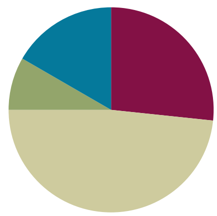
Lesson 3

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)
Total Time	**(60 minutes)**



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.

A NOTE ON MULTIPLE MEANS FOR ACTION AND EXPRESSION:

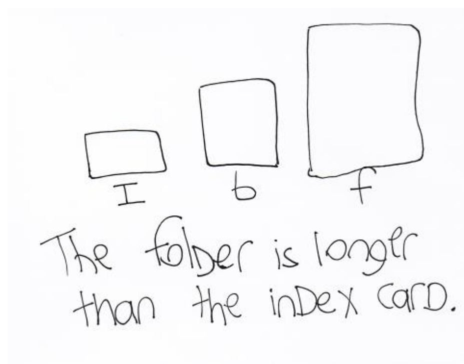
When using words your English language learners may not be familiar with, be sure to illustrate your meaning by using real objects or show pictures as you are speaking.

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.

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.)

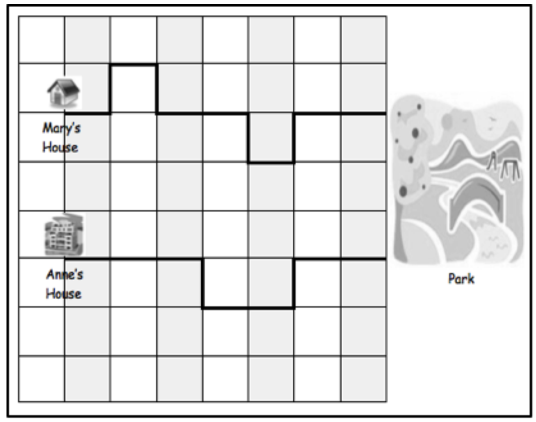
T: How many city blocks long is Anne's path?

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.



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.

MP.7

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.

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?

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.

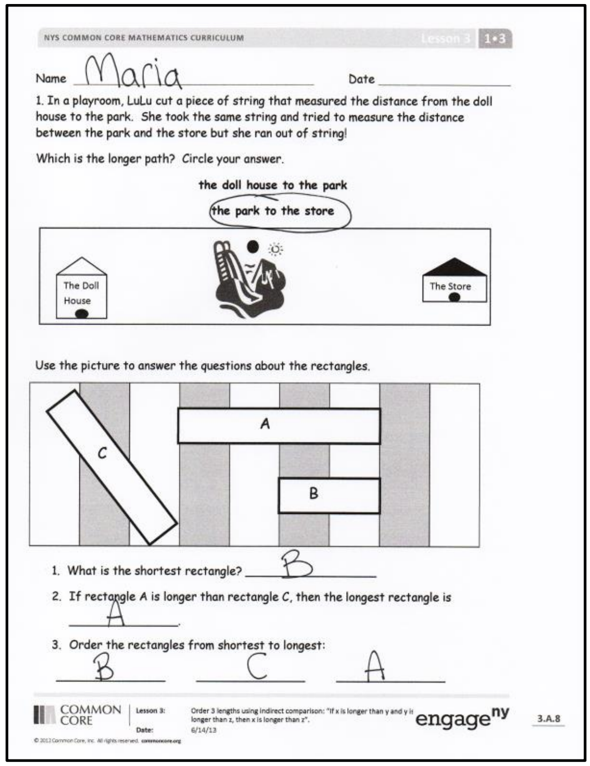
The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

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.

