






New Mexico Instructional Scope 1st Grade Operations and Algebraic Thinking 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](#)

Key		
	<i>Priority Standard</i>	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.
	<i>Conceptual Understanding</i>	Conceptual Understanding standards help students build a deep understanding of the how and why of mathematics.
	<i>Application</i>	Application standards help students identify the appropriate concepts and skills to tackle novel real-world problems .
	<i>Procedural Skill and Fluency</i>	Procedural standards help students develop efficiency and accuracy in computations.

Standards Breakdown

- Represent and solve problems involving addition and subtraction.
 - [1.OA.A.1](#)
 - [1.OA.A.2](#)
- Understand and apply properties of operations and the relationship between addition and subtraction.
 - [1.OA.B.3](#)
 - [1.OA.B.4](#)
- Add and subtract within 20.
 - [1.OA.C.5](#)
 - [1.OA.C.6](#)
- Work with addition and subtraction equations.
 - [1.OA.D.7](#)
 - [1.OA.D.8](#)


Grade	CCSS Domain	CCSS Cluster
1	Operations and Algebraic Thinking	Represent and solve problems involving addition and subtraction.
 Cluster Standard: 1.OA.A.1		
Standard		Standards for Mathematical Practice
<p>Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.</p>		<ul style="list-style-type: none"> ● SMP 1: Make sense of problems and persevere in solving them. ● SMP 2: Reason abstractly and quantitatively. ● SMP 3: Construct viable arguments and critique the reasoning of others.
Clarification Statement		Students Who Demonstrate Understanding Can...
<ul style="list-style-type: none"> ● In a Compare situation, two quantities are compared to find "how many more" or "how many less." Addition and Subtraction Situations by Grade Level. 		<ul style="list-style-type: none"> ● Represent word problems involving adding to, taking from, putting together, taking apart, or comparison situations using objects and drawings. ● Write equations involving adding to, taking from, putting together, taking apart, or comparison situations with unknown numbers in different positions. ● Explain how an equation represents an adding to, taking from, putting together, taking apart, or comparison situation. ● Solve word problems representing adding to, taking from, putting together, taking apart, or comparison situations with unknown numbers in different positions.
DOK		Blooms
2		Apply and Analyze

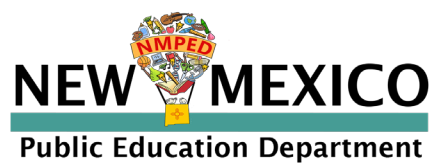
Grade	CCSS Domain	CCSS Cluster
1	Operations and Algebraic Thinking	Understand and apply properties of operations and the relationship between addition and subtraction.
 Cluster Standard: 1.OA.A.2		
Standard	Standards for Mathematical Practice	
Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	<ul style="list-style-type: none"> ● SMP 1: Make sense of problems and persevere in solving them. ● SMP 2: Reason abstractly and quantitatively. ● SMP 3: Construct viable arguments and critique the reasoning of others. 	
Clarification Statement	Students Who Demonstrate Understanding Can...	
<ul style="list-style-type: none"> ● In all mathematical problem solving, what matters is the explanation a student gives to relate a representation to a context, and not the representation separated from its context. 	<ul style="list-style-type: none"> ● Represent and solve word problems requiring the addition of three whole numbers using objects and drawings. ● Write equations involving the addition of three whole numbers representing the unknown using a symbol. ● Add three whole numbers whose sum is less than or equal to 20. 	
DOK	Blooms	
2	Apply and analyze	

Common Misconceptions


- Students may believe that certain words always
- Students may believe it is not possible to add or

indicate a particular operation.	subtract more than two numbers.
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Grade	CCSS Domain	CCSS Cluster
1	Operations and Algebraic Thinking	Understand and apply properties of operations and the relationship between addition and subtraction.
 Cluster Standard: 1.OA.B.3		
Standard		Standards for Mathematical Practice
Apply properties of operations as strategies to add and subtract. <i>Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$. (Associative property of addition.)</i>		<ul style="list-style-type: none"> ● SMP 2: Reason abstractly and quantitatively. ● SMP 7: Look for and make use of structure.
Clarification Statement		Students Who Demonstrate Understanding Can...
<ul style="list-style-type: none"> ● Methods involve decomposing an addend and composing it with the other addend to form an equivalent but easier problem. This relies on properties of operations. Students do not necessarily have to justify their representations or solutions using properties, but they can begin to learn to recognize these properties in action and discuss their use after solving. 		<ul style="list-style-type: none"> ● Use representations to solve addition and subtraction problems. ● Describe and make generalizations regarding properties (adding or subtracting 0 does not change the number) and strategies (making a ten when adding more than two numbers). ● Show or explain their thinking.
DOK		Blooms
2		Apply and Analyze





New Mexico Instructional Scope
**1st Grade Operations and Algebraic
Thinking Guide**

