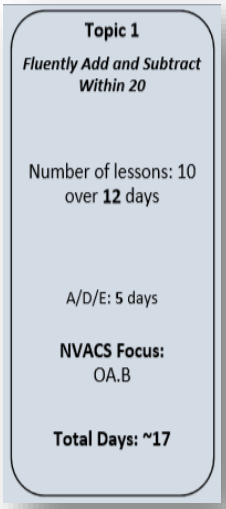
Grade 2 Topic 1: Fluently Add and Subtract Within 20



2nd Grade Curriculum Pacing Framework: Balanced Calendar

Big Conceptual Idea: K-5 Progression Operations and Algebraic Thinking (pp. 18-21)
Prior to instruction, view the Topic 1 Professional Development Video located in Pearson Realize online. This takes less than 3 minutes. Read the Teacher's Edition (TE): Cluster Overview/Math Background pages (pp. 1A-1E), the Topic Planner (pp.1I-1K), the Topic Performance Assessment (pp. 75-76A) and all 10 lessons.

Mathematical Background: Read Cluster Overview (TE, pp. 1A-1F)	Topic Essential Question: What are strategies for finding addition and subtraction facts? *Reference TE p. 1 and Answering the Topic Essential Questions (TE, pp. 71-72) for key elements of answers to the Essential Questions.*

The lesson map for this topic is as follows:

1-1	1-2	1-3	1-4	1-5	1-6	1-7	1-8	1-9	1-10	Assessment

5 A/D/E days used strategically throughout the topic.

Instructional note:
This topic focuses on fluently adding and subtracting within 20, and the big idea that the operations of addition and subtraction are related. Focus instruction on Nevada Academic Content Standard (NVACS, 2010) 2.OA.B.2.

> *2.OA.B.2 Add and subtract within 20.*
> *2. Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.*

As defined by the NVACS, fluency refers to "skill in carrying out procedures flexibly, accurately, efficiently and appropriately" (2010, p. 6). It does NOT mean memorization. When instruction focuses on memorization, students are less willing to think about numbers and their relationships and to apply and develop their number sense (Boaler, 2009).

> *High achieving students use number sense and it is critical that lower achieving students, instead of working on drill and memorization, also learn to use numbers flexibly and conceptually. Memorization and timed testing stand in the way of number sense, giving students the impression that sense making is not important (Boaler, 2015).*

Rather, development of fluency occurs in three phases: 1) Constructing meaning and counting strategies (e.g., count on, count back) 2) Reasoning strategies (e.g., making 10, near doubles) and 3) Working toward quick recall. The third phase, quick recall is defined as ~3 seconds, allowing students to use a known fact to quickly derive an unknown fact without resorting to inefficient counting methods (Van de Walle, Karp, Lovin, & Bay-Williams, 2014).

In first grade, students used strategies to add and subtract within 20, demonstrating fluency within 10 (NVACS, 2010, 1.OA.C.6). These strategies included counting on, making ten, decomposing a number leading to a ten, using the relationship between addition and subtraction, and creating equivalent but easier or known sums. First grade students connect concrete and representational models to abstract equations. Instruction in Topic 1 focuses on developing these strategies and others through relationships and number sense. The part-part-whole relationship- conceptualizing a number as being composed of parts is the most important numerical relationship that can be developed (Van de Walle, et al., 2014). Maintain focus on reasoning and discuss strategies that students invent. Although the lessons focus on a particular strategy, encourage students to use the strategy but do not require them to do so. A requirement such as this removes the reasoning from strategy development. Instead, honor student strategies by emphasizing their ability to determine the appropriateness of a strategy and justify its use.

When assessing fluency, AVOID timed tests. Approximately one-third of students begin to experience math anxiety at the onset of timed testing (Boaler, 2014). Brain research also concludes that stress blocks the working memory, preventing students from accessing math facts they know (Beilock, 2011; Ramirex, et al., 2013). In addition, timed tests do not tell us which strategies a student used or their level of flexibility. It is important that our instruction and assessment focus on numbers and their relationships. Better options for assessment include student interviews, observations, journaling or quizzes based on strategies (Bay-Williams, Kling, 2014). For examples, reference "Assessing Basic Fact Fluency" and My Fluency Progress (Teaching Tool 63).

