4th Grade Math Curriculum

Board Approved: March 21, 2024

Course Information

Course Description:
In Grade 4, instructional time focuses on five areas: (1) generalizing place value understanding for multi-digit whole numbers and using place value understanding and properties of operations to perform multi-digit arithmetic and the four operations with whole numbers to solve problems; (2) extending understanding of fraction equivalence and ordering and building fractions from unit fractions by applying and extending previous understandings of operations on whole numbers; (3) understanding decimal notation for fractions and comparing decimal fractions; (4) describing and analyzing shapes and attributes of shapes and solving problems involving measurement; 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 4

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

Unit 1: Number Sense and Operations in Base Ten

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

Unit Description: This unit extends students' understanding of the base ten number system (including reading, writing, comparing,ordering, and rounding numbers) and the four mathematical operations. Students will:

- Use place value understanding to round whole numbers up to one million to any place and recognize that in multi-digit whole numbers, a digit represents 10 times what it would represent in the place to its right.
- Read, write, and identify whole numbers within 1,000,000 using base-ten numerals, number names, and expanded form.
- Compare and order numbers up to 1,000,000.
- Use strategies based on place value and properties of operations to add and subtract multi-digit numbers.
- Use strategies based on place value and properties of operations to multiply and divide.

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.
- Place value can help round large numbers to numbers that are easier to compute mentally.
- There are many ways to use place value concepts to add and subtract with larger numbers.
- Products can be found mentally by using place value patterns, multiplication properties or compensation.
- Arrays and area models can represent multiplication.
- The Distributive Property breaks apart factors to make multiplication easier.
- Estimation and rounding can help explain why an answer is reasonable or unreasonable.
- Estimation is rounding to the nearest 10; 100; 1,000; and so on.
- Place value patterns can be used with basic facts to divide multiples of 10 and 100 by single digit numbers.

Essential Questions:

- How are numbers and their names organized?
- How can I write numbers up to 1,000,000 using the standard form (numerals), word form (number names), and expanded form?
- How can I use place value to compare two numbers?
- How can place value help me add, subtract, multiply, and divide?
- What is estimation?
- How can I find good estimates when adding, subtracting, multiplying, and dividing?
- How can I determine the best strategy to use when adding, subtracting, multiplying, and dividing?
- How can mental math be used to divide?
- How can place value help determine a quotient?
- How do I know my answer makes sense?

○ Example: 72/8=9; 720/8= 90 or 9 tens; 7200/8=900 or 9 hundreds. ● Rounding, substituting compatible numbers, and using multiplication are some ways to estimate quotients. ○ Example: use rounding to estimate 484/6; 480/6=80 so 484/6 is about 80; ○ Example: use compatible numbers to estimate 496/5; 500/5=100 so 496/5 is about 100; ○ Example: use multiplication to estimate 445/5; 5 x 90=450 so 445/5 is about 90.	

Unit 1 Standards	
STANDARD CODE	**STUDENTS WILL KNOW, BE ABLE TO, AND UNDERSTAND:**
4.NBT.A.1	● I can estimate whole numbers ranging from four to five digits to tens or hundreds using rounding. ● I can estimate whole numbers ranging from five to six digits to hundreds or thousands using rounding.
4.NBT.A.2	● **I can write or identify numbers up to one million in base ten numerals (standard form) given number names (word form).** ● **I can write or identify numbers up to one million in base ten numerals (standard form) given expanded form.** ● **I can write or identify numbers up to one million in number names (word form) given base ten numerals (standard form).** ● **I can write or identify numbers up to one million in number names (word form) given expanded form.** ● **I can identify numbers up to one million in expanded form given base ten numerals (standard form).** ● **I can identify numbers up to one million in expanded form given number names (word form).** ● **I can convert between the number names (word form), base ten numerals (standard form) and expanded form in numbers up to one million.**
4.NBT.A.3	● I can compare two whole numbers using the symbols >, = or <. ● I can justify the solution by identifying the place value that was used to compare the two whole numbers.
4.NBT.A.4	● I can use multi-digit whole numbers or pictorial representations to show

	that the value of a digit is ten times greater than the value of the digit in the place to the immediate right.
4.NBT.A.5	• I can use multiple representations to model real-world and mathematical problems involving addition and subtraction of whole numbers. • I can respectfully critique the reasoning of others, identifying errors and alternate approaches to solving problems involving addition and subtraction of whole numbers. • I can decontextualize and contextualize problems and solutions to explain my reasoning in addition and subtraction problems of 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 addition and subtraction of whole numbers. • I can communicate my reasoning precisely to problems involving addition and subtraction of whole numbers.
4.NBT.A.6	• I can multiply a number up to four digits by one-digit number. • I can multiply a two-digit number by a two-digit number. • I can use distributive property to solve one digit by up to four digit numbers. • I can use an area model or array to solve two-digit by two digit multiplication. • I can justify a solution by using estimation or by identifying a strategy.
4.NBT.A.7	• I can divide three-digit by one digit whole numbers with remainders. • I can divide four-digit by one digit whole numbers with remainders. • I can justify a solution by using estimation or by identifying a strategy.

