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New Mexico Instructional Scope

3rd Grade Measurement and Data Guide

The NMIS is a teacher-influenced tool, designed to provide instructional planning support at the programmatic level for districts and instructional level for teachers. Its foundation stems from the vision and mission of the PED and came into existence to assure that students in NM will be engaged in a culturally and linguistically responsive educational system that meets the social, emotional, and academic needs of ALL students. This is also rooted in the belief that all students must have access to on-grade-level standards, focusing on acceleration. The purpose of this tool is to help educators understand each of the grade level standards and how those standards connect to the students' overall preparation for college and career readiness.

Standards are defined as the most critical prerequisite skills and knowledge. This document is color-coded to reflect both anchor and priority standards. Though previous emphasis was placed on priority standards to address lost learning due to COVID-19, New Mexico teachers should note that moving forward, while priority standards allow for acceleration of learning, all standards should be addressed in instruction throughout the school year.

In this guide you will find:

- A breakdown of each of the grade level standards within the cluster, including:
  - Standards of Mathematical Practice
  - Common Misconceptions
  - Identification of Priority Standards, as identified by NMPED.
  - Level of Rigor Identification
- Sample aligned assessment items
- Suggested Student Discourse Guide **(only provided for clusters with Conceptual Understanding standards)**
- A multilayered system of supports (MLSS) and culturally and linguistically responsive instruction (CLR) guide

NEW MEXICO
Public Education Department

New Mexico Instructional Scope

3rd Grade Measurement and Data Guide

Key		
	Priority Standard	Priority standards, as identified by NMPED, are denoted with red highlighting. Priority standards are the most critical prerequisite skills and knowledge a student needs. This does not mean that these are only standards required to be taught, just these are the standards that will allow for the acceleration the students of New Mexico need during this time.
	*Conceptual Understanding*	Conceptual Understanding standards help students build a deep understanding of the **how** and **why** of mathematics.
	*Application*	Application standards help students identify the appropriate concepts and skills to tackle **novel real-world problems.**
	*Procedural Skill and Fluency*	Procedural standards help students develop **efficiency** and **accuracy** in computations.

Standards Breakdown

- Solve problems involving measurement and estimation.
  - 3.MD.A.1
  - 3.MD.A.2
- Represent and Interpret Data
  - 3.MD.B.3
  - 3.MD.B.4
- Geometric measurement: understand concepts of area and relate area to multiplication and to addition.
  - 3.MD.C.5
  - 3.MD.C.6
  - 3.MD.C.7
- Geometric measurement: recognize perimeter.
  - 3.MD.D.8

NEW MEXICO
Public Education Department

New Mexico Instructional Scope
3rd Grade Measurement and Data Guide

Grade	*CCSS Domain*	*CCSS Cluster*
3	**Measurement and Data**	**Solve problems involving measurement and estimation.**

Cluster Standard: 3.MD.A.1

Standard	**Standards for Mathematical Practice**
Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.	• **SMP 1:** Make sense of problems and persevere in solving them. • **SMP 6:** Attend to precision. • **SMP 7:** Look for and make use of structure.
Clarification Statement	**Students Who Demonstrate Understanding Can:**
• In this standard, students reason about the units of length, capacity and weight using customary units. Students need to develop a basic understanding of the size and weight of customary units and apply this understanding when estimating and measuring. • Students are not expected to convert between units. The focus is on measuring and also reasoning as they estimate, using benchmarks to measure length, weight, and capacity. • Word problems should only be one-step and include the same unit. The number range for these tasks should match the number size described in the OA and NBT standards	• Recognize minute marks on an analog clock and minute position on a digital clock. • Write time to the nearest minute. • Tell time to the nearest minute. • Find elapsed time in minutes using a number line diagram. • Solve word problems involving elapsed time in minutes by using a number line diagram.
DOK	**Blooms**
1-2	Remember, Understand and Apply

NEW MEXICO
Public Education Department

New Mexico Instructional Scope
3rd Grade Measurement and Data Guide

Grade	*CCSS Domain*	*CCSS Cluster*
3	**Measurement and Data**	**Solve problems involving measurement and estimation.**

Cluster Standard: 3.MD.A.2

Standard	**Standards for Mathematical Practice**
Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.	• **SMP 1**: Make sense of problems and persevere in solving them. • **SMP 5**: Use appropriate tools strategically. • **SMP 6:** Attend to precision.
Clarification Statement	**Students Who Demonstrate Understanding Can:**
• In this standard, students reason about the units of length, capacity and weight using customary units. Students need to develop a basic understanding of the size and weight of customary units and apply this understanding when estimating and measuring. • Students are not expected to convert between units. The focus is on measuring and also reasoning as they estimate, using benchmarks to measure length, weight, and capacity. • Word problems should only be one-step and include the same unit. The number range for these tasks should match the number size described in the OA and NBT standards.	• Estimate and measure liquid volumes using standard units of liters (l) • Solve one-step word problems involving liquid volume given in the same units • Estimate and measure masses of objects using standard units of grams(g) and kilograms (kg) • Solve one-step word problems involving masses given in the same units • Represent a word problem involving liquid volume or mass using various strategies
DOK	**Blooms**
1-2	Understand, Apply and Analyze

Common Misconceptions

• Students might overgeneralize the base-10	• Students may believe that a larger object

structure and apply it to time, such as changing 1 hour 15 minutes to minutes as 115 minutes or 25 minutes.	automatically has more mass.

