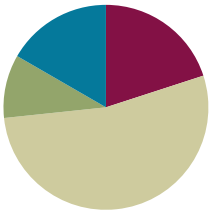
Lesson 2

Objective: Use iteration with one physical unit to measure.

Suggested Lesson Structure

Fluency Practice	(12 minutes)
Application Problem	(6 minutes)
Concept Development	(32 minutes)
Student Debrief	(10 minutes)
Total Time	**(60 minutes)**



Fluency Practice (12 minutes)

- Renaming the Say Ten Way **2.NBT.1** (2 minutes)
- Say Ten to the Next Ten **2.NBT.1** (4 minutes)
- Making the Next Ten to Add **2.OA.2** (6 minutes)

Renaming the Say Ten Way (2 minutes)

Note: Renaming the Say Ten way reviews skills taught in Module 1 and reinforces using place value concepts to add. Use a Rekenrek to model the first few times to help students with visualization.

T: When I say 52, you say 5 tens 2. Ready? 67.
S: 6 tens 7.
T: 98.
S: 9 tens 8.
T: 100.
S: 10 tens.
T: 113.
S: 11 tens 3.

Continue with the following possible sequence: 103, 123, 127, 137, 132, 142, 143, 163, 168, 188, 198, and 200.

Say Ten to the Next Ten (4 minutes)

Note: This activity helps students see the connection between renaming the Say Ten way and making a ten. It provides practice adding ones to make a multiple of 10.

T: Let's add to make the next ten the Say Ten way. I say 5 tens 2, you say 5 tens 2 + 8 = 6 tens. Ready? 6 tens 7.
S: 6 tens 7 + 3 = 7 tens.
T: 5 tens 1.
S: 5 tens 1 + 9 = 6 tens.
T: 7 tens 8.
S: 7 tens 8 + 2 = 8 tens.

Continue with the following possible sequence: 8 tens 4, 8 tens 5, 8 tens 9, 9 tens 6, 9 tens 3, and 9 tens 9.

Making the Next Ten to Add (6 minutes)

Materials: (S) Personal white board

Note: Students make a unit of ten to add within 20. This foundational fluency is a review of Lesson 3 from Module 1.

T: Let's make 10 to add. If I say 9 + 2, you say 9 + 2 = 10 + 1. Ready? 9 + 3.
S: 9 + 3 = 10 + 2.
T: Answer?
S: 12.
T: 9 + 5.
S: 9 + 5 = 10 + 4.
T: Answer?
S: 14.

Post on board:

9 + 3 = _____
/\
1 2

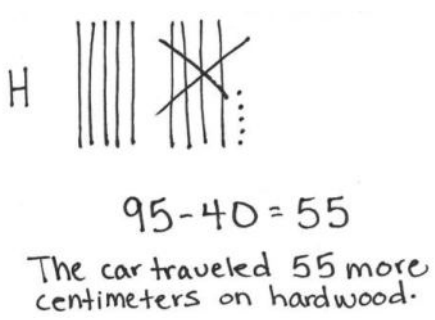
9 + 3 = 10 + 2

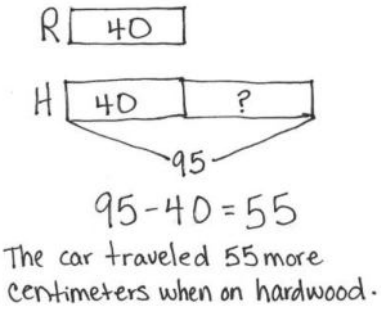
Continue with the following possible sequence: 9 + 7, 9 + 6, 9 + 8, 8 + 3, 8 + 5, 7 + 4, and 7 + 6.

T: On your personal white board, write at least three other similar examples.

Application Problem (6 minutes)

With one push, Brian's toy car traveled 40 centimeters across the rug. When pushed across a hardwood floor, it traveled 95 centimeters. How many more centimeters did the car travel on the hardwood floor than across the rug?





Note: This *compare with difference unknown* problem gives students further practice with comparing quantities. A new complexity is to compare length measurements rather than numbers of discrete objects.

Concept Development (32 minutes)

Materials: (T/S) Small resealable bag with 1 centimeter cube, 1 paper clip, 3 linking cubes (joined), 1 crayon, 1 dry erase marker, 1 sticky note, 1 index card, pencil, paper

T: (Call students to the carpet.) Yesterday, we measured a pencil box together using many centimeter cubes. Today, we will measure some other objects, but this time we will only use one centimeter cube.

