

Grade 5 Mathematics *Standards of Learning* - 2023 Overview of Revisions

This overview includes a summary of the content embedded in five content strands.

Number and Number Sense: *Exploring relationships between fractions and decimals and their representations provides meaning and structure and allows us to quantify, measure and make decisions in life.*

- Identify and represent equivalency between fractions and decimals, and compare and order sets of fractions and/or decimals
- Demonstrate an understanding of the number characteristics prime and composite; determine prime factorization for whole numbers up to 100

Computation and Estimation: *The operations of addition, subtraction, multiplication, and division, and estimation, allow us to model, represent, and solve different types of problems with whole numbers and rational numbers (not including integers).*

- Estimate, represent, solve, and justify solutions to single-step and multistep contextual problems using addition, subtraction, multiplication, and division with whole numbers
- Add and subtract fractions with like and unlike denominators, and solve single-step and multistep contextual problems
- Solve single-step contextual problems involving multiplication of a whole number and a proper fraction
- Add, subtract, multiply, and divide with decimal numbers and solve single-step and multistep contextual problems
- Simplify whole number numerical expressions using the order of operations

Measurement and Geometry: *Analyzing and describing geometric objects, the relationships and structures among them, or the space that they occupy can be used to classify, quantify, measure, or count one or more attributes.*

- Solve problems, including those in context, that involve length, mass, and liquid volume using metric units
- Solve problems involving area, perimeter, and volume
- Classify and measure angles and triangles

Probability and Statistics: *The world can be investigated through posing questions and collecting, representing, analyzing, and interpreting data to describe and predict events and real-world phenomena.*

- Apply the data cycle (formulate questions; collect or acquire data; organize and represent data; and analyze data and communicate results) with a focus on line plots (dot plots) and stem-and-leaf plots
- Solve contextual problems using measures of center and the range
- Determine the probability of a simple event by constructing a model of a sample space and using the Fundamental (Basic) Counting Principle

Patterns, Functions, and Algebra: *Relationships can be described and generalizations can be made using patterns and relations.*

- Identify, describe, extend, and create increasing and decreasing patterns with whole numbers, fractions, and decimals using various representations
- Investigate and use variables in contextual problems

Comparison of Grade 5 *Mathematics Standards of Learning* – 2016 to 2023

2016 Standards of Learning Essential Knowledge and Skills (EKS) Number and Number Sense * On the state assessment, items measuring this objective are assessed without the use of a calculator.	2023 Standards of Learning Knowledge and Skills (KS) Number and Number Sense (NS) *On the state assessment, items measuring this objective are assessed without the use of a calculator.
<p>5.1 The student, given a decimal through thousandths, will round to the nearest whole number, tenth, or hundredth.</p> <ul style="list-style-type: none"> ● Given a decimal through thousandths, round to the nearest whole number, tenth, or hundredth. 	<p>[Included in 5.CE.3]</p>
<p>5.2 The student will</p> <p>a) represent and identify equivalencies among fractions and decimals, with and without models;* and</p> <p>b) compare and order fractions, mixed numbers, and/or decimals, in a given set, from least to greatest and greatest to least.*</p> <ul style="list-style-type: none"> ● Represent fractions with denominators that are thirds, eighths, and factors of 100 in their equivalent decimal form with concrete or pictorial models. (a) ● Represent decimals in their equivalent fraction form (thirds, eighths, and factors of 100) with concrete or pictorial models. (a) ● Identify equivalent relationships between decimals and fractions with denominators that are thirds, eighths, and factors of 100 in their equivalent decimal form without models. (a) ● Compare and order from least to greatest and greatest to least a given set of no more than four decimals, fractions (proper or improper), and/or mixed numbers with denominators of 12 or less. (b) 	<p>5.NS.1 The student will use reasoning and justification to identify and represent equivalency between fractions (with denominators that are thirds, eighths, and factors of 100) and decimals; and compare and order sets of fractions (proper, improper, and/or mixed numbers having denominators of 12 or less) and decimals (through thousandths).</p> <ul style="list-style-type: none"> a) Use concrete and pictorial models to represent fractions with denominators that are thirds, eighths, and factors of 100 in their equivalent decimal form.* b) Use concrete and pictorial models to represent decimals in their equivalent fraction form (with denominators that are thirds, eighths, and factors of 100).* c) Identify equivalent relationships between decimals and fractions with denominators that are thirds, eighths, and factors of 100 in their equivalent decimal form, with and without models.* d) Compare (using symbols $<$, $>$, $=$) and order (least to greatest and greatest to least) a set of no more than four decimals, fractions, and/or mixed numbers using multiple strategies (e.g.,

