

AFTERSCHOOL ACHIEVERS:
MATH CLUB © 2002

Grades K-8

correlated to

**South Carolina
Mathematics Curriculum
Standards**



YOUR SOUTH CAROLINA GREAT SOURCE REPRESENTATIVE

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correlated to

SOUTH CAROLINA MATHEMATICS CURRICULUM STANDARDS Grades K-8

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correlated to
South Carolina Mathematics Curriculum Standards
Kindergarten

Number and Operations

Standard I

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

Expectation A

Count with understanding and recognize “how many” in sets of objects.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
*1. Given a set containing 10 or fewer concrete items, tell how many are in a set by counting the number of items orally using 1:1 correspondence.	Instructor’s Guide: 2, 4, 7, 9, 12, 14, 17, 19, 22, 24, 27, 29, 34, 37, 39, 44, 49, 54, 59
*2. Given a set of 10 or fewer concrete items, identify and describe one set as having more, fewer, or the same number of members as the other set.	Instructor’s Guide: 2, 4, 7, 9, 10, 12, 14, 17, 22, 24, 27, 29, 32, 34, 38, 39, 44, 48, 49, 54, 55, 58, 62, 64, 68, 69, 73, 74, 77, 79, 84, 88, 89, 93, 94, 98, 99, 103, 104, 107, 108, 114, 118, 119, 128, 129, 130, 133, 137, 143, 158, 172, 173
*3. Count forward to 20 and backward from 10.	Instructor’s Guide: 2, 4, 7, 9, 12, 14, 17, 19, 22, 23, 27, 29, 30, 32, 37, 39, 44, 45, 49, 54, 59, 70, 74, 79, 80, 89, 94, 99, 104, 109, 114, 115, 117, 124, 129, 137, 139, 152

Expectation C

Develop understanding of the relative position and magnitude of whole numbers and of ordinal and cardinal numbers and their connections.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
1. Identify the positions first through tenth using an ordered set of objects.	Instructor’s Guide: 163

Expectation D

Develop a sense of whole numbers and represent and use them in flexible ways, including relating, composing, and decomposing numbers.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
1. Discuss and explain how numerals are used in the environment (e.g., house numbers, phone numbers, dates).	Instructor's Guide: 28, 38, 58, 68, 98, 103, 108, 118

Expectation E

Connect number words and numerals to the quantities they represent, using various physical models and representations.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
*1. Identify the numeral that matches a quantity (1-10).	Instructor's Guide: 2, 4, 7, 9, 12, 14, 17, 22, 24, 27, 29, 32, 34, 39, 44, 48, 49, 54, 62, 64, 68, 69, 74, 77, 79, 86, 84, 89, 94, 99, 104, 107, 108, 114, 118, 119, 129, 130, 137, 172

Expectation F

Understand and represent commonly used fractions, such as $\frac{1}{4}$, $\frac{1}{3}$, and $\frac{1}{2}$.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
1. Divide a set of objects into equal groups.	Instructor's Guide: 7

Standard II

Understand meanings of operations and how they relate to one another.

Expectation A

Understand various meanings of addition and subtraction of whole numbers and the relationship between the two operations.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
*1. Add and subtract whole numbers using up to ten concrete items.	Instructor's Guide: 5, 29, 32, 34, 35, 54, 55, 59, 60, 62, 67, 85, 105, 110, 127, 135, 142, 144, 149, 154, 155, 158, 159, 160, 162, 164, 169, 174, 177, 179

Expectation B

Understand the effects of adding and subtracting whole numbers.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
1. Relate the operation of addition to increase in quantity and subtraction to decrease in quantity.	Instructor's Guide: 5, 29, 32, 34, 35, 54, 55, 59, 60, 62, 67, 85, 105, 110, 127, 135, 142, 144, 149, 154, 155, 158, 159, 160, 162, 164, 169, 174, 177, 179

Algebra

Standard I

Understand patterns, relations, and functions.

Expectation A

Sort, classify, and order objects by size, number, and other properties.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
1. Sort and classify objects by one attribute (size, shape, and color).	Instructor's Guide: 1, 6, 11, 13, 16, 21, 25, 26, 31, 36, 41, 45, 51, 52, 56, 61, 66, 71, 76, 81, 86, 91, 96, 101, 107, 111, 116, 138, 147, 148
2. Sort and classify objects by more than one attribute (size, shape, and color).	Instructor's Guide: 51, 52, 86
3. Order objects by size, quantity, and other properties.	Instructor's Guide: 40, 140

Expectation B

Recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
*1. Identify, describe, and extend a repeating relationship (pattern) found in common objects, sounds, and movements.	Instructor's Guide: 176
2. Construct two-part and three-part patterns.	Instructor's Guide: 141, 146, 151, 156, 161, 166, 167, 171

Expectation C

Analyze how both repeating and growing patterns are generated.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
1. Determine a rule for repeating and growing patterns.	Instructor's Guide: 1, 6, 11, 16, 21, 26, 41, 45, 50, 56, 57, 61, 66, 71, 75, 76, 81, 91, 97, 100, 111, 116, 121, 126, 131, 136, 141, 146, 150, 151, 156, 157, 161, 166, 167, 171, 175, 176

Standard II

Represent and analyze mathematical situations and structures using algebraic symbols.

Expectation A

Illustrate general principles and properties of operations, such as commutativity, using specific numbers.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
1. Using concrete materials, construct addition and subtraction models.	Instructor's Guide: 5, 29, 32, 34, 35, 54, 55, 59, 60, 62, 67, 85, 105, 110, 127, 135, 142, 144, 149, 154, 155, 158, 159, 160, 162, 164, 169, 174, 177, 179

Expectation B

Use concrete, pictorial, and verbal representations to develop an understanding of invented and conventional symbolic notations.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
*1. Use language such as <i>less than</i> , <i>more than</i> , or <i>the same number as</i> to describe the relative sizes of sets of concrete objects.	Instructor's Guide: 10, 38, 48, 55, 58, 68, 73, 88, 98, 103, 128, 133, 143, 158, 173

Standard III

Use mathematical models to represent and understand quantitative relationships.

Expectation A

Model situations that involve the addition and subtraction of whole numbers, using objects, pictures, and symbols.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
*1. Combine two sets of objects and count the result.	Instructor's Guide: 5, 29, 32, 34, 35, 54, 55, 59, 60, 62, 67, 85, 105, 110, 127, 135, 142, 144, 149, 154, 155, 158, 159, 160, 162, 164, 169, 174, 177, 179
2. Given a set of objects, remove some and then count the result.	Instructor's Guide: 5, 29, 32, 34, 35, 54, 55, 59, 60, 62, 67, 85, 105, 110, 127, 135, 142, 144, 149, 154, 155, 158, 159, 160, 162, 164, 169, 174, 177, 179

Geometry

Standard I

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Expectation A

Recognize, name, build, draw, compare, and sort two- and three-dimensional shapes.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
*1. Identify, model, and draw two-dimensional geometric shapes (circle, square, triangle, rectangle).	Instructor's Guide: 1, 6, 11, 16, 20, 21, 23, 37, 45, 53, 61, 63, 66, 70, 71, 87, 107, 113, 137, 172, 178
2. Identify, sort, and classify two-dimensional geometric shapes according to their attributes (size, shape, color).	Instructor's Guide: 1, 6, 11, 16, 20, 21, 23, 37, 45, 53, 61, 63, 66, 70, 71, 87, 107, 113, 137, 172, 178
3. Identify examples of three-dimensional shapes seen in the environment (cube, sphere, cone, cylinder).	Instructor's Guide: 38, 63, 78, 87, 113, 120, 145, 148, 170, 178

Expectation B

Describe attributes and parts of two- and three-dimensional shapes.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
*1. Compare the size (larger/smaller) and shape of plane geometric figures (circles, triangles, squares, rectangles)	Instructor's Guide: 1, 6, 11, 16, 20, 21, 23, 37, 45, 53, 61, 63, 66, 70, 71, 87, 107, 113, 137, 172, 178
2. Locate two-dimensional shapes on parts of three-dimensional objects.	Instructor's Guide: 63, 78, 113, 120

Expectation C

Investigate and predict the results of putting together and taking apart two- and three-dimensional shapes.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
1. Combine and subdivide geometric shapes and discuss the results (square, rectangle, triangle, circle).	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 2.</i>)

Standard II

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Expectation A

Describe, name, and interpret relative positions in space and apply ideas about relative position.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
*1. Use positional words to describe the location of objects (<i>near, far, up, down, below, above, beside, next to, between, over, under</i>).	Instructor's Guide: 42, 95, 104, 109, 113, 114, 125, 139, 163

Standard III

Apply transformations and use symmetry to analyze mathematical situations.

Expectation B

Recognize and create shapes that have symmetry.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
*1. Identify and describe shapes in the world that show symmetry across a line (nature, art, the human body).	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 1.</i>)

Standard IV

Use visualization, spatial reasoning, and geometric modeling to solve problems.

Expectation C

Relate ideas in geometry to ideas in number and measurement.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
1. Recall the configuration of dots on dominoes or name objects seen briefly.	Instructor's Guide: 1, 4, 5, 6, 9, 11, 14, 16, 19, 20, 21, 23, 24, 26, 29, 34, 35, 37, 38, 39, 44, 45, 49, 53, 54, 55, 59, 61, 62, 63, 64, 66, 69, 70, 71, 73, 74, 78, 79, 80, 84, 87, 89, 94, 99, 104, 105, 107, 108, 109, 110, 113, 114, 119, 120, 124, 127, 129, 130, 134, 137, 139, 144, 145, 148, 149, 154, 155, 159, 164, 170, 172, 178
2. Identify, describe, and extend a repeating pattern found in common objects, numerals, sounds, and movements.	Instructor's Guide: 1, 6, 11, 16, 21, 26, 41, 45, 50, 56, 57, 61, 66, 71, 75, 76, 81, 91, 97, 100, 111, 116, 121, 126, 131, 136, 141, 146, 150, 151, 156, 157, 161, 166, 167, 171, 175, 176
3. Compare the relative size of objects as bigger, smaller, or the same.	Instructor's Guide: 6, 16, 21

Expectation D

Recognize geometric shapes and structures in the environment and specify their location.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
1. Identify and describe objects in the environment that depict geometric figures (triangle, rectangle, square, and circle).	Instructor's Guide: 1, 6, 11, 20, 23, 37, 53, 133, 137, 178

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
2. Connect geometrical patterns and their relationships with other aspects of mathematics and with other disciplines.	Instructor's Guide: 1, 6, 11, 16, 21, 26, 41, 45, 50, 56, 57, 61, 66, 71, 75, 76, 81, 91, 97, 100, 111, 116, 121, 126, 131, 136, 141, 146, 150, 151, 156, 157, 161, 166, 167, 171, 175, 176

Measurement

Standard I

Understand measurable attributes of objects and the units, systems, and processes of measurement.

Expectation A

Recognize the attributes of length, volume, weight, area, and time.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
1. Identify the attributes of length, volume, weight, area, and time by using manipulatives.	Instructor's Guide: 43, 65, 90, 115, 132, 140, 165, 180

Expectation B

Compare and order objects according to their attributes.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
*1. Compare two objects by using direct comparisons according to one or more of the following attributes: length (shorter, longer), height (taller, shorter), weight (heavier, lighter), and time (longer, shorter).	Instructor's Guide: 15, 40, 43, 47, 65, 90, 92, 140, 165, 180
*2. Order objects by length, height, and weight.	Instructor's Guide: 40, 140

Expectation C

Understand how to measure using nonstandard and standard units.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
1. Use nonstandard linear measures (fingers, hands, feet, and arms).	Instructor's Guide: 65, 90, 115, 132, 140, 165
2. Use nonstandard measures to explore the area of everyday objects.	Instructor's Guide: 15, 40, 47, 92, 140, 180

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
3. Compare quantities using nonstandard units of capacity.	Instructor's Guide: 15, 40, 47, 92, 140, 180

Expectation D

Select an appropriate unit and tool for the attribute being measured.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
*1. Identify the instruments used to measure length (ruler), weight (scale), time (digital and analog clocks), day, month, and season (calendar), and temperature (thermometer).	Instructor's Guide: 28, 43, 65, 90, 92
2. Use appropriate units of linear measure (foot rulers, yard tape measures).	Instructor's Guide: 43

Standard II

Apply appropriate techniques, tools, and formulas to determine measurements.

