

Unit B - Equal: To Be or Not to Be?

Overview

In this unit, students will continue modeling with mathematical tools to build confidence using efficient and effective strategies to add and subtract single-digit numbers. They will continue to develop flexibility with numbers through visualizing combinations of 5 and 10. They develop mastery with number facts up to 10 and the use of strategies to model number families to 20. While students have been using the equals sign before, this is the first time they learn that two expressions are of equal value (rather than just the symbol that means “the answer”). They explore finding missing addends and subtrahends (the number being subtracted). Students identify, select, and implement efficient strategies when problem solving.

21st Century Capacities: Synthesizing, Problem Identification

Stage 1 - Desired Results

ESTABLISHED GOALS/ STANDARDS

MP 2 Reason abstractly and quantitatively
 MP 3 Construct viable arguments and critique the reasoning of others.
 MP 7 Look for and make use of structure

Represent and solve problems involving addition and subtraction.
 CCSS.MATH.CONTENT.1.OA.A.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

CCSS.MATH.CONTENT.1.OA.B.3 Apply properties of operations as strategies to add and subtract.² *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.)*

CCSS.MATH.CONTENT.1.OA.B.4 Understand subtraction as an unknown-addend problem. *For example, subtract $10 - 8$ by finding the number that makes 10 when added to 8.*

CCSS.MATH.CONTENT.1.OA.C.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

CCSS.MATH.CONTENT.1.OA.C.6

Transfer:

Students will be able to independently use their learning in new situations to...

1. Identify, select, and implement efficient strategies when problem solving
2. Articulate what quantities, symbols, and/or expressions represent (abstract) and identify examples (concrete)
3. Justify how the composition and decomposition of numbers clarified relationships in order to perform operations and solve problems

Meaning:

UNDERSTANDINGS: *Students will understand that:*

1. Recognition of patterns and structures fosters efficiency in solving problems
2. Every problem is a member of a category of problems that has a similar structure and set of characteristics.
3. Addition and subtraction are inversely related (addition helps to solve subtraction problems and vice versa)

ESSENTIAL QUESTIONS: *Students will explore & address these recurring questions:*

- A. What type of problem is this? How can I use strategies to solve this problem? How do I know if it's right? (strategy or solution)
- B. How do I show my thinking? (using representations e.g. words, numbers, models)

Grade 1 Math Curriculum

<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> <p>CCSS.MATH.CONTENT.1.OA.D.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? $6 = 6$, $7 = 8 - 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$.</p> <p>CCSS.MATH.CONTENT.1.OA.D.8 Determine the unknown whole number in an addition or subtraction equation relating three whole numbers.</p> <p>CCSS.MATH.CONTENT.1.NBT.A.1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.</p> <p>CCSS.MATH.CONTENT.1.NBT.B.2 Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:</p> <p>CCSS.MATH.CONTENT.1.NBT.B.2.A 10 can be thought of as a bundle of ten ones — called a "ten."</p> <p>CCSS.MATH.CONTENT.1.NBT.B.2.B The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.</p> <p>CCSS.MATH.CONTENT.1.NBT.B.2.C The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).</p> <p>CCSS.MATH.CONTENT.1.NBT.B.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$.</p> <p>CCSS.MATH.CONTENT.1.NBT.C.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.</p>	Acquisition:	
	<p><i>Students will know...</i></p> <ol style="list-style-type: none"> 1. Strategies for number facts up to 20, including doubles, even/odd numbers, make ten, ten and some more, comparison; 2. Models such as the number rack, unifix cubes, dominoes, dot cards, etc helps develop powerful reasoning strategies; 3. Models can be translated into equations; 4. How to solve for an unknown in a given problem; 5. <u>Vocabulary</u>: add(ition), double(s), equal, sum or total, greater/ less than, equation, fact family, minus, plus, subtract(ion), problem solving, reasonable, strategies, difference, cent, compare, dime, nickel, penny, even, odd, graph date, day/month/year, number tree, pattern, story problem, data chart, estimat(ion), combinations, row/column, ones, tens, decade, number line, fraction, half, parts, whole, hour, minute, backward, forward. 	<p><i>Students will be skilled at...</i></p> <ol style="list-style-type: none"> 1. Using tools as a ‘model of’ a given number context; 2. Using tools as a ‘model for’ a given operation; 3. Seeing a combination of a number and writing it as an equation; 4. Subitizing to 20; 5. Using part-part whole relations in problem contexts that involve combining or separating numbers; 6. “Seeing” numbers inside of larger numbers; 7. Thinking creatively and informally to strategize when problem solving; 8. Recognize and reproduce quantities without having to count individually; 9. Recognize numbers as odd or even; 10. Counting forward and backward from any number in range 1-100; 11. Comparing quantities.