Math Practice 3: Construct viable arguments and critique the reasoning of others.
Focus on opportunities for students to develop MP.3 behaviors. This is the focus of lesson 1-10. Reference the Teacher's Edition (TE, pp. F25-F25A) and the Nevada Academic Content Standards for Mathematical Practice.

Finally, please note that lessons 1-1 and 1-2 could be 2-day lessons giving you additional time to establish class routines and expectations for:

- Accessing and returning manipulatives
- Classroom discussion norms
- Mathematical Mindset
- Integrating ideas from the Math Practices and Problem Solving Handbook (TE, p. F19-F35)
    - Problem Solving Guide and Problem Solving Recording Sheet (TE, p. F31-F32)
    - Pay particular attention to "A Caution" (TE, p. F32, last paragraph)

Anchor Chart of Addition and Subtraction Strategies: Throughout the topic, have students construct a class anchor chart of addition and subtraction strategies. It is helpful to include representations of each strategy. These strategies include, but are not limited to: Count On to Add, Doubles, Near Doubles, Make a 10 to Add, Patterns on the Addition Fact Table, Count On to Subtract, Count Back, Think Addition, Make a 10 to Subtract (Add on to Make 10 and Subtract to Make 10).

Note: The purpose of the curriculum guides is for additional considerations. Therefore, not all components may have additional notes included in this guide.

Essential Academic Vocabulary Use these words consistently during instruction and post on math focus wall.	
New Academic Vocabulary: (First time explicitly taught)	Review Academic Vocabulary: (Vocabulary explicitly taught in prior grades or topics)
addends doubles near doubles	*equal sign, =* *equation* *sum* *difference*

Additional terminology that students may need support with: *add, break apart, compare, connect, contrast, minuend (the whole), part, subtract, subtrahend (part subtracted), whole*

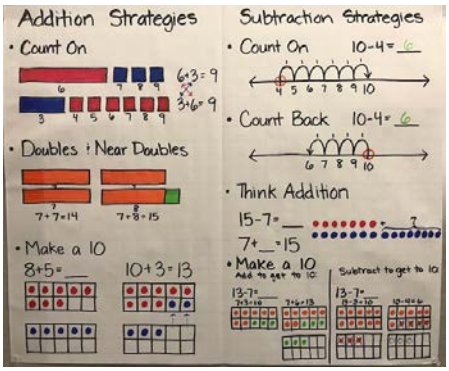
*Collaborative Team Conversations (CTC)

Consider using ***one*** of the following as part of the formative assessment process at the lesson level to collect student work to analyze for evidence of mathematical understanding:

Guiding question: "Are students developing conceptual understanding of the relationship between addition and subtractions to help develop fluency within 20?" (every subtraction fact has a related addition fact-inverse relationships)

Lesson	Evidence	Look for
1-6	***Solve & Share*** (student work samples)	Focus CTC around the big idea: • student strategies and models • use of reasoning to analyze the relationship between addition and subtraction • use part/part/whole understanding when subtracting or adding
1-6	***Quick Check*** (digital platform)	Focus CTC around data analysis and collection of student workspace (scratch paper). Printable version available under "Teacher Resources".

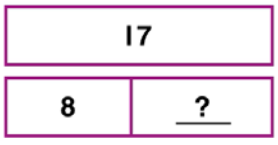
Learning Cycle Assessments (summative)	*Topic Assessments* SE pp. 71-76	Use *Scoring Guide* TE pp. 71-76

