problem type or computation.



## Concept Development (27 minutes)

**Materials:** (T) Chart paper, 3 new pencils of different color (e.g., red, blue, yellow) from the same brand and size, mixed set of large and small paper clips (S) Bag of 20 large paper clips and 20 small paper clips

**Note:** Model for students how to measure objects that are longer or shorter than a whole unit. Also, discuss how best to choose the number of units when estimating.

Gather students in the meeting area with their materials.

### A NOTE ON MULTIPLE MEANS OF REPRESENTATION:

Ask questions to guide connections, analysis, and mastery of concepts. This allows students the opportunity to develop critical thinking skills instead of just memorizing answers.

- T: For the past few days, we have been measuring with centimeter cubes. Today, let's measure with paper clips. What did we learn about the rules of measuring? (Write the rules on chart paper as students respond. Model how to measure objects that are longer or shorter than a whole unit. Discuss how best to choose the number of units when estimating.)
- S: Line up the endpoints. → Don't leave any gaps. → Don't overlap what you are measuring with.
- T: Let's see how long this red pencil is by using paper clips as our length unit. (Measure with a mix of both paper clips, e.g., 3 large and 1 small.) How many paper clips long is the red pencil?
- S: 4 paper clips long.
- T: (Keep the red pencil measurement displayed.) This blue pencil is the same length. Let's measure it using paper clips as the length unit. (Measure with a different combination of paper clips, e.g., 1 large and 4 small.) How many paper clips long is the blue pencil?



- S: 5 paper clips long.
- T: According to these measurements, the blue pencil is longer than the red. Is this correct?
- S: Yes. → But, it looks like the pencils are the same length!
- T: Let's compare the pencils directly. (Pick up the pencils from their places and stand them up from the floor. Leave the paper clip measurements where they are.) Are they the same length?
- S: Yes!
- T: (Put the pencils back so they are aligned with their paper clips.)
- T: Hmm. Let me measure again. This yellow pencil is also the same length as the others. (Measure with a different combination of paper clips, e.g., 4 large paperclips.) Oh boy, this time, it's *less* than 4 paper clips long! Why do I keep getting different measurements when the pencils are the same size?
- T: I'm using the length unit of a paperclip. (Refer to the chart with measuring rules.) I'm aligning my endpoints, making sure there are no gaps or overlaps. I should be getting the same length measurement each time since the pencils are the same length.
- T: Talk to your partner. Can you figure out what I need to change about the way I'm measuring?
- S: The paper clips are different sizes! → Some paper clips are long and others are short! → It's not an accurate measurement because the paper clips have to be the same size, just like our centimeter cubes were the same size, a centimeter. → We should only use the smaller paper clips. → Or, we should only use the bigger paper clips. But, we can't mix them.
- T: It sounds to me like we have a new rule for proper measuring! (Add to the chart: *Length units must be the same length.*) Just like you said, we need to make a decision: either use just the small paper clips or...
- S: Just the big paper clips!
- T: Great. And what should we make sure we don't do?
- S: Mix them up because they are different sizes.
- T: (Ask a student volunteer to come up and use small paper clips to measure the red pencil. Measure the blue pencil with small paper clips as the student measures the red pencil.) How many paper clips long is the blue pencil? How many paper clips long is the red pencil?
- S: They are both about 6 small paper clips long!
- T: Thank you for solving my measurement problem! You're ready to go and measure with paper clips on your Problem Set. Before you go, let's read all of our rules for measuring.

MP.3

While distributing a bag of varying paper clips to each student, remind the class of the new rule, to make sure they use the same length paper clips as they measure. (Note: It will be helpful to students to have the chart hanging in the classroom for future reference.)



### NOTES ON MULTIPLE MEANS FOR ENGAGEMENT:

Provide challenging extensions for students who are able to measure more complex objects. Provide them with an object to be measured both horizontally and vertically and find the difference. Or, students can measure something round using a tape measure. Have them present their findings to the class.

## 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.

Note: Circulate to ensure that students use the correct size of paper clip for each set of questions. The last two items in the chart are found in the classroom, not in the Problem Set.

## Student Debrief (10 minutes)

**Lesson Objective:** Measure the same objects from Topic B with different non-standard units simultaneously to see the need to measure with a consistent unit.

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 a new rule we must remember when we are measuring? (Length units must be the same size.)
- Compare your first chart to your partner's. Explain why you have the same measurements.
- Even though we measured the same objects, why are your measurements different on your first chart from your second chart?
- A student said she used new pencil-top erasers from a pack to measure how long her pencil is. All the erasers are the same size. Her partner said she couldn't use these erasers to measure properly because they are all different colors. Who is correct?
- Look at your Application Problem. What measurement rules did you have to keep in mind? Did you add more cubes or take cubes away to solve this problem? What number sentence matches the problem?

NYS COMMON CORE MATHEMATICS CURRICULUM 1•3

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

Measure the length of each object with your large paper clips. Fill in the chart with your measurement.

Name of Object	Number of Large Paper Clips
Bottle	2
Caterpillar	2
Key	1
Pen	3
Sticker	2
Paper	6
Reading book	4

COMMON CORE Lesson 7: Measure the same objects from Topic B with different non-standard units simultaneously to see the need to measure with a consistent unit. 5/18/13 engage<sup>ny</sup> 3.C.8

NYS COMMON CORE MATHEMATICS CURRICULUM 1•3

Measure the length of each object with your small paper clips. Fill in the chart with your measurement.

Name of Object	Number of Small Paper Clips
Bottle	3
Caterpillar	4
Key	2
Pen	4
Sticker	3
Paper	8
Reading book	6

COMMON CORE Lesson 7: Measure the same objects from Topic B with different non-standard units simultaneously to see the need to measure with a consistent unit. 5/18/13 engage<sup>ny</sup> 3.C.8

**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.

**A**

Number correct:

Name \_\_\_\_\_

Date \_\_\_\_\_

\*Write the missing number.

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

**B**

Name \_\_\_\_\_

Number correct:

Date \_\_\_\_\_

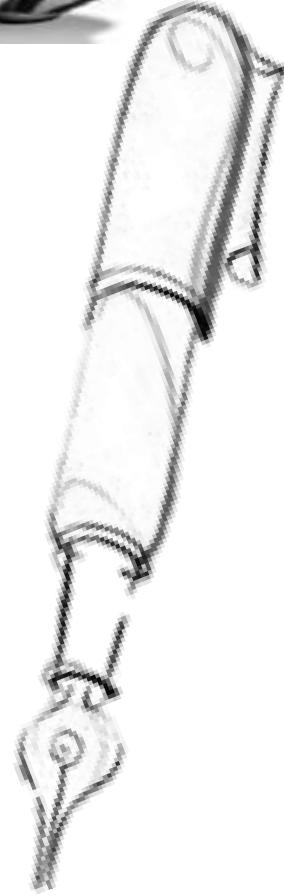
\*Write the missing number.

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

Name \_\_\_\_\_

Date \_\_\_\_\_

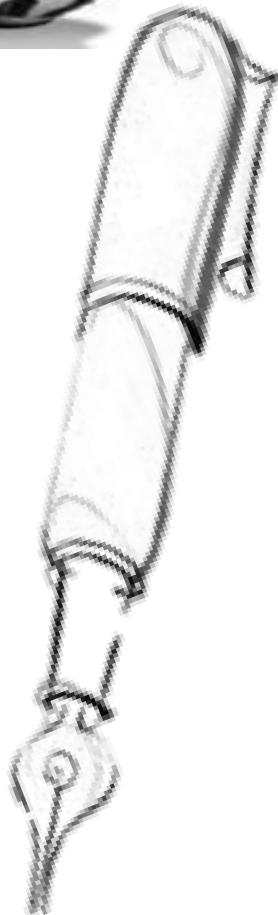
Measure the length of each object with your **LARGE** paper clips. Fill in the chart with your measurement.



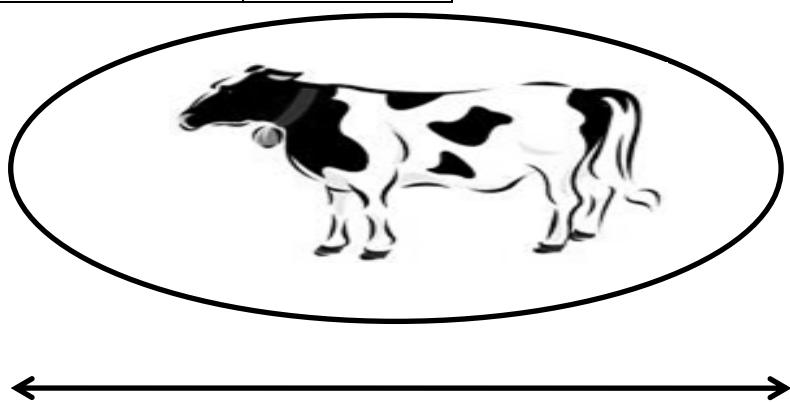
Name of Object	Number of Large Paper Clips
Bottle	
Caterpillar	
Key	
Pen	
Sticker	
Paper	
Reading book	



Measure the length of each object with your **SMALL** paper clips. Fill in the chart with your measurement.



Name of Object	Number of Small Paper Clips
Bottle	
Caterpillar	
Key	
Pen	
Sticker	
Paper	
Reading book	

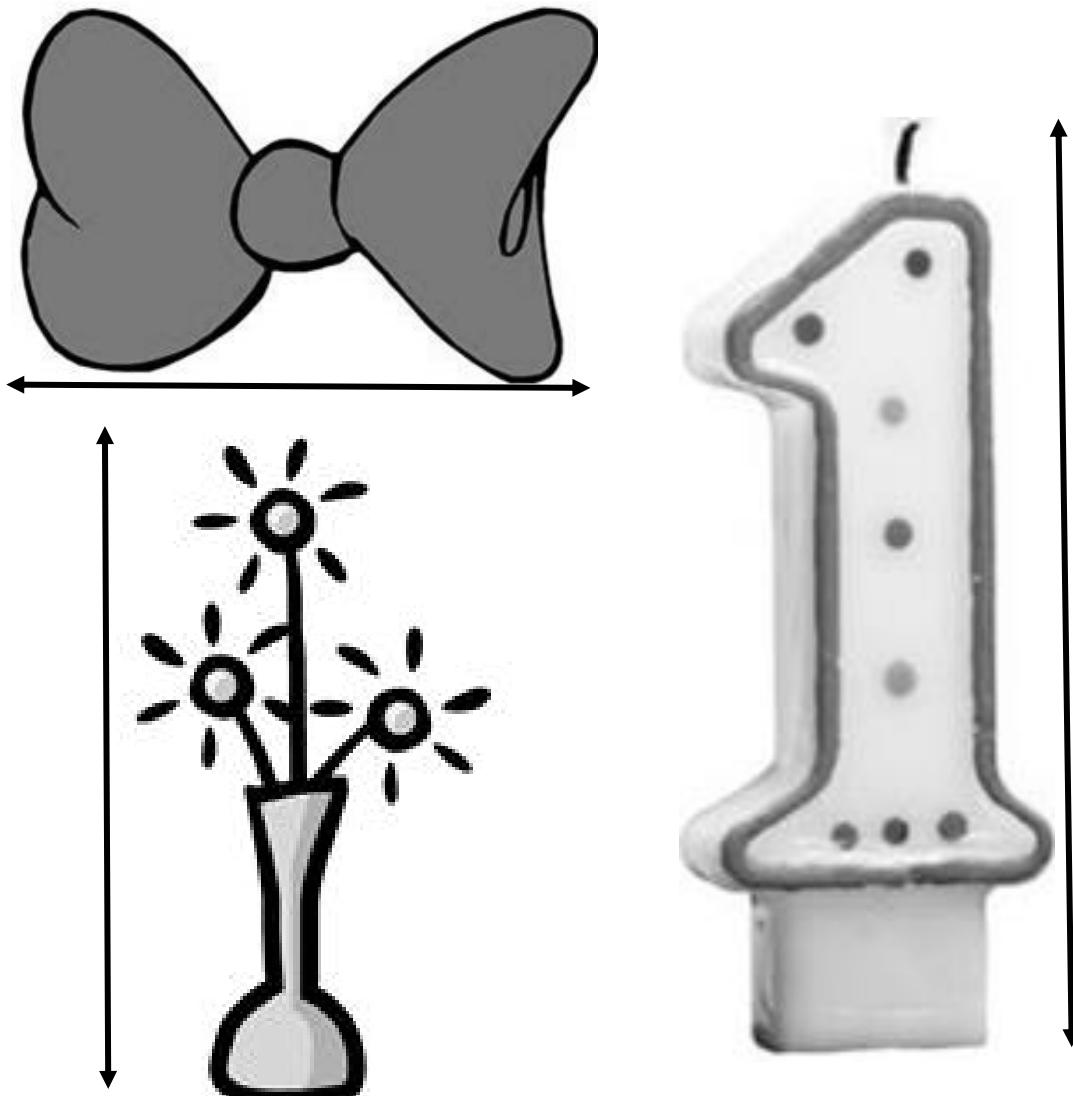


Name \_\_\_\_\_

Date \_\_\_\_\_

Measure the length of each object with your **small** and **large** paper clips. Fill in the chart with your measurements.

Name of Object	Number of Large Paper Clips	Number of Small Paper Clips
Bow		
Candle		
Vase and Flowers		



Name \_\_\_\_\_

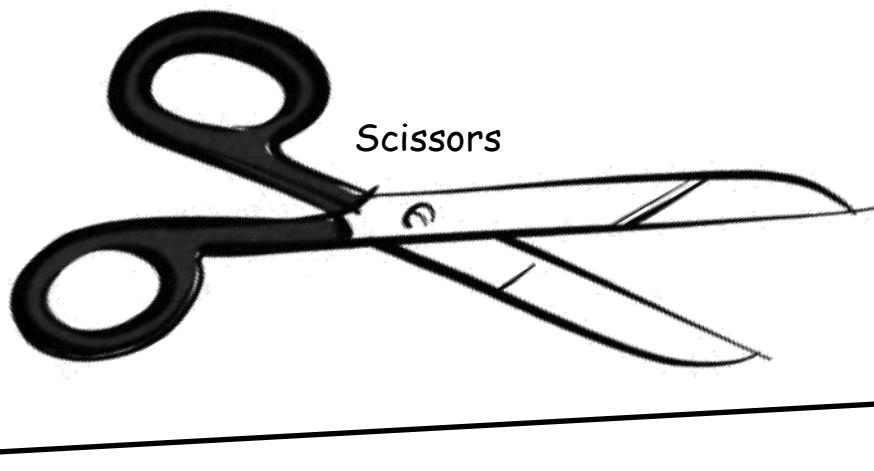
Date \_\_\_\_\_

Cut the strip of paper clips. Measure the length of each object with your **large** paper clips to the right. Then, measure the length with your **small** paper clips on the back. Fill in the chart on the back of the page with your measurements.

