VIRGINIA STATE STANDARDS

Academy of **MATH** ®

Proven to Raise Achievement for Struggling Students

Grades 2–12

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Virginia Standards of Learning in Mathematics

Academy of MATH: Correlated to the State Standards for Mathematics, K-8

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Academy of MATH: Correlated to Virginia Mathematics Standards of Learning for Kindergarten

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
Number and Number Sense.		
K.1	Given two sets containing 10 or fewer concrete items, identify and describe one set as having more, fewer, or the same number of members as the other set, using the concept of one-to-one correspondence.	Level 1: Number Sense, Addition, Subtraction
K.2a	Given a set containing 10 or fewer concrete items, tell how many are in the set by counting the number of items orally.	Level 1: Number Sense, Addition, Subtraction, Equations
K.2b	Given a set containing 10 or fewer concrete items, select the corresponding numeral from a given set.	Level 1: Number Sense, Addition, Subtraction, Equations
K.2c	Given a set containing 10 or fewer concrete items, write the numeral to tell how many are in the set.	Level 1: Number Sense, Addition, Subtraction, Equations
K.3	Given an ordered set of three objects and/or pictures, indicate the ordinal position of each item, first through third, and the ordered position of each item from left-to-right, right-to-left, top-to-bottom, and/or bottom-to-top.	Level 1: Number Sense
K.4	Investigate and recognize patterns from counting by fives and tens to 30, using concrete objects and a calculator.	Level 1: Number Sense
K.5	Count forward to 30 and backward from 10.	Level 1: Number Sense, Addition
Computation and Estimation.		
K.6	Add and subtract whole numbers, using up to 10 concrete items.	Level 1: Addition, Subtraction, Equations, Graphing
Measurement.		
K.7	Recognize a penny, nickel, dime, and quarter and will determine the value of a collection of pennies and/or nickels whose total value is 10 cents or less.	Level 1: Measurement
K.8	Identify the instruments used to measure length (ruler), weight (scale), time (clock: digital and analog; calendar: day, month, and season), and	Level 1: Measurement

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
	temperature (thermometer).	
K.9	Tell time to the hour, using an analog or digital clock.	Level 3: Measurement
K.10	Compare two objects or events, using direct comparisons or nonstandard units of measure, according to one or more of the following attributes: length (shorter, longer), height (taller, shorter), weight (heavier, lighter), temperature (hotter, colder). Examples of nonstandard units include foot length, hand span, new pencil, paper clip, block.	Level 1: Measurement
	Geometry.	
K.11	Geometry. Identify, describe, and draw two-dimensional (plane) geometric figures (circle, triangle, square, and rectangle).	Levels 1-2: Geometry
K.12	Geometry. Describe the location of one object relative to another (above, below, next to) and identify representations of plane geometric figures (circle, triangle, square, and rectangle) regardless of their position and orientation in space.	Levels 1-2: Geometry
K.13	Geometry. Compare the size (larger, smaller) and shape of plane geometric figures (circle, triangle, square, and rectangle).	Level 1: Geometry
	Probability and Statistics.	
K.14	Gather data relating to familiar experiences by counting and tallying.	Level 1: Graphing
K.15	Display objects and information, using objects graphs, pictorial graphs, and tables.	Level 1: Graphing
	Patterns, Functions, and Algebra.	
K.17	Sort and classify objects according to similar attributes (size, shape, and color).	Level 1: Number Sense, Geometry
K.18	Identify, describe, and extend a repeating relationship (pattern) found in common objects, sounds, and movements.	Level 1: Geometry

Academy of MATH: Correlated to Virginia Mathematics Standards of Learning for Grade 1

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
Number and Number Sense.		
1.1	Count objects in a given set containing between 1 and 100 objects and write the corresponding numeral.	Level 1: Number Sense, Addition, Subtraction, Multiplication, Division, Equations
1.2	Group a collection of up to 100 objects into tens and ones and write the corresponding numeral to develop an understanding of place value.	Level 1: Number Sense, Addition, Subtraction
1.3	Count forward by ones, fives, and tens to 100, by twos to 20, and backward by ones from 20.	Levels 1-2: Number Sense
1.4	Recognize and write numerals 0 through 100.	Level 1: Number Sense, Addition, Subtraction, Multiplication, Division, Equations
1.5	Identify the ordinal positions first through tenth, using an ordered set of objects.	Levels 1-2: Number Sense
1.6	Identify and represent the concepts of one-half and one-fourth, using appropriate materials or a drawing.	Level 1: Fractions
Computation and Estimation.		
1.7a	Given a familiar problem situation involving magnitude, select a reasonable magnitude from three given quantities: a one-digit numeral, a two-digit numeral, and a three-digit numeral (e.g., 5, 50, and 500).	Level 2: Measurement
1.7b	Given a familiar problem situation involving magnitude, explain the reasonableness of his/her choice.	Level 2: Measurement
1.8	Recall basic addition facts — i.e., sums to 10 or less — and the corresponding subtraction facts.	Level 1: Addition, Subtraction
1.9	Create and solve story and picture problems involving one-step solutions, using basic addition and subtraction facts.	Level 1: Addition, Subtraction

