Virginia Mathematics

Grade 4

Number and Number Sense	**NS.1**	**The student will use place value understanding to read, write, and identify the place and value of each digit in a nine-digit whole number.** 4.NS.1
	NS.2	**The student will demonstrate an understanding of the base 10 system to compare and order whole numbers up to seven digits.** 4.NS.2
	NS.3	**The student will use mathematical reasoning and justification to represent, compare, and order fractions (proper, improper, and mixed numbers with denominators 12 or less), with and without models.** 4.NS.3
	NS.4	**The student will use mathematical reasoning and justification to represent, compare, and order decimals through thousandths, with and without models.** 4.NS.4
	NS.5	**The student will reason about the relationship between fractions and decimals (limited to halves, fourths, fifths, tenths, and hundredths) to identify and represent equivalencies.** 4.NS.5
Read nine-digit whole numbers, presented in standard form, and represent the same number in written form. 4.NS.1.A	**a**	**Read nine-digit whole numbers, presented in standard form, and represent the same number in written form.** 4.NS.1.A
Write nine-digit whole numbers in standard form when the numbers are presented orally or in written form. 4.NS.1.B	**b**	**Write nine-digit whole numbers in standard form when the numbers are presented orally or in written form.** 4.NS.1.B
Apply patterns within the base 10 system to determine and communicate, orally and in written form, the place and value of each dig wh 568,165,724, the 8	**c**	**Apply patterns within the base 10 system to determine and communicate, orally and in written form, the place and value of each digit in a nine-digit whole number (e.g., in 568,165,724, the 8 represents 8 millions and its value is 8,000,000).** 4.NS.1.C

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represents 8 millions and its value is 8,000,000). 4.NS.1.C	
Compare two whole numbers up to seven digits each, using words (greater than, less than, equal to, not equal to) and/or using symbols (>, <, =, ≠). 4.NS.2.A	a Compare two whole numbers up to seven digits each, using words (greater than, less than, equal to, not equal to) and/or using symbols (>, <, =, ≠). 4.NS.2.A
Order up to four whole numbers up to seven digits each, from least to greatest or greatest to least. 4.NS.2.B	b Order up to four whole numbers up to seven digits each, from least to greatest or greatest to least. 4.NS.2.B
Compare and order no more than four fractions (proper or improper), and/or mixed numbers, with like denominators by comparing the number of parts (numerators) using fractions with denominators of 12 or less (e.g., 1 5 < 3 5). Justify comparisons orally, in writing, or with a model.* 4.NS.3.A	a Compare and order no more than four fractions (proper or improper), and/or mixed numbers, with like denominators by comparing the number of parts (numerators) using fractions with denominators of 12 or less (e.g., 1 5 < 3 5). Justify comparisons orally, in writing, or with a model.* 4.NS.3.A
Compare and order no more than four fractions (proper or improper), and/or mixed numbers, with like numerators and unlike denominators by comparing the size of the parts using fractions with denominators of 12 or less (e.g., 3 8 < 3 5). Justify comparisons orally, in writing, or with a model.* 4.NS.3.B	b Compare and order no more than four fractions (proper or improper), and/or mixed numbers, with like numerators and unlike denominators by comparing the size of the parts using fractions with denominators of 12 or less (e.g., 3 8 < 3 5). Justify comparisons orally, in writing, or with a model.* 4.NS.3.B

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Use benchmarks (e.g., 0, 1 2 , or 1) to compare and order no more than four fractions (proper or improper), and/or mixed numbers, with like and unlike denominators of 12 or less. Justify comparisons orally, in writing, or with a model.* 4.NS.3.C	c Use benchmarks (e.g., 0, 1 2 , or 1) to compare and order no more than four fractions (proper or improper), and/or mixed numbers, with like and unlike denominators of 12 or less. Justify comparisons orally, in writing, or with a model.* 4.NS.3.C
Compare two fractions (proper or improper) and/or mixed numbers using fractions with denominators of 12 or less, using the symbols >, <, and = (e.g., 2 3 > 1 7). Justify comparisons orally, in writing, or with a model.* 4.NS.3.D	d Compare two fractions (proper or improper) and/or mixed numbers using fractions with denominators of 12 or less, using the symbols >, <, and = (e.g., 2 3 > 1 7). Justify comparisons orally, in writing, or with a model.* 4.NS.3.D
Represent equivalent fractions with denominators of 12 or less, with and without models.* 4.NS.3.E	e Represent equivalent fractions with denominators of 12 or less, with and without models.* 4.NS.3.E
Compose and decompose fractions (proper and improper) and/or mixed numbers with denominators of 12 or less, in multiple ways, with and without models.* 4.NS.3.F	f Compose and decompose fractions (proper and improper) and/or mixed numbers with denominators of 12 or less, in multiple ways, with and without models.* 4.NS.3.F
Represent the division of two whole numbers as a fraction given a contextual situation and a model (e.g., 3 5 means the same as 3 divided by 5 or 3 5 represents the amount of muffin each of five children will re	g Represent the division of two whole numbers as a fraction given a contextual situation and a model (e.g., 3 5 means the same as 3 divided by 5 or 3 5 represents the amount of muffin each of five children will receive when sharing three muffins equally). 4.NS.3.G

