Differentiation in Investigation 2

Mathematics in This Investigation

The mathematics focuses on understanding length as a distance that can be measured, and developing strategies for accurately measuring distances.

Understanding the Mathematics

Students understand that using different-length units to measure the same distance will result in different measurements. They use craft sticks, basketball player steps, and baby steps to accurately measure distances. They understand the idea that the bigger the unit used to measure, the smaller the total number of units will be (and vice versa).

Option: Assign the **Extension** activity.

Partially Understanding the Mathematics

Students use craft sticks, basketball player steps, and baby steps to measure with a fair degree of accuracy, but occasionally leave gaps or overlaps as they line up units, or make other errors that result in inaccurate measurements. They are coming to understand that the unit being used to measure is important, and may be starting to explore the idea that the bigger the unit used to measure, the smaller the total number of units will be (and vice versa).

Option: Assign the **Practice** activity.

Not Understanding the Mathematics

Students use craft sticks, basketball player steps, and baby steps to measure but are still developing techniques for accurate measurement. They may not put units in a straight line, or start/stop measuring at the exact beginning/end of the object, or they may leave gaps or overlaps as they measure. They have difficulty with the concept that different-length measurements result in different measurements. They may not understand the importance of recording which unit they are using.

Option: Assign the **Intervention** activity.

Investigation 2 Quiz

In addition to your observations and students' work in Investigation 2, the Quiz (R46) can be used to gather more information.

Name _____ Date _____

Fish Lengths and Animal Jumps

Quiz

Choose the correct answer.

1. A rabbit jumped 6 kid steps. Then it jumped 7 kid steps. How far did it jump in all?

  Ⓐ 12 kid steps   Ⓒ 14 kid steps

  ● 13 kid steps   Ⓓ 15 kid steps

2. How many steps long is the strip?

  Ⓐ 6   ● $6\frac{1}{2}$ Ⓒ 7   Ⓓ $7\frac{1}{2}$

3. You measure from the teacher's desk to your seat. Which unit would give you the smallest number?

  Ⓐ paper clips   Ⓒ kid steps

  Ⓑ craft sticks   ● basketball player steps

4. Vic measured his desk with craft sticks. It was 7 craft sticks long. If he measured his desk with cubes, would it be more than 7 cubes or fewer than 7 cubes? Show how you know.

Answers will vary. Review students' work.

R46   **Unit 5**   **Use after Session 2.5.**

Intervention

20 MIN **PAIRS**

Measuring with Shoes

Use anytime after Session 2.1.

Math Focus Points

◆ Measuring length by iterating a single unit

◆ Comparing lengths to determine which is longer

◆ Describing measurements that are *in between* whole numbers of units

Vocabulary: distance

Materials: lengths of tape (from Session 2.1), yardstick (as needed)

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Choose 2 of the tapes A–H that students did *not* compare on *Student Activity Book* page 16. Draw attention to Tape [E] and Tape [H] and explain what each represents. **Tape [E] represents the distance between [Leah's] desk and [William's] desk. Tape [H] is the distance from the [rug] to the [door].**

Students use kid steps to measure the tapes. Students who struggle to keep their balance while measuring can use a yardstick to steady themselves. Or, have one person from each pair take off his or her shoes to use to measure.

As you measure the tape, help each other keep track of how many kid steps have been taken by counting aloud. Ask students to leave the shoe on the tape in the next-to-final step. Use this concrete image of the remainder to help the students discuss how long the remaining tape is. **So this shoe here was the 11th step. And a whole other shoe doesn't fit, but there's still some room on this tape.** Place the other shoe above that space on the tape. **How many steps should we say Tape [H] is?**

[11] steps

H
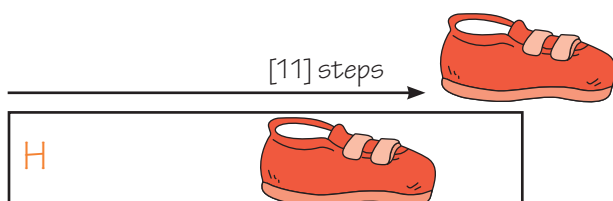
Students might say:

"It's a little more than [11]."

"It's less than [12], more like [11$\frac{1}{2}$]."

Students should record their measurements for Tape [E] and Tape [H]. **Is it farther from [Leah's] desk to [William's] desk or from the [rug] to the [door]?** Have students circle the farther distance. **How do you know?** Have pairs work together to verbalize how they know that one tape is farther than the other tape because it has a greater measurement.

If time allows, repeat the activity with 2 different lengths.

ELL **English Language Learners**

Partner Talk Have pairs discuss the following questions to practice their English. **Which tape is longer? How did you decide?** Beginning English Language Learners may complete the activity with a partner from their language group in their native language. More proficient speakers should explain how they know which tape measure is longer.