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
Measurement.		
1.10a	Identify the number of pennies equivalent to a nickel, a dime, and a quarter.	Level 1: Measurement
1.10b	Determine the value of a collection of pennies, nickels, and dimes whose total value is 100 cents or less.	Levels 1-2: Measurement
1.11	Tell time to the half-hour, using an analog or digital clock.	Level 3: Measurement
1.12	Use nonstandard units to measure length and weight.	Levels 1-2: Measurement
1.13	Compare the volumes of two given containers by using concrete materials (e.g., jelly beans, sand, water, rice).	Level 1: Measurement
1.14	Compare the weights of two objects, using a balance scale.	Level 1: Measurement
Geometry.		
1.15	Describe the proximity of objects in space (near, far, close by, below, above, up, down, beside, and next to).	Level 1: Geometry
1.16	Draw, describe, and sort plane geometric figures (triangle, square, rectangle, and circle) according to number of sides, corners, and square corners.	Levels 1-2: Geometry
1.17	Identify and describe objects in his/her environment that depict plane geometric figures (triangle, rectangle, square, and circle).	Levels 1-2: Geometry
Probability and Statistics.		
1.18	Investigate, identify, and describe various forms of data collection in his/her world (e.g., recording daily temperature, lunch count, attendance, and favorite ice cream), using tables, picture graphs, and object graphs.	Level 1: Graphing
1.19	Interpret information displayed in a picture or object graph, using the vocabulary more, less, fewer, greater than, less than, and equal to.	Level 1: Graphing

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
	Patterns, Functions, and Algebra.	
1.20	Sort and classify concrete objects according to one or more attributes, including color, size, shape, and thickness.	Levels 1-2: Geometry
1.21	Recognize, describe, extend, and create a wide variety of patterns, including rhythmic, color, shape, and numerical. Patterns will include both growing and repeating patterns. Concrete materials and calculators will be used by students.	Level 1: Number Sense, Graphing

Academy of MATH: Correlated to Virginia Mathematics Standards of Learning for Grade 2

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
Number and Number Sense.		
2.1a	Read, write, and identify the place value of each digit in a three-digit numeral, using numeration models.	Level 2: Number Sense
2.2	Compare two whole numbers between 0 and 999, using symbols (>, <, or =) and words (greater than, less than, or equal to).	Level 2: Number Sense, Addition, Subtraction
2.3	Identify the ordinal positions first through twentieth, using an ordered set of objects.	Levels 1-2: Number Sense
2.4	Identify the part of a set and/or region that represents fractions for one-half, one-third, one-fourth, one-eighth, and one-tenth and write the corresponding fraction.	Level 2: Fractions
2.5a	Count forward by twos, fives, and tens to 100, starting at various multiples of 2, 5, or 10, using mental mathematics, paper and pencil, hundred chart, calculators, and/or concrete objects, as appropriate.	Level 2: Number Sense
2.5c	Group objects by threes and fours.	Levels 1-2: Multiplication, Division
2.5d	Recognize even and odd numbers, using objects.	Level 2: Number Sense, Addition, Subtraction
Computation and Estimation.		
2.6	Recall basic addition facts — i.e., sums to 18 or less — and the corresponding subtraction facts.	Levels 1-2: Addition, Subtraction
2.7a	Given two whole numbers whose sum is 99 or less, estimate the sum.	Level 2: Addition
2.7b	Given two whole numbers whose sum is 99 or less, find the sum, using various methods of calculation (mental computation, concrete materials, and paper and pencil).	Level 2: Addition
	Given two whole numbers, each of which is 99 or	Level 2: Subtraction

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
2.8a	less, estimate the difference.	
2.8b	Given two whole numbers, each of which is 99 or less, find the difference, using various methods of calculation (mental computation, concrete materials, and paper and pencil).	Level 2: Subtraction
2.9	Create and solve one-step addition and subtraction problems using data from simple tables, picture graphs, bar graphs, and practical situations.	Level 2: Graphing
2.10	Given a simple addition or subtraction fact, recognize and describe the related facts which represent and describe the inverse relationship between addition and subtraction (e.g., 3 + __ = 7, ___ + 3 = 7; 7 − 3 = __, and 7 − __ = 3).	Level 2: Equations
	Measurement.	
2.11a	Count and compare a collection of pennies, nickels, dimes, and quarters whose total value is $2.00 or less.	Levels 1-2: Measurement
2.11b	Identify the correct usage of the cent symbol (¢), dollar symbol ($), and decimal point (.).	Levels 1-2: Measurement
2.12	Estimate and then use a ruler to make linear measurements to the nearest centimeter and inch, including measuring the distance around a polygon in order to determine perimeter.	Level 2: Measurement
2.13	Given grid paper, estimate and then count the number of square units needed to cover a given surface in order to determine area.	Level 2: Measurement
2.14	Estimate and then count the number of cubes in a rectangular box in order to determine volume.	Level 5: Measurement
2.15	Estimate and then determine weight/mass of familiar objects in pounds and/or kilograms, using a scale.	Level 2: Measurement