NVACS (Content and Practices)	Mathematical Development of the Big Idea	Instructional Clarifications & Considerations
Lesson 1-1: Addition Fact Strategies		
2.OA.B.2 MP.2 MP.4 MP.7 MP.8	Access Prior Learning: *(Coherence: TE p.1C-1D)* In first grade, (1.OA.C.6) students used the counting on strategy to add within 20, demonstrating fluency within 10. Students also applied the commutative and associative properties of addition (1.OA.B.3). Securing the Big Idea: In this lesson, students are *securing* understanding that counting on is a strategy to find sums within 10. Developing the Big Idea: In this lesson, students are *developing* understanding that counting on is a strategy to find sums extending to within 20. They are also *developing* understanding of the Commutative Property of Addition, that the order of the addends does not change the sum. Associative Property of Addition: (a + b) + c = a + (b + c) Commutative Property of Addition: a + b = b + a	Possible 2-day lesson Day 1: Topic Opener: Limit use of the *Topic Opener* to the *Topic Essential Question*, *Review What You Know* and *Topic 1 Vocabulary Words Activity* with the word, *sum*. Introduce remaining vocabulary words as they appear in the lessons. Consider establishing class discussion norms and activating student schema by asking students to discuss the *Topic Essential Questions* (TE, p.1). This conversation will inform your instruction while establishing routines and expectations. Post the questions and student strategies on your math focus wall. *Solve & Share:* Introduce routines for tool use and management. Students MUST have access to, and be encouraged to use tools throughout math instruction daily. Use student solutions to begin an anchor chart of addition and subtraction strategies (see sample below). Add to this chart throughout the topic. Although the image is teacher-made, student made resources are encouraged.  Day 2: Visual Learning: Have students use connecting cubes to explore 6 + 3 and 3 + 6 to increase conceptual understanding of the commutative property and increase engagement. Add any new strategies to the anchor chart started on Day 1. • Add the Commutative Property and other student-invented strategies to the anchor chart • Reinforce with representations and examples Independent Practice/Math Practices and Problem Solving: Throughout this topic, students do NOT need to do all of the problems in their student edition. However, ALL students NEED to have opportunities to solve problems at varying DOK levels. The *Independent Practice* page offers problems that support procedural skill and fluency. The *Math Practices and Problem Solving* page offers problems that support application. The *Quick Check* items (marked with a pink check) offer both opportunities. Have students complete these items first and continue on to other items as appropriate. For item 14, consider using the *Problem Solving Recording Sheet* (Teaching Tool 1) to model how this tool can help students solve problems but do not require them to complete the sheet in written form during this lesson. Assess and Differentiate: If time permits, teach students how to play *Listen and Learn* from lesson 1-8 (TE, p. 51A). All students should have the opportunity to play this game throughout the topic. Based upon child-watching for the Commutative Property of Addition and counting on, identify students who need additional support and pull them in a small group to do the *Intervention Activity* (TE, p.9A)