T: Think back to the two different ways we measured the pencil boxes yesterday. What mistake did I make?

MP.6

S: You left spaces between the cubes. → You were supposed to put the cubes right next to each other.

T: Talk with your partner: How could we measure with one cube?

S: You could put the cube down and then put your finger down to show where it ends. → You could mark the end with a pencil.

NOTES ON DIFFERENTIATING THE APPLICATION PROBLEM:

The 9 Application Problems of Module 2 are all comparison situations.

- Lessons 1 and 2: *compare with difference unknown*
- Lessons 3 and 4: *compare with bigger unknown*
- Lessons 5 and 6: *compare with smaller unknown*
- Lesson 7: *compare with smaller unknown* using *more than*
- Lesson 8: *compare with bigger unknown* using *less than*
- Lesson 9: *compare with bigger unknown* using *shorter than*

The challenging situation types in Lessons 7, 8, and 9 might be frustrating if students have not been successful in Lessons 1–6. Consider editing the situations in Lessons 7–9 to instead repeat those of Lessons 1–6, returning to the more challenging problem types in either Module 3 or 4 after students have gained more confidence with the simpler comparison situations.

T: (Model measuring the paper clip with one centimeter cube using the mark and move forward technique. Use a document camera or an overhead projector so students can see. If such technology is unavailable, use a base ten thousands block to measure a line drawn on the board to show students the mark and move forward technique.)

T: Watch my measurement strategy. I make a mark where the cube ends. (Do so.) Then, I move my cube forward so that the mark is right at the beginning of the cube, with no **overlap**. (Do so.) I mark where the cube ends again. Now, talk to your partner about what I'll do next.

S: Move the cube forward so the new mark is at the beginning of the cube!

T: What did you notice about how I measured with my centimeter cube?

S: You didn't leave any space between your pencil mark and the centimeter cube. → Your pencil line is very tiny. → You put the edge of the cube down right on the line.

T: What do you notice about the distance between the pencil marks I've made? Talk with your partner.

MP.6

S: They're all the same length.

T: When I measured my paper clip, the length was just a little less than 3 centimeters. I can say my paper clip is *about* 3 centimeters because it is very close.

T: Now, it's your turn to measure. Open your bag, and take out the paper clip and the centimeter cube.

T: Put the paper clip on your paper. Now, put your centimeter cube down alongside the paper clip. Make sure your centimeter cube is exactly even with the start of your paper clip. (Walk students through the mark and move forward strategy.)

S: (Measure.)

T: How many centimeters long is the paper clip? Thumbs up when you have your answer.

S: 3 centimeters!

T: Let's measure the crayon this time. Give me a thumbs-up when you know the length of the crayon. (Discuss answer with class.)

NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Get moving! Demonstrate the iteration strategy by calling a student forward to measure the classroom board with her body, placing marks on either side of her shoulders and continuing to move forward along the length of the board.

NOTES ON MULTIPLE MEANS OF REPRESENTATION:

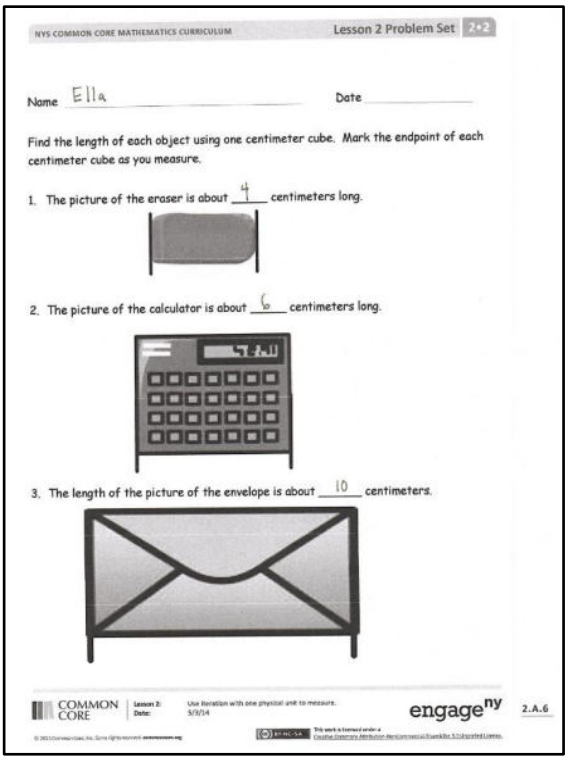
For Problem 5 on the Problem Set, clarify and make connections to important math concepts: repeating equal units and the mark and move forward strategy.

