MAKING MATH MEANINGFUL
Embracing the Principles of Analysis and Induction

NUMBER AND OPERATIONS	K LK	1 L1	2 L2	3 L3	4 L4	5 L5	6 L6
Understands the relationship between quantities (whole numbers)							
Count aloud forward in sequence to 10.	●	✓					
Recognize that a number can be used to represent how many objects are in a set up to 20.	●	✓					
Use ordinal numbers to represent the position of an object in a sequence up to 20.	●	✓					
Recognize without counting the quantity of a small group of objects in organized and random arrangements up to 10.	●	✓					
Count forward, with and without objects, from any given number up to 10.	●	✓					
Read, write, discuss, and represent whole numbers from 0 to at least 10. Representations may include numerals, pictures, real objects, spoken words, and manipulatives.	●	✓					
Find a number that is 1 more or 1 less than a given number up to 10.	●	✓					
Using the words more than, less than or equal to compare and order whole numbers, with and without objects, from 0 to 20.	●	✓					
Develop conceptual fluency with addition and subtraction (up to 10) using objects and pictures.							
Compose and decompose numbers up to 10 with objects and pictures.	●	✓					
Understand the relationship between whole numbers and fractions.							
Distribute equally a set of objects into at least two smaller equal sets.	●	✓					
Count, compare, and represent whole numbers up to 100, with an emphasis on groups of tens and ones.							
Recognize numbers 0 to 20	●	✓					
Read, write, discuss, and represent whole numbers up to 20. Representations may include numerals, addition and subtraction, pictures, tally marks, and manipulatives.		✓					
Count forward, with and without objects, from any given number up to 20.	●	✓					
Compare and order whole numbers from 0 to 20.	●	✓					
Use knowledge of number relationships to locate the position of a given whole number on an open number line up to 20.	●	✓					
Use objects to represent and use words to describe the relative size of numbers, such as more than, less than, and equal to.	●	✓					
Use the appropriate math symbols (<, >, =, ≠)to describe the relative size of numbers, such as more than, less than, equal and unequal.		✓	▶				
Solve addition and subtraction problems up to 10 in real-world and mathematical contexts.							
Represent and solve real-world and mathematical problems using addition and subtraction up to ten.		● ✓					
Determine if equations involving addition and subtraction are true.		● ✓	▶				
Demonstrate fluency with basic addition facts and related subtraction facts up to 10.		●	✓				
Compare and represent whole numbers up to 99 with an emphasis on place value and equality.							
Read, write, discuss, and represent whole numbers up to 99. Representations may include numerals, addition and subtraction, pictures, tally marks, number lines and manipulatives, such as bundles of sticks and base 10 blocks.			● ✓	▶			
Count forward, with and without objects, from any given number up to 99 by 1s, 2s, 5s and 10s.			● ✓				
Find a number that is 10 more or 10 less than a given number up to 100.			● ✓				
Compare and order whole numbers from 0 to 99.			● ✓				
Read, write, discuss, and represent whole numbers up to 99. Representations may include numerals, words, pictures, tally marks, number lines and manipulatives.			● ✓				
Use knowledge of number relationships to locate the position of a given whole number on an open number line up to 99.			● ✓				
Use place value to describe whole numbers between 10 and 99 in terms of tens and ones.			● ✓				
Use place value to compare and order whole numbers up to 99 using comparative language, numbers, and symbols (e.g., 25 > 17, 73 < 98, page 85 comes after page 84, 53 is between 50 and 60).			● ✓				
Determine the unknown addend(s) or factor(s) in equivalent and non-equivalent expressions. (e.g., 5 + 6 = 4 + ☐ , 3 x 8 < 3 x ☐).		●	● ✓				
Add and subtract one- and two- digit numbers in real-world and mathematical problems.							
Use the relationship between addition and subtraction to generate basic facts up to 20.		●	✓				
Demonstrate fluency with basic addition facts and related subtraction facts up to 99.			● ✓				
Use strategies and algorithms based on knowledge of place value and equality to add and subtract two-digit numbers.			● ✓				
Solve real-world and mathematical addition and subtraction problems involving whole numbers up to 2 digits.			● ✓				
Use concrete models and structured arrangements, such as repeated addition, arrays and ten frames to develop understanding of multiplication.			●	✓	▶	▶	
Explore the foundational ideas of fractions.							
Identify the parts of a set and area that represent fractions for halves, thirds, and fourths.			●	✓	▶		
Construct equal-sized portions through fair sharing including length, set, and area models for halves, thirds, and fourths.			●	✓	▶		
Identify coins and their values							
Identify pennies, nickels, dimes, and quarters by name.			● ✓	▶			
Determine the value of a set of coins.							