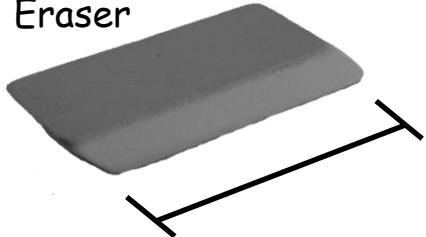
Paintbrush



Scissors



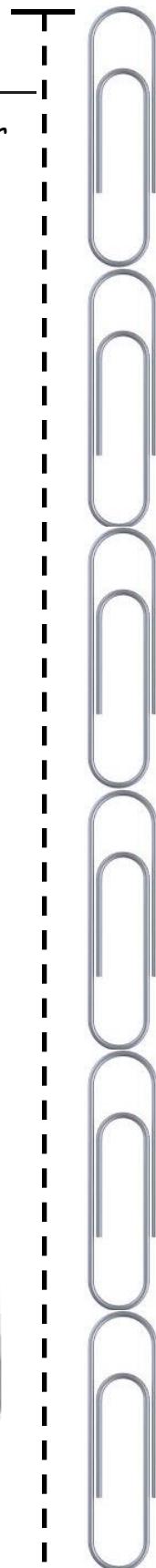
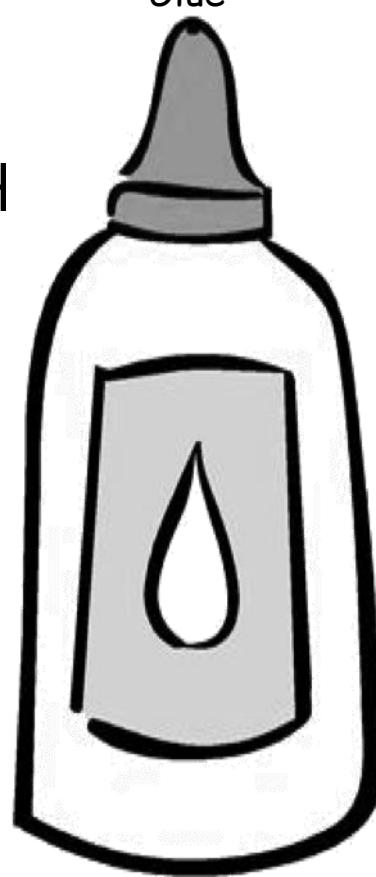
Eraser



Crayon



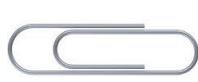
Glue





Name of Object	Length in Large Paper Clips	Length in Small Paper Clips
Paintbrush		
Scissors		
Eraser		
Crayon		
Glue		

Now find objects around your home to measure. Record the objects you find on the chart.



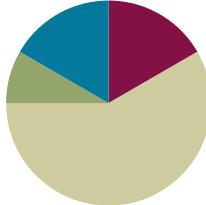
Name of Object	Length in Large Paper Clips	Length in Small Paper Clips

## Lesson 8

**Objective:** Understand the need to use the same units when comparing measurements with others.

### Suggested Lesson Structure

Fluency Practice	(10 minutes)
Application Problem	(5 minutes)
Concept Development	(35 minutes)
Student Debrief	(10 minutes)
<b>Total Time</b>	<b>(60 minutes)</b>



### Fluency Practice (10 minutes)

- Speed Writing **1.OA.5** (3 minutes)
- Race and Roll Addition **1.OA.6** (4 minutes)
- Cold Call: Addition and Subtraction Within 20 **1.OA.6** (3 minutes)

### Speed Writing (3 minutes)

Materials: (S) Personal white boards, timer

Note: Throughout the first two modules, students have been practicing counting by ones, twos, fives, and tens, as well as Say Ten counting.

Reviewing these counting patterns prepares students for Module 4 by strengthening their understanding of place value and their ability to add and subtract. Many students are familiar with skip-counting, and though skip-counting by twos, fives, and tens is not a Grade 1 standard, the teacher can incorporate these counting patterns if appropriate.

Choose a counting pattern with which students need more practice. Students count on their boards by the chosen pattern for a minute. Tell them to erase their boards but remember how high they counted. Then, give them another minute to try to count even higher.



#### NOTES ON MULTIPLE MEANS OF REPRESENTATION:

If you have students who are not able to count by the chosen pattern without numerical visual cues at this point in the year, use a tool such as a number line or the hundreds chart. Students can color the pattern on the number line or hundreds chart so that they have a visual representation as they count on their own.

## Race and Roll Addition (4 minutes)

Materials: (S) 1 die per set of partners

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

All students start at 0. Partners take turns rolling a die, then saying a number sentence adding the number rolled to the total. (For example, Partner A rolls 6 and says, “0 + 6 = 6.” Partner B rolls 3 and says, “6 + 3 = 9.”) They continue rapidly rolling and saying number sentences until they get to 20, without going over. Partners stand when they reach 20. (For example, if partners are at 18 and roll 5, they take turns rolling until one of them rolls 2 or both of them roll 1. Then, they both stand.)

## Cold Call: Addition and Subtraction Within 20 (3 minutes)

Note: This review fluency addresses Grade 1's standard and practices including units when adding length.

For directions on how to play Cold Call, refer to G1–M3–Lesson 6.

T: 4 centimeters + 2 centimeters is? (Pause to provide thinking time.) Students with pets?

S: (Only students with pets answer.) 6 centimeters.

T: 14 centimeters + 2 centimeters is? (Pause to provide thinking time.) Students with no pets?

S: (Only students with no pets answer.) 16 centimeters.

Continue playing, practicing addition and subtraction within 20. As always, scaffold instruction by beginning with easy problems and slowly increasing the complexity.

## Application Problem (5 minutes)

Each crayon is 9 centimeter cubes long. The paintbrush is the same length as 2 crayons. How many centimeter cubes long is the paintbrush? Use centimeter cubes to solve the problem. Write a number sentence and a statement to answer the question.

$$\begin{array}{r} 9 + 9 = 18 \\ \swarrow \quad \searrow \\ 1 \quad 8 \\ 9 + 1 = 10 \\ 10 + 8 = 18 \end{array}$$

The paintbrush is 18 centimeter cubes long.

Note: Students continue to use concrete materials to consider problem situations. Continue to encourage students to build each part of the story, using the cubes to think through what they know and to identify what they do not yet know. During the Debrief, students can demonstrate their strategies for solving the problem. The example above right shows several ways in which students may solve this Application Problem. Some students may simply align the cubes and solve without drawing.

## Concept Development (35 minutes)

Materials: (T) Measuring Rules chart (from G1–M3–Lesson7) (S) 1 brown bag of 2 new crayons, 10 linking cubes, and 10 centimeter cubes per pair

Gather the students in the meeting area in a semi-circle.

- T: We have measured with many different tools so far. Who can name the different tools we have used to measure?
- S: String. → Strip of paper (or pipe cleaners). → Centimeter cubes. → Centimeter ruler. → Small paper clips. → Large paper clips.

Review the rules for measuring properly using the chart created in the previous days' lesson.

- T: (Distribute a brown bag with materials listed above to each pair of students.) You and your partner are going to measure the new crayons with the materials in your bag. Don't forget about the rules for proper measuring!
- T: How many cubes long was your new crayon? (Note: Do not tell students which cubes to use.)
- S: Mine was 9 cubes long. → Mine was 3 cubes long.
- T: That's interesting. These crayons are brand new, they came from the same box which means they should be the same size. (Match up the crayons.) And they are! Why are we getting different measurements?

Ask students if they measured properly by going over each rule, repeating the last rule twice to ensure that no one mixed the cubes to measure.

- MP.6**
- T: Why do we have different measurements? Talk with your partner.
- S: We were measuring with different cubes. We didn't mix them up, but I measured with smaller cubes, the centimeter cubes. My partner measured with bigger cubes, the linking cubes. → We didn't do anything wrong. We measured correctly. It's just that our answers are different because we used different size cubes from each other.
- T: Great thinking! Even though you measured properly, it sounds like we need to add a rule for *sharing and communicating* about our measurements. When someone says, "My crayon is 3 cubes long," and another person says, "No! It's 9 cubes long," this can become a frustrating conversation because they are both right! So, how can we help these two students?
- S: They have to say, "My crayon is 3 *linking* cubes long," or, "My crayon is 9 *centimeter* cubes long." → We have to say what type of tool we used to measure!
- T: Yes! We need to be precise when we communicate about which length unit we used to measure. Let's practice measuring more items and communicating their measurements precisely on your Problem Set.



### NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Highlight vocabulary that could be unfamiliar for your English language learners as you teach the lesson. Vocabulary in this lesson that you may want to highlight is *sharing* and *communicating*. Provide some examples of how students share and communicate outside of math so that they can make the connection.

Give each student, or pair of students, *one* set of the following measuring tools:

- 20 small paper clips
- 20 large paper clips
- 20 toothpicks
- 20 centimeter cubes

Ask students to measure the classroom objects with their assigned measuring tools. Remind students to write the word *about* if their measurement is not exactly a certain length unit long. Circulate and ask students about their measurements, encouraging them to use the length unit label as they share. (Note: The use of the word *about* was first introduced in G1–M3–Lesson 4. Remind students that if they are going to use this word the appropriate way to use it is, “My pretzel rod is about 18 centimeter cubes long.”)

### 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.

For the Problem Set and Homework, each student gets one of the following: bag of 20 small paper clips, bag of 20 large paper clips, bag of 20 toothpicks, bag of 20 centimeter cubes. Be sure to have each student take the bag home to complete the homework assignment.

### Student Debrief (10 minutes)

**Lesson Objective:** Understand the need to use the same units when comparing measurements with others.

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 who used the same length unit 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.

- Compare your measurements to your partner’s (a student who used a different tool). How are your answers different?
- Why do we need a label, or a length unit, along with a number when we are writing our measurements? Why can’t we use the number only?
- How can it be true that when Student A says the glue stick is X paper clips long and Student B says it is Y centimeter cubes long, they are both correct?

NYS COMMON CORE MATHEMATICS CURRICULUM																	
Lesson 8 • Grade 1																	
Name <u>Maria</u> Date _____																	
Circle the length unit you used to measure.																	
Small Paperclips																	
Large Paperclips																	
Toothpicks																	
Centimeter cubes																	
Measure each object listed in the chart and record the measurement. Add the names of other objects in the room and record their measurements.																	
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; padding: 2px;">Classroom Object</th> <th style="text-align: left; padding: 2px;">Measurement</th> </tr> </thead> <tbody> <tr> <td style="text-align: left; padding: 2px;">Glue Stick</td> <td style="text-align: left; padding: 2px;">8</td> </tr> <tr> <td style="text-align: left; padding: 2px;">Dry Erase Marker</td> <td style="text-align: left; padding: 2px;">12</td> </tr> <tr> <td style="text-align: left; padding: 2px;">Unsharpened Pencil</td> <td style="text-align: left; padding: 2px;">19</td> </tr> <tr> <td style="text-align: left; padding: 2px;">Personal White Board</td> <td style="text-align: left; padding: 2px;">28</td> </tr> <tr> <td style="text-align: left; padding: 2px;">Book</td> <td style="text-align: left; padding: 2px;">18</td> </tr> <tr> <td style="text-align: left; padding: 2px;">eraser</td> <td style="text-align: left; padding: 2px;">5</td> </tr> <tr> <td style="text-align: left; padding: 2px;">Straw</td> <td style="text-align: left; padding: 2px;">20</td> </tr> </tbody> </table>		Classroom Object	Measurement	Glue Stick	8	Dry Erase Marker	12	Unsharpened Pencil	19	Personal White Board	28	Book	18	eraser	5	Straw	20
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<small>© 2012 Common Core, Inc. All rights reserved. commoncore.org</small>																	
<small>COMMON CORE   Lesson 8: Understand the need to use the same units when comparing measurements with others. Date: 6/18/13</small>																	
<small>engage<sup>ny</sup></small>																	
<small>3.C.6</small>																	

- Student A says she used 9 centimeter cubes to measure the crayon. Student B says she used 3 small paper clips to measure the crayon. Why do you think she needed so many more centimeter cubes to measure the crayon compared to using the small paper clips?
- Pick three objects from your sheet. Name your items in order from shortest to longest. Name your items in order from longest to shortest.
- Would the order change if you were using a different measuring tool to measure length? Why or why not?
- Display an example of the Problem Set for Lesson 7. Look at the caterpillar on each page. How do our measurements on each page relate to today's lesson?
- Look at your Application Problem. How much longer is the paintbrush compared to one crayon? Why is it important that you included the label *centimeters* or *centimeter cubes* after the number in your statement?

### 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.

Name \_\_\_\_\_

Date \_\_\_\_\_

Circle the length unit you used to measure. Use the same length unit for all objects.

Small Paperclips



Large Paperclips



Toothpicks



Centimeter Cubes



Measure each object listed in the chart and record the measurement.

Add the names of other objects in the room and record their measurements.

Classroom Object	Measurement
Glue Stick	
Dry Erase Marker	
Unsharpened Pencil	
Personal White Board	

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

Circle the length unit you used to measure. Use the same length unit for all objects.

Small Paperclips



Large Paperclips



Toothpicks



Centimeter Cubes



Choose two objects in your desk. Fill in the chart and record the measurement.

Classroom Object	Measurement

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

Circle the length unit you used to measure. Use the same length unit for all objects.

Small Paperclips



Large Paperclips



Toothpicks



Centimeter Cubes



Measure each object listed in the chart and record the measurement.

Add the names of other objects in your house and record their measurements.

Home Object	Measurement
Fork	
Picture Frame	
Pan	
Shoe	

Home Object	Measurement
Stuffed Animal	

Did you remember to add the name of the length unit after the number? Yes   No

Pick 3 items. List your items from longest to shortest:

1. \_\_\_\_\_

2. \_\_\_\_\_

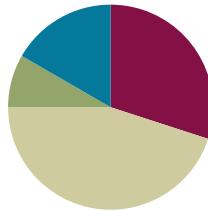
3. \_\_\_\_\_

## Lesson 9

**Objective:** Answer *compare with difference unknown* problems about lengths of two different objects measured in centimeters.

### Suggested Lesson Structure

Fluency Practice	(18 minutes)
Application Problem	(5 minutes)
Concept Development	(27 minutes)
Student Debrief	(10 minutes)
<b>Total Time</b>	<b>(60 minutes)</b>



### Fluency Practice (18 minutes)

- Race and Roll Addition **1.OA.6** (5 minutes)
- Sprint: Addition Within 20 **1.OA.6** (10 minutes)
- Number Sentence Swap **1.OA.4** (3 minutes)

### Race and Roll Addition (5 minutes)

Materials: (S) 1 die per set of partners

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

All students start at 0. Partners take turns rolling a die, then saying a number sentence adding the number rolled to the total. (For example, Partner A rolls 6 and says, “0 + 6 = 6.” Partner B rolls 3 and says, “6 + 3 = 9.”) They continue rapidly rolling and saying number sentences until they get to 20, without going over. Partners stand when they reach 20. (For example, if partners are at 18 and roll 5, they take turns rolling until one of them rolls 2 or both of them roll 1. Then, they both stand.)

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

Materials: (S) Addition Within 20 Sprint

Note: This Sprint addresses the Grade 1 standard of adding and subtracting within 20. It is the same Sprint from two days prior, so students will likely do better today. Along with celebrating improvement between Sides A and B, celebrate improvement from the last time this Sprint was given.



### A NOTE ON STANDARDS ALIGNMENT:

In this lesson, students compare centimeter cubes as a concrete form of *compare with difference unknown* problem types. This bridges towards the Grade 2 standard of measuring to determine how much longer one object is than another (**2.MD.4**), although the lesson specifically focuses on comparing the concrete cubes rather than the more abstract numerical representations of the measurements.



### NOTES ON MULTIPLE MEANS FOR ENGAGEMENT:

While some students thrive during Sprints, others may not enjoy having to complete a task being timed. Cultivate healthy *personal best* competition during Sprints so that students focus on their improvement.

### Number Sentence Swap (3 minutes)

Say a subtraction sentence aloud, saying “the mystery number” for the unknown answer (e.g., “ $5 - 3 =$  the mystery number”). Call on a student to rephrase the sentence as an addition sentence (e.g., “ $3 +$  the mystery number = 5”). Pause to provide thinking time. Students solve for the mystery number on your signal.

Suggested sequence:  $5 - 3$ ,  $15 - 3$ ,  $6 - 4$ ,  $6 - 4$ ,  $16 - 4$ , etc.

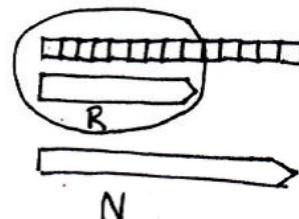
### Application Problem (5 minutes)

Corey buys a super-cool, extra-long crayon that is 14 centimeters long. His regular crayon is 9 centimeters long. Use centimeter cubes to decide how much longer Corey’s new crayon is than his regular crayon.