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
2.16	Tell and write time to the quarter hour, using analog and digital clocks.	Level 3: Measurement
2.18a	Use calendar language appropriately (e.g., months, today, yesterday, next week, last week).	Level 2: Measurement
2.18b	Determine past and future days of the week.	Level 2: Measurement
2.18c	Identify specific dates on a given calendar.	Level 2: Measurement
2.19	Read the temperature on a Celsius and/or Fahrenheit thermometer to the nearest 10 degrees.	Levels 2-3: Measurement
	Geometry.	
2.20	Identify, describe, and sort three-dimensional (solid) concrete figures, including a cube, rectangular solid (prism), square pyramid, sphere, cylinder, and cone, according to the number and shape of the solid's faces, edges, and corners.	Level 3: Geometry
2.21	Identify and create figures, symmetric along a line, using various concrete materials.	Level 2: Geometry
2.22	Compare and contrast plane and solid geometric shapes (circle/sphere, square/cube, and rectangle/rectangular solid).	Level 3: Geometry
	Probability and Statistics.	
2.23	Read, construct, and interpret a simple picture and bar graph.	Level 2: Graphing
	Patterns, Functions, and Algebra.	
2.25	Identify, create, and extend a wide variety of patterns, using numbers concrete objects and pictures.	Level 2: Number Sense, Geometry
2.26	Solve problems by completing a numerical sentence involving the basic facts for addition and subtraction. Examples include: 3 + __ = 7, or 9 – __ = 2. Students will create story problems, using the numerical sentences.	Level 2: Equations

Academy of MATH: Correlated to Virginia Mathematics Standards of Learning for Grade 3

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
	Number and Number Sense.	
3.1	Read and write six-digit numerals and identify the place value for each digit.	Levels 3-5: Number Sense
3.2	Round a whole number, 9,999 or less, to the nearest ten, hundred, and thousand.	Level 4: Number Sense, Addition, Subtraction
3.3	Compare two whole numbers between 0 and 9,999, using symbols (>, <, or =) and words (greater than, less than, or equal to).	Level 3: Number Sense
3.4	Recognize and use the inverse relationships between addition/subtraction and multiplication/division to complete basic fact sentences. Students will use these relationships to solve problems such as 5 + 3 = 8 and 8 – 3 = ____.	Level 3: Equations
3.5a	Divide regions and sets to represent a fraction.	Level 3: Fractions
3.5b	Name and write the fractions represented by a given model (area/region, length/measurement, and set). Fractions (including mixed numbers) will include halves, thirds, fourths, eighths, and tenths.	Level 3: Fractions
3.6	Compare the numerical value of two fractions having like and unlike denominators, using concrete or pictorial models involving areas/regions, lengths/measurements, and sets.	Levels 3-5: Fractions
3.7	Read and write decimals expressed as tenths and hundredths, using concrete materials and models.	Level 3: Fractions
	Computation and Estimation.	
3.8	Solve problems involving the sum or difference of two whole numbers, each 9,999 or less, with or without regrouping, using various computational methods, including calculators, paper and pencil, mental computation, and estimation.	Levels 3-4: Addition, Subtraction

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3.9	Recall the multiplication and division facts through the nines table.	Levels 2-3: Multiplication, Division
3.10	Represent multiplication and division, using area and set models, and create and solve problems that involve multiplication of two whole numbers, one factor 99 or less and the second factor 5 or less.	Level 2: Measurement Levels 3-4: Multiplication, Division
3.11	Add and subtract with proper fractions having like denominators of 10 or less, using concrete materials and pictorial models representing areas/regions, lengths/measurements, and sets.	Level 4: Fractions
3.12	Add and subtract with decimals expressed as tenths, using concrete materials, pictorial representations, and paper and pencil.	Level 3: Fractions
	Measurement.	
3.13	Determine by counting the value of a collection of bills and coins whose total value is $5.00 or less, compare the value of the coins or bills, and make change.	Level 3: Measurement
3.14a	Estimate and then use actual measuring devices with metric and U.S. Customary units to measure length — inches, feet, yards, centimeters, and meters.	Level 3: Measurement
3.14b	Estimate and then use actual measuring devices with metric and U.S. Customary units to measure liquid volume — cups, pints, quarts, gallons, and liters.	Level 3: Measurement
3.14c	Estimate and then use actual measuring devices with metric and U.S. Customary units to measure weight/mass — ounces, pounds, grams, and kilograms.	Level 2: Measurement
3.15	Tell time to the nearest five-minute interval and to the nearest minute, using analog and digital clocks.	Level 3: Measurement
3.16	Identify equivalent periods of time, including	Level 2: Measurement

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	relationships among days, months, and years, as well as minutes and hours.	
3.17	Read temperature to the nearest degree from a Celsius thermometer and a Fahrenheit thermometer. Real thermometers and physical models of thermometers will be used.	Levels 2-3: Measurement
Geometry		
3.18	Analyze two-dimensional (plane) and three-dimensional (solid) geometric figures (circle, square, rectangle, triangle, cube, rectangular solid [prism], square pyramid, sphere, cone, and cylinder) and identify relevant properties, including the number of corners, square corners, edges, and the number and shape of faces, using concrete models.	Level 3: Geometry
3.19	Identify and draw representations of line segments and angles, using a ruler or straightedge.	Level 3: Geometry
3.20	Given appropriate drawings or models, will identify and describe congruent and symmetrical, two-dimensional (plane) figures, using tracing procedures.	Level 3: Geometry
Probability and Statistics.		
3.21b	Given grid paper, will construct a line plot, a picture graph, or a bar graph to represent the results. Each graph will include an appropriate title and key.	Level 3: Graphing
3.22	Read and interpret data represented in line plots, bar graphs, and picture graphs and write a sentence analyzing the data.	Level 3: Graphing
3.23	Investigate and describe the concept of probability as chance and list possible results of a given situation.	Levels 7-8: Graphing
Patterns, Functions, and Algebra.		
3.24	Recognize and describe a variety of patterns	Level 3: Number Sense, Addition, Subtraction,

