KIRKWOOD
SCHOOL DISTRICT

FIFTH GRADE MATH

Approved by KSD Board of Education: May 19, 2025

Course Description:

In Grade 5, instructional time should focus on three critical areas: (1) developing fluency with addition and subtraction of fractions, and developing understanding of the multiplication of fractions and of division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions); (2) extending division to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations; and (3) developing understanding of volume.

Grade Level: 5th Grade

Unit Scope and Sequence

Unit 1: Volume
Unit 2: Fractions as Quotients and Fraction Multiplication
Unit 3: Multiplying and Dividing Fractions
Unit 4: Wrapping Up Multiplication and Division with Multi-Digit Numbers
Unit 5: Place Value Patterns and Decimal Operations
Unit 6: More Decimal and Fractions Operations
Unit 7: Shapes on the Coordinate Plane

Course Enduring Understandings:

- A fraction can describe the parts of a whole, the parts of a set, fair sharing, or a real place on the number line.
- Fractions are related to decimals.

Course Essential Questions:

- How can we represent equal-sharing situations when a fraction of a whole is being shared?
- How can we use place value to add, subtract, multiply, and divide decimals?

FIFTH GRADE MATH
Unit 1: Volume

Students develop several strategies to determine the volumes of rectangular prisms and figures composed of rectangular prisms.

Unit Essential Learning Targets

Enduring Understandings	***Essential Questions***
• Volume can be used to help describe and compare three-dimensional objects. • You can determine the volume of a figure that is composed of rectangular prisms.	• How does volume help to describe and compare three-dimensional objects? • How can you determine the volume of a figure that is composed of rectangular prisms?
Students must know:	***Students must be able to:***

• Basic multiplication facts within 12
• Vocabulary
  ○ Associative Property of Multiplication
  ○ Cubic Unit(s)
  ○ Unit Cube(s)
  ○ Volume
	• Describe and determine the volume of a rectangular prism using its layered structure.
	• Determine the volume of a rectangular prism using the formulas $V = \ell \times w \times h$ and $V = B \times h$.
	• Determine the volume of a figure composed of rectangular prisms.
	• Understand the concept of volume and recognize that volume is measured in cubic units.
	• Describe a cube with an edge length of 1 unit as a “unit cube” and understand it is said to have “one cubic unit” of volume.
	• Understand that unit cubes can be used to measure volume.
	• Understand that the volume of a right rectangular prism can be found by stacking multiple layers of the base.

FIFTH GRADE MATH
Unit 1: Volume

Missouri Learning Standards

Priority Standards

- Describe a cube with edge length 1 unit as “unit cube’ and is said to have “one cubic unit” of volume and can be used to measure volume. (5.GM.B.4a)
- Understand that the volume of a right rectangular prism can be found by stacking multiple layers of the base. (5.GM.B.4b)
- Solve and justify multi-step problems involving variables, whole numbers, fractions and decimals. (5.RA.C.5)

Supporting Standards

- Write, evaluate and interpret numeric expressions using the order of operations. (5.RA.B.3)
- Translate written expressions into algebraic expressions. (5.RA.B.4)
- Apply the formulas V = l × w × h and V = B × h for volume of right rectangular prisms with whole-number edge lengths. (5.GM.B.5)

FIFTH GRADE MATH
Unit 2: Fractions as Quotients and Fraction Multiplication

Students interpret fractions as the division of the numerator by the denominator and multiply whole numbers by fractions.

Unit Essential Learning Targets	
Enduring Understandings	***Essential Questions***
• Division and fractions are related. • You can determine the area of a rectangle with fractional side lengths.	• How are division and fractions related? • How can we determine the area of a rectangle with fractional side lengths?
Students must know:	***Students must be able to:***

• Review Vocabulary
  ○ Area
  ○ Denominator
  ○ Distributive Property
  ○ Dividend
  ○ Divisor
  ○ Equipartition
  ○ Equivalent Expression
  ○ Expression
  ○ Factor
  ○ Mixed Numbers
  ○ Non-unit Fraction
  ○ Numerator
  ○ Part-of-a-whole Situation
  ○ Quotient
  ○ Unit Fraction
	• Represent and explain the relationship between division and fractions.
	• Solve problems involving division of whole numbers leading to answers that are fractions.
	• Explain the relationship between division by a whole number and multiplication by a unit fraction.
	• Explain how different equivalent expressions represent the product of a whole number and a non-unit fraction.
	• Determine the area of a rectangle with 1 whole-number side length and 1 fractional side length.
	• Write, interpret, and evaluate numerical expressions that represent the area of a rectangle with a whole-number side length and a fractional side length.
	• Represent and solve problems involving the multiplication of a whole number by a fraction or mixed number.