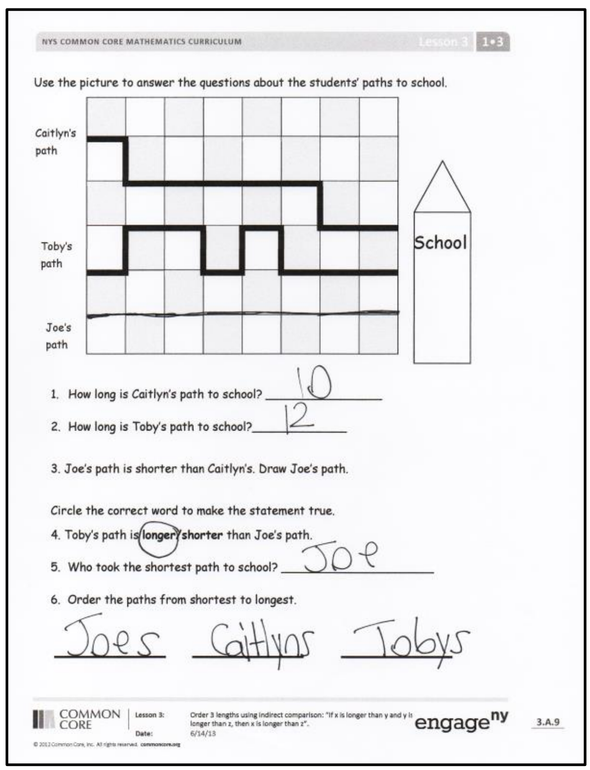
the doll house to the park

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: Order 3 lengths using indirect comparison: "If x is longer than y and y is longer than z, then x is longer than z". Date: 6/14/13 engage^ny 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.

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.

Joes Caitlyns Tobys

COMMON CORE Lesson 3: Order 3 lengths using indirect comparison: "If x is longer than y and y is longer than z, then x is longer than z". Date: 6/14/13 engage^ny 3.A.9

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. Pay attention to the + and – signs.

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

B

Number correct:

Name ____________________ Date ____________

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

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

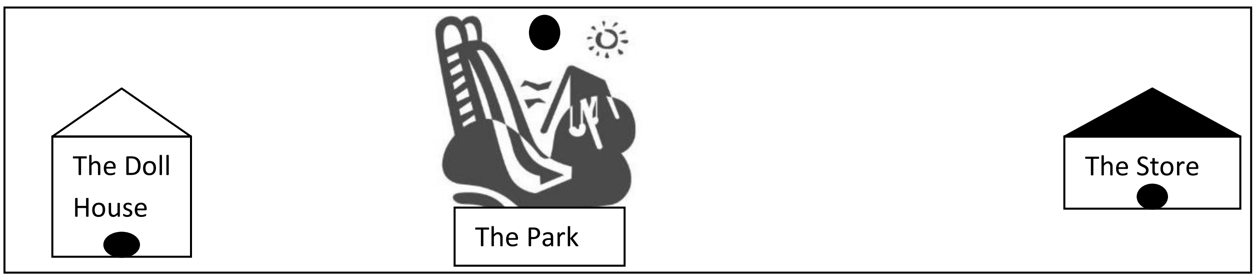
Name ______________________________ Date ______________

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!

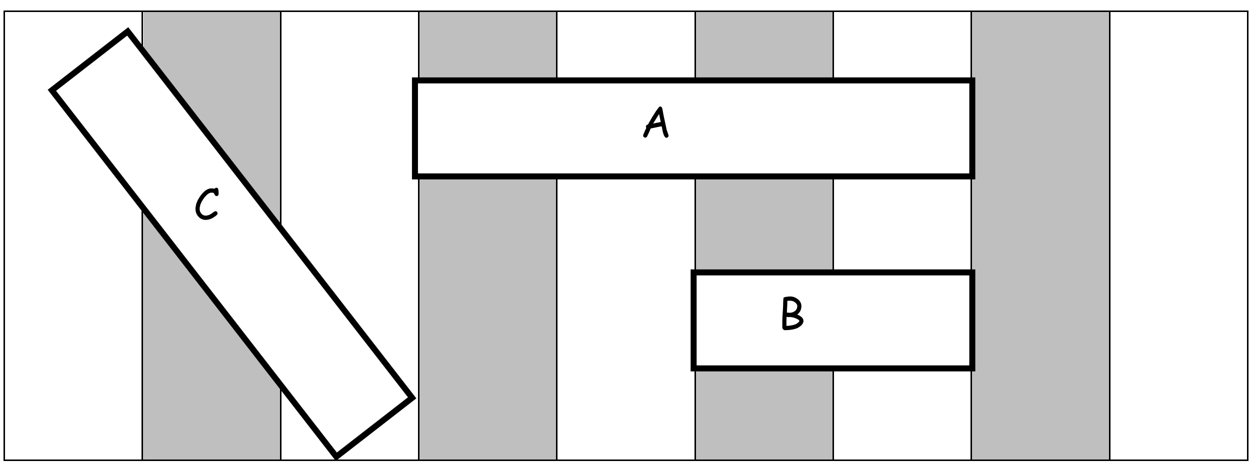
   Which is the longer path? Circle your answer.