Additional Resource

Student Math Handbook pages 103–104

Practice

20 MIN   PAIRS

Measuring with Kid Steps

Use anytime after Session 2.1.

Math Focus Points

◆ Measuring length by iterating a single unit

◆ Comparing lengths to determine which is longer

Vocabulary: distance

Materials: R47

Name _____ Date _____
Fish Lengths and Animal Jumps

Measuring with Kid Steps

Count the number of kid steps for each distance in the classroom.
Answers will vary. Review students' work.

Distance	Kid Steps
1. From the teacher's desk to your desk.	
2. From the door to the window.	
3. From ___ to ___	
4. From ___ to ___	
5. From ___ to ___	

Use anytime after Session 2.1.   Unit 5 R47

On the board, list 3–4 pairs of places in the classroom that represent distances students have not yet measured.

Sink to Door

Door to Window

Calendar to Cubbies
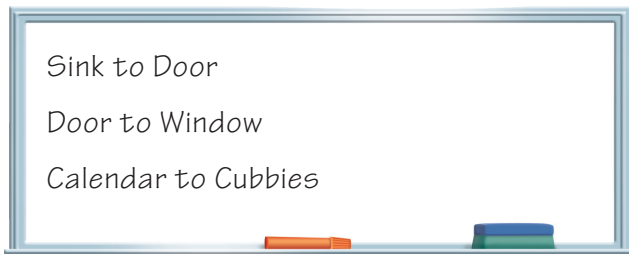
Today you are going to measure the distance between things in the classroom in kid steps. What have you been learning about how to measure accurately using kid steps?

Students might say:

"Make sure that for each step your heel touches your other toe."

"You have to keep track of the counting and the last step can be tricky if it's only part of a step."

Partners work together to measure the distances, but each student should take his or her own measurements and record them.

Have partners compare their results. **Did you get the same answers as your partner? Why or why not?** Students should recognize that the tape is the same length, but their shoes aren't the same size.

Look at the measurements you took with your kid steps. Which tape is longer? Which distance is farther? Students record the lengths in order, from the shortest to the longest measure. **Check with your partner. Do you agree about the order?**

Distribute copies of Measuring with Kid Steps (R47).

ELL **English Language Learners**

Provide a Word List Write the words *measure, length,* and *distance* on the board. Review their meanings with students. Encourage students to use these words as they discuss how they know one tape is longer than the other or one distance is farther than the other.

Additional Resource

Student Math Handbook pages 103–104

Extension

15 MIN   INDIVIDUALS

How Much Longer?

Use anytime after Session 2.1.

Math Focus Points

◆ Measuring length by iterating a single unit

◆ Comparing lengths to determine which is longer

Materials: *Student Activity Book* pp. 16–17, connecting cubes (as needed), R48

How Much Longer?

Find out which tape is longer and how much longer.

1. Tape A is 10 kid steps long.

Tape B is 14 kid steps long.

Which is longer? Circle.   Tape A (Tape B)

How much longer?   **4**   kid steps

2. Tape C is 6 kid steps long.

Tape D is 9 kid steps long.

Which is longer? Circle.   Tape C (Tape D)

How much longer?   **3**   kid steps

3. Tape E is 12 kid steps long.

Tape F is 5 kid steps long.

Which is longer? Circle.   (Tape E) Tape F

How much longer?   **7**   kid steps

R48 Unit 5   Use anytime after Session 2.1.

Explain that students are going to look back at the work they did measuring in kid steps and comparing those lengths. Refer them to *Student Activity Book* page 16.

When you compared Tape A and Tape B, which one was longer?

Your job today is to figure out *how much longer* Tape A is compared to Tape B. How could you figure that out?
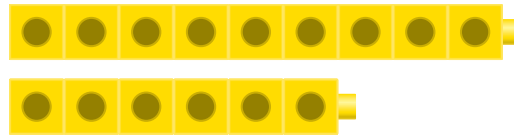

Students might say:

"Tape B is 6 kid steps. You need 3 more kid steps to get to 9. So Tape A is 3 kid steps longer than Tape B."

"Tape A is 9 kid steps. Tape B is 6 kid steps. I'll count up from 6: 7, 8, 9. It is 3 kid steps longer."

"Use cubes. Make a tower with 9 and a tower with 6 and compare them."

Students figure out how much longer the longer tape is for each of the problems on *Student Activity Book* pages 16–17.

Distribute copies of How Much Longer? (R48).

ELL   English Language Learners

Model Thinking Aloud Some students may have difficulty verbalizing their process for finding how much longer Tape A is compared to Tape B. Help these students by modeling your thinking aloud for one method. For example: **I know that Tape A is 9 kid steps. Tape B is 6 kid steps. To find out *how much longer* Tape A is, I can use cubes.** Line up the two cube trains. Then point to the cube train with 9 cubes. **I can see that there are 1, 2, 3 more cubes in this cube train.**

Additional Resource

Student Math Handbook pages 104–105