Inspect
CCR Performance Tasks

Math Grade 2: Solve Problems Using Measurement Concepts

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Content Bank for English/Language Arts and Math Grades 2 – High School	▪ More than 36,000 items ▪ More 1500 complex texts, including authentic permissioned texts ▪ Includes Literacy in History, Social Science, Science, and Technical Subjects
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Observational Tasks for English/Language Arts and Math Grades K - 1	▪ Developmentally appropriate for individual students and small groups

Inspect Assessment Content is available through a variety of assessment administration and data analysis platforms.

Inspect assessment content offers these benefits:

Native college- and career-ready and NGSS content prepares students to meet their post-secondary goals. Content re-aligned from legacy standards cannot do this.

Professional development embedded within content that

- shows the relationship between specific skills and higher-order thinking
- includes authentic, permissioned texts of appropriate complexity
- and documents student progress using DOK and learning progressions

Content that addresses your scope and sequence so that your assessments do not waste valuable instruction time

Help for teachers addressing the instructional shifts with content that elicits evidence of learning from each response

STUDENT LEARNING

NATIVE CCR & NGSS

SCOPE & SEQUENCE

EMBEDDED PD

INSTRUCTIONAL SHIFTS

We constantly update our content. Ask us about what's new!

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Student Rubric

This problem tests if you can:
• Estimate lengths;
• Compare lengths;
• Solve a hard problem using pictures, numbers, rulers, or other tools.

Your teacher will give your answer a 4, 3, 2, 1, or 0.

This is how you get a 4:
Your answer is correct and complete.
• You make good estimates of the lengths of Tasha's and Niki's feet.
• You estimate how much longer Tasha's foot is than Niki's and explain how you made your estimate.
• You estimate the number of steps that Tasha takes to cross the room and you explain how you made your estimate.

This is how you get a 3:
Your answer is correct but your explanations are not complete.
• You make good estimates of the lengths of Tasha's and Niki's feet.
• You estimate how much longer Tasha's foot is than Niki's but you do not completely explain how you made your estimate.
• You estimate the number of steps that Tasha takes to cross the room but you do not completely explain how you made your estimate.

This is how you get a 2:
You do not answer one part, or you make some mistakes.
• You make a good estimate of the length of Tasha's foot or the length of Niki's foot.
• You estimate how much longer Tasha's foot is than Niki's but you do not explain how you made your estimate.
• You do not solve part C or your estimate does not make sense.

This is how you get a 1:
You do not answer two parts or you make mistakes in all the parts;
• You make a poor estimate of the length of Tasha's foot or Niki's foot;
• You make a poor estimate of how much longer Tasha's foot is than Niki's foot;
• You do not solve the problem in the last part or your estimate does not make sense.

This is how you get a 0:
• You do not answer the question or your teacher cannot understand your answer.

Name:_____

Math Grade 2: Solve Problems Using Measurement Concepts

Complete all the tasks in the test booklet.

1 Tasha has a younger sister named Niki. Look at the picture of Tasha's foot and Niki's foot on the last page of this test booklet.