Unit 2: Relationships and Algebraic Thinking

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

Unit Description: Students in Grade 4 continue to work with patterns and solve problems using the four operations. Students will:

- Use the four operations with whole numbers to solve problems.
- Work with factors and multiples and understand prime and composite numbers.
- Generate and analyze patterns.

Enduring Understandings:

- Real life math problems often involve creating and solving multiple expressions before finding an answer.
- Writing an equation can help us organize the information given in the problem.
- An equation is a math sentence that has two equal sides separated by an equal sign.
- The equal sign is a math symbol that means “the same value as”; 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.
- When solving real-world problems, if we determine that division is needed, it is important to think about what would happen in real-life with the divisor and the remainder.
- Addition is adding on to a group, combining groups, or joining parts to make a whole.
- Subtraction is separating parts from a whole, finding a missing part, or comparing two quantities.
- Multiplication can represent combining equal groups, arrays, area models, and comparative differences between values (“times as many/much”). .
- Multiplication helps us find a total number when we know the number of equal groups and the quantity in each group.
- Division can be used to solve problems that involve partitioning, repeated

Essential Questions:

- 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 place value help me add, subtract, multiply, and divide?
- How can I use math models and equations to solve multi-step problems?
- How can I use equations to represent what is happening in a math problem?
- What is a variable?
- What is the meaning of a remainder in a division problem?
- How are remainders and divisors related?
- How can I check whether my answer is reasonable?
- What is a multiple?
- How can I use patterns or multiplication to find the multiples of a number?
- What is a factor?
- How can I use arrays or multiplication to find the factors of a number?
- How do I know if a number is prime or composite?
- How can patterns help me solve problems?
- How can I describe patterns like a mathematician?
- How can I use a rule to continue a pattern?
- How can I use a table to extend a pattern?

subtraction, and comparison situations. ● The remainder represents the quantity that is left over when creating groups and must be less than the divisor. ● Factors are what we can multiply to get a number. Multiples are what we get after multiplying the number by a whole number.Factors and multiples are related. ● Prime numbers have exactly two factors- 1 and the number. Composite numbers have more than two factors. ● Number patterns can be used to solve new problems using math facts we know. ● Every pattern has a rule that can be used to extend the pattern and find missing terms. ● Patterns often have many features that repeat and can be predicted.	

Unit 2 Standards	
STANDARD CODE	**STUDENTS WILL KNOW, BE ABLE TO, AND UNDERSTAND:**
4.RA.A.1	● I can solve multiplication word problems involving missing factors. ● I can identify an equation that represents a multiplicative comparison in a given word problem.
4.RA.A.2	● **I can identify an equation using a variable that represents a given problem.** ● **I can solve a whole number, multi-step word problem involving any of the four operations.** ● **I can solve a multi-step, whole number equation.** ● **I can use estimation to interpret the reasonableness of an answer.** ● **I can identify a strategy that may be used to determine the reasonableness of a solution.**
4.RA.A.3	● **I can solve division problems and determine how the remainder will affect the solution.** ● **I can choose an equation, including an equation using a variable, to represent a given word problem.**
4.RA.B.4	● I can identify factors of a given number from a list. ● I can recognize the characteristics of a composite number based on its factors. ● I can identify multiples of a given number.

	● I can generate factors of a given number. ● I can generate multiples of a given number.
4.RA.B.5	● I can identify a given number as prime or composite. ● I can find all factor pairs for a given whole number. ● I can identify all factor pairs for a given whole number.
4.RA.C.6	● **I can generate a numeric pattern when given the starting number and given the rule.**
4.RA.C.7	● **I can use words to express a rule for a given pattern.** ● **I can use an equation to express a rule for a given pattern.**

Unit 3: Number Sense and Operations in Fractions

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

Unit Description: Students develop an understanding of fractions, beginning with unit fractions. Students will:

- Develop an understanding of fractions as numbers.
- View fractions in general as being built out of unit fractions.
- Use fractions along with visual fraction models to represent parts of a whole.
- Understand that the size of a fractional part is relative to the size of the whole. (For example, ½ of a small cookie could be less than ⅓ of a larger cookie, but ⅓ of a ribbon is longer than ¼ of the same ribbon because when the ribbon is divided into 3 parts, the parts are longer than when it is divided into 4 parts.)
- Solve problems that involve comparing fractions by using visual models and strategies based on noticing equal numerators or denominators.

