NEW MEXICO
Public Education Department

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

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

- Understand addition as putting together and adding to, and subtraction as taking apart and taking from.
    - K.OA.A.1
    - K.OA.A.2
    - K.OA.A.3
    - K.OA.A.4
    - K.OA.A.5

NEW MEXICO
Public Education Department

Grade	CCSS Domain	CCSS Cluster
K	**Operations and Algebraic Thinking**	**Understand addition as putting together and adding to, and subtraction as taking apart and taking from.**

Cluster Standard: K.OA.A.1

Standard	Standards for Mathematical Practice
Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.	● **SMP 2:** Reason abstractly and quantitatively. ● **SMP 5:** Use appropriate tools strategically.

Clarification Statement	Students Who Demonstrate Understanding Can...
● Math drawings facilitate reflection and discussion because they remain after the problem is solved. ● The teacher can write expressions (e.g., 3 - 1) to represent operations, as well as writing equations that represent the whole situation before the solution (e.g., 3 - 1 = ?) or after (e.g., 3 - 1 = 2). Expressions like 3 - 1 or 2 + 1 show the operation, and it is helpful for students to have experience just with the expression so they can conceptually chunk this part of an equation. ● Students may share different ways they show numbers using their fingers at home. Students show numbers with their fingers and to raise (or lower) them when counting. The three major ways used around the world are starting with the thumb, the little finger, or the pointing finger (ending with the thumb in the latter two cases). Each way has advantages physically or mathematically, so students can use whatever is familiar to them. The teacher can use the range of methods present in the classroom, and these methods can be compared by students to expand their understanding of numbers.	● Represent addition as putting together and adding to; with objects, fingers, drawings, sounds, acting out situations, or verbal explanations. ● Represent subtraction as taking apart and taking from with objects, fingers, drawings, sounds, acting out situations, or verbal explanations. ● Identify the mathematical symbols used to show addition and subtraction. ● Relate an expression or equation for addition or subtraction to a situation.

DOK	Blooms

Kindergarten Operations and Algebraic Thinking Guide

2	Apply and Analyze

Grade	CCSS Domain	CCSS Cluster
K	**Operations and Algebraic Thinking**	**Understand addition as putting together and adding to, and subtraction as taking apart and taking from.**

💡 Cluster Standard: K.OA.A.2

Standard	Standards for Mathematical Practice
Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.	• **SMP 1:** Make sense of problems and persevere in solving them. • **SMP 4:** Model with mathematics.

Clarification Statement	Students Who Demonstrate Understanding Can...
• In Put Together/Take Apart situations, two quantities jointly compose a third quantity (the total), or a quantity can be decomposed into two quantities (the addends). This composition/decomposition may be physical or conceptual. These situations are acted out with objects initially and later students begin to move to conceptual mental actions of shifting between seeing the addends and seeing the total (e.g., seeing students or seeing boys and girls, or seeing red and green apples or all the apples). • Addition and Subtraction Situations by Grade Level.	• Represent addition word problems with objects or drawings. • Represent subtraction word problems with objects or drawings. • Add within 10. • Subtract within 10. • Solve addition and subtraction word problems using objects and drawings.

DOK	Blooms

2	Apply and Analyze

Grade	CCSS Domain	CCSS Cluster
K	**Operations and Algebraic Thinking**	**Understand addition as putting together and adding to, and subtraction as taking apart and taking from.**

Cluster Standard: K.OA.A.3

Standard	Standards for Mathematical Practice
Decompose numbers less than or equal to 10 into pairs in more than one way; using objects or drawings, and record each decomposition with a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).	• **SMP 2:** Reason abstractly and quantitatively. • **SMP 7:** Look for and make use of structure.

Clarification Statement	Students Who Demonstrate Understanding Can...
• Put Together/Take Apart situations with Both Addends Unknown play an important role in kindergarten because they allow students to explore various compositions that make each number. • Addition and Subtraction Situations by Grade Level.	• Decompose (break apart) numbers to 10 using objects or drawings, increasing their range with time. • Decompose a number between 1 and 10 in more than one way (e.g., 5 = 2 + 3 and 5 = 4 + 1). • Identify an equation for a decomposed number.