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three muffins equally). 4.NS.3.G		
Investigate and describe the ten-to-one place value relationship for decimals through thousandths, using concrete models (e.g., place value mats/charts, decimal squares, base 10 blocks). 4.NS.4.A	a	Investigate and describe the ten-to-one place value relationship for decimals through thousandths, using concrete models (e.g., place value mats/charts, decimal squares, base 10 blocks). 4.NS.4.A
Represent and identify decimals expressed through thousandths, using concrete, pictorial, and numerical representations. 4.NS.4.B	b	Represent and identify decimals expressed through thousandths, using concrete, pictorial, and numerical representations. 4.NS.4.B
Read and write decimals expressed through thousandths, using concrete, pictorial, and numerical representations. 4.NS.4.C	c	Read and write decimals expressed through thousandths, using concrete, pictorial, and numerical representations. 4.NS.4.C
Identify and communicate, both orally and in written form, the place and value of each digit in a decimal through thousandths (e.g., given 0.385, the 8 is in the hundredths place and has a value of 0.08). 4.NS.4.D	d	Identify and communicate, both orally and in written form, the place and value of each digit in a decimal through thousandths (e.g., given 0.385, the 8 is in the hundredths place and has a value of 0.08). 4.NS.4.D
Compare using symbols (<, >, =) and/or words (greater than, less than, equal to) and order (least to greatest and greatest to least), a set of no more than four de thi usi	e	Compare using symbols (<, >, =) and/or words (greater than, less than, equal to) and order (least to greatest and greatest to least), a set of no more than four decimals expressed through thousandths, using multiple strategies (e.g., benchmarks, place value, number lines). Justify comparisons with a model, orally, and in writing. 4.NS.4.E

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(e.g., benchmarks, place value, number lines). Justify comparisons with a model, orally, and in writing. 4.NS.4.E	
Represent fractions (proper or improper) and/or mixed numbers as decimals through hundredths, using multiple representations, limited to halves, fourths, fifths, tenths, and hundredths.* 4.NS.5.A	a Represent fractions (proper or improper) and/or mixed numbers as decimals through hundredths, using multiple representations, limited to halves, fourths, fifths, tenths, and hundredths.* 4.NS.5.A
Identify and model equivalent relationships between fractions (proper or improper) and/or mixed numbers and decimals, using halves, fourths, fifths, tenths, and hundredths.* 4.NS.5.B	b Identify and model equivalent relationships between fractions (proper or improper) and/or mixed numbers and decimals, using halves, fourths, fifths, tenths, and hundredths.* 4.NS.5.B
Write the decimal and fraction equivalent for a given model (e.g., 1 4 = 0.25 or 0.25 = 1 4 ; 1.25 = 5 4 or 11 4 ; 1.02 = 102 100 or 1 2 100).* 4.NS.5.C	c Write the decimal and fraction equivalent for a given model (e.g., 1 4 = 0.25 or 0.25 = 1 4 ; 1.25 = 5 4 or 11 4 ; 1.02 = 102 100 or 1 2 100).* 4.NS.5.C
Computation and Estimation	CE.1 The student will estimate, represent, solve, and justify solutions to single-step and multistep problems, including those in context, using addition and subtraction with whole numbers. 4.CE.1
	CE.2 The student will estimate, represent, solve, and justify solutions to single-step and multistep problems, including those in context, using multiplication with whole numbers, and single-step problems, including those in context, using division with whole numbers; and recall with automaticity the multiplication facts through 12 × 12 and the corresponding division facts. 4.CE.2
	CE.3 The student will estimate, represent, solve, and justify solutions to single-step problems, including those in context, using addition and subtraction of fractions (proper, improper, and mixed numbers with like denominators of 2, 3, 4, 5, 6, 8, 10, and 12), with and without models; and solve single-step

