Grade: 2 **Unit 1—Utilize Addition and Subtraction Strategies within 20**	**Subject: Math** • **Time Frame: 30 days** • **Domains: Operations and Algebraic Thinking, Number and Operations in Base Ten**	
Standards	Content Standards: 2.OA.1, 2.OA.2, 2.OA.3, 2.NBT.5,2. NBT.6, 2.NBT.9 http://www.corestandards.org/wp-content/uploads/Math_Standards.pdf	Practice Standards: MP 1, 2, 3, 4, 5, 6, 7, 8
Enduring Understandings	1. There are many strategies that can be used to add and subtract. 2. There are properties of operations that can help us solve addition and subtraction problems. 3. Algebraic thinking involves choosing, combining and applying effective strategies for answering quantitative questions. 4. Understanding place value can lead to number sense and efficient strategies for computing with numbers.	
Essential Questions	1. How can strategies be used to add and subtract? 2. How can I use the properties of operations to solve addition and subtraction problems? 3. How can I use place value to solve addition and subtraction problems? 4. How does a digit's position affect its value?	
Vocabulary	Equation, Math Mountain, partners, addends, total, dime, penny, Make-A-Ten Strategy, addition doubles, subtraction doubles, doubles plus 1, doubles minus 1, doubles plus 2, doubles minus 2, equation, equal sign, is equal to, is not equal to, equation chain, vertical form, add to problem, take from problems, compare, pattern, decompose.	

Priority and Supporting CCSS	Explanations and Examples*
2 .OA.1. Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	**2. OA.1.** Word problems that are connected to students' lives can be used to develop fluency with addition and subtraction. Table 1 (Appendix A) describes the four different addition and subtraction situations and their relationship to the position of the unknown. Examples: • Take-from example: David had 63 stickers. He gave 37 to Susan. How many stickers does David have now? 63 – 37 = __ • Add to example: David had $37. His grandpa gave him some money for his birthday. Now he has $63. How much money did David's grandpa give him? $37 +__ = $63 • Compare example: David has 63 stickers. Susan has 37 stickers. How many more stickers does David have than Susan? 63 – 37 =__ Even though the modeling of the two problems above is different, the equation, 63 - 37 = __ , can represent both situations (How many more do I need to make 63 ?) • Take-from (Start Unknown) David had some stickers. He gave 37 to Susan. Now he has 26 stickers. How many stickers did David have before? __ - 37 = 26 It is important to attend to the difficulty level of the problem situations in relation to the position of the unknown. • Result Unknown problems are the least complex for students followed by Total Unknown and Difference Unknown. • The next level of difficulty includes Change Unknown, Addend Unknown, followed by Bigger Unknown. • The most difficult are Start Unknown, Both Addends Unknown, and Smaller Unknown.

*Source – Connecticut Core Standards for Mathematics as adapted from the Arizona Academic Content Standards

	Second grade students should work on ALL problem types regardless of the level of difficulty. Students can use interactive whiteboard or document camera to demonstrate and justify their thinking. This standard focuses on developing an algebraic representation of a word problem through addition and subtraction, the intent is not to introduce traditional algorithms or rules.

Priority and Supporting CCSS	Explanations and Examples*
2. OA.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.	**2. OA.2.** This standard is strongly connected to all the standards in this domain. It focuses on students being able to fluently add and subtract numbers to 20. Adding and subtracting fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently. Mental strategies help students make sense of number relationships as they are adding and subtracting within 20. The ability to calculate mentally with efficiency is very important for all students. Mental strategies may include the following: • Counting on • Making tens (9 + 7 = 10 + 6) • Decomposing a number leading to a ten (14 – 6 = 14 – 4 – 2 = 10 – 2 = 8) • Fact families (8 + 5 = 13 is the same as 13 - 8 = 5) • Doubles • Doubles plus one (7 + 8 = 7 + 7 + 1) However, the use of objects, diagrams, or interactive whiteboards, and various strategies will help students develop fluency.