Expectation C

Use tools to measure.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
*1. Tell time to the hour by using analog and digital clocks.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 1.</i>)
*2. Use a calendar to do the following: a. read and write numerals to 31, b. identify the day and the date, c. identify the days of the week, d. identify the months of the year, and e. identify "yesterday," "today," and "tomorrow."	Instructor's Guide: 28
3. Identify a penny, nickel, dime, quarter, and dollar.	Instructor's Guide: 122

Expectation D

Develop common referents for measures to make comparisons and estimates.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
1. Make and use estimates of measurements.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 1.</i>)
2. Identify the relationship between the minute hand and the hour hand on an analog clock.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 1.</i>)

Data Analysis and Probability

Standard I

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

Expectation A

Pose questions and gather data about themselves and their surroundings.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
*1. Collect data related to familiar experiences.	Instructor's Guide: 93

Expectation B

Sort and classify objects according to their attributes and organize data about the objects.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
1. Compare, sort, and group objects by a given attribute.	Instructor's Guide: 1, 6, 11, 13, 16, 21, 25, 26, 31, 36, 41, 45, 51, 52, 56, 61, 66, 71, 76, 81, 86, 91, 96, 101, 107, 111, 116, 128, 138, 143, 147, 148

Expectation C

Represent data using concrete objects, pictures, and graphs.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
*1. Display information by using object graphs, pictorial graphs, and tables.	Instructor's Guide: 15, 65, 90, 93

Standard II

Select and use appropriate statistical methods to analyze data.

Expectation A

Describe parts of the data and the set of data as a whole to determine what the data show.

Kindergarten Standards	Afterschool Achievers: Math Club, Kindergarten
*1. Interpret information on a graph.	Instructor's Guide: 93



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South Carolina Mathematics Curriculum Standards
Grade 1

Number and Operations

Standard I

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

Expectation A

Count with understanding and recognize “how many” in sets of objects.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Given a set of 10 to 100 objects, tell how many items there are by using 1:1 correspondence.	Instructor’s Guide: 2, 4, 5, 14, 19, 22, 28, 32, 37, 65, 85, 113, 123, 138

Expectation B

Use multiple models to develop initial understandings of place value and the base-ten number system.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
*1. Represent up to three-digit numerals using various concrete and pictorial models.	Instructor’s Guide: 2, 4, 5, 9, 14, 17, 19, 22, 24, 28, 32, 37, 59, 65, 74, 85, 89, 104, 113, 119, 123, 138
2. Identify the place value of each digit in a three-digit numeral.	Instructor’s Guide: 83, 108, 112, 123, 126, 138, 157, 165, 168

Expectation C

Develop understanding of the relative position and magnitude of whole numbers and of ordinal and cardinal numbers and their connections.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Compare the magnitudes of three given quantities (a one-digit numeral, a two-digit numeral, and a three-digit numeral).	Instructor's Guide: 68, 82, 105, 111, 112, 116, 121, 123, 126, 136, 138, 156, 157, 161, 165, 168
*2. Identify the positions first through twentieth, using an ordered set of objects.	Instructor's Guide: 27, 45, 81, 98, 101, 131
3. Describe pairs of numerals each less than 100 using the words <i>is greater than</i> , <i>is less than</i> , and <i>equals</i> .	Instructor's Guide: 9, 17, 19, 22, 28, 44, 49, 52, 68, 83, 105, 157
*4. Read whole numbers from a number line labeled from 0 to 180 (180 school days).	Instructor's Guide: 28, 55, 67, 68, 82, 97, 105, 111, 116, 121, 126, 136, 141, 146, 161, 176

Expectation D

Develop a sense of whole numbers and represent and use them in flexible ways, including relating, composing, and decomposing numbers.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Construct representations of number combinations up to 10 (e.g., number stories, equations, pictures).	Instructor's Guide: 14, 17, 19, 22, 24, 28, 30, 32, 50, 54, 59, 62, 64, 69, 72, 74, 79, 84, 86, 89, 91, 92, 94, 99, 104, 107, 109, 110, 114, 119, 122, 124, 129, 130, 163, 164, 166

Expectation E

Connect number words and numerals to the quantities they represent, using various physical models and representations.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
*1. Write the numeral that corresponds to a given set up to 100.	Instructor's Guide: 14, 17, 19, 22, 24, 28, 30, 32, 50, 54, 59, 62, 64, 69, 72, 74, 79, 84, 86, 89, 91, 92, 94, 99, 104, 107, 109, 110, 114, 119, 122, 124, 129, 130, 134, 137, 138, 139, 142, 166, 167, 169, 170, 174, 176, 177, 179
2. Write in words whole numbers through 10.	Instructor's Guide: 37, 123
*3. Identify odd and even numerals up to 100.	Instructor's Guide: 106, 113, 116, 121, 174, 179

Expectation F

Understand and represent commonly used fractions, such as $\frac{1}{4}$, $\frac{1}{3}$, and $\frac{1}{2}$.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
*1. Identify and represent $\frac{1}{4}$, $\frac{1}{3}$, and $\frac{1}{2}$ of a whole using concrete and pictorial models.	Instructor's Guide: 117, 118, 173

Standard II

Understand meanings of operations and how they relate to one another.

Expectation A

Understand various meanings of addition and subtraction of whole numbers and the relationship between the two operations.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
*1. Demonstrate concretely and symbolically the meaning of one-digit and two-digit addition and subtraction.	Instructor's Guide: 14, 17, 19, 22, 24, 28, 30, 32, 50, 54, 59, 62, 64, 69, 72, 74, 79, 84, 86, 89, 91, 92, 94, 99, 104, 107, 109, 110, 114, 119, 122, 124, 129, 130, 134, 137, 138, 139, 142, 166, 167, 169, 170, 174, 176, 177, 179

Standard III

Compute fluently and make reasonable estimates.

Expectation A

Develop and use strategies for whole-number computations, with a focus on addition and subtraction.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Explain and describe strategies for addition and subtraction.	Instructor's Guide: 14, 17, 19, 22, 24, 28, 30, 32, 50, 54, 59, 62, 64, 69, 72, 74, 79, 84, 86, 89, 91, 92, 94, 99, 104, 107, 109, 110, 114, 119, 122, 124, 129, 130, 134, 137, 138, 139, 142, 166, 167, 169, 170, 174, 176, 177, 179
*2. Solve story and picture problems using one-step solutions and basic addition facts with sums up to 18 and corresponding subtraction facts.	Instructor's Guide: 14, 17, 19, 22, 24, 28, 30, 32, 50, 54, 59, 62, 64, 69, 72, 74, 79, 84, 86, 89, 91, 92, 94, 99, 104, 107, 109, 110, 114, 119, 122, 124, 129, 130, 134, 137, 138, 139, 142, 166, 167, 169, 170, 174, 176, 177, 179

Expectation B

Develop fluency with basic number combinations for addition and subtraction.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
*1. Recall basic addition facts with sums up to 18 and the corresponding subtraction facts.	Instructor's Guide: 24, 30, 50, 54, 59, 62, 69, 72, 74, 84, 89, 91, 92, 99, 104, 107, 110, 114, 119, 122, 129, 130, 134, 137, 142, 144, 150, 159, 164, 167, 169, 170, 177
*2. Add and subtract pairs of two-digit whole numbers without regrouping.	Instructor's Guide: 162

Expectation C

Use a variety of methods and tools to compute, including objects, mental computation, estimation, paper and pencil, and calculators.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Estimate the number of objects in a set of from 5 to 20 objects.	Instructor's Guide: 2, 4, 9, 14, 17, 19, 22, 24, 32, 59, 65, 74, 85, 89, 104, 113, 119, 136, 156
2. Determine the most reasonable answer for an addition or subtraction problem.	Instructor's Guide: 30, 50, 65, 85, 110, 130, 150, 170

Algebra

Standard I

Understand patterns, relations, and functions.

Expectation A

Sort, classify, and order objects by size, number, and other properties.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Sort and classify concrete objects according to one or more attributes including color, size, shape, and thickness.	Instructor's Guide: 1, 3, 6, 8, 12, 13, 18, 21, 23, 48, 53, 58, 60, 63, 80, 100, 132, 153, 158, 160, 180
*2. Sequence random numerals between 1 and 100.	Instructor's Guide: 28, 44, 67, 68, 83, 97, 105, 126, 156, 161, 172

Expectation B

Recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
*1a. Using symbols and objects, identify and create and extend a wide variety of patterns	Instructor's Guide: 11, 16, 26, 31, 36, 41, 46, 51, 56, 61, 66, 71, 76, 81, 86, 91, 96, 101, 106, 111, 116, 121, 126, 131, 136, 141, 146, 151, 156, 161, 171, 176
1b. Use letters to represent a created pattern (e.g., ABC, ABC).	Instructor's Guide: 31, 36, 41, 46, 51, 56, 61, 66, 71, 81, 101, 106, 111, 116, 131, 136, 141, 171
*2. Use numerical patterns to skip count by 2s, 5s, and 10s.	Instructor's Guide: 106, 111, 116, 121, 125, 136, 141, 145, 146, 156, 161, 172, 176

Expectation C

Analyze how both repeating and growing patterns are generated.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Create a repeating or growing pattern.	Instructor's Guide: 11, 16, 26, 31, 36, 41, 46, 51, 56, 61, 66, 71, 76, 81, 86, 91, 96, 101, 106, 111, 116, 121, 126, 131, 136, 141, 146, 151, 156, 161, 171, 176
2. Identify missing numerals and elements in a pattern or sequence.	Instructor's Guide: 11, 16, 26, 31, 36, 41, 46, 51, 56, 61, 66, 71, 76, 81, 86, 91, 96, 101, 106, 111, 116, 121, 126, 131, 136, 141, 146, 151, 156, 161, 171, 176

Standard II

Represent and analyze mathematical situations and structures using algebraic symbols.

Expectation A

Illustrate general principles and properties of operations, such as commutativity, using specific numbers.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
*1. Identify inverse relationships between addition and subtraction facts (fact families).	Instructor's Guide: 122, 137, 142, 154, 159, 164, 167, 169, 177

Expectation B

Use concrete, pictorial, and verbal representations to develop an understanding of invented and conventional symbolic notations.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
*1. Recognize that the equals sign (=) indicates that the quantities on each side are equivalents.	Instructor's Guide: 10, 24, 30, 50, 54, 59, 62, 64, 69, 72, 73, 79, 84, 86, 89, 91, 92, 94, 99, 104, 107, 109, 110, 114, 119, 122, 124, 129, 130, 134, 137, 139, 142, 144, 149, 150, 152, 154, 159, 162, 164, 167, 169, 170, 174, 177, 179

Standard III

Use mathematical models to represent and understand quantitative relationships.

Expectation A

Model situations that involve the addition and subtraction of whole numbers, using objects, pictures, and symbols.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Use concrete and pictorial models to develop an understanding of the concepts of addition and subtraction of whole numbers.	Instructor's Guide: 24, 30, 37, 50, 52, 54, 59, 62, 65, 69, 72, 74, 79, 85, 89, 92, 94, 99, 104, 107, 113, 114, 119, 129, 130, 164, 169, 170, 174

Standard IV

Analyze change in various contexts.

Expectation A

Describe qualitative change, such as a student's growing taller.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Describe the change in one attribute over time.	No specific lesson addresses this standard.

Expectation B

Describe quantitative change, such as a student's growing two inches in one year.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Compare a wide variety of measurements over time (e.g., students' heights, plant growth).	No specific lesson addresses this standard.