Grade	*CCSS Domain*	*CCSS Cluster*
3	**Measurement and Data**	**Represent and Interpret Data**

Cluster Standard: 3.MD.B.3

Standard	**Standards for Mathematical Practice**
Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*	• **SMP 1:** Make sense of problems and persevere in solving them. • **SMP 4:** Model with mathematics. • **SMP 6:** Attend to precision.
Clarification Statement	**Students Who Demonstrate Understanding Can:**
• In Grade 3, the most important development in **data** representation for **categorical data** is that students now draw **picture graphs** in which each picture represents more than one object, and they draw **bar graphs** in which the **height** of a given bar in **tick marks** must be multiplied by the **scale factor** in order to yield the number of objects in the given category. These developments connect with the emphasis on **multiplication** in this grade.	• Interpret data in a scaled picture and bar graphs (e.g., one box equals 4 students). • Collect data by asking a question that yields data in several categories. • Draw a scaled picture graph and a scaled bar graph (with axes provided) to represent a data set with several categories. • Solve one and two-step “how many more” and “how many less” problems using information from these graphs.
DOK	**Blooms**
1, 2	Understand, apply, and analyze

NEW MEXICO
Public Education Department

New Mexico Instructional Scope
3rd Grade Measurement and Data Guide

Grade	*CCSS Domain*	*CCSS Cluster*
3	**Measurement and Data**	**Represent and Interpret Data**

Cluster Standard: 3.MD.B.4

Standard	**Standards for Mathematical Practice**
Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.	• **SMP 5**: Use appropriate tools strategically. • **SMP 6:** Attend to precision. • **SMP 7:** Look for and make use of structure.
Clarification Statement	**Students Who Demonstrate Understanding Can:**
• In Grade 3, students are beginning to learn fraction concepts (3.NF). They understand fraction equivalence in simple cases, and they use visual fraction models to represent and order fractions. Grade 3 students also measure lengths using rulers marked with halves and fourths of an inch. They use their developing knowledge of fractions and number lines to extend their work from the previous grade by working with measurement data involving fractional measurement values.	• Generate measurement data by measuring lengths using rules marked with whole inches and halves and fourths of an inch. • Create a line plot where the horizontal scale is marked off in appropriate units-whole numbers, halves, or quarters. • Analyze data from a line plot.
DOK	**Blooms**
2	Apply and analyze

Common Misconceptions

• Students may not count each square or tick mark on a scaled graph as one (rather than one unit).	• Students may confuse the axes on a graph.

NEW MEXICO
Public Education Department

New Mexico Instructional Scope
3rd Grade Measurement and Data Guide

Grade	*CCSS Domain*	*CCSS Cluster*
3	**Measurement and Data**	**Geometric measurement: understand concepts of area and relate area to multiplication and to addition.**

Cluster Standard: 3.MD.C.5

Standard	Standards for Mathematical Practice
3.MD.C.5: Recognize area as an attribute of plane figures and understand concepts of area measurement. • **3.MD.C.5.A:** A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area. • **3.MD.C.5.B**: A plane figure which can be covered without gaps or overlaps by *n* unit squares is said to have an area of *n* square units.	• **SMP 6:** Attend to precision. • **SMP 7:** Look for and make use of structure.
Clarification Statement	**Students Who Demonstrate Understanding Can:**
• Students need to learn to conceptualize **area** as the amount of **two-dimensional space** in a bounded region and to measure it by choosing a **unit of area**, often a **square**. A **two-dimensional geometric figure** that is covered by a certain number of squares without **gaps** or **overlaps** can be said to have an area of that number of **square units**.	• Recognize that area is the measurement as the space occupied by a flat shape or the surface of an object. • Recognize a unit square has 1 square unit of area and is used to measure area of two-dimensional shapes. • Recognize any plane figure covered without gaps or overlaps and filled with n unit squares indicates the total square units or area.
DOK	**Blooms**
1, 2, 3	Remember, Understand, Apply, and Analyze

Grade	*CCSS Domain*	*CCSS Cluster*
3	**Measurement and Data**	**Geometric measurement: understand concepts of area and relate area to multiplication and to addition.**

Cluster Standard: 3.MD.C.6

Standard	**Standards for Mathematical Practice**
Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).	• **SMP 5:** Use appropriate tools strategically. • **SMP 6**: Attend to precision.
Clarification Statement	**Students Who Demonstrate Understanding Can:**
• To begin an explicit focus on area, teachers might then ask students which of three rectangles covers the most area. Students may first solve the problem with decomposition (cutting and/or folding) and re-composition, and eventually analyses with area-units, by covering each with unit squares (tiles).	• Measure areas by counting unit squares of cm, m, in, ft, and other sizes.
DOK	**Blooms**
1-2	Understand, Apply

NEW MEXICO
Public Education Department

New Mexico Instructional Scope
3rd Grade Measurement and Data Guide

Grade	*CCSS Domain*	*CCSS Cluster*
3	**Measurement and Data**	**Geometric measurement: understand concepts of area and relate area to multiplication and to addition.**

