

Bachelor of Education (Elementary) & Bachelor of Education (Secondary) STEM/BETT Lesson Plan

Measuring Objects with Non-Standard Units – Popsicle Sticks,

Lesson Title: Hands, and Tubes Lesson # 7 Date: April 20, 2026
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Rationale:

This lesson builds on students’ prior experiences with non-standard measurement by introducing estimation as a key mathematical thinking skill. Students move beyond simply measuring to predicting and then verifying, which deepens their understanding of measurement as a purposeful process rather than just a procedure.

Using a variety of non-standard units (hands, popsicle sticks, tubes) helps students recognize that:

- Different units can measure the same object,
- Measurements depend on the size of the unit used,
- Accuracy requires consistent alignment and counting.

This hands-on, exploratory approach strengthens number sense, reasoning, and comparison skills while reinforcing that measurement is both a thinking and checking process. It also prepares students for later lessons where they will transition to more standardized tools.

Core Competencies:

Communication	Thinking	Personal & Social
Collaborating <i>Working Collectively</i> Students combine their efforts with those of others to effectively accomplish learning and tasks. As members of a group, they appreciate interdependence and cooperation, commit to needed roles and responsibilities, and are conscientious about contributing. They also negotiate respectfully and follow through on plans, strategies, and actions as they share resources, time, and spaces for collaborative projects.	Critical Thinking & Reflective Thinking <i>Reflecting & Assessing</i> Students apply critical, metacognitive, and reflective thinking in given situations, and relate this thinking to other experiences, using this process to identify ways to improve or adapt their approach to learning. They reflect on and assess their experiences, thinking, learning processes, work, and progress in relation to their purposes. Students give, receive, and act on feedback and set goals individually and collaboratively. They determine the extent to which they have met their goals and can set new ones.	

Big Ideas (Understand)

Solids and geometric figures have characteristics that can be described, measured, and compared.

Learning Standards

(DO)

(KNOW)

Learning Standards - Curricular Competencies	Learning Standards - Content
Reasoning & analyzing <ul style="list-style-type: none"> Estimate reasonably Use reasoning to explore and make connections Develop mental math strategies and abilities to make sense of quantities Understanding & solving <ul style="list-style-type: none"> Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving 	<ul style="list-style-type: none"> Direct measurement with non-standard units (non-uniform and uniform)

Instructional Objectives & Assessment

Instructional Objectives (students will be able to...)	Assessment
<ul style="list-style-type: none"> Estimate lengths of objects using popsicle sticks, hands, or connecting tubes Measure accurately using non-standard units Compare measurements and determine which objects are longer or shorter 	<ul style="list-style-type: none"> Observation of estimating and measuring Accuracy of recorded measurements

Prerequisite Concepts and Skills:

Students should already be able to: <ul style="list-style-type: none"> Measure objects using non-standard units (e.g., cubes, pennies) Line up units end-to-end with no gaps or overlaps Count objects accurately Use comparison language (longer, shorter, same length) Understand that measurement tells “how long” something is Participate in simple estimation discussions (even informal guesses)

Indigenous Connections/ First Peoples Principles of Learning:

Learning is holistic, reflexive, reflective, experimental, and relational (focused on connectedness, on reciprocal relationships, and a sense of place): This unit & its lessons are heavily designed to use manipulatives as a source of learning. The students using their hands and logic explore the role of measurement and the different things that can be used to do that.

Universal Design for Learning (UDL):

Multiple Means of Representation <ul style="list-style-type: none"> Teacher models estimation vs. measuring using concrete objects Visual demonstration of proper alignment (touching units, no gaps) Use of magnifier/projector for clear, enlarged examples Anchor vocabulary: <i>estimate, measure, longer, shorter, units</i> Multiple Means of Engagement <ul style="list-style-type: none"> Hands-on manipulatives Variety of measuring tools to maintain interest Prediction element (students naturally enjoy “guessing then checking”) Opportunities for discussion: “Was your estimate close?” Multiple Means of Expression <ul style="list-style-type: none"> Students record numbers on worksheets
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- Students demonstrate understanding through:
 - measuring
 - comparing

Differentiate Instruction (DI):

- Use partner support for counting and alignment
- Prompt with guiding questions:
 - "Where should your first unit go?"
 - "Are your units touching?"
- Provide & discuss the starting points on objects
- One-on-one check-ins to support counting and alignment
- Provide extra time for completion