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contextual problems involving multiplication of a whole number (12 or less) and a unit fraction, with models. 4.CE.3

CE.4 The student will estimate, represent, solve, and justify solutions to single-step and multistep problems, including those in context, using addition and subtraction of decimals through the thousandths, with and without models. 4.CE.4

Determine and justify whether an estimate or an exact answer is appropriate when solving contextual problems involving addition and subtraction with whole numbers. Refine estimates by adjusting the final amount, using terms such as closer to, between, and a little more than. 4.CE.1.A

a Determine and justify whether an estimate or an exact answer is appropriate when solving contextual problems involving addition and subtraction with whole numbers. Refine estimates by adjusting the final amount, using terms such as closer to, between, and a little more than. 4.CE.1.A

Apply strategies (e.g., rounding to the nearest 100 or 1,000, using compatible numbers, other number relationships) to estimate a solution for single-step or multistep addition or subtraction problems with whole numbers, where addends or minuends do not exceed 10,000.* 4.CE.1.B

b Apply strategies (e.g., rounding to the nearest 100 or 1,000, using compatible numbers, other number relationships) to estimate a solution for single-step or multistep addition or subtraction problems with whole numbers, where addends or minuends do not exceed 10,000.* 4.CE.1.B

Apply strategies (e.g., place value, properties of addition, other number relationships) and algorithms, including the standard algorithm, to determine the sum or difference of two whole numbers, wh
mi
10,000.* 4.CE.1.C

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c Apply strategies (e.g., place value, properties of addition, other number relationships) and algorithms, including the standard algorithm, to determine the sum or difference of two whole numbers, where addends and minuends do not exceed 10,000.* 4.CE.1.C

Estimate, represent, solve, and justify solutions to single-step and multistep contextual problems involving addition and subtraction with whole numbers where addends and minuends do not exceed 1,000,000. 4.CE.1.D	**d** **Estimate, represent, solve, and justify solutions to single-step and multistep contextual problems involving addition and subtraction with whole numbers where addends and minuends do not exceed 1,000,000.** 4.CE.1.D
Determine and justify whether an estimate or an exact answer is appropriate when solving contextual problems involving multiplication and division of whole numbers. Refine estimates by adjusting the final amount, using terms such as closer to, between, and a little more than. 4.CE.2.A	**a** **Determine and justify whether an estimate or an exact answer is appropriate when solving contextual problems involving multiplication and division of whole numbers. Refine estimates by adjusting the final amount, using terms such as closer to, between, and a little more than.** 4.CE.2.A
Recall with automaticity the multiplication facts through 12 × 12 and the corresponding division facts.* 4.CE.2.B	**b** **Recall with automaticity the multiplication facts through 12 × 12 and the corresponding division facts.*** 4.CE.2.B
Create an equation using addition, subtraction, multiplication, and division to represent the relationship between equivalent mathematical expressions (e.g., 4 × 3 = 2 × 6; 10 + 8 = 36 ÷ 2; 12 × 4 = 60 − 12). 4.CE.2.C	**c** **Create an equation using addition, subtraction, multiplication, and division to represent the relationship between equivalent mathematical expressions (e.g., 4 × 3 = 2 × 6; 10 + 8 = 36 ÷ 2; 12 × 4 = 60 − 12).** 4.CE.2.C
Identify and use the ap dis ex	**d** **Identify and use the appropriate symbol to distinguish between expressions that re equal and expressions that are not equal, using addition, subtraction, nultiplication, and division (e.g., 4 × 12 = 8 × 6 and 64 ÷ 8 ≠ 8 × 8).** 4.CE.2.D