Write a statement to answer the question.

Write a number sentence to show what you did.

Note: This problem continues to provide students with opportunities to concretely build various lengths with centimeter cubes. As students work towards solving *compare with difference unknown* problem types, experiences with concrete objects like centimeter cubes can strengthen understanding. Students will be exploring the comparison of centimeter cubes during today’s lesson. As students work, notice how they are solving and use your analysis during the Concept Development.



$$\begin{array}{rcl} 9 + 1 = 10 & & \\ \text{NEW } \swarrow \downarrow \nearrow & 14 & 10 + 4 = 14 \\ \text{view crayon is } 5 \text{ cube}s \text{ longer.} & & \end{array}$$

### Concept Development (27 minutes)

**Materials:** (T) 2 different color centimeter cubes (e.g., blue and yellow), dry erase marker, popsicle stick, crayon, glue stick, small paper clip, unsharpened pencil, new colored pencil, measurement chart from G1–M3–Lesson 6 (S) Bag with 20 blue and 20 yellow centimeter cubes, bag with classroom materials from G1–M3–Lesson 4, new colored pencil

Note: Adjust the Concept Development as necessary based on your observations of student successes and challenges during G1–M3–Lesson 6, as well as during the most recent Application Problems. Today’s Concept Development is an opportunity to continue supporting student understanding of the *compare with difference unknown* problem types within the concrete context of comparing lengths of centimeter cubes. As addressed in the Note on Standards Alignment, the focus of the lesson should be on comparing the cubes themselves rather than the Grade 2 standard of comparing the measurements alone.

Gather students in the meeting area in a semi-circle formation.

T: (Post the measurement chart from G1–M3–Lesson 6.) The teacher next door and I were playing a game. Whoever finds the longer object on our desk would win, but the object could not be longer than a new pencil. For each extra centimeter in length, the person with the longer object would get a point.

- T: He found a popsicle stick, and I found a dry erase marker, just like the ones on our chart (point to the chart). My dry erase marker measured 12 centimeters and his popsicle stick measured 15 centimeters. He said he gets 15 points, but I don't think that's right. Let's lay the centimeter cubes down and compare them to see how many points he will get in our game.
- T: I've got 12 centimeter cubes here in my hand. (Lay the two objects in the middle. Point to the chart.) The dry erase marker is 12 centimeters long. Will I have enough cubes to measure my dry erase marker?
- S: Yes! It is 12 centimeters long, and you have 12 centimeter cubes.
- T: (Lay down blue centimeter cubes next to the dry erase marker. Point to the popsicle stick measurement of 15 centimeters on the chart.) Will these same 12 cubes be enough to measure the popsicle stick?
- S: No! There are only 12 centimeter cubes. The popsicle stick is 15 centimeters long.
- T: (Lay down 12 blue centimeter cubes next to the popsicle stick.) The teacher next door says he gets 15 points because it took 15 more centimeter cubes to measure the popsicle stick! Look at the marker and the centimeter cubes we laid down. Is he right? Does he need 15 more cubes? Talk with a partner, how many more cubes does he need? (Have partners share their thinking with the class.)
- T: Now, let's try the other teacher's idea. (Add 15 more cubes, this time using yellow cubes.) Wow, this is too long! It's much longer than the difference between what he already has and what he needs. What should I do?
- S: Take away all of the extra cubes until it lines up with the end of the popsicle stick.
- T: (Three yellow cubes are left.) So, if I had 12 cubes and he had 15 cubes, how many more cubes did the teacher need compared to me?
- S: 3 more cubes.
- T: How much longer is the teacher's popsicle stick compared to my marker?
- S: 3 centimeters.
- T: How much shorter is my marker compared to the teacher's popsicle stick?
- S: 3 centimeters.
- T: So, for that round, the teacher got three points because his stick was 3 centimeters longer than my marker. He tried to get 15 points for that one, but I'm glad we figured out that he only gets 3 points.

**MP.2**

Repeat the process by having students work with their centimeter cubes, measuring using the following contexts.

Model as much as appropriate.

- Measure a new colored pencil and an unsharpened pencil as in the game between the two teachers.
- One student measures and compares the lengths of a crayon and a glue stick to see which item is shorter and by how much.



#### NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Reading word problems aloud facilitates problem solving for those students who have difficulty reading the text they are presented with. Make sure students with reading difficulties are not held back by the reading when they are able to solve the math problems.

- Kelly is knitting a scarf for her doll. It needs to be 13 centimeters long. She has already knitted 9 centimeters. How many more centimeters need to be knitted?

### 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.

Note: For the Problem Set, students will use actual centimeter cubes to solve the problems.

### Student Debrief (10 minutes)

**Lesson Objective:** Answer compare with difference unknown problems about lengths of two different objects.

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.

- Look at Problems 3 and 4 on the first page. What do you notice about the answers? Explain to your partner why this is so.
- Look at Problem 4 on the second page. Can you think of a number sentence that can help you check your answer?
- What strategy helped you when you tried to find the difference between two objects? (Counting on.)
- Look at today's Application Problem. How does it apply to today's lesson?

NYS COMMON CORE MATHEMATICS CURRICULUM 1•3

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

1. Look at the picture below. How much longer is Guitar A than Guitar B?

Guitar A is 1 units longer than Guitar B.

2. Measure each object with centimeter cubes.

Blue pen: The blue pen is 8 centimeters

Yellow pen: The yellow pen is 10 centimeters

3. How much longer is the yellow pen than the blue pen?  
The yellow pen is 2 centimeters longer than the blue pen.  
 $10 - 8 = 2$

4. How much shorter is the blue pen than the yellow pen?  
The blue pen is 2 centimeters shorter than the yellow pen.

COMMON CORE Lesson 9: Answer compare with difference unknown problems about lengths of 2 different objects. Date: 6/20/13 engage<sup>ny</sup> 3.C.7

NYS COMMON CORE MATHEMATICS CURRICULUM 1•3

Lesson 9: Use your centimeter cubes to model each problem.

1. Austin wants to make a paper clip train that is 13 paper clips long. If his train is already 9 paper clips long, how many more paper clips does he need?  
(Students use their cubes.)  
4 more paperclips

2. Keo's doll is 12 centimeters long and Megan's doll is 8 centimeters long. How much shorter is Keo's doll than Megan's doll?  
(Students use cubes to draw a picture of your model.)  
Keo's doll is 4 cubes shorter.

3. Kim cuts a piece of ribbon for her mom that is 14 centimeters long. Her mom says this ribbon is 8 centimeters too long. How long should the ribbon be?  
(Students model with centimeter cubes.)  
It should be 6 cubes longer.

4. The tail of Lee's dog is 15 centimeters long. If the tail of Kit's dog is 9 centimeters long, how much longer is Lee's dog's tail than the tail of Kit's dog?  
(Students use centimeter cubes to model.)  
Lee's dog's tail is 6 centimeter cubes longer than Kit's.

COMMON CORE Lesson 9: Answer compare with difference unknown problems about lengths of 2 different objects. Date: 6/20/13 engage<sup>ny</sup> 3.C.8

**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.

**A**

Number correct:

Name \_\_\_\_\_

Date \_\_\_\_\_

\*Write the missing number.

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

**B**

Number correct:

Name \_\_\_\_\_

Date \_\_\_\_\_

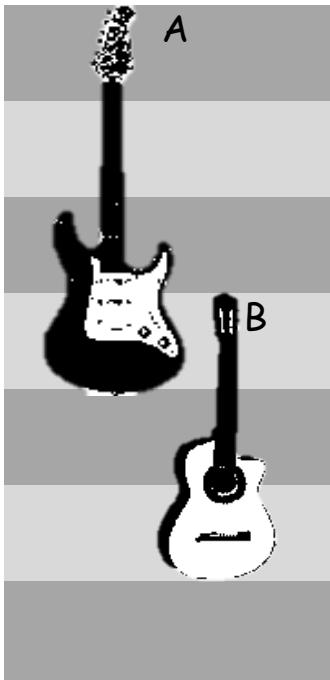
\*Write the missing number.

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

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Look at the picture below. How much **longer** is Guitar A than Guitar B?



Guitar A is \_\_\_\_\_ unit(s) **longer** than Guitar B.

2. Measure each object with centimeter cubes.



The blue pen is \_\_\_\_\_.



The yellow pen is \_\_\_\_\_.

3. How much **longer** is the yellow pen than the blue pen?

The yellow pen is \_\_\_\_\_ centimeters **longer** than the blue pen.

4. How much **shorter** is the blue pen than the yellow pen?

The blue pen is \_\_\_\_\_ centimeters **shorter** than the yellow pen.

Use your centimeter cubes to model each problem. Then, draw a picture of your model.

5. Austin wants to make a paper clip train that is 13 paper clips long. If his train is already 9 paper clips long, how many **more** paper clips does he need?
6. Kea's doll is 12 centimeters long, and Megan's doll is 8 centimeters long. How much **shorter** is Megan's doll than Kea's doll?
7. Kim cuts a piece of ribbon for her mom that is 14 centimeters long. Her mom says the ribbon is 8 centimeters too long. How **long** should the ribbon be?
8. The tail of Lee's dog is 15 centimeters long. If the tail of Kit's dog is 9 centimeters long, how much **longer** is Lee's dog's tail than the tail of Kit's dog?

Name \_\_\_\_\_

Date \_\_\_\_\_

Use your centimeter cubes to model each problem. Then, draw a picture of your model.

1. Mona's hair grew 7 centimeters. Claire's hair grew 15 centimeters. How much **less** did Mona's hair grow than Claire's hair?

Name \_\_\_\_\_

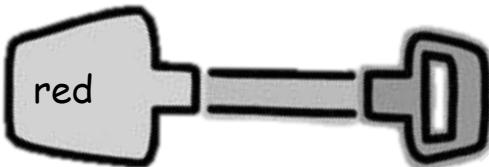
Date \_\_\_\_\_

1. Look at the picture below. How much **shorter** is Trophy A than Trophy B?

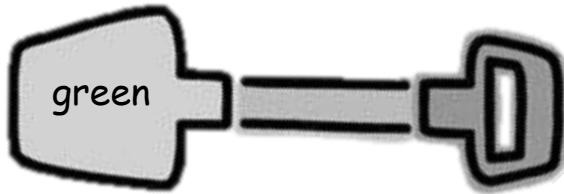


Trophy A is \_\_\_\_\_ units **shorter** than Trophy B.

2. Measure each object with centimeter cubes.



The red shovel is \_\_\_\_\_.



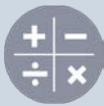
The green shovel is \_\_\_\_\_.

How much **longer** is the green shovel than the red shovel?

The green shovel is \_\_\_\_\_ centimeters **longer** than the red shovel.

Use your centimeter cubes to model each problem. Then, draw a picture of your model.

3. Susan grew 15 centimeters and Tyler grew 11 centimeters. How much **more** did Susan grow than Tyler?
4. Bob's straw is 13 centimeters. If Tom's straw is 6 centimeters, how much **shorter** is Tom's straw than Bob's straw?
5. A purple card is 8 toothpicks long. A red card is 12 toothpicks long. How much **longer** is the red card than the purple card?
6. Carlos' bean plant grew to be 9 centimeters high. Dallas' bean plant grew to be 14 centimeters high. How much **higher** is Dallas' plant than Carlos' plant?



## Topic D

# Data Interpretation

**1.OA.1, 1.MD.2, 1.MD.4**

<b>Focus Standard:</b>	1.OA.1	Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. (See Glossary, Table 1.)
	1.MD.2	Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. <i>Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.</i>
	1.MD.4	Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.
<b>Instructional Days:</b>	4	
<b>Coherence -Links from:</b>	GK-M3	Comparison of Length, Weight, Capacity, and Numbers to 10
<b>-Links to:</b>	G2-M2	Addition and Subtraction of Length Units
	G2-M7	Problem Solving with Length, Money, and Data

Topic D closes the module as students organize, represent, and interpret personally relevant data in Lesson 10 (**1.MD.4**). As students work as a class to collect, sort, and organize data into a graph, they find great purpose and excitement in data. They begin to answer, and then ask questions about, the number of data points in a given category, and in two categories.

For Lesson 11, students take a more independent role in the collecting, sorting, organizing, and representing phases involved in graphing. They work on their own to ask and answer questions about the data set, which prepares them for the comparison work of the last two lessons.

In Lesson 12, students interpret information presented in the graphs by exploring *compare with difference unknown* problems. They begin with visualizing these problems in their easily accessible “equalizing” contexts, by answering questions such as, “How many more students would Category A need to have the same amount as Category B?” Students use their understanding of comparing lengths from Topics A, B, and C to now compare the responses in three categories.

Lesson 13 continues this exploration, with students again interpreting data sets to ask and answer varied word problems including, “How many students were polled in all?” and, “How many more students are in Category C than in Category A?” (**1.OA.1**). Throughout Topic D, students also apply the learning from earlier in the module, as they lightly notice the connection between length units and data points on a graph.

### A Teaching Sequence Towards Mastery of Data Interpretation

**Objective 1:** Collect, sort, and organize data, then ask and answer questions about the number of data points.  
(Lessons 10–11)

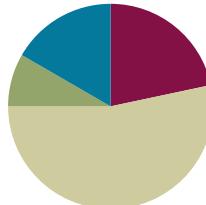
**Objective 2:** Ask and answer varied word problem types about a data set with three categories.  
(Lessons 12–13)

## Lesson 10

**Objective:** Collect, sort, and organize data, then ask and answer questions about the number of data points.

### Suggested Lesson Structure

Fluency Practice	(13 minutes)
Application Problem	(5 minutes)
Concept Development	(32 minutes)
Student Debrief	(10 minutes)
<b>Total Time</b>	<b>(60 minutes)</b>



### Fluency Practice (13 minutes)

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

### 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 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 proficient with counting by ones, twos, fives, and tens to 40, start at 40 and go to 80. If proficient between 40 and 80, work between 80 and 120. Alternate between counting the regular way and the Say Ten way to reinforce place value.

### 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.

Partners start at 20 and take turns rolling the die 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, which they must hit precisely. Partners stand when they reach 0. Repeat the game as time permits.

## Subtraction Within 20 (6 minutes)

Materials: (T) Hide Zero cards (S) Personal white boards

Note: This review fluency helps strengthen students' understanding of the take from ten and take from the ones subtraction strategies, as well as their ability to recognize appropriate strategies based on problem types.

T: (Show 14 with Hide Zero cards.) How can I take 14 apart to help me subtract?

S: 10 and 4.

T: I want to subtract 2 from 14. Write a number sentence to show whether I should subtract 2 from the 4 or the 10.

S: (Write  $4 - 2 = 2$ .)

T: Why wouldn't I take from my 10?

S: You don't need to because you have enough ones.

T: Yes! It's much easier to just subtract from my ones! Since  $4 - 2 = 2$ ,  $14 - 2$  is? Write the subtraction sentence.

S: (Write  $14 - 2 = 12$ .)

T: (Replace the 4 Hide Zero card with a 2.) Yes!

Repeat with  $14 - 5$ , eliciting that you need to take from ten because there are not enough ones. Repeat with similar problems.

## Application Problem (5 minutes)

There were 14 items on the table to measure. I already measured 5 of them. How many more items are there to measure?

Note: The use of the word *measure* in this problem raises a level of complexity as students may expect to use a measuring tool to solve. This problem encourages students to consider the context of the whole problem rather than focusing solely on key words.

$$\begin{array}{c} 00000 \\ \textcircled{5} \\ m \end{array} \quad \begin{array}{c} 00000 \\ 000 \end{array} \quad \begin{array}{c} 000 \\ \text{not } m \end{array}$$

$$14 - 5 = 9$$

There are 9 items left to measure.