A. Estimate the lengths of their feet. Explain how you made your estimate.

Tasha's foot: _____inches

Niki's foot: _____inches

Go On

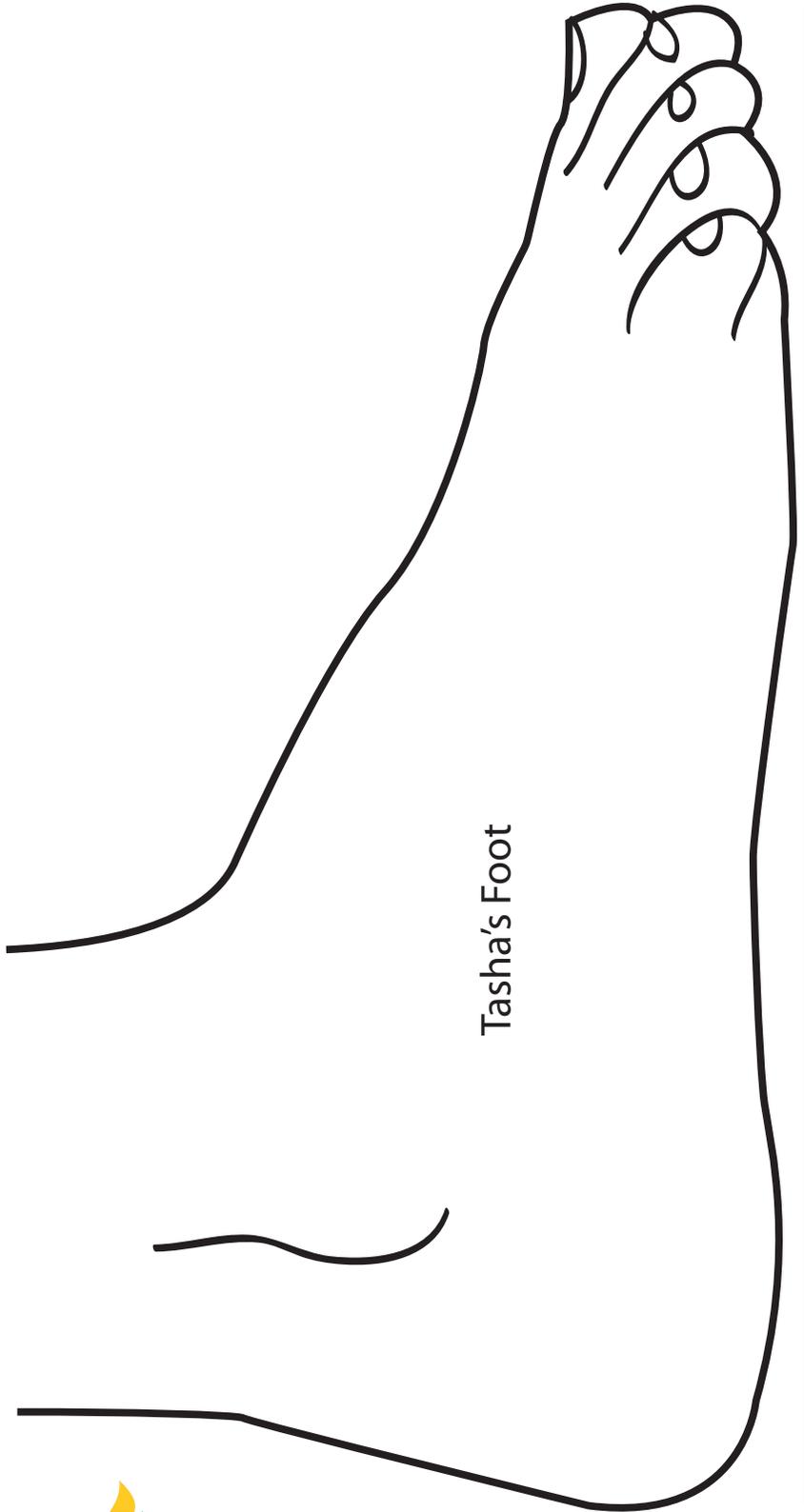B. About how many inches longer is Tasha's foot than Niki's foot? Show or explain how you found your answer.
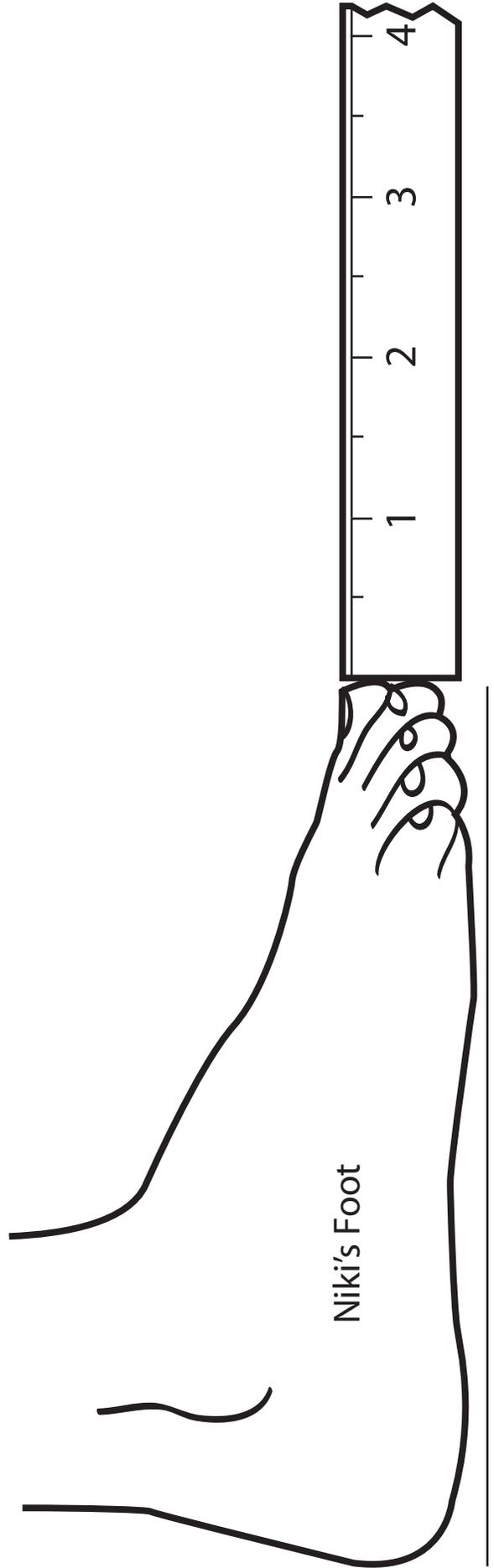
Go On