Geometry

Standard I

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Expectation A

Recognize, name, build, draw, compare, and sort two- and three-dimensional shapes.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Describe and draw two-dimensional geometric shapes and match plane figures to the appropriate name (circle, square, triangle, rectangle).	Instructor's Guide: 3, 8, 11, 12, 13, 16, 18, 21, 23, 26, 31, 36, 41, 46, 51, 56, 60, 61, 66, 80, 100, 132, 153
*2. Recognize three-dimensional shapes (cube, cone, cylinder, sphere, rectangular prism).	Instructor's Guide: 53, 58, 63, 87, 120, 132, 140, 158, 160, 180
3. Sort two- and three-dimensional models given prescribed criteria.	Instructor's Guide: 3, 8, 12, 13, 18, 21, 23, 48, 53, 58, 60, 63, 80, 100, 132, 153, 158, 160, 180

Expectation B

Describe attributes and parts of two- and three-dimensional shapes.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
*1. Classify concrete two- and three-dimensional objects according to one or more attributes including color, size, shape, and thickness.	Instructor's Guide: 3, 8, 12, 13, 18, 21, 23, 48, 53, 58, 60, 63, 80, 100, 132, 153, 158, 160, 180
2. Draw, describe, and order triangles, squares, rectangles, and circles according to the number of sides, corners, and square corners.	Instructor's Guide: 3, 8, 11, 12, 13, 16, 18, 21, 23, 26, 31, 36, 41, 46, 51, 56, 60, 61, 66, 80, 100, 132, 153

Expectation C

Investigate and predict the results of putting together and taking apart two- and three-dimensional shapes.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Using manipulatives, combine and subdivide geometric shapes to create a new shape or design.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 2.</i>)

Standard II

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Expectation A

Describe, name, and interpret relative positions in space and apply ideas about relative position.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Apply a knowledge of relative position to objects in space through conversations, demonstrations, and stories.	Instructor's Guide: 20, 40

Expectation B

Describe, name, and interpret direction and distance in navigating space and apply ideas about direction and distance.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Describe the direction from one object to another on a pictorial map using words such as <i>up</i> , <i>down</i> , <i>left</i> , and <i>right</i> .	Instructor's Guide: 98, 172

Expectation C

Find and name locations with simple relationships such as "near to" and in coordinate systems such as maps.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
*1. Identify locations on a pictorial map using the positional words <i>next to</i> , <i>beside</i> , <i>between</i> , and <i>across</i> .	Instructor's Guide: 20, 40, 56, 82, 97, 98, 105

Standard III

Apply transformations and use symmetry to analyze mathematical situations.

Expectation A

Recognize and apply slides, flips, and turns.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Choose the figure that is the result of a transformation of a geometric shape (slide, flip, or turn).	Instructor's Guide: 53, 58, 63, 158, 160, 180

Expectation B

Recognize and create shapes that have symmetry.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
*1. Draw lines of symmetry through shapes to divide them into congruent shapes.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 2.</i>)

Standard IV

Use visualization, spatial reasoning, and geometric modeling to solve problems.

Expectation A

Create mental images of geometric shapes using spatial memory and spatial visualization.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Draw geometric objects based on a mental image.	Instructor's Guide: 3, 8, 12, 13, 18, 36, 41, 46, 51, 56, 153

Expectation B

Recognize and represent shapes from different perspectives.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Recognize geometric shapes in different positions.	Instructor's Guide: 3, 8, 13, 18, 21, 23, 60, 80, 87, 100, 120, 132, 140, 153, 158, 160, 180
2. Find and identify geometric patterns in real-world settings (tile floors, sidewalks, art).	Instructor's Guide: 12, 87, 100, 120, 132, 140, 158, 160, 180

Expectation C

Relate ideas in geometry to ideas in number and measurement.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Reproduce collections of shapes and dot configurations after viewing them briefly.	Instructor's Guide: 3, 8, 12, 13, 18, 36, 41, 46, 51, 56, 153
2. Compare/contrast two different units of length used to measure the same object.	Instructor's Guide: 38, 42, 115, 133

Expectation D

Recognize geometric shapes and structures in the environment and specify their location.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Identify and describe geometry in the environment, including applications in science, art, and architecture.	Instructor's Guide: 12, 87, 100, 120, 132, 140, 158, 160, 180

Measurement

Standard I

Understand measurable attributes of objects and the units, systems, and processes of measurement.

Expectation B

Compare and order objects according to their attributes.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Compare objects to identify longer, longest, taller, tallest, smaller, smallest, shorter, shortest, and so forth.	Instructor's Guide: 38, 115, 133
*2. Compare the volumes of two or more containers.	Instructor's Guide: 35, 43
*3. Compare the weights of two objects using a balance scale.	Instructor's Guide: 15, 33, 55, 95
4. Complete a time sequence (example: 9:00, 10:00, _____, 12:00).	Instructor's Guide: 57

Expectation C

Understand how to measure using nonstandard and standard units.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Use nonstandard units to measure the length of an object. (Example: How many jelly beans long is this piece of string?)	Instructor's Guide: 43, 133
*2. Measure the length of an object in whole inches.	Instructor's Guide: 133
*3. Measure the length of an object in whole centimeters.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 3.</i>)

Expectation D

Select an appropriate unit and tool for the attribute being measured.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Recall which measuring instrument is needed in a specified measurement situation.	Instructor's Guide: 55, 88, 103, 127, 143, 178

Standard II

Apply appropriate techniques, tools, and formulas to determine measurements.

Expectation C

Use tools to measure.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
*1. Tell and record time to the half-hour, using analog and digital clocks.	Instructor's Guide: 57, 135, 147, 148, 175
*2. Use a calendar to do the following: a. sequence the days of the week and the months of the year and b. construct and use a calendar to identify dates in standard and numeric forms (January 1, 2001 and 1/1/01).	Instructor's Guide: 47, 93, 98
*3. Determine the total value of a collection of pennies, nickels, and dimes (not to exceed 100 cents).	Instructor's Guide: 29, 34, 39, 64, 73, 75, 76, 77, 78, 90, 94, 96, 102, 109, 124, 128, 139, 149, 151, 152, 155, 164, 169
4. Find money equivalencies in a given amount.	Instructor's Guide: 29, 34, 39, 64, 73, 75, 76, 77, 78, 94, 96, 102, 109, 124, 128, 139, 149, 151, 152, 155, 164, 169
5. Identify the correct usage of the cent symbol (¢), dollar symbol (\$), and decimal point (.).	Instructor's Guide: 39, 64, 75, 76, 77, 94, 96, 102, 109, 124, 128, 139, 149, 151, 152, 155, 169
6. Read temperatures using Fahrenheit thermometers.	Instructor's Guide: 103, 127, 143, 178

Expectation D

Develop common referents for measures to make comparisons and estimates.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Compare and contrast estimates of measurement to actual findings.	Instructor's Guide: 133
2. Relate measurements to other aspects of mathematics and to other disciplines.	Instructor's Guide: 15, 29, 33, 34, 35, 38, 39, 43, 47, 55, 57, 64, 73, 75, 76, 77, 78, 90, 93, 94, 95, 96, 98, 102, 103, 109, 115, 124, 127, 128, 133, 135, 139, 143, 147, 148, 149, 151, 152, 155, 164, 169, 175, 178

Data Analysis and Probability

Standard I

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

Expectation A

Pose questions and gather data about themselves and their surroundings.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Pose and answer questions about charts and graphs relating to familiar experiences (e.g., recording daily temperature, the lunch count, class attendance, and favorite flavors of ice cream).	Instructor's Guide: 163

Expectation B

Sort and classify objects according to their attributes and organize data about the objects.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Compare, sort, and group objects by observable attributes.	Instructor's Guide: 1, 3, 6, 8, 12, 13, 18, 21, 23, 48, 53, 58, 60, 63, 80, 100, 132, 153, 158, 160, 180

Expectation C

Represent data using concrete objects, pictures, and graphs.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
*1. Use organized data to construct picture, object, and bar graphs.	Instructor's Guide: 163

Standard II

Select and use appropriate statistical methods to analyze data.

Expectation A

Describe parts of the data and the set of data as a whole to determine what the data show.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
*1. Interpret information displayed in a picture graph, object graph, and bar graph using the vocabulary <i>more, less, fewer, greater than, and less than.</i>	Instructor's Guide: 163

Standard III

Develop and evaluate inferences and predictions that are based on data.

Expectation A

Discuss events related to students' experiences as likely or unlikely.

Grade 1 Standards	Afterschool Achievers: Math Club, Grade 1
1. Identify an event as likely or unlikely to occur.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6</i> and <i>Math to Learn.</i>)



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Grade 2

Number and Operations

Standard I

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

Expectation B

Use multiple models to develop initial understandings of place value and the base-ten number system.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Using a calculator, explain the patterns in the numeration system relating to place value in numerals up to four digits.	Instructor's Guide: 18, 36, 40, 60, 81, 90, 111, 122, 123, 132, 151
*2. Identify the place value of each digit in a four-digit numeral.	Instructor's Guide: 18, 36, 40, 60, 81, 90, 111, 122, 123, 132, 151

Expectation C

Develop understanding of the relative position and magnitude of whole numbers and of ordinal and cardinal numbers and their connections.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Name the positions first through thirtieth, using an ordered set of objects.	Instructor's Guide: 4, 9, 12, 14, 24, 36, 56, 73, 74, 79, 84, 89, 107, 109, 134, 138, 164, 169
*2. Compare and write two whole numerals between 0 and 999, using symbols and words ($>$, $<$, $=$, <i>is greater than</i> , <i>is less than</i> , and <i>equals</i>).	Instructor's Guide: 17, 31, 36, 40, 46, 51, 76, 90, 121, 122, 123, 146, 156

Expectation E

Connect number words and numerals to the quantities they represent, using various physical models and representations.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Write in words whole numbers through 20.	Instructor's Guide: 92, 147

Expectation F

Understand and represent commonly used fractions, such as $\frac{1}{4}$, $\frac{1}{3}$, and $\frac{1}{2}$.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Write the fractions that represent $\frac{1}{4}$, $\frac{1}{3}$, and $\frac{1}{2}$ of a set or region.	Instructor's Guide: 47, 48, 57, 58, 80, 97, 138, 142
*2. Using models, order $\frac{1}{4}$, $\frac{1}{3}$, and $\frac{1}{2}$.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 4.</i>)

Standard II

Understand meanings of operations and how they relate to one another.

Expectation A

Understand various meanings of addition and subtraction of whole numbers and the relationship between the two operations.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Demonstrate the inverse relationship between addition and subtraction.	Instructor's Guide: 33, 64, 102, 158

Expectation C

Understand situations that entail multiplication and division, such as equal groupings of objects and sharing equally.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
*1. Describe models of equal groupings (multiplication) as repeated addition and arrays.	Instructor's Guide: 73, 112, 113, 124, 128, 136, 139, 165, 174, 179
*2. Describe models of sharing equally (division) as repeated subtraction and arrays.	Instructor's Guide: 135, 142, 162, 170, 178

Standard III

Compute fluently and make reasonable estimates.

Expectation A

Develop and use strategies for whole-number computations, with a focus on addition and subtraction.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
*1. Demonstrate the connection between the base-ten concepts and computational strategies.	Instructor's Guide: 40, 54, 60, 117, 123, 127, 132, 137, 146, 164, 166, 176
*2. Solve addition and subtraction problems (two-step solutions) using data from simple charts and picture graphs.	Instructor's Guide: 4, 9, 14, 19, 24, 25, 31, 36, 39, 44, 49, 69, 74, 91, 121, 131, 146, 156, 166, 171, 174, 176, 179

Expectation B

Develop fluency with basic number combinations for addition and subtraction.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
*1. Write addition and subtraction facts in numerical sentences.	Instructor's Guide: 4, 9, 10, 12, 14, 19, 22, 24, 27, 29, 33, 39, 42, 44, 49, 51, 54, 61, 64, 69, 72, 74, 79, 84, 89, 94, 95, 96, 99, 102, 104, 107, 109, 110, 114, 129, 134, 143, 149, 158, 164, 169
*2. Add and subtract pairs of two-digit whole numbers with and without regrouping.	Instructor's Guide: 117, 127, 137, 146, 164, 166, 176
*3. Find missing addends and subtrahends in number combinations up to 20.	Instructor's Guide: 127, 137

Expectation C

Use a variety of methods and tools to compute, including objects, mental computation, estimation, paper and pencil, and calculators.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Given choices, select a reasonable estimate for a set of at most 1,000 objects.	Instructor's Guide: 2
2. Justify the most reasonable answer for an addition and subtraction problem using paper and pencil and using a calculator.	Instructor's Guide: 4, 9, 10, 12, 14, 19, 22, 24, 27, 29, 33, 39, 42, 44, 49, 51, 54, 61, 64, 69, 72, 74, 79, 84, 89, 94, 95, 96, 99, 102, 104, 107, 109, 110, 114, 129, 134, 143, 149, 158, 164, 169

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
3. Select the most efficient method to solve an addition or subtraction problem.	Instructor's Guide: 4, 9, 10, 12, 14, 19, 22, 27, 29, 33, 39, 42, 44, 49, 51, 54, 61, 64, 69, 72, 74, 79, 84, 89, 94, 95, 96, 99, 102, 104, 107, 109, 110, 114, 129, 134, 143, 149, 158, 164, 169
*4. Round numbers up to 90 to the nearest 10.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 3.</i>)

Algebra

Standard I

Understand patterns, relations, and functions.

