

Next Steps and Instructional Moves

The intended purpose of this document is to provide teachers with a tool to determine student understanding and suggest instructional moves that may help guide a student forward in their learning of a concept or standard. This guide is not an exhaustive list of strategies.

Third Grade: Cluster 8

Using Tools to Measure Length, Weight and Capacity

NC.3.MD.2 Solve problems involving customary measurement.

- Estimate and measure lengths in customary units to the quarter-inch and half-inch, and feet and yards to the whole unit.
- Estimate and measure capacity and weight in customary units to a whole number: cups, pints, quarts, gallons, ounces, and pounds
- Add, subtract, multiply, or divide to solve one-step word problems involving whole number measurements of length, weight, and capacity in the same customary units.

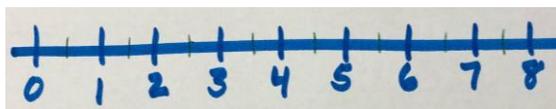
Not Yet

Students that are consistently scoring “Not Yet” may be having trouble measuring or estimating length, capacity, and/or weight within customary units. Students more than likely are also having trouble solving one-step word problems measuring length, weight, and capacity.

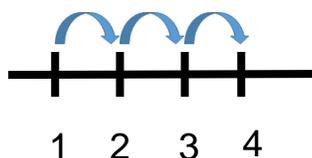
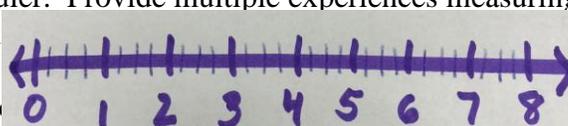
Next Steps:

For students having trouble reading or measuring with a ruler:

- Exploring Length Situations [lesson](#)
- Have students measure lengths using only a special ruler with only 1-inch increments. This ruler allows them to look at the whole pieces and not just parts of the whole as they would with $\frac{1}{2}$ or $\frac{1}{4}$ inch rulers. After students become proficient, have them measure with rulers that have only whole inches and half inches. When focusing on the $\frac{1}{2}$ inch portion, students can connect their prior knowledge of half from fractions in second grade and from Cluster 7 on fractions. Ask students to measure a variety of objects to the nearest half inch. Then move to rulers that are marked to the fourth of an inch.



- Ask students to label a ruler, especially focus on the leading edge so they understand they must start at **ZERO** on the ruler. Provide multiple experiences measuring with a ruler and have students self-check their measurements from the ZERO.
- Have students practice using a ruler with markings from 0 to 8 inches. Remind them that they must count the length from the ZERO. (See example below)



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For students having trouble estimating length:

- Pass out a few everyday classroom items and have the students measure them. For example, students would measure an unsharpened pencil to 7 inches. Students then use this pencil to estimate a variety of other objects in the room. A crayon is about half as long as an unsharpened pencil, so it is about 3 ½ inches. The edge of the front board is about 5 times as long, so a good estimate would be 35 inches. It is important to note that by having students first find the actual measurement of the pencil they have the experience of seeing what the actual measurements shows, thus making estimating the lengths of other objects less abstract. This can also decrease the number of unreasonable estimates.
- Refer to “benchmark items”, such as a colored tile is about 1 inch, a floor tile is about 1 foot, and the width of a door is about 3 feet which is 1 yard. Post these measurements in the classroom for reference.

For students having trouble measuring weight:

- Allow students multiple opportunities to weigh items (could be from the classroom or brought from home.) Measure them in ounces and pounds on a scale. An anchor chart posted in the classroom referring to how to use a scale is helpful. Students solidify the idea of measuring weight of an object when they have many experiences using the scale.
- Have students find and use benchmark weights of objects for reference. For example, a slice of bread is about an ounce. A bottle of salad dressing and a football each weigh about a pound.
- Provide opportunities and pose questions to allow students to discuss the similarities and differences between an ounce and a pound. It is also important for students to see how these items compare using a balance scale and holding the items in their hands to have a better understanding of what one pound feels like.

For students having trouble estimating weight:

- Have students gather items and measure them in ounces and pounds. First have students estimate the weight by comparing it to a slice of bread (ounce) and a football (pound). Comparing to a benchmark unit then measuring will allow students and opportunity to build understanding of the units of weight thus increasing their ability to estimate. Rich experiences weighing objects helps students estimate.

For students having trouble measuring capacity:

- Exploring Capacity Containers [lesson](#)
- Provide opportunities to use tools that measure in cups, pints, quarts, and gallons. Create a station that has kitchen tools such as measuring cups and capacity objects such as water, rice, sand, beans or pasta.
- Create an anchor chart with students that builds understanding of the benchmark units for 1 cup, 1 pint, 1 quart, and 1 gallon.
- Read aloud Room for Ripley by Stuart J. Murphy. Have students actively measure with one cup measuring cups as you are reading the text. Encourage students to construct a visual image of the relationship between cups, pints, quarts and gallons. The story provides great context for building understanding of this relationship.

