## Big Idea(s)/ Topic(s)
- Use standard units of measure.
- Measure, estimate, and perform operations involving lengths in standard units.
- Represent and interpret data.

## Standard(s) Alignment

**MGSE2.MD.2** Measure the length of an object twice, using length units of different measurements; describe how the two measurements relate to the size of the unit chosen. Understand the relative size of units in different systems of measurement. For example, an inch is longer than a centimeter. (Students are not expected to convert between systems of measurement.)

**MGSE2.MD.3** Estimate lengths using units of inches, feet, centimeters, and meters.

**MGSE2.MD.4** Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard-length unit.

**MGSE2.MD.9** Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole number units.

## Diagnostic Assessment

**Measurement True/False**

In this assessment, students view statements to determine if they are true or false. Students are asked to explain their reasoning to support their answer choice.
**Instructional Design**

**Desmos Activity:** Measurement with Standard Units - 2nd Grade.

**Overview:** In this learning plan, students will have multiple opportunities to engage in standards involving Measurement. Students will have the opportunity to estimate, measure, and compare lengths using various types of activities. At the conclusion of this Learning Plan, students should have an understanding of how to estimate and measure the length of objects using standard units, without gaps or overlaps.

**Engage** - Estimation 180: [https://estimation180.com/days-81-100/](https://estimation180.com/days-81-100/) In this activity, students will view images to estimate the measurements of objects. This is intended to spark discussion about student understanding of measurement; in particular, length.

**Explore** - Desmos Activity: Measurement with Standard Units - 2nd Grade. In this activity, students will explore various slides to engage in a task to further promote their understanding of measurement with standard units.

**Apply** - In this real-world activity, students will estimate and measure various body parts in centimeters and inches.

**Reflect** - Students will have the opportunity to reflect upon their learning throughout this learning plan to show prior and acquired knowledge of measurement in reference to 2nd grade math standards.

**Materials** - Electronic Device, Printed Resources for Unplugged/Offline students.

- **Synchronous** – These activities are ideal for being completed in a classroom setting. Many activities lend themselves to having rich mathematical discussions with classmates. Students can also compare thoughts, ideas, and answers throughout the tasks throughout this Learning Plan.

- **Asynchronous** – The activities in this Learning Plan are designed so that students can complete them on their own time if the classroom setting is not an option. Tasks can be completed independently, and the results can be seen by the teacher when possible.

- **Unplugged/Offline** - Most concepts in this Learning Plan can be adapted to meet students without internet or computer access. Tasks can be printed to be distributed.

**Engage**

To get students engaged with the concept of Measurement, begin looking at the pictures that lend themselves to estimation involving the length of objects. Several pictures are included on this website: Estimation 180: [https://estimation180.com/days-81-100/](https://estimation180.com/days-81-100/). Each picture should spark general conversation, using formal or informal vocabulary, to share their understanding. The images allow students to reason, estimate, share and see the solution.
● Synchronous - Complete during a classroom discussion as students give their estimates to determine which student gives the best estimate.

● Asynchronous - Introduce the problem to students in a virtual platform; this can be done via e-document or video. Allow students to share responses with the teacher or a parent.

● Unplugged/ Offline - Provide the opening image for students to engage in the task. Have students share ideas through email/text/phone.

Explore

Measurement with Standard Units - 2nd Grade

In this activity, students will have the opportunity to explore multiple opportunities to engage in Measurement using an online platform, Desmos. To begin, students will engage in a 3-Act Task: All the Little Duckies. In this activity, students determine the length of a math rack by using toy ducks which demonstrate how to measure by iterating objects. Next, students will have the opportunity to measure objects more than once with different measurements by click and dragging squares to determine the length of an object. Lastly, students are introduced to inches, feet, centimeters and meters to gain an understanding of commonly used standard units. Lastly, students will have the opportunity to measure and collect data by
determining the length of their arm. Class measurements are collected and displayed on a line plot to display whole class data. Throughout the activities, students have multiple opportunities to share their thinking as well as see the reasoning of their classmates while learning about these measurement concepts.

- **Synchronous**: Complete in the classroom setting. Students are allowed to see responses of other students as they respond to questions and prompts in real-time.

- **Asynchronous**: Students may complete this activity at their own pace. The teacher will be able to view responses using the Teacher Dashboard.