Determine the value of a collection(s) of coins.			● ✓	▶			
Use a combination of coins to represent a given amount of money up to one dollar.			● ✓	▶			
Use a combination of coins to purchase an item. Determine whether or not there was enough to purchase the item.			● ✓	▶			
Given a total cost and amount paid, find the change required.			● ✓	▶			
Compare and represent whole numbers up to 999 with an emphasis on place value and equality.							
Read, write, discuss, and represent whole numbers up to 1,000. Representations may include numerals, words, pictures, and manipulatives.				● ✓			
Use place value to describe whole numbers between 1 and 1,000 in terms of hundreds, tens and ones. Know that 100 is 10 tens, and 1,000 is 10 hundreds.				● ✓			
Find 10 more or 10 less than a given three-digit number. Find 100 more or 100 less than a given three-digit number.				● ✓			
Use place value to compare and order whole numbers up to 999 using comparative language, numbers, and symbols (e.g., 425 > 276, 73 < 107, page 351 comes after page 350, 753 is between 700 and 800).				● ✓			
Represent multiplication facts by using a variety of approaches, such as repeated addition, equal-sized groups, arrays, area models, equal jumps on a number line and skip counting.				● ✓			
Using the cumulative, associative and multiplication distributes over addition to represent the multiplication facts.				● ✓			
Demonstrate fluency of multiplication facts with factors up to 10.				● ✓	▶		
Use strategies and algorithms based on knowledge of place value and equality to fluently add and subtract multi-digit numbers.				● ✓	▶		
Use addition and subtraction to solve real-world and mathematical problems involving whole numbers. Using the part-whole relationship to determine which operation, addition or subtraction, is appropriate to solve the problem.		●	●	● ✓	▶	▶	
Represent division facts by using a variety of approaches, such as repeated subtraction, equal sharing and forming equal groups.				●	●	● ✓	▶
Recognize the relationship between multiplication and division to represent and solve real-world problems.			●	● ✓	▶	▶	▶
Understand meanings and uses of fractions in real-world and mathematical situations.							
Read and write fractions with words and symbols.			●	● ✓	▶		
Construct fractions using length, set, and area models.			●	● ✓	▶		
Recognize unit fractions and use them to compose and decompose fractions related to the same whole. Use the numerator to describe the number of parts and the denominator to describe the number of partitions.				●	●	● ✓	▶
Compare and represent whole numbers up to 999,999 with an emphasis on place value and equality.							
Read, write, discuss, and represent whole numbers up to 999,999. Representations may include numerals, expressions with operations, words, pictures, number lines, and manipulatives.					● ✓		
Use place value to describe whole numbers between 1,000 and 999,999 in terms of ten thousands, thousands, hundreds, tens and ones, including expanded form.					● ✓		
Find 10,000 more or 10,000 less than a given five-digit number. Find 1,000 more or 1,000 less than a given four- or five-digit number. Find 100 more or 100 less than a given four- or five-digit number.					● ✓		
Use place value to compare and order whole numbers up to 999,999, using comparative language, numbers, and symbols.					● ✓		
Recognize when to round numbers and apply understanding to round numbers to the nearest ten thousand, thousand, hundred, and ten and use compatible numbers to estimate sums and differences.					● ✓		
Use strategies and algorithms based on knowledge of place value, equality and properties of addition and multiplication to multiply a two-digit number by a one-digit number.					● ✓	▶	
Solve real-world and mathematical problems using multiplication and division.							
Demonstrate fluency with multiplication and division facts with factors up to 12.				●	✓	▶	
Use an understanding of place value to multiply or divide a number by 10, 100 and 1,000.					●		
Multiply 3-digit by 1-digit or a 2-digit by 2-digit whole numbers, using efficient and generalizable procedures and strategies, based on knowledge of place value, including multiplying two binomials as well as standard algorithms.					●	✓	
Estimate products of 3-digit by 1-digit or 2-digit by 2-digit whole numbers using rounding, benchmarks and place value to assess the reasonableness of results.					●	✓	
Solve multi-step real-world and mathematical problems requiring the use of addition, subtraction, and multiplication of multi-digit whole numbers. Use various strategies, including the part-whole relationship, the relationship between operations, and the context of the problem to assess the reasonableness of results.					●	✓	▶
Represent and compare fractions in real-world and mathematical situations.							