Cluster Standard: 3.MD.C.7

Standard	Standards for Mathematical Practice
Relate area to the operations of multiplication and addition. • **3.MD.C.7.A**: Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. • **3.MD.C.7.B:** Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. • **3.MD.C.7.C**: Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning. • **3.MD.C.7.D:** Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.	• **SMP 1:** Make sense of problems and persevere in solving them. • **SMP 4**: Model with mathematics. • **SMP 8:** Look for and express regularity in repeated reasoning.
Clarification Statement	**Students Who Demonstrate Understanding Can...**
• Students can be taught to multiply length measurements to find the area of a rectangular region. But, in order to make sense of these quantities, they first learn to interpret measurement of rectangular regions as a multiplicative relationship between the number of square units in a row and the number of rows. Students learn to understand and explain that the area of a rectangular region of, for example, 12 length-units by 5 length-units can be found either	• Relate area to the operations of multiplication and addition. • Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. • Apply their knowledge of the area of rectangles with whole-number side lengths in the context of problem solving. • Illustrate and explain that the area of a rectangle

by multiplying 12 x 5 or by adding two products, e.g., 10 x 5 and 2 x 5, illustrating the distributive property.	can be found by partitioning it into two smaller rectangles using tiles and/or arrays and that the area of the larger rectangle is the sum of the two smaller rectangles.
DOK	**Blooms**
2-3	Understand, Apply, Analyze

Common Misconceptions

● Students may not understand how to find the number of square units for non-rectangular shapes, such as combining two half-square units to make a whole square unit. ● Students may confuse perimeter and area.	● Students may believe that all shapes with a given perimeter have the same area.

Grade	*CCSS Domain*	*CCSS Cluster*
3	**Measurement and Data**	**Geometric measurement: recognize perimeter.**

Cluster Standard: 3.MD.D.8

Standard	**Standards for Mathematical Practice**
Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.	● **SMP 1:** Make sense of problems and persevere in solving them. ● **SMP 4:** Model with mathematics.
Clarification Statement	**Students Who Demonstrate Understanding Can...**
● Perimeter problems for rectangles and parallelograms often give only the lengths of two adjacent sides or only show numbers for these sides in a drawing of the shape. The common	● Solve problems involving perimeters of polygons. ● Determine the perimeter given the side lengths. ● Determine an unknown side length given the perimeter.

error is to add just those two numbers. Having students first label the lengths of the other two sides as a reminder is helpful. Students then find unknown side lengths in more difficult "missing measurements" problems and other types of perimeter problems.	• Illustrate how multiple rectangles can have the same perimeters and different areas or vice-versa.
DOK	**Blooms**
1-2	Understand, Apply, Analyze

Common Misconceptions

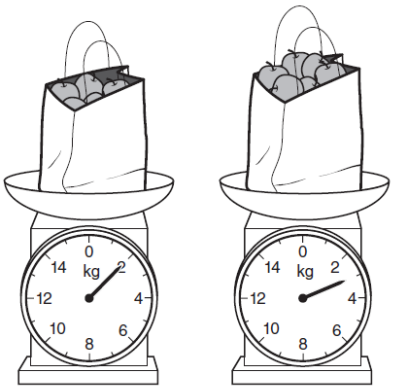
• Students may confuse area and perimeter.	• Students may not recognize that all rectangles have four sides, especially when only two side lengths are shown or provided.

ASSESSMENT GUIDE

- Solve problems involving measurement and data
- Represent and interpret data
- Geometric measurement: understand concepts of area and relate area to multiplication and to addition
- Geometric measurement: Recognize perimeter

Grade	*CCSS Domain*	*CCSS Strand*
3	**Measurement and Data**	**Solve problems involving measurement and data.**
	Sample Task #1 (Constructed Response)	
	Carlos gets to class at 9:08 a.m. He has to write down homework assignments and complete morning work before math begins at 9:30 a.m. How many minutes does Carlos have to complete his tasks before math begins?	
	Sample Task #2 (Multiple Choice)	

. Maria buys the two bags of apples shown on the two scales.



What is the total mass of the apples Maria buys?

Ⓐ 1 kilogram
Ⓑ 2 kilograms
Ⓒ 5 kilograms
Ⓓ 6 kilograms

Grade	*CCSS Domain*	*CCSS Strand*
3	**Measurement and Data**	**Represent and Interpret Data**

Sample Task #1 (Constructed Response)

. The students in Mrs. Klein's class voted for their favorite pets. This picture graph shows the results.

Favorite Pet

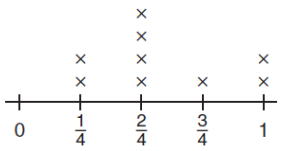
Dog	👤 👤 👤 👤
Cat	👤 👤 👤 ½
Bird	👤 ½
Fish	👤 👤

Key
👤 = 2 students

a. What is the total number of students who voted for a favorite pet? Show your work or explain how you know.

Sample Task #2 (Multiple Choice)

. This line plot shows the lengths of some bugs, in inches.



Length in Inches

How many **more** bugs have a length of $\frac{2}{4}$ inch than a length of $\frac{3}{4}$ inch?

Ⓐ 1
Ⓑ 2
Ⓒ 3
Ⓓ 4

NEW MEXICO
Public Education Department

New Mexico Instructional Scope

3rd Grade Measurement and Data Guide

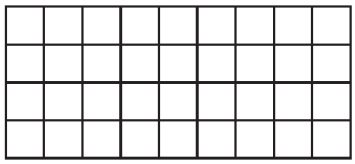
Grade	*CCSS Domain*	*CCSS Strand*
3	**Measurement and Data**	**Geometric measurement: understand concepts of area and relate area to multiplication and to addition.**

Sample Task #1 (Constructed Response)

1. Mara uses 15 square-centimeter tiles to make a rectangle. Ashton uses 9 square-centimeter tiles to make a rectangle.
   a. Draw what Mara and Ashton's rectangles might look like.
   b. Whose rectangle has a bigger area? How do you know?

Sample Task #2 (Multiple Choice)

This rectangle is made up of small squares. Each square is 1 square unit.



Which expression can be used to find the area, in square units, of the rectangle?