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<ul style="list-style-type: none"> ● Use the symbols $>$, $<$, $=$, and \neq to compare decimals through thousandths, fractions (proper or improper fractions), and/or mixed numbers, having denominators of 12 or less. (b) 	<p style="text-align: center;">benchmarks, place value, number line, etc.). Justify solutions orally, in writing, or with a model.*</p>
<p>5.3 The student will</p> <p>a) identify and describe the characteristics of prime and composite numbers; and</p> <p>b) identify and describe the characteristics of even and odd numbers.</p> <ul style="list-style-type: none"> ● Identify prime numbers less than or equal to 100. (a) ● Identify composite numbers less than or equal to 100. (a) ● Demonstrate with concrete or pictorial representations and explain orally or in writing why a number is prime or composite. (a) ● Identify which numbers are even or odd. (b) ● Demonstrate with concrete or pictorial representations and explain orally or in writing why a number is even or odd. (b) ● Demonstrate with concrete or pictorial representations and explain orally or in writing why the sum or difference of two numbers is even or odd. (b) 	<p>5.NS.2 The student will demonstrate an understanding of prime and composite numbers, and determine the prime factorization of a whole number up to 100.</p> <ul style="list-style-type: none"> a) Given a whole number up to 100, create a concrete or pictorial representation to demonstrate whether the number is prime or composite, and justify reasoning. b) Classify, compare, and contrast whole numbers up to 100 using the characteristics prime and composite. c) Determine the prime factorization for a whole number up to 100.

<p style="text-align: center;">2016 Standards of Learning Essential Knowledge and Skills (EKS) Computation and Estimation</p> <p style="text-align: center;">*On the state assessment, items measuring this objective are assessed without the use of a calculator.</p>	<p style="text-align: center;">2023 Standards of Learning Knowledge and Skills (KS) Computation and Estimation (CE)</p> <p style="text-align: center;">*On the state assessment, items measuring this objective are assessed without the use of a calculator.</p>
<p>5.4 The student will create and solve single-step and multistep practical problems involving addition, subtraction, multiplication, and division of whole numbers.</p> <ul style="list-style-type: none"> ● Create single-step and multistep practical problems involving addition, subtraction, multiplication, and division of whole numbers, with and without remainders. ● Estimate the sum, difference, product, and quotient of whole numbers. ● Apply strategies, including place value and application of the properties of addition and multiplication, to solve single-step and multistep practical problems involving addition, subtraction, multiplication, and division of whole numbers, with and without remainders, in which: <ul style="list-style-type: none"> ○ sums, differences, and products do not exceed five digits; ○ factors do not exceed two digits by three digits; ○ divisors do not exceed two digits; or ○ dividends do not exceed four digits. ● Use the context of a practical problem to interpret the quotient and remainder. 	<p>5.CE.1 The student will estimate, represent, solve, and justify solutions to single-step and multistep contextual problems using addition, subtraction, multiplication, and division with whole numbers.</p> <ul style="list-style-type: none"> a) Estimate the sum, difference, product, and quotient of whole numbers in contextual problems. b) Represent, solve, and justify solutions to single-step and multistep contextual problems by applying strategies (e.g., estimation, properties of addition and multiplication) and algorithms, including the standard algorithm, involving addition, subtraction, multiplication, and division of whole numbers, with and without remainders, in which: <ul style="list-style-type: none"> i) sums, differences, and products do not exceed five digits; ii) factors do not exceed two digits by three digits; iii) divisors do not exceed two digits; or iv) dividends do not exceed four digits. c) Interpret the quotient and remainder when solving a contextual problem.
<p>5.5 The student will</p> <ul style="list-style-type: none"> a) estimate and determine the product and quotient of two numbers involving decimals* and b) create and solve single-step and multistep practical problems involving addition, subtraction, and multiplication of decimals, 	<p>5.CE.3 The student will estimate, represent, solve, and justify solutions to single-step and multistep problems, including those in context, using addition, subtraction, multiplication, and division with decimal numbers.</p>