FIFTH GRADE MATH
Unit 2: Fractions as Quotients and Fraction Multiplication

Missouri Learning Standards

Priority Standards

- Recognize the relationship between multiplying fractions and finding the areas of rectangles with fractional side lengths. (5.NF.B.7.a)
- Calculate and interpret the product of a fraction by a whole number and a whole number by a fraction. (5.NF.B.7.c)

FIFTH GRADE MATH
Unit 3: Multiplying and Dividing Fractions

Students multiply any two fractions, including mixed numbers, and divide unit fractions and whole numbers.

Unit Essential Learning Targets	
Enduring Understandings	***Essential Questions***
• You can determine how many fractional-sized parts are in a number of wholes. • You can represent equal sharing situations when a fraction of a whole is being shared.	• How can we represent situations in which we determine a part of a part? • How can we represent equal-sharing situations when a fraction of a whole is being shared? • How can we determine how many fractional-sized parts are in a number of wholes?
Students must know:	***Students must be able to:***

• Review Vocabulary
  ○ Algorithm
  ○ Area
  ○ Column
  ○ Distributive Property
  ○ Denominator
  ○ Dividend
  ○ Divisor
  ○ Equation
  ○ Equipartition
  ○ Expression
  ○ Factors
  ○ Fraction
  ○ Mixed Number
  ○ Non-unit Fraction
  ○ Numerator
  ○ Product
  ○ Quotient
  ○ Row
  ○ Unit Fraction
	• Recognize and use a/b x c/d = axc/bxd and use this generalization to multiply fractions numerically.
	• Represent and describe multiplication of a fraction by a fraction using area concepts.
	• Make generalizations about multiplying a whole number by a fraction greater than, less than,and equal to 1.
	• Divide a unit fraction by a whole number using whole-number division concepts.
	• Divide a whole number by a unit fraction using whole-number division concepts.
	• Use the relationship between multiplication and division to represent multiplicative situations involving fractions with equivalent multiplication and division equations.

FIFTH GRADE MATH
Unit 3: Multiplying and Dividing Fractions

Missouri Learning Standards

Priority Standards

- Estimate the size of the product based on the size of the two factors. (5.NF.B.5.a)
- Explain why multiplying a given number by a fraction greater than 1 results in a product smaller than the given number. (5.NF.B.5.b)
- Explain why multiplying a given number by a fraction less than 1 results in a product smaller than the given number. (5.NF.B.5.c)
- Explain why multiplying the numerator and denominator by the same number is equivalent to multiplying the fraction by 1. (5.NF.B.5.d)
- Recognize the relationship between multiplying fractions and finding the areas of rectangles with fractional side lengths. (5.NF.B.7.a)
- Calculate and interpret the quotient of a unit fraction by a non-zero whole number. (5.NF.B.8.a)
- Calculate and interpret the quotient of a whole number by a unit fraction. (5.NF.B.8.b)

FIFTH GRADE MATH
Unit 4: Multiplication and Division with Multi-digit Whole Numbers

Students use place value strategies and algorithms to multiply and divide whole numbers.

Unit Essential Learning Targets

Enduring Understandings	***Essential Questions***
• Strategies for multiplication work no matter how many digits are in the factors. • Strategies for division work no matter how many digits are in the dividend and divisor.	• What strategies for multiplication work no matter how many digits are in the factors? • What strategies for division work no matter how many digits are in the dividend and divisor?
Students must know:	***Students must be able to:***

• Review Vocabulary
  ○ Algorithm
  ○ Area
  ○ Associative Property of Multiplication
  ○ Commutative Property of Multiplication
  ○ Composite
  ○ Difference
  ○ Distributive Property
  ○ Dividend
  ○ Divisor
  ○ Estimate
  ○ Expression
  ○ Factor
  ○ Mixed Number
  ○ Parentheses
  ○ Partial Products
  ○ Partial Quotients
  ○ Prime
  ○ Product
  ○ Quotient
  ○ Rectangular Prism
  ○ Remainder
  ○ Standard Algorithm
  ○ Sum
  ○ Volume
	• Multiply multi-digit whole numbers using the standard algorithm.
	• Divide multi-digit whole numbers using strategies based on place value and the relationship between multiplication and division.
	• Use parentheses in numerical expressions and evaluate expressions with parentheses.
	• Interpret and compare written and numerical expressions without evaluating them.