Grade	CCSS Domain	CCSS Cluster
1	Operations and Algebraic Thinking	Understand and apply properties of operations and the relationship between addition and subtraction.
 Cluster Standard: 1.OA.B.4		
Standard		Standards for Mathematical Practice
Understand subtraction as an unknown-addend problem. <i>For example, subtract 10 - 8 by finding the number that makes 10 when added to 8.</i>		<ul style="list-style-type: none"> ● SMP 4: Model with mathematics. ● SMP 7: Look for and make use of structure.
Clarification Statement		Students Who Demonstrate Understanding Can...
<ul style="list-style-type: none"> ● Put Together/Take Apart problems with Addend Unknown afford students the opportunity to see subtraction as the opposite of addition in a different way than as reversing the action, namely as finding an unknown addend. The meaning of subtraction as an unknown-addend addition problem is one of the essential understandings' students will need in middle school in order to extend arithmetic to negative rational numbers. 		<ul style="list-style-type: none"> ● Explain the relationship between addition and subtraction using objects, pictures, numbers and words. ● Represent the relationship between addition and subtraction using objects, pictures, numbers and words. ● Rewrite a subtraction equation as an addition equation with a missing addend.
DOK		Blooms
2		Apply and Analyze

Common Misconceptions

<ul style="list-style-type: none"> ● Students might believe that subtraction is commutative. ● Students may not realize they can count on to find the difference. 	<ul style="list-style-type: none"> ● Students confuse the parts of addition and subtraction equations.
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Grade	CCSS Domain	CCSS Cluster
1	Operations and Algebraic Thinking	Add and Subtract within 20.
 Cluster Standard: 1.OA.C.5		
Standard		Standards for Mathematical Practice
Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).		<ul style="list-style-type: none"> ● SMP 5: Use appropriate tools strategically. ● SMP 7: Look for and make use of structure.
Clarification Statement		Students Who Demonstrate Understanding Can...
<ul style="list-style-type: none"> ● Unlike counting down, counting on reinforces that subtraction is an unknown-addend problem. Learning to think of and solve subtractions as unknown addend problems makes subtraction as easy as addition (or even easier), and it emphasizes the relationship between addition and subtraction. 		<ul style="list-style-type: none"> ● Represent addition and subtraction with base ten blocks, counters, ten frames, number lines, and drawings. ● Add by counting all and counting on. ● Explain that one can count on from either addend in an addition equation. ● Recognize that +1 means the next number and that +2 means the next-next number in the counting sequence. ● Subtract by counting back or counting on. ● Explain that one can count back the total amount being subtracted (i.e. in 9-7, one can count back 7) or that one can count back to the number being subtracted (i.e. in 9-7, one can count back to 7). ● Recognize that -1 means the number before and that -2 means the number that is two numbers before in the counting sequence.
DOK		Blooms
1-2		Remember, Understand, and Analyze

Grade	CCSS Domain	CCSS Cluster
1	Operations and Algebraic Thinking	Add and subtract within 20.
 Cluster Standard: 1.OA.C.6		
Standard		Standards for Mathematical Practice
<p>Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).</p>		<ul style="list-style-type: none"> ● SMP 6: Attend to precision. ● SMP 7: Look for and make use of structure.
Clarification Statement		Students Who Demonstrate Understanding Can...
<ul style="list-style-type: none"> ● Students might use the commutative property in addition to change $? + 6 = 15$ to $6 + ? = 15$, then count on or use methods to compose 4 (to make ten) plus 5 (ones in the 15) to find 9. Students might reverse the action in the situation represented by $? - 6 = 9$ so that it becomes $9 + 6 = ?$. Or they might use their knowledge that the total is the first number in a subtraction equation and the last number in an addition equation to rewrite the situation equation as a solution equation: $? - 6 = 9$ becomes $9 + 6 = ?$ or $6 + 9 = ?$. Appendix from K, Counting and Cardinality; K–5, Operations and Algebraic Thinking: Methods used for solving single-digit addition and subtraction problems. 		<ul style="list-style-type: none"> ● Consistently add within 10 with accurate and efficient results. ● Consistently subtract within 10 with accurate and efficient results. ● Use strategies to find sums and differences when they can't be recalled quickly, including counting on, making ten, and doubles. ● Show or explain their thinking.


DOK	Blooms
1-2	Remember, Understand, and Analyze

Common Misconceptions

- Students might double count a number when adding or subtracting. For example, starting with the 6 when adding 4 to get 6, 7, 8, or 9 rather than 10.

Grade	CCSS Domain	CCSS Cluster
1	Operations and Algebraic Thinking	Work with addition and subtraction equations.
 Cluster Standard: 1.OA.D.7		
Standard		Standards for Mathematical Practice
Understand the meaning of the equal sign and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? $6 = 6$, $7 = 8 - 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$.		<ul style="list-style-type: none"> SMP 2: Reason abstractly and quantitatively. SMP 6: Attend to precision.
Clarification Statement		Students Who Demonstrate Understanding Can:
<ul style="list-style-type: none"> In this standard, students develop an understanding of the meaning of the equal sign and apply their understanding in order to determine whether an equation is true. Students learn that the equal sign does not mean “the answer comes next”, but that the symbol signifies an equivalent relationship. Students need to understand that an equation needs to “balance”, with equal quantities on both sides of the equal sign. Once students understand the meaning of the equal sign, they can determine if an equation is true ($9 = 9$) or not true ($9 = 8$). 		<ul style="list-style-type: none"> Explain the meaning of equal using models and drawings. Determine if two quantities are equal. Represent equal quantities with an equation with operations on either side, neither side, or both sides of the equal sign. Determine whether an equation is true or false.