Expectation A

Sort, classify, and order objects by size, number, and other properties.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Sequence random numerals between 1 and 1,000.	Instructor's Guide: 17, 31, 36, 46, 76, 106, 121, 146, 151, 156, 158

Expectation B

Recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Create, extend, and label a wide variety of patterns, orally and in writing, by using symbols and objects.	Instructor's Guide: 1, 6, 11, 18, 21, 26, 37, 41, 46, 51, 56, 66, 76, 81, 86, 91, 101, 111, 126, 131, 151, 156, 161, 166, 171, 176
*2. Skip count by any numeral (1-10) using mental mathematics, paper and pencil, hundreds charts, calculators, and concrete objects (starting at any numeral).	Instructor's Guide: 1, 18, 26, 37, 56, 71, 76, 81, 82, 86, 91, 103, 111, 151

Expectation C

Analyze how both repeating and growing patterns are generated.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Create and describe a general rule for a growing pattern and a repeating pattern, both orally and in writing.	Instructor's Guide: 1, 6, 11, 18, 21, 26, 37, 41, 46, 51, 56, 66, 76, 81, 86, 91, 101, 111, 126, 131, 151, 156, 161, 166, 171, 176

Standard II

Represent and analyze mathematical situations and structures using algebraic symbols.

Expectation B

Use concrete, pictorial, and verbal representations to develop an understanding of invented and conventional symbolic notations.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
*1. Use symbolic notation to represent a statement of equality ($_ + 2 = 5$; $3 + 6 = _$).	Instructor's Guide: 127, 137

Standard III

Use mathematical models to represent and understand quantitative relationships.

Expectation A

Model situations that involve the addition and subtraction of whole numbers, using objects, pictures, and symbols.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
*1. Use concrete and pictorial models to develop an understanding of the concepts of addition, subtraction, multiplication, and division with whole numbers.	Instructor's Guide: 2, 12, 16, 102, 113, 118, 158, 165, 178

Standard IV

Analyze change in various contexts.

Expectation A

Describe qualitative change, such as a student's growing taller.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Compare and contrast the attribute changes over time in two or more qualities.	No specific lesson addresses this standard.

Expectation B

Describe quantitative change, such as a student's growing two inches in one year.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Compare and contrast the quantitative changes over time in two or more quantities.	No specific lesson addresses this standard.

Geometry

Standard I

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Expectation A

Recognize, name, build, draw, compare, and sort two- and three-dimensional shapes.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Describe, model, and draw two-dimensional geometric shapes with up to eight sides.	Instructor's Guide: 11, 15, 23, 38, 52, 66, 78, 115, 133, 173, 175
2. Identify, name, model, and draw two-dimensional geometric shapes with up to eight sides.	Instructor's Guide: 11, 15, 23, 38, 52, 66, 78, 115, 133, 173, 175

Expectation B

Describe attributes and parts of two- and three-dimensional shapes.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
*1. Compare and describe three-dimensional shapes according to the number and shape of faces, edges, bases, and corners (cube, rectangular solid, square pyramid).	Instructor's Guide: 3, 13, 23, 35, 38, 50, 52, 63, 88, 98, 125, 133, 163, 173, 175
*2. Compare and contrast plane and solid geometric shapes (circle/sphere, square/cube, triangle/pyramid, rectangle/rectangular solid).	Instructor's Guide: 13, 23, 38, 63, 88, 98, 125, 133, 163, 173, 175

Expectation C

Investigate and predict the results of putting together and taking apart two- and three-dimensional shapes.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Predict the results of combining and partitioning two- and three-dimensional geometric shapes.	Instructor's Guide: 115

Standard II

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Expectation B

Describe, name, and interpret direction and distance in navigating space and apply ideas about direction and distance.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Compare distances between objects on a pictorial map using words such as <i>closer to</i> and <i>farther than</i> .	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 1.</i>)

Expectation C

Find and name locations with simple relationships such as “near to” and in coordinate systems such as maps.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
*1. Identify locations on a pictorial map using the positional words <i>left, right, north, south, east,</i> and <i>west.</i>	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 1.</i>)

Standard III

Apply transformations and use symmetry to analyze mathematical situations.

Expectation A

Recognize and apply slides, flips, and turns.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Predict the results of and demonstrate transformations of geometric shapes, including slides, flips, and turns.	Instructor’s Guide: 13, 23, 35, 38, 50, 63, 98, 130

Expectation B

Recognize and create shapes that have symmetry.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
*1. Using various concrete materials, create figures that are symmetrical across a line.	Instructor’s Guide: 153

Standard IV

Use visualization, spatial reasoning, and geometric modeling to solve problems.

Expectation A

Create mental images of geometric shapes using spatial memory and spatial visualization.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Create geometric objects based on mental images.	Instructor’s Guide: 3, 11, 13, 15, 23, 38, 63, 66, 88, 98, 133, 163, 173

Expectation B

Recognize and represent shapes from different perspectives.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Describe congruent and similar shapes.	Instructor's Guide: 75

Expectation C

Relate ideas in geometry to ideas in number and measurement.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Analyze and predict the effect on the number of pieces used to form a geometric shape when various arrangements are formed using the same number of pieces.	Instructor's Guide: 153
2. Using square tiles, grid paper, and unifix cubes, connect geometry to related concepts in measurement and number.	Instructor's Guide: 53, 113

Expectation D

Recognize geometric shapes and structures in the environment and specify their location.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Describe relationships among geometric shapes in the environment, including applications in science, art, and architecture.	Instructor's Guide: 13, 15, 35, 50, 52,
2. Recognize, describe, extend, and create a wide variety of patterns using geometric symbols and objects.	Instructor's Guide: 6, 11, 21, 41, 56, 66, 91, 101, 126, 131

Measurement

Standard I

Understand measurable attributes of objects and the units, systems, and processes of measurement.

Expectation A

Recognize the attributes of length, volume, weight, area, and time.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
*1. Discriminate among the functions of length, capacity, weight (mass), perimeter, area, time, and temperature.	Instructor's Guide: 7, 8, 20, 28, 30, 43, 45, 53, 62, 68, 83, 85, 93, 105, 108, 148, 150, 160, 168

Expectation C

Understand how to measure using nonstandard and standard units.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
*1. Use nonstandard and standard (U.S. customary or English and metric) systems of measurement: a. use actual measuring devices to measure length, volume, and mass; and b. use actual measuring devices to compare metric and U.S. customary units (cups, pints, quarts, gallons, and liters) for measuring liquid volume, using the concepts of <i>more</i> , <i>less</i> , and <i>equivalent</i> .	Instructor's Guide: 7, 8, 20, 28, 30, 43, 45, 62, 83, 85, 148, 150, 160, 168
2. Measure the length of an object in inches and/or half inches.	Instructor's Guide: 7, 30, 70, 85, 168

Expectation D

Select an appropriate unit and tool for the attribute being measured.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Determine the appropriate unit and instrument needed for specific measurement in length, volume, weight/mass, area, and temperature.	Instructor's Guide: 7, 20, 30, 45, 62, 83, 85, 93, 148, 150, 160, 168

Standard II

Apply appropriate techniques, tools, and formulas to determine measurements.

Expectation C

Use tools to measure.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
*1. Use tools to compare units of measure within a given system: a. tell and write time to the quarter hour, using analog and digital clocks; b. using a calendar, determine past and future days of the week and identify specific dates; c. convert money and make money exchanges; d. read temperatures using Celsius and Fahrenheit thermometers.	Instructor's Guide: 32, 34, 47, 59, 77, 86, 93, 100, 108, 118, 119, 140, 144, 159, 161
2. Determine the total value of a collection of coins.	Instructor's Guide: 16, 32, 34, 59, 77, 86, 100, 140, 144, 159, 161
3. Make change up to one dollar by counting up.	Instructor's Guide: 140
*4. Create and solve money-story problems.	Instructor's Guide: 16, 32, 161

Expectation D

Develop common referents for measures to make comparisons and estimates.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Make, use, and evaluate the reasonableness of estimates of measurement.	Instructor's Guide: 7, 8, 28, 43, 53, 148
2. Relate measurement to other aspects of mathematics and to other disciplines.	Instructor's Guide: 7, 8, 16, 20, 28, 30, 32, 34, 43, 45, 47, 53, 59, 62, 68, 77, 83, 85, 93, 100, 105, 108, 118, 119, 140, 144, 148, 150, 159, 160, 161, 168

Data Analysis and Probability

Standard I

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

Expectation A

Pose questions and gather data about themselves and their surroundings.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Collect data using surveys.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5</i> and <i>Math to Learn</i> .)

Expectation B

Sort and classify objects according to their attributes and organize data about the objects.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
*1. Collect, sort, and organize data.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5</i> and <i>Math to Learn</i> .)

Expectation C

Represent data using concrete objects, pictures, and graphs.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
*1. Use organized data to create charts, graphs, and tables.	Instructor's Guide: 25, 70, 85, 155

Standard II

Select and use appropriate statistical methods to analyze data.

Expectation A

Describe parts of the data and the set of data as a whole to determine what the data show.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
1. Explain the trends of a data set (e.g., increasing, decreasing, random).	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5</i> and <i>Math to Learn</i> .)

Standard III

Develop and evaluate inferences and predictions that are based on data.

Expectation A

Discuss events related to students' experiences as likely or unlikely.

Grade 2 Standards	Afterschool Achievers: Math Club, Grade 2
*1. Describe events as more likely or less likely to occur.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6</i> and <i>Math to Learn.</i>)



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Grade 3

Number and Operations

Standard I

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

Expectation A

Understand the place-value structure of the base-ten number system and be able to represent and compare whole numbers and decimals.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
*1. Explain the place value structure of whole numbers through hundred thousands.	Instructor's Guide: 5, 7, 35, 48, 60, 71, 103, 127, 180
2. Read and write whole numbers.	Instructor's Guide: 48, 140
3. Compare whole numbers using symbols ($>$, $<$, $=$) and words (<i>is greater than</i> , <i>is less than</i> , and <i>equals</i>).	Instructor's Guide: 18, 22
4. Identify the place value of decimals through hundredths using concrete and pictorial models.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 4.</i>)
5. Read and write decimals through hundredths based on concrete and pictorial models.	Instructor's Guide: 48, 140
6. Compare decimals (through hundredths) using symbols ($>$, $<$, and $=$) and words (<i>is greater than</i> , <i>is less than</i> , and <i>equals</i>) with concrete and pictorial models.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 4.</i>)
7. Read and write amounts of money using the dollar sign (\$) and decimal notation (.).	Instructor's Guide: 32, 35, 73, 78, 95, 99, 117, 168, 169

Expectation B

Recognize equivalent representations for the same number and generate them by decomposing and composing numbers.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
*1. Recognize equivalent representations for the same whole number by decomposing and composing whole numbers up through three digits.	Instructor's Guide: 1, 2, 4, 6, 7, 8, 9, 10, 11, 12, 14, 16, 19, 21, 24, 26, 29, 31, 33, 34, 36, 37, 39, 40, 41, 46, 48, 49, 51, 53, 56, 61, 66, 68, 85, 90, 94, 105, 127, 144, 154, 164
2. Write three-digit whole numbers in standard form, in expanded form, and in words.	Instructor's Guide: 5, 35, 48, 103, 127, 180

Expectation C

Develop understanding of fractions as parts of unit wholes, as parts of a collection, as locations on number lines, and as divisions of whole numbers.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
*1. Describe fractional parts of a unit or a group of objects ($\frac{1}{100}$, $\frac{1}{10}$, $\frac{1}{8}$, $\frac{1}{6}$, $\frac{1}{5}$, $\frac{1}{4}$, $\frac{1}{3}$, and $\frac{1}{2}$).	Instructor's Guide: 82, 83, 145

Expectation E

Recognize and generate equivalent forms of commonly used fractions, decimals, and percents.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
*1. Represent equivalent forms of commonly used fractions using concrete and pictorial models.	Instructor's Guide: 82, 83, 137, 145, 150

Expectation G

Describe classes of numbers according to characteristics such as the nature of their factors.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Describe and identify the characteristics of even and odd numbers by examining their divisibility by 2.	Instructor's Guide: 18, 29, 76, 81, 106, 109, 115, 180

Standard II

Understand meanings of operations and how they relate to one another.