Priority and Supporting CCSS	Explanations and Examples*
2. NBT.9. Explain why addition and subtraction strategies work, using place value and the properties of operations.	**2. NBT.9.** Students need multiple opportunities explaining their addition and subtraction thinking. Operations embedded within a meaningful context promote development of reasoning and justification. Example: Mason read 473 pages in June. He read 227 pages in July. How many pages did Mason read altogether? • Karla's explanation: 473 + 227 = _____. I added the ones together (3 + 7) and got 10. Then I added the tens together (70 + 20) and got 90. I knew that 400 + 200 was 600. So I added 10 + 90 for 100 and added 100 + 600 and found out that Mason had read 700 pages altogether. • Debbie's explanation: 473 + 227 = _____. I started by adding 200 to 473 and got 673. Then I added 20 to 673 and I got 693 and finally I added 7 to 693 and I knew that Mason had read 700 pages altogether. • Becky's explanation: I used base ten blocks on a base ten mat to help me solve this problem. I added 3 ones (units) plus 7 ones and got 10 ones which made one ten. I moved the 1 ten to the tens place. I then added 7 tens rods plus 2 tens rods plus 1 tens rod and got 10 tens or 100. I moved the 1 hundred to the hundreds place. Then I added 4 hundreds plus 2 hundreds plus 1 hundred and got 7 hundreds or 700. So Mason read 700 pages. Students should be able to connect different representations and explain the connections. Representations can include numbers, words (including mathematical language), pictures, number lines, and/or physical objects. Students should be able to use any/all of these representations as needed. An interactive whiteboard or document camera can be used to help students develop and explain their thinking.

Priority and Supporting CCSS	Explanations and Examples*
2. NBT.5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.	**2 .NBT.5.** Adding and subtracting fluently refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently. Students should have experiences solving problems written both horizontally and vertically. They need to communicate their thinking and be able to justify their strategies both verbally and with paper and pencil. Addition strategies based on place value for 48 + 37 may include: • Adding by place value: 40 + 30 = 70 and 8 + 7 = 15 and 70 + 15 = 85. • Incremental adding (breaking one number into tens and ones): 48 + 10 = 58, 58 + 10 = 68, 68 + 10 = 78, 78 + 7 = 85 • Compensation (making a friendly number): 48 + 2 = 50, 37 – 2 = 35, 50 + 35 = 85 Subtraction strategies based on place value for 81 - 37 may include: • Adding Up (from smaller number to larger number): 37 + 3 = 40, 40 + 40 = 80, 80 + 1 = 81, and 3 + 40 + 1 = 44. • Incremental subtracting: 81-10 = 71, 71–10 = 61, 61–10 = 51, 51 –7 = 44 • Subtracting by place value: 81–30 = 51, 51–7 = 44 Properties that students should know and use are: • Commutative Property of Addition (Example: 3 + 5 = 5 + 3) • Associative Property of Addition (Example: (2 + 7) + 3 = 2 + (7+3)) • Identity Property of 0 (Example: 8 + 0 = 8) Students in second grade need to communicate their understanding of why some properties work for some operations and not for others. • Commutative Property: In first grade, students investigated whether the Commutative Property works with subtraction. The intent was for students to recognize that taking 5 from 8 is not the same as taking 8 from 5. Students

	should also understand that they will be working with numbers in later grades that will allow them to subtract larger numbers from smaller numbers. This exploration of the commutative property continues in second grade. Associative Property: Recognizing that the Associative Property does not work for subtraction is difficult for students to consider at this grade level as it is challenging to determine all the possibilities.