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.
- Fractions (smaller than and greater than 1) can be shown on a number line, divided into equal parts.
- Benchmark numbers such as 0, ½, and 1 can be used to compare fractions.
- 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.
- The same fractional amount can be represented by an infinite set of different but equivalent fractions.
- Mixed numbers (a whole number with a fraction) and improper fractions (a fraction with a larger numerator than denominator) can be used interchangeably.
- Fractions that name the same amount are equivalent fractions.
- The meanings of addition and subtraction are the same whether working with fractions, mixed numbers

Essential Questions:

- How can I show fractions and mixed numbers in models and symbols?
- What are equivalent fractions?
- What are improper fractions?
- What is a mixed number?
- How can I compare and order fractions?
- How are addition and subtraction with fractions 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/subtract fractions with like denominators?
- Why does the denominator remain the same when I add/subtract fractions with like denominators?
- How can I model multiplication of a whole number by a fraction?
- What is a decimal?
- 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 decimals?

or whole numbers. ● Mixed numbers can be added and subtracted by decomposing the mixed number into a whole number and a fraction. ○ Whole numbers may need to be renamed to subtract fractions. ○ Another way to add or subtract mixed numbers is to first change each to an equivalent fraction. ○ A third way to subtract mixed numbers is to count up. ● Using what we know about adding and subtracting whole numbers can help us multiply a fraction and a whole number. ● 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. ● A decimal is a number that shows multiples of 1/10 and 1/100 by using a decimal point. ● Fractions that use tenths and hundredths can be converted directly to decimals (and vice versa).	

Unit 3 Standards	
STANDARD CODE	**STUDENTS WILL KNOW, BE ABLE TO, AND UNDERSTAND:**
4.NF.A.1	● I can select models of equivalent fractions. ● I can illustrate using models of equivalence for fractions less than one.
4.NF.A.2	● I can recognize and identify equivalent fractions. ● I can generate equivalent fractions.
4.NF.A.3	● **I can compare two fractions and justify the solution by using a number line.** ● **I can compare two fractions and justify the solution by using a visual fraction model.** ● **I can compare two fractions using the symbols >, = or <.** ● **I can identify flaws in a justification for comparing two fractions.**
4.NF.B.4	● I can combine fractions with like denominators to make a fraction or whole

	number using a visual model. • I can separate a whole or fraction to make fractional parts using a visual model.
4.NF.B.5	• I can create an equation that shows a given fraction decomposed into fractional parts with the same denominator. • I can create an equation that shows a given fraction decomposed in more than one way. • I can justify a sum of an equation by using a number line. • I can justify a sum of an equation by using a visual fraction model.
4.NF.B.6	• **I can solve addition problems involving fractions with like denominators.** • **I can solve addition problems involving mixed numbers with like denominators.** • **I can solve subtraction problems involving fractions with like denominators.** • **I can solve subtraction problems involving mixed numbers with like denominators.**
4.NF.B.7	• I can find repeated addition or equal groups when given the multiplication problem. • I can find the multiplication equation when given the repeated addition or equal groups.
4.NF.B.8	• **I can solve word problems involving multiplication of a fraction by a whole number.** • **I can find the product of a fraction and a whole number.**
4.NF.C.9	• I can rename a given fraction with a denominator of ten as a decimal. • I can rename a given fraction with a denominator of one hundred as a decimal.
4.NF.C.10	• I can rename a given decimal as a fraction with a denominator of ten. • I can rename a given decimal as a fraction with a denominator of one hundred. • I can identify equivalent representations of fractions and decimals.
4.NF.C.11	• I can write or identify decimals up to the hundredths place in base ten numerals (standard form) given number names (word form). • I can write or identify decimals up to the hundredths place in base ten numerals (standard form) given expanded form. • I can write or identify decimals up to the hundredths place in number names (word form) given base ten numerals (standard form). • I can write or identify decimals up to the hundredths place in number names (word form) given expanded form. • I can identify decimals up to the hundredths place in expanded form given base ten numerals (standard form).

	• I can identify decimals up to the hundredths place in expanded form given number names (word form).
4.NF.C.12	• **I can compare two decimals and justify the solution by using a visual model.** • **I can compare two decimals and justify the solution in written form.** • **I can compare two decimals using the symbols >, = or <.**

Unit 4: Geometry and Measurement

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

Unit Description:

Students describe, analyze, compare, and classify 2-dimensional shapes and solve problems using their understanding of relationships between units in one system of measurement. Students will:

- Classify 2-dimensional shapes by properties of their lines and angles.
- Understand the concepts of angle and measure angles.
- Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
- Solve problems using area and perimeter.

