Virginia Mathematics

Grade 5

Number and Number Sense	**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).** 5.NS.1
	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.** 5.NS.2
Use concrete and pictorial models to represent fractions with denominators that are thirds, eighths, and factors of 100 in their equivalent decimal form.* 5.NS.1.A	**a**	**Use concrete and pictorial models to represent fractions with denominators that are thirds, eighths, and factors of 100 in their equivalent decimal form.*** 5.NS.1.A
Use concrete and pictorial models to represent decimals in their equivalent fraction form (thirds, eighths, and factors of 100).* 5.NS.1.B	**b**	**Use concrete and pictorial models to represent decimals in their equivalent fraction form (thirds, eighths, and factors of 100).*** 5.NS.1.B
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.* 5.NS.1.C	**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.*** 5.NS.1.C
Co <, to		**ompare (using symbols <, >, =) and order (least to greatest and greatest to least) set of no more than four decimals and fractions (proper, improper) and/or mixed**

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to least) a set of no more than four decimals and fractions (proper, improper) and/or mixed numbers using multiple strategies (e.g., benchmarks, place value, number lines). Justify solutions orally, in writing, or with a model.* 5.NS.1.D		numbers using multiple strategies (e.g., benchmarks, place value, number lines). Justify solutions orally, in writing, or with a model.* 5.NS.1.D
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. 5.NS.2.A	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. 5.NS.2.A
Classify, compare, and contrast whole numbers up to 100 using the characteristics prime and composite. 5.NS.2.B	b	Classify, compare, and contrast whole numbers up to 100 using the characteristics prime and composite. 5.NS.2.B
Determine the prime factorization for a whole number up to 100. 5.NS.2.C	c	Determine the prime factorization for a whole number up to 100. 5.NS.2.C
Computation and Estimation	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. 5.CE.1
	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. 5.CE.2
	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. 5.CE.3
	4	The student will simplify numerical expressions with whole numbers using the order of operations. 5.CE.4

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Estimate the sum, difference, product, and quotient of whole numbers in contextual problems. 5.CE.1.A	**a** Estimate the sum, difference, product, and quotient of whole numbers in contextual problems. 5.CE.1.A
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: 5.CE.1.B	**i** sums, differences, and products do not exceed five digits; 5.CE.1.B.I **ii** factors do not exceed two digits by three digits; 5.CE.1.B.II **iii** divisors do not exceed two digits; or 5.CE.1.B.III **iv** dividends do not exceed four digits. 5.CE.1.B.IV
Interpret the quotient and remainder when solving a contextual problem. 5.CE.1.C	**c** Interpret the quotient and remainder when solving a contextual problem. 5.CE.1.C
Determine the least common multiple of two numbers to find the least common denominator for two fractions. 5.CE.2.A	**a** Determine the least common multiple of two numbers to find the least common denominator for two fractions. 5.CE.2.A
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., 5 8 + 1 4 , 4 5 − 2 3 , 33 4 + 2 5 12), and simplify the resulting fraction.* 5.CE.2.B	**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., 5 8 + 1 4 , 4 5 − 2 3 , 33 4 + 2 5 12), and simplify the resulting fraction.* 5.CE.2.B

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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 should be limited to 2, 3, 4, 5, 6, 8, 10, and 12. Answers should be expressed in simplest form. 5.CE.2.C	**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 should be limited to 2, 3, 4, 5, 6, 8, 10, and 12. Answers should be expressed in simplest form. 5.CE.2.C
Solve single-step contextual problems involving multiplication of a whole number, limited to 12 or less, and a proper fraction (e.g., 9 × 2 3 , 8 × 3 4), with models. The denominator will be a factor of the whole number and answers should be expressed in simplest form.* 5.CE.2.D	**d** Solve single-step contextual problems involving multiplication of a whole number, limited to 12 or less, and a proper fraction (e.g., 9 × 2 3 , 8 × 3 4), with models. The denominator will be a factor of the whole number and answers should be expressed in simplest form.* 5.CE.2.D
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-ste pr	**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. 5.CE.3.A

