Content Area: Mathematics
Standard: 1. Number Sense, Properties, and Operations

Prepared Graduates:
➢ Understand the structure and properties of our number system. At their most basic level numbers are abstract symbols that represent real-world quantities

Grade Level Expectation: First Grade

Concepts and skills students master:
1. The whole number system describes place value relationships within and beyond 100 and forms the foundation for efficient algorithms

Evidence Outcomes	**21st Century Skills and Readiness Competencies**
Students can:	**Inquiry Questions:**
a. Count to 120 (CCSS: 1.NBT.1)	1. Can numbers always be related to tens?
i. Count starting at any number less than 120. (CCSS: 1.NBT.1)	2. Why not always count by one?
ii. Within 120, read and write numerals and represent a number of objects with a written numeral. (CCSS: 1.NBT.1)	3. Why was a place value system developed?
b. Represent and use the digits of a two-digit number. (CCSS: 1.NBT.2)	4. How does a position of a digit affect its value?
i. Represent the digits of a two-digit number as tens and ones.[1] (CCSS: 1.NBT.2)	5. How big is 100?
ii. Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <. (CCSS: 1.NBT.3)	**Relevance and Application:**
iii. Compare two sets of objects, including pennies, up to at least 25 using language such as "three more or three fewer" (PFL)	1. The comparison of numbers helps to communicate and to make sense of the world. (For example, if someone has two more dollars than another, gets four more points than another, or takes out three fewer forks than needed.
c. Use place value and properties of operations to add and subtract. (CCSS: 1.NBT)	
i. Add within 100, including adding a two-digit number and a one-digit number and adding a two-digit number and a multiple of ten, using concrete models or drawings, and/or the relationship between addition and subtraction. (CCSS: 1.NBT.4)	
ii. Identify coins and find the value of a collection of two coins (PFL)	**Nature of Mathematics:**
iii. Mentally find 10 more or 10 less than any two-digit number, without counting; explain the reasoning used. (CCSS: 1.NBT.5)	1. Mathematics involves visualization and representation of ideas.
iv. Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. (CCSS: 1.NBT.6)	2. Numbers are used to count and order both real and imaginary objects.
	3. Mathematicians reason abstractly and quantitatively. (MP)
v. Relate addition and subtraction strategies to a written method and explain the reasoning used. (CCSS: 1.NBT.4 and 1.NBT.6)	4. Mathematicians look for and make use of structure. (MP)

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[1] 10 can be thought of as a bundle of ten ones — called a "ten." (CCSS: 1.NBT.2a)
The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. (CCSS: 1.NBT.2b)
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). (CCSS: 1.NBT.2c)

Content Area: Mathematics
Standard: 1. Number Sense, Properties, and Operations

Prepared Graduates:
- ➢ Apply transformation to numbers, shapes, functional representations, and data

Grade Level Expectation: First Grade

Concepts and skills students master:
2. Number relationships can be used to solve addition and subtraction problems

Evidence Outcomes	21st Century Skills and Readiness Competencies

Students can:
a. Represent and solve problems involving addition and subtraction. (CCSS: 1.OA)
  i. Use addition and subtraction within 20 to solve word problems.[1] (CCSS: 1.OA.1)
  ii. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20.[2] (CCSS: 1.OA.2)
b. Apply properties of operations and the relationship between addition and subtraction. (CCSS: 1.OA)
  i. Apply properties of operations as strategies to add and subtract.[3] (CCSS: 1.OA.3)
  ii. Relate subtraction to unknown-addend problem.[4] (CCSS: 1.OA.4)
c. Add and subtract within 20. (CCSS: 1.OA)
  i. Relate counting to addition and subtraction.[5] (CCSS: 1.OA.5)
  ii. Add and subtract within 20 using multiple strategies.[6] (CCSS: 1.OA.6)
  iii. Demonstrate fluency for addition and subtraction within 10. (CCSS: 1.OA.6)
d. Use addition and subtraction equations to show number relationships. (CCSS: 1.OA)
  i. Use the equal sign to demonstrate equality in number relationships.[7] (CCSS: 1.OA.7)
  ii. Determine the unknown whole number in an addition or subtraction equation relating three whole numbers.[8] (CCSS: 1.OA.8)
	Inquiry Questions:
	  1. What is addition and how is it used?
	  2. What is subtraction and how is it used?
	  3. How are addition and subtraction related?
	
	Relevance and Application:
	  1. Addition and subtraction are used to model real-world situations such as computing saving or spending, finding the number of days until a special day, or determining an amount needed to earn a reward.
	  2. Fluency with addition and subtraction facts helps to quickly find answers to important questions.
	
	Nature of Mathematics:
	  1. Mathematicians use addition and subtraction to take numbers apart and put them back together in order to understand number relationships.
	  2. Mathematicians make sense of problems and persevere in solving them. (MP)
	  3. Mathematicians look for and make use of structure. (MP)

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First Grade

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[1] 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. (CCSS: 1.OA.1)

[2] e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. (CCSS: 1.OA.2)

[3] 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: 1.OA.3)

[4] For example, subtract $10 - 8$ by finding the number that makes 10 when added to 8. (CCSS: 1.OA.4)

[5] e.g., by counting on 2 to add 2. (CCSS: 1.OA.5)

[6] 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 $6 + 6 + 1 = 12 + 1 = 13$). (CCSS: 1.OA.6)

[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? $6 = 6$, $7 = 8 - 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$.* (CCSS: 1.OA.7)

[8] For example, determine the unknown number that makes the equation true in each of the equations $8 + ? = 11$, $5 = ? - 3$, $6 + 6 = ?$. (CCSS: 1.OA.8)