C. Niki walks heel-to-toe across the living room. She takes a total of 23 steps to cross the room. Tasha also walks heel-to-toe across the same room. About how many steps does Tasha take to cross the room? Use pictures, words, or numbers to explain how you found your answer.

Go On

D. Does your answer in part C make sense based on what you know about Tasha's feet and Niki's feet? Explain why.

Tasha's Foot

Niki's Foot

4

3

2

1

CCR Performance Tasks

Math Grade 2: Solve Problems Using Measurement Concepts

Teacher Guide

About the Teacher Guide

This document contains support materials for "Grade 2: Solve Problems Using Measurement Concepts."

This includes:

(a) The task and specific instructions
(b) The standards and depth of knowledge level of the task
(c) The scoring rubric
(d) Discussion questions
(e) Extension activities

These specifications have been included to help you connect the task to the Common Core content standards and the standards for mathematical practice. The rubric is designed to help you look for the development of mathematical practices in student work. It is also here to help you look for consistencies in student content errors that can help guide intervention and reteach strategies.

Test Definition File

Item #	Correct Answer	Practice Standard	Content Standards
1	See Scoring Rubric	Mathematical Practice 1	2.MD.2, 2.MD.3, 2.MD.4

SBAC Claims	PARCC Sub-Claims
1 and 2	A and D

Specific Instructions

Students will need to use the picture on the last page of their test booklet to solve the problem. Have the students remove the last page from the test booklet and use it as a reference.

The picture is included on the last page of this document as well.

If you want your students to work on part C as a group, you may encourage them to cut out the images of the feet and use them as tools to solve the problem.

Performance Task

Tasha has a younger sister named Niki. Look at the picture of Tasha's foot and Niki's foot on the last page of this test booklet.

A. Estimate the lengths of their feet. Explain how you made your estimate.

B. About how many inches longer is Tasha's foot than Niki's foot? Show or explain how you found your answer.

C. Niki walks heel-to-toe across the living room. She takes a total of 23 steps to cross the room. Tasha also walks heel-to-toe across the same room. About how many steps does Tasha take to cross the room? Use pictures, words, or numbers to explain how you found your answer.

D. Does your answer in part C make sense based on what you know about Tasha's feet and Niki's feet? Explain why.

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Standards Alignment

MP1 > DOK 3

Make sense of problems and persevere in solving them. -- Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

Content Standards

2.MD.2
Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.

2.MD.3
Estimate lengths using units of inches, feet, centimeters, and meters.

2.MD.4
Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.

SBAC Claims

Mathematics Claim #1:
Concepts and Procedures. Students can explain and apply mathematical concepts and interpret and carry out mathematical procedures with precision and fluency.

Mathematics Claim #2:
Problem Solving. Students can solve a range of complex well-posed problems in pure and applied mathematics, making productive use of knowledge and problem solving strategies.

PARCC Sub-Claims

Sub-Claim A:
Major Content with Connections to Practices. The student solves problems involving the Major Content for her grade/course with connections to the Standards for Mathematical Practice.

Sub-Claim D:
Highlighted Practice MP.4 with Connections to Content: modeling/application. The student solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge and skills articulated in the standards for the current grade/course (or, for more complex problems, knowledge and skills articulated in the standards for previous grades/courses), engaging particularly in the Modeling practice, and where helpful making sense of problems and persevering to solve them (MP.1), reasoning abstractly and quantitatively (MP.2), using appropriate tools strategically (MP.5), looking for and making use of structure (MP.7), and/or looking for and expressing regularity in repeated reasoning (MP.8).