FIFTH GRADE MATH
Unit 4: Multiplication and Division with Multi-digit Whole Numbers

Missouri Learning Standards

Priority Standard

- Solve and justify multi-step problems involving variables, whole numbers, fractions and decimals. (5.RA.C.5)

Supporting Standards

- Write, evaluate, and interpret numeric expressions using the order of operations. (5.RA.B.3)
- Translate written expressions into algebraic expressions. (5.RA.B.4)
- Divide multi-digit whole numbers and decimals to the hundredths place using up to two-digit divisors and four-digit dividends, and justify the solution. (5.NBT.A.8)

FIFTH GRADE MATH
Unit 5: Place Value Patterns and Decimal Operations

Students deepen their understanding of place value as they perform the four operations with decimals to the hundredths.

Unit Essential Learning Targets

Enduring Understandings	***Essential Questions***
• We can use place value to add, subtract, multiply and divide decimals. • The value of a digit in a decimal number is determined by its place value.	• How are tenths, hundredths, and thousandths related? • How can we use place value to add, subtract, multiply, and divide decimals to the hundredths?
Students must know:	***Students must be able to:***

• New Vocabulary
  ○ Thousandths
• Review Vocabulary
  ○ Area
  ○ Associative Property of Multiplication
  ○ Compose
  ○ Decimal
  ○ Decompose
  ○ Difference
  ○ Distributive Property
  ○ Dividend
  ○ Division
  ○ Divisor
  ○ Equation
  ○ Expression
  ○ Factor
  ○ Fraction
  ○ Hundredths
  ○ Multiplication
  ○ Part
  ○ Product
  ○ Quotient
  ○ Relationship
  ○ Rounding
  ○ Standard Algorithm
  ○ Sum
  ○ Tenths
	• Read, write, and represent decimals to the thousandths, including in expanded form.
	• Compare and round multi-digit decimals based on the values of the digits in each place.
	• Add and subtract decimals to the hundredths using strategies based on place value.
	• Multiply decimals with products resulting in the hundredths using place value reasoning and properties of operations.
	• Divide decimals with quotients resulting in the hundredths using place value reasoning and properties of operations.

FIFTH GRADE MATH
Unit 5: Place Value Patterns and Decimal Operations

Missouri Learning Standards

Priority Standards

- Understand that parts of a whole can be expressed as fractions and/or decimals. (5.NF.A.1)
- Convert decimals to fractions and fractions to decimals. (5.NF.A.2)
- Compare and order fractions and/or decimals to the thousandths place using the symbols >, = or <, and justify the solution. (5.NF.A.3)
- Estimate results of sums, differences, and products with fractions and decimals to the thousandths. (5.NF.B.4)
- Solve and justify multi-step problems involving variables, whole numbers, fractions, and decimals. (5.RA.C.5)

Supporting Standards

- Read, write and identify numbers from billions to thousandths using number names, base ten numerals and expanded form. (5.NBT.A.1)
- Compare two numbers from billions to thousandths using the symbols >, =, or <, and justify the solution. (5.NBT.A.2)
- Understand that in a multi-digit number, a digit represents 1/10 times what it would represent in the place to its left. (5.NBT.A.3)
- Round numbers from billions to thousandths place. (5.NBT.A.5)
- Add and subtract multi-digit whole numbers and decimals to the thousandths place, and justify the solution. (5.NBT.A.6)
- Multiply multi-digit whole numbers and decimals to the hundredths place, and justify the solution. (5.NBT.A.7)
- Translate written expressions into algebraic expressions. (5.RA.B.4)

FIFTH
Unit 6: More Decimal and Fraction Operations

Students multiply and divide with powers of 10, use multiplication and division to convert between units, and add and subtract fractions and mixed numbers with unlike denominators.