## Concept Development (32 minutes)

Materials: (T) 3 pieces of chart paper (S) 1 jumbo popsicle stick and a marker (distributed at each seat), personal white board

Note: Before today's math lesson begins, prepare three charts:

- Chart 1: *Favorite Read Aloud Books*
- Chart 2: *Favorite Read Aloud Books* with a blank table labeled with *Number of Students*
- Chart 3: *Favorite Sports* with a blank table labeled with *Name of Sport* and *Number of Students*

Also, later in the lesson, students will be asked to vote for one of three sports. A topic other than sports can be used to match the class's preference. The lesson requires that only three choices be provided from which the students can pick. Model for students that when making a table of information, as they will be making today, the symbols within the table all need to be the same.

Have students come to the meeting area with their personal white boards and sit in a semi-circle formation.

- T: I want to find out which read aloud books from first grade you like the most. Can you name some of the books we read together this year?
- S: (Answers may vary. Choose three titles and write them on Chart 1. You may want to use the most important word from the title to alleviate students from writing many words during the following activity.)
- T: Let's collect some information, or data, to find out how many students like which books the most. How should we collect our data?
- S: Ask each student, and then write their name down next to the book title. → Call out each title and ask us to raise our hands if it is our favorite book.
- T: Each of you has a popsicle stick at your table. Decide which book you liked the most out of these three choices. Then, write the name of the book on the popsicle stick. Come up to this chart and place your stick anywhere. (Lay the chart on the floor in the middle of the meeting area.)
- S: (Write down their favorite book and freely place them on the chart.)
- T: Wow, this chart is filled with \_\_\_ (the number of students) popsicle sticks. How many students liked Book A? (Give five seconds for students to count.)
- S: (Answers may vary.) I can't count that fast! I need more time.

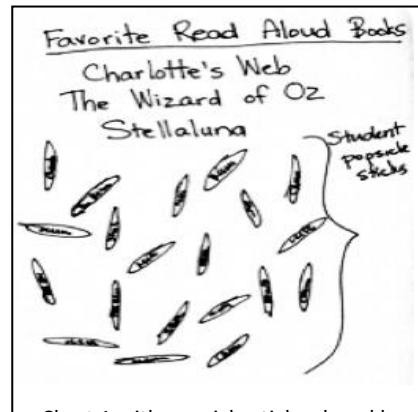


Chart 1 with popsicle sticks placed by students.

### NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Highlight the critical vocabulary for your students as you teach the lesson. Vocabulary that you will want to highlight is *collecting*, *organize*, *sorting*, *data*, and *table* as this is the first time students are being introduced to these words in the context of math. Try relating the vocabulary to something they already know. This will be especially helpful to English language learners.

T: We have different answers and some people didn't even get to finish counting! How can we make counting these popsicle sticks easier?

S: After we count each popsicle stick, take it off so we can keep track of which ones we have already counted. → Get all the popsicle sticks for each book and put them together. We should separate and sort them. → We should organize these sticks by book titles!

T: These are great ideas. I agree! Here is a table. It will help us organize our information or data. (Lay Chart 2 on the floor and write in the titles. Ask a few student volunteers to rearrange their popsicle sticks in a horizontal line next to each book title.)

T: Now is it easier to see?

S: Yes!

T: How can we organize the data so we can count more efficiently and see more easily?

S: Group them by twos. → Group them by fives. Put them in 5-group rows!

T: I love the idea of organizing them into groups of 5. In fact, we are going to arrange some of these sticks in a special way to show groups of 5. Help me count as I show you how this is done.

S: 1, 2, 3, 4, 5. (Count as the teacher points to each popsicle stick.)

T: Stop! Since we have a group of 5 here, I'm going to take the fifth stick and lay it across the others. (Model.) Show me in the air how this group of 5 is made as we count from 1 through 5 again.

S: 1, 2, 3, 4, 5. (Make tally marks in the air with teacher modeling.)

T: You just used **tally marks**. Tally marks come in groups of 5 where the fifth line always goes across the rest of the four lines. Let's continue with the rest of these sticks.

Students count to 5 and make tally marks in the air as the teacher makes tally marks with popsicle sticks.

After a few, ask student volunteers to rearrange the remaining popsicle sticks.

T: Great job organizing the data by sorting the information we collected. Now we can see and count our information more easily.

Count the tally marks for each book title and record the number directly on the table. Invite students to interpret the data by posing questions such as those below.

- How many students liked Book A the most?
- How many students liked Book A or Book B the most? (Note: Because the question says "or," students need to add the number for A and the number for B.)
- Which book is most liked by our classmates? Least liked?

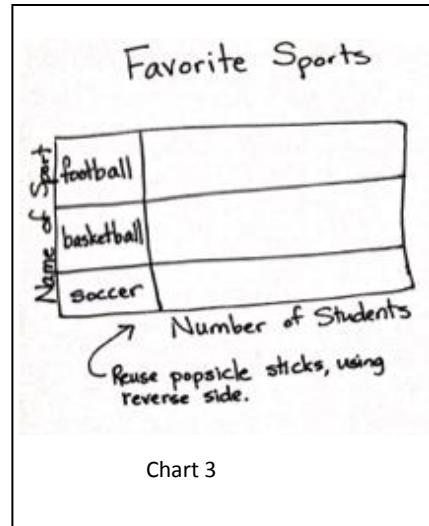
Favorite Read Aloud Books	
Charlotte's Web	
The Wizard of Oz	
Stellaluna	

→ Number of Students  
Students arrange popsicle sticks, first in rows and then adjust to tally marks.

Chart 2 with popsicle sticks arranged as tallies.

Repeat the process with favorite sports using football, basketball, and soccer as the three choices. Alternatively, you may use a theme other than sports if it would have more appeal for your class. Another strategy is to offer *other* as a choice. Students may use the back of the original popsicle sticks to record their choice. After creating the table on Chart 3, have students write down their answers as you ask the following questions:

- How many students chose football as the sport they like best?
- How many students chose basketball as the sport they like best?
- How many students chose soccer as the sport they like best?
- What is the total number of students who like soccer or basketball the best?
- Which sport received the most votes?
- Think of a question you could ask a friend about the table.



Note: Save these tables for reference in the future lessons in this topic.

### 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.

### Student Debrief (10 minutes)

**Lesson Objective:** Collect, sort, and organize data, then ask and answer questions about the number of data points.

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.

- How is making a table helpful when we are looking at a lot of information?
- Why is sorting and organizing data important when you are making a table?
- In what ways do tables help us see information in a quicker and easier way?

- Share the problem you made up using the favorite sports table. Solve each other's questions and check your answers.
- How are 5-group rows and tally marks similar? How are they different?
- Why is using **tally marks** better than using 5-group rows when making a table?

### 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.

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 10 | 1•3

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

A group of people were asked their favorite color. Organize the data using tally marks and answer the questions.

Red	
Green	
Blue	

How many people like red? 6 people like red.  
 How many people like blue? 5 people like blue.  
 How many people like green? 2 people like green.  
 What color do people like the least? green  
 Write a number sentence that tells the total number of people interviewed.  
 $0 + 5 + 2 = 13$

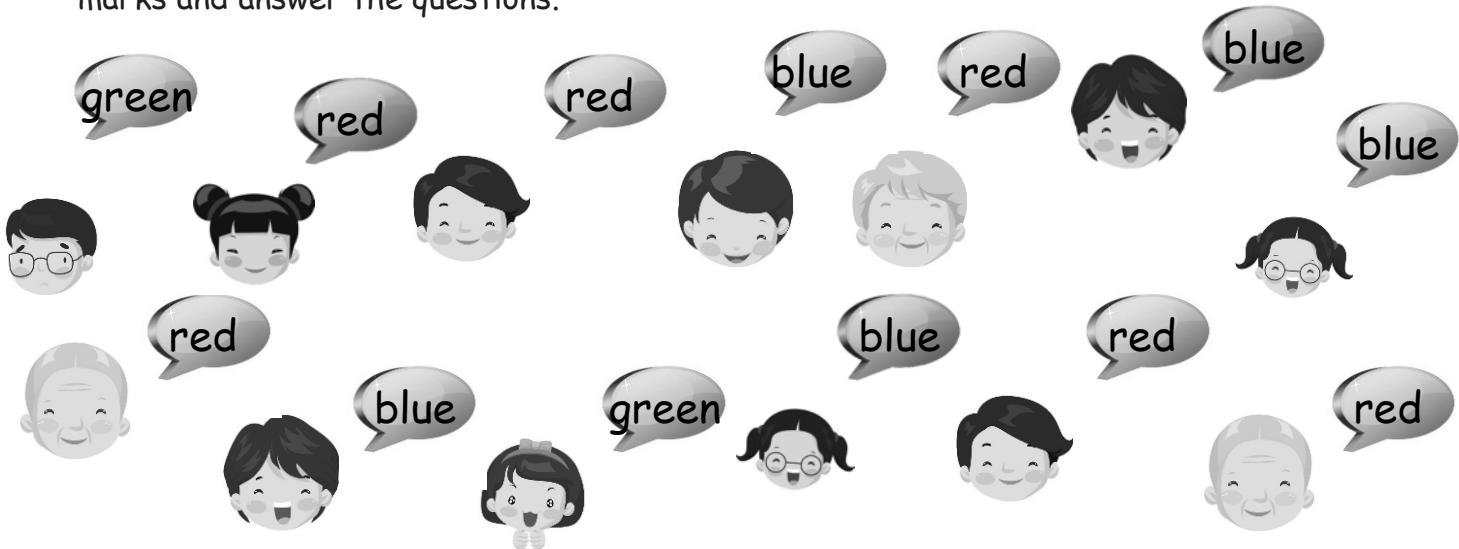
COMMON CORE | Lesson 10: Collect, sort and organize data, then ask and answer questions about the number of data points.  
 Date: 6/21/13  
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engage<sup>ny</sup> 3.D.6

Name \_\_\_\_\_

Date \_\_\_\_\_

A group of people were asked their favorite color. Organize the data using tally marks and answer the questions.



Red	
Green	
Blue	

How many people like red? \_\_\_\_\_ people like red.

How many people like blue? \_\_\_\_\_ people like blue.

How many people like green? \_\_\_\_\_ people like green.

What color do people like the least? \_\_\_\_\_

Write a number sentence that tells the total number of people who were asked their favorite color.

---

Name \_\_\_\_\_

Date \_\_\_\_\_

Use the data below to answer the following questions.

How many teeth has each student lost?

Student	Number of Teeth Lost
Mayra	3
Eddie	5
Luna	4

- What is the **total** number of students that lost 3 teeth each? \_\_\_\_\_ student(s)
- What is the **greatest** number of teeth lost? \_\_\_\_\_ teeth
- What is the total number of students that lost **fewer** than 5 teeth? \_\_\_\_\_ student(s)
- Write an addition sentence for the **total** number of teeth all 3 students lost.  
\_\_\_\_\_

Name \_\_\_\_\_

Date \_\_\_\_\_

Students were asked about their favorite ice cream flavor. Use the data below to answer the questions.

Ice Cream Flavor	Tally Marks	Votes
Chocolate		
Strawberry		
Cookie Dough		

1. Write the number of students that liked each flavor in the **Votes** column.
2. How many students chose cookie dough as the flavor they like **best**?  
\_\_\_\_\_ students
3. What is the total number of students who like chocolate or strawberry the **best**? \_\_\_\_\_ students
4. Which flavor is the **least** favorite? \_\_\_\_\_
5. What is the total number of students who like cookie dough or chocolate the **best**?  
\_\_\_\_\_ students
6. Which two flavors were liked by a **total** of 7 students?  
\_\_\_\_\_ and \_\_\_\_\_
7. Write an addition sentence that shows how many students voted for their favorite ice cream flavor:  
\_\_\_\_\_

Students voted on what they like to read the most. Organize the data using tally marks and then answer the questions.

comic book	magazine	chapter book	comic book	magazine
chapter book	comic book	comic book	chapter book	chapter book
chapter book	chapter book	magazine	magazine	magazine

What Students Like to Read the Most	Number of People
Comic Book	
Magazine	
Chapter Book	

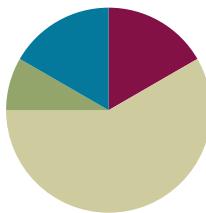
- How many students like to read chapter books? \_\_\_\_\_ students
- Which item is the least favorite to read among the students? \_\_\_\_\_
- How many more students like to read chapter books than magazines?  
\_\_\_\_\_ students
- What is the total number of students that like to read magazines or chapter books?  
\_\_\_\_\_ students
- Which two items did a total of 9 students like to read?
- \_\_\_\_\_ and \_\_\_\_\_
- Write an addition sentence that shows how many students voted.  
\_\_\_\_\_

## Lesson 11

**Objective:** Collect, sort, and organize data, then ask and answer questions about the number of data points.

### Suggested Lesson Structure

Fluency Practice	(10 minutes)
Application Problem	(5 minutes)
Concept Development	(35 minutes)
Student Debrief	(10 minutes)
<b>Total Time</b>	<b>(60 minutes)</b>



### Fluency Practice (10 minutes)

- Sprint: Subtraction Within 20 **1.OA.6** (10 minutes)

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

Materials: (S) Subtraction Within 20 Sprint

Note: This Sprint addresses the Grade 1 objective of subtracting within 20. This is the second time students are seeing this Sprint. Ask students if they were able to complete more problems than the last time they tried this Sprint.

### Application Problem (5 minutes)

Larry asked his friends whether dogs or cats are smarter. Nine of his friends think dogs are smarter and 6 think cats are smarter. Make a table to show Larry's data collection. How many friends did he ask?

Note: This Application Problem reviews data collection (G1–M3–L10). Some students may show their work with simple shapes such as lines or circles, while others may experiment with tally marks.

#### NOTES ON

#### MULTIPLE MEANS OF REPRESENTATION:

Remember that the strength of the Sprint is in students' on-going experience of success. The tendency is to want to compete with a peer rather than with themselves. At times, it is wise to downplay who improved the most or who got the most correct, but rather opt for self-reflection:

- Who felt they tried hard today?
- Who feels they have improved with their subtraction since the beginning of first grade?
- Who feels they are memorizing more facts?

dogs    00000 0 000  
 cats    00000 0  
 $9 + 6 = 15$        $9 + 6 = 15$   
 $10 + 5 = 15$

## Concept Development (35 minutes)

**Materials:** (T) Chart paper with a table entitled, *Favorite Rainy Day Activities* with *Activity* and *Number of Students* on the top line, class list (S) Clipboard, class list (preferably with first names in alphabetical order)

Have students sit in the meeting area in a semi-circle formation.

- T: (Post the chart.) Let's brainstorm some of our favorite rainy day activities and make a table to see how many students like which activity the best and compare the information. To make this table, what do we need to do first? Turn and talk to your partner.
- S: (Answers may vary.) We need to figure out the choices we will vote on.
- T: You are right! What are some of your favorite things to do on a rainy day?

Answers may vary. Choose three activities and write them down on the chart in the first column. For example, they could be *read a book*, *watch a movie*, and *play board games*.

MP.3

- T: Now what do we do? Turn and talk to your partner.
- S: We need to ask around and get everyone to vote. → We need to write down who likes which activity the best. → We can use 5-group rows to show our votes. → We can use tally marks to show everyone's votes.
- T: If we want to compare the information on the table, what do you think is the best way to record the information? Why?
- S: (Answers may vary.) 5-group rows help me see better because I can line them up with the other rows. → I like using the tally marks because I can count more quickly.
- T: Good thinking! (Project the class list.) To make sure I interview everyone and get everyone's vote, I'm going to use the class list to help me keep track of who answered my question and what they voted for. (Start from the top of the list. Model collecting data using the class list by asking the first seven to eight students on the class list. Check off each name as a student volunteer either makes tally mark or draws a circle in 5-group rows on the table to represent each vote.)