Scoring Rubric

4 Point Response:
The response demonstrates a high level of understanding, including:

- A strong ability to estimate lengths with standard units (inches) using familiar referents (the partial ruler or the length of the page);

- A strong ability to solve a complex problem about measurement using pictures, modeling directly with objects, or using other strategies;

- A strong ability to check that an answer makes sense and explain why it does or does not make sense in a given problem context;

- A solid understanding that the smaller a unit, the more iterations of that unit are needed to cover a given length.

A level 4 response is characterized by:

- A good estimate of the lengths for Tasha's and Niki's feet, and a correct explanation for how the estimates were determined;

- An accurate estimate of the difference in lengths between Tasha's and Niki's feet, and a correct explanation for how the difference was determined;

- A reasonable estimate for the number of steps that Tasha takes, and a valid justification that indicates an understanding of the relationship between the unit and the number of units required for a given length.

A sample level 4 response follows.

Part A: Tasha's foot is 7-9 inches, and Niki's foot is 5-6 inches. (Because students are estimating, a length within reason should be accepted.)

Sample explanation 1: "The ruler in front of Niki's foot shows 4 inches. Tasha's foot is about twice as long as the ruler, so Tasha's foot is about 8 inches. Niki's foot is a little longer than the ruler, so it is about 5 inches."

Sample explanation 2: "The sheet of paper is 11 inches wide. Tasha's foot is a little less than that, so I think it's about 9 inches long. Niki's foot is about half the length of the paper, so it is about 6 inches long."

Part B: About 3 inches.

Sample explanation 1: "I think Tasha's foot is about 8 inches, and I think Niki's foot is about 5 inches, so Tasha's foot is 3 inches longer because 8 - 5 = 3," or an answer consistent with the estimates from part A.

Sample explanation 2: "The ruler shows that Tasha's foot is about 3 inches longer than Niki's foot."

Part C: Encourage students to use creative strategies to model and solve this problem. They might cut out the pictures of the feet and mark off distances on large paper on the floor. The might make a drawing to show 23 of Niki's steps and then draw each of Tasha's steps in another row to cover the same distance, then count the steps in the drawing. More advanced students might reason about the size of the steps as follows: "Since Tasha's foot is almost two times as long as Niki's foot, it takes Tasha a little more than half the number of steps as Niki. I guess that it takes Tasha about 15 steps to cross the living room." Encourage students to check their reasoning with direct models.

3 Point Response:
The response demonstrates a strong understanding, but the work contains minor errors or the explanations are incomplete. A level 3 response is characterized by:

- A strong ability to estimate lengths with standard units (inches) using familiar referents (the partial ruler or the length of the page);

- An ability to solve a complex problem about measurement using pictures or direct modeling. The student may need support developing a strategy, but can execute the strategy correctly once developed. The student may struggle with explaining reasoning or solution strategies;

- An ability to check that an answer makes sense. The student may need prompting to check the reasonableness of answers and may struggle to explain why the answer does or does not make sense;

- A strong understanding that the smaller a unit, the more iterations of that unit are needed to cover a given length, with a reasonable estimate for the number of steps required.

2 Point Response:
The response demonstrates a basic but incomplete understanding. A level 2 response is characterized by:

- A basic ability to estimate a length with standard units (inches) using familiar referents and/or use a standard tool (ruler) to measure length, possibly with some minor errors in accuracy;

- A weak ability to solve a complex problem about measurement using pictures or direct modeling. The student needs support to develop and execute a strategy. The student struggles with explaining reasoning or solution strategies;

- A weak ability to check that an answer makes sense. The student may need prompting to check the reasonableness of answers and cannot think of how to check the reasonableness;

- An incomplete understanding that the smaller a unit, the more iterations of that unit are needed to cover a given length.

1 Point Response:
The response demonstrates minimal understanding. A level 1 response is characterized by:

- A weak ability to estimate a length with standard units (inches) using familiar referents and/or use a standard tool (ruler) to measure length. The student makes conceptual errors or just guesses wildly.

- No ability to solve a complex problem about measurement.

- No ability to check that an answer makes sense;

- Little or no understanding that the smaller a unit, the more iterations of that unit are needed to cover a given length.