Ⓐ $9-4$
Ⓑ $9+4$
Ⓒ $9\div4$
Ⓓ 9×4

Grade	*CCSS Domain*	*CCSS Strand*
3	**Measurement and Data**	**Geometric measurement: recognize perimeter.**

Sample Task #1 (Constructed Response)

Gale makes a miniature stop sign, a regular octagon, with a perimeter of 48 centimeters for the town he built with blocks. What is the length of each side of the stop sign?

Sample Task #2 (Multiple Choice)

2. These are 5 different-sized rectangles.

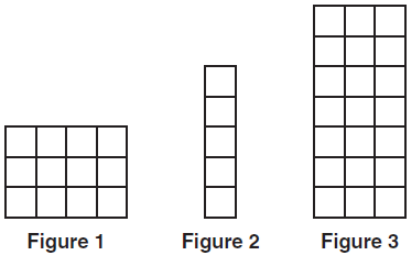


Figure 1 Figure 2 Figure 3

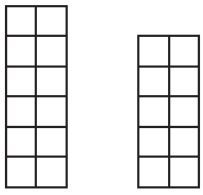


Figure 4 Figure 5

Which two rectangles have the same perimeter? Select the **two** correct answers.

Ⓐ Figure 1
Ⓑ Figure 2
Ⓒ Figure 3
Ⓓ Figure 4
Ⓔ Figure 5

NEW MEXICO
Public Education Department

New Mexico Instructional Scope
3rd Grade Measurement and Data Guide

MLSS AND CLR GUIDE

- Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects
- Represent and interpret data
- Geometric measurement: understand concepts of area and relate area to multiplication and to addition
- Geometric measurement: Recognize perimeter

CCSS Domain	*CCSS Cluster*
Measurement and Data	**Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.**

Culturally and Linguistically Responsive Instruction

Relevance to Families and Communities	During a unit focused on measurement, consider options for learning from your families and communities the cultural and linguistic ways this mathematics exists outside of school to create stronger home to school connections for students, for example, learning about the different structures for the different units of measurement across the languages in your classroom can lead to a more robust understanding of units used for measurement for all students by making connections to the different structures of units of measurement used in other countries. Relate the metric system to the countries of origin of your students.	
Cross-Curricular Connections	Science: In third grade the NGSS recommends students work with data related to weather conditions. Consider providing a connection for students to collect and measure the amount of rain during different seasons. Language Arts**:** When students have independent reading time during school or at home, consider having them track when they started, when they ended, and use this as the context for elapsed time problems.	
Validate/Affirm/Build/ Bridge	• *How can you design your mathematics classroom to intentionally and purposefully legitimize the home culture and languages of students and reverse the negative stereotypes regarding*	• Posing Purposeful Questions: CLRI requires intentional planning around the questions posed in a mathematics classroom. It is critical to consider "who is being positioned as competent, and whose ideas are featured and privileged" within the classroom through both the types of questioning and who is being questioned. Mathematics classrooms traditionally ask short answer questions and reward

	the mathematical abilities of students of marginalized cultures and languages? • *How can you create connections between the cultural and linguistic behaviors of your students' home culture and language, the culture and language of school mathematics to support students in creating mathematical identities as capable mathematicians that can use mathematics within school and society?*	students that can respond quickly and correctly. When questioning seeks to understand students' thinking by taking their ideas seriously and asking the community to build upon one another's ideas a greater sense of belonging in mathematics is created for students from marginalized cultures and languages. For example, when studying solving problems involving measurement and estimation of intervals of time, liquid volumes, and mass of objects the pattern of questions within the classroom is critical because these purposeful questions are used to guide students and advance students' reasoning and make sense about important mathematical ideas and relationships. Students having access to funneling and focusing questions gives them the support they need to be successful. When students have access to purposeful questions in the classroom, students understand that the teacher or their peers are seeking to understand their thinking by taking their ideas seriously and asking the community to build upon one another's ideas. A greater sense of belonging in mathematics is created for students from marginalized cultures and languages.

Planning for Multi-Layered System of Supports

Vertical Alignment

Previous Learning	*Current Learning*	*Future Learning*
• Connect to telling and writing time from analog and digital clocks to the nearest 5 minutes using AM and PM. **(2.MD.7)**	• Connect to understanding a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; and understanding a fraction a/b as the quantity formed by a part of size 1/b. **(3.NF.1)** • Connect to solving two-step word problems using the four operations; and **r**epresenting these problems using equations with a letter standing for the unknown	• Connect to recording measurement equivalents in a two-column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36). **(4.MD.1)** • Connect to multiplying or dividing to solve word problems involving multiplicative comparison,

	quantity. Connect to assessing the reasonableness of answers using mental computation and estimation strategies including rounding. **(3.OA.8)**	e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison. **(4.OA.2)** ● Connect to using the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Connect to representing measurement quantities using diagrams such as number line diagrams that feature a measurement scale. **(4.MD.2)**

Suggested Instructional Strategies

Pre-Teach

Level of Intensity	***Essential Question***	***Examples***
Targeted	*What pre-teaching will prepare students to productively struggle with the mathematics for this*	For example, some learners may benefit from targeted pre-teaching that rehearses prior learning when studying solving problems involving measurement and estimation of intervals of time, liquid volumes, and masses of

	cluster within your HQIM?	objects because students are building on previous knowledge from earlier grades where they described, measured, estimated, and compared amounts, using standard units of measurement as well as non-standard units such as scoops or cups to measure liquids. Students are also building on previous knowledge from earlier grades in telling and writing time to the nearest hour and half hour.
Intensive	*What critical understandings will prepare students to access the mathematics for this cluster?*	2.MD.a.1: This standard provides a foundation for work with solving problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects because students will be using measurement and estimation to solve problems. If students have unfinished learning within this standard, based on assessment data, consider ways to provide intensive pre-teaching support prior to the start of the unit to ensure students are ready to access grade level instruction and assignments.