To save time, ask the rest of the students to raise their hand as you call out a choice. Elicit one to two questions to interpret the data, and have students come up with additional questions for their partners to answer including any of the following:

- How many students like to [watch a movie] the most on a rainy day?
- Which rainy day activity is liked the most least by our class? The least? How can you tell from the table?
- How many students like to [read a book] or [play board games] the most on a rainy day?
- If two more students voted for [watching a movie], how many students would like [watching a movie] the best?



### NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Connect literature with the table students will be making in class today. Maybe you have a favorite selection, or you can visit your school librarian to check one out. Read it before making the table to get your student's ready with ideas.

T: Just like we created this entire table as a class, you will now get to create your own table! Let's look at the Problem Set together to see how!

### Problem Set (20 minutes)

Students should do their personal best to create questions based on their tables in the Problem Set and answering their partner's questions within the allotted 20 minutes.

Read over the Problem Set directions and go over the steps to follow. Distribute the Problem Set and a class list. Give students approximately 20 minutes to collect and organize their data.

Students who need more structured directions can work in a small group with the teacher for step-by-step guidance.

Photocopy today's Problem Set on two separate sheets of paper so that students can set their papers side by side as they refer to their tables and design questions.

### Student Debrief (10 minutes)

**Lesson Objective:** Collect, sort, and organize data, then ask and answer questions about the number of data points.

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.

- How did you organize your data?
- How could you have used tallies? Pictures? Shapes? What other ways might someone organize data?
- How did you solve Problem 4?

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 11: 1•3

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

Welcome to Data Day! Follow the directions to collect, organize, ask, and answer questions about data.

- Choose a question. Circle your choice.
- Pick 3 answer choices.
- Ask your classmates the question and record the data on a class list.
- Organize the data on the chart below.

Which fruit do you like best?	Which snack do you like best?	What do you like to do on the playground the most?	Which school subject do you like the best?	Which animal would you most like to be if you could be?
-------------------------------	-------------------------------	--	--	---

Answer Choices	Number of students
monkey bars!	/
Swings!	
tag!	/     /

COMMON CORE | Lesson 11: Collect, sort and organize data, then ask and answer questions about the number of data points. engage<sup>ny</sup> 3.D.6

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 11: 1•3

- Complete the question sentence frames to ask questions about your data.
- Trade papers with a partner and have your partner answer your questions.

1. How many students liked monkey bars the best?  
8 students
2. How many students liked swings the best?  
6 students
3. How many students liked tag the best?  
12 students
4. What is the total number of students that liked tag or swings the best?  
 $12 + 6 = 18$  students
5. How many total students answered the question?  
26 students  
I counted the tally marks.

COMMON CORE | Lesson 11: Collect, sort and organize data, then ask and answer questions about the number of data points. engage<sup>ny</sup> 3.D.7

- How did you solve Problem 5? How can you solve Problem 5 by looking at your notes on the class list? Which would be easier to use to find the answer, the class list or the table?
- Look at your Application Problem. How did you organize your data? How did you solve the problem?

### 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.

**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**

Name \_\_\_\_\_

Date \_\_\_\_\_

Number correct:

\*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 \_\_\_\_\_

Welcome to Data Day! Follow the directions to **collect, organize, ask, and answer questions** about data.

- Choose a question. Circle your choice.
- Pick 3 answer choices.
- Ask your classmates the question and record the data on a class list.
- Organize the data in the chart below.

Which fruit do you like best?	Which snack do you like best?	What do you like to do on the playground the most?	Which school subject do you like the best?	Which animal would you most like to be?
-------------------------------	-------------------------------	--	--	---

Answer Choices	Number of Students

- Complete the question sentence frames to ask questions about your data.
- Trade papers with a partner and have your partner answer your questions.

1. How many students liked \_\_\_\_\_ the best?
2. How many students liked \_\_\_\_\_ the least?
3. How many more students liked \_\_\_\_\_ than \_\_\_\_\_?
4. What is the total number of students that liked \_\_\_\_\_ or \_\_\_\_\_ the best?
5. How many total students answered the question?

Name \_\_\_\_\_

Date \_\_\_\_\_

A class collected the information in the chart below. Students asked each other:  
Among stuffed animals, toy cars, and blocks, which is your favorite toy?

Then, they organized the information on this chart.

Toy	Students' Favorite Toy
stuffed animals	15
toy cars	9
blocks	18

- How many students chose toy cars? \_\_\_\_\_
- How many more students chose blocks than stuffed animals? \_\_\_\_\_
- How many students would need to choose toy cars to equal the number of students who chose blocks? \_\_\_\_\_

Name \_\_\_\_\_

Date \_\_\_\_\_

Collect information about things you own. Then, organize your data like you did for the Problem Set and answer the questions.

How many pets do you have?	How many toothbrushes are in your home?	How many pillows are in your home?	How many jars of tomato sauce are in your home?	How many picture frames are in your home?

- Complete the question sentence frames to ask questions about your data.
- Answer your own questions.

1. How many \_\_\_\_\_ do you have? (Pick the item you have the **most** of.)

2. How many \_\_\_\_\_ do you have? (Pick the item you have the **least** of.)

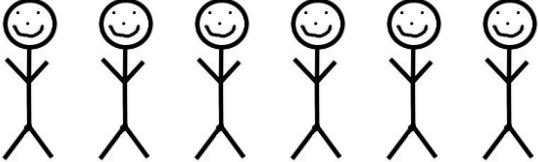
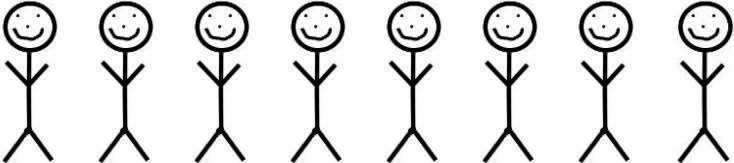
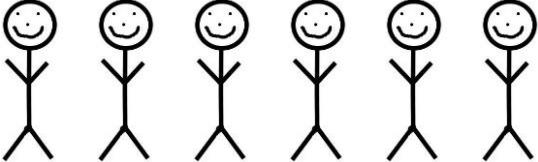
3. **Together**, how many picture frames and pillows do you have?

4. Write and answer two more questions using the data you collected.

5. \_\_\_\_\_?

6. \_\_\_\_\_?

Students took a poll asking which museum is their favorite to visit. Each student could only vote once. Answer the questions based on the table.

Science Museum	
Art Museum	
History Museum	

1. How many students chose art museums? \_\_\_\_\_ students

2. How many students chose the art museum or the science museum?

\_\_\_\_\_ students

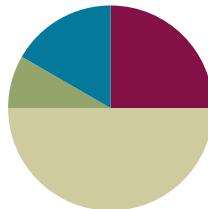
3. From this data, can you tell how many students are in this class?

## Lesson 12

**Objective:** Ask and answer varied word problem types about a data set with three categories.

### Suggested Lesson Structure

Fluency Practice	(15 minutes)
Application Problem	(5 minutes)
Concept Development	(30 minutes)
Student Debrief	(10 minutes)
<b>Total Time</b>	<b>(60 minutes)</b>



### Fluency Practice (15 minutes)

- Addition with Cards **1.OA.6** (7 minutes)
- Get to 10 or 20 **1.OA.5** (3 minutes)
- Subtraction with Partners **1.OA.6** (5 minutes)

### Addition with Cards (7 minutes)

Materials: (S) 1 pack of numeral cards 0–10 per pair (from G1–M1–Lesson 36), counters (if needed)

Note: This review fluency strengthens students' abilities to add within and across ten.

Students place the deck of cards face down between them.

Each partner flips over two cards and adds the numbers.

The partner with the greatest total keeps the cards played by both players. The player with the most cards at the end of the game wins. If there is a tie, players each turn over one final card. The player with the greater number wins. If the cards are of equal value, they continue to turn over a card until there is a winner.

### Get to 10 or 20 (3 minutes)

Materials: (T) 20-bead Rekenrek

Note: Practicing getting to 10 or 20 reinforces strategically counting on, which enables students to solve addition problems by stopping at 10 and continuing to the desired number.



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

When playing games with your students, provide a variety of ways to respond. Oral fluency games should be adjusted for deaf and hearing impaired students. This can be done in many ways including showing the answer with fingers, using student boards to write answers, or using a visual signal or vibration.

- T: (Show 8 on the Rekenrek.) What number do you see?  
 S: 8.  
 T: Give me the complete number sentence to get to 10.  
 S:  $8 + 2 = 10$ .  
 T: (Move two beads to make 10.) Good. (Show 18.) What number do you see?  
 S: 18.  
 T: Give me the complete number sentence to get to 20.  
 S:  $18 + 2 = 20$ .

Add two beads to confirm, then continue with other numbers within 20.

### Subtraction with Partners (5 minutes)

Materials: (S) Personal white boards

Note: This fluency reviews subtracting 7, 8, and 9 from teen numbers. Allow students who still require pictorial representations to draw 5-groups to solve.

Assign partners of equal ability. Partners assign each other a number from 11 to 17 (e.g., 12). On their personal white boards, they write number sentences with 9, 8, and 7 as the subtrahend and solve them (e.g.,  $12 - 9 = 3$ ,  $12 - 8 = 4$ ,  $12 - 7 = 5$ ). Partners then exchange white boards and check each other's work.

### Application Problem (5 minutes)

Kingston's class took a trip to the zoo. He collected data about his favorite African animals. He saw 2 lions, 11 gorillas, and 7 zebras. What does his table look like? Write one question your classmate can answer by looking at the table.

Note: Students may use any of the methods to collect data from the previous lessons. As they are working, circulate and notice how students are representing the data. Encourage them to line up their shapes and focus on organization. Remind students that they need to use the same symbol to represent the information throughout their table. Representations should make counting and comparing data easy. During the Debrief, the students will share and answer their partners' questions.

L	
G	<del>     </del>
Z	<del>     </del>

How many ~~zebras~~ and  
gorillas did he see?

## Concept Development (30 minutes)

**Materials:** (T) Chart with a three-column vertical graph entitled *Our Favorite Fruits*, chart with rules of proper measuring from G1–M3–Lesson 8 (post on the side of the board), *Favorite Read Aloud Books* from G1–M3–Lesson 10 (S) Sticky notes, personal white boards

Distribute one sticky note at each student's seat. Have students sit in the meeting area in a semi-circle formation.

T: (Post *Our Favorite Fruits* graph.) What are some of your favorite fruits?

S: (Responses may vary. Choose only three, or possibly four, categories from the students' suggestions.) Strawberries. → Watermelon. → Apples.

Fill in the three categories as students make suggestions. Have students go back to their seats, write their names on sticky notes, and come back to the meeting area with them.

T: My vote is for strawberry as my favorite fruit. I'm going to place it right beneath the line where it says *Strawberry*. (Model.) Who likes watermelon the best? (Choose a student to come up.) He's also going to place his sticky note, right beneath the line where it says *Watermelon*. (Choose another student to come up and place her sticky note for *Apple*. Be sure to have these sticky notes aligned with each other.)

T: We need one more person who likes strawberries the most. (Have the student come up.) When he puts his sticky note, he's going to put it right beneath my sticky note, so there are no overlap or gaps.

T: (Call up one third of the class to post their votes, encouraging them to avoid making gaps or overlaps between the sticky notes.) What do you notice about the rules of completing this chart with our votes on the sticky notes?

S: The rules are just like the rules for measuring! → We had to line up our endpoints when we first started! → We couldn't have any overlaps or gaps. → The sticky notes are the same size, the same length unit.

T: Excellent connections! Let's have the rest of the class complete the graph as they put up their votes following these rules.

T: Which fruit is the most popular among our students? Which fruit has the least number of votes? How can you tell?

S: I counted. The fruit with the highest total is the most popular. → I just looked at the sticky notes. The longest strip of notes means the most votes. The shortest strip means the least number of votes. → This reminds me of measuring again! The one that used the most length units to measure is the longest one, and that is the most popular fruit!

T: How many students voted for strawberries? Watermelon? Apples? (Record the number amount on the graph.) When we organize our data this way, it makes it easy for us to compare. We call this a **graph**. A graph lets us see the data easily. In this graph, it lines up our data just like when we



### NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Students demonstrate a true understanding of math concepts when they can apply them in a variety of situations. Often students learn math concepts in an isolated fashion and they do not see how to transfer their application to new situations.

Celebrate student success when they make these connections.

measure lengths of different items, so we can easily compare.

- T: (Point to the corresponding parts of the graph and ask.) Which received more votes, strawberries or watermelon?
- S: Category \_\_\_\_.
- T: Did you have to look at the numbers for each, or could you see it just by looking at the lengths of the bars?
- S: I just looked at the bar. → The longer bar has more.
- T: How many more students would Category A need to have the same amount as Category B? Tell your partner how you figured it out.
- S: I just counted the part that was longer, the part that was sticking out. → I used subtraction.  
→ I used addition with a mystery number in the middle. → This reminds me of measuring again! We used all of these strategies when we tried to figure out which length was longer when we compared two things!
- T: You are right! So, how many more votes did Category \_\_\_\_ receive than Category \_\_\_\_?
- T: (Using the same two categories as above, rephrase the question.) How many fewer votes did Category \_\_\_\_ receive than Category \_\_\_\_?

Continue to ask *compare with difference unknown* problems and *put together with result unknown* problems presented by this graph. Ask students to write a number sentence to show how they got their answer using their personal white boards. If time allows, use *Favorite Read Aloud Books* from G1–M3–Lesson 10 to answer more *compare with difference unknown* problems. Students may work with their partners to answer each other's questions.

### 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.

### Student Debrief (10 minutes)

**Lesson Objective:** Ask and answer varied word problem types about a data set with three categories.

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.

Name <u>Maria</u>	Date _____
Use squares with no overlaps to organize the data from the list.	
<b>Favorite Ice Cream Flavor</b> $\square = 1$ student	
Flavors <input type="checkbox"/> Vanilla <input checked="" type="checkbox"/> Chocolate	 Number of Students
1. How many more students liked chocolate than liked vanilla? <u>2</u>	
2. How many total students were asked about their favorite ice cream flavor? <u>16</u> students	
<b>Rectangular Shoes</b> $\square = 1$ student	
Types of Shoe Ties Velcro Laces No Ties	 Number of Students
3. Write a number sentence to show how many total students were asked about their sneakers? $5 + 8 + 7 = 20$	
4. Write a number sentence to show how many fewer students have Velcro sneakers than have sneakers with laces? $8 - 5 = 3$	
<small>COMMON CORE</small> Lesson 12 Ask and answer varied word problem types about a data set with three categories.	
<small>engage</small> ny	

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

- What are the strategies to figure out how many more or fewer votes a category received compared to the other?
- How are tables and **graphs** similar? How are they different? (Tables and graphs both organize information. With a graph, the information can be compared in a way similar to how length units can be compared.)
- How are the graphs in Problem 3 and 5 different? How are they similar?
- How is measuring objects similar to creating graphs like these to compare information about different categories?
- How does a graph that is created properly help you see and understand its information better? Did you follow these rules when you made your graph for Problem 1?
- Look at your Application Problem. What question did you come up with? Share with your partner and answer each other's questions.

Each student in the class added a sticky note to show their favorite kind of pet. Use the chart to answer the questions.

Favorite Pet		
Dog	Fish	Cat
 15	 10	 10
15	10	10

5. How many students chose dogs and cats as their favorite?  
15 students

6. How many more students chose dogs as their favorite pet than students that chose cats?  
3 students

7. How many more sticky notes would need to be under Fish to have the same number of sticky notes as under Cat?  
2 sticky notes

COMMON CORE | Lesson #: \_\_\_\_\_ | Lesson Name: EXACTLY G1-M3-TE-L12-problem set.docx  
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**engage<sup>ny</sup>** X.X.2

### 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.

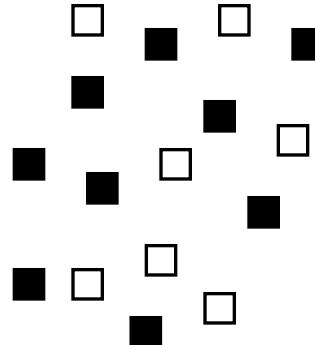
Name \_\_\_\_\_ Date \_\_\_\_\_

Use squares with no overlaps to organize the data from the list. Line up your **squares** carefully.