Represent and rename equivalent fractions using fraction models (e.g. parts of a set, area models, fraction strips, number lines).					●	✓	▶
Use common fractions to locate additional fractions on a number line.					●	✓	▶
Decompose a fraction in more than one way into a sum of fractions with the same denominator using concrete and pictorial models and recording results with symbolic representations					●	✓	▶
Use fraction models to add and subtract fractions with like denominators in real-world and mathematical situations.					●	✓	▶
Represent and compare fractions and decimals in real-world and mathematical situations; use place value to understand how decimals represent quantities.							
Represent tenths and hundredths with concrete models, making connections between fractions and decimals.						●	● ✓
Represent, read and write decimals up to at least the hundredths place in a variety of contexts including money.						●	● ✓
Compare and order decimals and whole numbers using place value, a number line and models such as grids and base 10 blocks.						●	● ✓
Divide multi-digit numbers and solve real-world and mathematical problems using arithmetic.							
Estimate solutions to division problems in order to assess the reasonableness of results.					●	●	● ✓
Divide multi-digit numbers, by one- and two-digit divisors, using efficient and generalizable procedures, based on knowledge of place value, including standard algorithms.						●	● ✓
Recognize that quotients can be represented in a variety of ways, including a whole number with a remainder, a fraction or mixed number, or a decimal and consider the context in which a problem is situated to select and interpret the most useful form of the quotient for the solution.						●	● ✓
Solve real-world and mathematical problems requiring addition, subtraction, multiplication, and division of multi-digit whole numbers. Use various strategies, including the inverse relationships between operations, the use of technology, and the context of the problem to assess the reasonableness of results.					●	●	● ✓
Read, write, represent, and compare fractions and decimals; recognize and write equivalent fractions; convert between fractions and decimals; use fractions and decimals in real-world and mathematical situations.							
Represent decimal fractions using a variety of models to make connections between fractions and decimals.						●	● ✓
Represent, read and write decimals using place value to describe decimal numbers including fractional numbers as small as thousandths and whole numbers as large as millions.						●	● ✓
Compare and order fractions and decimals, including mixed numbers and fractions less than one.						●	● ✓
Recognize and generate equivalent decimals, fractions, mixed numbers, and fractions less than one in various contexts.						●	● ✓
Add and subtract fractions with like and unlike denominators, mixed numbers and decimals to solve real- world and mathematical problems.							
Estimate sums and differences of fractions with like and unlike denominators, mixed numbers, and decimals to assess the reasonableness of the results.						●	● ✓
Illustrate addition and subtraction of fractions with like and unlike denominators, mixed numbers, and decimals using a variety of representations (e.g., fraction strips, area models, fraction rods).						●	● ✓
Add and subtract fractions with like and unlike denominators, mixed numbers, and decimals, using efficient and generalizable procedures, including but not limited to standard algorithms in order to solve real-world and mathematical problems including those involving money, measurement, and data.						●	● ✓
Read, write, and represent integers and rational numbers expressed as fractions, decimals, percents, and ratios; write positive integers as products of factors; use these representations in real-world and mathematical situations.							
Compare and order positive rational numbers, represented in various forms, or integers using the symbols <, >, and =.					●	●	● ✓
Explain that a percent represents parts "out of 100" and ratios "to 100."							● ✓
Determine equivalencies among fractions, decimals, and percents. Select among these representations to solve problems.							●
Factor whole numbers.							●
Determine the greatest common factors and least common multiples. Use common factors and multiples to calculate with fractions, find equivalent fractions, and express the sum of two-digit numbers with a common factors.						●	● ✓
Add and subtract integers in order to solve real-world and mathematical problems.							
Estimate solutions to addition and subtraction of integers problems in order to assess the reasonableness of results.				●	●	●	●
Illustrate addition and subtraction of integers using a variety of representations.				●	●	●	●
Add and subtract integers; use efficient and generalizable procedures including but not limited to standard algorithms.				●	●	●	●
Understand the concept of ratio and its relationship to fractions and percents and to the multiplication and division of whole numbers. Use ratios to solve real-world and mathematical problems.							
Identify and use ratios to compare quantities.							●
Apply the relationship between ratios, equivalent fractions and percents to solve problems in various contexts.							●
Multiply and divide decimals, fractions, and mixed numbers; solve real-world and mathematical problems with rational numbers.							
Estimate solutions to problems with whole numbers, decimals, fractions, and mixed numbers and use the estimates to assess the reasonableness of results in the context of the problem.						●	●
Illustrate multiplication and division of fractions and decimals to show connections to fractions, whole number multiplication, and inverse relationships. **Multiply and divide fractions and decimals using efficient and generalizable procedures.**						●	● ✓

Exploring the Idea - ● -

Explaining the Idea - ✓ -

Expanding the Idea - ▶