Expectation A

Understand various meanings of multiplication and division.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
*1. Describe the meaning of multiplication using concrete and pictorial models.	Instructor's Guide: 23, 55, 62, 91
*2. Describe the meaning of division using concrete and pictorial models.	Instructor's Guide: 55, 120, 124

Expectation C

Identify and use relationships between operations, such as division as the inverse of multiplication, to solve problems.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
*1. Use the inverse relationships between addition and subtraction to solve problems.	Instructor's Guide: 33, 85

Expectation D

Understand and use properties of operations, such as the distributivity of multiplication over addition.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Recognize commutativity in the addition facts.	Instructor's Guide: 33, 53, 85
2. Use the associative property to add efficiently.	Instructor's Guide: 11, 34, 39, 53, 56, 154

Standard III

Compute fluently and make reasonable estimates.

Expectation A

Develop fluency with basic number combinations for multiplication and division and use these combinations to mentally compute related problems, such as 30×50 .

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Recall multiplication and division facts through 9.	Instructor's Guide: 64, 69, 77, 79, 84, 86, 89, 91, 97, 102, 124, 126, 129, 131, 136, 138, 147, 149, 153, 154, 159, 164, 165, 169, 171, 173, 174, 179
*2. Use basic number combinations to compute related problems in multiplication and division using multiples of 10 (e.g., using 3×5 to compute 30×5).	Instructor's Guide: 102

Expectation B

Develop fluency in adding, subtracting, multiplying, and dividing whole numbers.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Compare and contrast different addition and subtraction algorithms to select the most efficient one for solving a given problem.	Instructor's Guide: 75, 90, 144, 154, 164
2. Construct and analyze concrete models (rectangular arrays) for multiplication of one and two-digit numbers.	Instructor's Guide: 69, 77, 91, 97, 173
*3. Demonstrate fluency in the use of both addition and subtraction algorithms and explain the steps involved.	Instructor's Guide: 1, 2, 4, 6, 7, 8, 9, 10, 11, 12, 14, 16, 19, 24, 26, 31, 33, 34, 36, 37, 39, 40, 41, 46, 49, 51, 53, 56, 61, 66, 68, 85, 94, 105, 144, 154, 164

Expectation C

Develop and use strategies to estimate the results of whole-number computations and to judge the reasonableness of such results.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Round whole numbers to the nearest 10, 100, and 1,000.	Instructor's Guide: 43, 70, 75, 105, 122, 158
2. Estimate whole number sums and differences, describe the method used, and determine the reasonableness of the results.	Instructor's Guide: 43, 70, 75, 105, 122, 158

Expectation F

Select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tool.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
*1. Select appropriate methods and tools and use the selected method or tool to solve addition and subtraction problems.	Instructor's Guide: 75, 90, 144, 154, 164

Algebra

Standard I

Understand patterns, relations, and functions.

Expectation A

Describe, extend, and make generalizations about geometric and numeric patterns.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Describe, create, and extend numeric patterns with and without models and calculators.	Instructor's Guide: 6, 18, 21, 58, 61, 67, 76, 115, 121, 126, 136, 141, 146, 151, 153, 156

Expectation B

Represent and analyze patterns and functions, using words, tables, and graphs.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Determine the pattern to identify missing numbers in a sequence and in a table of number pairs.	Instructor's Guide: 6, 18, 21, 58, 61, 67, 76, 115, 121, 126, 136, 141, 146, 151, 153, 156
*2. Use pattern identification to solve problems.	Instructor's Guide: 6, 18, 21, 58, 61, 67, 76, 115, 116, 121, 126, 136, 141, 146, 151, 153, 156, 176

Standard II

Represent and analyze mathematical situations and structures using algebraic symbols.

Expectation B

Represent the idea of a variable as an unknown quantity using a letter or a symbol.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Use concrete or pictorial models and symbols to represent missing addends or factors.	Instructor's Guide: 90

Expectation C

Express mathematical relationships using equations.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
*1. Use concrete or pictorial models and symbols to identify missing addends or factors in equations that express relationships between two quantities.	Instructor's Guide: 90

Standard III

Use mathematical models to represent and understand quantitative relationships.

Expectation A

Model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
*1. Use patterns and relationships in a variety of real-world contexts.	Instructor's Guide: 25, 44, 55, 70, 78, 91, 92, 112, 130, 147, 168, 170, 175

Standard IV

Analyze change in various contexts.

Expectation B

Identify and describe situations with constant or varying rates of change and compare them.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Identify real situations and events that show change.	No specific lesson addresses this standard. (See <i>Math to Know</i> .)

Geometry

Standard I

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Expectation A

Identify, compare, and analyze attributes of two- and three-dimensional shapes and develop vocabulary to describe the attributes.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
*1. Using appropriate vocabulary, identify and describe attributes of polygons including triangles, quadrilaterals (rectangles, squares, other parallelograms, trapezoids), pentagons, hexagons, and octagons.	Instructor's Guide: 15, 45, 57, 93, 108, 111, 135, 142, 176, 178
*2. Using appropriate vocabulary, describe properties of circles (center, radius, and diameter).	Instructor's Guide: 82, 108, 121
*3. Using appropriate vocabulary, identify and describe attributes of three-dimensional shapes including prisms, pyramids, spheres, cones, and cylinders.	Instructor's Guide: 3, 65, 107, 123, 142, 143, 178

Expectation B

Classify two- and three-dimensional shapes according to their properties and develop definitions of classes of shapes such as triangles and pyramids.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Classify three-dimensional shapes according to their attributes.	Instructor's Guide: 3, 65, 107, 123, 142, 143, 178

Expectation C

Investigate, describe, and reason about the results of subdividing, combining, and transforming shapes.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Combine two-dimensional shapes to form new shapes and draw conclusions about area and fractional relationships.	Instructor's Guide: 27, 82, 133, 137, 145, 150, 156, 161

Expectation D

Explore congruence and similarity.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
*1. Compare two-dimensional shapes to determine if they exactly match (congruency).	Instructor's Guide: 123

Expectation E

Make and test conjectures about geometric properties and relationships and develop logical arguments to justify conclusions.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Using models, make and test conjectures about geometric properties and relationships and explain the conclusions.	Instructor's Guide: 3, 15, 45, 57, 65, 93, 107, 108, 111, 123, 135, 142, 143, 176, 178

Standard II

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Expectation A

Describe location and movement using common language and geometric vocabulary.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Give instructions (direction, distance, turns) for moving from one location to another.	Instructor's Guide: 51, 61, 66, 165

Expectation B

Make and use coordinate systems to specify locations and to describe paths.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Specify locations on maps and grids using direction and distance.	Instructor's Guide: 51, 61, 66, 165
*2. Locate points corresponding to given whole numbers on a number line.	Instructor's Guide: 165

Standard III

Apply transformations and use symmetry to analyze mathematical situations.

Expectation B

Describe a motion or a series of motions that will show that two shapes are congruent.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Use slides, flips, and turns informally with models to determine whether or not two shapes are congruent.	Instructor's Guide: 3, 143, 178

Expectation C

Identify and describe line and rotational symmetry in two- and three-dimensional shapes and designs.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
*1. Identify and describe the line symmetry of two-dimensional shapes.	Instructor's Guide: 28, 57, 108

Standard IV

Use visualization, spatial reasoning, and geometric modeling to solve problems.

Expectation A

Build and draw geometric objects.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
*1. Create representations of points, lines (intersecting, perpendicular, and parallel), line segments (including intersecting and parallel), rays, and angles in a plane.	Instructor's Guide: 45, 135
*2. Build and draw two-dimensional geometric objects.	Instructor's Guide: 15, 45, 57, 93, 111, 135, 142, 176, 178

Expectation B

Create and describe mental images of objects, patterns, and paths.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Identify two-dimensional shapes given a verbal description.	Instructor's Guide: 15, 45, 57, 93, 111, 135, 142, 176, 178
2. Describe the path that results from following specific directions in moving from one location to another.	Instructor's Guide: 51, 61, 66

Expectation C

Identify and build a three-dimensional object from two-dimensional representations of that object.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Identify and build a cube from its two-dimensional representation (net).	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 8</i> and <i>Math to Know.</i>)

Expectation D

Identify and build a two-dimensional representation of a three-dimensional object.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Identify and build a two-dimensional representation (net) of a cube.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 8</i> and <i>Math to Know.</i>)

Measurement

Standard I

Understand measurable attributes of objects and the units, systems, and processes of measurement.

Expectation A

Understand such attributes as length, area, weight, volume, and size of angle and select the appropriate type of unit for measuring each attribute.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Use a variety of objects to measure length (e.g., width, height, perimeter), volume, weight/mass, and area (e.g., cubes, grid, paper, string, squares).	Instructor's Guide: 13, 20, 27, 30, 50, 52, 80, 100, 110, 113, 133, 156, 160, 161
*2. Compare the size of a given angle with a right angle (<i>greater than, less than, or equal to</i>) and classify as obtuse, acute, or right.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 4.</i>)
*3. Develop strategies and determine perimeters of polygons.	Instructor's Guide: 27, 100, 133, 156
4. Select appropriate units of measurement—length, weight/mass, and time—and explain the basis for the selection.	Instructor's Guide: 13, 30, 38, 50, 52, 63, 72, 80, 88, 110, 125, 148, 155

Expectation B

Understand the need for measuring with standard units and become familiar with standard units in the customary and metric systems.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Explain the need for measuring with standard units.	Instructor's Guide: 13, 17, 20, 30, 50, 52, 63, 80, 110, 113, 128, 148, 155, 160, 166
*2. Use metric and U.S. customary units to measure length (inches, feet, yards, centimeters, and meters), liquid volume (cups, pints, quarts, gallons, and liters), temperature (degrees Fahrenheit, degrees Celsius), and weight/mass (ounces, pounds, grams, and kilograms).	Instructor's Guide: 13, 17, 20, 30, 50, 52, 63, 80, 110, 113, 128, 148, 155, 160, 166

Standard II

Apply appropriate techniques, tools, and formulas to determine measurements.

Expectation B

Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Determine an appropriate measurement unit to measure time, length, weight, and volume (e.g., student chooses centimeters instead of meters to measure a pencil).	Instructor's Guide: 13, 17, 30, 38, 50, 52, 63, 72, 80, 88, 110, 113, 125, 148, 155, 160, 166
*2. Select and use an appropriate tool to measure time (minutes or larger), length (centimeters, meters, inches, feet, yards), mass/weight (grams, kilograms, ounces, pounds), and liquid volume (cups and fractional parts, liters and fractional parts).	Instructor's Guide: 13, 17, 30, 38, 50, 52, 63, 72, 80, 88, 110, 113, 125, 148, 155, 160, 166
3. Read temperature to the nearest degree from a Celsius thermometer and from a Fahrenheit thermometer.	Instructor's Guide: 128
4. Estimate 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, and normal body temperature is about 37°C and 98.6°F).	Instructor's Guide: 128

Expectation C

Select and use benchmarks to estimate measurements.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Develop a sense for measurement by using appropriate benchmarks (e.g., the distance from the elbow to the index finger is about a foot, a paper clip is about a gram).	Instructor's Guide: 13, 50, 52, 80, 160

Expectation D

Develop, understand, and use formulas to find the area of rectangles and related triangles and parallelograms.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Use concrete and graphic models to find areas of common two-dimensional shapes.	Instructor's Guide: 27, 133, 161

Data Analysis and Probability

Standard I

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

Expectation A

Design investigations to address a question and consider how data-collection methods affect the nature of the data set.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Write questions about objects and events that can be investigated by collecting data.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5</i> and <i>Math to Know</i> .)

Expectation B

Collect data using observations, surveys, and experiments.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Collect data using observations.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5</i> and <i>Math to Know</i> .)

Expectation C

Represent data using tables and graphs such as line plots, bar graphs, and line graphs.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
*1. Construct line (dot) plots for data sets.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5</i> and <i>Math to Know</i> .)

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
*2. Read and interpret information from tables, pictographs, bar graphs, and line (dot) plots.	Instructor's Guide: 25

Expectation D

Recognize the differences in representing categorical and numerical data.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Define and give examples of categorical data.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5</i> and <i>Math to Know</i> .)

