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<tr><td>Grade: 1<br><br>Unit 2- Strategies for Addition and Subtraction with 20</td><td colspan="2">Subject: Math<ul><li>Time Frame: 28 days</li><li>Domain: Operations and Algebraic Thinking</li></ul></td></tr>
<tr><td>Standards</td><td>Content Standards:<br>1.OA.1, 1.OA.3, 1.OA.5, 1.OA.6, 1.OA.7, 1.OA.8<br>http://www.corestandards.org/wp-content/uploads/Math_Standards.pdf</td><td>Practice Standards:<br>MP 1 ,2, 3, 4, 5, 6, 7, 8</td></tr>
<tr><td>Enduring Understandings</td><td colspan="2">1. Represent a situation or numerical problem with groups of objects, a drawing, fingers, or equations.<br>2. Model the situation by composing two addend groups or decomposing a total group.<br>3. Work toward fluency for addition and subtraction within 10.</td></tr>
<tr><td>Essential Questions</td><td colspan="2">1. What strategies would you use to solve addition equations?<br>2. How do we use addition to solve story problems and visualize equality?</td></tr>
<tr><td>Vocabulary</td><td colspan="2">add, partners, plus sign, total, circle drawing, equal, equal sign, not equal sign, equation, count all, count on, unknown total, minus, minus sign, subtract, proof drawing, subtraction story problem, vertical forms</td></tr>
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| Priority and Supporting CCSS | Explanations and Examples* |
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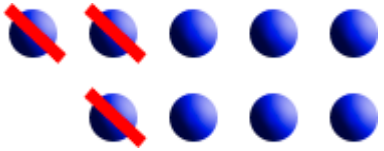
| **1. OA.1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.** | **1. OA.1.** Contextual problems that are closely connected to students' lives should 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. Students use objects or drawings to represent the different situations.<br><br>• *Take-from* example: Abel has 9 balls. He gave 3 to Susan. How many balls does Abel have now?<br>  <br>• *Compare* example: Abel has 9 balls. Susan has 3 balls. How many more balls does Abel have than Susan? A student will use 9 objects to represent Abel's 9 balls and 3 objects to represent Susan's 3 balls. Then they will compare the 2 sets of objects.<br><br>Note that even though the modeling of the two problems above is different, the equation, 9 - 3 = __, can represent both situations yet the compare example can also be represented by 3 + __ = 9 (How many more do I need to make 9?)<br><br>It is important to attend to the difficulty level of the problem situations in relation to the position of the unknown.<br>• *Result Unknown* problems are the least complex for students followed by *Total Unknown* and *Difference Unknown*.<br>• The next level of difficulty includes *Change Unknown, Addend*<br>• *Unknown,* followed by *Bigger Unknown*<br>• The most difficult are *Start Unknown, Both Addends Unknown* |

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

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| | and *Smaller Unknown.*<br><br>Students may use document cameras to display their combining or separating strategies. This gives them the opportunity to communicate and justify their thinking. |

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| **1. OA.3. Apply properties of operations as strategies to add and subtract.** ***Examples:***<br>***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.)****<br><br>****Students need not use formal terms for these properties.* | **1. OA.3.** Students should understand the important ideas of the following properties:<br>• Identify Property of Addition (e.g., 6 = 6 + 0)<br>• Identify Property of Subtraction (e.g., 9 – 0 = 9)<br>• Commutative Property of Addition (e.g., 4 + 5 = 5 + 4)<br>• Associative Property of Addition (e.g., 3 + 9 + 1 = 3 + 10 = 13)<br><br>Students need several experiences investigating whether the Commutative Property works with subtraction. The intent is not for students to experiment with negative numbers but only to recognize that taking 5 from 8 is not the same as taking 8 from 5. Students should recognize that they will be working with numbers later on that will allow them to subtract larger numbers from smaller numbers. However, in first grade we do not work with negative numbers. |

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| **1. OA.5. Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).** | **1. OA. 5**. Students' multiple experiences with counting may hinder their understanding of counting on and counting back as connected to addition and subtraction. To help them make these connections when students count on 3 from 4, they should write this as 4 + 3 = 7. When students count back (3) from 7, they should connect this to 7 – 3 = 4. Students often have difficulty knowing where to begin their count when counting backward. |
| **1. OA.6. 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).** | **1. OA. 6.** 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 10 and having experiences adding and subtracting within 20. By studying patterns and relationships in addition facts and relating addition and subtraction, students build a foundation for fluency with addition and subtraction facts. 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. The use of objects, diagrams, or interactive whiteboards and various strategies will help students develop fluency. |
| **1. OA.7. 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.*** | **1.OA.7.** Interchanging the language of "equal to" and "the same as" as well as "not equal to" and "not the same as" will help students grasp the meaning of the equal sign. Students should understand that "equality" means "the same quantity as".<br><br>In order for students to avoid the common pitfall that the equal sign means "to do something" or that the equal sign means "the answer is," they need to be able to:<br>• Express their understanding of the meaning of the equal sign |