<p style="text-align: center;">2016 Standards of Learning Essential Knowledge and Skills (EKS) Computation and Estimation</p> <p style="text-align: center;">*On the state assessment, items measuring this objective are assessed without the use of a calculator.</p>	<p style="text-align: center;">2023 Standards of Learning Knowledge and Skills (KS) Computation and Estimation (CE)</p> <p style="text-align: center;">*On the state assessment, items measuring this objective are assessed without the use of a calculator.</p>
<p>and create and solve single-step practical problems involving division of decimals.</p> <ul style="list-style-type: none"> ● Estimate and determine the product of two numbers in which: <ul style="list-style-type: none"> ○ the factors do not exceed two digits by two digits (e.g., 2.3×4.5, 0.08×0.9, 0.85×2.3, 1.8×5); and ○ the products do not exceed the thousandths place. (Leading zeroes will not be considered when counting digits.) (a) ● Estimate and determine the quotient of two numbers in which <ul style="list-style-type: none"> ○ quotients do not exceed four digits with or without a decimal point; ○ quotients may include whole numbers, tenths, hundredths, or thousandths; ○ divisors are limited to a single digit whole number or a decimal expressed as tenths; and ○ no more than one additional zero will need to be annexed. (a) ● Use multiple representations to model multiplication and division of decimals and whole numbers. (a) ● Create and solve single-step and multistep practical problems involving addition, subtraction, and multiplication of decimals. (b) ● Create and solve single-step practical problems involving division of decimals. (b) 	<ul style="list-style-type: none"> a) Apply estimation strategies (e.g., rounding to the nearest whole number, tenth or hundredth; compatible numbers, place value) to determine a reasonable solution for single-step and multistep contextual problems involving addition, subtraction, and multiplication of decimals, and single-step contextual problems involving division of decimals. b) Estimate and determine the product of two numbers using strategies and algorithms, including the standard algorithm, when given: <ul style="list-style-type: none"> i) a two-digit factor and a one-digit factor (e.g., 2.3×4; 0.08×0.9; $.16 \times 5$);* ii) a three-digit factor and a one-digit factor (e.g., 0.156×4, 3.28×7, 8.09×0.2);* and iii) a two-digit factor and a two-digit factor (e.g., 0.85×3.7, 14×1.6, 9.2×3.5).* <p>(Products will not exceed the thousandths place, and leading zeroes will not be considered when counting digits.)</p> c) Estimate and determine the quotient of two numbers using strategies and algorithms, including the standard algorithm, in which*: <ul style="list-style-type: none"> i) quotients do not exceed four digits with or without a decimal point; ii) quotients may include whole numbers, tenths, hundredths, or thousandths; iii) divisors are limited to a single digit whole number a decimal expressed as tenths; and

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	<p>iv) no more than one additional zero will need to be annexed.</p> <p>d) Solve single-step and multistep contextual problems involving addition, subtraction, and multiplication of decimals by applying strategies (e.g., estimation, modeling) and algorithms, including the standard algorithm.</p> <p>e) Solve single-step contextual problems involving division with decimals by applying strategies (e.g., estimation, modeling) and algorithms, including the standard algorithm.</p>
<p>5.6 The student will</p> <p>a) solve single-step and multistep practical problems involving addition and subtraction with fractions and mixed numbers; and</p> <p>b) solve single-step practical problems involving multiplication of a whole number, limited to 12 or less, and a proper fraction, with models.*</p> <ul style="list-style-type: none"> ● Solve single-step and multistep practical problems involving addition and subtraction with fractions (proper or improper) having like and unlike denominators and/or mixed numbers. Denominators in the problems should be limited to 12 or less (e.g., $\frac{5}{8} + \frac{1}{4}$, $\frac{5}{6} - \frac{2}{3}$, $3\frac{3}{4} + 2\frac{5}{12}$) and answers should be expressed in simplest form. (a) ● Solve single-step practical problems involving multiplication of a whole number, limited to 12 or less, and a proper fraction (e.g., $6 \times \frac{1}{3}$, $\frac{1}{4} \times 8$, $9 \times \frac{2}{3}$), with models. The denominator will be a factor 	<p>5.CE.2 The student will estimate, represent, solve, and justify solutions to single-step and multistep problems, including those in context, using addition and subtraction of fractions with like and unlike denominators (with and without models), and solve single-step contextual problems involving multiplication of a whole number and a proper fraction, with models.</p> <ul style="list-style-type: none"> a) Determine the least common multiple of two numbers to find the least common denominator for two fractions. b) Estimate and determine the sum or difference of two fractions (proper or improper) and/or mixed numbers, having like and unlike denominators limited to 2, 3, 4, 5, 6, 8, 10, and 12 (e.g., $\frac{5}{8} + \frac{1}{4}$, $\frac{4}{5} - \frac{2}{3}$, $3\frac{3}{4} + 2\frac{5}{12}$), and simplify the resulting fraction.* c) Estimate and solve single-step and multistep contextual problems involving addition and subtraction with fractions (proper or improper) and/or mixed numbers having like and unlike denominators, with and without models. Denominators

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<p>of the whole number and answers should be expressed in simplest form. (b)</p> <ul style="list-style-type: none"> ● Apply the inverse property of multiplication in models. (For example, use a visual fraction model to represent $\frac{4}{4}$ or as the product of $4 \times \frac{1}{4}$). (b) 	<p>should be limited to 2, 3, 4, 5, 6, 8, 10, 12. Answers should be expressed in simplest form.</p> <p>d) Solve single-step practical problems involving multiplication of a whole number, limited to 12 or less, and a proper fraction (e.g., $9 \times \frac{2}{3}$, $8 \times \frac{3}{4}$), with models. The denominator will be a factor of the whole number and answers should be expressed in simplest form.*</p>
<p>5.7 The student will simplify whole number numerical expressions using the order of operations.*</p> <ul style="list-style-type: none"> ● Use the order of operations to simplify whole number numerical expressions, limited to addition, subtraction, multiplication, and division. Expressions may contain parentheses. ● Given a whole number numerical expression involving more than one operation, describe which operation is completed first, which is second, etc. 	<p>5.CE.4 The student will simplify numerical expressions with whole numbers using the order of operations.</p> <p>a) Use order of operations to simplify numerical expressions with whole numbers, limited to addition, subtraction, multiplication, and division in which:*</p> <ol style="list-style-type: none"> i) expressions may contain no more than one set of parentheses; ii) simplification will be limited to five whole numbers and four operations in any combination of addition, subtraction, multiplication, or division; iii) whole numbers will be limited to two digits or less; and iv) expressions should not include braces, brackets, or fraction bars. <p>b) Given a whole number numerical expression involving more than one operation, describe which operation is completed first, which is second, and which is third.*</p>