**Favorite Ice Cream Flavor**  $\square = 1$  student

<b>Flavors</b> <input type="checkbox"/> Vanilla <input checked="" type="checkbox"/> Chocolate	

**Number of Students**



1. How many **more** students liked chocolate than liked vanilla? \_\_\_\_\_

2. How many **total** students were asked about their favorite ice cream flavor? \_\_\_\_\_

students

**Ties on Shoes**

$\square = 1$  student

<b>Types of Shoe Ties</b> Velcro Laces No Ties	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25px;"></td><td style="width: 25px;"></td><td style="width: 25px;"></td><td style="width: 25px;"></td></tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25px;"></td><td style="width: 25px;"></td><td style="width: 25px;"></td><td style="width: 25px;"></td><td style="width: 25px;"></td></tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25px;"></td><td style="width: 25px;"></td><td style="width: 25px;"></td><td style="width: 25px;"></td><td style="width: 25px;"></td></tr> </table>														

**Number of Students**

3. Write a number sentence to show how many **total** students were asked about their shoes?

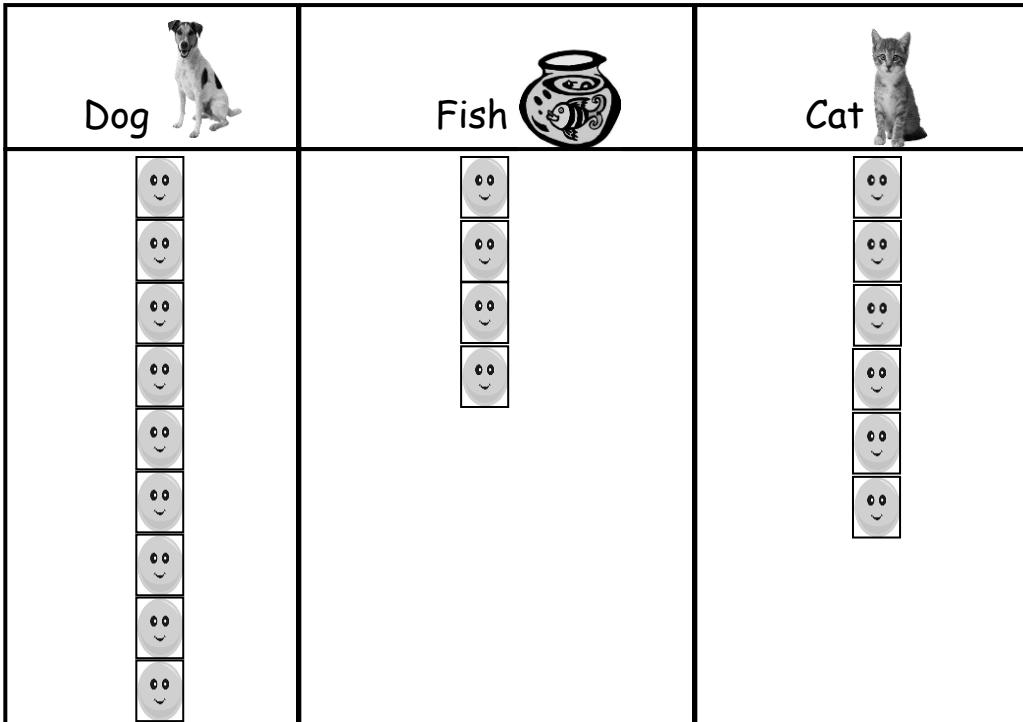
\_\_\_\_\_

4. Write a number sentence to show how many **fewer** students have Velcro ties on their shoes than laces?

\_\_\_\_\_

Each student in the class added a sticky note to show their favorite kind of pet. Use the chart to answer the questions.

**Favorite Pet**



5. How many students chose dogs or cats as their favorite?

\_\_\_\_\_ students

6. How many more students chose dogs as their favorite pet than cats?

\_\_\_\_\_ students

7. How many more students chose cats than fish?

\_\_\_\_\_ students

Name \_\_\_\_\_

Date \_\_\_\_\_

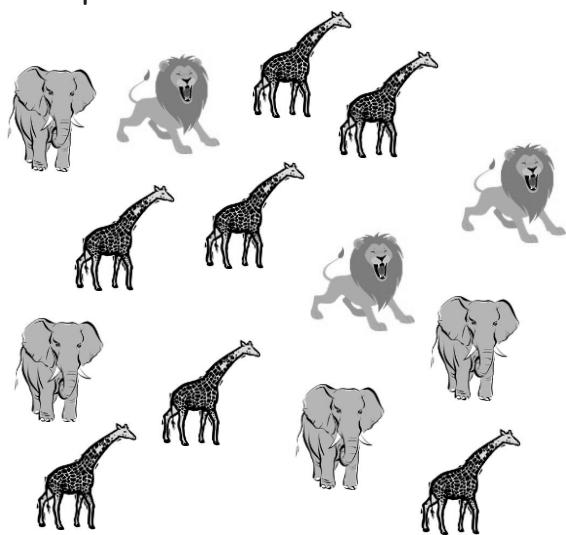
Use squares with no overlaps to organize the data from the pictures.

Line up your **squares** carefully.

### Favorite Animals at the Zoo

Giraffe	
Elephant	
Lion	

**Number of Students**



Each picture represents  
1 student's vote

1. Write a number sentence to show how many **total** students were asked about their favorite animal at the zoo.
- 

2. Write a number sentence to show how many **fewer** students like elephants than like giraffes.
-

Name \_\_\_\_\_

Date \_\_\_\_\_

The class has 18 students and they wore different kinds of shoes to school on Friday. Nine students wore sneakers, six students wore sandals, and three students wore boots. Use squares with no overlaps to organize the data from the pictures. Line up your squares carefully.

### Shoes Worn on Friday

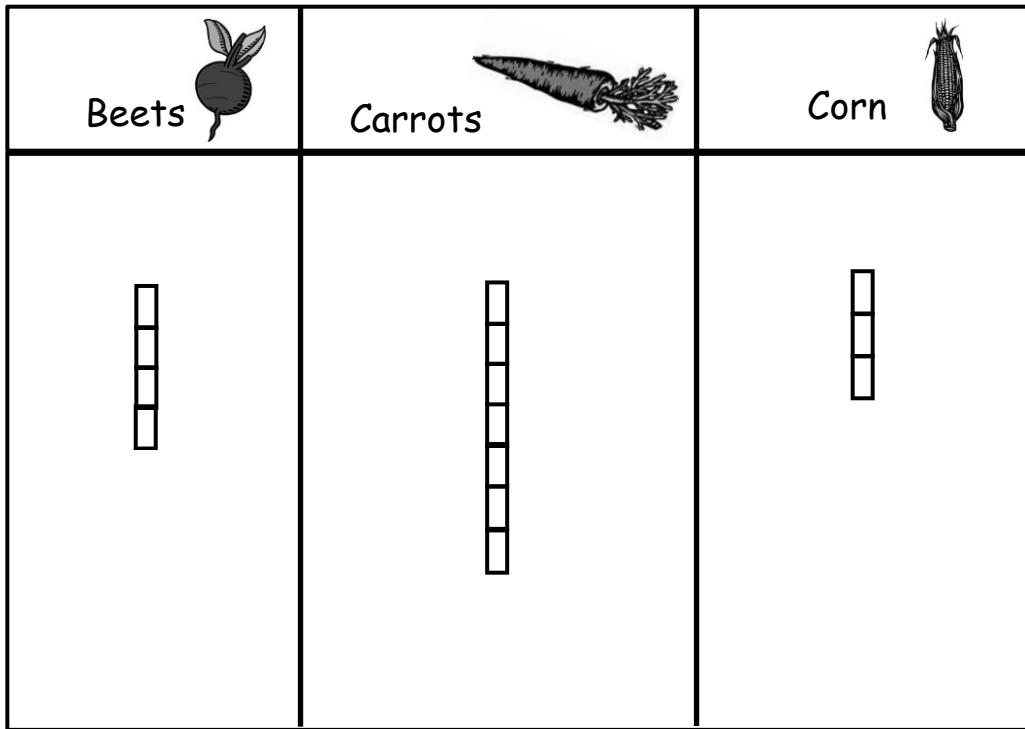
	
	
	

### Number of Students

- How many more students wore sneakers than sandals? \_\_\_\_\_ students
  
- Write a number sentence to show how you could use the chart to tell how many students were asked about their shoes on Friday.  
\_\_\_\_\_
  
- Write a number sentence to show how many fewer students wore boots than sneakers.  
\_\_\_\_\_

Our school garden has been growing for two months. These are the vegetables that we have harvested so far.

### Vegetables Harvested



8. How many total vegetables were harvested?

\_\_\_\_\_ vegetables

9. What vegetable have students harvested the most of?

\_\_\_\_\_

10. How many more beets were harvested than corn?

\_\_\_\_\_

11. How many more beets would need to grow to have the same as the number of carrots?

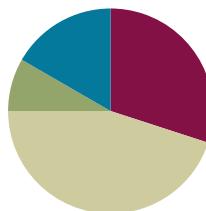
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## Lesson 13

**Objective:** Ask and answer varied word problem types about a data set with three categories.

### Suggested Lesson Structure

Fluency Practice	(18 minutes)
Application Problem	(5 minutes)
Concept Development	(27 minutes)
Student Debrief	(10 minutes)
<b>Total Time</b>	<b>(60 minutes)</b>



### Fluency Practice (18 minutes)

- Hide Zero Number Sentences **1.NBT.2, 1.NBT.4** (3 minutes)
- Add Three Numbers **1.OA.2** (5 minutes)
- Sprint: Add Three Numbers **1.OA.2** (10 minutes)

### Hide Zero Number Sentences (3 minutes)

Materials: (S) Hide Zero cards (from G1–M1–Lesson 38, with additional cards found at the end of this lesson)

Note: This fluency activity strengthens the understanding of place value and prepares students for Module 4.

Show students numbers from 10 to 40 with Hide Zero cards (e.g., 15). Students say an addition sentence with 10 as an addend (e.g.,  $10 + 5 = 15$ ). As students say the sentence, pull apart the Hide Zero cards to model the equation. Alternate asking students to say the numbers the Say Ten way and the regular way.

Suggested sequence: 15, 25, 35; 14, 24, 34; 16, 26, 36; etc.

### Add Three Numbers (5 minutes)

Materials: (S) 3 dice per pair of students, personal white boards

Note: This is review fluency for adding three numbers.

Assign students partners. Partners take turns rolling the three dice and adding them together. The partner with the highest sum each round scores a point. If there is a tie, players should keep playing until one of them has the highest sum. The person with the highest sum after the tie scores two points. Students record points with tally marks on their personal white boards.

**Sprint: Add Three Numbers (10 minutes)**

Materials: (S) Add Three Numbers Sprint

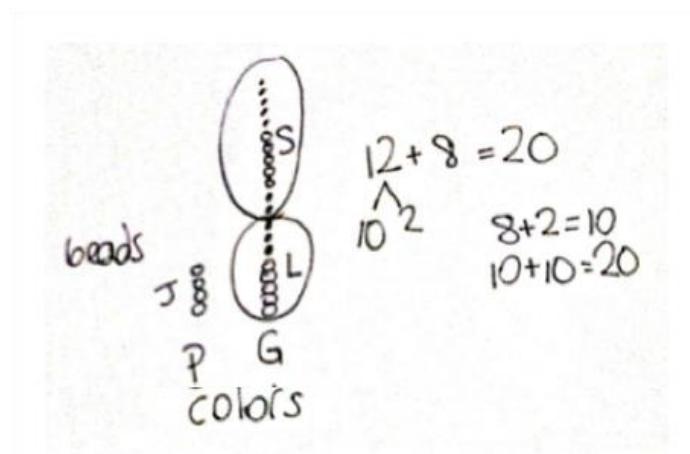
Note: This Sprint provides students practice with adding three numbers within 20 and encourages students to apply properties of operations as strategies to add.

**Application Problem (5 minutes)**

Zoe wanted to make a friendship necklace for her closest friends. Make a graph to show the two colors of beads she used. She used 8 green beads for Lily, 4 purple beads for Jamilah, and 12 green beads for Sage. How many green beads did she use?

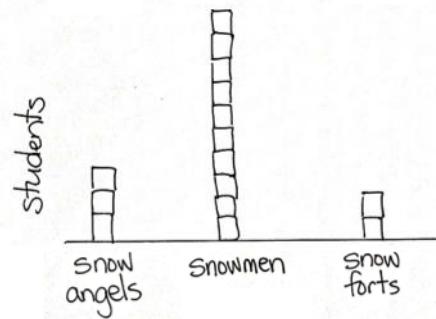
Note: As students finish, ask additional questions to help them interpret the data, focusing on Grade 1 problem types.

- How many more purple beads would need to be used to have the same amount as the green beads?
- How many fewer beads does Lily have than Sage?
- If Lily added 3 beads to her necklace, how many more beads would she need to have the same amount as Sage?

**Concept Development (27 minutes)**

Materials: (T) Graph entitled *Favorite Things to Make with Snow*  
(S) Personal white boards

Note: Adjust the Concept Development as necessary based on your observations of student successes and challenges during Lesson 12, as well as during the most recent Application Problems. Today's Concept Development is an opportunity to continue supporting student understanding of the *compare with difference unknown* problem types using appropriate number sentences as they interpret the given data.

*Favorite Things to Make with Snow*

Have students gather in the meeting area in a semi-circle formation with their personal white boards.

- T: (Post the chart.) Here's a graph I made yesterday after talking to the children in my neighborhood. I asked what they like to do in the snow, and this is what they said. What do you notice about this graph that is different from the graphs we used yesterday? What is similar?
- S: The starting point is on the bottom on this graph. Yesterday, we started from the top. Today, they are built like towers. → But it's still following the rules. → No overlaps. → No gaps. → The same

endpoints.

- T: Turn and talk to your partner about what you notice.  
What information can you gather from reading this graph?

Answers may vary. Be sure to record how many votes each category received.

- T: How many people prefer building a snowman over making snow angels? How did you figure it out?  
S: I looked at the snowman and snow angels columns.  
I counted on from 4 since they both have 3 votes.  
→ I already know that there are 3 votes for snow angels and 12 votes for the snowman, so I took away 3 from 12 and got 9.  
T: I noticed that yesterday, many students counted to figure out which had more or fewer votes.  
What subtraction sentence can you use to solve this problem?  
S:  $12 - 3 = 9$ .  
T: Explain to your partner how both of these strategies are related.  
T: No matter how you solve this, we can use the number sentence  $12 - 3 = 9$  as a way to show how we solved the problem.

Continue to ask *compare with difference unknown* and *put together with result unknown* problems, encouraging students to include a number sentence. In all problems, have students discuss how both counting on and using a subtraction sentence are related to one another. You may use the following suggested sequence:

- How many more children prefer making the snowman over building a fort? Making the snow angel over building a fort? Making the snowman or the snow angel?
- How many children took this **poll**? (Note: Students might not be familiar with the word *poll*. Explain that a poll is a situation in which people vote. The teacher can give the example that, in this case, students were polled about their favorite things to make with snow.)

In the next set of questions, encourage students to visualize how the graph might change based on the information presented in the following situations:

**MP.2**

- How many more votes do we need if we want to make the number of votes for building the fort the same as making the snowman?
- Some more children came by and answered the question. If there were 20 children total that answered the question, how many more children came by and voted?
- If 4 more children came along and said they like building snow forts the most, then how many votes would there be for building forts?