Universal Support Framework

A student should know/understand:	A student should be able to:	***Potential Scaffolds***

• The smaller the unit, the more units will be needed to measure an object.
• Larger units (such as feet) can be subdivided into equivalent smaller units.
• How to select an efficient tool for measurement.
• A unit square, within a shape, is the same as one square unit and measures as 1 and unit squares will not overlap or have gaps.
• Area is the measurement of a
	• Line up a measuring tool with the end of the object and measure with no gaps or overlaps.
	• Compare and explain two measurements and how they are affected by the size of the unit chosen.
	• Measure two objects using the same standard length unit to determine their difference in length.
	• Use tiles to find the area of a rectangle using whole numbers.
	• Decompose rectilinear figures into rectangles, and
		• Build on students' experience with the following skills:
		  ○ Using standard and non-standard tools to measure objects
		  ○ Comparing numbers (<, >, =)
		
		• Cognitive Strategies
		  ○ Repeatedly model the strategies
		  ○ Monitor the students' use of the strategies
		  ○ Provide feedback to students
		  ○ Teach self-questioning and self-monitoring strategies
		  ○ Introduce multiple means of representation for mathematical ideas
		
		• Encourage students to use alternative tools to better access the grade level content. Examples include:
		  ○ Customary and metric rulers, yardsticks, meter sticks, and measuring tapes
		  ○ Graduated cylinders and beakers\

two-dimensional figure. ● Why multiplying side lengths of a rectangle is the same as counting the tiles. ● The area of a rectangular region can be found either by multiplying the side lengths or by adding two products which illustrate the distributive property.	find the area of each part then add the areas of the various rectangles together. ● Find the perimeter of a rectangle given the side lengths and find an unknown side length of a rectangle given the perimeter. ● Find rectangles with the same perimeter and different areas and rectangles with the same area and different perimeter.	○ Scales and weights ○ Cooking tools ○ Measuring cups ○ Stop watches ○ Analog clocks with moveable hands ● Build on students' experience with the following skills: ○ Adding all sides of a closed figure ○ Use arrays to reinforce concepts of area as well as area equations ○ Apply understanding of the distributive property to find area of composite figures ● Cognitive Strategies ○ Repeatedly model the strategies ○ Monitor the students' use of the strategies ○ Provide feedback to students ○ Teach self-questioning and self-monitoring strategies ○ Introduce multiple means of representation for mathematical ideas ● Encourage students to use alternative tools to better access the grade level content. Examples include: ○ Graph paper ○ Counting tiles ○ Counters
Re-Teach		

NEW MEXICO
Public Education Department

New Mexico Instructional Scope

3rd Grade Measurement and Data Guide

Level of Intensity	*Essential Question*	*Examples*
Targeted	What formative assessment data (e.g., tasks, exit tickets, observations) will help identify content needing to be revisited during a unit?	For example, students may benefit from re-engaging with content during a unit on solving problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects by providing specific feedback to students on their work through a short mini-lesson because students may need more time exploring measurement and working with what units they are using to measure objects and why. Students also may need more time exploring reading time. As the students explore, the teacher gives them specific feedback to help clear up misconceptions.
Intensive	What assessment data will help identify content needing to be revisited for intensive interventions?	For example, students may benefit from re-engaging with content during a unit on solving problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects by confronting student misconceptions in a small group setting or pull out if needed. In a smaller group setting, the teacher will be able to monitor students' progress on a biweekly basis to assess student growth and their responses to intensive interventions.

Extension	
Essential Question	***Examples***
What type of extension will offer additional challenges to 'broaden' your student's knowledge of the mathematics developed within your HQIM?	For example, some learners may benefit from an extension such as the opportunity to explore links between various topics when studying solving problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects because students can make connections between different types of measurement and how they are used in the real world and across different topics.

NEW MEXICO
Public Education Department

New Mexico Instructional Scope
3rd Grade Measurement and Data Guide

CCSS Domain	*CCSS Cluster*
Measurement and Data	**Represent and interpret data.**

Culturally and Linguistically Responsive Instruction

Relevance to Families and Communities	During a unit focused on representing and interpret data, consider options for learning from your families and communities the cultural and linguistic ways this mathematics exists outside of school to create stronger home to school connections for students, for example, discussing data that is relevant to the lives of students in the class such as exploring data trends regarding human migration, population growth, and language usage.	
Cross-Curricular Connections	Science: In third grade the NGSS recommends students work with data related to weather conditions. Consider providing opportunities to make a picture graph or bar graph to display and analyze weather data. Social Studies: In third grade one of ideas the New Mexico Social Studies Standards state focuses on is the rights of citizens. Consider providing opportunities to use and interpret data within this context, such as the growth of the civil rights movement in the 1950s-60s.	
Validate/Affirm/Build/ Bridge	• *How can you design your mathematics classroom to intentionally and purposefully legitimize the home culture and languages of students and reverse the negative stereotypes regarding the mathematical abilities of students of marginalized cultures and languages?* • *How can you create connections between the cultural and linguistic behaviors of your students' home culture and language, the culture and language of school mathematics to support students in creating mathematical identities as capable mathematicians that can*	• Posing Purposeful Questions: CLRI requires intentional planning around the questions posed in a mathematics classroom. It is critical to consider "who is being positioned as competent, and whose ideas are featured and privileged" within the classroom through both the types of questioning and who is being questioned. Mathematics classrooms traditionally ask short answer questions and reward students that can respond quickly and correctly. When questioning seeks to understand students' thinking by taking their ideas seriously and asking the community to build upon one another's ideas a greater sense of belonging in mathematics is created for students from marginalized cultures and languages. For example, when studying representing and interpreting data the pattern of questions within the classroom is critical because in data interpretation there are always various perspectives that play into what that data set reflects and asking deep questions allows students to explore those perspectives together as a class.

	use mathematics within school and society?	