DOK	Blooms
2-3	Analyze and Evaluate

Grade	CCSS Domain	CCSS Cluster
1	Operations and Algebraic Thinking	Work with addition and subtraction equations.
 Cluster Standard: 1.OA.D.8		
Standard		Standards for Mathematical Practice
Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. <i>For example, determine the unknown number that makes the equation true in each of the equations $8 + ? = 11$, $5 = _ - 3$, $6 + 6 = _$.</i>		<ul style="list-style-type: none"> SMP 3: Construct viable arguments and critique the reasoning of others. SMP 7: Look for and make use of structure.
Clarification Statement		Students Who Demonstrate Understanding Can...
<ul style="list-style-type: none"> In this standard, students develop an understanding of the meaning of the equal sign and apply their understanding in order to determine whether an equation is true. Students learn that the equal sign does not mean “the answer comes next”, but that the symbol signifies an equivalent relationship. Students need to understand that an equation needs to “balance”, with equal quantities on both sides of the equal sign. Once students understand the meaning of the equal sign, they can determine if an equation is true ($9 = 9$) or not true ($9 = 8$). 		<ul style="list-style-type: none"> Determine the unknown in various positions in an addition equation. Determine the unknown in various positions in a subtraction equation. Explain how an unknown in an equation was determined.

DOK	Blooms
2	Apply and Analyze

Common Misconceptions

- Students thinking that the equals sign means that an operation must be performed on the numbers on the left and the result of this operation is written on the right.

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, verbal). 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: **Represent and solve problems involving addition and Subtraction.**

Suggested Student Discourse Questions

- | | |
|---|---|
| <ul style="list-style-type: none"> ● How do you know when you add? How do you know when you subtract? ● Why did (student's name) use subtraction/addition to solve the problem? | <ul style="list-style-type: none"> ● When do you add or subtract at the grocery store? ● Can you explain how (students name) represented adding objects together? |
|---|---|

Domain: **Operations and Algebraic Thinking**

Strand: **Understand and apply properties of**

		addition and subtraction
Suggested Student Discourse Questions		
<ul style="list-style-type: none"> • How can we decompose the number “5”? • Why can we switch numbers when we add but not when we subtract? (associative) 	<ul style="list-style-type: none"> • Think about things that go together (green/red chili, brother/sister, salt/pepper). When you put them together in any order, do you still get the same thing? (commutative) • Describe the strategy you used to solve the equation. 	

Domain: Operations and Algebraic Thinking	Strand: Add and subtract within 20.	
Suggested Student Discourse Questions		
<ul style="list-style-type: none"> • How do you “make a ten?” • How can you tell a friend how to find a missing number in an equation? 	<ul style="list-style-type: none"> • Where do you see addition and subtraction used in your home? • What tools can you use to add or subtract? 	



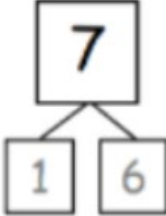
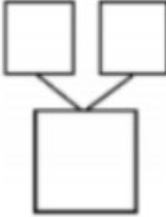
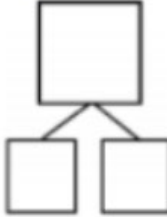




Domain: Operations and Algebraic Thinking	Strand: Work with addition and subtraction equations.	
Suggested Student Discourse Questions		
<ul style="list-style-type: none"> • What does it mean to balance something? How can we find the unknown addend? • How do you know when to add and when to subtract? 	<ul style="list-style-type: none"> • How would you use an addition or subtraction equation on your next trip to the store? • How can you show that you know when to add or subtract, and how do you know which strategy to pick? 	

ASSESSMENT GUIDE

- [Represent and solve problems involving addition and subtraction](#)
- [Understand and apply properties of operations and the relationship between addition and subtraction](#)
- [Add and subtract within 20](#)
- [Work with addition and subtraction equations](#)

<i>Grade</i>	<i>CCSS Domain</i>	<i>CCSS Strand</i>
1	Operations and Algebraic Thinking	Represent and solve problems involving addition and subtraction.
	Sample Task #1 (Constructed Response)	

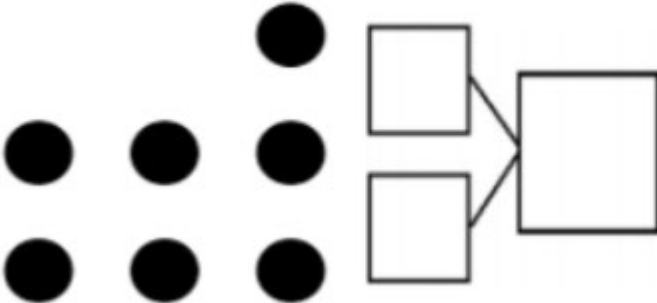
Match the dice to show different ways to make 7. Then, draw a number bond for each pair of dice.

a.			a.		b.		c.	
b.								
c.								

Sample Task #2

Circle 2 parts you see. Make a number bond to match.

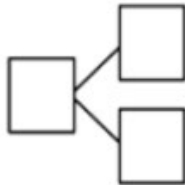
1.