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| | • Accept sentences other than a + b = c as true (a = a, c = a + b, a = a + 0, a + b = b + a)<br>• Know that the equal sign represents a relationship between two equal quantities<br>• Compare expressions without calculating<br><br>These key skills are hierarchical in nature and need to be developed over time. Experiences determining if equations are true or false help students develop these skills. Initially, students develop an understanding of the meaning of equality using models. However, the goal is for students to reason at a more abstract level. At all times students should justify their answers, make conjectures (e.g., if you add a number and then subtract that same number, you always get zero), and make estimates.<br><br>Once students have a solid foundation of the key skills listed above, they can begin to rewrite true/false statements using the symbols, < and >.<br><br>Examples of true and false statements:<br>• 7 = 8 – 1<br>• 8 = 8<br>• 1 + 1 + 3 = 7<br>• 4 + 3 = 3 + 4<br>• 6 – 1 = 1 – 6<br>• 12 + 2 – 2 = 12<br>• 9 + 3 = 10<br>• 5 + 3 = 10 – 2<br>• 3 + 4 + 5 = 3 + 5 + 4<br>• 3 + 4 + 5 = 7 + 5<br>• 13 = 10 + 4<br>• 10 + 9 + 1 = 19<br><br>Students can use a clicker (electronic response system) or interactive |

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| | whiteboard to display their responses to the equations. This gives them the opportunity to communicate and justify their thinking. |

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| **1. OA.8. Determine the unknown whole number in an addition or subtraction equation relating three whole numbers.** ***For example, determine the unknown number that makes the equation true in each of the equations 8 + __ = 11, 5 = __ – 3, 6 + 6 =__*** | **1. OA. 8**. Students need to understand the meaning of the equal sign and know that the quantity on one side of the equal sign must be the same quantity on the other side of the equal sign. They should be exposed to problems with the unknown in different positions. Having students create word problems for given equations will help them make sense of the equation and develop strategic thinking.<br><br>Examples of possible student "think-throughs":<br>• *8 + __ = 11*: "8 and some number is the same as 11. 8 and 2 is 10 and 1 more makes 11. So the answer is 3."<br>• *5 = __– 3*: "This equation means I had some cookies and I ate 3 of them. Now I have 5. How many cookies did I have to start with? Since I have 5 left and I ate 3, I know I started with 8 because I count on from 5. . . 6, 7, 8."<br><br>Students may use a document camera or interactive whiteboard to display their combining or separating strategies for solving the equations. This gives them the opportunity to communicate and justify their thinking. |

| Resources |
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| Math Expressions - Unit 2, Lessons 1-16<br>Soar to Success Math Intervention<br>Mega Math<br>Destination Math<br>Common Core Mathematics-Newmark Learning- Units-1 ,2, 3, 5, 6, 7, 8 |

| **Unit Assessments** |
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| Unit Test<br>Quick Quizzes<br>Formative Assessments<br>Performance Assessment |

| Technology: Videos, Websites, Links |
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| www.learnzillion.com<br>www.xtramath.org<br>https://www.georgiastandards.org/Common-Core/Pages/Math-K-5.aspx<br>http://exchange.smarttech.com/index.html#tab=0<br>http://nlvm.usu.edu/en/nav/vlibrary.html<br>http://www.mathplayground.com/common_core_state_standards_for_mathematics.html<br>https://grade1commoncoremath.wikispaces.hcpss.org/1.OA.1<br>https://grade1commoncoremath.wikispaces.hcpss.org/1.OA.3<br>http://www.internet4classrooms.com/common_core/apply_properties_operations_strategies_add_subtract_operations_algebraic_thinking_first_1st_grade_math_mathematics.htm<br>http://mrnussbaum.com/grade_1_standards/<br>http://www.youtube.com/watch?v=OWpTqaSr7e8<br>http://ccssmath.org/?page_id=49<br>http://www.ohiorc.org/standards/commoncore/mathematics/grade.aspx?id=5022<br>https://sites.google.com/a/bryantschools.org/math-common-core-resource-site/home-1/1st-grade/1-0a-6<br>http://www.mrmaffesoli.com/1stGrade/1stGradeCCS.html |

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?<br>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?<br>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?<br>? + 3 = 5 |
| **Take from** | Five apples were on the table. I ate two apples. How many apples are on the table now?<br>5 − 2 = ? | Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat?<br>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?<br>? − 2 = 3 |

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

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