

Core Content

Cluster Title: Measure and estimate lengths in standard units.
Standard 3: Estimate lengths using units of inches, feet, centimeters, and meters.
MASTERY Patterns of Reasoning:
<p>Conceptual:</p> <ul style="list-style-type: none"> Students will understand the length of inches, feet, centimeters, and meters. Students will understand the value of using a point of reference when estimating length (e.g., the top joint of your thumb is approximately an inch). Students will understand how to check the reasonableness of an estimate and adjust as needed. <p>Procedural:</p> <ul style="list-style-type: none"> Students can estimate a length, then justify the reasonableness of the estimation and the unit of measurement used. Students can estimate a length, measure only a small section, then adjust the estimation as needed. <p>Representational:</p> <ul style="list-style-type: none"> Students can record the estimation of an object’s length and specify the purpose for the unit of measurement used. Students can show justification for use of chosen unit of measurement.

Supports for Teachers

Critical Background Knowledge
<p>Conceptual:</p> <ul style="list-style-type: none"> Students will understand linear measurement. Students will understand iterating (using one object, end to end, to measure another object). Students will understand units of measure (inches, feet, centimeters, meters). Students will understand the concept of measuring length by comparing units. They will identify which units are smaller and larger, and compare sizes.

<p>Procedural: Estimation strategies should be taught and then estimation incorporated into all other measurement activities for maximum learning. Students will know how to measure objects to check reasonableness of estimates. Students can use measurement tools correctly (e.g., start with 0, not 1, on the measurement tool).</p> <p>Representational: Students can record length and unit of measure.</p>	
<p>Academic Vocabulary and Notation estimate, inch, foot, ruler, centimeter, meter, meterstick, measuring tape, length, customary, metric, measure, unit(s)</p>	
<p>Instructional Strategies Used</p> <p>Practice estimating and measuring often.</p> <p>Use a three-column chart to track estimates, actual measurements, and the difference.</p> <p>Use parts of students' bodies to measure classroom objects and make an estimate, then measure with a standard tool (e.g., measure with the top joint of your thumb and then test with inches).</p> <p>Shel Silverstein's poem "How Many, How Much" is freely available on the Internet. Read the poem to the students and have them discuss in small groups which parts of the poem are measureable, and which are not. Which parts could be estimated in inches and centimeters? Which in what other measurement system? How might you estimate them?</p>	<p>Resources Used</p> <p>Adler, David A. <i>How Tall, How Short, How Far Away?</i> Holiday House, 2000.</p> <p>Murphy, Stuart. <i>Betcha (MathStart Level 3)</i>. HarperCollins, 1997.</p> <p>Clement, Rod. <i>Counting on Frank</i>. Houghton Mifflin School, 1994.</p> <p>Silverstein, Shel. "How Many, How Much" from <i>A Light in the Attic</i>. HarperCollins, 1981. Available at http://www.youtube.com/watch?feature=endscreen&NR=1&v=9sbUkLHz5UE&safety_mode=true&persist_safety_mode=1 or http://www.manmachine.org/gj/silverstein.html or http://smiley00.tripod.com/poem228.html</p>

Assessment Tasks Used	
<p>Skill-Based Task: Estimate the length of your hand. Test your estimate.</p> <p>Think about your principal's height. Which is the best estimate of his/her height? Will you estimate in centimeters, inches, feet, or meters? Why?</p> <p>Estimate the distance from your desk to the door in feet. Make the same estimate in inches. Why is the number of inches different from the number of feet?</p>	<p>Problem Task: You need to tell your Grandma how tall you are, but you don't have anything to measure yourself with. Tell how tall you think you are using inches, feet, centimeters, or meters. What unit of measurement did you use? Why? How do you know that your estimate is reasonable?</p>