Lesson 1-2: Doubles and Near Doubles		
2.OA.B.2 MP.4 MP.6 MP.7 MP.8	Access Prior Learning: Doubles facts are often referred to as "equivalent but easier or known sums". In first grade (1.OA.C.6) students created equivalent but easier or known sums within 20, demonstrating fluency within 10. For example, when adding 6 + 7, they used a doubles plus one equivalent: 6 + 6 + 1 = 12 + 1 = 13. Securing the Big Idea: In this lesson, students are *securing* understanding that doubles facts can be used to find basic addition facts that are near doubles within 10. Developing the Big Idea: In this lesson, students are *developing* understanding that doubles facts can be used to find basic addition facts that are near doubles extending to within 20.	Possible 2-day lesson Day 1: To assess readiness for near doubles, consider having students create a word web (Teaching Tool 60; also see TE pp. 437-438 for examples) for doubles using pictures or equations. The word web can be used again in the future for explicit vocabulary work. Solve & Share: Continue to build routines for tool use and management. Students should be encouraged to model with math (MP.4) using connecting cubes. As the near doubles strategy emerges from student solutions and the class discussion, add it to the anchor chart of addition strategies. • Add Doubles and other student-invented strategies to the anchor chart • Reinforce with representations and examples Day 2: Visual Learning: Have students use connecting cubes to explore 7+7, 7 + 8, and 7 + 9 to increase understanding of the near doubles strategy and increase engagement. • Add Near-Doubles (Doubles +1, Doubles +2, Doubles -1, Doubles -2) and other student-invented strategies to the anchor chart • Reinforce with representations and examples Independent Practice/Math Practices and Problem Solving: Students do NOT need to do all of the problems in their Student Edition. However, ALL students NEED to have opportunities to solve problems at varying DOK levels. The *Independent Practice* page offers problems that support procedural skill and fluency. The *Math Practices and Problem Solving* page offers problems that support application. The *Quick Check* items (marked with a pink check) offer both opportunities. Have students complete these items first and continue on to other items as appropriate. Assess and Differentiate: If time permits, teach or revisit *Listen and Learn* center game from lesson 1-8 (TE, p. 51A). All students should have the opportunity to play this game throughout the topic. Child-watch to identify students who need additional support with doubles/near doubles. Pull these students in a small group to do the *Intervention Activity* (TE, p.15A)
Lesson 1-3: Make A 10 to Add		
2.OA.B.2 MP.1 MP.2 MP.3 MP.5 MP.7	Access Prior Learning: In kindergarten, (K.OA.A.4) students worked on sums to 10. In first grade, (1.OA.C.6) students used the making ten strategy to add within 20, demonstrating fluency within 10. Developing the Big Idea: In this lesson, students are *developing* understanding that some addition facts with an addend near 10 can be found by changing to an equivalent fact with 10. (9 + 3 = 9 + 1 + 2 = 10 + 2 = 12) Students will relate this strategy to the Making 10 to Subtract strategy in lesson 1-8.	The Make a 10 strategy may be the most important strategy for children to know (Van de Walle, et al., 2014, p. 160). It helps students develop flexibility in their ability to add and subtract. The use of tools such as ten-frames and math racks* help students to visualize number relationships. Although students begin with the use of concrete manipulatives, they will eventually be able to apply the strategy mentally. As articulated in the instructional note at the start of this document, fluency development occurs in three phases. Pushing students to quick recall too early is detrimental to their mathematical mindset and ability to apply strategies flexibly. Understanding of the Make A 10 to Add strategy will later extend to their application of the Make a 10 to Subtract strategy and to their work with adding and subtracting multiples of ten within 100. *In first grade students worked with number racks. Number racks are not provided with the instructional materials. Example of Number Racks  Solve & Share: Students had extensive experience with ten-frames and number racks in kindergarten and first grade. These tools reinforces students' understanding of the structure of 10 in our number system. Look for students who make use of the structure provided by placing 9 counters on one ten frame, decomposing the 3 into 2 and 1, then combine the 9 and 1 to make 10 before placing the remaining two counters on the second ten frame. These students are inherently using the associative property by decomposing the 3 into a 1 and a 2, then associating the 9 and 1 before adding 10 and 2. Also, look for students who count all or count on without attending to the ten structure. Use the *Intervention Activity*, *Stacking and Making 10* (TE, p. 21A) with these students. • Add Make a 10 and other student-invented strategies to the anchor chart • Reinforce with representations and examples *-continues on next page-*

		Assess and Differentiate: Consider replacing the *On-Level* and *Advanced* Activity Center with *Listen and Learn* center game from lesson 1-8 (TE, p. 51A). All students should have the opportunity to play this game. As noted above, child-watch during the *Solve & Share*. Identify students who did not use the structure of ten to solve 9 + 3. Engage these students in the *Intervention Activity: Stacking and Making 10* (TE, p. 21A).
Lesson 1-4: Addition Fact Patterns		
2.OA.B.2 MP.2 MP.5 MP.6 MP.7 MP.8	Access Prior Learning: Earlier in this topic, students learned strategies for developing fluency with addition facts within 20 (reference the anchor chart you've built thus far). Beginning the Big Idea: In this lesson, students are *beginning* find and recognize patterns in the addition facts table. They begin to see these patterns as useful for adding numbers and developing mental math strategies.	A note of CAUTION: We do not want students to rely on the Addition Facts Table to find answers to basic facts. Watch for students who want to use the Addition Facts Table to find sums and missing addends. Emphasize that this table is a tool to help them see patterns in addition facts and a relationship between the parts of a problem (addends and sum). Solve & Share: Consider extending the guiding questions in the *During* phase (TE, p.23) by asking students to also reason about the addends with questions such as: "How are the first addends changing? How are the second addends changing?" The goal of these questions is for students to make a connection between changes in the sums and changes in the addends. These conversations will link to the *Visual Learning* and offer another entry point for students into the content. If your students do not identify the patterns displayed in *Analyze Student Work* (Manny's Work and Gordon's Work), consider displaying the samples provided (TE, p. 23, and available online under the *Solve & Share* as "Teacher Resources").  • Add patterns to the anchor chart • Reinforce with representations and examples Independent Practice/Math Practices and Problem Solving: Consider adding item 10 to guided practice. Provide students with time to write as many addition facts with a sum of 12 as they can. Look for students who organize these facts in a way that promotes the use of patterns. Facilitate a whole class discussion around how patterns can help us solve the problem.
Lesson 1-5: Count On And Count Back To Subtract		
2.OA.B.2 MP.1 MP.2 MP.4 MP.5	Access Prior Learning: In first grade, (1.OA.C.6) students used counting on and the relationship between addition and subtraction to add and subtract within 20, demonstrating fluency within 10. The number line was used for both addition and subtraction. Securing the Big Idea: In this lesson, students are *securing* understanding of the count on and count back strategies to subtract on a number line within 10. Developing the Big Idea: In this lesson, students are *developing* understanding of the count on and count back strategies to subtract on a number line within 20.	The use of the number line helps students connect counting to adding and subtracting. When students count on to subtract, help them to understand that they are adding to subtract and that subtraction is an unknown-addend problem. This will be a helpful connection to lesson 1-6: *Think Addition to Subtract*. If students have trouble keeping track of how many spaces they are counting, or if they are counting the tick marks instead of spaces, refer to the Error Intervention: Item 2 suggestion (TE, p.30) for an appropriate scaffold. Students generally find counting back to be a more difficult strategy, but certain contexts lend themselves to this strategy. Consider extending student understanding throughout the lesson by asking students to show another way to solve the problem. This might elicit a greater balance between the count on and count back strategies should students choose to use the number line again rather than a picture, equation or concrete manipulative such as counters. To extend even further, encourage students to make a generalization by considering when *count on* is a more appropriate strategy (e.g., the minuend and subtrahend are close together such as in 14 – 11 = ?) and when *count back* is a more appropriate strategy based upon the numbers (e.g., the minuend and subtrahend are further apart such as in 12 – 4 = ?). • Add Count On, Count Back and other student-invented strategies to the anchor chart. • Reinforce with representations and examples