   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? ________________

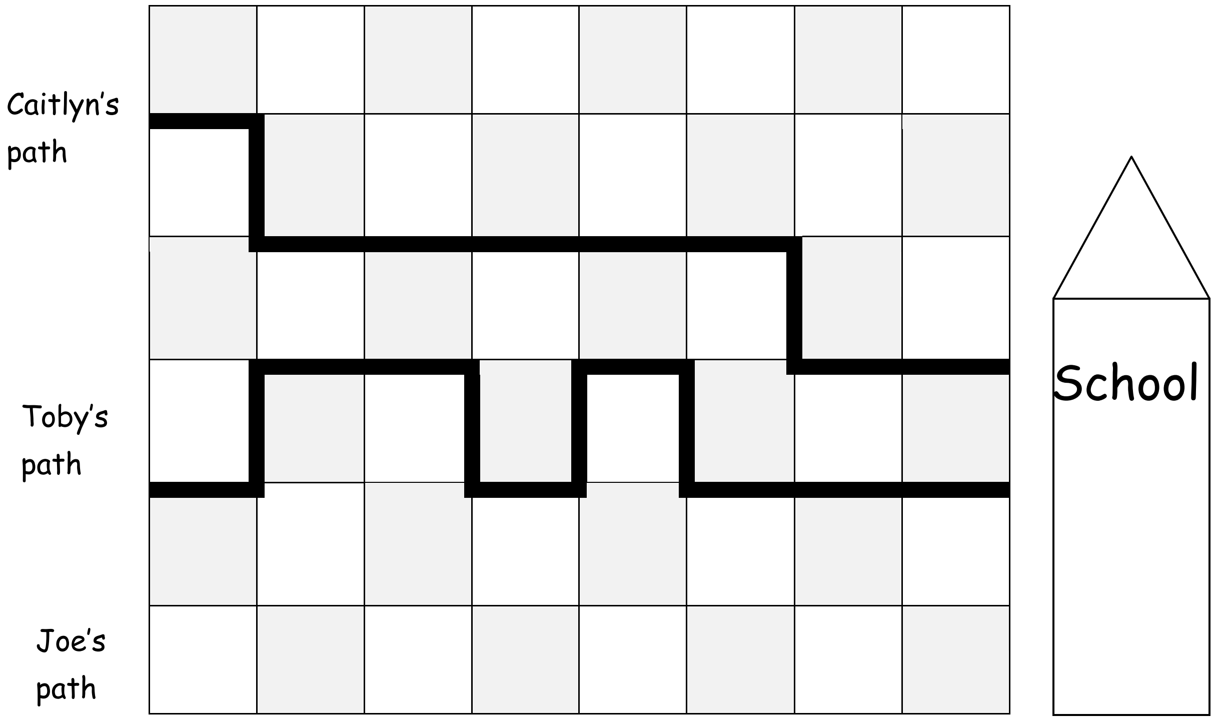
2. If Rectangle A is longer than Rectangle C, the longest rectangle is

   ______________.

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.