<p style="text-align: center;">2016 Standards of Learning Essential Knowledge and Skills (EKS) Measurement and Geometry</p>	<p style="text-align: center;">2023 Standards of Learning Knowledge and Skills (KS) Measurement and Geometry (MG)</p>
<p>5.8 The student will</p> <p>a) solve practical problems that involve perimeter, area, and volume in standard units of measure; and</p> <p>b) differentiate among perimeter, area, and volume and identify whether the application of the concept of perimeter, area, or volume is appropriate for a given situation.</p> <ul style="list-style-type: none"> ● Solve practical problems that involve perimeter, area, and volume in standard units of measure. (a) ● Determine the perimeter of a polygon, with or without diagrams, when <ul style="list-style-type: none"> ○ the lengths of all sides of a polygon that is not a rectangle or a square are given; ○ the length and width of a rectangle are given; or ○ the length of a side of a square is given. (a) ● Estimate and determine the area of a square and rectangle using whole number measurements given in metric or U.S. Customary units, and record the solution with the appropriate unit of measure (e.g., 24 square inches). (a) ● Develop a procedure for determining the area of a right triangle using only whole number measurements given in metric or U.S. Customary units, and record the solution with the appropriate unit of measure (e.g., 12 square inches). (a) ● Estimate and determine the area of a right triangle, with diagrams, when the base and the height are given. (a) ● Develop a procedure for determining volume using manipulatives (e.g., cubes). (a) 	<p>5.MG.2 The student will use multiple representations to solve problems, including those in context, involving perimeter, area, and volume.</p> <ul style="list-style-type: none"> a) Investigate and develop a formula for determining the area of a right triangle. b) Estimate and determine the area of a right triangle, with diagrams, when the base and the height are given in whole number units, in metric or U.S. Customary units, and record the solution with the appropriate unit of measure (e.g., 16 square inches). c) Describe volume as a measure of capacity and give examples of volume as a measurement in contextual situations. d) Investigate and develop a formula for determining the volume of rectangular prisms using concrete objects. e) Solve problems, including those in context, to estimate and determine the volume of a rectangular prism using concrete objects, diagrams, and formulas when the length, width, and height are given in whole number units. Record the solution with the appropriate unit of measure (e.g., 12 cubic inches). f) Identify whether the application of the concept of perimeter, area, or volume is appropriate for a given situation. g) Solve contextual problems that involve perimeter, area, and volume in standard units of measure.

<p style="text-align: center;">2016 Standards of Learning Essential Knowledge and Skills (EKS) Measurement and Geometry</p>	<p style="text-align: center;">2023 Standards of Learning Knowledge and Skills (KS) Measurement and Geometry (MG)</p>
<ul style="list-style-type: none"> ● Estimate and determine the volume of a rectangular prism with diagrams, when the length, width, and height are given, using whole number measurements. Record the solution with the appropriate unit of measure (e.g., 12 cubic inches). (a) ● Describe practical situations where perimeter, area, and volume are appropriate measures to use, and justify orally or in writing. (b) ● Identify whether the application of the concept of perimeter, area, or volume is appropriate for a given situation. (b) 	
<p>5.9 The student will</p> <p>a) given the equivalent measure of one unit, identify equivalent measurements within the metric system; and</p> <p>b) solve practical problems involving length, mass, and liquid volume using metric units.</p> <ul style="list-style-type: none"> ● Given the equivalent measure of one unit, identify equivalent measurements within the metric system for the following: <ul style="list-style-type: none"> ○ length (millimeters, centimeters, meters, and kilometers); ○ mass (grams and kilograms); and ○ liquid volume (milliliters and liters). (a) ● Estimate and measure to solve practical problems that involve metric units: <ul style="list-style-type: none"> ○ length (millimeters, centimeters, meters, and kilometers); ○ mass (grams and kilograms); and ○ liquid volume (milliliters, and liters). (b) 	<p>5.MG.1 The student will reason mathematically to solve problems, including those in context, that involve length, mass, and liquid volume using metric units.</p> <ul style="list-style-type: none"> a) Determine the most appropriate unit of measure to use in a contextual problem that involves metric units: <ul style="list-style-type: none"> i) length (millimeters, centimeters, meters, and kilometers); ii) mass (grams and kilograms); and iii) liquid volume (milliliters and liters). b) Estimate and measure to solve contextual problems that involve metric units: <ul style="list-style-type: none"> i) length (millimeters, centimeters, and meters); ii) mass (grams and kilograms); and iii) liquid volume (milliliters and liters). c) Given the equivalent metric measure of one unit, in a contextual problem, determine the equivalent measurement within the metric system for the following: <ul style="list-style-type: none"> i) length (millimeters, centimeters, meters, and kilometers);

