5th Grade Math Curriculum

Board Approved: March 21, 2024

Course Information

Course Description:
In Grade 5, instructional time focuses on five areas: (1) place value understanding for numbers to billions and decimals to thousandths and using place value understanding and properties of operations to perform arithmetic with the four operations, including writing and interpreting equations; (2) perform operations and solve problems with fractions and decimals; (3) representing and analyzing patterns; (4) solving problems involving measurement, including volume, and plotting and interpreting points on a coordinate grid; and (5) solving problems with data, including the use of graphs.

Transfer Goals:

- Apply mathematics to problems arising in everyday life, society, and the workplace using a problem solving model that incorporates analyzing information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
- Select tools as appropriate, including real objects, manipulatives, paper/pencil, and technology to solve problems.
- Select techniques as appropriate, including mental math, estimation, and number sense, to solve problems.
- Organize, record, and communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.
- Analyze mathematical patterns and relationships to connect and communicate mathematical ideas.
- Display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

Curriculum Standards: Missouri Learning Standards for Mathematics, Grade 5

Curriculum Resource(s): *enVisionMATH Realize Edition © 2015, Savvas Education*

Priority standards indicated in **bold*

Patrons with questions about the course should contact curriculum@fhsdschools.org

Unit 1: Number Sense and Operations in Base Ten

Timeframe: ***See current resource scope and sequence***

Unit Description: This unit extends students' work with place value to include decimal numbers to the thousandths place and large numbers to billions. They extend their understanding of whole number operations to adding, subtracting, multiplying, and dividing multi-digit whole numbers and decimals. Students will:

- Use place value understanding to read, write, identify, round, compare, and order multi-digit whole numbers to billions and decimals to thousandths.
- Develop an understanding of the powers of 10 and exponential notation.
- Add and subtract multi-digit whole numbers to billions and decimals to thousandths and justify their solutions.
- Multiply and divide multi-digit whole numbers and decimals to the hundredths place and justify their solutions.

Enduring Understandings:

- Our number system is based on groups of ten. Each place value represents ten times the value of the place to the right.
- Numbers can be represented in many ways (word/number names, expanded form, standard/base ten numerals), each with their own conventions.
- The place of a digit determines its value.
- Models can help with understanding decimals.
- Decimals can be rounded in a way similar to whole numbers.
- It is important to pay attention to place value when adding or subtracting decimals.
- The traditional algorithm for multiplication is a shortened version of the area model, sometimes called the box method, and partial products model.
- The process for multiplication and division of whole numbers also apply to decimals.
- Arrays and area models can represent multiplication.
- Rounding, substituting compatible numbers, and using multiplication are some ways to estimate quotients.

Essential Questions:

- What is the relationship between whole numbers and decimals?
- How are decimals used in life?
- How can I read, write, and compare large numbers up to billions and decimal numbers to thousandths using the standard form (numerals), word form (number names), and expanded form?
- How do I round decimals?
- How can I use models to help me add, subtract, multiply, and divide decimals?
- How can I determine the best strategy to use when adding, subtracting, multiplying, and dividing?
- What strategies can I use to add, subtract, multiply, and divide decimals?
- How can answers to addition, subtraction, multiplication, and division with large numbers and decimals be estimated?
- How do I know if my answers make sense?

Unit 1 Standards	
STANDARD CODE	**STUDENTS WILL KNOW, BE ABLE TO, AND UNDERSTAND:**
5.NBT.A.1	• **I can write or identify numbers using number names (word form), given base ten numerals (standard form).** • **I can write or identify numbers using number names (word form), given expanded form.** • **I can write or identify numbers using base ten numerals (standard form), given number names (word form).** • **I can write or identify numbers using base ten numerals (standard form), given expanded form.** • **I can identify numbers using expanded form, given number names (word form).** • **I can identify numbers using expanded form, given base ten numerals (standard form).** • **I can find multiple equivalent representations in number names (word form), base ten numerals (standard form) and expanded form.**
5.NBT.A.2	• I can compare two numbers from billions to thousandths using the symbols >, =, or <. • I can explain how a given number is >, =, or < another given number. • I can identify if a given justification is correct.
5.NBT.A.3	• I can recognize that a digit in one place represents ten times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
5.NBT.A.4	• I can calculate the value of powers of ten. • I can compare how place value changes in relation to powers of ten. • I can convert between base ten numerals (standard form) and expanded form with powers of ten.
5.NBT.A.5	• I can estimate whole numbers with six to eight digits using rounding. • I can estimate decimal numbers up to the thousandths place using rounding.
5.NBT.A.6	• **I can add multi-digit whole numbers.** • **I can add multi-digit decimals.** • **I can subtract multi-digit whole numbers.** • **I can subtract multi-digit decimals.** • **I can identify or explain an error in adding or subtracting.** • **I can explain the reasonableness of the solution.** • **I can identify if a given justification is correct.**
5.NBT.A.7	• I can multiply multi-digit decimals. • I can use multiple representations to model real-world and mathematical