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	formed using concrete objects, numbers, tables, and pictures, and extend the pattern, using the same or different forms (concrete objects, numbers, tables, and pictures).	Multiplication
3.25a	Investigate and create patterns involving numbers, operations (addition and multiplication), and relations that model the identity and commutative properties for addition and multiplication.	Levels 3-4: Number Sense, Addition

Academy of MATH: Correlated to Virginia Mathematics Standards of Learning for Grade 4

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
	Number and Number Sense.	
4.1a	Identify (orally and in writing) the place value for each digit in a whole number expressed through millions.	Levels 4-6: Number Sense
4.1b	Compare two whole numbers expressed through millions, using symbols (>, <, or =).	Levels 4-6: Number Sense
4.1c	Round whole numbers expressed through millions to the nearest thousand, ten thousand, and hundred thousand.	Levels 4-6: Number Sense, Addition, Subtraction
4.2a	Identify, model, and compare rational numbers (fractions and mixed numbers), using concrete objects and pictures.	Levels 4-6: Fractions
4.2b	Represent equivalent fractions.	Level 4: Fractions
4.2c	Relate fractions to decimals, using concrete objects.	Level 4: Fractions
4.3	Compare the numerical value of fractions (with like and unlike denominators) having denominators of 12 or less, using concrete materials.	Levels 4-6: Fractions
4.4a	Read, write, represent, and identify decimals expressed through thousandths.	Levels 4-6: Fractions
4.4b	Round to the nearest whole number, tenth, and hundredth.	Levels 4-8: Number Sense
4.4c	Compare the value of two decimals, using symbols (<, >, or =), concrete materials, drawings, and calculators.	Levels 3-4: Fractions
	Computation and Estimation.	
4.5	Estimate whole-number sums and differences and describe the method of estimation. Students will refine estimates, using terms such as closer to, between, and a little more than.	Levels 4-5: Addition, Subtraction
4.6	Add and subtract whole numbers written in vertical	Levels 4-5: Addition, Subtraction, Equations

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	and horizontal form, choosing appropriately between paper and pencil methods and calculators.	
4.7	Find the product of two whole numbers when one factor has two digits or fewer and the other factor has three digits or fewer, using estimation and paper and pencil. For larger products (a two-digit numeral times a three-digit numeral), estimation and calculators will be used.	Levels 4-5: Multiplication
4.8	Estimate and find the quotient of two whole numbers, given a one-digit divisor.	Level 4: Division
4.9a	Add and subtract with fractions having like and unlike denominators of 12 or less, using concrete materials, pictorial representations, and paper and pencil.	Levels 4-6: Fractions
4.9b	Add and subtract with decimals through thousandths, using concrete materials, pictorial representations, and paper and pencil.	Levels 4-6: Fractions
4.9c	Solve problems involving addition and subtraction with fractions having like and unlike denominators of 12 or less and with decimals expressed through thousandths, using various computational methods, including calculators, paper and pencil, mental computation, and estimation.	Levels 4-6: Fractions
Measurement.		
4.10b	Identify equivalent measurements between units within the U.S. Customary system (ounces and pounds) and between units within the metric system (grams and kilograms).	Levels 4-5: Measurement
4.10c	Estimate the conversion of ounces and grams and pounds and kilograms, using approximate comparisons (1 ounce is about 28 grams, or 1 gram is about the weight of a paper clip; 1 kilogram is a little more than 2 pounds).	Level 2: Measurement

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
4.11a	Estimate and measure length, using actual measuring devices, and describe the results in both metric and U.S. Customary units, including part of an inch (1/2, 1/4, and 1/8), inches, feet, yards, millimeters, centimeters, and meters.	Level 3: Measurement
4.11b	Identify equivalent measurements between units within the U.S. Customary system (inches and feet; feet and yards; inches and yards) and between units within the metric system (millimeters and centimeters; centimeters and meters; and millimeters and meters).	Levels 3-4: Measurement
4.12a	Estimate and measure liquid volume, using actual measuring devices and using metric and U.S. Customary units, including cups, pints, quarts, gallons, milliliters, and liters.	Level 4: Measurement
4.12b	Identify equivalent measurements between units within the U.S. Customary system (cups, pints, quarts, and gallons) and between units within the metric system (milliliters and liters).	Levels 4-5: Measurement
4.13a	Identify and describe situations representing the use of perimeter and area.	Levels 4-5: Measurement
4.13b	Use measuring devices to find perimeter in both standard and nonstandard units of measure.	Levels 4-5: Measurement
	Geometry.	
4.14	Investigate and describe the relationships between and among points, lines, line segments, and rays.	Level 4: Geometry
4.15a	Identify and draw representations of points, lines, line segments, rays, and angles, using a straightedge or ruler.	Level 4: Geometry
4.15b	Describe the path of shortest distance between two points on a flat surface.	Levels 4-5: Measurement
4.16	Identify and draw representations of lines that illustrate intersection, parallelism, and perpendicularity.	Level 4: Geometry