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division of decimals. 5.CE.3.A	
Estimate and determine the product of two numbers using strategies and algorithms, including the standard algorithm, when given: 5.CE.3.B	i a two-digit factor and a one-digit factor (e.g., 2.3 × 4; 0.08 × 0.9; .16 × 5);* 5.CE.3.B.I
	ii a three-digit factor and a one-digit factor (e.g., 0.156 × 4, 3.28 × 7, 8.09 × 0.2);* and 5.CE.3.B.II
	iii a two-digit factor and a two-digit factor (e.g., 0.85 × 3.7, 14 × 1.6, 9.2 × 3.5).* (Products will not exceed the thousandths place, and leading zeroes will not be considered when counting digits.) 5.CE.3.B.III
Estimate and determine the quotient of two numbers using strategies and algorithms, including the standard algorithm, in which:* 5.CE.3.C	i quotients do not exceed four digits with or without a decimal point; 5.CE.3.C.I
	ii quotients may include whole numbers, tenths, hundredths, or thousandths; 5.CE.3.C.II
	iii divisors are limited to a single digit whole number or a decimal expressed as tenths; and 5.CE.3.C.III
	iv no more than one additional zero will need to be annexed. 5.CE.3.C.IV
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. 5.CE.3.D	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. 5.CE.3.D
Solve single-step contextual problems involving division with decimals by applying strategies (e.g., estimation, modeling) and algorithms, including the standard algorithm. 5.CE.3.E	e Solve single-step contextual problems involving division with decimals by applying strategies (e.g., estimation, modeling) and algorithms, including the standard algorithm. 5.CE.3.E
Use order of operations to ex| numbers, limited to	i expressions may contain no more than one set of parentheses; 5.CE.4.A.I

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addition, subtraction, multiplication, and division in which:* 5.CE.4.A	ii simplification will be limited to five whole numbers and four operations in any combination of addition, subtraction, multiplication, or division; 5.CE.4.A.II
	iii whole numbers will be limited to two digits or less; and 5.CE.4.A.III
	iv expressions should not include braces, brackets, or fraction bars. 5.CE.4.A.IV
Given a whole number numerical expression involving more than one operation, describe which operation is completed first, which is second, and which is third.* 5.CE.4.B	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.* 5.CE.4.B
Measurement and Geometry	MG.1 The student will reason mathematically to solve problems, including those in context, that involve length, mass, and liquid volume using metric units. 5.MG.1
	2 The student will use multiple representations to solve problems, including those in context, involving perimeter, area, and volume. 5.MG.2
	3 The student will classify and measure angles and triangles, and solve problems, including those in context. 5.MG.3
Determine the most appropriate unit of measure to use in a contextual problem that involves metric units: 5.MG.1.A	i length (millimeters, centimeters, meters, and kilometers); 5.MG.1.A.I
	ii mass (grams and kilograms); and 5.MG.1.A.II
	iii liquid volume (milliliters and liters). 5.MG.1.A.III
Estimate and measure to solve contextual problems that involve metric units: 5.MG.1.B	i length (millimeters, centimeters, and meters); 5.MG.1.B.I
	ii mass (grams and kilograms); and 5.MG.1.B.II
	iii liquid volume (milliliters and liters). 5.MG.1.B.III
Given the equivalent metric measure of one unit, in a contextual problem, determine the equivalent measurement within the me	i length (millimeters, centimeters, meters, and kilometers); 5.MG.1.C.I
	ii mass (grams and kilograms); and 5.MG.1.C.II
	iii liquid volume (milliliters and liters). 5.MG.1.C.III

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Investigate and develop a formula for determining the area of a right triangle. 5.MG.2.A	**a** Investigate and develop a formula for determining the area of a right triangle. 5.MG.2.A
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). 5.MG.2.B	**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). 5.MG.2.B
Describe volume as a measure of capacity and give examples of volume as a measurement in contextual situations. 5.MG.2.C	**c** Describe volume as a measure of capacity and give examples of volume as a measurement in contextual situations. 5.MG.2.C
Investigate and develop a formula for determining the volume of rectangular prisms using concrete objects. 5.MG.2.D	**d** Investigate and develop a formula for determining the volume of rectangular prisms using concrete objects. 5.MG.2.D
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). 5.MG.2.E	**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). 5.MG.2.E

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Identify whether the application of the concept of perimeter, area, or volume is appropriate for a given situation. 5.MG.2.F	**f** **Identify whether the application of the concept of perimeter, area, or volume is appropriate for a given situation.** 5.MG.2.F
Solve contextual problems that involve perimeter, area, and volume in standard units of measure. 5.MG.2.G	**g** **Solve contextual problems that involve perimeter, area, and volume in standard units of measure.** 5.MG.2.G
Classify angles as right, acute, obtuse, or straight and justify reasoning. 5.MG.3.A	**a** **Classify angles as right, acute, obtuse, or straight and justify reasoning.** 5.MG.3.A
Classify triangles as right, acute, or obtuse and equilateral, scalene, or isosceles and justify reasoning. 5.MG.3.B	**b** **Classify triangles as right, acute, or obtuse and equilateral, scalene, or isosceles and justify reasoning.** 5.MG.3.B
Identify congruent sides and right angles using geometric markings to denote properties of triangles. 5.MG.3.C	**c** **Identify congruent sides and right angles using geometric markings to denote properties of triangles.** 5.MG.3.C
Compare and contrast the properties of triangles. 5.MG.3.D	**d** **Compare and contrast the properties of triangles.** 5.MG.3.D
Identify the appropriate tools (e.g., protractor, straightedge, angle ruler, available technology) to measure and draw angles. 5.MG.3.E	**e** **Identify the appropriate tools (e.g., protractor, straightedge, angle ruler, available technology) to measure and draw angles.** 5.MG.3.E
Measure right, acute, obtuse, and straight an	**f** **Measure right, acute, obtuse, and straight angles, using appropriate tools, and identify measures in degrees.** 5.MG.3.F

