MA.2.M.1.1

Overarching Standard: *MA.2.M.1 Measure the length of objects and solve problems involving length.*

Benchmark of Focus

MA.2.M.1.1: Estimate and measure the length of an object to the nearest inch, foot, yard, centimeter or meter by selecting and using an appropriate tool.

Benchmark Clarifications

Clarification 1: Instruction includes seeing rulers and tape measures as number lines.

Clarification 2: Instruction focuses on recognizing that when an object is measured in two different units, fewer of the larger units are required. When comparing measurements of the same object in different units, measurement conversions are not expected.

Clarification 3: When estimating the size of an object, a comparison with an object of known size can be used.

Related Benchmark/Horizontal Alignment
- MA.2.GR.2.1

Vertical Alignment

Previous Benchmarks	**Next Benchmarks**
MA.1.M.1.1	MA.3.M.1.1

Purpose and Instructional Strategies

The purpose of this benchmark is to build instruction from grade 1 to include additional U.S. customary and metric units. Students will both estimate and measure objects in various units and are expected to select an appropriate measurement tool.
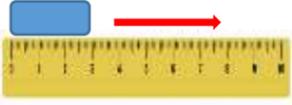- Instruction includes helping students identify benchmark measurement references.
- Instruction includes helping students connect the concept of a number line to linear measurement tools such as rulers and tape measures.

Common Misconceptions or Errors
- Students may misalign the ruler with the object and measure an object from 1 instead of 0.
- Students may count all marks, not just the whole-unit marks, when labeling a ruler.
- Students may not have a clear concept of the approximate length of an inch, a foot, a centimeter or a meter.

Strategies to Support Tiered Instruction
- Instruction includes modeling how to measure an object and guiding students to notice that the object's measurement does not change if the object is placed further down the ruler.
  - For example, modeling may include identifying the end points of an object and lining the end point with the zero mark of the ruler. Note that often the "zero" mark is not labeled and may be the end of the ruler or on the very first tick mark depending on the ruler. The teacher states the correct measurement and then as students watch, move the object down the ruler and ask, "Does the object's measurement change if its end point lines up with a different number?"

"Where an object starts and stops are called 'end points.'"	*"We will line up an end point with the first tick mark on the ruler."*	*"The block is 3 inches long."*
	"If we move the block so the end point lines up with 1, is it still 3 inches? How do you know?"	

- Instruction includes directing students to make connections between their world and measurements of inch, foot, centimeter and meter. Students discuss these relationships, draw pictures and write labels that can be used as a reference to help them remember the different length units and their approximate sizes.
    - For example, students can use index cards to draw examples of each length unit relationship. Multiple cards can be made so that students can sort, do a memory match, or combined to create a mini booklet.

Questions to ask students:
- Ask: About how long do you think this textbook is? Why do you think that is a good estimate?
    - Sample answer that would indicate understanding: The student would say that it is about 12 inches long, because it looks like it is about the length of the rulers we have been using to measure.
    - Sample answer that indicates an incomplete understanding or a misconception: The student might say that the book is about 2 inches long and not really have a reason. OR The student might say that the book is about 12 feet long, because it is about the length of the ruler we have been using to measure.
- Ask: How many inches long is this pencil? How do you know?
    - Sample answer that would indicate understanding: The student will line up the "0" with the end of the pencil and record the closest inch.
    - Sample answer that indicates an incomplete understanding or a misconception: The student does not line up the pencil with the "0"; thereby recording an incorrect measurement. OR The student might use the cm side of the ruler rather than the inches side.
- Ask: I want to measure how tall the door is. What tool would be most appropriate to use? Why?
    - Sample answer that would indicate understanding: The student will say that they should use a yard stick, because it would take a lot more rulers to measure the length of the hallway.

- Sample answer that indicates an incomplete understanding or a misconception: The student will say that they would use a ruler, because they would use feet and a ruler is one foot long.

Instructional Tasks

Instructional Task 1 (MTR.4.1, MTR.6.1)

As a class, determine several classroom objects whose lengths can be measured (e.g., pencil, book, desk, glue stick, etc.).

Part A. Before measuring, select an appropriate tool and estimate the number of units.

Part B. Compare their estimates to the actual measurement. Include a comparison of the number of units based on the tool selected.

Instructional Items

Instructional Item 1

Nancy measured her index card using a ruler. She thinks the index card is about 9 cm. long. Is Nancy's work correct? Explain why or why not.
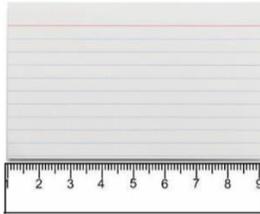
Additional Resources:

CPALMS Resources

Video:

https://learnzillion.com/lesson_plans/5002-understand-estimation/

Resources/Tasks to Support Your Child at Home:

- Have your child choose objects to measure the length of at home using a ruler. Before they measure the length, have them estimate the length based on the length of one inch/centimeter or whichever unit you choose. You can also give them benchmarks such as: the width of your pinky is about one centimeter, the distance between your thumb knuckle and end of your finger is about an inch. After they estimate, have them measure the actual length and compare.
- LearnZillion Instructional Video: Measure Using a Ruler