Standard 1: **MAFS.2.MD.1.1** Measure the length of an object to the nearest inch, foot, centimeter, or meter by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.

* Bloom’s Level: This standard is evaluating procedural knowledge.
* Justification: By accomplishing this standard, students are working in the “Evaluating” stage of the Bloom’s taxonomy cognitive domain. This is evaluating because the students are making a judgment and evaluating the object given by selecting the appropriate tool to measure the length of an object. The student is estimating appropriateness and measuring based on their appraisal. For the knowledge dimension, completion of this standard demonstrates procedural knowledge. This is procedural because measuring with appropriate tools involves knowledge of subject-specific skills, techniques and methods. Also, students must have knowledge of criteria for determining when to use appropriate procedures (the tools).
* Measurable Objective: The student will be able to choose appropriate measuring tools and accurately measure objects.

Standard 2: **MAFS.2.MD.1.2** Describe the inverse relationship between the size of a unit and number of units needed to measure a given object. *Example: Suppose the perimeter of a room is lined with one-foot rulers. Now, suppose we want to line it with yardsticks instead of rulers. Will we need more or fewer yardsticks than rulers to do the job? Explain your answer.*

* Bloom’s Level: This standard is understanding conceptual knowledge.
* Justification: The standard asks students to describe a relationship, therefore they are exemplifying the “Understand” level of cognitive demand. The knowledge demand of this standard is conceptual, as students are expected to examine the interrelationship between the size and number of units in order to measure. In this way, students are examining principles of mathematics.
* Measurable Objective: The student will be able to identify and interpret the relationship between unit size and number of units needed to measure the same object.

Standard 3: **MAFS.2.MD.1.3** Estimate lengths using units of inches, feet, yards, centimeters, and meters.

* Bloom’s Level: This standard is applying procedural knowledge.
* Justification: The “Applying” domain of Bloom’s taxonomy’s cognitive dimension is displayed by accomplishing this standard, because the learner implements estimation through discovery. Students are demonstrating their ability to use information they have learned about length to interpret the length of an object. Within this standard, students are demonstrating procedural knowledge because their knowledge of criteria for determining when to use appropriate procedures (units) is shown through estimation. Students are demonstrating their knowledge of how to do something through the proper method of estimation inquiry.
* Measurable Objective: The student will be able to demonstrate estimation skills by using inches, feet, yards, centimeters and meters.

Standard 4: **MAFS.2.MD.1.4** Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.

* Bloom’s Level: This standard is analyzing procedural knowledge.
* Justification: Through completion of this standard, students are working in the “Analyzing” component of Bloom’s revised taxonomy cognitive domain because the students are comparing two objects for their differences in length and distinguishing between the two to examine how they relate to each other. The students are measuring, so they are demonstrating procedural knowledge of how to do something.
* Measurable Objective: The student will be able to compare the length of objects to identify and infer the difference in length between them.

How I Will Teach The Material

Through a process of discovery and investigation, students will be engaged with hands-on learning activities to examine the length of objects. I will apply the practice of scaffolding to move students progressively to stronger understanding. We will practice the “I do, We do, You do,” method when addressing new concepts. Various grouping styles will be included as students work in a whole group setting, in small groups, pairs or independently. During each lesson, a teacher checklist will be maintained that includes each student and aspects of the relevant objective and standard. At the end of each lesson, students will complete an exit slip and journal independently in their Learning Logs.

*Measurable Objective 1 (The student will be able to choose appropriate measuring tools and accurately measure objects):* Students will be provided with multiple tools for measurement; yardsticks, rulers, measuring tape and meter sticks. We will examine each tool to recognize the units displayed, for example, inches and centimeters on a ruler. This process will be utilized to satisfy the student’s ability to choose appropriate measuring tools. As we explore the classroom and the lengths of familiar items, even the students themselves, students will be able to accurately measure objects.

*Measurable Objective 2 (The student will be able to identify and interpret the relationship between unit size and number of units needed to measure the same object):* Students will be comfortable with various tools for measuring objects, so we will then practice identifying the correct unit to examine objects. Students will be given two tools (a yardstick and ruler) to measure the length of the rug in the room. We will discover that it takes more rulers than yardsticks to determine the length. Students will be able to discuss and explain the relationship between the amount of yardsticks needed or rulers needed. They will be guided to understanding that the unit size of a yard (three feet) is larger than a ruler’s one foot, so more rulers are needed than yardsticks for the same object.

*Measurable Objective 3 (The student will be able to demonstrate estimation skills by using inches, feet, yards, centimeters and meters):* Students will create pre-measured strips/sticks to initially practice estimating. Through investigation, students will practice their estimation skills when shown familiar objects without the strips and when objects are not exactly on the whole number unit. Students will measure after estimating to ensure their hypotheses are correct, and we will address accurate rounding when measurements aren’t exact. The students will play a Jeopardy style game in which they have to quickly provide estimates for the lengths of objects.

*Measurable Objective 4 (The student will be able to compare the length of objects to identify and infer the difference in length between them):* Students will be given the opportunity to choose two objects and measure them both. We will apply mathematical procedures (subtracting) to determine the difference in lengths between the objects. Students will be given problems that include American architecture and famous structures, like the Statue of Liberty and the White House, and will compare the lengths in height of the two.

Two Formative Assessment Ideas

During the lessons, the teacher will maintain a checklist that includes aspects of student’s understanding, relevant to the learning objective and corresponding standard. If many students are not demonstrating understanding during whole class activities, the teacher will redirect instruction to address questions before moving on with the lesson. Also, students will be given tasks and their ability to accurately complete the task will be noted on the checklist as understanding. For example, students will be asked to choose an appropriate tool (rulers or meter sticks) to measure a hallway.

After completion of the lessons, students will fill out an Exit Ticket. The ticket includes self-reflective questions for students to rate their understanding of the concept and a practice problem that they will complete independently. By indicating their assumed level of understanding and answering a challenging problem independently, students are able to demonstrate their learning, or their misunderstandings, to the teacher.

Students will contribute to a Learning and Response Log for the mathematics lessons. At the end of each lesson, students will journal their reflections on the material, any remaining questions and a restatement of what they’ve learned. The teacher will respond to the student’s log entries and ensure that all students’ questions are addressed. The Logs are excellent formative assessment in mathematics as teachers are able to identify student’s misunderstandings during the learning process.

One Summative Assessment Idea

The summative assessment will measure student understanding at the end of the unit. Students will be given a performance task in which they will build a structure with paper and glue and ambiguous instructions that require demonstration of measurement knowledge. The instructions will require students to be able to perform the measurable objectives taught throughout the unit. This summative assessment allows students to independently demonstrate mastery of their measurement skills.