Grade	CCSS Domain	CCSS Strand
1	Operations and Algebraic Thinking	Understand and apply properties of operations and the relationship between addition and subtraction.
Sample Task #1 (Constructed Response)		
<p>Match the math stories to the number sentences that tell the story. Make a math drawing to solve.</p> <p>1. a.</p> <div style="display: flex; justify-content: space-between;"> <div style="border: 1px solid black; padding: 5px; width: 45%;"> <p>There are 10 flowers in a vase. 6 are red. The rest are yellow. How many flowers are yellow?</p> </div> <div style="border: 1px solid black; padding: 5px; width: 45%;"> $\square + \square = \square$ $9 - \square = \square$ </div> </div> <p>b.</p> <div style="display: flex; justify-content: space-between;"> <div style="border: 1px solid black; padding: 5px; width: 45%;"> <p>There are 9 apples in a basket. 6 are red. The rest are green. How many apples are green?</p> </div> <div style="border: 1px solid black; padding: 5px; width: 45%;"> $3 + \square = 10$ $10 - \square = \square$ </div> </div>		
Sample Task #2		

Subtract. Make a math drawing for each problem like the ones above. Write a number bond.

1.



10 - 5 = _____

Grade	CCSS Domain	CCSS Strand
1	Operations and Algebraic thinking	Add and Subtract within 20.

Sample Task #1 (Constructed Response)

There are 9 ducks swimming along in a line. There are 2 grown-up ducks, and the rest are babies. How many of the ducks are babies?

a. Explain your thinking using pictures, numbers, or words.

b. Write a number sentence that shows how you solved the problem.

	Sample Task #2
	<p>Fill in the missing number. Visualize your 5-groups to help you.</p> <p>1. $7 - \underline{\quad} = 7$</p>

Grade	CCSS Domain	CCSS Strand
1	Operations and Algebraic Thinking	Work with addition and subtraction equations
	Sample Task #1 (Constructed Response)	
	<p>To solve $7 - 6$, Ben thinks you should count back, and Pat thinks you should count on. Which is the best way to solve this expression? Make a simple math drawing to show why.</p> <p style="text-align: center;">$7 - 6 = \underline{\hspace{2cm}}$</p>	
	Sample Task #2	

	<div style="border: 1px solid black; display: inline-block; padding: 10px 40px;"> $0 = 7 - \square$ </div> <div style="border: 1px solid black; display: inline-block; width: 150px; height: 60px; vertical-align: middle; margin-left: 10px;"></div>
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MLSS AND CLR GUIDE

- [Represent and solve problems involving addition and subtraction](#)
- [Understand and apply properties of operations and the relationship between addition and subtraction](#)
- [Add and subtract within 20](#)
- [Work with addition and subtraction equations](#)

<i>CCSS Domain</i>	<i>CCSS Cluster</i>
Operations and Algebraic Thinking	Represent and solve problems involving addition and subtraction.

Culturally and Linguistically Responsive Instruction

Relevance to Families and Communities	<p>During a unit focused on how to represent and solve problems involving addition and subtraction with the use of up to 3 numbers within 20, 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, since students are learning to solve addition and subtraction problems, they can relate this skill to real world examples relevant to their city and culture. Students can bring in examples that relate to them and even provide pictures of the items to support their knowledge of adding to and taking away.</p>
Cross-Curricular Connections	<p>Social Studies: In first grade the New Mexico Social Studies Standards state students should “understand the concept of goods and services”. Consider providing a connection for students to “sell” goods to each other or the larger community (such as in a first-grade market) as a context for math story problems.</p> <p>Language Arts: Writer’s Workshop in first grade includes a unit on Small Moments. Consider providing a connection between the beginning, middle and end of the stories students write and making sense of a math story problem using the structure of beginning, middle and end.</p>

<p>Validate/Affirm/Build/Bridge</p>	<ul style="list-style-type: none"> • <i>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?</i> • <i>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?</i> 	<ul style="list-style-type: none"> • 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 and low achievement. For example, when studying how to represent and solve problems involving addition and subtraction with the use of up to 3 numbers within 20 goal setting is critical because it allows students to take ownership of their own learning related to addition and subtraction. Students can self-reflect on their level of comfort related to this skill and reflect on areas in which they need support. Students can also make goals of making real world connections relevant to their culture using addition and subtraction. Students may benefit from using objects, drawings or equations to solve for the unknown value. Another example is students may use objects or drawings that are significant to them culturally, and this may allow for more student engagement to take place.
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Planning for Multi-Layered System of Supports

Vertical Alignment

<i>Previous Learning</i>	<i>Current Learning</i>	<i>Future Learning</i>
<ul style="list-style-type: none"> • Connect to learning the partners that make 10 for any number and knowing all decompositions for any number below 10. The idea of decomposing numbers (taking apart numbers) lays a foundation for developing strategies based on place value and properties of 	<ul style="list-style-type: none"> • Connect to using what students know about making 10 to work with larger numbers and problems with multiple addends. (1.OA.3,6) • Connect to working to gain confidence and fluency with strategies when solving problems and using these skills to answer questions regarding 	<ul style="list-style-type: none"> • Connect to working to become fluent within 100 and to extend their known strategies to larger numbers and two-step word problems. (2.OA.1) • Connect to applying this skill with problems in a variety of contexts involving length, picture graphs and bar

operations. (K.OA.3-4) <ul style="list-style-type: none"> Connect to knowing all teen numbers as 10 ones and some more. (K.NBT.1) 	data in a graph. (1. MD.4)	graphs. (2.NBT.5)
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Suggested Instructional Strategies