DOK	Blooms
2-3	Analyze and Evaluate

Grade	CCSS Domain	CCSS Cluster
K	**Operations and Algebraic Thinking**	**Understand addition as putting together and adding to, and subtraction as taking apart and taking from.**

Cluster Standard: K.OA.A.4

Standard	Standards for Mathematical Practice
For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.	• **SMP 2**: Reason abstractly and quantitatively. • **SMP 6:** Attend to precision.
Clarification Statement	**Students Who Demonstrate Understanding Can...**
	• Determine the number to add to a given number between 1 and 9 to make 10. • Represent combinations of 10 with a drawing or equation.
DOK	**Blooms**
1-2	Remember and Apply

Grade	CCSS Domain	CCSS Cluster
K	**Operations and Algebraic Thinking**	**Understand addition as putting together and adding to, and subtraction as taking apart and taking from.**

Cluster Standard: K.OA.A.5

Standard	Standards for Mathematical Practice

Public Education Department

Fluently add and subtract within 5.	● **SMP 6:** Attend to precision. ● **SMP 7:** Look for and make use of structure.
Clarification Statement	**Students Who Demonstrate Understanding Can...**
● Experience with decompositions of numbers and with Add to and Take From situations enable students to begin to fluently add and subtract within 5.	● Consistently add within 5 with accurate and efficient results. ● Consistently subtract within 5 with accurate and efficient results.
DOK	**Blooms**
1	Remember

Common Misconceptions

● Believing that certain words always indicate a particular operation.

Student Discourse Guide

● **Purposeful, rich classroom discourse offers students the opportunity to express their ideas, thinking, and to critique the reasoning of others in a variety of ways (writing, drawing, verbalizing). Purposeful implementation of classroom discourse allows students to activate funds of knowledge and to refine their mathematical understanding. When students have frequent opportunities for discourse they find various paths to solutions and reveal knowledge or misunderstandings to educators. The process also allows educators to honor students' culture, lived experiences and evolving math identities.**

● **Discourse that focuses on tasks that promote reasoning and problem solving is a primary mechanism for developing conceptual understanding and meaningful learning of mathematics (Michaels, O'Connor, and Resnick, 2008)**

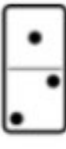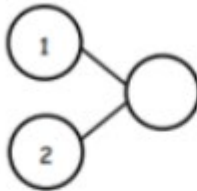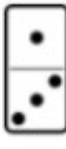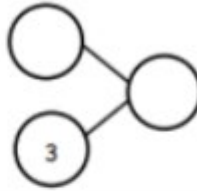|	
Domain: **Operations and Algebraic Thinking**	Strand: **Understand addition as putting together and adding to, and subtraction as taking apart**
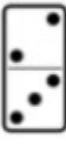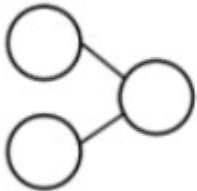
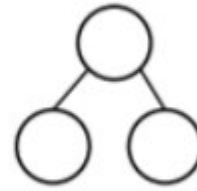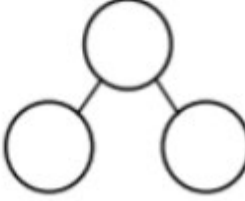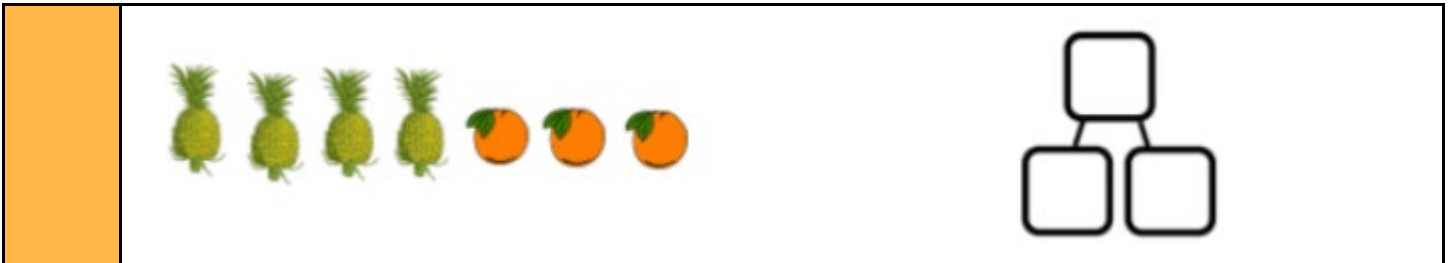|	and taking from.
Suggested Student Discourse Questions	
- What does it mean to decompose a number? Compose? - Explain to your partner how both of your groups are equal? If they are not equal, how can you make them equal?	- How do you use addition/subtraction at home? - How can you show a number bond using your fingers?

ASSESSMENT GUIDE

- Understand addition as putting together and adding to, and subtraction as taking apart and taking from.

Grade	CCSS Domain	CCSS Strand
K	**Operations and Algebraic Thinking**	**Understand addition as putting together and adding to, and subtraction as taking apart and taking from.**
	Sample Task #1	

Fill in the number bond to match the domino.

Fill in the domino with dots, and fill in the number bond to match.

Sample Task #2

NEW MEXICO
Public Education Department

MLSS AND CLR GUIDE

- Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.