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
4.17a	Analyze and compare the properties of two-dimensional (plane) geometric figures (circle, square, rectangle, triangle, parallelogram, and rhombus) and three-dimensional (solid) geometric figures (sphere, cube, and rectangular solid [prism]).	Levels 4-5: Geometry
4.17b	Identify congruent and noncongruent shapes.	Level 4: Geometry
4.17c	Investigate congruence of plane figures after geometric transformations such as reflection (flip), translation (slide) and rotation (turn), using mirrors, paper folding, and tracing.	Level 4: Geometry
4.18	Identify the ordered pair for a point and locate the point for an ordered pair in the first quadrant of a coordinate plane.	Level 5: Graphing
4.14	Investigate and describe the relationships between and among points, lines, line segments, and rays.	Level 4: Geometry
Probability and Statistics.		
4.19a	Predict the likelihood of outcomes of a simple event, using the terms certain, likely, unlikely, impossible.	Level 8: Graphing
4.19b	Determine the probability of a given simple event, using concrete materials.	Levels 7-8: Graphing
4.20	Collect, organize, and display data in line and bar graphs with scale increments of one or greater than one and use the display to interpret the results, draw conclusions, and make predictions.	Levels 4-5: Graphing
Patterns, Functions, and Algebra.		
4.21	Recognize, create, and extend numerical and geometric patterns, using concrete materials, number lines, symbols, tables, and words.	Level 4: Number Sense, Addition, Subtraction
4.22	Recognize and demonstrate the meaning of equality, using symbols representing numbers, operations, and relations [e.g., 3 + 5 = 5 + 3 and 15 + (35 + 16) = (15 + 35) + 16].	Level 4: Equations

Academy of MATH: Correlated to Virginia Mathematics Standards of Learning for Grade 5

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
	Number and Number Sense.	
5.1a	Read, write, and identify the place values of decimals through thousandths.	Level 8: Number Sense
5.1b	Round decimal numbers to the nearest tenth or hundredth.	Level 8: Number Sense
5.1c	Compare the values of two decimals through thousandths, using the symbols >, <, or =.	Levels 4-6: Fractions
5.2a	Recognize and name commonly used fractions (halves, fourths, fifths, eighths, and tenths) in their equivalent decimal form and vice versa.	Level 5: Fractions
5.2b	Order a given set of fractions and decimals from least to greatest. Fractions will include like and unlike denominators limited to 12 or less, and mixed numbers.	Levels 5-6: Fractions
	Computation and Estimation.	
5.3	Create and solve problems involving addition, subtraction, multiplication, and division of whole numbers, using paper and pencil, estimation, mental computation, and calculators.	Level 5: Addition, Subtraction, Multiplication, Division, Equations, Measurement, Graphing
5.4	Find the sum, difference, and product of two numbers expressed as decimals through thousandths, using an appropriate method of calculation, including paper and pencil, estimation, mental computation, and calculators.	Levels 5-6: Fractions
5.5	Given a dividend of four digits or fewer and a divisor of two digits or fewer, find the quotient and remainder.	Level 5: Division
5.6	Given a dividend expressed as a decimal through thousandths and a single-digit divisor, find the quotient.	Levels 6-7: Fractions
5.7	Add and subtract with fractions and mixed	Levels 5-6: Fractions

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
	numbers, with and without regrouping, and express answers in simplest form. Problems will include like and unlike denominators limited to 12 or less.	
Measurement.		
5.8	Describe and determine the perimeter of a polygon and the area of a square, rectangle, and right triangle, given the appropriate measures.	Levels 5-6: Measurement
5.9	Identify and describe the diameter, radius, chord, and circumference of a circle.	Level 5: Geometry
5.10	Differentiate between perimeter, area, and volume and identify whether the application of the concept of perimeter, area, or volume is appropriate for a given situation.	Levels 5-6: Measurement
5.11a	Choose an appropriate measuring device and unit of measure to solve problems involving measurement of length — part of an inch (1/2, 1/4, and 1/8), inches, feet, yards, miles, millimeters, centimeters, meters, and kilometers.	Level 5: Measurement
5.11b	Choose an appropriate measuring device and unit of measure to solve problems involving measurement of weight/mass — ounces, pounds, tons, grams, and kilograms.	Level 5: Measurement
5.11c	Choose an appropriate measuring device and unit of measure to solve problems involving measurement of liquid volume — cups, pints, quarts, gallons, milliliters, and liters.	Level 5: Measurement
5.11d	Choose an appropriate measuring device and unit of measure to solve problems involving measurement of area — square units.	Level 5: Measurement
5.11e	Choose an appropriate measuring device and unit of measure to solve problems involving measurement of temperature — Celsius and Fahrenheit units. Problems also will include	Levels 4-5: Measurement