Lesson 1-6: Think Addition To Subtract		
2.OA.B.2 MP.2 MP.7 MP.8	Access Prior Learning: In first grade, (1.OA.C.6) students used the relationship between addition and subtraction to add and subtract within 20, demonstrating fluency within 10. Students also understood subtraction as an unknown-addend problem (1.OA.B.4). Securing the Big Idea: In this lesson, students are *securing* understanding of the inverse relationship between addition and subtraction and that this relationship can help them find subtraction facts within 10. Developing the Big Idea: In this lesson, students are *developing* understanding of the inverse relationship between addition and subtraction and that this relationship can help them find subtraction facts within 20. Students are developing understanding that every subtraction fact has a related addition fact.	Students continue to develop fluency by using previously learned addition facts to solve subtraction facts. This work develops their understanding of the inverse relationship of addition and subtraction. It also develops student understanding of part-part-whole relationships. The terms *part* and *whole* are not explicitly taught, but are essential to students developing understanding of the relationship of numbers. As Van de Walle, et al., (2014) states, "To conceptualize a number as being made up of two or more parts is the most important relationship that can be developed about numbers. For example, 7 can be thought of as a set of 3 and a set of 4 or a set of 2 and a set of 5" (p. 108). Solve & Share: • Add Think-Addition and other student-invented strategies to the anchor chart • Reinforce with representations and examples Visual Learning*:* In the *Do You Understand? Show Me!,* allow students to provide examples of addition facts that help them solve subtraction facts. Use these examples to facilitate a class discussion on how mathematicians can explain their thinking using words and sentences. As a class, craft a written response to model Math Practice 3: Construct Viable Arguments and Critique the Reasoning of Others, and second grade expectations including: • Provides complete and clear explanations of one's thinking. • Uses examples and counterexamples when appropriate. • See the Math Practices and Problem Solving Handbook for ideas on how to develop, connect and assess the Math Practices (TE, p.F25A) This crafted response can stand as a model in future lessons, reflecting expectations for student written work. *CTC: ***Solve & Share** *(*student work samples) *CTC: ***Quick Check*** (digital platform)
Lesson 1-7: Make A 10 To Subtract		
2.OA.B.2 MP.3 MP.4 MP.5 MP.7 MP.8	Access Prior Learning: In lesson 1-3, students learned to add by making 10. Developing the Big Idea: In this lesson, students are *developing* understanding that some subtraction facts can be simplified by making use of the numbers' relationships to 10. They will learn that there are two different ways to Make A 10 to Subtract: add on to make a 10, and subtract to make a 10.	Students use ten-frames as tools to represent the "Make A 10 strategy", which helps build fluency. This also helps students understand that a subtraction fact can be changed into a fact with a 10 without changing the difference. For students who struggle with this strategy, consider offering another entry point through the use of the make a 10 strategy using a number line. Help these students connect the different representations (number lines and ten-frames) of the same strategy. Solve & Share*:* As students problem solve, child-watch for students who add on to make a 10 (similar to Laura's Work, TE, p. 41) and students who subtract to make a 10 (similar to Amari's Work, TE, p. 41). Consider selecting students to share so that the strategies build in efficiency or accuracy. For example, you may have a child who does not use make a 10 share first, and then follow with a child who added on to make a 10 and finish with a child who subtracted to make a 10. If these strategies were not used by your students, use the work samples provided on TE, p. 41. Focus the conversation so that students make connections between the various strategies and evaluate which are the quickest and most accurate. Visual Learning: If students struggle to make a 10 in the *Solve & Share*, consider having them solve 13 – 7 (the problem posed in the animation) using their strategy of choice prior to viewing and discussing the *Visual Learning Animation*. Provide students with counters and ten-frames so they can represent the problem and connect to their experience in the *Solve & Share*. Guided Practice*:* Consider using ten frames (Teaching Tool 8) and counters to support students' understanding of the Make A 10 to Subtract strategies. Item 3 from Independent Practice may also be used during Guided Practice.