Planning for Multi-Layered System of Supports

Vertical Alignment

Previous Learning	*Current Learning*	*Future Learning*
• Connect to practice measuring objects and inputting data on picture and bar graphs to represent data and answering questions relating and comparing the data represented on the graphs. **(2.MD.1-4, 10)** 5 minutes using AM and PM. **(2.MD.7)**	• Connect to solving two-step word problems using the four operations and representing these problems using equations with a letter standing for the unknown quantity. **(3.OA.8)** • Connect to understanding a fraction as a number on the number line and representing fractions on a number line diagram. **(3.NF.2)**	• Connect to making a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8) and solving problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection. **(4.MD.4)** • Connect to understanding a fraction a/b with a > 1 as a sum of fractions 1/b. **(4.NF.3)**

Suggested Instructional Strategies

Pre-Teach

Level of Intensity	*Essential Question*	*Examples*
Targeted	*What pre-teaching will prepare students to productively struggle with the mathematics for this cluster within your HQIM?*	For example, some learners may benefit from targeted pre-teaching that provides additional time for confusion to happen with new mathematical ideas when studying representing and interpreting data because this will allow students time to practice new concepts without fear and to experiment with ideas that they may not otherwise explore.

Intensive	*What critical understandings will prepare students to access the mathematics for this cluster?*	1.MD.C.4: This standard provides a foundation for working with representing and interpreting data because this standard introduces the idea of collecting data and representing as well as analyzing “one more” and “one less”, thus connecting to the comparative aspect of interpreting data in 3rd grade . If students have unfinished learning within this standard, based on assessment data, consider ways to provide intensive pre-teaching support prior to the start of the unit to ensure students are ready to access grade level instruction and assignments. problems. If students have unfinished learning within this standard, based on assessment data, consider ways to provide intensive pre-teaching support prior to the start of the unit to ensure students are ready to access grade level instruction and assignments.
Re-Teach		
Level of Intensity	***Essential Question***	***Examples***
Targeted	What formative assessment data (e.g., tasks, exit tickets, observations) will help identify content needing to be revisited during a unit?	For example, students may benefit from re-engaging with content during a unit on solving problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects by providing specific feedback to students on their work through a short mini-lesson because students may need more time exploring measurement and working with what units they are using to measure objects and why. Students also may need more time exploring reading time. As the students explore, the teacher gives them specific feedback to help clear up misconceptions.
Intensive	What assessment data will help identify content needing to be revisited for intensive interventions?	For example, students may benefit from re-engaging with content during a unit on solving problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects by confronting student misconceptions in a small group setting or pull out if needed. In a smaller group setting, the teacher will be able to monitor students' progress on a biweekly basis to assess student growth and their responses to intensive interventions.

Extension	
Essential Question	***Examples***
What type of extension will offer additional challenges to 'broaden' your student's knowledge of the mathematics developed within your HQIM?	For example, some learners may benefit from an extension such as in-depth, self-directed exploration of self-selected topics when studying representing and interpreting data because this would allow students to explore how they can apply this learning as individuals.

CCSS Domain	*CCSS Cluster*
Measurement and Data	**Geometric measurement: understand concepts of area and relate area to multiplication and to addition**

Culturally and Linguistically Responsive Instruction

Relevance to Families and Communities	During a unit focused on area, consider options for learning from your families and communities the cultural and linguistic ways this mathematics exists outside of school to create stronger home to school connections for students, for example, learning about the different ways area is used in the home and community can a be a great way to connect schools tasks with home tasks. Students can talk with their family members about the concept of the area. They can make connections to buying and laying flooring or carpet, planning and building a garden, or planning and laying bricks to build a rectangular patio floor.	
Cross-Curricular Connections	Science: In third grade the NGSS states students should be able to "make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard." Consider providing a connection where students look at how an area can relate to the impact of weather-related hazards, such as tsunamis and stilt houses. Art: Painting a wall requires knowing the area of the wall and also how much area each paint can cover. Consider providing an opportunity for students to apply their knowledge of area to a real-life application within the school, such as painting an outside wall used during recess.	
Validate/Affirm/Build/ Bridge	• *How can you design your mathematics classroom to intentionally and purposefully legitimize the home culture and languages of students and reverse the negative stereotypes regarding the mathematical*	• Goal Setting: Setting challenging but attainable goals with students can communicate the belief and expectation that all students can engage with interesting and rigorous mathematical content and achieve in mathematics. Unfortunately, the reverse is also true, when students encounter low expectations through their interactions with adults and the media, they may see little reason to persist in mathematics, which can create a vicious cycle of low expectations

	abilities of students of marginalized cultures and languages? • *How can you create connections between the cultural and linguistic behaviors of your students' home culture and language, the culture and language of school mathematics to support students in creating mathematical identities as capable mathematicians that can use mathematics within school and society?*	and low achievement. For example, when studying understanding concepts of area and related areas to multiplication and addition goal setting is critical because students understand and know the learning goals and expectations for the lesson. When using both content and language objectives, the students are able to clearly understand the expectations and learning goals for the lesson, feel comfortable in the classroom setting, and are immersed in a classroom culture where ALL students can engage with interesting and rigorous mathematical content and achieve in mathematics to high levels.