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	estimating the conversion of Celsius and Fahrenheit units relative to familiar situations (water freezes at 0°C and 32°F, water boils at 100°C and 212°F, normal body temperature is about 37°C and 98.6°F).	
5.12	Determine an amount of elapsed time in hours and minutes within a 24-hour period.	Levels 3-5: Measurement
5.13	Measure and draw right, acute, and obtuse angles and triangles, using appropriate tools.	Level 5: Geometry
	Geometry.	
5.14	Classify angles and triangles as right, acute, or obtuse.	Level 5: Geometry
5.15a	Using two-dimensional (plane) figures (square, rectangle, triangle, parallelogram, rhombus, kite, and trapezoid) recognize, identify, describe, and analyze their properties in order to develop definitions of these figures.	Levels 5-6: Geometry
5.15b	Using two-dimensional (plane) figures (square, rectangle, triangle, parallelogram, rhombus, kite, and trapezoid) identify and explore congruent, noncongruent, and similar figures.	Level 8: Geometry
5.15c	Using two-dimensional (plane) figures (square, rectangle, triangle, parallelogram, rhombus, kite, and trapezoid) investigate and describe the results of combining and subdividing shapes.	Levels 7-8: Measurement
5.15d	Using two-dimensional (plane) figures (square, rectangle, triangle, parallelogram, rhombus, kite, and trapezoid) identify and describe a line of symmetry.	Levels 7-8: Geometry
5.15e	Using two-dimensional (plane) figures (square, rectangle, triangle, parallelogram, rhombus, kite, and trapezoid) recognize the images of figures resulting from geometric transformations such as translation (slide), reflection (flip), or rotation (turn).	Level 5: Geometry

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
5.16	Identify, compare, and analyze properties of three-dimensional (solid) geometric shapes (cylinder, cone, cube, square pyramid, and rectangular prism).	Level 5: Geometry
Probability and Statistics.		
5.17a	Solve problems involving the probability of a single event by using tree diagrams or by constructing a sample space representing all possible results.	Levels 7-8: Graphing
5.17b	Predict the probability of outcomes of simple experiments, representing it with fractions or decimals from 0 to 1, and test the prediction.	Levels 7-8: Graphing
5.17c	Create a problem statement involving probability and based on information from a given problem situation. Students will not be required to solve the created problem statement.	Levels 7-8: Graphing
5.18	Given a problem situation, collect, organize, and display a set of numerical data in a variety of forms, using bar graphs, stem-and-leaf plots, and line graphs, to draw conclusions and make predictions.	Level 5: Graphing
5.19	Find the mean, median, mode, and range of a set of data.	Level 8: Graphing
Patterns, Functions, and Algebra.		
5.20	Analyze the structure of numerical and geometric patterns (how they change or grow) and express the relationship, using words, tables, graphs, or a mathematical sentence. Concrete materials and calculators will be used.	Levels 5: Number Sense, Addition, Subtraction
5.21a	Investigate and describe the concept of variable.	Level 5: Equations
5.21b	Use a variable expression to represent a given verbal quantitative expression involving one operation.	Level 5: Equations
5.21c	Write an open sentence to represent a given mathematical relationship, using a variable.	Level 5: Equations

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STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
5.22	Create a problem situation based on a given open sentence using a single variable.	Level 5: Equations

Academy of MATH: Correlated to Virginia Mathematics Standards of Learning for Grade 6

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
	Number and Number Sense.	
6.1	Identify representations of a given percent and describe orally and in writing the equivalence relationships among fractions, decimals, and percents.	Levels 6-7: Fractions
6.2	Describe and compare two sets of data, using ratios, and will use appropriate notations, such as a/b, a to b, and a:b.	Level 8: Number Sense
6.3a	Find common multiples and factors, including least common multiple and greatest common factor.	Level 6: Multiplication
6.3b	Identify and describe prime and composite numbers; and identify and describe the characteristics of even and odd integers.	Levels 5-6: Multiplication
6.4	Compare and order whole numbers, fractions, and decimals, using concrete materials, drawings or pictures, and mathematical symbols.	Levels 6-8: Fractions
6.5	Identify, represent, order, and compare integers.	Levels 7-8: Number Sense
	Computation and Estimation.	
6.6a	Solve problems that involve addition, subtraction, multiplication, and/or division with fractions and mixed numbers, with and without regrouping, that include like and unlike denominators of 12 or less, and express their answers in simplest form.	Levels 6-8: Fractions Level 6: Equations
6.6b	Find the quotient, given a dividend expressed as a decimal through thousandths and a divisor expressed as a decimal to thousandths with exactly one non-zero digit.	Levels 7-8: Fractions
6.7	Use estimation strategies to solve multistep practical problems involving whole numbers, decimals, and fractions (rational numbers).	Levels 6-8: Fractions, Equations
6.8	Solve multistep consumer-application problems	Levels 6-8: Fractions