Lesson 1-8: Practice Addition and Subtraction Facts		
2.OA.B.2 MP.2 MP.3 MP.4 MP.8	Access Prior Learning: In first grade, (1.OA.C.6) students selected strategies to add and subtract within 20, demonstrating fluency within 10. Securing the Big Idea: In this lesson, students are *securing* understanding that addends determine efficient strategies and the use of efficient strategies builds fluency within 10. Developing the Big Idea: In this lesson, students are *developing* understanding that addends determine efficient strategies and the use of efficient strategies builds fluency within 20.	The strategies for fluently adding and subtracting in lessons 1-1 to 1-7 are interconnected. In this lesson, students apply these strategies to continue to build fluency. Before the Solve and Share, consider using the English Language Learners example (TE, p.47A) to support vocabulary and context. Solve & Share: Modify the problem to remove "…as quickly as you can. Hold up your hand when you are done". As discussed in the instructional note at the beginning of this document, an emphasis on speed causes anxiety and negatively affects students' mathematical mindsets (Boaler, 2016). In the discussion, help students to determine that many math problems have more than one correct answer. In this case, students could accurately write four related facts for 9, 7, and 2 or 9, 7, and 16. Visual Learning: It is easy to fall into old habits. Although the lesson refers to "recall", our emphasis should be on students' flexible, accurate and efficient use of strategies, not on memorizing. When students struggle with a fact or group of facts, ask them the *Essential Question* (TE, p.48): How do you decide which strategy to use to add and subtract quickly* and accurately? Encourage students to revisit the anchor chart of addition and subtraction strategies. *Quickly is defined as approximately 3 seconds, as indicated in the instructional note at the beginning of this document.
Lesson 1-9: Solve Addition and Subtraction Word Problems		
2.OA.A.1 2.OA.B.2 MP.1 MP.2 MP.6	Access Prior Learning: In kindergarten, (K.CC.C.6) students compared the number of objects in groups. In kindergarten, (K.OA.A.1, K.OA.A.2) students also understood addition as putting together and adding to, and subtraction as taking apart and taking from. In first grade, (1.OA.A.1) students represented and solved addition and subtraction word problems within 20. These problem types included add to, take from, put together, take apart and compare with an unknown in all positions. First grade students had an opportunity to solve and discuss start unknown and compare problem types but were not expected to demonstrate security. Developing the Big Idea: In this lesson, students are *developing* understanding that objects, diagrams, and equations can help solve different types of addition and subtraction word problems including add to, take from, put together, take apart and compare with an unknown in all positions.	Students will solve and discuss various problem types including add to, take from, put together, take apart and compare. For clarification on these problem types, and their progression, reference page 6-7, and 18-21, of the K-5 Progression on Counting and Cardinality and Operations and Algebraic Thinking . Although the lesson specifies using counters also provide access to connecting cubes, as it is beneficial to allow students to choose an appropriate tool when problem solving (MP. 5). Their ability to physically connect or group these cubes supports place value understanding. Solve & Share: This word problem is a compare difference unknown problem type. Although students have experience with compare problems from prior grades, the language and context can be challenging for some students. As stated in the Progression Documents (linked above), "in Compare problems, one of the quantities (the difference) is not present in the situation physically, and must be conceptualized and constructed in a representation…" (p. 12) For this reason, the use of labels (e.g., D or Diego and L or Leslie) and matching with objects and drawings can be helpful. Monitor students' solving the problem, ask questions that will encourage students to utilize these tools to conceptualize the context of the problem. "How can you use counters/connecting cubes to help you model and solve the problem?" Visual Learning*:* In the discussions that occur during *Visual Learning*, ask questions to help students connect their solutions in the *Solve & Share* to the comparison bar diagram. In doing so, students will gain conceptual understanding of the comparison bar diagram by connecting to their work with concrete and representational drawings or models. This will help students develop understanding of part-part-whole relationships. The comparison bar diagram is different than the bar diagram because the part sections are proportionally sized, rather than the same size. Example of comparison bar diagram  *-continues on next page-* Independent Practice/Math Practices and Problem Solving: Encourage students to begin by solving the quick check items (indicated with pink check marks) using concrete objects and/or drawings before connecting to the abstract equation. If a student is struggling with these word problems using objects and drawings, consider asking them to solve a word problem of a different type. For example, if a student struggles with item 5 (a put together, addend unknown problem), consider modifying the problem as shown below: *-continues on next page-*