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equal and expressions that are not equal, using addition, subtraction, multiplication, and division (e.g., 4 × 12 = 8 × 6 and 64 ÷ 8 ≠ 8 × 8). 4.CE.2.D	
Determine all factor pairs for a whole number 1 to 100, using concrete, pictorial, and numerical representations. 4.CE.2.E	e Determine all factor pairs for a whole number 1 to 100, using concrete, pictorial, and numerical representations. 4.CE.2.E
Determine common factors and the greatest common factor of no more than three numbers. 4.CE.2.F	f Determine common factors and the greatest common factor of no more than three numbers. 4.CE.2.F
Apply strategies (e.g., rounding, place value, properties of multiplication and/or addition) and algorithms, including the standard algorithm, to estimate and determine the product of two whole numbers when given: 4.CE.2.G	i a two-digit factor and a one-digit factor;* 4.CE.2.G.I ii a three-digit factor and a one-digit factor;* or 4.CE.2.G.II iii a two-digit factor and a two-digit factor.* 4.CE.2.G.III
Estimate, represent, solve, and justify solutions to single-step and multistep contextual problems that involve multiplication with whole numbers. 4.CE.2.H	h Estimate, represent, solve, and justify solutions to single-step and multistep contextual problems that involve multiplication with whole numbers. 4.CE.2.H
Apply strategies (e.g., rounding, compatible numbers, place value) an inc alg	i Apply strategies (e.g., rounding, compatible numbers, place value) and algorithms, including the standard algorithm, to estimate and determine the quotient of two whole numbers, given a one-digit divisor and a two- or three-digit dividend, with nd without remainders.* 4.CE.2.I

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and determine the quotient of two whole numbers, given a one-digit divisor and a two- or three-digit dividend, with and without remainders.* 4.CE.2.I	
Estimate, represent, solve, and justify solutions to single-step contextual problems involving division with whole numbers. 4.CE.2.J	**j** **Estimate, represent, solve, and justify solutions to single-step contextual problems involving division with whole numbers.** 4.CE.2.J
Interpret the quotient and remainder when solving a contextual problem. 4.CE.2.K	**k** **Interpret the quotient and remainder when solving a contextual problem.** 4.CE.2.K
Estimate and determine the sum or difference of two fractions (proper or improper) and/or mixed numbers, having like denominators limited to 2, 3, 4, 5, 6, 8, 10, and 12 (e.g., 3 8 + 3 8 , 21 5 + 4 5 , 7 4 - 5 4) and simplify the resulting fraction. Addition and subtraction with fractions may include regrouping.* 4.CE.3.A	**a** **Estimate and determine the sum or difference of two fractions (proper or improper) and/or mixed numbers, having like denominators limited to 2, 3, 4, 5, 6, 8, 10, and 12 (e.g., 3 8 + 3 8 , 21 5 + 4 5 , 7 4 - 5 4) and simplify the resulting fraction. Addition and subtraction with fractions may include regrouping.*** 4.CE.3.A
Estimate, represent, solve, and justify solutions to single-step contextual problems using addition and subtraction with fractions (proper or improper) and/or mixed numbers, having like denominators limited to 2, 3, 4, 5, 6, 8, 10, and 12 an res	**b** **Estimate, represent, solve, and justify solutions to single-step contextual problems using addition and subtraction with fractions (proper or improper) and/or mixed numbers, having like denominators limited to 2, 3, 4, 5, 6, 8, 10, and 12, and simplify the resulting fraction. Addition and subtraction with fractions may include regrouping.** 4.CE.3.B

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Addition and subtraction with fractions may include regrouping. 4.CE.3.B	
Solve single-step contextual problems involving multiplication of a whole number, limited to 12 or less, and a unit fraction (e.g., 6 × 1 3 , 1 5 × 8, 2 × 1 10), with models.* 4.CE.3.C	c Solve single-step contextual problems involving multiplication of a whole number, limited to 12 or less, and a unit fraction (e.g., 6 × 1 3 , 1 5 × 8, 2 × 1 10), with models.* 4.CE.3.C
Apply the inverse property of multiplication in models (e.g., use a visual fraction model to represent 4 4 or 1 as the product of 4 × 1 4). 4.CE.3.D	d Apply the inverse property of multiplication in models (e.g., use a visual fraction model to represent 4 4 or 1 as the product of 4 × 1 4). 4.CE.3.D
Apply strategies (e.g., rounding to the nearest whole number, using compatible numbers) and algorithms, including the standard algorithm, to estimate and determine the sum or difference of two decimals through the thousandths, with and without models, in which:* 4.CE.4.A	i decimals do not exceed the thousandths; and 4.CE.4.A.I ii addends, subtrahends, and minuends are limited to four digits. 4.CE.4.A.II
Estimate, represent, solve, and justify solutions to single-step and multistep contextual problems using addition and subtraction of decimals through the thousandths. 4.CE.4.B	b Estimate, represent, solve, and justify solutions to single-step and multistep contextual problems using addition and subtraction of decimals through the thousandths. 4.CE.4.B
Me Skip to main content Ge	.1 The student will reason mathematically to solve problems, including those in context, that involve length, weight/mass, and liquid volume using U.S.