- **Unplugged/ Offline**: Slides/Task Cards may be printed to use at home. Some of the slides, such as the videos, will not be accessible which may reduce the effectiveness of this task. However, students at home may apply these concepts to further enhance the exploration of measuring objects.

Apply

Real-world experiences for Measurement are everywhere! To further apply the concept of Measurement, in particular, inches and centimeters, students may engage in a Measurement Scavenger Hunt (see below).
Students can also be encouraged to find additional things either in the classroom or at home that measure in inches, feet, centimeters, or meters. Students can also measure the length of random objects by using standard units (the same units repeated). Also, have students compare their actual with their estimates in order for students to determine the difference.

- **Synchronous** - Complete above activity in the classroom. Ideally, students would work in pairs to allow students to critique the reasoning of others. This also allows students to compare measurements of others to determine how much more/less one measurement is than another.
- **Asynchronous** - Students may work at their own pace to complete the Scavenger Hunt. Have students compare their measurements with someone else in their home, or work with another classmate virtually.
- **Unplugged/ Offline** Provide students with access to the task sheet. Have students share their answers with a family member or teacher.

**Reflect**

Students reflect upon their learning throughout the Desmos lesson as they are continually expressing their thought processes as well as see the thoughts of their classmates. Students also have the chance to reflect
at the end of the Desmos lesson to share what they learned, what they liked, and what they still have questions about.

- **Synchronous** - In the classroom setting, have a time of reflection to talk about ideas, understandings, and misconceptions of measurement. Use the reflection slide responses to active discussions within the classroom.
- **Asynchronous** - Have students reflect upon their learning using the teacher dashboard or share what they have learned on an e-platform that students have used before.
- **Unplugged/ Offline** - Share with an adult or family member new knowledge that has been obtained as well as address misconceptions about measurement that students may have.
Evidence of Student Success

- Refer back to the initial Diagnostic Assessment: Measurement True/False to see if initial answers/responses have changed as a result of completing this Learning Plan.
- Accuracy of student thinking can be assessed with response questions throughout the Desmos Activity. Student understandings and misconceptions can be addressed based on responses.
- Students are accurately able to determine the length of objects using the Scavenger Hunt task.
- Students can identify objects that measure close to an inch, foot, centimeter and meter.

Student Learning Supports

Establish mathematics goals to focus learning.
- Make instructions and expectations clear for the activities.
- Make explicit connections between current and prior lessons or units.

Facilitate meaningful mathematical discourse.
- Explicitly model and teach good “discussion board” etiquette.

Pose purposeful questions.
- Predetermine when you will call on the student or use the pause feature within the activities.
- Break class into small discussion groups to work collaboratively and then have groups report back to the whole group.

Support productive struggle in learning mathematics.
- Offer outlines and other scaffolding tools and share tips that might help students learn.
- Provide feedback using the feedback feature within activities and offer corrective opportunities.
- Consider the pacing of the lesson.

Elicit and use evidence of student thinking.
Anticipate any misconceptions or questions students might have about the task, materials or technology. Proactively address them with readily available and accessible resources.

Additional Learning Support Strategies
- Identify additional strategies to support students as they progress towards mastery of the big idea.

Engaging Families

Students can deepen their understanding of Measurement by completing the following activities. Students may find it helpful to review the concepts alongside their parents, siblings, or friends at home.

Online Games:
- Length and Distance Measurement - Units of Measurement Game - Turtle Diary
- 2nd Grade Online Measurement Games - Education.com
- PBS Kids - Measurement Games
<table>
<thead>
<tr>
<th>STATEMENT</th>
<th>T</th>
<th>F</th>
<th>WHY I (or WE) THINK SO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lengths can be measured with inches, feet, centimeters, or meters.</td>
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<tr>
<td>2. To measure an object with a ruler, you always have to start at the</td>
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<tr>
<td>beginning of the ruler.</td>
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<td>3. A ruler is the best tool to use to measure the length of an object.</td>
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<td>4. I only use measurement when I am trying to find the length of an</td>
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<tr>
<td>object.</td>
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<tr>
<td>5. To get an accurate length measurement, it is important to not have any</td>
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<td>gaps or overlaps.</td>
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