Priority and Supporting CCSS	Explanations and Examples*
2 .NTB.6. Add up to four two-digit numbers using strategies based on place value and properties of operations.	2. NTB.6. Students demonstrate addition strategies with up to four two-digit numbers either with or without regrouping. Problems may be written in a story problem format to help develop a stronger understanding of larger numbers and their values. Interactive whiteboards and document cameras may also be used to model and justify student thinking.
2 .OA.3. Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.	2. OA.3. Students explore odd and even numbers in a variety of ways including the following: students may investigate if a number is odd or even by determining if the number of objects can be divided into two equal sets, arranged into pairs, or counted by twos. After the above experiences, students may derive that they only need to look at the digit in the ones place to determine if a number is odd or even since any number of tens will always split into two even groups. Example: Students need opportunities writing equations representing sums of two equal addends, such as: 2 + 2 = 4, 3 + 3 = 6, 5 + 5 = 10, 6 + 6 = 12, or 8 + 8 =16. This understanding will lay the foundation for multiplication and is closely connected to 2.OA.4. The use of objects and/or interactive whiteboards will help students develop and demonstrate various strategies to determine even and odd numbers.

Resources
Math Expressions - Unit 1, Lessons 1-21 Soar to Success Math Intervention Mega Math Destination Math Common Core Mathematics-Newmark Learning- Units-1,2,3,8,9,12

Unit Assessments
Unit Test Quick Quizzes Formative Assessments Performance Assessments

Technology: Videos, Websites, Links
https://grade2commoncoremath.wikispaces.hcpss.org/2.OA.1 https://grade2commoncoremath.wikispaces.hcpss.org/2.OA.2 https://grade2commoncoremath.wikispaces.hcpss.org/2.OA.3 https://grade2commoncoremath.wikispaces.hcpss.org/2.NBT.5 https://grade2commoncoremath.wikispaces.hcpss.org/2.NBT.6 https://grade2commoncoremath.wikispaces.hcpss.org/2.NBT.9 http://ccssmath.org/?page_id=222 http://illuminations.nctm.org/LessonDetail.aspx?ID=L100 http://www.youtube.com/watch?v=tIQWeDGiCH4

APPENDIX A—TABLE 1

Table 1. Common addition and subtraction situations.[6]

	Result Unknown	Change Unknown	Start Unknown
Add to	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? 2 + 3 = ?	Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two? 2 + ? = 5	Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before? ? + 3 = 5
Take from	Five apples were on the table. I ate two apples. How many apples are on the table now? 5 – 2 = ?	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat? 5 – ? = 3	Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before? ? – 2 = 3

	Total Unknown	Addend Unknown	Both Addends Unknown[1]
Put Together/ Take Apart[2]	Three red apples and two green apples are on the table. How many apples are on the table? 3 + 2 = ?	Five apples are on the table. Three are red and the rest are green. How many apples are green? 3 + ? = 5, 5 – 3 = ?	Grandma has five flowers. How many can she put in her red vase and how many in her blue vase? 5 = 0 + 5, 5 = 5 + 0 5 = 1 + 4, 5 = 4 + 1 5 = 2 + 3, 5 = 3 + 2

	Difference Unknown	Bigger Unknown	Smaller Unknown
Compare[3]	("How many more?" version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy? ("How many fewer?" version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie? 2 + ? = 5, 5 – 2 = ?	(Version with "more"): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have? (Version with "fewer"): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? 2 + 3 = ?, 3 + 2 = ?	(Version with "more"): Julie has three more apples than Lucy. Julie has five apples. How many apples does Lucy have? (Version with "fewer"): Lucy has 3 fewer apples than Julie. Julie has five apples. How many apples does Lucy have? 5 – 3 = ?, ? + 3 = 5

[1]These take apart situations can be used to show all the decompositions of a given number. The associated equations, which have the total on the left of the equal sign, help children understand that the = sign does not always mean makes or results in but always does mean is the same number as.
[2]Either addend can be unknown, so there are three variations of these problem situations. Both Addends Unknown is a productive extension of this basic situation, especially for small numbers less than or equal to 10.
[3]For the Bigger Unknown or Smaller Unknown situations, one version directs the correct operation (the version using more for the bigger unknown and using less for the smaller unknown). The other versions are more difficult.