In the beginning, you might want to use additional sticky notes or tiles for those students who need the concrete-visual support. Again, encourage students to use a number sentence to solve.



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

Asking questions for comprehension during this lesson is important to guide students to evaluate their thinking. This provides students an opportunity to evaluate their process and analyze errors.

## 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.

## Student Debrief (10 minutes)

**Lesson Objective:** Ask and answer varied word problem types about a data set with three categories.

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.

- How is using the counting on strategy related to using a subtraction sentence when looking for how many more or fewer votes one received when comparing two categories?
- How is using the counting on strategy related to using an addition sentence when combining the votes for two or more categories?
- When is it more efficient to use number combinations to solve rather than counting on?
- Look at Problem 1. Which problem on Page 2 connects to this one? How do you know?
- How are the *Favorite Fruit* and *School Day Weather* graphs set up differently?
- Explain how you solved Problem 10 to your partner. Compare how each of you solved the problem.
- How did the Application Problem connect to today's lesson?

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 13 Problem Set 1•3

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

Use the chart to answer the questions. Fill in the blank and write a number sentence.

**School Day Weather**

Sunny ☀	Rainy ☂	Cloudy ☁

Fill in the blank and write a number sentence to the right to solve the problem.

- How many more day(s) were cloudy than sunny? 1 more day(s) were cloudy than sunny.  $5 - 4 = 1$
- How many fewer days were cloudy than rainy? 2 more day(s) were cloudy than rainy.  $7 - 5 = 2$
- How many more days were rainy than sunny? 3 more day(s) were rainy than sunny.  $7 - 4 = 3$
- How many total days did the class keep track of the weather? 16 total days
- If the next 3 days were sunny, how many of the school days will be sunny in all? 19 days would be sunny.

COMMON CORE | Lesson 13: Ask and answer varied word problem types about a data set with three categories. Date: 3/24/13 © 2013 Common Core, Inc. Some rights reserved. commoncore.org This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License. engage<sup>ny</sup> 3.D.41

Use the graph to answer the questions. Fill in the blank and write a number sentence that helps you solve the problem.

**Favorite Fruit**

Number of Students	Apple	Grape	Banana

= 1 student

7. How many fewer students chose bananas than apples? 1 fewer students like bananas than apples.  $6 - 5 = 1$

8. How many more students chose bananas than grapes? 1 more students chose bananas than grapes.  $6 - 4 = 1$

9. How many fewer students chose grapes than apples? 2 fewer students chose grapes than apples.  $6 - 4 = 2$

10. Some more students answered about their favorite fruits. If the new total number of students who answered is 20, how many more students answered? 5 more students answered the question.  $20 - 15 = 5$

COMMON CORE | Lesson 13: Ask and answer varied word problem types about a data set with three categories. Date: 6/16/13 Lesson Name EXACTLY G1-M3-TD-L13-Problem Set.docx © 2013 Common Core, Inc. All rights reserved. commoncore.org engage<sup>ny</sup> X.X.2

**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.

**A**

Number correct:

Name \_\_\_\_\_

Date \_\_\_\_\_

\*Write the missing number.

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

**B**

Number correct:

Name \_\_\_\_\_

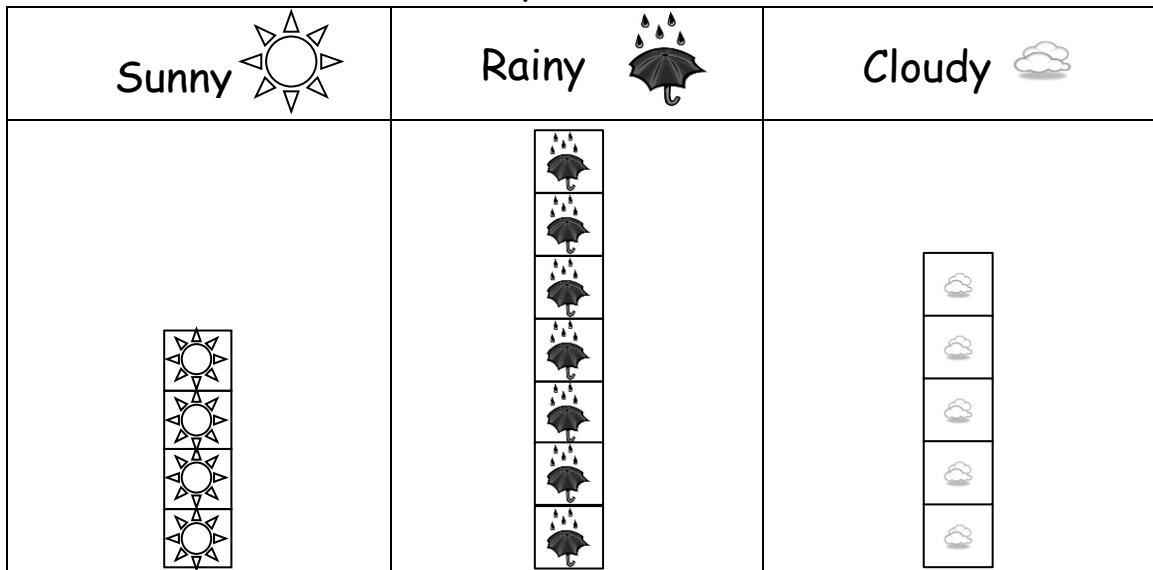
Date \_\_\_\_\_

\*Write the missing number.

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

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

Use the chart to answer the questions. Fill in the blank and write a number sentence.

**School Day Weather**

Fill in the blank and write a number sentence to the right to solve the problem.

1. How many more day(s) were cloudy than sunny?

\_\_\_\_\_ more day(s) were cloudy than sunny. \_\_\_\_\_

2. How many fewer days were cloudy than rainy?

\_\_\_\_\_ more day(s) were cloudy than rainy. \_\_\_\_\_

3. How many more days were rainy than sunny?

\_\_\_\_\_ more day(s) were rainy than sunny. \_\_\_\_\_

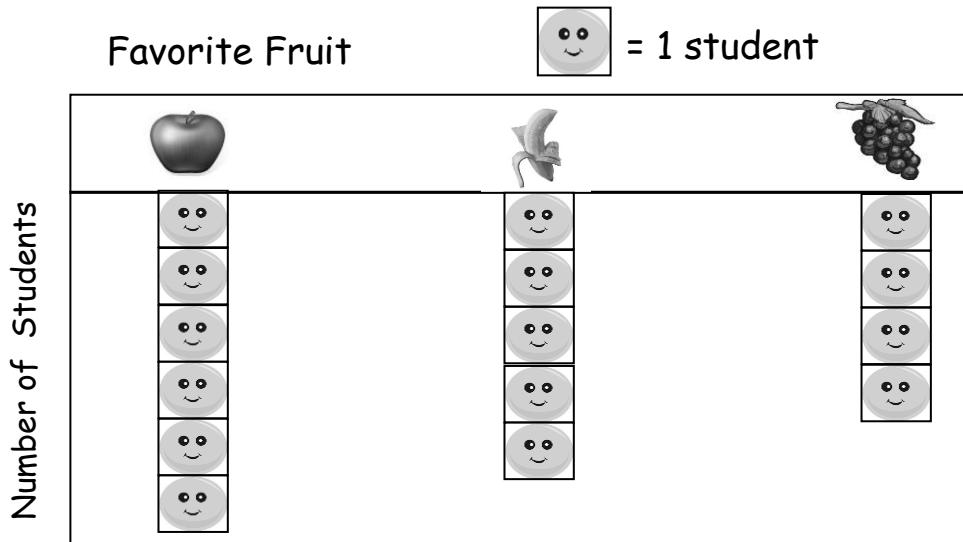
4. How many total days did the class keep track of the weather?

\_\_\_\_\_ total days

5. If the next 3 days were sunny, how many of the school days will be sunny in all?

\_\_\_\_\_ days would be sunny.

Use the graph to answer the questions. Fill in the blank and write a number sentence that helps you solve the problem.



7. How many fewer students chose bananas than apples?

\_\_\_\_\_ fewer students like bananas than apples. \_\_\_\_\_

8. How many more students chose bananas than grapes?

\_\_\_\_\_ more students chose bananas than grapes. \_\_\_\_\_

9. How many fewer students chose grapes than apples?

\_\_\_\_\_ fewer students chose grapes than apples. \_\_\_\_\_

10. Some more students answered about their favorite fruits. If the new total number of students who answered is 20, how many more students answered?

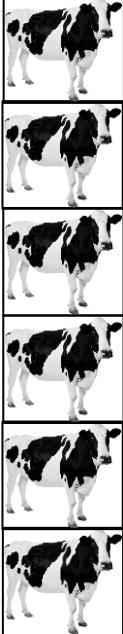
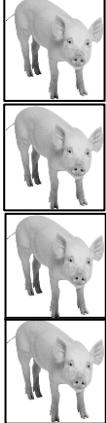
\_\_\_\_\_ more students answered the question. \_\_\_\_\_

Name \_\_\_\_\_

Date \_\_\_\_\_

Use the graph to answer the questions. Write a number sentence.

### Animals on Lily's Farm

Sheep	Cows	Pigs
		

- How many animals are on Lily's farm in all? \_\_\_\_\_ animals
- How many fewer sheep than pigs are on Lily's farm? \_\_\_\_\_ fewer sheep
- How many more cows are on Lily's farm than sheep? \_\_\_\_\_ more cows

Name \_\_\_\_\_

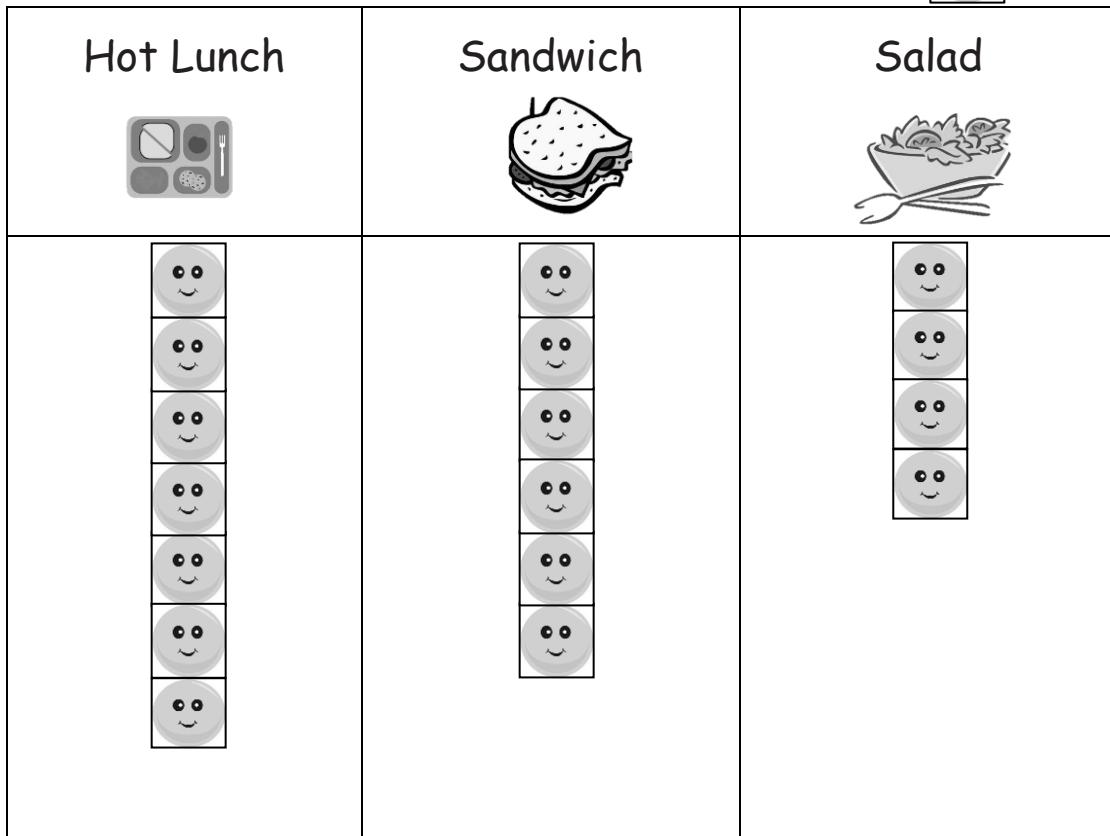
Date \_\_\_\_\_

Use the graph to answer the questions. Fill in the blank and write a number sentence.

### School Lunch Order



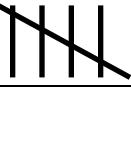
= 1 student



- How many more hot lunch orders than sandwich orders?  
\_\_\_\_\_ more hot lunch orders
- How many fewer salad orders than hot lunch orders?  
\_\_\_\_\_ fewer salad orders
- If 5 more students order hot lunch, how many hot lunch orders will there be?  
\_\_\_\_\_ hot lunch orders

Use the chart to answer the questions. Fill in the blanks and write a number sentence.

Favorite Type of Book

 = 5 students

Fairy Tales			
Science Books			
Picture Books			

1. How many more students like fairy tales than science books?

\_\_\_\_\_ more students

2. How many fewer students like science books than picture books?

\_\_\_\_\_ fewer students

3. How many students picked fairy tales or science books in all?

\_\_\_\_\_ students

4. How many more students would need to pick science books to have the same number as fairy tales?

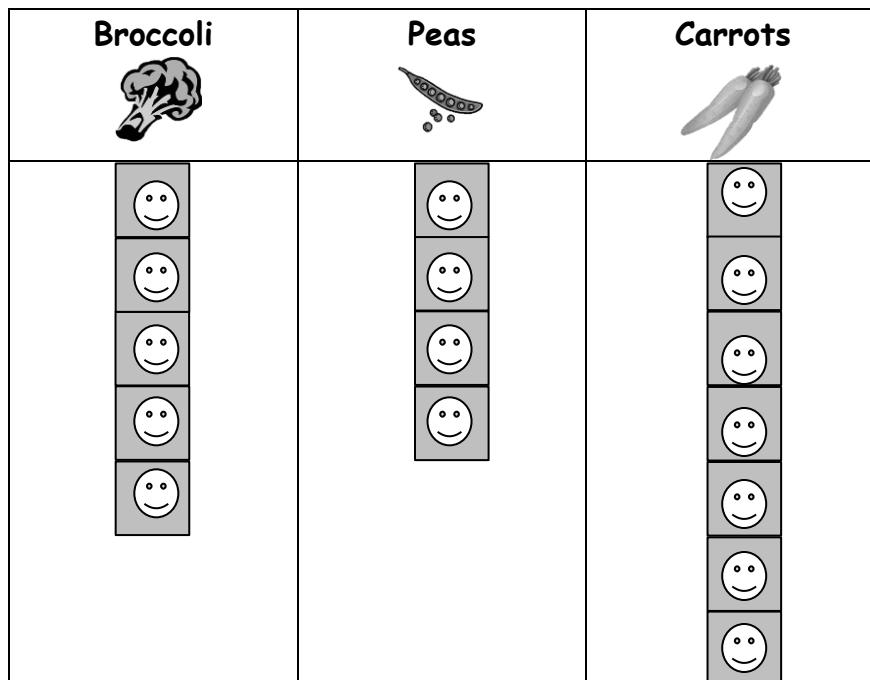
\_\_\_\_\_ students

5. If 5 more students show up late and all pick fairy tales will this be the type of book that the most students picked as their favorite? Yes or no? Use a number sentence to show your answer.

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Each student in the class put a sticky note in the chart to show the vegetable they like best. Use the table below to answer the questions. Remember to label your answers.

**Vegetables that Students Like Best**

a. How many students like carrots the best? \_\_\_\_\_

b. How many students like carrots and peas the best? \_\_\_\_\_

c. How many total students answered the survey? \_\_\_\_\_

d. How many more students like broccoli than like peas the best?  
\_\_\_\_\_

e. How many fewer students like broccoli than like carrots the best?  
\_\_\_\_\_



2. Cesar has a piece of string that he wants to use to compare how far his cat's bed



and his dog's bed are from their shared water bowl.