Model written response starters, such as, "Elijah's answer will be incorrect, because …."

Next, have students measure the linking cube stick. Send students to their seats to measure the remaining items in their bags. Keep students who need extra support on the carpet to guide them.

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 should solve these problems using the RDW approach used for Application Problems.


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

Name Ella Date

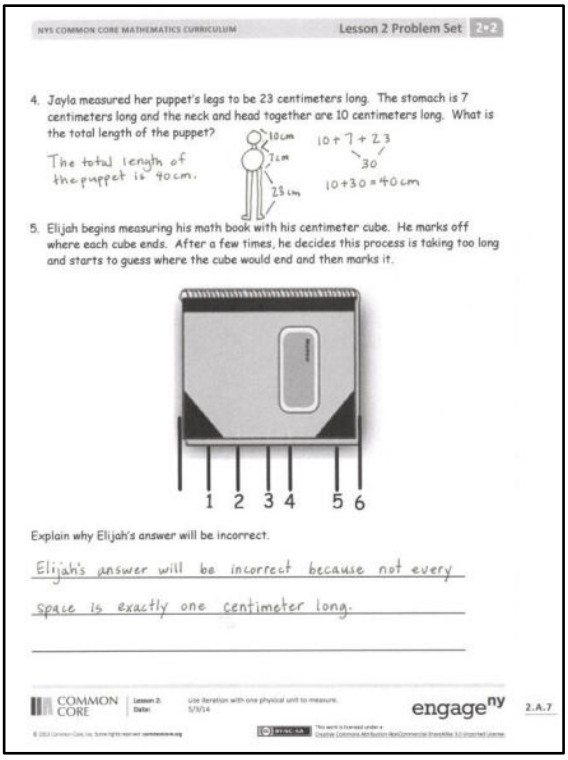
Find the length of each object using one centimeter cube. Mark the endpoint of each centimeter cube as you measure.

1. The picture of the eraser is about 4 centimeters long.

2. The picture of the calculator is about 6 centimeters long.

3. The length of the picture of the envelope is about 10 centimeters.

COMMON CORE Lesson 2: Use iteration with one physical unit to measure. Date: 5/9/14 engage^ny 2.A.6


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

4. Jayla measured her puppet's legs to be 23 centimeters long. The stomach is 7 centimeters long and the neck and head together are 10 centimeters long. What is the total length of the puppet?

The total length of the puppet is 40cm.

10cm 7cm 23cm 10+7+23 30 10+30=40cm

5. Elijah begins measuring his math book with his centimeter cube. He marks off where each cube ends. After a few times, he decides this process is taking too long and starts to guess where the cube would end and then marks it.

1 2 3 4 5 6

Explain why Elijah's answer will be incorrect.

Elijah's answer will be incorrect because not every space is exactly one centimeter long.

COMMON CORE Lesson 2: Use iteration with one physical unit to measure. Date: 5/9/14 engage^ny 2.A.7

Student Debrief (10 minutes)

Lesson Objective: Use iteration with one physical unit to measure.

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.

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

- Compare your answers to Problems 1–3 with a partner. What did you do to measure accurately?
- What are your thoughts about Elijah's estimation strategy in Problem 5? (Students share answers. Elicit and reinforce the repetition of equal units being necessary to measure.)
- Turn and talk: Why do you think I called today's strategy for measuring the *mark and move forward* strategy? Why is it important not to **overlap**?
- Which method for measuring do you think is better, easier, or quicker—measuring with multiple cubes or measuring with just one cube? Why?
- During our lesson, we measured 3 linking cubes with centimeter cubes. Could we use a linking cube to measure instead of a centimeter cube? Let's measure the picture of Elijah's notebook with one linking cube. What do you notice?

Exit Ticket (3 minutes)

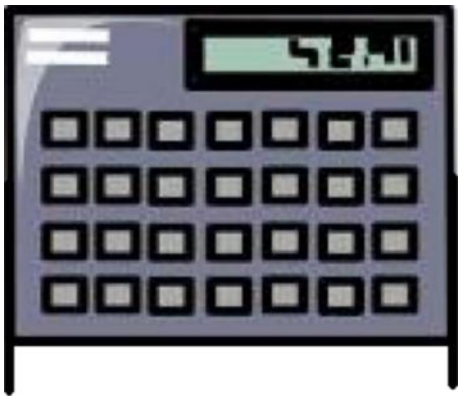
After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help with assessing students' understanding of the concepts that were presented in today's lesson and planning more effectively for future lessons. The questions may be read aloud to the students.