0 Point Response:
There is no response, or the response is off topic.

Discussion Questions

Use the following questions to stimulate discussion:

1. How can you estimate the length of everyday objects?

Possible Response: *Use common items for which you know the dimensions as a comparison. For instance, a piece of paper is 8.5 inches by 11 inches, a dollar bill is about 2.5 inches by 6 inches.*

2. If we put rulers end-to-end from one side of the room to the other, how many would we need? What if we used yardsticks instead? Would we need more or fewer yardsticks? Why?

Possible Response: *The number of rulers will be more than the number of yardsticks, because the rulers are shorter. It takes three rulers to make the length of one yardstick. (This can be demonstrated in the classroom. As a follow-up, you could ask the same question using two items of different sizes, such as a shoe and a book. Use two items that are not normally used for measuring, to make the concept explicit without numbers getting in the way.)*

Extension Activities

1. Develop common referents for estimation, such as things that are one inch or one foot long, that weigh a gram or a pound, or that contain one ounce of fluid.
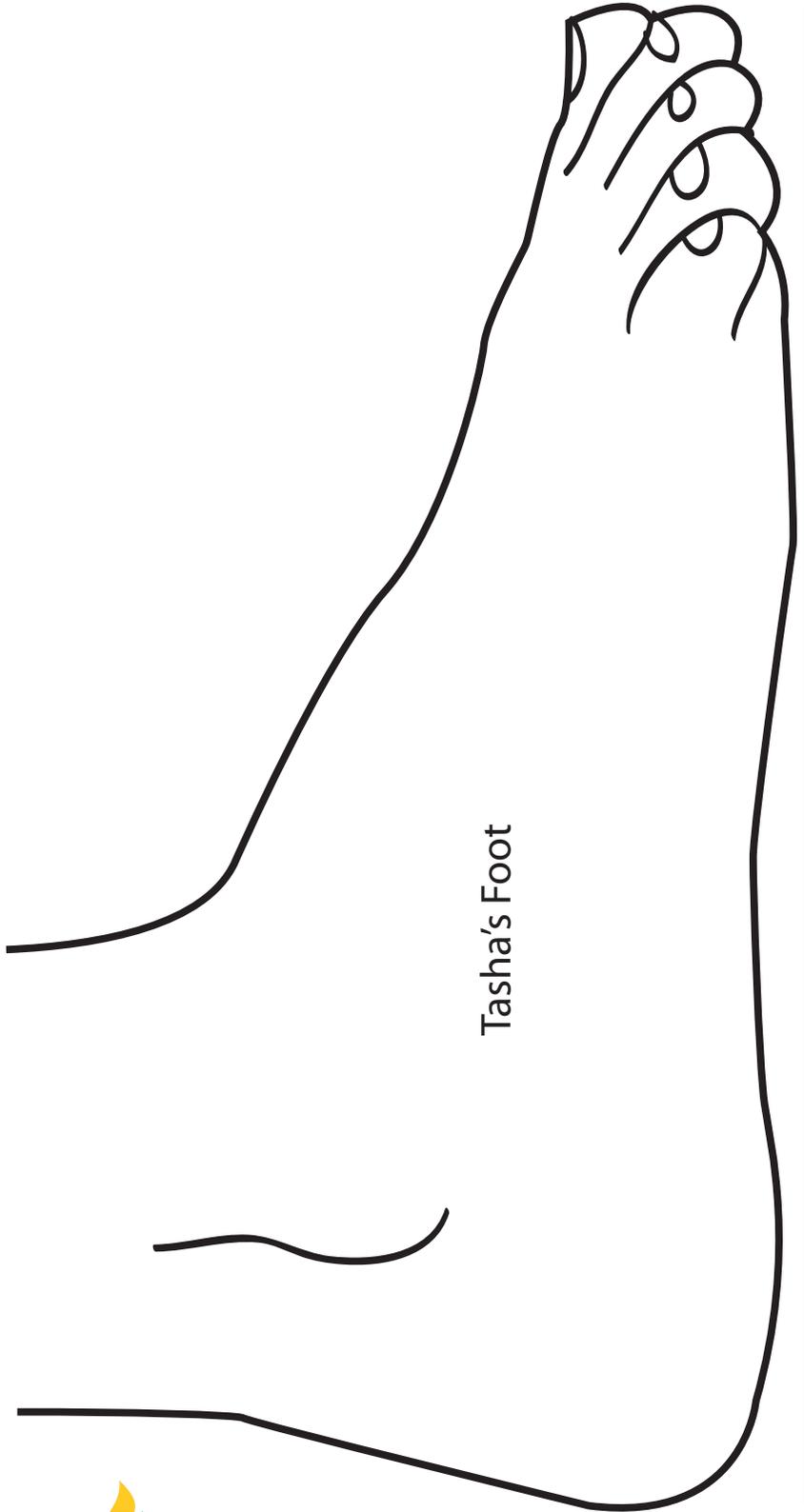
Example: Create a bulletin board with a section for each common unit, and let students add items to each section that represent the requisite measure. For instance, students might add paper clips (a standard paper clip weighs about one gram) or post a picture of their knuckle (which is about one inch long).