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	<ul style="list-style-type: none"> ii) mass (grams and kilograms); and iii) liquid volume (milliliters and liters).
<p>5.10 The student will identify and describe the diameter, radius, chord, and circumference of a circle.</p> <ul style="list-style-type: none"> ● Identify and describe the diameter, radius, chord, and circumference of a circle. ● Investigate and describe the relationship between <ul style="list-style-type: none"> ○ diameter and radius; ○ diameter and chord; ○ radius and circumference; and ○ diameter and circumference. 	<p>[Included in Grade 6]</p>
<p>5.11 The student will solve practical problems related to elapsed time in hours and minutes within a 24-hour period.</p> <ul style="list-style-type: none"> ● Solve practical problems related to elapsed time in hours and minutes within a 24-hour period: <ul style="list-style-type: none"> ○ when given the beginning time and the ending time, determine the time that has elapsed; ○ when given the beginning time and amount of elapsed time in hours and minutes, determine the ending time; or ○ when given the ending time and the elapsed time in hours and minutes, determine the beginning time. 	<p>[Deleted]</p>
<p>5.12 The student will classify and measure right, acute, obtuse, and straight angles.</p>	<p>5.MG.3 The student will classify and measure angles and triangles, and solve problems, including those in context.</p>

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<ul style="list-style-type: none"> ● Classify angles as right, acute, obtuse, or straight. ● Identify the appropriate tools (e.g., protractor and straightedge or angle ruler as well as available software) used to measure and draw angles. ● Measure right, acute, obtuse, and straight angles, using appropriate tools, and identify their measures in degrees. ● Solve addition and subtraction problems to determine unknown angle measures on a diagram in practical problems. 	<ul style="list-style-type: none"> a) Classify angles as right, acute, obtuse, or straight and justify reasoning. b) Classify triangles as right, acute, or obtuse and equilateral, scalene, or isosceles and justify reasoning. c) Identify congruent sides and right angles using geometric markings to denote properties of triangles. d) Compare and contrast the properties of triangles. e) Identify the appropriate tools (e.g., protractor, straightedge, angle ruler, available technology) to measure and draw angles. f) Measure right, acute, obtuse, and straight angles, using appropriate tools, and identify measures in degrees. g) Use models to prove that the sum of the interior angles of a triangle is 180 degrees and use the relationship to determine an unknown angle measure in a triangle. h) Solve addition and subtraction contextual problems to determine unknown angle measures on a diagram.
<p>5.13 The student will</p> <ul style="list-style-type: none"> a) classify triangles as right, acute, or obtuse and equilateral, scalene, or isosceles; and b) investigate the sum of the interior angles in a triangle and determine an unknown angle measure. <ul style="list-style-type: none"> ● Classify triangles as right, acute, or obtuse. (a) ● Classify triangles as equilateral, scalene, or isosceles. (a) ● Compare and contrast the properties of triangles. (a) 	<p>[Included in 5.MG.3]</p>

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<ul style="list-style-type: none"> ● Identify congruent sides and right angles using geometric markings to denote properties of triangles. (a) ● Use models to prove that the sum of the interior angles of a triangle is 180 degrees, and use that relationship to determine an unknown angle measure in a triangle. (b) 	
<p>5.14 The student will a) recognize and apply transformations, such as translation, reflection, and rotation; and</p> <ul style="list-style-type: none"> ● Apply transformations to polygons in order to determine congruence. (a) ● Recognize that translations, reflections, and rotations preserve congruency. (a) ● Identify the image of a polygon resulting from a single transformation (translation, reflection, or rotation). (a) 	<p style="text-align: center;">[Included in Grades 7 and 8]</p>
<p>5.14 The student will b) investigate and describe the results of combining and subdividing polygons.</p> <ul style="list-style-type: none"> ● Investigate and describe the results of combining and subdividing polygons. (b) ● Compare and contrast the characteristics of a given polygon that has been subdivided with the characteristics of the resulting parts. (b) 	<p style="text-align: center;">[Deleted]</p>