	problems involving multiplication of multi-digit whole numbers. ● I can respectfully critique the reasoning of others, identifying errors and alternate approaches to solving problems involving multiplication of multi-digit whole numbers. ● I can decontextualize and contextualize problems and solutions to explain his or her reasoning in multiplication of multi-digit whole numbers. ● I can identify and explain patterns and the structure of the problems with specific focus on the properties of mathematics when solving problems involving multiplication of multi-digit whole numbers. ● I can communicate my reasoning precisely to problems involving multiplication of multi-digit whole numbers.
5.NBT.A.8	● I can divide multi-digit whole numbers. ● I can divide multi-digit decimals. ● I can explain the reasonableness of the solution. ● I can identify if a given justification is correct.

Unit 2: Relationships and Algebraic Thinking

Timeframe: ***See current resource scope and sequence***

Unit Description: Students in Grade 5 explore, interpret, and evaluate numerical expressions. Students will:

- Represent and analyze patterns and relationships.
- Write and interpret numerical expressions.
- Use the four operations to represent and solve problems

Enduring Understandings:

- Every pattern has a rule that can be used to extend the pattern and find missing terms.
- Two patterns can be extended using the same rule, and there will be a relationship between the patterns.
- A graph can show the relationship between two number sequences.
- The equal sign is a math symbol that means “the same value as”; in an equation, each side of the equal sign should show the same amount.
- A variable is a letter or symbol that represents any number used in an equation.
- Writing an equation can help us organize the information given in the problem.
- There is an agreed-upon order in which operations are carried out in a numerical expression.
- The order in which operations are carried out affects the result.
- Numerical expressions can represent the calculations needed to solve a problem.
- Noticing similarities and patterns in problems can help when planning how to solve a problem.
- Models, pictures, and equations can be used to help represent a math problem.

Essential Questions:

- How can I use rules to create number patterns?
- How can number patterns be analyzed and graphed?
- How can number patterns and graphs be used to solve problems?
- What is an equation?
- What is a variable?
- What is the order of operations?
- Why is it important to carry out operations in a certain order?
- How can I use what I know about similar problems to help me be a more efficient problem solver?
- How do I determine when to add, subtract, multiply, and divide when solving problems?
- How can I use models, pictures, and equations to represent what is happening in a math problem?
- How can I use math models and equations to solve multi-step problems?
- How can I check whether my answer is reasonable?

Unit 2 Standards	
STANDARD CODE	**STUDENTS WILL KNOW, BE ABLE TO, AND UNDERSTAND:**

5.RA.A.1	• I can generate two numeric patterns (up to five terms) given starting numbers and rules. • I can fill in the missing terms given two incomplete patterns and their rules. • I can extend two numeric patterns given the rules. • I can write corresponding ordered pairs given two numeric patterns. • I can graph ordered pairs given two numeric patterns on the Cartesian coordinate plane. • I can describe the relationship between two given numeric patterns.
5.RA.A.2	• **I can identify a rule to describe a numeric pattern (rules should include the starting number).** • **I can fill in a missing number(s) in a numeric pattern.** • **I can extend a given numeric pattern.** • **I can choose the sequence of numbers that matches a given rule.**
5.RA.B.3	• **I can evaluate numeric expressions containing positive integers using the order of operations.** • **I can determine where to place parentheses given an expression in word form.** • **I can determine if the given process for solving an expression with two operations is correct.** • **I can determine if the given process for solving an expression with two operations and grouping symbols is correct.**
5.RA.B.4	• I can rewrite a written expression into an algebraic expression using numbers and a variable.
5.RA.C.5	• I can solve multi-step problems involving variables, whole numbers, fractions and decimals. • I can use estimation to assess the reasonableness of answers. • I can identify the mistake in the steps taken to solve a problem. • I can identify if a given justification is correct

Unit 3: Number Sense and Operations in Fractions

Timeframe: ***See current resource scope and sequence***

Unit Description: Students build on previous experiences with fractions and use a variety of visual models and strategies to solve problems with fractions and decimals. Students will:

- Understand the relationship between fractions and decimals.
- Perform operations and solve problems with fractions and decimals.