Standard II

Select and use appropriate statistical methods to analyze data.

Expectation A

Describe the shape and important features of a set of data and compare related data sets, with an emphasis on how the data are distributed.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Describe the shape of a line (dot) plot or bar graph of a numerical data set (i.e., where the data are concentrated, values for which there are no data, the range, and data points with unusual values).	Instructor's Guide: 25

Expectation B

Use measures of center, focusing on the median, and understand what each does and does not indicate about the data set.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
*1. Find the median and mode of a data set and explain what each indicates about the data set.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6</i> and <i>Math to Know</i> .)

Expectation C

Compare different representations of the same data and evaluate how well each representation shows important aspects of the data.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Compare the tabular, line (dot) plot, and bar graph representations of a given data set and explain the benefits of each.	Instructor's Guide: 25

Standard III

Develop and evaluate inferences and predictions that are based on data.

Expectation A

Propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
1. Use line (dot) plots and bar graphs to make conjectures about populations based on data sets.	Instructor's Guide: 25

Standard IV

Understand and apply basic concepts of probability.

Expectation A

Describe events as likely or unlikely and discuss the degree of likelihood using such words as *certain*, *equally likely*, and *impossible*.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
*1. Identify common events as likely, unlikely, certain, or impossible.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6</i> and <i>Math to Know</i> .)

Expectation B

Predict the probability of outcomes of simple experiments and test the predictions.

Grade 3 Standards	Afterschool Achievers: Math Club, Grade 3
*1. Record the possible outcomes for a simple event (e.g., tossing a coin) and systematically keep track of the outcomes when the event is repeated many times.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6</i> and <i>Math to Know</i> .)



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Grade 4

Number and Operations

Standard I

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

Expectation A

Understand the place-value structure of the base-ten number system and be able to represent and compare whole numbers and decimals.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Explain the place value structure of whole numbers including periods (thousands, millions, billions, etc.).	Instructor's Guide: 22, 27, 38, 48, 58, 62, 98, 103, 173, 174, 179
*2. Compare decimals (through hundredths) using symbols (>, <, and =) and words (<i>is greater than, is less than, and equals</i>).	Instructor's Guide: 175

Expectation B

Recognize equivalent representations for the same number and generate them by decomposing and composing numbers.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Write whole numbers in standard form, in expanded form, and in words.	Instructor's Guide: 95

Expectation C

Develop understanding of fractions as parts of unit wholes, as parts of a collection, as locations on number lines, and as divisions of whole numbers.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Describe fractional parts of collections of objects.	Instructor's Guide: 82, 113, 132, 133
2. Locate points on a number line corresponding to a unit fraction and its multiples between 0 and 1.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5.</i>)

Expectation D

Use models, benchmarks, and equivalent forms to judge the size of fractions.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Relate the size of fractions to the benchmark fractions of 0, $\frac{1}{2}$, and 1.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5.</i>)
2. Compare concrete or pictorial models of fractions using the symbols $>$, $<$, and $=$	Instructor's Guide: 150

Expectation E

Recognize and generate equivalent forms of commonly used fractions, decimals, and percents.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Write equivalent forms of commonly used fractions.	Instructor's Guide: 113, 144, 150, 154
2. Write equivalent forms of decimals.	Instructor's Guide: 147
*3. Identify and represent common fraction-decimal equivalents.	Instructor's Guide: 133, 145

Expectation F

Explore numbers less than 0 by extending the number line and through familiar applications.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Identify situations in which numbers less than 0 are used.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5.</i>)

Expectation G

Describe classes of numbers according to characteristics such as the nature of their factors.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
*1. Determine the factors of a given number up to 50.	Instructor's Guide: 13, 20, 35, 39, 68, 92, 108, 119, 124, 129, 148, 162, 168
*2. Determine common multiples of pairs of whole numbers each of which is less than or equal to 12.	Instructor's Guide: 45, 111, 126

Standard II

Understand meanings of operations and how they relate to one another.

Expectation A

Understand various meanings of multiplication and division.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Explain the meaning of a remainder.	Instructor's Guide: 84, 141, 142, 146, 151, 156, 161, 166, 171, 176

Expectation B

Understand the effects of multiplying and dividing whole numbers.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Explain the effect on the product when one of the factors is changed.	Instructor's Guide: 68, 108
2. Compare the size of the quotient to the dividend when dividing two whole numbers.	Instructor's Guide: 59, 64, 69, 74, 79, 93, 134, 139

Expectation C

Identify and use relationships between operations, such as division as the inverse of multiplication, to solve problems.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
*1. Use the inverse relationships between multiplication and division to solve problems.	Instructor's Guide: 92, 167, 172

Expectation D

Understand and use properties of operations, such as the distributivity of multiplication over addition.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Recognize commutativity in the multiplication facts.	Instructor's Guide: 67, 90
*2. Use the associative and distributive properties to multiply efficiently.	Instructor's Guide: 67, 115
3. Apply divisibility rules for 2, 5, and 10.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5.</i>)

Standard III

Compute fluently and make reasonable estimates.

Expectation A

Develop fluency with basic number combinations for multiplication and division and use these combinations to mentally compute related problems, such as 30×50 .

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Use basic number combinations to compute related problems in multiplication and division using multiples of 100 and 1,000.	Instructor's Guide: 65

Expectation B

Develop fluency in adding, subtracting, multiplying, and dividing whole numbers.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
*1. Construct and analyze algorithms for all operations on whole numbers.	Instructor's Guide: 77, 104, 109, 114, 141, 146, 151, 156, 161, 166, 169, 171, 176
*2. Demonstrate fluency in the use of a multiplication algorithm and explain the steps involved.	Instructor's Guide: 44, 65, 68, 108, 124, 129

Expectation C

Develop and use strategies to estimate the results of whole-number computations and to judge the reasonableness of such results.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Round whole numbers to the nearest 10,000, 100,000, and 1,000,000.	Instructor's Guide: 62
*2. Estimate and determine the reasonableness of the product of whole numbers (one factor with two digits or less and the other factor with three digits or less).	Instructor's Guide: 100, 124, 129, 177
3. Estimate the quotient of whole numbers with a one-digit divisor, a two-digit divisor, and multiples of 10 and determine the reasonableness of results.	Instructor's Guide: 134, 177
4. Refine estimates using terms such as <i>closer to</i> , <i>between</i> , and <i>a little more than</i> .	Instructor's Guide: 102

Expectation D

Develop and use strategies to estimate computations involving fractions and decimals in situations relevant to students' experience.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Round decimals to the nearest tenth and hundredth.	Instructor's Guide: 178
2. Develop and use strategies to estimate sum and difference of decimals.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5.</i>)

Expectation E

Use visual models, benchmarks, and equivalent forms to add and subtract commonly used fractions and decimals.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Add and subtract decimals through hundredths using concrete and pictorial models.	Instructor's Guide: 165

Expectation F

Select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tool.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
*1. Explain why a particular method or tool may be the most appropriate one to use in solving a given problem.	Instructor's Guide: 97, 177

Algebra

Standard I

Understand patterns, relations, and functions.

Expectation A

Describe, extend, and make generalizations about geometric and numeric patterns.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Using models and calculators, create, extend, and analyze numeric patterns (including decimal patterns through thousandths).	Instructor's Guide: 7, 16, 21, 31, 65, 78, 91

Expectation B

Represent and analyze patterns and functions, using words, tables, and graphs.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Describe and represent number relationships with tables.	Instructor's Guide: 140
*2. Determine the rule to identify missing numbers in a sequence or a table.	Instructor's Guide: 140

Standard II

Represent and analyze mathematical situations and structures using algebraic symbols.

Expectation B

Represent the idea of a variable as an unknown quantity using a letter or a symbol.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Use variables to represent an unknown quantity using a letter or a symbol.	Instructor's Guide: 40, 96, 140, 152, 167, 172

Expectation C

Express mathematical relationships using equations.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
*1. Use equations to represent relationships.	Instructor's Guide: 52, 152, 167, 172

Standard IV

Analyze change in various contexts.

Expectation A

Investigate how a change in one variable relates to a change in a second variable.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Describe how a rate of growth varies over time.	No specific lesson addresses this standard. (See <i>Math to Know</i> .)

Expectation B

Identify and describe situations with constant or varying rates of change and compare them.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
*1. Using charts and graphs, describe changes over time as increasing, decreasing, and varying.	No specific lesson addresses this standard. (See <i>Math to Know</i> .)

Geometry

Standard I

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Expectation A

Identify, compare, and analyze attributes of two- and three-dimensional shapes and develop vocabulary to describe the attributes.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
*1. Choose appropriate models of two- and three-dimensional shapes from descriptions of attributes.	Instructor's Guide: 3, 28, 60, 110, 137, 158

Expectation B

Classify two- and three-dimensional shapes according to their properties and develop definitions of classes of shapes such as triangles and pyramids.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
*1. Classify triangles by lengths of sides (scalene, isosceles, and equilateral) and sizes of angles (acute, obtuse, and right).	Instructor's Guide: 3, 110

Expectation C

Investigate, describe, and reason about the results of subdividing, combining, and transforming shapes.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Subdivide two-dimensional shapes to form new shapes and draw conclusions about area and fractional relationships.	Instructor's Guide: 35, 88, 107, 120, 145, 150

Expectation E

Make and test conjectures about geometric properties and relationships and develop logical arguments to justify conclusions.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Using models and mathematical vocabulary, make and test conjectures about geometric properties and relationships and explain the conclusions.	Instructor's Guide: 3, 28, 42, 60, 110, 137, 158

Standard II

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Expectation A

Describe location and movement using common language and geometric vocabulary.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Describe location and movement using common language and geometric vocabulary and illustrate both with and without technology.	Instructor's Guide: 135

Expectation B

Make and use coordinate systems to specify locations and to describe paths.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
*1. Investigate possible paths from one point to another along vertical and horizontal gridlines.	Instructor's Guide: 135
2. Identify and name points on a coordinate grid using an ordered pair of whole numbers.	Instructor's Guide: 135

Standard III

Apply transformations and use symmetry to analyze mathematical situations.

Expectation A

Predict and describe the results of sliding, flipping, and turning two-dimensional shapes.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Using models, describe the results of translations (slides), reflections (flips), and rotations (turns).	Instructor's Guide: 163
2. Using models and technology, create simple tessellations.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 3.</i>)

Expectation B

Describe a motion or a series of motions that will show that two shapes are congruent.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
*1. Draw two-dimensional shapes that are related by translation (slide) or reflection (flip).	Instructor's Guide: 163
2. Given a shape and its translation (slide) or reflection (flip), describe the motion that has been applied.	Instructor's Guide: 163

Standard IV

Use visualization, spatial reasoning, and geometric modeling to solve problems.

Expectation A

Build and draw geometric objects.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
*1. Draw and label representations of points, lines, line segments, rays, and angles, using mathematical notation.	Instructor's Guide: 43, 82, 85, 153

Expectation B

Create and describe mental images of objects, patterns, and paths.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
*1. Write a description of a given three-dimensional object.	Instructor's Guide: 28, 60
2. Describe a path along grid lines from one point to another.	Instructor's Guide: 135
3. Given a verbal description, draw two- or three-dimensional objects.	Instructor's Guide: 3, 28, 158

Expectation C

Identify and build a three-dimensional object from two-dimensional representations of that object.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
*1. Identify and build rectangular prisms and cylinders from a given two-dimensional representation (net).	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 8</i> and <i>Math to Know</i> .)

Expectation D

Identify and build a two-dimensional representation of a three-dimensional object.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Identify and build a two-dimensional representation (net) of a given rectangular prism.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 8</i> and <i>Math to Know</i> .)

Expectation F

Recognize geometric ideas and relationships and apply them to other disciplines and to problems that arise in the classroom or in everyday life.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Connect geometry to other areas of mathematics, to other disciplines, and to the world outside the classroom.	Instructor's Guide: 60

Measurement

Standard I

Understand measurable attributes of objects and the units, systems, and processes of measurement.