<p align="center">2016 Standards of Learning Essential Knowledge and Skills (EKS) Probability and Statistics</p>	<p align="center">2023 Standards of Learning Knowledge and Skills (KS) Probability and Statistics (PS)</p>
<p>5.15 The student will determine the probability of an outcome by constructing a sample space or using the Fundamental (Basic) Counting Principle.</p> <ul style="list-style-type: none"> ● Construct a sample space, using a tree diagram to identify all possible outcomes. ● Construct a sample space, using a list or chart to represent all possible outcomes. ● Determine the probability of an outcome by constructing a sample space. The sample space will have a total of 24 or fewer equally likely possible outcomes. ● Determine the number of possible outcomes by using the Fundamental (Basic) Counting Principle. 	<p>5.PS.3 The student will determine the probability of an outcome by constructing a model of a sample space and using the Fundamental (Basic) Counting Principle.</p> <ul style="list-style-type: none"> a) Determine the probability of an outcome by constructing a sample space (with a total of 24 or fewer equally likely possible outcomes), using a tree diagram, list, or chart to represent and determine all possible outcomes. b) Determine the number of possible outcomes by using the Fundamental (Basic) Counting Principle.
<p>5.16 The student, given a practical problem, will</p> <p>a) represent data in line plots and stem-and-leaf plots;</p> <p>b) interpret data represented in line plots and stem-and-leaf plots; and</p> <p>c) compare data represented in a line plot with the same data represented in a stem-and-leaf plot.</p> <ul style="list-style-type: none"> ● Collect data, using observations (e.g., weather), measurement (e.g., shoe sizes), surveys (e.g., hours watching television), or experiments (e.g., plant growth). (a) ● Organize the data into a chart or table. (a) ● Represent data in a line plot. Line plots will have no more than 30 data points. (a) 	<p>5.PS.1 The student will apply the data cycle (formulate questions; collect or acquire data; organize and represent data; and analyze data and communicate results) with a focus on line plots (dot plots) and stem-and-leaf plots.</p> <ul style="list-style-type: none"> a) Formulate questions that require the collection or acquisition of data. b) Determine the data needed to answer a formulated question and collect or acquire existing data (limited to 30 or fewer data points) using various methods (e.g., polls, observations, measurements, experiments). c) Organize and represent a data set using a line plot (dot plot) with a title, labeled axes, and a key, with and without the use of technology tools. Line plots (dot plots) may contain whole numbers, fractions, or decimals.

<p align="center">2016 Standards of Learning Essential Knowledge and Skills (EKS) Probability and Statistics</p>	<p align="center">2023 Standards of Learning Knowledge and Skills (KS) Probability and Statistics (PS)</p>
<ul style="list-style-type: none"> ● Represent data in a stem-and-leaf plot where the stem is listed in ascending order and the leaves are in ascending order, with or without commas between leaves. Stem-and-leaf plots will be limited to no more than 30 data points. (a) ● Title the given graph or identify an appropriate title. (a) ● Interpret data by making observations from line plots and stem-and-leaf plots, describing the characteristics of the data, and describing the data as a whole. One set of data will be represented on a graph. (b) ● Interpret data by making inferences from line plots and stem-and-leaf plots. (b) ● Compare data represented in a line plot with the same data represented in a stem-and-leaf plot. (c) 	<ul style="list-style-type: none"> d) Organize and represent numerical data using a stem-and-leaf plot with a title and key, where the stems are listed in ascending order and the leaves are in ascending order, with or without commas between the leaves. e) Analyze data represented in line plots (dot plots) and stem-and-leaf plots and communicate results orally and in writing: <ul style="list-style-type: none"> i) describe the characteristics of the data represented in a line plot (dot plot) and stem-and-leaf plot as a whole (e.g., the shape and spread of the data); ii) make inferences about data represented in line plots (dot plots) and stem-and-leaf plots (e.g., based on a line plot (dot plot) of the number of books students in a bus line have in their backpack, every student will have from two to four books in their backpack); iii) identify parts of the data that have special characteristics and explain the meaning of the greatest, the least, or the same (e.g., the stem-and-leaf plot shows that the same number of students scored in the 90s as scored in the 70s); iv) draw conclusions about the data and make predictions based on the data to answer questions; and v) solve single-step and multistep addition and subtraction problems using data from line plots (dot plots) and stem-and-leaf plots.
<p>5.17 The student, given a practical context, will</p> <ul style="list-style-type: none"> a) describe mean, median, and mode as measures of center; b) describe mean as fair share; c) describe the range of a set of data as a measure of spread; and d) determine the mean, median, mode, and range of a set of data. 	<p>5.PS.2 The student will solve contextual problems using measures of center and the range.</p> <ul style="list-style-type: none"> a) Describe mean as fair share.