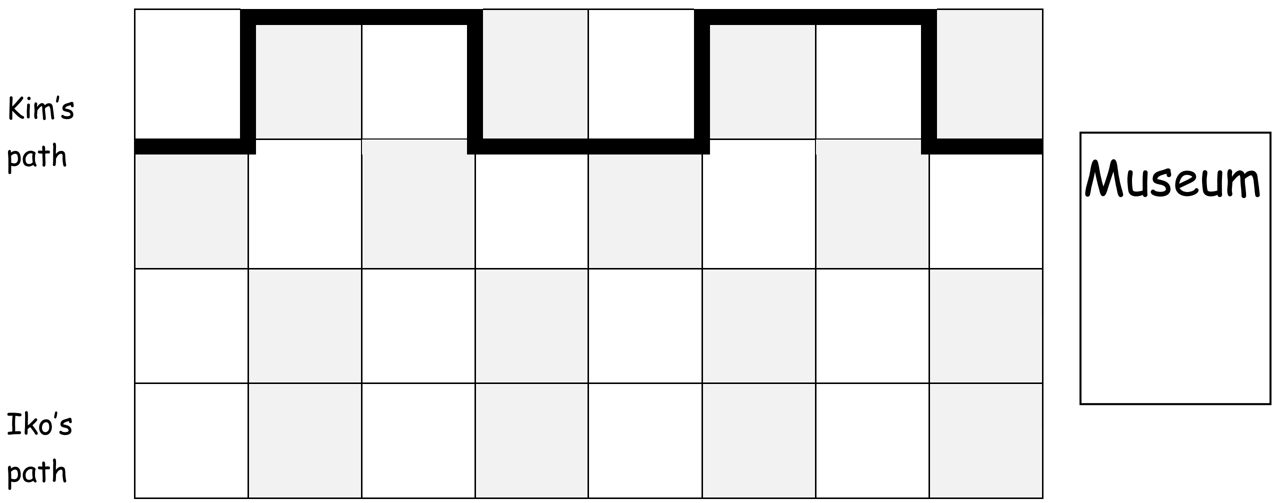
5. Who took the shortest path to school? ____________________

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.

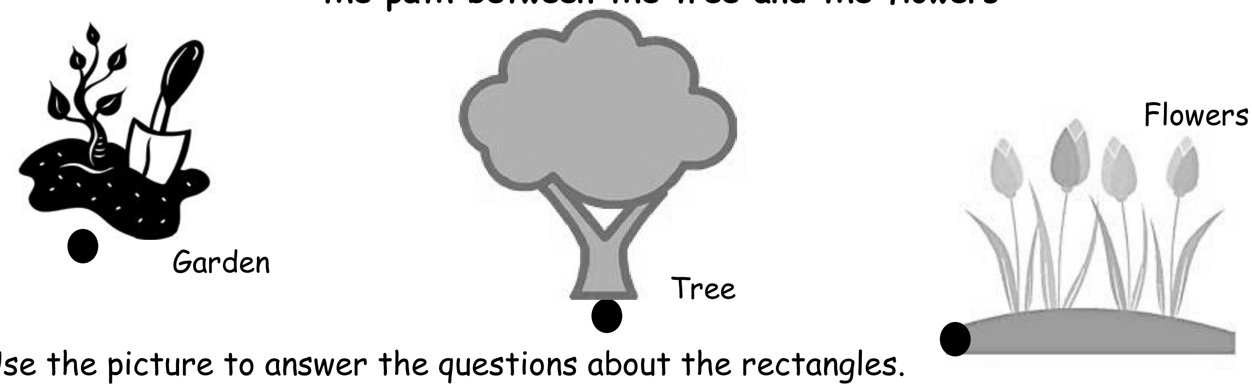
   How long is Iko's path?

Name ______________________________ Date ______________

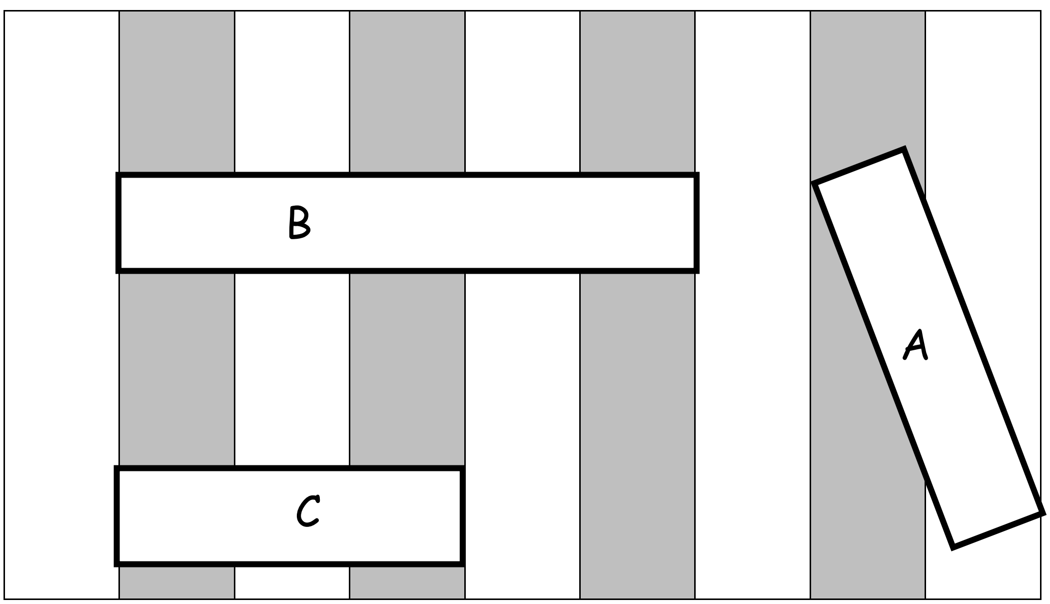
1. The string that measures the path from the garden to the tree is longer than the path between the tree and the flowers. Circle the shorter path.