Name _____ Date _____

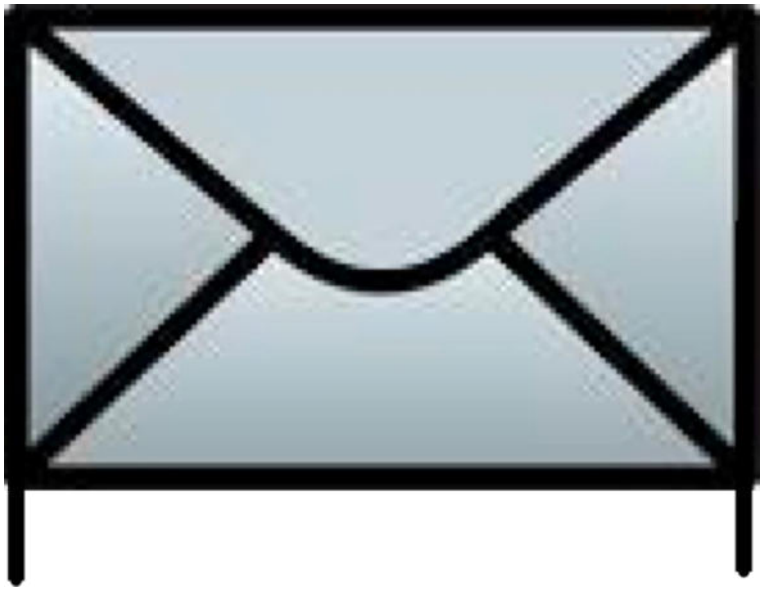
Find the length of each object using one centimeter cube. Mark the endpoint of each centimeter cube as you measure.

1. The picture of the eraser is about _____ centimeters long.

2. The picture of the calculator is about _____ centimeters long.

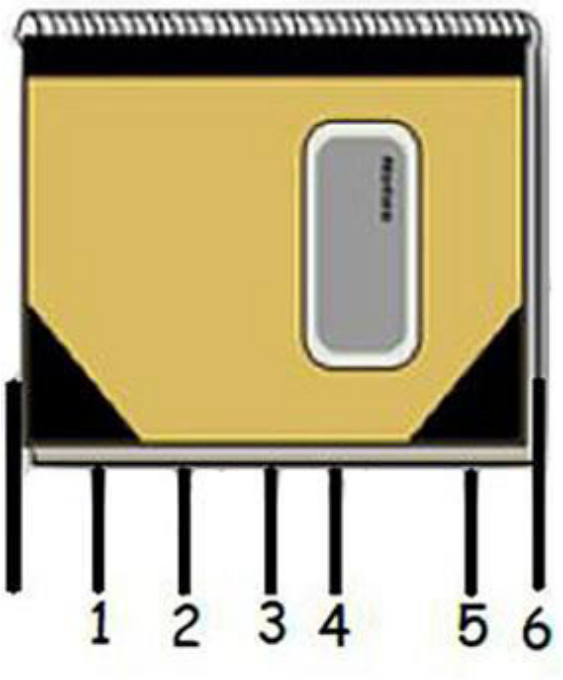


3. The length of the picture of the envelope is about _____ centimeters.



4. Jayla measured her puppet's legs to be 23 centimeters long. The stomach is 7 centimeters long, and the neck and head together are 10 centimeters long. What is the total length of the puppet?

5. Elijah begins measuring his math book with his centimeter cube. He marks off where each cube ends. After a few times, he decides this process is taking too long and starts to guess where the cube would end and then mark it.