		Original item 5 (Put Together, Addend Unknown): Juan reads 5 books. Susan reads some books. They read 11 books in all. How many books did Susan read? Possible modification (Add to, Change Unknown): Juan held 5 books. Susan handed him some more. Now Juan is holding 11 books. How many books did Susan hand him? *The inclusion of an explicit action (handing books) in the modified problem can offer an easier entry point for the student, if needed.* Possible modification (Add to, Result Unknown): Juan held 5 books. Susan handed him 6 more. How many books is Juan holding now? *The inclusion of an explicit action (handing books) AND changing from a "change unknown" to a "result unknown" offers another scaffold for students, if needed.*
Lesson 1-10: Math Practices And Problem Solving: Construct Arguments		
2.OA.A.1 2.OA.B.2 MP.1 MP.2 MP.3 MP.4	Access Prior Learning: In first grade, students engaged in Math Practice 3. Earlier in this topic, students used the make a 10 strategy to solve addition and subtraction problems. Developing the Big Idea: In this lesson, students are *developing* understanding of Math Practice 3: Construct viable arguments and critique the reasoning of others. Students will use a combination of words, symbols, pictures and numbers to construct a clear and concise explanation of their thinking.	This lesson provides an opportunity to focus on the Thinking Habits associated with Math Practice 3. Refer to the *Math Practices and Problem Solving Handbook* (TE, pp. F25-F25A, F31) for suggestions on how to develop, connect and assess this Math Practice. Also, reference the handbook in the student edition (SE, p.F25). Solve & Share: In addition to having your students' share their work, consider displaying the samples provided in *Analyze Student Work* (TE, p. 59, and available online under the *Solve & Share* as "Teacher Resources").  Facilitate a discussion comparing Michaela's Work to Robin's Work. Ask questions such as, "How did Michaela/Robin show their work? Is their work accurate? What makes their work clear and easy to understand?" Display student work and label the pictures, numbers, symbols and words that illustrate their thinking. Visual Learning: After the *Visual Learning Animation*, work on *Do You Understand? Show Me!* (p. 60), by facilitating a class discussion on how mathematicians can explain their thinking, focusing on words and sentences. As a class, craft a written response to model Math Practice 3: Construct Viable Arguments and Critique the Reasoning of Others, and second grade expectations including: • Provides complete and clear explanations of one's thinking. • Uses examples and counterexamples when appropriate. • See the Math Practices and Problem Solving Handbook for ideas on how to develop, connect and assess the Math Practices (TE, p.F25A) This crafted response can stand as a model in future lessons, reflecting expectations for student written work. In future topics, students will craft these responses individually or with partners.

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