Expectation A

Understand such attributes as length, area, weight, volume, and size of angle and select the appropriate type of unit for measuring each attribute.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Apply counting procedures to estimate measurements of length, area, volume, and weight/mass.	Instructor's Guide: 5, 30, 55

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
*2. Investigate and compare angle measures using models and manipulatives with angles of measure 45 degrees, 90 degrees, and 180 degrees.	Instructor's Guide: 82, 85, 153
*3. Using models, find the area of geometric shapes.	Instructor's Guide: 35, 88, 137
4. Select units appropriate for the attributes being measured (length and area) and explain the basis for the selection.	Instructor's Guide: 5, 8, 30, 55, 82

Expectation C

Carry out simple unit conversions, such as from centimeters to meters, within a system of measurement.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
*1. Convert units of measure within the metric system: length (centimeters, meters, kilometers), mass (grams, kilograms), and capacity (milliliters, liters); and within the customary system: length (inches, feet, yards), weight (ounces, pounds), and liquid volume (cups, pints, quarts, gallons).	Instructor's Guide: 8, 73, 82
2. Convert units of time including days, hours, minutes, and seconds.	Instructor's Guide: 32, 82, 105, 123, 130

Standard II

Apply appropriate techniques, tools, and formulas to determine measurements.

Expectation C

Develop strategies for estimating the perimeters, areas, and volumes of irregular shapes.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Develop and describe strategies for estimating the area and perimeter of irregular shapes using manipulatives (e.g., geoboards, square tiles, graphic representations).	Instructor's Guide: 35, 88

Expectation B

Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Estimate the distance to objects or places and determine the amounts of various units of time (minutes, hours, days, weeks, etc.) it will take to reach these objects or places.	No specific lesson addresses this standard.
*2. Select and use an appropriate tool to measure liquid volume including pints and quarts.	Instructor's Guide: 33, 55
3. Determine the amount of elapsed time in hours and minutes within a twelve-hour period.	Instructor's Guide: 105, 123, 130
*4. Using analog and digital clocks, tell time to the nearest minute and to the nearest five-minute interval, including use of A.M. and P.M.	Instructor's Guide: 32, 82
5. Determine temperature changes during time intervals from a Celsius thermometer and a Fahrenheit thermometer.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 3.</i>)

Expectation D

Develop, understand, and use formulas to find the area of rectangles and related triangles and parallelograms.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
*1. Use concrete and graphic models to discover formulas for finding the area of common two-dimensional shapes.	Instructor's Guide: 88

Data Analysis and Probability

Standard I

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

Expectation A

Design investigations to address a question and consider how data-collection methods affect the nature of the data set.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Develop strategies for administering a simple survey to obtain unbiased results.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5.</i>)

Expectation B

Collect data using observations, surveys, and experiments.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Systematically collect data using surveys.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5.</i>)

Expectation C

Represent data using tables and graphs such as line plots, bar graphs, and line graphs.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
*1. Construct bar graphs for collected data sets with scale increments of one or greater.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5.</i>)
*2. Read and interpret information from tables, line graphs, and bar graphs.	Instructor's Guide: 31, 91, 140

Expectation D

Recognize the differences in representing categorical and numerical data.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Describe types of graphs that may be used to represent categorical data.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5.</i>)
2. Describe types of graphs that may be used to represent numerical data.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5.</i>)

Standard II

Select and use appropriate statistical methods to analyze data.

Expectation A

Describe the shape and important features of a set of data and compare related data sets, with an emphasis on how the data are distributed.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Compare the shapes of graphs of two different numerical data sets that address the same question for different populations.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5.</i>)

Expectation B

Use measures of center, focusing on the median, and understand what each does and does not indicate about the data set.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Use the mode to describe a set of categorical data.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6 and Math to Know.</i>)

Expectation C

Compare different representations of the same data and evaluate how well each representation shows important aspects of the data.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Compare the line graph and bar graph representations of a given data set and explain the benefits of each.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5.</i>)

Standard III

Develop and evaluate inferences and predictions that are based on data.

Expectation A

Propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
*1. Use line graphs to make conjectures about populations based on data sets.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 5.</i>)

Standard IV

Understand and apply basic concepts of probability.

Expectation A

Describe events as likely or unlikely and discuss the degree of likelihood using such words as *certain*, *equally likely*, and *impossible*.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Record the outcomes of a multiple-stage event (e.g., tossing two coins), explain the method used, and determine whether the outcomes are equally likely.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6</i> and <i>Math to Know.</i>)

Expectation B

Predict the probability of outcomes of simple experiments and test the predictions.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
1. Using models, determine the probability of a given simple event.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6</i> and <i>Math to Know.</i>)
2. Construct tree diagrams to list the possible outcomes for multiple-stage events (e.g., tossing two coins).	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6</i> and <i>Math to Know.</i>)

Expectation C

Understand that the measure of the likelihood of an event can be represented by a number from 0 to 1.

Grade 4 Standards	Afterschool Achievers: Math Club, Grade 4
*1. Give examples of events for which the probability is a fraction between 0 and 1 inclusive and explain.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6</i> and <i>Math to Know</i> .)



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correlated to
South Carolina Mathematics Curriculum Standards
Grade 5

Number and Operations

Standard I

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

Expectation A

Understand the place-value structure of the base-ten number system and be able to represent and compare whole numbers and decimals.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Describe the place value structure of decimals.	Instructor's Guide: 20, 77, 152, 157, 172
2. Read and write decimals.	Instructor's Guide: 152, 157, 172
*3. Order lists of three or more numbers that contain whole numbers, decimals, or both.	Instructor's Guide: 20, 77, 157

Expectation B

Recognize equivalent representations for the same number and generate them by decomposing and composing numbers.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Write decimals (ten thousandths) in standard form, in expanded form, and in words.	Instructor's Guide: 172

Expectation C

Develop understanding of fractions as parts of unit wholes, as parts of a collection, as locations on number lines, and as divisions of whole numbers.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Name and write mixed numbers and improper fractions shown in concrete and pictorial models.	Instructor's Guide: 44, 65, 169, 173
2. Locate points on a number line corresponding to mixed numbers and improper fractions.	Instructor's Guide: 121
3. Explain the relationship between fractions and division.	Instructor's Guide: 27, 44, 87, 91, 178

Expectation D

Use models, benchmarks, and equivalent forms to judge the size of fractions.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Relate the size of fractions to the benchmark fractions 0, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, and 1.	Instructor's Guide: 121
*2. Compare fractions using symbols ($>$, $<$, and $=$) and words (<i>is greater than</i> , <i>is less than</i> , and <i>equals</i>).	Instructor's Guide: 27, 121, 157

Expectation E

Recognize and generate equivalent forms of commonly used fractions, decimals, and percents.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Represent fractions as decimals and percents using concrete and pictorial models.	Instructor's Guide: 27, 28, 58, 87, 91, 178
*2. Identify equivalent relationships among fractions, decimals, and percents such as $\frac{1}{4} = .25 = 25\%$, $\frac{1}{3} = 33\frac{1}{3}\%$, $\frac{2}{5} = .40 = 40\%$, $\frac{1}{2} = .50 = 50\%$, and $\frac{3}{4} = .75 = 75\%$.	Instructor's Guide: 27, 28, 58, 87, 91, 178

Expectation F

Explore numbers less than 0 by extending the number line and through familiar applications.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Describe numbers less than 0 using real world models.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6.</i>)

Expectation G

Describe classes of numbers according to characteristics such as the nature of their factors.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Identify a number as prime, composite, or neither.	Instructor's Guide: 7, 41, 67, 70, 120, 168, 180
*2. Explain the characteristics of prime numbers and composite numbers.	Instructor's Guide: 7, 41, 67, 70, 120, 168, 180
*3. Determine the least common multiple of two whole numbers.	Instructor's Guide: 11, 45, 101, 106

Standard II

Understand meanings of operations and how they relate to one another.

Expectation A

Understand various meanings of multiplication and division.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Solve problems using multiplication and division.	Instructor's Guide: 7, 19, 24, 29, 34, 39, 42, 46, 50, 53, 59, 62, 64, 68, 69, 74, 75, 79, 82, 93, 100, 114, 117, 124, 163

Expectation B

Understand the effects of multiplying and dividing whole numbers.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Describe and explain the effect on the product when both factors are changed.	Instructor's Guide: 59, 114
2. Describe and explain the effect on the quotient when the divisor is changed.	Instructor's Guide: 62, 64, 69, 74, 79

Expectation C

Identify and use relationships between operations, such as division as the inverse of multiplication, to solve problems.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Describe the relationships among the four operations.	Instructor's Guide: 17, 40, 57
2. Solve multiplication problems such as rates and applications of the Fundamental Counting Principle.	Instructor's Guide: 151

Expectation D

Understand and use properties of operations, such as the distributivity of multiplication over addition.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Apply the divisibility rules for 3, 6, and 9.	Instructor's Guide: 6, 21

Standard III

Compute fluently and make reasonable estimates.

Expectation B

Develop fluency in adding, subtracting, multiplying, and dividing whole numbers.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Find the quotient and a remainder given a dividend of four digits or less and a divisor of two digits or less.	Instructor's Guide: 34, 42, 62, 64, 69, 74, 75, 79, 82, 93
*2. Demonstrate fluency in the use of a division algorithm and explain the steps involved.	Instructor's Guide: 34, 42, 62, 64, 69, 74, 75, 79, 82, 93
3. Explain computational strategies used to solve mathematical problem situations.	Instructor's Guide: 50, 75

Expectation C

Develop and use strategies to estimate the results of whole-number computations and to judge the reasonableness of such results.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Use estimation as a tool for judging the reasonableness of calculator, mental, and paper-and-pencil computations.	Instructor's Guide: 13, 25, 33, 53, 68, 74, 75, 78, 79, 93, 100, 118, 124, 147, 148, 163
*2. Apply a variety of computational estimation strategies to solve problems involving whole numbers.	Instructor's Guide: 13, 25, 33, 53, 68, 74, 75, 78, 79, 93, 100, 118, 124, 147, 148, 163

Expectation D

Develop and use strategies to estimate computations involving fractions and decimals in situations relevant to students' experience.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Round decimals to the nearest tenth, hundredth, and thousandth.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6.</i>)
2. Estimate the sum and difference of decimals through thousandths and determine the reasonableness of the results.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6.</i>)

Expectation E

Use visual models, benchmarks, and equivalent forms to add and subtract commonly used fractions and decimals.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Add and subtract commonly used fractions using concrete models, pictorial models, and equivalent forms.	Instructor's Guide: 47, 89, 125, 133, 144, 155, 160, 169
2. Multiply commonly used fractions (including decimals) using area models.	Instructor's Guide: 122, 139, 159
3. Relate connections between products of fractions and products of decimals using area models.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6.</i>)
*4. Add and subtract decimals through thousandths.	Instructor's Guide: 54, 104, 129, 174

Expectation F

Select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tool.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Create and solve problems involving addition, subtraction, multiplication, and division of whole numbers using appropriate methods and tools.	Instructor's Guide: 32, 42, 117

Algebra

Standard I

Understand patterns, relations, and functions.

Expectation A

Describe, extend, and make generalizations about geometric and numeric patterns.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Using models and calculators, analyze and extend numeric and geometric patterns such as triangular numbers, perfect squares, and arithmetic sequences.	Instructor's Guide: 121, 149, 168
2. Find the missing elements in numeric and nonnumeric patterns.	Instructor's Guide: 176

Expectation B

Represent and analyze patterns and functions, using words, tables, and graphs.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Represent and analyze patterns and functions using words, tables, and graphs.	Instructor's Guide: 51, 56, 66, 71, 76, 151, 176
2. Analyze, describe, and use function rules to make generalizations.	Instructor's Guide: 51, 56, 66, 71, 76, 151, 176

Standard II

Represent and analyze mathematical situations and structures using algebraic symbols.

Expectation B

Represent the idea of a variable as an unknown quantity using a letter or a symbol.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Use variables to write a mathematical expression in symbolic form.	Instructor's Guide: 17, 40, 51, 56, 57, 66, 71, 76, 83, 103, 151

Expectation C

Express mathematical relationships using equations.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Use a variable to write an open sentence representing a given mathematical relationship.	Instructor's Guide: 17, 40, 51, 56, 57, 66, 71, 76, 83, 103, 151

Standard III

Use mathematical models to represent and understand quantitative relationships.

Expectation A

Model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Use a single variable to create a problem situation based on a given open sentence.	Instructor's Guide: 17, 40, 51, 56, 57, 66, 71, 76, 83, 103, 151

Standard IV

Analyze change in various contexts.