Pre-Teach

<i>Level of Intensity</i>	<i>Essential Question</i>	<i>Examples</i>
Targeted	<i>What pre-teaching will prepare students to productively struggle with the mathematics for this cluster within your HQIM?</i>	For example, some learners may benefit from targeted pre-teaching that rehearses prior learning when studying how to represent and solve problems involving addition and subtraction because it is building on the foundational skills that students learn in kindergarten such as understanding addition as adding to and subtraction as being taking apart, or taking away from.
Intensive	<i>What critical understandings will prepare students to access the mathematics for this cluster?</i>	K.OA.A.1: This standard provides a foundation for work with being able to represent addition and subtraction with objects, fingers, mental images, drawings*, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations because this standard is critical for students to understand what counting through addition and subtraction is. Also, it allows for students to fluently add or subtract within 10 using manipulatives or drawings if needed. 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...	<i>Potential Scaffolds</i>
<ul style="list-style-type: none"> What is happening in a word problem and how to identify what they are looking for in each situation. 	<ul style="list-style-type: none"> Solve addition and subtraction word problems within 20 using a strategy that makes sense to them. 	<ul style="list-style-type: none"> Build on students' experience with the following skills: <ul style="list-style-type: none"> Model how to use a number line and hundreds chart to count on or count back to add or subtract. Model multiple strategies to add and

<ul style="list-style-type: none"> • The relationship between addition and subtraction when solving for unknowns in all positions. 	<ul style="list-style-type: none"> • Represent their thinking using objects, pictures, number lines, hundreds charts, words, and numbers. • Write equations that represent the action of addition and subtraction word problems. 	<ul style="list-style-type: none"> ○ subtract. ○ Model how the symbols represent the action of addition and subtraction as well as the sum or difference is represented using the equal to symbol. ○ Utilize think alouds, classroom discourse to allow students to learn how to use and explain how the symbols represent the action of addition and subtraction. <ul style="list-style-type: none"> • Cognitive Strategies <ul style="list-style-type: none"> ○ 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: <ul style="list-style-type: none"> ○ Digital or hands on manipulatives: two colored counters, linking cubes, base ten blocks, bears, ten frame counters, beans, straws, subitizing cards, beads, number bonds, dice, dominoes, playing cards, etc... ○ Digital resources from math programs or online resources for counting, comparing, addition, and subtraction practice.
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Re-Teach

<i>Level of Intensity</i>	<i>Essential Question</i>	<i>Examples</i>
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 being able to represent and solve problems involving addition and subtraction by examining tasks from a different perspective through a short mini-lesson because students may benefit from seeing things in a new way and gaining a new perspective to make meaning. In addition, students can benefit from

		the use of manipulatives and/or drawings to solidify the understanding of this skill.
Intensive	What assessment data will help identify content needing to be revisited for intensive interventions?	For example, some students may benefit from intensive extra time during and after a unit in which students are able to represent and solve problems involving addition and subtraction by offering opportunities to understand and explore different strategies because students can better understand the skill if they have multiple strategies to approach and solve a problem. Students may make more connections and see things differently if they have knowledge of multiple strategies. Also, students may recognize patterns within numbers while adding and subtracting, such as looking for and identifying a combination of 10 and patterns with doubling of a number.
Extension		
<i>Essential Question</i>		<i>Examples</i>
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 application of and development of abstract thinking skills when studying the skill of being able to represent and solve problems involving addition and subtraction because students are now thinking about numbers in a more abstract way. This allows them to shift their thinking from concrete and pictorial to abstract which allows for more depth of knowledge to take place. Students can also apply this knowledge to multiple problems without having the items in front of them.

<i>CCSS Domain</i>	<i>CCSS Cluster</i>
Operations and Algebraic Thinking	Understand and apply properties of operations and the relationship between addition and subtraction
Culturally and Linguistically Responsive Instruction	
Relevance to Families and Communities	During a unit focused on the skill of being able to understand and apply properties of operations and the relationship between addition and subtraction, consider options for

	<p>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 can share ways to count or refer to numbers in their language, or a language spoken at home, to support their learning and extension of peers' learning. Also, this can promote engagement with all students and provide a more robust understanding of numbers as students make connections to different structures of number-names in other languages.</p>	
<p>Cross-Curricular Connections</p>	<p>Language Arts: Literature can offer connections to help students move from counting to addition such as: <i>Math Fables</i> by Greg Tang and <i>Math Fables Too</i> by Greg Tang. Art: Even though it is not explicit in the standard, the clarification statement makes it clear that it is important for students to share, discuss and compare their strategies as a class. Consider providing a connection where they can work together to make posters that illustrate each strategy.</p>	
<p>Validate/Affirm/Build/Bridge</p>	<ul style="list-style-type: none"> • <i>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?</i> • <i>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?</i> 	<ul style="list-style-type: none"> • 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 the skill of being able to understand and apply properties of operations and the relationship between addition and subtraction the types of mathematical tasks are critical because students are building the foundation and understanding of numbers and the relationship between them, while also solving for an unknown value. Also, students are developing multiple strategies associated with the commutative property and associative property. As students are developing skills related to addition and subtraction, they can relate to real world examples that can be important to their culture and language. Students can also incorporate their language and how to count in their language as they work to solve math problems.
<p>Planning for Multi-Layered System of Supports</p>		