For students having trouble estimating capacity:

- After multiple experiences measuring with capacity tools, ask students to estimate the capacity of various containers and then have them fill the container with water, rice, beans

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or pasta by scooping 1 cup at a time. Students will then determine how close they were between their actual measurement and their estimate.

For students having trouble solving one step word problems:

- Pose questions that ask them to add, subtract, multiply or divide quantities. One of the first questions to ask after reading the word problem is “What is the unit in our word problem?” Answers may include ounces, pounds, inches, feet, yards, cups, pints, quarts or gallons. This allows the students to “see” the unit in their mind giving a deeper understanding of the word problem before they solve. They can also select from a group of measuring tools as the first step of the word problem.
 - Kelly went on a field trip to the NC Zoo in Asheboro. She saw a zebra that weighed 812 pounds and a lion that weighed 454 pounds. How much more does the zebra weigh than the lion?
 - What is the unit in our word problem? Pounds (1 pound = a football)
 - What is the operation we need to use? Justify your thinking.
 - Use strategies to calculate the difference in the weight.
 - Drew is a contractor who builds houses. He must cut 40 feet of wood to make seats for a homeowner’s new porch. Each section of seating is 8 feet long. How many sections can he cut?
 - What is the unit in our word problem? Feet (1 foot = length of a ruler)
 - What is the operation we need to use? Justify your thinking.
 - Use strategies to calculate the answer.
- Create an anchor chart to help students build understanding of all measurement units (weight, capacity, length).
- Ask the student to draw pictures of the objects from the problem. Once they have drawn the items, ask the student what they believe a reasonable measurement would be and what measurement they would use for the object. Be sure they justify their reasoning.

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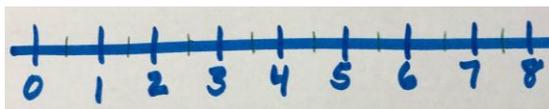
Progressing

Students that are consistently scoring “Progressing” have strategies to use for measuring or estimating length, weight and capacity; however, they have inconsistencies using their strategies. Inconsistencies would include using a ruler and estimating the measurements of objects with length, capacity, and weight.

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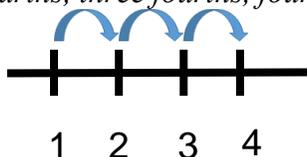
For students inconsistently measuring and estimating length with a ruler:

- Have students measure a variety of objects using rulers with only whole and $\frac{1}{2}$ inch increments. Once they have mastered this ask students have students measure using rulers with increments to the nearest $\frac{1}{4}$ inch. Create a set of these specific rulers to scaffold learning for students.



- Provide opportunities for students to measure using a ruler. Highlight the whole inch with a black sharpie, the $\frac{1}{2}$ inch increment with a green sharpie, and the $\frac{1}{4}$ inch increment with a red sharpie. The color coding will serve as a visual cue for each fractional increment.
- Practice skip counting by $\frac{1}{4}$ inch increments on a ruler. Remind the student to begin at ZERO and count the jumps to the tick marks of the $\frac{1}{4}$ inch just as they would on a number line.

Say: “one fourth, two fourths, three fourths, four fourths which is one whole”



For students inconsistently estimating and measuring weight:

- Provide students with experiences to use a balance scale to weigh objects. Adding whole increments in ounces will allow students to weigh accurately.
- Revisit the benchmark items such as a slice of bread weighs about an ounce and a football weighs about a pound.
- Read aloud, On the Scale, A Weighty Tale by Brian P. Cleary. Create a math station for students to explore the weight of objects students read about in the story. This rhyming book is high interest and provides students with fun ways to measure the weight of objects.

For students inconsistently estimating and measuring capacity:

- Provide opportunities to use tools that measure in cups, pints, quarts, and gallons. Create a station that has kitchen tools such as measuring cups and capacity objects such as water, rice, sand, beans or pasta.
- Activity: Create a kitchen math station/center for students. Provide recipes and a variety of measuring tools for students. Ask them to measure our liquid and dry ingredients so they can have rich experiences with math in the context of real world cooking.
- After multiple experiences measuring with capacity tools, ask students to bring in a variety of jars and containers. Have students estimate the capacity of the container then have them fill the container with water, rice, beans or pasta by scooping 1 cup at a time. Students will then determine how close they were between their actual measurement and their estimate.

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Meets Expectation	Students that are consistently scoring “Meets Expectation” on measuring or estimating length, weight and capacity tasks.
	<u>Next Steps:</u> <ul style="list-style-type: none">• Have students create “How to” guides for measuring length, capacity and weight. These could be written, typed, or include videos of students explaining how to measure.• Provide opportunities for students to estimate during daily routines. Examples include measuring holiday candy or applying their knowledge of measurement to events happening in the news such as the birth of a new zoo animal, length of a local charity race event, or number of recycled bottles from the cafeteria.• Ask students to create tasks for measuring and estimating length, weight or capacity. Involving students in the creation of measurement word problems is a great way for students to apply their knowledge.