CCSS Domain	CCSS Cluster
Operations and Algebraic Thinking	Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from

Culturally and Linguistically Responsive Instruction

Relevance to Families and Communities	During a unit focused on understanding addition as putting together and adding to, and understanding subtraction as taking apart and taking from, 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, students may bring from home different ways to show numbers with their fingers and to raise (or lower) them when counting. The three major ways used around the world are starting with the thumb, the little finger, or the pointing finger (ending with the thumb in the latter two cases).	
Cross-Curricular Connections	Social Studies: In Kindergarten, the New Mexico Social Studies Standards state students should "describe trade (e.g., buying and selling, bartering, simple exchange).". Consider providing a connection for students to add and subtract related to buying and selling. Language Arts: Literature can offer connections about addition and subtraction such as: *Making Tens* by John Burstein and *Ten Little Caterpillars* by Bill Martin, Jr.	
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*	Eliciting and Using Evidence of Student Thinking: Eliciting and using student thinking can promote a classroom culture in which mistakes or errors are viewed as opportunities for learning. When student thinking is at the center of classroom activity, "it is more likely that students who have felt evaluated or judged in their past mathematical experiences will make meaningful contributions to the classroom over

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?*	time." For example, when studying understanding addition as putting together and adding to, and understanding subtraction as taking apart and taking from, eliciting and using student thinking is critical because providing opportunities for instructional conversations as students work through conceptualizing addition and subtraction helps build equity of participation and develops active listening skills.

Planning for Multi-Layered System of Supports

Vertical Alignment

Previous Learning	*Current Learning*	*Future Learning*
● Connect to students work with counting.	● Connect to decomposing large numbers in the range of 11-19 to gain foundations for place value by composing and decomposing into "ten ones and some more." (e.g., 18 is ten ones and eight more). **(K.NBT.1)**	● Connect to represent and solve problems with addition and subtraction within 20, including a new type of problem situation (compare). **(1.OA.1)** ● Connect to understanding and applying properties of operations and the relationship between addition and subtraction. **(1.OA.3)** ● Connect to adding and subtracting within 20. **(1.OA.6)** ● Connect to working with addition and subtraction equations. **(1.OA.7)**

Public Education Department

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 introduces new representations when studying the understanding of addition and subtraction because new symbols and concepts, such as the plus, minus, and equal sign will be introduced. Students at this point will more than likely have not been exposed to the understanding of combining numbers.
Intensive	*What critical understandings will prepare students to access the mathematics for this cluster?*	Indicator 9.3 (New Mexico Early Learning Guidelines, Essential Indicator): This standard provides a foundation for work with understanding addition as putting together and adding to, and subtraction as taking apart and taking away from because students need foundational skills relating to initial understanding of numbers and rote counting. Also, students learn that numbers are associated with words and numeral symbols. 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*

● Addition is putting together (composing).
● Subtraction is taking apart (decomposing).
● Understand that numbers, within 10, can be put together and taken apart in different ways and
	● Use concrete materials to model how numbers up to 10 are composed and decomposed.
	● Solve various types of addition and subtraction problems within 10, including word problems, using objects or
		● Build on students' experience with the following skills:
		  ○ Model how two parts (two quantities) can be put together to make a new quantity or larger quantity.
		  ○ Model how a whole number can be broken into parts or smaller numbers.
		  ○ Model how to use objects or drawings to represent and solve an addition and/or subtraction problem.

Public Education Department

be recorded using equations or drawings.
● The connections between physical representations, drawings and provided equations and expressions for numbers within 10.
	drawings.
	● Find the missing addend that makes 10 when given a number 1-9.
	● Accurately, efficiently, flexibly and appropriately add and subtract numbers within 5.
		● 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:
		  ○ Digital or hands on manipulatives: two colored counters, linking cubes, base ten blocks, bears, ten frame counters, beans, straws, subitizing cards, beads, number bonds, etc...
		  ○ Digital resources from math programs or online resources for counting, comparing, addition, and subtraction practice.

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?	Examine assessments for evidence of lingering misconceptions (see common misconceptions). If students exhibit one more of these misconceptions, consider addressing the misconception by: having students re-engage with content during a unit on understanding addition and subtraction by examining tasks from a different perspective. Students may be able to learn addition or subtraction concepts in multiple ways such as through a short mini-lesson or with the use of visuals or manipulatives.
Intensive	What assessment data will help identify content needing to be revisited for intensive interventions?	Examine assessments for evidence of students still developing the underlying ideas, for example, some students may benefit from intensive extra time during and after a unit on being able to represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps, finger snaps), acting out situations, verbal explanations, expressions, or equations

		by offering opportunities to understand and explore different strategies through the use of concrete manipulatives or fingers and to accommodate various learning styles because some students may need to practice the concept by using more than one modality of learning to then progress from concrete to pictorial representations of the models.

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?	To extend students learning on understanding addition as putting together and adding to, and understanding subtraction as taking apart and taking from, 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 the skill to represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations because students may benefit from learning to reframe a certain problem in a new way, such as moving away from using physical and visual cues to add and subtract and start using word based, or oral problems.