Enduring Understandings:

GEOMETRY

- Geometric figures can be classified and analyzed based on their properties.
- A polygon is a closed plane figure made up of three or more sides and named by the number and type of sides and angles it has.
- A triangle is a polygon with three sides and can be classified by its angles and number of congruent sides.
- A quadrilateral is a polygon with four sides and can be classified by its angles and pairs of sides.
- 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
- Angles are measured in units called degrees, using a protractor or other known angles.
- The measure of an angle does not depend on the lengths of its sides.
- A right angle measures 90 degrees.
- A straight angle measures 180 degrees.
- An acute angle measures greater than 0 degrees, but less than 90 degrees.
- An obtuse angle measures greater than 90 degrees but less than 180 degrees.

MEASUREMENT

Essential Questions:

GEOMETRY

- How can I sort polygons?
- How can I classify triangles and quadrilaterals?
- How do I know when two lines are parallel?
- How do I know when two lines are perpendicular?
- How can I measure the space between intersecting lines?
- How is symmetry used in different areas (such as architecture and art)?
- How do I know when a shape has symmetry?
- What is an angle? What are special types of angles?
- How can I measure angles?

MEASUREMENT

- How do I determine the best tool and unit to use when measuring?
- What is the relationship between different units of measure?
- How are fluid ounces, cups, pints, quarts, and gallons related?
- How are grams and kilograms related?
- How do I find the perimeter of a shape?
- How do I find the area of a shape?
- How does changing a shape affect its area and perimeter?
- How are the units used to measure perimeter alike and/or different from the

• 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 object. • Perimeter is measured with linear units. It is the sum of all of the object's sides. • Area is measured in square units. It is the number of square units that cover the shape. • Area and perimeter may change in the same or different ways when attributes of a figure are changed. • 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.	units used to measure area? • How can I solve measurement problems? • How can I convert from one unit to another? • How can I be precise when solving measurement problems?

Unit 4 Standards	
STANDARD CODE	**STUDENTS WILL KNOW, BE ABLE TO, AND UNDERSTAND:**
4.GM.A.1	• I can draw and identify points, lines, line segments and rays. • I can draw and identify perpendicular lines and parallel lines. • I can draw and identify angles.
4.GM.A.2	• I can classify two-dimensional shapes by their sides. • I can classify two-dimensional shapes into more than one category. • I can classify two-dimensional shapes by their angles.

4.GM.A.3	• I can estimate the measure of an angle.
4.GM.B.4	• I can construct lines of symmetry for a two-dimensional figure. • I can identify lines of symmetry in a two-dimensional figure.
4.GM.B.5	• I can measure angles using a protractor. • I can draw angles using a protractor.
4.GM.C.6	• I can choose the correct unit of measurement for a given situation within a single system. • I can convert measurements from larger units to smaller units.
4.GM.C.7	• I can use the four operations to solve problems involving distance. • I can use the four operations to solve problems involving intervals of time. • I can use the four operations to solve problems involving liquid volume. • I can use the four operations to solve problems involving weight of objects. • I can use the four operations to solve problems involving money.
4.GM.C.8	• **I can apply area formulas for rectangles to solve problems.** • **I can find the width of a rectangle when given the area and the length.** • **I can find the length of a rectangle when given the area and the width.** • **I can apply perimeter formulas for rectangles to solve problems.** • **I can find the width of a rectangle when given the perimeter and the length.** • **I can find the length of a rectangle when given the perimeter and the width.**

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 frequency tables, scaled picture graphs, bar graphs, and line plots to represent a data set with several categories.
- Solve multi-step word problems using information presented in graphs.
- Analyze data in frequency tables, picture graphs, bar graphs, and line plots.

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.
- Bar graphs, picture graphs, frequency tables, 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 mode and range, 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 picture graph, bar graph, frequency table, and line plot?
- What is a line plot used for?
- How do I find the mode for a set of data?
- How do I find the 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:
4.DS.A.1	• I can identify a frequency table for a given set of measurement data. • I can identify a line plot for a given set of measurement data. • I can list the data on a given frequency table or plot data on a line plot when given a set of measurement data. • I can correctly place numbers for the scale on a line plot given a set of measurement data.

4.DS.A.2	• I can solve problems using information on a given data display by adding or subtracting.
4.DS.A.3	• **I can find the mode given a frequency table, line plot, bar graph or picture graph.** • **I can find the range given a frequency table, line plot, bar graph or picture graph.** • **I can identify the least occurring data.** • **I can identify trends in the data.** • **I can answer questions about trends on the graph.** • **I can make predictions using the data.**