Planning for Multi-Layered System of Supports

Vertical Alignment

Previous Learning	*Current Learning*	*Future Learning*
• Connect to measuring the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes. **(2.MD.1)** • Connect to partitioning a rectangle into rows and columns of same-size squares and counting to find the total number of them. **(2.G.2)** • Connect to using addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns and writing an equation to express the total as a sum of equal addends. **(2.OA.4)**	• Connect to understanding division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8. **(3.OA.6)** • Connect to solving two-step word problems using the four operations and representing these problems using equations with a letter standing for the unknown quantity. **(3.OA.8)** • Connect to applying properties of operations as strategies to multiply and divide. **(3.OA.5)**	• Connect to applying the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor. **(4.MD.3)**

Suggested Instructional Strategies		
Pre-Teach		
Level of Intensity	***Essential Question***	***Examples***
Targeted	*What pre-teaching will prepare students to productively struggle with the mathematics for this cluster within your HQIM?*	For example, some learners may benefit from targeted pre-teaching that rehearses prior learning when studying understanding concepts of area and relating area to multiplication and addition because students are building on prior understanding of linear measurement, tiling rectangles, and partitioning a rectangle into rows and columns of same-size squares and count to find the total number of them.
Intensive	*What critical understandings will prepare students to access the mathematics for this cluster?*	2.G.A.2: This standard provides a foundation for work with understanding concepts of area and relating area to multiplication and addition because this standard focuses on reasoning with shapes and their attributes and partitioning a rectangle into rows and columns of same-size squares and counting to find the total number of them. This prior knowledge and understanding is important because students can make connections from tiling rectangles and decomposing them into rows and columns of same-sized squares to using square units to measure the amount of space covered by a rectangle. If students have unfinished learning within this standard, based on assessment data, consider ways to provide intensive pre-teaching support prior to the start of the unit to ensure students are ready to access grade level instruction and assignments.
Universal Support Framework		
A student should know/understand...	A student should be able to do...	***Potential Scaffolds***

• A unit square, within a shape, is the same as one square unit and measures as 1 and unit squares will not overlap or have gaps.
• Area is the
	• Use tiles to find the area of a rectangle using whole numbers.
	• Decompose rectilinear figures into rectangles, and find the area of each part then add the
		• Build on students' experience with the following skills:
		  ○ Adding all sides of a closed figure
		  ○ Use arrays to reinforce concepts of area as well as area equations
		  ○ Apply understanding of the distributive property to find area of composite figures

measurement of a two-dimensional figure. ● Why multiplying side lengths of a rectangle is the same as counting the tiles. ● The area of a rectangular region can be found either by multiplying the side lengths or by adding two products which illustrate the distributive property.	areas of the various rectangles together. ● Find the perimeter of a rectangle given the side lengths and find an unknown side length of a rectangle given the perimeter. ● Find rectangles with the same perimeter and different areas and rectangles with the same area and different perimeter.	● Cognitive Strategies ○ Repeatedly model the strategies ○ Monitor the students' use of the strategies ○ Provide feedback to students ○ Teach self-questioning and self-monitoring strategies ○ Introduce multiple means of representation for mathematical ideas ● Encourage students to use alternative tools to better access the grade level content. Examples include: ○ Graph paper ○ Counting tiles ○ Counters

Re-Teach		
Level of Intensity	***Essential Question***	***Examples***
Targeted	What formative assessment data (e.g., tasks, exit tickets, observations) will help identify content needing to be revisited during a unit?	For example, students may benefit from re-engaging with content during a unit on understanding concepts of area and relating area to multiplication and addition by critiquing student approaches/solutions to make connections through a short mini-lesson because being able to see different strategies and solutions and make connections between those strategies and solutions will promote discourse between students and helps to clear up misconceptions and give students the opportunity to reflect on where they are in their learning and what they might still be struggling with.
Intensive	What assessment data will help identify content needing to be revisited for intensive interventions?	For example, students may benefit from re-engaging with content during a unit on understanding concepts of area and relating area to multiplication and addition by offering students opportunities to understand and explore different strategies in a small group setting or pull out if needed. In a smaller group setting, the teacher will be able to monitor students' progress on a biweekly basis to assess student growth and their responses to intensive interventions.

Extension	
Essential Question	***Examples***
What type of extension will offer additional challenges to 'broaden' your student's knowledge of the mathematics developed within your HQIM?	For example, some learners may benefit from an extension such as the opportunity to understand concepts more quickly and explore them in greater depth than other students when studying understanding concepts of area and relating area to multiplication and addition because it gives students the opportunity to explore with measuring efficiently and effectively using standard units, their learning experiences can be directed to situations that encourage them to "discover" measurement formula. Students can also make connections to what types of jobs might utilize area and why it is important to be accurate and efficient.