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? ________________

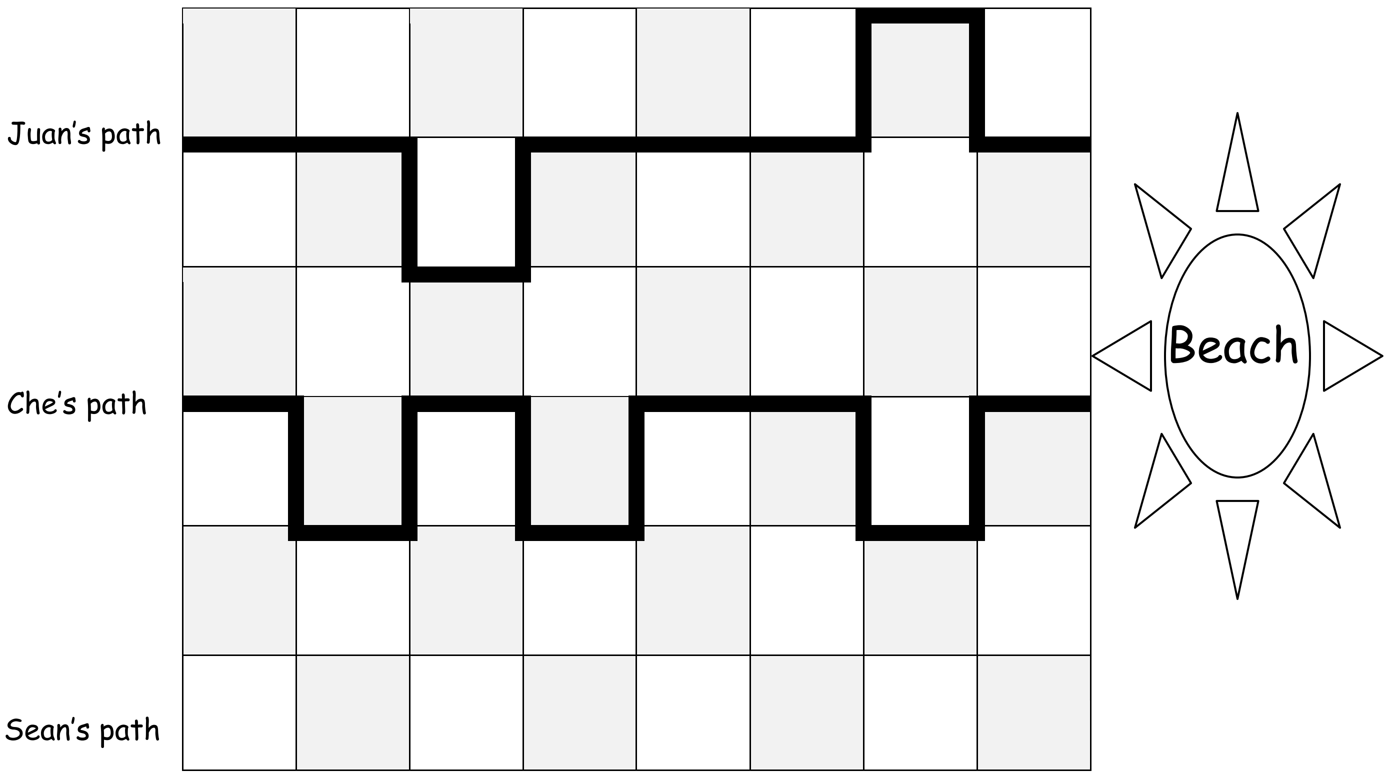
3. If Rectangle A is longer than Rectangle C, the shortest rectangle is

______________.

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.

