Mathematics (Grade 4)

Course Description:

The curriculum for this course is developed from the Common Core State Standards for Mathematics. In this course, instructional time will focus on three critical areas: (1) developing an understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends; (2) developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers; (3) analyzing and classifying geometric figures based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

Mastery Standards:

Operations and Algebraic Thinking (4.OA)

Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
CCSS.MATH.CONTENT.4.OA.A.3

Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.
CCSS.MATH.CONTENT.4.OA.B.4

Number and Operations in Base Ten (4.NBT)

Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
CCSS.MATH.CONTENT.4.NBT.A.2

Use place value understanding to round multi-digit whole numbers to any place.
CCSS.MATH.CONTENT.4.NBT.A.3

Fluently add and subtract multi-digit whole numbers using the standard algorithm.
CCSS.MATH.CONTENT.4.NBT.B.4

Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
CCSS.MATH.CONTENT.4.NBT.B.5

Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Number and Operations- Fractions (4.NF)

Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

CCSS.MATH.CONTENT.4.NF.A.1

Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

CCSS.MATH.CONTENT.4.NF.A.2

Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
CCSS.MATH.CONTENT.4.NF.B.3.A

Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.
CCSS.MATH.CONTENT.4.NF.C.7

Measurement and Data (4.MD)
Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor*.
CCSS.MATH.CONTENT.4.MD.A.3

Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:
CCSS.MATH.CONTENT.4.MD.C.5

Geometry (4.G)
Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
CCSS.MATH.CONTENT.4.G.A.1

Unit	Description of Unit and Learning Targets
Unit Title: Operations and Algebraic Thinking Essential Questions: ● What strategies can we use to solve multi-digit word problems? ● What are the strategies we can use to find the factors of a whole number?	Students will develop fluency with efficient procedures for multiplying and dividing whole numbers, understand and explain why the procedures work based on place value and properties of operations, and use them to solve problems. Learning Targets: ● I can solve word problems for +, -, x, / using a letter for the unknown number. ● I can find the factors of a whole number.
Unit Title: Number and Operations in Base Ten Essential Questions: ● How does place value help me compare, round, add, subtract, multiply, and divide numbers.	Students will generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place. They select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context. Learning Targets: ● I can read and write multi-digit whole numbers and I compare

	multi-digit numbers. ● I can round and compare multi-digit whole numbers. ● I can fluently add and subtract multi-digit numbers. ● I can multiply multi-digit numbers. ● I can divide multi-digit numbers.
Unit Title: Number and Operations--Fractions Essential Questions: ● What strategies can be used to compare fractions and decimals?	Students will develop understanding of fraction equivalence and operations with fractions. They extend previous understandings about how fractions are built from unit fractions, composing and decomposing fractions using unit fractions, and using the meaning of fractions and of multiplication to multiply a fraction by a whole number. Learning Targets: ● I can identify and generate equivalent fractions. ● I can compare fractions. ● I can add and subtract fractions with like denominators. ● I can compare decimals to the hundreths.
Unit Title: Measurement and Data Essential Questions: ● How can your knowledge of shapes help you identify perimeter and area?	Students will solve problems involving measurement and conversions from a larger unit to a smaller unit. They will represent and interpret data, find area and perimeter, and explore concepts of angles, including measuring angles. Learning Targets: ● I can find the area and perimeter of a shape. ● I can identify geometric shapes and understand concepts of angle measurement.
Unit Title: Geometry Essential Questions: ● What tools do you need to draw an angle?	Students will describe, analyze, compare, and classify two-dimensional shapes by building, drawing, and analyzing them. They use their understanding of properties of 2-D shapes to solve problems involving symmetry. Learning Targets: ● I can draw and identify angles (right, acute, and obtuse) and parallel and perpendicular lines.