Unit Essential Learning Targets

Enduring Understandings	***Essential Questions***
• Measurements in one unit can be converted to other units in the same system. • The smaller the unit used, the more units are needed to measure a given object.	• How can we represent and multiply or divide with powers of 10? • How can we use the relationship between multiplication and division to convert between units? • How can we add and subtract fractions with unlike denominators?
Students must know:	***Students must be able to:***

• New Vocabulary
  ○ Base
  ○ Exponent
  ○ Cup
  ○ Gallon
  ○ Pint
  ○ Quart
  ○ Mile
  ○ Milligram
  ○ Millimeter
  ○ Ton
• Review Vocabulary
  ○ Centimeter
  ○ Common Denominator
  ○ Denominator
  ○ Difference
  ○ Dividend
  ○ Factor
  ○ Gram
  ○ Inch
  ○ Kilo
  ○ Line Plot
  ○ Liter
  ○ Meter
  ○ Milliliter
  ○ Mixed Number
  ○ Multiple
  ○ Ounce
  ○ Pound
  ○ Power of 10
  ○ Product
  ○ Standard Form
  ○ Quotient
  ○ Yard
	• Explain patterns when multiplying and dividing by powers of 10.
	• Solve multi-step problems involving measurement conversions.
	• Add and subtract fractions with unlike denominators.
	• Solve problems involving addition and subtraction of fractions.
	• Create line plots to display fractional measurement data and use the information to solve problems.

FIFTH
Unit 6: More Decimal and Fraction Operations

Missouri Learning Standards

Priority Standards

- Convert measurements of capacity, length, and weight within a given measurement system. (5.GM.D.8)
- Solve multi-step problems that require measurement conversions. (5.GM.D.9)
- Create a line plot to represent a given or generated data set, and analyze the data to answer questions and solve problems, recognizing the outliers and generating the median. (5.DS.A.2)

Supporting Standards

- Understand that in a multi-digit number, a digit represents 1/10 times what it would represents in the place to its left. (5.NBT.A.3)
- Evaluate the value of powers of 10 and understand the relationship to the place value system. (5.NBT.A.4)

FIFTH GRADE MATH
Unit 7: Shapes on the Coordinate Plane

Students classify shapes in hierarchies and use the coordinate grid to represent real-world problems.

Unit Essential Learning Targets

Enduring Understandings	***Essential Questions***
• Two- and three-dimensional geometric figures can be classified and analyzed based on their properties. • A coordinate grid has an x-axis and a y-axis that can be used to locate points in two dimensions. A point can be named by an ordered pair in the form (x,y).	• How do you know the most specific name for a shape? • How can you use the coordinate grid to represent and interpret mathematical and real-world problems?
Students must know:	***Students must be able to:***

• New Vocabulary
  ○ Axis (axes)
  ○ Coordinate
  ○ Coordinate Grid
  ○ Origin
  ○ Ordered Pair
  ○ x-coordinate
  ○ y-coordinate
  ○ Trapezoid
• Review Vocabulary
  ○ Area
  ○ Attribute
  ○ Intersect
  ○ Parallel
  ○ Parallelogram
  ○ Pattern
  ○ Perimeter
  ○ Perpendicular
  ○ Plot
  ○ Quadrilateral
  ○ Rectangle
  ○ Rhombus
  ○ Right Angle
  ○ Rule
  ○ Square
  ○ Triangle
	• Classify quadrilaterals in a hierarchy based on angle measurements and side lengths.
	• Locate and label points on the coordinate grid.
	• Generate, identify, and graph relationships between corresponding terms in 2 patterns, given a rule.
	• Represent and interpret real-world and mathematical problems on a coordinate grid.

FIFTH GRADE MATH
Unit 7: Shapes on the Coordinate Plane

Missouri Learning Standards

Priority Standards

- Generate two numeric patterns given two rules. (5.RA.A.1.a)
- Translate two numeric patterns into two sets of ordered pairs. (5.RA.A.1.b)
- Graph numeric patterns on the Cartesian coordinate plane. (5.RA.A.1.c)
- Identify the relationship between two numeric patterns. (5.RA.A.1.d)
- Write a rule to describe or explain a given numeric pattern. (5.RA.A.2)
- Classify figures in a hierarchy based on properties. (5.GM.A.2)
- Analyze and describe the properties of prisms and pyramids. (5.GM.A.3)
- Represent the axes as scaled perpendicular number lines that both intersect at 0, the origin. (5.GM.C.6.a)
- Identify any point on the Cartesian coordinate plane by its ordered pair coordinates. (5.GM.C.6.b)
- Define the first number in an ordered pair as the horizontal distance from the origin. (5.GM.C.6.c)
- Define the second number in an ordered pair as the vertical distance from the origin. (5.GM.C.6.d)

Supporting Standards

- Understand that attributes belonging to a category of figures also belong to all subcategories. (5.GM.A.1)
- Plot and interpret points in the first quadrant of the Cartesian coordinate plane. (5.GM.C.7)