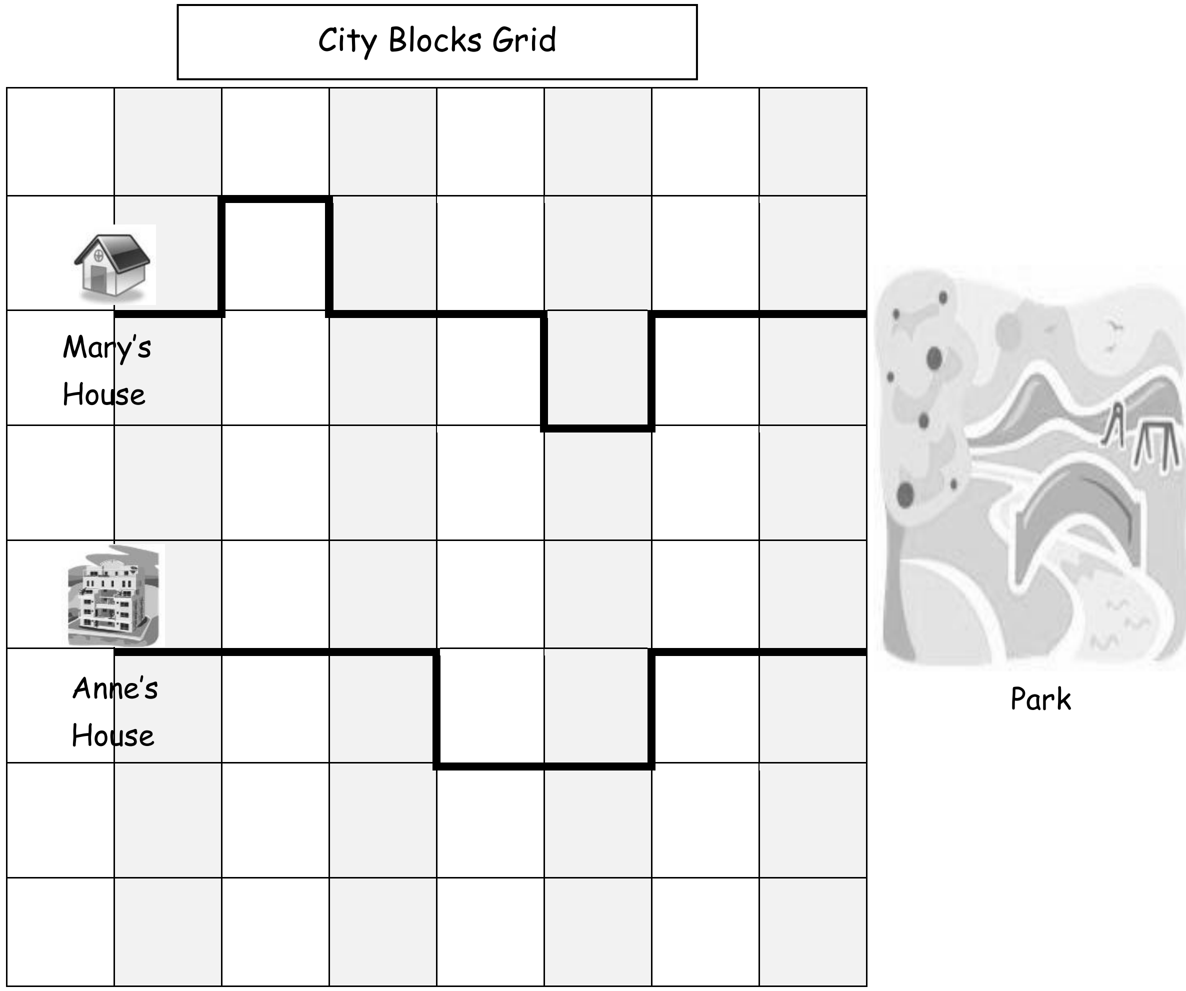
Circle the correct word to make the statement true.

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:

_______________ _______________ _______________


City Blocks Grid
Mary's House
Anne's House
Park