Vertical Alignment		
<i>Previous Learning</i>	<i>Current Learning</i>	<i>Future Learning</i>
<ul style="list-style-type: none"> Connect to developing the understanding that addition means putting together and subtraction means taking apart and representing and solving word problems within 10. (K.OA.2) 	<ul style="list-style-type: none"> Connect to using patterns that students notice; such as place value understanding and properties of operations to add and subtract within 100. (1.NBT.4) Connect to becoming fluent adding and subtracting within 10, using strategies that make sense to them and explaining the reasoning behind the strategies used. (1.OA.6) 	<ul style="list-style-type: none"> Connect to using place value understanding and properties of operations to add and subtract within 100 using up to four 2-digit numbers and explaining why certain strategies work. Connect to using concrete models, drawings, and place value strategies to explore addition and subtraction within 1000. (2.NBT.5-9)
Suggested Instructional Strategies		
Pre-Teach		
<i>Level of Intensity</i>	<i>Essential Question</i>	<i>Examples</i>
Targeted	<i>What pre-teaching will prepare students to productively struggle with the mathematics for this cluster within your HQIM?</i>	For example, some learners may benefit from targeted pre-teaching that provides additional time for confusion to happen with new mathematical ideas when studying the skill of being able to understand and apply properties of operations and the relationship between addition and subtraction because students are learning about the commutative property along with the associative property to support the understanding of addition. Students are also looking for combinations to make ten and may benefit from having additional time with this new thinking.
Intensive	<i>What critical understandings will prepare students to access the mathematics for this cluster?</i>	K.OA.A.2: This standard provides a foundation for work with having access to solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem because this skill allows students to fully understand that addition is adding parts together and subtraction is taking apart from a total. Students can use manipulative

and/or drawings to support their thinking and development of the skill. 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...	<i>Potential Scaffolds</i>
<ul style="list-style-type: none"> ● Important properties of addition and subtraction. ● The relationship between addition and subtraction. 	<ul style="list-style-type: none"> ● Describe addition and subtraction patterns and make generalizations. ● Use addition to solve subtraction problems. 	<ul style="list-style-type: none"> ● Build on students' experience with the following skills: <ul style="list-style-type: none"> ○ Utilize objects to show that they can be put together in any order and it will have the same total. ○ Model how the sum of an addition problem can be used as the whole in a subtraction problem pointing out that the whole is broken into the same numbers as the addends of the addition problem. ● Cognitive Strategies <ul style="list-style-type: none"> ○ 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: <ul style="list-style-type: none"> ○ Digital or hands on manipulatives: two colored counters, linking cubes, base ten blocks, bears, ten frame counters, beans, straws, subitizing cards, beads, number bonds, dice, dominoes, playing cards, etc... ○ Digital resources from math programs or online resources for counting,

		comparing, addition, and subtraction practice.
Re-Teach		
<i>Level of Intensity</i>	<i>Essential Question</i>	<i>Examples</i>
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 being able to understand and apply properties of operations and the relationships between addition and subtraction by providing specific feedback to students on their work through a short mini-lesson because the students can then receive immediate feedback to support and correct any misconceptions the students may have. It is important to ensure that students are following the correct procedure when adding or subtracting, and immediate feedback and help support students to follow the correct order of steps.
Intensive	What assessment data will help identify content needing to be revisited for intensive interventions?	For example, some students may benefit from intensive extra time during and after a unit on being able to understand and apply properties of operations and the relationships between addition and subtraction by offering opportunities to understand and explore different strategies because this allows students to rely on multiple strategies to approach and solve a problem rather than one that may be causing confusion. Also, students can benefit from knowing multiple strategies because it can deepen their understanding and allow them to make connections about addition and subtraction.
Extension		
	<i>Essential Question</i>	<i>Examples</i>
	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 application of and development of abstract thinking skills when studying how to understand and apply properties of operations and the relationships between addition and subtraction because students can move from concrete and pictorial representations of addition and subtraction to more abstract concepts. This allows students to build on their skills and understand

mathematical relationships, specifically related to addition and subtraction.

CCSS Domain		CCSS Cluster	
Operations and Algebraic Thinking		Add and subtract within 20	
Culturally and Linguistically Responsive Instruction			
Relevance to Families and Communities	During a unit focused on adding and subtracting within 20, 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, count, add and subtract in your home language. Use items from around the house to model addition and subtraction problems.		
Cross-Curricular Connections	<p>Science: In first grade the NGSS state students should "make observations at different times of year to relate the amount of daylight to the time of year." Consider providing a connection for students to find the difference in the number of hours of daylight during different times of the year.</p> <p>Language Arts: Letters or digraphs are something that students can count. Consider providing a connection where students "hunt" for particular letters or digraphs on 2 different pages of their reading book and then add or subtract to find the total or difference, being mindful that all answers are within 20.</p>		
Validate/Affirm/Build/Bridge	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Task: When planning with your HQIM, consider how to modify tasks to represent the prior experiences, culture, language and interests of your students to "portray mathematics as useful and important in students' lives and promote students' lived experiences as important in mathematics class." Tasks can also be designed to "promote social justice [to] engage students in using mathematics to understand and eradicate social inequities (Gutstein 2006)." For example, when studying adding and subtracting within 20 the types of mathematical tasks are critical because it allows students flexibility to work within components of their own culture and language. They can use their home language skills to help understand what the problem is asking. 	