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.
- Any whole number can also be written as a fraction.
- Mixed numbers (a whole number with a fraction) and improper fractions (a fraction with a larger numerator than denominator) can be used interchangeably.
- Decimal numeration is just an extension of whole number numeration; a new place-value unit is formed to the right of a place by breaking a value into 10 equal parts.
- Fractions that use tenths and hundredths can be converted directly to decimals (and vice versa).
- Fractions that name the same amount are equivalent fractions.
- Benchmark numbers such as 0, ½, and 1 can be used to compare fractions and decimals.
- If two fractions have the same denominator, the fraction with the greater numerator is the greater fraction.
- If two fractions have the same numerator, the fraction with the smaller denominator is the greater fraction.
- Just like with whole numbers, place value, including digits AFTER the decimal (tenths, hundredths, thousandths, etc.), is an important factor when comparing numbers with decimals.
- The meanings of addition and subtraction are the same whether working with whole

Essential Questions:

- How can I show decimals numbers, fractions, and mixed numbers in models and symbols?
- What are equivalent fractions?
- What are improper fractions?
- What is a mixed number?
- What is a decimal?
- How can I compare and order fractions?
- How can I write a fraction as a decimal?
- What is the relationship between whole numbers, fractions, and decimals?
- How can I use place value to compare and order numbers with decimals?
- How are addition and subtraction with fractions, decimals, and mixed numbers similar and different from addition and subtraction with whole numbers?
- How can I use a number line or other models to add and subtract fractions?
- How do I add and subtract fractions with the same denominator?
- What strategies can I use for adding and subtracting fractions and mixed numbers- with and without different denominators?
- How can I model multiplication of a whole number by a fraction?
- How can I model multiplication of a fraction by a fraction?
- What is the result of multiplying a whole number by a fraction or decimal less than 1?
- What is the result of dividing a fraction or decimal less than 1 by a whole number?
- What is the result of dividing a whole number by a fraction or decimal less

numbers, decimals, fractions, or mixed numbers. ● It is sometimes necessary to change fractions with unlike denominators to an equivalent calculation with like denominators before adding and subtracting. ● It is sometimes necessary to change mixed numbers by decomposing and/or using equivalent fractions in order to add or subtract. ● Multiplication by a fraction involves finding a part of a set or a part of a part. ● When I divide a fraction or decimal less than 1 by a whole number, the answer is smaller. ● When I divide a whole number by a fraction or decimal less than 1, the answer is larger.	than 1?

Unit 3 Standards	
STANDARD CODE	**STUDENTS WILL KNOW, BE ABLE TO, AND UNDERSTAND:**
5.NF.A.1	● I can identify parts of a whole using fractions. ● I can identify parts of a whole using decimals. ● I can identify parts of a whole using fractions and decimals.
5.NF.A.2	● **I can convert decimals to fractions.** ● **I can convert fractions to decimals.**
5.NF.A.3	● **I can compare fractions using >, =, or <.** ● **I can compare decimals using >, =, or <.** ● **I can compare fractions and decimals using >, =, or <.** ● **I can place fractions in order.The student will place decimals in order.** ● **I can place fractions and decimals in order.** ● **I can justify the solution by identifying a correct explanation from a list of choices.** ● **I can justify the solution.**
5.NF.B.4	● I can estimate sums of fractions. ● I can estimate sums of decimals to the thousandths place. ● I can estimate differences of fractions. ● I can estimate the differences of decimals to the thousandths place. ● I can estimate products of fractions.