	Customary and metric units. 4.MG.1
	MG.2 The student will solve single-step and multistep contextual problems involving elapsed time (limited to hours and minutes within a 12-hour period). 4.MG.2
	MG.3 The student will use multiple representations to develop and use formulas to solve problems, including those in context, involving area and perimeter limited to rectangles and squares (in both U.S. Customary and metric units). 4.MG.3
	MG.4 The student will identify, describe, and draw points, rays, line segments, angles, and lines, including intersecting, parallel, and perpendicular lines. 4.MG.4
	MG.5 The student will classify and describe quadrilaterals (parallelograms, rectangles, squares, rhombi, and/or trapezoids) using specific properties and attributes. 4.MG.5
	MG.6 The student will identify, describe, compare, and contrast plane and solid figures according to their characteristics (number of angles, vertices, edges, and the number and shape of faces), with and without models. 4.MG.6
Determine an appropriate unit of measure to use when measuring: 4.MG.1.A	**i** length in both U.S. Customary (inch, foot, yard, mile) and metric units (millimeter, centimeter, meter); 4.MG.1.A.I
	ii weight/mass in both U.S. Customary (ounce, pound) and metric units (gram, kilogram); and 4.MG.1.A.II
	iii liquid volume in both U.S. Customary (cup, pint, quart, gallon) and metric units (milliliter, liter). 4.MG.1.A.III
Estimate and measure: 4.MG.1.B	**i** length of an object to the nearest U.S. Customary unit (1 2 inch, 1 4 inch, 1 8 inch, foot, yard) and nearest metric unit (millimeter, centimeter, or meter); 4.MG.1.B.I
	ii weight/mass of an object to the nearest U.S. Customary unit (ounce, pound) and nearest metric unit (gram, kilogram); and 4.MG.1.B.II
	iii liquid volume to the nearest U.S. Customary unit (cup, pint, quart, gallon) and nearest metric unit (milliliter, liter). 4.MG.1.B.III
Compare estimates of length, weight/mass, or liquid volume with the actual measurements. 4.MG.1.C	**c** Compare estimates of length, weight/mass, or liquid volume with the actual measurements. 4.MG.1.C
Gi Skip to main content **measure of one unit,**	**ngth (inches and feet, feet and yards, inches and yards);** 4.MG.1.D.I

solve problems, including those in context, by determining the equivalent measures within the U.S. Customary system for: 4.MG.1.D	**ii** weight/mass (ounces and pounds); and 4.MG.1.D.II **iii** liquid volume (cups, pints, quarts, and gallons). 4.MG.1.D.III
Solve single-step and multistep contextual problems involving elapsed time in hours and minutes, within a 12-hour period (within a.m., within p.m., and across a.m. and p.m.) when given: 4.MG.2.A	**i** the starting time and the ending time, determine the amount of time that has elapsed in hours and minutes; 4.MG.2.A.I **ii** the starting time and amount of elapsed time in hours and minutes, determine the ending time; or 4.MG.2.A.II **iii** the ending time and the amount of elapsed time in hours and minutes, determine the starting time. 4.MG.2.A.III
Use concrete materials and pictorial models to develop a formula for the area and perimeter of a rectangle (including a square). 4.MG.3.A	**a** Use concrete materials and pictorial models to develop a formula for the area and perimeter of a rectangle (including a square). 4.MG.3.A
Determine the area and perimeter of a rectangle when given the measure of two adjacent sides (in whole number units), with and without models. 4.MG.3.B	**b** Determine the area and perimeter of a rectangle when given the measure of two adjacent sides (in whole number units), with and without models. 4.MG.3.B
Determine the area and perimeter of a square when given the measure of one side (in whole number units), with and without models. 4.MG.3.C	**c** Determine the area and perimeter of a square when given the measure of one side (in whole number units), with and without models. 4.MG.3.C
Use concrete materials and pictorial models to explore the relationship between area and perimeter of re	**d** Use concrete materials and pictorial models to explore the relationship between area and perimeter of rectangles. 4.MG.3.D