	<p><i>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?</i></p>	<p>Students can also choose items such as counters lines or methods of counting that might be available in the home setting.</p>
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Planning for Multi-Layered System of Supports

Vertical Alignment

<i>Previous Learning</i>	<i>Current Learning</i>	<i>Future Learning</i>
<ul style="list-style-type: none"> • Connect to counting to 100 and count on from any given number within 100. (K.CC.1) • Connect reading and writing to 20 and demonstrating one-to-one correspondence when counting objects. (K.CC.3, K.CC.4a) 	<ul style="list-style-type: none"> • Connect to developing fluency (working flexibly, accurately, efficiently and appropriately) when adding and subtracting within 10 but continuing to use strategies to solve within 100 and explaining their reasoning. (1.NBT.4) 	<ul style="list-style-type: none"> • Connect to fluently adding and subtracting within 20 using mental strategies and mentally adding two 1-digit numbers. (2.OA.2)

Suggested Instructional Strategies

Pre-Teach

<i>Level of Intensity</i>	<i>Essential Question</i>	<i>Examples</i>
Targeted	<i>What pre-teaching will prepare students to productively struggle with the mathematics for this cluster within your HQIM?</i>	For example, some learners may benefit from targeted pre-teaching that rehearses prior learning when studying add and subtract within 20 because the foundation of this cluster is to understand that counting leads to understanding addition and subtraction. Students can practice counting forward and/or backward from a given number. This can be a group activity.
Intensive	<i>What critical understandings</i>	K.CC. A2: Counting to tell the number of objects, is the

	<p><i>will prepare students to access the mathematics for this cluster?</i></p>	<p>prior standard. This standard provides a foundation for work with adding and subtracting numbers within 20 because it provides the understanding that you can a given number of objects within 20. 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.</p>
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Universal Support Framework

A student should know/understand...	A student should be able to do...	Potential Scaffolds
<ul style="list-style-type: none"> ● How to use strategies for addition and subtraction, including counting on, counting back, making 10, doubles, doubles + 1, and thinking of subtraction as an unknown addend problem. ● How to extend strategies for facts with sums to 10 to numbers within 20. 	<ul style="list-style-type: none"> ● Explain their strategy for finding the answer to addition and subtraction facts within 10. ● Look for patterns as they use counting strategies. ● Flexibly, accurately, efficiently and appropriately add and subtract within 10. ● Use concrete, pictorial, and symbolic representations to add and subtract with sums to 20. 	<ul style="list-style-type: none"> ● Build on students' experience with the following skills: <ul style="list-style-type: none"> ○ Give students multiple opportunities to add and subtract within 10 using various strategies, counting on, counting back, doubles, doubles +1, number lines, etc... ○ Model how to start with a group of ten and then count on to add. ○ Model how to start with the whole and count back to subtract. ○ Recognize that +1 means the next number and that +2 means the next-next number in the counting sequence. ○ Recognize the -1 means the number before and that -2 means the number that is two numbers before in the counting sequence. ○ Emphasizing that efficiently means to solve quickly and correctly, for instance using x's and o's for drawings and not using detailed drawings to solve. ● Cognitive Strategies <ul style="list-style-type: none"> ○ 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

		<p>representation for mathematical ideas</p> <ul style="list-style-type: none"> Encourage students to use alternative tools to better access the grade level content. Examples include: <ul style="list-style-type: none"> Digital or hands on manipulatives: two colored counters, linking cubes, base ten blocks, bears, ten frame counters, beans, straws, subitizing cards, beads, number bonds, dice, dominoes, playing cards, etc... Digital resources from math programs or online resources for counting, comparing, addition, and subtraction practice.
Re-Teach		
<i>Level of Intensity</i>	<i>Essential Question</i>	<i>Examples</i>
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 add and subtract within 20 by critiquing student approaches/solutions to make connections through a short mini-lesson because students need to know that counting objects leads to the total number of objects given. This is a foundational skill to adding numerical amounts.
Intensive	What assessment data will help identify content needing to be revisited for intensive interventions?	For example, some students may benefit from intensive extra time during and after a unit on add and subtract within 20 by addressing conceptual understanding because they need to connect the idea of counting objects in groups and adding to what they have already counted without starting from 1.
Extension		
<i>Essential Question</i>		<i>Examples</i>
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 adding and subtracting within 20 because students may be ready for

larger numbers by using units of 10 or previously learned strategies. This is also related to the next standard in the progression.

CCSS Domain		CCSS Cluster
Operations and Algebraic Thinking		Work with addition and subtraction equations.
Culturally and Linguistically Responsive Instruction		
Relevance to Families and Communities	During a unit focused on work with addition and subtraction equations, 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, Continue to practice adding and subtracting within 20 or Practice “counting on” as a strategy for addition, e.g. if you have 7 LEGO pieces, and then you get 3 more, encourage your student to start with the number 7 and count “8...9...10” to find the total. Discuss various ways to take apart a given number, e.g. 6 is made of 1 and 5, 2 and 4, 3 and 3, etc.	
Cross-Curricular Connections	<p>Language Arts: Literature can offer connections to help students find the unknown in various positions in addition and subtraction equations such as: <i>Safari Park</i> by Stuart J. Murphy.</p> <p>Physical Education: Keeping score during a team game can offer connections to help students understand that equal means the “same as” or “tied”. Basketball, football or another game where the total number of points could be scored in a variety of different ways (e.g. 2 touchdowns + 1 safety = 2 touchdowns + 2 conversions) is especially helpful in developing this idea.</p>	
Validate/Affirm/Build/Bridge	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Supporting Productive Struggle in Learning Mathematics: The standard for mathematical practice, makes sense of mathematics and persevere in solving them is the foundation for supporting productive struggle in the mathematics classroom. “Too frequently, historically marginalized students are overrepresented in classes that focus on memorizing and practicing procedures and rarely provide opportunities for students to think and figure things out for themselves. When students in these classes struggle, the teacher often tells them what to