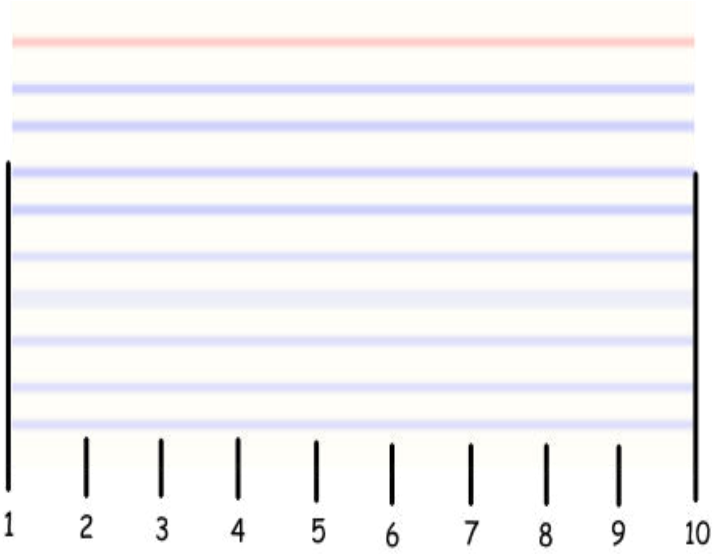
Explain why Elijah's answer will be incorrect.

_____

_____

Name _____ Date _____

Matt measured his index card using a centimeter cube. He marked the endpoint of the cube as he measured. He thinks the index card is 10 centimeters long.



a. Is Matt's work correct? Explain why or why not.

_____

_____

_____

b. If you were Matt's teacher what would you tell him?

_____

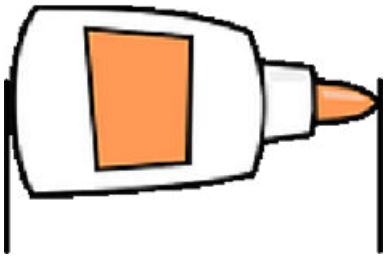
_____

_____

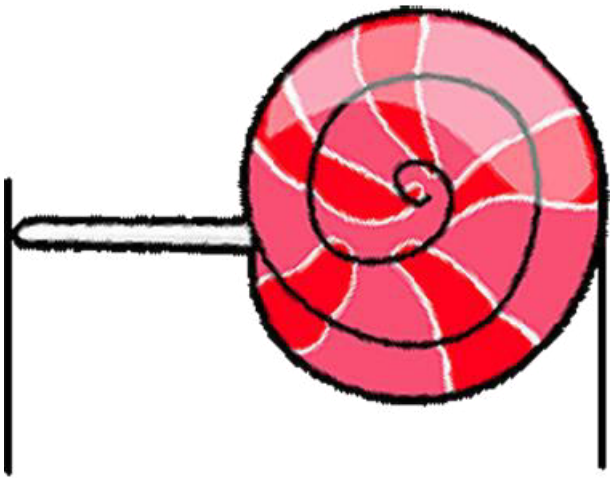
Name _____ Date _____

Use the centimeter square at the bottom of the next page to measure the length of each object. Mark the endpoint of the square as you measure.

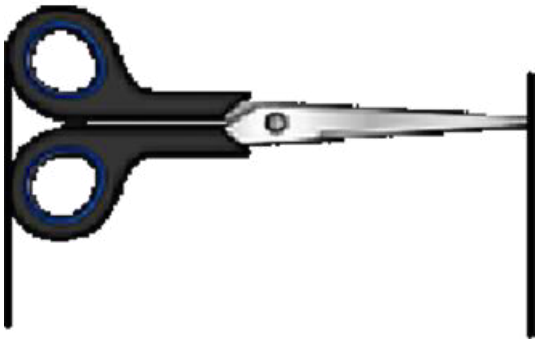
1. The picture of the glue is about _____ centimeters long.



2. The picture of the lollipop is about _____ centimeters long.



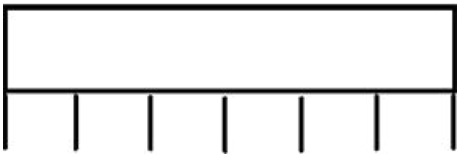
3. The picture of the scissors is about _____ centimeters long.



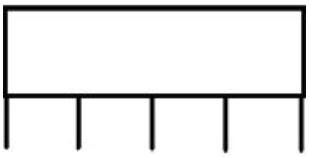
4. Samantha used a centimeter cube and the mark and move forward strategy to measure these ribbons. Use her work to answer the following questions.

Red Ribbon

Blue Ribbon



Yellow Ribbon



a. How long is the red ribbon? _____ centimeters long.

b. How long is the blue ribbon? _____ centimeters long.

c. How long is the yellow ribbon? _____ centimeters long.

d. Which ribbon is the longest? Red Blue Yellow

e. Which ribbon is the shortest? Red Blue Yellow

f. The total length of the ribbons is _____ centimeters.

Cut out the centimeter square below to measure the length of the glue bottle, lollipop, and scissors.