	• I can estimate products of decimals to the thousandths place.
5.NF.B.5	• I can determine how large/small the product of two fractions will be compared to benchmarks with estimation. • I can select the correct model representing the estimate of multiplying two fractions. • I can explain why multiplying a given number by an improper fraction will result in a product larger than the given number. • I can explain why multiplying a given number by a mixed number will result in a product larger than the given number. • I can explain why multiplying a given number by a whole number, greater than 1, will result in a product larger than the given number. • I can select the correct model representing what would happen when multiplying a fraction by a number greater than one. • I can explain why multiplying a given number by a fraction between zero and one will result in a product smaller than the given number. • I can select the correct model representing what would happen when multiplying a fraction between zero and one. • I can explain that a fraction containing the same number in the numerator and denominator is equal to one. • I can explain why multiplying a numerator and denominator by the same number is equivalent to multiplying by one. • I can select the correct answer representing what would happen when multiplying a fraction by a fraction equivalent to one.
5.NF.B.6	• I can add fractions with unlike denominators. • I can add mixed numbers with unlike denominators. • I can add fractions and mixed numbers with unlike denominators. • I can subtract fractions with unlike denominators. • I can subtract mixed numbers with unlike denominators. • I can subtract mixed numbers and fractions with unlike denominators. • The student will explain the reasonableness of an answer. • I can identify the mistake in the steps taken to solve a problem. • I can identify if a given justification is correct.
5.NF.B.7	• I can identify the correct equation of a given area model showing a fraction by a fraction. • I can identify the correct equation of a given area model showing a whole number by a fraction. • I can identify the model that represents multiplying a fraction by a fraction. • The student will identify the model that represents multiplying a whole number by a fraction. • I can describe how multiplying fractions relates to finding the areas of rectangles with fractional side lengths. • I can calculate the product of a fraction by a whole number. • I can calculate the product of a whole number by a fraction. • I can select the correct restatement of a problem involving multiplication of

	whole numbers and fractions. ● I can calculate the product of two fractions between zero and one. ● I can select the correct restatement of a problem involving multiplication of two fractions between zero and one.
5.NF.B.8	● I can calculate the quotient of a unit fraction by a non-zero whole number. ● I can identify a visual model that represents the quotient of a unit fraction by a non-zero whole number. ● I can identify an equation that represents the quotient of a unit fraction by a non-zero whole number. ● I can calculate the quotient of a whole number by a unit fraction. ● I can identify a visual model that represents the quotient of a whole number by a unit fraction. ● I can identify an equation that represents the quotient of a whole number by a unit fraction.

Unit 4: Geometry and Measurement

Timeframe: ***See current resource scope and sequence***

Unit Description: Students understand shapes and our coordinate system and solve problems of measurement. Students will:

- Classify 2- and 3-dimensional geometric shapes.
- Understand and compute volume.
- Graph and interpret points within the first quadrant of the Cartesian coordinate plane.
- Solve problems involving measurement and conversions within a measurement system.

Enduring Understandings:

GEOMETRY

- Two- and three-dimensional geometric figures can be classified and analyzed based on their properties.
- Two lines are parallel if they never intersect and are always equidistant.
- Two lines are perpendicular if they intersect in right angles (90°).
- A figure has symmetry when it can be folded so that its two halves match.

COORDINATE SYSTEMS

- The coordinate system uses two perpendicular number lines intersecting at 0 to name the location of points in the plane.
- 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).
- The coordinate plane can be used to model and compare numerical patterns.
- Graphical representations can be used to make predictions and interpretations about real world situations.

MEASUREMENT

- In the U.S. we use two systems of measurement – the metric system and the U.S. customary system.
- 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

Essential Questions:

GEOMETRY

- How can I sort 2-D and 3-D shapes?
- How do I know when two lines are parallel?
- How do I know when two lines are perpendicular?
- How is symmetry used in different areas (such as architecture and art)?
- How do I know when a shape has symmetry?

COORDINATE SYSTEMS

- How does the coordinate system work?
- How can I plot points on a coordinate grid?
- How can I represent numerical patterns on a coordinate grid?
- How might a coordinate grid help me understand a relationship between two numbers?
- How can the coordinate system help me better understand other map systems?

MEASUREMENT

- How do I determine the best tool and unit to use when measuring?
- How can I convert from one unit to another?
- What is the relationship between different units of measure?
- How do I find the volume of a shape?
- How can I solve and be precise with measurement problems?

object. ● Volume of a 3-D shape is measured with cubic units. It is the number of cubic units that fill a 3-D shape. ● When I am solving measurement problems, it can be helpful to create a table of equivalents for the given units. ● To convert from a larger unit to a smaller unit, multiply the number of larger units by the conversion factor, that is, the number of smaller units in each larger unit. ○ Example: Kendra is 4 feet tall. How many inches tall is Kendra? 1 foot= 12 inches 4 feet= 4x12=48 inches ● Precision with measurement involves using clear definitions, stating the meaning of symbols, specifying units of measure and calculating accurately and efficiently.	