CCSS Domain	***CCSS Cluster***
Measurement and Data	**Geometric measurement: recognize perimeter**

Culturally and Linguistically Responsive Instruction

Relevance to Families and Communities	During a unit focused on recognizing perimeter as an attribute of plane figures and distinguishing between linear and area measures, consider options for learning from your families and communities the cultural and linguistic ways this mathematics exists outside of school to create stronger home to school connections for students. Example 1: During a unit focused on perimeter, consider options for learning from your families and communities the cultural and linguistic ways this mathematics exists outside of school to create stronger home to school connections for students, for example, learning about the different structures for the different units of measurement across the languages in your classroom can lead to a more robust understanding of units used for measurement for all students by making connections to the different structures of units of measurement used in other countries. Relate the metric system to the countries of origin of your students. Example 2: During a unit focused on perimeter, consider options for learning from your families and communities the cultural and linguistic ways this mathematics exists outside

	of school to create stronger home to school connections for students, for example, learning about the different ways perimeter is used in the home and community can a be a great way to connect schools' tasks with home tasks. Students can talk with their families about the perimeter. What are some items in your home that have a perimeter? What units of measure would you use? Example 3: During a unit focused on perimeter, consider options for learning from your families and communities the cultural and linguistic ways this mathematics exists outside of school to create stronger home to school connections for students, for example, learning about the mathematics used within the different careers of your family and community can provide a strong connection between school and careers. What careers in their family or community would utilize perimeter? Maybe landscapers, interior designers, what about sports fields? Have you ever noticed the lines on the field or the court?	
Cross-Curricular Connections	Science: In third grade the NGSS states students should be able to "make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard." Consider providing a connection where students look at how perimeter can relate to the impact of weather-related hazards, such as wildfires and leaving containers of water around the perimeter of a property. Social Studies: In third grade the New Mexico Social Studies Standards recommend students "identify the components of the Earth's biosystems and their makeup (e.g., air, land, water, plants, and animals)." Consider providing opportunities for students to think about farmland and animals and how to best construct a fence for them within the context of perimeter.	
Validate/Affirm/Build /Bridge	• *How can you design your mathematics classroom to intentionally and purposefully legitimize the home culture and languages of students and reverse the negative stereotypes regarding the mathematical abilities of students of marginalized cultures and languages?* • *How can you create connections between the cultural and linguistic behaviors of your students' home culture and language, the culture and language of school mathematics to support students in*	• Tasks: The type of mathematical tasks and instruction students receive provides the foundation for students' mathematical learning and their mathematical identity. Tasks and instructions that provide greater access to mathematics and convey the creativity of mathematics by allowing for multiple solution strategies and development of the standards for mathematical practice lead to more students viewing themselves mathematically successful capable mathematicians than tasks and instruction which define success as memorizing and repeating a procedure demonstrated by the teacher. For example, when studying recognizing perimeter as an attribute of plane figures and distinguishing between linear and area measures the types of mathematical tasks are critical because they should be accessible to ALL students. Choosing floor to ceiling tasks gives each student an opportunity to access the task at their level and build on and deepen their understanding of the mathematics being explored. Tasks should promote reasoning and problem

	creating mathematical identities as capable mathematicians that can use mathematics within school and society?	solving, promote student discourse, and support students in productive struggle.

Planning for Multi-Layered System of Supports

Vertical Alignment

Previous Learning	*Current Learning*	*Future Learning*
• Connect to measuring the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes. **(2.MD.1)** • Connect to using addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem. **(2.MD.5)**	• Connect to solving two-step word problems using the four operations and representing these problems using equations with a letter standing for the unknown quantity. **(3.OA.8)**	• Connect to applying the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor. **(4.MD.3)**

Suggested Instructional Strategies

Pre-Teach

Level of Intensity	*Essential Question*	*Examples*
Targeted	*What pre-teaching will prepare students to productively struggle with the mathematics for this cluster within your HQIM?*	For example, some learners may benefit from targeted pre-teaching that rehearses prior learning when studying recognizing perimeter as an attribute of plane figures and distinguishes between linear and area measures because students build on prior knowledge of recognizing polygons and knowing their attributes and measuring and estimating lengths in standard units.

Intensive	*What critical understandings will prepare students to access the mathematics for this cluster?*	2.MD.A.1: This standard provides a foundation for work with recognizing perimeter as an attribute of plane figures and distinguishing between linear and area measures because students will be measuring the distance around polygons using standard units and using these measurements to find the perimeter. If students have unfinished learning within this standard, based on assessment data, consider ways to provide intensive pre-teaching support prior to the start of the unit to ensure students are ready to access grade level instruction and assignments.
Re-Teach		
Level of Intensity	***Essential Question***	***Examples***
Targeted	What formative assessment data (e.g., tasks, exit tickets, observations) will help identify content needing to be revisited during a unit?	For example, students may benefit from re-engaging with content during a unit on recognizing perimeter as an attribute of plane figures and distinguishing between linear and area measures by clarifying mathematical ideas and/or concepts through a short mini-lesson because this gives students time to explore more with perimeter and clear up their misconceptions. Students may need time to explore that perimeter is the distance around the shape, which is different from area.
Intensive	What assessment data will help identify content needing to be revisited for intensive interventions?	For example, students may benefit from re-engaging with content during a unit on recognizing perimeter as an attribute of plane figures and distinguishing between linear and area measures by addressing conceptual understanding in a small group setting or pull out if needed. In a smaller group setting, the teacher will be able to monitor students' progress on a biweekly basis to assess student growth and their responses to intensive interventions.
Extension		
Essential Question		***Examples***
What type of extension will offer additional challenges to 'broaden' your student's knowledge of the mathematics		For example, some learners may benefit from an extension such as open-ended tasks linking multiple

developed within your HQIM?	disciplines when studying recognizing perimeter as an attribute of plane figures and distinguishing between linear and area measures because students can explore tasks that involve “Big Ideas” and spend time reasoning and making connections which the students can visualize, play, and investigate. This leads to a deeper understanding of the mathematical content.