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Identify and represent rectangles with the same perimeter and different areas or with the same area and different perimeters. 4.MG.3.E	**e** **Identify and represent rectangles with the same perimeter and different areas or with the same area and different perimeters.** 4.MG.3.E
Solve contextual problems involving area and perimeter of rectangles and squares. 4.MG.3.F	**f** **Solve contextual problems involving area and perimeter of rectangles and squares.** 4.MG.3.F
Identify and describe points, lines, line segments, rays, and angles, including endpoints and vertices. 4.MG.4.A	**a** **Identify and describe points, lines, line segments, rays, and angles, including endpoints and vertices.** 4.MG.4.A
Describe endpoints and vertices in relation to lines, line segments, rays, and angles. 4.MG.4.B	**b** **Describe endpoints and vertices in relation to lines, line segments, rays, and angles.** 4.MG.4.B
Draw representations of points, line segments, rays, angles, and lines, using a ruler or straightedge. 4.MG.4.C	**c** **Draw representations of points, line segments, rays, angles, and lines, using a ruler or straightedge.** 4.MG.4.C
Identify parallel, perpendicular, and intersecting lines and line segments in plane and solid figures, including those in context. 4.MG.4.D	**d** **Identify parallel, perpendicular, and intersecting lines and line segments in plane and solid figures, including those in context.** 4.MG.4.D
Use symbolic notation to name points, lines, line segments, rays, angles, and to describe parallel and perpendicular lin	**e** **Use symbolic notation to name points, lines, line segments, rays, angles, and to describe parallel and perpendicular lines.** 4.MG.4.E

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Develop definitions for parallelograms, rectangles, squares, rhombi, and trapezoids through the exploration of properties and attributes. 4.MG.5.A	**a** Develop definitions for parallelograms, rectangles, squares, rhombi, and trapezoids through the exploration of properties and attributes. 4.MG.5.A
Identify and describe points, line segments, angles, and vertices in quadrilaterals. 4.MG.5.B	**b** Identify and describe points, line segments, angles, and vertices in quadrilaterals. 4.MG.5.B
Identify and describe parallel, intersecting, perpendicular, and congruent sides in quadrilaterals. 4.MG.5.C	**c** Identify and describe parallel, intersecting, perpendicular, and congruent sides in quadrilaterals. 4.MG.5.C
Compare, contrast, and classify quadrilaterals (parallelograms, rectangles, squares, rhombi, and/or trapezoids) based on the following properties and attributes: 4.MG.5.D	**i** parallel sides; 4.MG.5.D.I
	ii perpendicular sides; 4.MG.5.D.II
	iii congruence of sides; and 4.MG.5.D.III
	iv number of right angles. 4.MG.5.D.IV
Denote properties of quadrilaterals and identify parallel sides, congruent sides, and right angles by using geometric markings. 4.MG.5.E	**e** Denote properties of quadrilaterals and identify parallel sides, congruent sides, and right angles by using geometric markings. 4.MG.5.E
Use symbolic notation to name line segments and angles in quadrilaterals. 4.MG.5.F	**f** Use symbolic notation to name line segments and angles in quadrilaterals. 4.MG.5.F
Identify concrete models and pictorial representations of solid figures (cube, rectangular prism, sq co cylinder). 4.MG.6.A	**a** Identify concrete models and pictorial representations of solid figures (cube, rectangular prism, square pyramid, sphere, cone, and cylinder). 4.MG.6.A

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Identify and describe solid figures (cube, rectangular prism, square pyramid, and sphere) according to their characteristics (number of angles, vertices, edges, and by the number and shape of faces). 4.MG.6.B	**b** **Identify and describe solid figures (cube, rectangular prism, square pyramid, and sphere) according to their characteristics (number of angles, vertices, edges, and by the number and shape of faces).** 4.MG.6.B
Compare and contrast plane and solid figures (limited to circles, squares, triangles, rectangles, spheres, cubes, square pyramids, and rectangular prisms) according to their characteristics (number of sides, angles, vertices, edges, and the number and shape of faces). 4.MG.6.C	**c** **Compare and contrast plane and solid figures (limited to circles, squares, triangles, rectangles, spheres, cubes, square pyramids, and rectangular prisms) according to their characteristics (number of sides, angles, vertices, edges, and the number and shape of faces).** 4.MG.6.C
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 graphs.** 4.PS.1
	PS.2 **The student will model and determine the probability of an outcome of a simple event.** 4.PS.2
Formulate questions that require the collection or acquisition of data. 4.PS.1.A	**a** **Formulate questions that require the collection or acquisition of data.** 4.PS.1.A
Determine the data needed to answer a formulated question and collect or acquire existing data (limited to 10 or fewer data points) using various methods (e.g., observations, me ex	**b** **Determine the data needed to answer a formulated question and collect or acquire existing data (limited to 10 or fewer data points) using various methods (e.g., observations, measurements, experiments).** 4.PS.1.B