Unit 4 Standards	
STANDARD CODE	**STUDENTS WILL KNOW, BE ABLE TO, AND UNDERSTAND:**
5.GM.A.1	● **I can identify two-dimensional shapes based on their attributes.** ● **I can identify three-dimensional shapes based on their attributes.** ● **I can describe a shape within a category (e.g., prisms) regardless of the subcategory.**
5.GM.A.2	● **I can select all categories that describe a two-dimensional shape.** ● **I can select all categories that describe a three-dimensional shape.**
5.GM.A.3	● **I can describe the properties of prisms according to the number of edges, faces or vertices as well as the types of bases.** ● **I can describe the properties of pyramids according to the number of edges, faces or vertices as well as the types of bases.** ● **I can compare/contrast prisms and/or pyramids.**
5.GM.B.4	● **I can define volume.** ● **I can distinguish the difference between volume and area.** ● **I can determine if volume, area or perimeter should be found in a given situation.** ● **I can use volume units correctly, using cubic units.**

	• **I can count cubic units in a given container to determine the volume.** • **I can determine the number of cubic units needed to fill the box, given the base.**
5.GM.B.5	• **I can apply the formula for volume on a right rectangular prism with labeled sides.**
5.GM.C.6	• **I can define the origin as the point (0, 0).** • **I can pick the correctly drawn Cartesian coordinate plane.** • **I can use perpendicular number lines to construct a first quadrant Cartesian coordinate plane.** • **I can place the x and y axis as well as numbers on a given coordinate plane.** • **I can identify the ordered pair of a given point in the first quadrant of the Cartesian coordinate plane.** • **I can identify the correct point from choices on a Cartesian coordinate plane, given the ordered pair.** • **I can identify what the x coordinate represents.** • **I can name the x coordinate given a point in the first quadrant of a Cartesian coordinate plane.** • **I can identify what the y coordinate represents.** • **I can name the y coordinate given a point in the first quadrant of a Cartesian coordinate plane.**
5.GM.C.7	• **I can plot a point in the first quadrant of the Cartesian coordinate plane given an ordered pair.** • **I can interpret points using real-world examples.** • **I can interpret points using mathematical situations**
5.GM.D.8	• I can convert measures of capacity within the metric system. • I can convert measures of capacity within the customary system. • I can convert measures of length within the metric system. • I can convert measures of length within the customary system. • I can convert measures of weight within the metric system. • I can convert measures of weight within the customary system.
5.GM.D.9	• I can conduct multiple operations within a problem to determine an answer and convert it into a new unit. • When given a problem containing two different units, I can convert one and solve the problem.

Unit 5: Data and Statistics

Timeframe: ***See current resource scope and sequence***

Unit Description: Students experience activities to help them formulate and answer questions using data. Students will:

- Create line graphs and line plots from a set of data.
- Analyze data to answer questions and solve problems.

Enduring Understandings:

- Graphs have features that help others interpret information and can be used to help see data in different ways to answer questions and solve problems.
- Line graphs, like other types of graphs, and line plots can be used to organize and answer questions about data.
- A line plot (sometimes called a dot plot) uses marks over positions on a number line to show the number of times that each value or result occurs.
- A line plot shows how closely grouped together or how spread out over a range the data are.
- When analyzing data, finding the outliers, minimum, maximum, range, mode and median, identifying trends, and making predictions can help us understand the data better.

Essential Questions:

- How can graphs help me talk about numbers to solve problems?
- How can I show data in a line graph and line plot?
- What is a line plot used for?
- What is a line graph used for?
- How do I find the outliers in a set of data?
- How do I find the mode and median for a set of data?
- How do I find the minimum, maximum, and range for a set of data?
- How do I find the trends for a set of data?
- How can I make predictions for a set of data?

Unit 5 Standards

STANDARD CODE	STUDENTS WILL KNOW, BE ABLE TO, AND UNDERSTAND:
5.DS.A.1	• I can choose appropriate axis labels. • I can choose reasonable scales for the x and y axis. • I can choose an appropriate title for a line graph. • I can create a line graph to represent given data by placing points correctly. • I can choose the correct graph representing a given data set. • I can choose the correct data set given a line graph. • I can identify the least occurring or most occurring (i.e. mode) data. • I can identify trends in the data. • I can identify the range of the data. • I can answer questions about trends on the graph (i.e.

	increasing/decreasing) by using data. ● I can make predictions using the data.
5.DS.A.2	● **I can choose an appropriate title for a line plot.** ● **I can create a line plot to represent given data by placing points (x) correctly.** ● **I can choose the correct line plot representing a given data set.** ● **I can choose the correct data set given a line plot.** ● **I can identify the least/most occurring (mode) data.** ● **I can identify trends in the data.The student will identify the range of the data.** ● **I can identify the median of the data.** ● **I can identify the outlier(s) of the data.** ● **I can answer questions by using data from the line plot.**