Extensions:

- Ask students to compare measurements across tools:
 - "Why did the number change when you used hands vs. cubes?"
- Measure classroom objects not on the worksheet

Materials and Resources

- Video: <https://www.youtube.com/watch?v=q8o7n-A0SC0>
- Worksheet: Estimating and measuring a chair with popsicle sticks, hands, paper clips, and connecting tubes (in their measurement math booklets)
- Manipulatives: popsicle sticks, connecting cubes, paper clips, & markers (use as unit of measurement)
- Small baskets to hold the manipulatives on each table
- Each group will need a chair
- Pencils
- Erasers
- Laptop
- Projector
- Magnifier
- Two objects to model estimating & then measuring with paper clips (i.e. a marker & a Hot Wheels car)

Lesson Activities:

Teacher Activities	Student Activities	Time
<p>Introduction (anticipatory set – "HOOK"):</p> <p>Quick Review</p> <p>The teacher will:</p> <ul style="list-style-type: none"> • Play the video: https://www.youtube.com/watch?v=q8o7n-A0SC0 • "Do we remember those rules when we measure something?" • "We need to make sure that we measure from the end of the object." • "We need to make sure that we are using units that are the same size." • "We need to make sure that we line the measuring objects in a line." 	<ul style="list-style-type: none"> • Students will listen to the teacher • Students will watch the video • Students that want to answer the questions will raise their hand 	4 min

<ul style="list-style-type: none"> • “All of these things make it fair when we measure.” • “Today we will practice estimating first, then measure using paper clips, popsicle sticks, hands, markers, and cubes.” 		
<p>Body: Modeling</p> <ul style="list-style-type: none"> • Model measuring one object with paper clips (i.e. a marker): <ul style="list-style-type: none"> ○ Make a guess first (estimate) ○ Line up paper clips from one end to the other ○ Count carefully ○ Record number on whiteboard • Repeat quickly connecting cubes for a second object (i.e. hot Wheels car). • Emphasize: <ul style="list-style-type: none"> ○ Units must touch each other (no gaps) ○ Count slowly and carefully ○ Compare estimated vs. actual measurement 	<ul style="list-style-type: none"> • Students will listen to the teacher • Students will raise their hand if they want to ask or answer a question 	4 min
<p>Closure: Independent Practice</p> <ul style="list-style-type: none"> • In their table partners, students will work together to complete the worksheet measuring with popsicle sticks, hands, and tubes • Encourage: <ul style="list-style-type: none"> ○ Estimate first, measure second ○ Record numbers carefully ○ Compare results to identify longest and shortest • Teacher circulates to: <ul style="list-style-type: none"> ○ Support alignment and counting 	<ul style="list-style-type: none"> • Students will work with their table partners to estimate and measure a chair using the manipulative objects given 	17 min

Organizational Strategies:

<ul style="list-style-type: none"> • Pre-set table baskets (each table has a basket with popsicle sticks, snap cubes, markers, & paper clips) • Defined workspace (students measure only at their desk space to reduce movement and distractions) • Modeling where materials go (top of desk vs. working area). • “Estimate → Measure → Record” Routine <ul style="list-style-type: none"> ○ Post or verbally repeat this 3-step process: Estimate (guess), measure (build with units), & then record (write the number) • Material Expectations Anchor (Quick reminder before starting: Units touch, start at the end, & count slowly) • Early Finisher Plan: Have a clear, automatic extension (see below) so students don’t interrupt others (Baldev & Emma P.) • Teacher Circulation

Proactive, Positive Classroom Learning Environment Strategies:

- Normalize estimation as "smart guessing" (i.e. it's okay for your estimate to be incorrect, that's why we measure)
- Praise the process not just accuracy
- Clear & positive expectations
- Offer an error friendly environment
- Choice of measurement tools

Extensions:

Classroom Measurement Hunt

Students find:

- 1 object longer than their pencil
- 1 object shorter than their hand
- 1 object about the same length as their glue stick

Create-Your-Own Measuring Tool

Students use:

- linking cubes
- or draw their own "unit strip"

Then measure an object and share:

- "My object is ___ units long."

Reflections (if necessary, continue on separate sheet):