The string is a lot **longer** than the dog's path to the bowl.

The string is a lot **shorter** than the cat's path to the bowl.

Whose path is shorter to their water bowl, the dog's or the cat's? Draw a picture to show how you know.



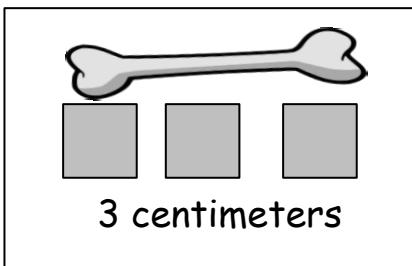
water bowl

3. Circle the pictures that show a correct measurement.

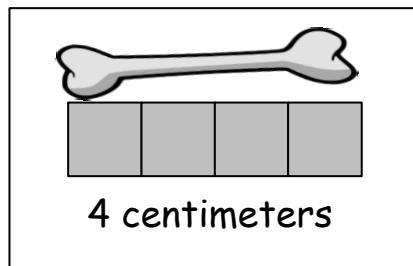


is a centimeter cube.

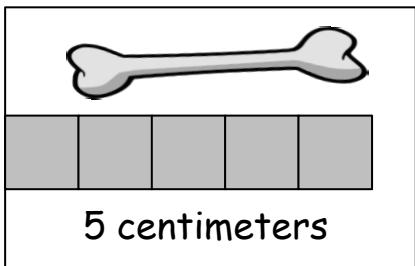
a.



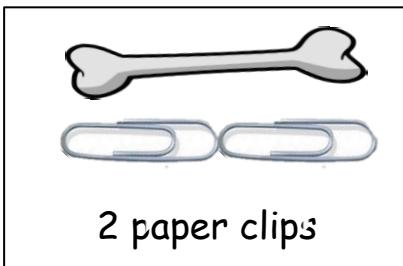
b.



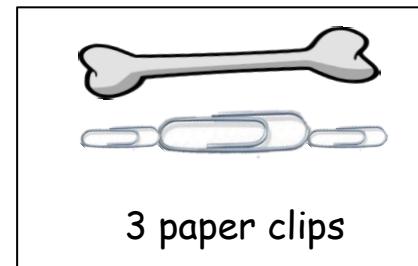
c.



d.



e.



- a. Why did you pick these pictures? Explain your thinking with two reasons.

---

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- b. What was the length measurement of the bone for each correct picture?

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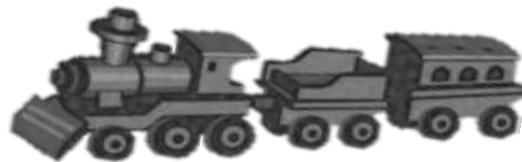
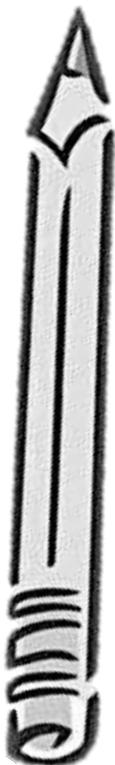
- c. Why are the (d) and (e) measurements with paper clips different?

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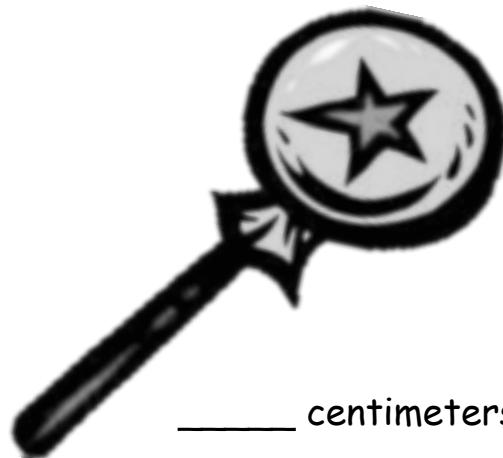
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4. Measure the length of the picture of each item with centimeter cubes.

a.



\_\_\_\_\_ centimeters



\_\_\_\_\_ centimeters

\_\_\_\_\_ centimeters

- b. Order the train, pencil, and lollipop from shortest to longest.
- 

- c. Which item, or items, are longer than the lollipop?
- 

- d. How much longer is the pencil than the train?
-

**End-of-Module Assessment Task  
Standards Addressed****Topics A–D****Represent and solve problems involving addition and subtraction.**

- 1.OA.1** Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. (See Glossary, Table 1.)

**Measure lengths indirectly and by iterating length units.**

- 1.MD.1** Order three objects by length; compare the length of two objects indirectly by using a third object.
- 1.MD.2** Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.*

**Represent and interpret data.**

- 1.MD.4** Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

**Evaluating Student Learning Outcomes**

A Progression Toward Mastery is provided to describe steps that illuminate the gradually increasing understandings that students develop *on their way to proficiency*. In this chart, this progress is presented from left (Step 1) to right (Step 4). The learning goal for each student is to achieve Step 4 mastery. These steps are meant to help teachers and students identify and celebrate what the student CAN do now and what they need to work on next.

A Progression Toward Mastery				
Assessment Task Item and Standards Assessed	STEP 1 Little evidence of reasoning without a correct answer.  <b>(1 Point)</b>	STEP 2 Evidence of some reasoning without a correct answer.  <b>(2 Points)</b>	STEP 3 Evidence of some reasoning with a correct answer or evidence of solid reasoning with an incorrect answer.  <b>(3 Points)</b>	STEP 4 Evidence of solid reasoning with a correct answer.  <b>(4 Points)</b>
<b>1</b>  <b>1.MD.4</b> <b>1.OA.1</b>	The student demonstrates little to no understanding of how to read or interpret the graph.	The student demonstrates some understanding of how many students are represented in the graph in a given category or categories (may be off by one or two), but is unable to solve either of the comparison problems accurately.	The student correctly solves (a), (b), and (c), but solves (d) or (e) incorrectly.  Or, the student solves the comparison problems (d) and (e) correctly, but is unable to correctly solve (a), (b), and/or (c).	The student correctly: <ul style="list-style-type: none"><li>▪ Identifies and solves (a) as 7, (b) as 11, and (c) as 16.</li><li>▪ Compares the quantities and writes the difference between the two quantities for questions (d), 1 student, and (e), 2 students.</li></ul>
<b>2</b>  <b>1.MD.1</b>	The student demonstrates little to no understanding of the comparison.	The student demonstrates some understanding of how the string can be used to compare the two paths (i.e., by using pictures), but provides inaccurate responses.	The student identifies that dog's path is shorter, but is unable to provide a clear explanation.  Or, the student incorrectly identifies the cat's path as shorter, but is able to draw a picture to explain (this may reflect a linguistic interpretation issue).	The student correctly: <ul style="list-style-type: none"><li>▪ Identifies that dog's path is shorter.</li><li>▪ Explains how the string could be used to compare the distance from each desk to the door (transitivity), by drawing pictures.</li></ul>
<b>3</b>  <b>1.MD.2</b> <b>1.OA.1</b>	The student demonstrates little to no understanding of proper measurement technique or reasoning behind it.	The student demonstrates some understanding of proper measurement techniques by either selecting or measuring the correct items, but cannot explain her thinking clearly and accurately.	The student clearly and accurately completes three out of the four following components: <ul style="list-style-type: none"><li>▪ Identifies (b) and (d) as having the proper measurement.</li><li>▪ Cites at least two key elements to measuring accurately (no gaps,</li></ul>	The student clearly and accurately: <ul style="list-style-type: none"><li>▪ Identifies (b) and (d) as having the proper measurement.</li><li>▪ Cites at least two key elements to measuring accurately (no gaps,</li></ul>

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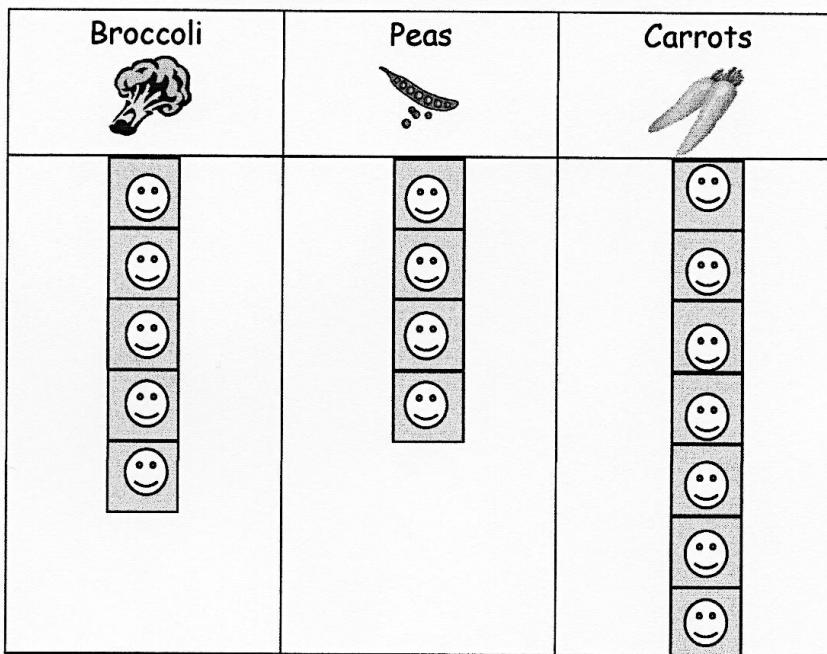
		<p>Or, the student demonstrates some understanding of her thinking behind measurement methods, but cannot measure or identify measurements accurately.</p>	<p>measuring accurately (no gaps, attentive to endpoints, same-sized length units) in her own words.</p> <ul style="list-style-type: none"> <li>▪ Identifies two correct measurements (2 paper clips and 4 centimeters; units are not required).</li> <li>▪ Explains that measuring with different lengths of units (small or large paper clips) can result in different quantities of measurement for the same length item.</li> </ul>	<p>attentive to endpoints, same-sized length units) in her own words.</p> <ul style="list-style-type: none"> <li>▪ Identifies two correct measurements (2 paper clips and 4 centimeters; units are required).</li> <li>▪ Explains that measuring with different lengths of units (small or large paper clips) can result in different quantities of measurement for the same length item.</li> </ul>
<b>4</b>  <b>1.MD.1</b> <b>1.MD.2</b> <b>1.OA.1</b>	<p>The student demonstrates little to no understanding of how to measure or use the measurement to compare.</p>	<p>The student demonstrates some understanding of how to measure, but is unable to manipulate the measurements to order or compare.</p>	<p>The student accurately measures and orders the items by length, but is unable to solve one or the other comparison problems. Or, the student is able to solve the comparison problems correctly, but with slight inaccuracy in the measurements (i.e., he is off by 1 or 2 centimeters, which then impacts the accuracy of (d)).</p>	<p>The student clearly and accurately:</p> <ul style="list-style-type: none"> <li>▪ Measures the train (8 cm), pencils (11 cm), and lollipop (9 cm).</li> <li>▪ Orders the items by length (train, lollipop, pencil).</li> <li>▪ Identifies the pencil as longer than the lollipop.</li> <li>▪ Solves the comparison problem correctly by identifying the pencil as 3 centimeters longer than the train.</li> </ul>

Name Maria

Date \_\_\_\_\_

1. Each student in the class put a sticky note in the chart to show the vegetable they like best. Use the table below to answer the questions. Remember to label your answers.

Vegetables that Students Like Best



- How many students like carrots the best?
- How many students like carrots and peas the best?
- How many total students answered the survey?
- How many more students like broccoli than like peas the best?

7 students  
11 students  
16 students

- How many fewer students like broccoli than like carrots the best?

1 student  
2 students



2. Cesar has a piece of string that he wants to use to compare how far his cat's bed and his dog's bed are from their shared water bowl.

The string is a lot **longer** than the dog's path to the bowl.

The string is a lot **shorter** than the cat's path to the bowl.

Whose path is shorter to their food bowls, the dog's or the cat's? Draw a picture to show how you know.

The dog's path  
is shorter than  
the cat's.



water bowl

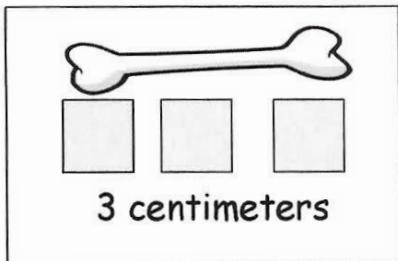
string

3. Circle the pictures that show a correct measurement.

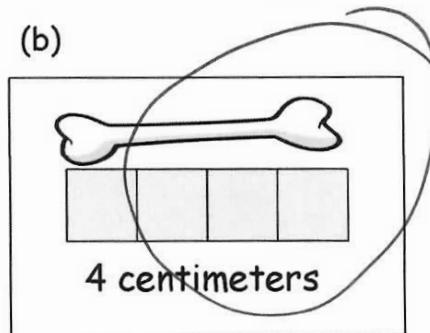


is a centimeter cube.

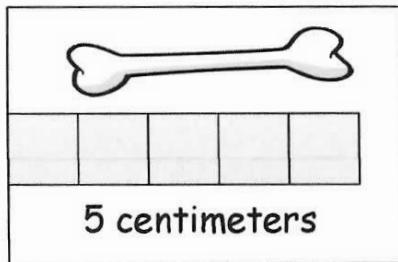
(a)



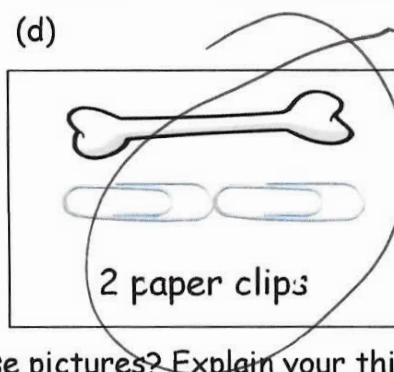
(b)



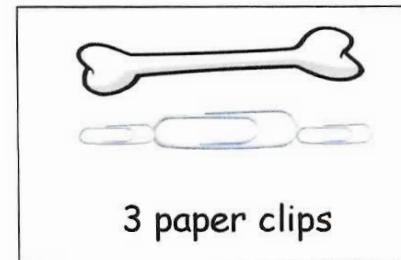
(c)



(d)



(e)



a. Why did you pick these pictures? Explain your thinking with two reasons.

They both start at one end and go to the other end with the same size pieces.

b. What was the length measurement of the bone for each correct picture?

4 centimeters

2 paper clips

c. Why are the (d) and (e) measurements with paper clips different?

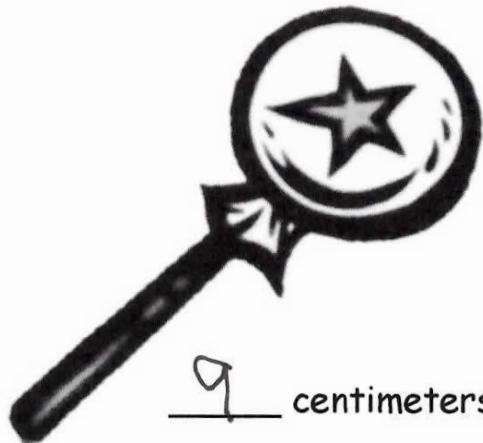
The paperclips in(e) are different sizes than the paperclips in (d).

4. Measure the length of the picture of each item with centimeter cubes.

a.



8 centimeters



9 centimeters

11 centimeters

- b. Order the train, pencil, and lollipop from shortest to longest.

train, lollipop, pencil

- c. Which item, or items, are longer than the lollipop?

The pencil is longer than the lollipop.

- d. How much longer is the pencil than the train?

The pencil is 3 centimeters longer than the train.