<p align="center">2016 Standards of Learning Essential Knowledge and Skills (EKS) Probability and Statistics</p>	<p align="center">2023 Standards of Learning Knowledge and Skills (KS) Probability and Statistics (PS)</p>
<ul style="list-style-type: none"> ● Describe and determine the mean of a group of numbers representing data from a given context as a measure of center. (a, d) ● Describe and determine the median of a group of numbers representing data from a given context as a measure of center. (a, d) ● Describe and determine the mode of a group of numbers representing data from a given context as a measure of center. (a, d) ● Describe mean as fair share. (b) ● Describe and determine the range of a group of numbers representing data from a given context as a measure of spread. (c, d) 	<ul style="list-style-type: none"> b) Describe and determine the mean of a set of data values representing data from a given context as a measure of center. c) Describe and determine the median of a set of data values representing data from a given context as a measure of center. d) Describe and determine the mode of a set of data values representing data from a given context as a measure of center. e) Describe and determine the range of a set of data values representing data from a given context as a measure of spread.

<p align="center">2016 Standards of Learning Essential Knowledge and Skills (EKS) Patterns, Functions, and Algebra</p>	<p align="center">2023 Standards of Learning Knowledge and Skills (KS) Patterns, Functions, and Algebra (PFA)</p>
<p>5.18 The student will identify, describe, create, express, and extend number patterns found in objects, pictures, numbers, and tables.</p> <ul style="list-style-type: none"> ● Identify, create, describe, and extend patterns using concrete materials, number lines, tables, or pictures. 	<p>5.PFA.1 The student will identify, describe, extend, and create increasing and decreasing patterns with whole numbers, fractions, and decimals, including those in context, using various representations.</p>

<p style="text-align: center;">2016 Standards of Learning Essential Knowledge and Skills (EKS) Patterns, Functions, and Algebra</p>	<p style="text-align: center;">2023 Standards of Learning Knowledge and Skills (KS) Patterns, Functions, and Algebra (PFA)</p>
<ul style="list-style-type: none"> ● Describe and express the relationship found in patterns, using words, tables, and symbols. ● Solve practical problems that involve identifying, describing, and extending single-operation input and output rules (limited to addition, subtraction, and multiplication of whole numbers; addition and subtraction of fractions, with denominators of 12 or less; and addition and subtraction of decimals expressed in tenths or hundredths). ● Identify the rule in a single-operation numerical pattern found in a list or table (limited to addition, subtraction, and multiplication of whole numbers; addition and subtraction of fractions, with denominators of 12 or less; and addition and subtraction of decimals expressed in tenths or hundredths). 	<ul style="list-style-type: none"> a) Identify, describe, extend, and create increasing and decreasing patterns using various representations (e.g., objects, pictures, numbers, number lines, input/output tables, function machines). b) Analyze an increasing or decreasing single-operation numerical pattern found in lists, input/output tables, and function machines, and generalize the change to identify the rule, extend the pattern, or identify missing terms. (Patterns will be limited to addition, subtraction, multiplication, and division of whole numbers; addition and subtraction of fractions with like denominators of 12 or less; and addition and subtraction of decimals expressed in tenths or hundredths). c) Solve contextual problems that involve identifying, describing, and extending increasing and decreasing patterns using single-operation input and output rules (limited to addition, subtraction, multiplication, and division of whole numbers; addition and subtraction of fractions with like denominators of 12 or less; and addition and subtraction of decimals expressed in tenths or hundredths).
<p>5.19 The student will</p> <ul style="list-style-type: none"> a) investigate and describe the concept of variable; b) write an equation to represent a given mathematical relationship, using a variable; c) use an expression with a variable to represent a given verbal expression involving one operation; and d) create a problem situation based on a given equation, using a single variable and one operation. 	<p>5.PFA.2 The student will investigate and use variables in contextual problems.</p> <ul style="list-style-type: none"> a) Describe the concept of a variable (presented as a box, letter, or other symbol) as a representation of an unknown quantity. b) Write an equation (with a single variable that represents an unknown quantity and one operation) from a contextual situation, using addition, subtraction, multiplication, or division.

<p style="text-align: center;">2016 <i>Standards of Learning</i> Essential Knowledge and Skills (EKS) Patterns, Functions, and Algebra</p>	<p style="text-align: center;">2023 <i>Standards of Learning</i> Knowledge and Skills (KS) Patterns, Functions, and Algebra (PFA)</p>
<ul style="list-style-type: none"> ● Describe the concept of a variable (presented as boxes, letters, or other symbols) as a representation of an unknown quantity. (a) ● Write an equation with addition, subtraction, multiplication, or division, using a variable to represent an unknown quantity. (b) ● Use an expression with a variable to represent a given verbal expression involving one operation (e.g., “5 more than a number” can be represented by $y + 5$). (c) ● Create and write a word problem to match a given equation with a single variable and one operation. (d) 	<ul style="list-style-type: none"> c) Use an expression with a variable to represent a given verbal expression involving one operation (e.g., “5 more than a number” can be represented by $y + 5$). d) Create and write a word problem to match a given equation with a single variable and one operation.