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identify measures in degrees. 5.MG.3.F	
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. 5.MG.3.G	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. 5.MG.3.G
Solve addition and subtraction contextual problems to determine unknown angle measures on a diagram. 5.MG.3.H	h Solve addition and subtraction contextual problems to determine unknown angle measures on a diagram. 5.MG.3.H
Probability and Statistics	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. 5.PS.1
	2 The student will solve contextual problems using measures of center and the range. 5.PS.2
	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. 5.PS.3
Formulate questions that require the collection or acquisition of data. 5.PS.1.A	a Formulate questions that require the collection or acquisition of data. 5.PS.1.A
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). 5.PS.1.B	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). 5.PS.1.B
Or a d	Skip to main content rganize and represent a data set using a line plot (dot plot) with a title, labeled xes, and a key, with and without the use of technology tools. Lines plots (dot

plot (dot plot) with a title, labeled axes, and a key, with and without the use of technology tools. Lines plots (dot plots) may contain whole numbers, fractions, or decimals. 5.PS.1.C		plots) may contain whole numbers, fractions, or decimals. 5.PS.1.C
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. 5.PS.1.D	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. 5.PS.1.D
Analyze data represented in line plots (dot plots) and stem-and-leaf plots and communicate results orally and in writing: 5.PS.1.E	i	describe the characteristics of the data represented in a line plot (dot plot) and stem-andleaf plot as a whole (e.g., the shape and spread of the data); 5.PS.1.E.I
	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); 5.PS.1.E.II
	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); 5.PS.1.E.III
	iv	draw conclusions about the data and make predictions based on the data to answer questions; and 5.PS.1.E.IV
	v	solve single-step and multistep addition and subtraction problems using data from line plots (dot plots) and stem-and-leaf plots. 5.PS.1.E.V
Describe mean as fair share. 5.PS.2.A	a	Describe mean as fair share. 5.PS.2.A
Describe and determine the mean of a set of data values representing data fro me cer	b	Describe and determine the mean of a set of data values representing data from a given context as a measure of center. 5.PS.2.B

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Describe and determine the median of a set of data values representing data from a given context as a measure of center. 5.PS.2.C	**c** Describe and determine the median of a set of data values representing data from a given context as a measure of center. 5.PS.2.C
Describe and determine the mode of a set of data values representing data from a given context as a measure of center. 5.PS.2.D	**d** Describe and determine the mode of a set of data values representing data from a given context as a measure of center. 5.PS.2.D
Describe and determine the range of a set of data values representing data from a given context as a measure of spread. 5.PS.2.E	**e** Describe and determine the range of a set of data values representing data from a given context as a measure of spread. 5.PS.2.E
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. 5.PS.3.A	**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. 5.PS.3.A
Determine the number of possible outcomes by using the Fundamental (Basic) Counting Principle. 5.PS.3.B	**b** Determine the number of possible outcomes by using the Fundamental (Basic) Counting Principle. 5.PS.3.B
Patterns, Functions, and Algebra	**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. 5.PFA.1
	PFA.2 The student will investigate and use variables in contextual problems. 5.PFA.2

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Identify, describe, extend, and create increasing and decreasing patterns using various representations (e.g., objects, pictures, numbers, number lines, input/output tables, function machines). 5.PFA.1.A	**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).** 5.PFA.1.A
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). 5.PFA.1.B	**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).** 5.PFA.1.B
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	**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).** 5.PFA.1.C

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of 12 or less; and addition and subtraction of decimals expressed in tenths or hundredths). 5.PFA.1.C

Describe the concept of a variable (presented as a box, letter, or other symbol) as a representation of an unknown quantity. 5.PFA.2.A

a Describe the concept of a variable (presented as a box, letter, or other symbol) as a representation of an unknown quantity. 5.PFA.2.A

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. 5.PFA.2.B

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. 5.PFA.2.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). 5.PFA.2.C

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). 5.PFA.2.C

Create and write a word problem to match a given equation with a single variable and one operation. 5.PFA.2.D

d Create and write a word problem to match a given equation with a single variable and one operation. 5.PFA.2.D