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Organize and represent a data set using line graphs with a title and labeled axes with whole number increments, with and without the use of technology tools. 4.PS.1.C	**c** Organize and represent a data set using line graphs with a title and labeled axes with whole number increments, with and without the use of technology tools. 4.PS.1.C
Analyze data represented in line graphs and communicate results orally and in writing: 4.PS.1.D	**i** describe the characteristics of the data represented in a line graph and the data as a whole (e.g., the time period when the temperature increased the most); 4.PS.1.D.1
	ii identify parts of the data that have special characteristics and explain the meaning of the greatest, the least, or the same (e.g., the highest temperature shows the warmest day); 4.PS.1.D.2
	iii make inferences about data represented in line graphs; 4.PS.1.D.3
	iv draw conclusions about the data and make predictions based on the data to answer questions; and 4.PS.1.D.4
	v solve single-step and multistep addition and subtraction problems using data from line graphs. 4.PS.1.D.V
Describe probability as the degree of likelihood of an outcome occurring using terms such as impossible, unlikely, equally likely, likely, and certain. 4.PS.2.A	**a** Describe probability as the degree of likelihood of an outcome occurring using terms such as impossible, unlikely, equally likely, likely, and certain. 4.PS.2.A
Model and determine all possible outcomes of a given simple event where there are no more than 24 possible outcomes, using a variety of manipulatives (e.g., coins, two-sided counters, number cubes, spinners). 4.PS.2.B	**b** Model and determine all possible outcomes of a given simple event where there are no more than 24 possible outcomes, using a variety of manipulatives (e.g., coins, two-sided counters, number cubes, spinners). 4.PS.2.B
Write the probability of a g fra 1,	**c** Write the probability of a given simple event as a fraction between 0 and 1, where here are no more than 24 possible outcomes. 4.PS.2.C

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more than 24 possible outcomes. 4.PS.2.C

Determine the likelihood of an event occurring and relate it to its whole number or fractional representation (e.g., impossible or zero; equally likely; certain or one). 4.PS.2.D	d Determine the likelihood of an event occurring and relate it to its whole number or fractional representation (e.g., impossible or zero; equally likely; certain or one). 4.PS.2.D
Create a model or contextual problem to represent a given probability. 4.PS.2.E	e Create a model or contextual problem to represent a given probability. 4.PS.2.E
Patterns, Functions, and Algebra	PFA.1 The student will identify, describe, extend, and create increasing and decreasing patterns (limited to addition, subtraction, and multiplication of whole numbers), including those in context, using various representations. 4.PFA.1
Identify, describe, extend, and create increasing and decreasing patterns using various representations (e.g., objects, pictures, numbers, number lines, input/output tables, and function machines). 4.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, and function machines). 4.PFA.1.A
Analyze an increasing or decreasing single-operation numerical pattern found in lists, input/output tables, or function machines and generalize the change to identify the rule, extend the pattern, or identify missing terms. 4.PFA.1.B	b Analyze an increasing or decreasing single-operation numerical pattern found in lists, input/output tables, or function machines and generalize the change to identify the rule, extend the pattern, or identify missing terms. 4.PFA.1.B

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Given a rule, create increasing and decreasing patterns using numbers and input/output tables (including function machines). 4.PFA.1.C	**c** **Given a rule, create increasing and decreasing patterns using numbers and input/output tables (including function machines).** 4.PFA.1.C
Solve contextual problems that involve identifying, describing, and extending increasing and decreasing patterns using single-operation input and output rules. 4.PFA.1.D	**d** **Solve contextual problems that involve identifying, describing, and extending increasing and decreasing patterns using single-operation input and output rules.** 4.PFA.1.D