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
	involving fractions and decimals and present data and conclusions in paragraphs, tables, or graphs. Planning a budget will be included.	
Measurement.		
6.9a	Compare and convert units of measure for length, area, weight/mass, and volume within the U.S. Customary system and the metric system and estimate conversions between units in each system: length — part of an inch (1/2, 1/4, and 1/8), inches, feet, yards, miles, millimeters, centimeters, meters, and kilometers.	Level 6: Measurement
6.9b	Compare and convert units of measure for length, area, weight/mass, and volume within the U.S. Customary system and the metric system and estimate conversions between units in each system: weight/mass — ounces, pounds, tons, grams, and kilograms.	Level 6: Measurement
6.9c	Compare and convert units of measure for length, area, weight/mass, and volume within the U.S. Customary system and the metric system and estimate conversions between units in each system: liquid volume — cups, pints, quarts, gallons, milliliters, and liters.	Level 6: Measurement
6.9d	Compare and convert units of measure for length, area, weight/mass, and volume within the U.S. Customary system and the metric system and estimate conversions between units in each system: area — square units.	Level 6: Measurement
6.10	Estimate and then determine length, weight/mass, area, and liquid volume/capacity, using standard and nonstandard units of measure.	Level 6: Measurement
6.11	Determine if a problem situation involving polygons of four or fewer sides represents the application of perimeter or area and apply the appropriate	Level 7: Measurement

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
	formula.	
6.12a	Solve problems involving the circumference and/or area of a circle when given the diameter or radius.	Level 6: Measurement
6.12b	Derive approximations for pi (π) from measurements for circumference and diameter, using concrete materials or computer models.	Level 6: Measurement
6.13a	Estimate angle measures, using 45°, 90°, and 180° as referents, and use the appropriate tools to measure the given angles.	Level 6: Geometry
6.13b	Measure and draw right, acute, and obtuse angles and triangles.	Level 6: Geometry
	Geometry.	
6.14	Identify, classify, and describe the characteristics of plane figures, describing their similarities, differences, and defining properties.	Level 6: Geometry
6.15	Determine congruence of segments, angles, and polygons by direct comparison, given their attributes. Examples of noncongruent and congruent figures will be included.	Levels 7-8: Geometry
6.17	Sketch, construct models of, and classify solid figures (rectangular prism, cone, cylinder, and pyramid).	Level 6: Geometry
	Probability and Statistics.	
6.18a	Given a problem situation, will collect, analyze, display, and interpret data in a variety of graphical methods, including line, bar, and circle graphs. Circle graphs will be limited to halves, fourths, and eighths.	Level 6: Graphing
6.19	Describe the mean, median, and mode as measures of central tendency, describe the range, and determine their meaning for a set of data.	Level 8: Graphing
6.20a	Make a sample space for selected experiments and represent it in the form of a list, chart, picture, or tree diagram.	Levels 7-8: Graphing

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
6.20b	Determine and interpret the probability of an event occurring from a given sample space and represent the probability as a ratio, decimal or percent, as appropriate for the given situation.	Levels 7-8: Graphing
Patterns, Functions, and Algebra.		
6.22	Investigate and describe concepts of positive exponents, perfect squares, square roots, and, for numbers greater than 10, scientific notation. Calculators will be used to develop exponential patterns.	Levels 7-8: Number Sense Level 8: Equations
6.23a	Model and solve algebraic equations, using concrete materials.	Level 6: Equations
6.23b	Solve one-step linear equations in one variable, involving whole number coefficients and positive rational solutions.	Level 6: Equations
6.23c	Use the following algebraic terms appropriately: variable, coefficient, term, and equation.	Levels 6-8: Equations

Academy of MATH: Correlated to Virginia Mathematics Standards of Learning for Grade 7

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
Number and Number Sense.		
7.1	Compare, order, and determine equivalent relationships between fractions, decimals, and percents, including use of scientific notation for numbers greater than 10.	Level 7: Fractions
7.2	Simplify expressions that contain rational numbers (whole numbers, fractions, and decimals) and positive exponents, using order of operations, mental mathematics, and appropriate tools.	Levels 7-8: Equations
7.3a	Identify and apply the following properties of operations with real numbers: the commutative and associative properties for addition and multiplication.	Levels 7-8: Addition, Multiplication, Equations
7.3b	Identify and apply the following properties of operations with real numbers: the distributive property.	Level 6: Equations
7.3c	Identify and apply the following properties of operations with real numbers: the additive and multiplicative identity properties.	Level 4: Multiplication
7.3d	Identify and apply the following properties of operations with real numbers: the additive and multiplicative inverse properties.	Level 7: Addition, Fractions
7.3e	Identify and apply the following properties of operations with real numbers: the multiplicative property of zero.	Level 4: Multiplication
Computation and Estimation.		
7.4a	Solve practical problems using rational numbers (whole numbers, fractions, decimals) and percents.	Levels 7-8: Fractions
7.4b	Solve consumer-application problems involving tips, discounts, sales tax, and simple interest.	Levels 7-8: Fractions
7.5	Formulate rules for and solve practical problems involving basic operations (addition, subtraction,	Levels 7-8: Number Sense, Addition Level 8: Subtraction, Multiplication, Division