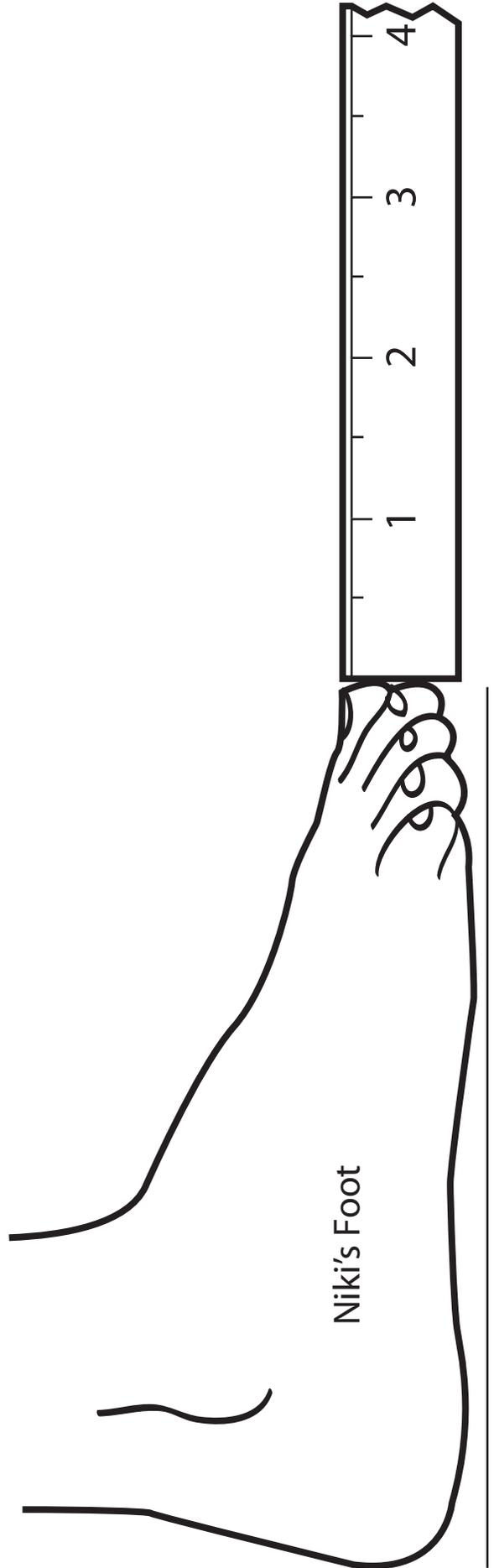2. Understand how to use common measurement tools.

One of the most common mistakes that students make is to align the "1" on a ruler with the edge of an object, instead of aligning the edge of the ruler where "0" occurs. An effective technique for overcoming this error is to reinforce that the length of an object is the difference between the markings at either end.

Example: A four-inch object could be measured by aligning a ruler with "3" at one end of the object and "7" at the other, and 7 – 3 = 4. When students measure the same object by placing "1" at an end of the object, note that "5" occurs at the other end, and 5 – 1 = 4. (Students intuitively realize that the length of the object must remain the same, even though the markings on the ruler were different.) When the ruler is aligned with "0" at one end of the object, the other end will occur at "4," and the length is 4 – 0 = 4 inches.

3. Ask students to measure their desks, books, shoes, hands, and any other items that can be found in the classroom. Then ask them to write a note to a friend explaining how a ruler can be used to measure length.

Tasha's Foot

Niki's Foot

4

3

2

1