	<p><i>and languages?</i></p> <ul style="list-style-type: none"> • <i>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?</i> 	<p>do without building their capacity for persistence.” Teachers need to provide tasks that challenge students and maintain that challenge while encouraging them to persist. This encouragement or “warm-demander” requires a strong relationship with students and an understanding of the culture of the students. For example, when studying work with addition and subtraction equations. Supporting productive struggle is critical because when solving addition and subtraction students need consistent fluency practice without a lot of guidance from teachers. Allowing them to productively struggle with these equations will encourage perseverance no matter the culture of the student.</p>
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Planning for Multi-Layered System of Supports

Vertical Alignment

<i>Previous Learning</i>	<i>Current Learning</i>	<i>Future Learning</i>
<ul style="list-style-type: none"> • Connect to comparing the number of objects in one group to the number of objects in another group to decide if they are equal, as well as comparing two written numbers between 1 and 10 and discussing if they are equal. (K.CC.6-7) 	<ul style="list-style-type: none"> • Connect to changing the structure of problems (e.g., changing a subtraction problem to an addition problem) and being flexible with the position of unknowns and the location of the equal sign in equations (e.g., $5 + 4 = 9$ or $9 = 5 + 4$) (1.OA.3-4) 	<ul style="list-style-type: none"> • Connect writing equations to express equivalent groups and the ideas of even numbers, equal parts, skip counting, etc. (2.OA.3-4) • Connect to writing equations to solve word problems. (2.OA.1) • Connect to thinking about inequalities and students continuing to use their understanding of the equal sign. (1.NBT.4)

Suggested Instructional Strategies

Pre-Teach

<i>Level of Intensity</i>	<i>Essential Question</i>	<i>Examples</i>
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Targeted	<i>What pre-teaching will prepare students to productively struggle with the mathematics for this cluster within your HQIM?</i>	For example, some learners may benefit from targeted pre-teaching that introduces new representations (e.g., number lines) when studying work with addition and subtraction equations because OA.D is a new concept for first graders there are no kindergarten standards that link to it, therefore going into detail about what an equal sign is and the importance of it, is very important for a deep understanding.
Intensive	<i>What critical understandings will prepare students to access the mathematics for this cluster?</i>	1.OA.D.7: This standard provides a foundation for work with addition and subtraction equations because first graders are introduced to this standard for the first time in first grade and in order to be successful in the rest of their computing careers in school they need to master this first skill of understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. 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
<ul style="list-style-type: none"> ● The equal sign (=) means “same as”. ● The equal sign can be located anywhere in the equation. ● The meaning of true and false and how to use this language to categorize equations. 	<ul style="list-style-type: none"> ● Make addition and subtraction equations true by naming the unknown (in any position). ● Compare quantities using the equal sign. ● Explain how they found the unknown value in an equation. 	<ul style="list-style-type: none"> ● Build on students’ experience with the following skills: <ul style="list-style-type: none"> ○ Using a student balance and objects model that the number of objects on each side are equal which also means the same as balanced. ○ Explain that equal means the same as the word “is”. ○ Represent equal quantities ○ Give examples of what is true and what is false to build understanding of vocabulary. ○ Model or think aloud how to determine if an equation is true or false. ● Cognitive Strategies <ul style="list-style-type: none"> ○ Repeatedly model the strategies ○ Monitor the students’ use of the

		<p>strategies</p> <ul style="list-style-type: none"> ○ Provide feedback to students ○ Teach self-questioning and self-monitoring strategies ○ Introduce multiple means of representation for mathematical ideas <ul style="list-style-type: none"> ● Encourage students to use alternative tools to better access the grade level content. Examples include: <ul style="list-style-type: none"> ○ Digital or hands on manipulatives: two colored counters, linking cubes, base ten blocks, bears, ten frame counters, beans, straws, subitizing cards, beads, number bonds, dice, dominoes, playing cards, student balance etc... ○ Digital resources from math programs or online resources for counting, comparing, addition, and subtraction practice.
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Re-Teach

<i>Level of Intensity</i>	<i>Essential Question</i>	<i>Examples</i>
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 work with addition and subtraction equations by critiquing student approaches/solutions to make connections through a short mini-lesson because in order for students to truly be successful in addition or subtraction fluidly they need to be proficient in understanding what the equal sign means and be able to solve.
Intensive	What assessment data will help identify content needing to be revisited for intensive interventions?	For example, some students may benefit from intensive extra time during and after a unit work with addition and subtraction equations by helping students move from specific answers to generalizations for certain types of problems because students should solve addition and subtraction equations with different structures so that they are able to see the connections between addition and subtraction more easily. Examples should be presented with the sum or difference on either side of the equal sign in order to dispel the notion that it means "compute."

Extension	
<i>Essential Question</i>	<i>Examples</i>
<p>What type of extension will offer additional challenges to 'broaden' your student's knowledge of the mathematics developed within your HQIM?</p>	<p>Some learners may benefit from an extension such as the application of and development of abstract thinking skills when studying work with addition and subtraction equations. As students become more fluent with adding and subtracting, they will need to be able to solve equations regardless of the position of the equal sign.</p>