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
	multiplication, and division) with integers.	
7.6	Use proportions to solve practical problems, which may include scale drawings that contain rational numbers (whole numbers, fractions, and decimals) and percents.	Level 8: Number Sense, Division, Fractions, Geometry, Graphing
	Measurement.	
7.7a	Given appropriate dimensions, estimate and find the area of polygons by subdividing them into rectangles and right triangles.	Levels 7-8: Measurement
7.7b	Given appropriate dimensions, apply perimeter and area formulas in practical situations.	Levels 7-8: Measurement
7.8	Investigate and solve problems involving the volume and surface area of rectangular prisms and cylinders, using concrete materials and practical situations to develop formulas.	Levels 7-8: Measurement
	Geometry.	
7.9	Compare and contrast the following quadrilaterals: parallelogram, rectangle, square, rhombus, and trapezoid. Deductive reasoning and inference will be used to classify quadrilaterals.	Levels 7-8: Geometry
7.10	Identify and draw the following polygons: pentagon, hexagon, heptagon, octagon, nonagon, and decagon.	Levels 7-8: Geometry
7.11	Determine if geometric figures — quadrilaterals and triangles — are similar and write proportions to express the relationships between corresponding parts of similar figures.	Level 8: Geometry
7.12	Identify and graph ordered pairs in the four quadrants of a coordinate plane.	Level 8: Graphing
7.13	Given a polygon in the coordinate plane, represent transformations — rotation and translation — by graphing the coordinates of the vertices of the transformed polygon and sketching the resulting figure.	Level 8: Geometry

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
Probability and Statistics.		
7.14	Investigate and describe the difference between the probability of an event found through simulation versus the theoretical probability of that same event.	Levels 7-8: Graphing
7.15	Identify and describe the number of possible arrangements of several objects, using a tree diagram or the Fundamental (Basic) Counting Principle.	Levels 7-8: Graphing
7.16	Create and solve problems involving the measures of central tendency (mean, median, mode) and the range of a set of data.	Level 8: Graphing
7.17a	Given a problem situation, will collect, analyze, display, and interpret data, using a variety of graphical methods, including frequency distributions.	Level 7: Graphing
7.17b	Given a problem situation, will collect, analyze, display, and interpret data, using a variety of graphical methods, including line plots.	Levels 7-8: Graphing
7.17c	Given a problem situation, will collect, analyze, display, and interpret data, using a variety of graphical methods, including histograms.	Levels 7-8: Graphing
7.17f	Given a problem situation, will collect, analyze, display, and interpret data, using a variety of graphical methods, including scattergrams.	Levels 7-8: Graphing
Patterns, Functions, and Algebra.		
7.19	Represent, analyze, and generalize a variety of patterns, including arithmetic sequences and geometric sequences, with tables, graphs, rules, and words in order to investigate and describe functional relationships.	Level 8: Number Sense
7.20	Write verbal expressions as algebraic expressions and sentences as equations.	Levels 7-8: Equations
7.21	Use the following algebraic terms appropriately:	Levels 7-8: Equations

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
	equation, inequality, and expression.	
7.22a	Solve one-step linear equations and inequalities in one variable with strategies involving inverse operations and integers, using concrete materials, pictorial representations, and paper and pencil.	Level 6: Equations
7.22b	Solve practical problems requiring the solution of a one-step linear equation.	Level 6: Equations

Academy of MATH: Correlated to Virginia Mathematics Standards of Learning for Grade 8

STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
	Number and Number Sense.	
8.1a	Simplify numerical expressions involving positive exponents, using rational numbers, order of operations, and properties of operations with real numbers.	Level 8: Equations
8.1c	Compare and order decimals, fractions, percents, and numbers written in scientific notation.	Level 8: Fractions
8.2	Describe orally and in writing the relationship between the subsets of the real number system.	Level 7: Number Sense
	Computation and Estimation.	
8.3	Solve practical problems involving rational numbers, percents, ratios, and proportions. Problems will be of varying complexities and will involve real-life data, such as finding a discount and discount prices and balancing a checkbook.	Level 8: Number Sense, Fractions
8.4	Apply the order of operations to evaluate algebraic expressions for given replacement values of the variables. Problems will be limited to positive exponents.	Level 8: Equations
8.5	Given a whole number from 0 to 100, identify it as a perfect square or find the two consecutive whole numbers between which the square root lies.	Level 8: Number Sense
	Measurement.	
8.6	Verify by measuring and describe the relationships among vertical angles, supplementary angles, and complementary angles and will measure and draw angles of less than 360°.	Level 8: Geometry
8.7	Investigate and solve practical problems involving volume and surface area of rectangular solids (prisms), cylinders, cones, and pyramids.	Level 8: Measurement
	Geometry.	

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STANDARD REFERENCE	VIRGINIA CONTENT EXPECTATIONS	ACADEMY OF MATH
8.8	Apply transformations (rotate or turn, reflect or flip, translate or slide, and dilate or scale) to geometric figures represented on graph paper. The student will identify applications of transformations, such as tiling, fabric design, art, and scaling.	Level 8: Geometry
	Probability and Statistics.	
8.11	Analyze problem situations, including games of chance, board games, or grading scales, and make predictions, using knowledge of probability.	Level 8: Graphing
8.12	Make comparisons, predictions, and inferences, using information displayed in frequency distributions; box-and-whisker plots; scattergrams; line, bar, circle, and picture graphs; and histograms.	Level 8: Graphing
	Patterns, Functions, and Algebra.	
8.14a	Describe and represent relations and functions, using tables, graphs, and rules.	Level 8: Graphing
8.14b	Relate and compare tables, graphs, and rules as different forms of representation for relationships.	Level 8: Equations, Graphing
8.15	Solve two-step equations and inequalities in one variable, using concrete materials, pictorial representations, and paper and pencil.	Level 8: Equations
8.17	Create and solve problems, using proportions, formulas, and functions.	Level 8: Number Sense, Equations, Geometry