2023 Grade 5 Mathematics SOL – Summary of Changes

Grade 5 (2016 SOL to 2023 SOL Numbering)	Parameter Changes/Clarification (2023 SOL)
<ul style="list-style-type: none"> ● 5.1 → [Included in 5.CE.3] ● 5.2a-b → 5.NS.1 ● 5.3a-b → 5.NS.2 ● 5.4 → 5.CE.1 ● 5.5a-b → 5.CE.3 ● 5.6a-b → 5.CE.2 ● 5.7 → 5.CE.4 ● 5.8a-b → 5.MG.2 ● 5.9a-b → 5.MG.1 ● 5.10 → [Included in Grade 6] ● 5.11 → [Deleted] ● 5.12 → 5.MG.3 ● 5.13a-b → [Included in 5.MG.3] ● 5.14a → [Included in Grades 7 and 8] ● 5.14b → [Deleted] ● 5.15 → 5.PS.3 ● 5.16a-c → 5.PS.1 ● 5.17a-d → 5.PS.2 ● 5.18 → 5.PFA.1 ● 5.19a-d → 5.PFA.2 	<ul style="list-style-type: none"> ● 5.CE.1 - “Create and solve...” reworded to “Estimate, represent, solve, and justify...” for whole number problems ● 5.CE.2, and 5.CE.3 – Standard now states “estimate, represent, solve, and justify...” for fraction and decimal problems ● 5.CE.2b,c - Fraction denominators limited to 2, 3, 4, 5, 6, 8, 10, and 12 (previously 12 or less) ● 5.CE.3a - Rounding to the nearest whole, tenth, or hundredth included as an estimation strategy for decimal computation ● 5.CE.4a - Order of operations limited to expressions containing no more than one set of parentheses; simplification will be limited to five whole numbers and four operations in any combination of addition, subtraction, multiplication, or division; whole numbers will be limited to two digits or less; expressions should not include braces, brackets, or fraction bars ● 5.MG.2 – Use of multiple representations when solving area, perimeter, and volume problems ● 5.MG.2a,d – Investigate and develop formulas for determining the area of a right triangle and volume of a rectangular prism (previously develop a procedure) ● 5.MG.3 – Solve problems, including those in context, with angles and triangles ● 5.PFA.1 – Increasing and decreasing patterns with whole numbers, fractions with like denominators of 12 or less, and decimals expressed in tenths or hundredths ● 5.PFA.2 – Investigate and use variables in contextual problems

Deletions from Grade 5 (2016 SOL)	Additions to Grade 5 (2023 SOL)
<ul style="list-style-type: none"> ● 5.3b [EKS] – Identify which numbers are even and odd ● 5.3 [EKS] - Demonstrate with concrete or pictorial representations and explain orally or in writing why the sum or difference of two numbers is even or odd ● 5.4 - Create single-step and multistep practical problems involving addition, subtraction, multiplication, and division of whole numbers, with and without remainders ● 5.5b [EKS] – Create single-step and multistep practical problems involving addition, subtraction, and multiplication of decimals and create single-step practical problems involving division of decimals ● 5.6 [EKS] - Apply the inverse property of multiplication in models. (For example, use a visual fraction model to represent $\frac{4}{4}$ or as the product of $4 \times \frac{1}{4}$) [Moved to Grade 4] ● 5.8 [EKS] - Determine the perimeter of a polygon when the lengths of all sides are given ● 5.8 [EKS] – Estimate and determine the area of a square and rectangle using whole number measurements [Moved to Grade 4] ● 5.9 [EKS] - Estimate and measure to solve practical problems that involve length (kilometers removed) ● 5.10 - Identify and describe the diameter, radius, chord, and circumference of a circle [Included in Grade 6] ● 5.11 - Solve practical problems related to elapsed time in hours and minutes within a 24-hour period ● 5.14a - Recognize and apply transformations, such as translation, reflection, and rotation [Included in Grades 7 and 8] ● 5.14b - Investigate and describe the results of combining and subdividing polygons 	<ul style="list-style-type: none"> ● 5.NS.2c – Determine the prime factorization of a whole number up to 100 ● 5.CE.2a - Determine the least common multiple of two numbers to find the least common denominator for two fractions [Moved from Grade 4] ● 5.CE.3b – multiplication of decimals expanded to include a three-digit factor and a one-digit factor ● 5.MG.1a - Determine the most appropriate unit of measure to use in a contextual problem that involves metric units for length mass, and liquid volume ● 5.MG.2c - Describe volume as a measure of capacity ● 5.PS.1 - Additional data analysis knowledge and skills representing the data cycle have been included ● 5.PFA.1b,c – Patterns may include division

KEY: NS = Number and Number Sense; CE = Computation and Estimation; MG = Measurement and Geometry; PS = Probability and Statistics; PFA = Patterns, Functions, and Algebra; EKS = Essential Knowledge and Skills (2016); KS = Knowledge and Skills (2023); US = Understanding the Standard