Expectation A

Investigate how a change in one variable relates to a change in a second variable.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Describe the relationship among distance, speed, and time.	No specific lesson addresses this standard.

Expectation B

Identify and describe situations with constant or varying rates of change and compare them.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Create charts and graphs to show change over time.	Instructor's Guide: 151, 156, 176
2. Represent situations with number tables, graphs, and verbal descriptions.	Instructor's Guide: 151, 156, 176
*3. Associate tables, graphs, and stories of the same event.	Instructor's Guide: 151, 156, 176

Geometry

Standard I

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Expectation A

Identify, compare, and analyze attributes of two- and three-dimensional shapes and develop vocabulary to describe the attributes.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Using models and appropriate vocabulary, compare and analyze attributes of polygons, attributes of polyhedra, and attributes of cones and cylinders.	Instructor's Guide: 10, 22, 35, 60, 63, 102, 110, 115, 128, 138, 140, 141, 153

Expectation B

Classify two- and three-dimensional shapes according to their properties and develop definitions of classes of shapes such as triangles and pyramids.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Using models and appropriate vocabulary classify quadrilaterals, polyhedra, cones, and cylinders according to their attributes.	Instructor's Guide: 10, 22, 35, 60, 63, 102, 110, 115, 128, 138, 140, 141, 153
2. Develop definitions for classes of two- and three-dimensional shapes.	Instructor's Guide: 10, 22, 35, 60, 63, 102, 110, 115, 128, 138, 140, 141, 153

Expectation D

Explore congruence and similarity.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Compare two-dimensional shapes to determine if they are similar by transformations of magnifying or shrinking.	No specific lesson addresses this standard.

Expectation E

Make and test conjectures about geometric properties and relationships and develop logical arguments to justify conclusions.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Make and test conjectures about geometric properties and relationships and then develop logical arguments to justify the conclusions.	Instructor's Guide: 10, 60

Standard II

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Expectation B

Make and use coordinate systems to specify locations and to describe paths.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Using ordered pairs of numbers, locate and name points in the first quadrant of a coordinate system.	Instructor's Guide: 135, 151, 156, 176

Expectation C

Find the distance between points along horizontal and vertical lines of a coordinate system.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Find the distance between points in the first quadrant of a coordinate system along horizontal and vertical lines.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 7.</i>)

Standard III

Apply transformations and use symmetry to analyze mathematical situations.

Expectation A

Predict and describe the results of sliding, flipping, and turning two-dimensional shapes.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Predict the results of geometric motion of shapes including combinations of translations (slides), reflections (flips), and rotations (turns).	Instructor's Guide: 146

Expectation B

Describe a motion or a series of motions that will show that two shapes are congruent.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Describe series of motions that may be used to show that two shapes are congruent.	Instructor's Guide: 146

Expectation C

Identify and describe line and rotational symmetry in two- and three-dimensional shapes and designs.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Determine whether given two-dimensional shapes and designs have rotational symmetry.	No specific lesson addresses this standard. (See <i>Math at Hand</i> .)
2. Investigate and describe symmetry and congruence of shapes drawn on a grid.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6</i> .)

Standard IV

Use visualization, spatial reasoning, and geometric modeling to solve problems.

Expectation A

Build and draw geometric objects.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Build and draw three-dimensional objects.	Instructor's Guide: 10, 60

Expectation B

Create and describe mental images of objects, patterns, and paths.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Sketch the front, top, and side views of a model of a three-dimensional shape built with cubes.	No specific lesson addresses this standard. (See <i>Math at Hand</i> .)

Measurement

Standard I

Understand measurable attributes of objects and the units, systems, and processes of measurement.

Expectation A

Understand such attributes as length, area, weight, volume, and size of angle and select the appropriate type of unit for measuring each attribute.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Using models, investigate and describe the measure of circumference of a circle as length.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6</i> .)
2. Identify, describe, and draw right, acute, and obtuse angles.	Instructor's Guide: 85, 102, 110, 123, 128, 140
3. Using models, create examples of polygons with a given area and explain.	No specific lesson addresses this standard. (See <i>Math at Hand</i> .)
*4. Using models, create examples of right prisms with a given volume and explain.	No specific lesson addresses this standard. (See <i>Math at Hand</i> .)
5. Select units appropriate for the attributes being measured (length, area, and volume) and explain the basis for the selection.	Instructor's Guide: 5, 30, 158, 175

Expectation D

Understand that measurements are approximations and understand how differences in units affect precision.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Describe factors that affect precision such as the limitations of the measuring tool, the scale on the measuring instrument, and the need for accuracy.	Instructor's Guide: 2, 55, 143

Expectation E

Explore what happens to measurements of a two-dimensional shape such as its perimeter and area when the shape is changed in some way.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Compare changes in area and changes in total perimeter when shapes are combined or subdivided.	Instructor's Guide: 127
2. Construct models to demonstrate the effect of holding one variable constant while changing the value of another variable such as building rectangles with varying perimeters and constant areas.	Instructor's Guide: 127

Standard II

Apply appropriate techniques, tools, and formulas to determine measurements.

Expectation C

Develop strategies for estimating the perimeters, areas, and volumes of irregular shapes.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Compare and evaluate different strategies for estimating area and perimeter of irregular shapes.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6.</i>)
2. Develop and describe strategies for estimating volumes of irregular shapes.	No specific lesson addresses this standard.

Expectation B

Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Select and use appropriate tools and units to measure given items to an indicated precision (time in seconds through years; length in millimeters through kilometers, one-eighth of an inch through miles; liquid volume in milliliters through liters, ounces through gallons; mass/weight in milligrams through kilograms, ounces through pounds).	Instructor's Guide: 2, 5, 8, 30, 38, 55, 73, 88, 96, 101, 105, 106, 108, 116, 121, 126, 130, 131, 143, 170
*2. Determine an amount of elapsed time in hours, minutes, and seconds within a 24-hour period.	Instructor's Guide: 105, 108, 126, 130, 131
*3. Using a protractor, measure angles between 0 and 180 degrees inclusive.	Instructor's Guide: 123, 128

Expectation D

Develop, understand, and use formulas to find the area of rectangles and related triangles and parallelograms.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Investigate and solve problems involving area, using concrete, graphic or pictorial models to identify patterns and develop formulas for determining area.	Instructor's Guide: 103, 127, 175
*2. Describe and determine the area of rectangles and related triangles and parallelograms.	Instructor's Guide: 127, 175

Expectation E

Develop strategies to determine the surface areas and volumes of rectangular solids.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Using models, develop and describe strategies for determining the volume and surface area of rectangular solids.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6.</i>)

Data Analysis and Probability

Standard I

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

Expectation A

Design investigations to address a question and consider how data-collection methods affect the nature of the data set.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Compare data sets collected in different ways to address a given question and then determine how the methods of collection affected the data sets.	Instructor's Guide: 156

Expectation B

Collect data using observations, surveys, and experiments.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Collect data using observations, surveys, and experiments.	Instructor's Guide: 161

Expectation C

Represent data using tables and graphs such as line plots, bar graphs, and line graphs.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Determine appropriate horizontal and vertical scales for data sets and then how to represent zero on a graph.	Instructor's Guide: 151, 156, 161, 166, 176
*2. Construct and interpret tables and line graphs for data sets from applied situations.	Instructor's Guide: 56, 76, 151, 156, 176
3. Explain what type of graph may be appropriate for a given data set.	Instructor's Guide: 151, 156, 161, 166, 176

Expectation D

Recognize the differences in representing categorical and numerical data.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Compare the types of graphs that may be used for categorical data with the types that may be used for numerical data.	Instructor's Guide: 151, 156, 161, 166, 176

Standard II

Select and use appropriate statistical methods to analyze data.

Expectation A

Describe the shape and important features of a set of data and compare related data sets, with an emphasis on how the data are distributed.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Describe the features of a data set, including measures of center, range, and outliers.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6.</i>)

Expectation B

Use measures of center, focusing on the median, and understand what each does and does not indicate about the data set.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Find the mean, median, and mode of a numerical data set and explain what each indicates about the data set.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6.</i>)

Expectation C

Compare different representations of the same data and evaluate how well each representation shows important aspects of the data.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Compare the different types of graphs (bar graph, line [dot] plot, line graph and pictograph) to represent a given data set and explain the benefits of each.	Instructor's Guide: 151, 156, 161, 166, 176

Standard III

Develop and evaluate inferences and predictions that are based on data.

Expectation A

Propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Make and justify predictions based on data from a variety of applied situations.	Instructor's Guide: 126
2. Consider alternative explanations to the conjectures formed on the basis of presentations of data and then design further studies to test the conjectures.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6.</i>)

Standard IV

Understand and apply basic concepts of probability.

Expectation B

Predict the probability of outcomes of simple experiments and test the predictions.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
*1. Determine the probability of a simple single-stage and a two-stage event.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6.</i>)
2. Create a problem statement involving probability based on information from a given problem situation. (Students will not be required to solve the problem created.)	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6.</i>)

Expectation C

Understand that the measure of the likelihood of an event can be represented by a number from 0 to 1.

Grade 5 Standards	Afterschool Achievers: Math Club, Grade 5
1. Understand when the probability of an event is 0 or 1 and give examples in each case.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6.</i>)
2. Explain why the sum of the probabilities of the outcomes of an experiment must equal 1.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 6.</i>)



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South Carolina Mathematics Curriculum Standards
Grade 6

Number and Operations

Standard I

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

Expectation A

Work flexibly with fractions, decimals, and percents to solve problems.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
*1. Show the relationship among fractions, decimals, and percents.	Instructor's Guide: 26, 44, 59, 62, 76, 104, 105, 151, 156

Expectation B

Compare and order fractions, decimals, and percents efficiently and find their approximate locations on a number line.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Use order symbols to compare two fractions, two decimals, or two percents.	Instructor's Guide: 25, 156

Expectation C

Develop meaning for percents greater than 100 and less than 1.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Use models to represent percents greater than 100 percent and solve problems involving them.	No specific lesson addresses this standard. (See <i>Math on Call</i> .)

Expectation D

Understand and use ratios and proportions to represent quantitative relationships.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Connect the concept of ratio and fractions by determining the equivalence of two ratios.	Instructor's Guide: 9, 30, 100

Expectation E

Develop an understanding of large numbers and recognize and appropriately use exponential, scientific, and calculator notation.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Evaluate powers of ten up to 10^6 .	Instructor's Guide: 51, 96

Expectation F

Use factors, multiples, prime factorization, and relatively prime numbers to solve problems.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Solve problems using prime factorization, common multiples, and common factors and then explain the reasoning used.	Instructor's Guide: 1, 35, 36, 48, 62, 63, 73, 153

Expectation G

Develop meaning for integers and represent and compare quantities with them.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Use integers to describe real-world phenomena in order to develop meanings for integers.	Instructor's Guide: 81, 139, 164

Standard II

Understand meanings of operations and how they relate to one another.

Expectation A

Understand the meaning and effects of arithmetic operations with fractions, decimals, and integers.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Explain the meaning and effects of adding, subtracting, multiplying, and dividing.	Instructor's Guide: 10, 20, 29, 31, 40, 46, 55, 60, 65, 69, 81, 91, 96, 109, 116, 121, 125, 129, 131, 139, 160, 164

Expectation B

Use the associative and commutative properties of addition and multiplication and the distributive property of multiplication over addition to simplify computations with integers, fractions, and decimals.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Apply the commutative, associative, and distributive properties to simplify computations with whole numbers, fractions, and decimals.	Instructor's Guide: 37, 38, 55, 75, 95, 150

Standard III

Compute fluently and make reasonable estimates.

Expectation A

Select appropriate methods and tools for computing with fractions and decimals from among mental computation, estimation, calculators or computers, and paper and pencil, depending on the situation, and apply the selected methods.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Select appropriate methods and tools to solve problems requiring the addition and subtraction of fractions and decimals.	Instructor's Guide: 10, 20, 29, 31, 40, 46, 55, 60, 69, 106, 109, 116, 121, 125, 131

Expectation B

Develop and analyze algorithms for computing with fractions, decimals, and integers and develop fluency in their use.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Using models, divide commonly used fractions (including decimals).	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 7.</i>)
*2. Use models and numbers to develop and analyze algorithms with fractions and decimals.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 7.</i>)
*3. Add, subtract, multiply, and divide fractions (including decimals) to solve a variety of applied and mathematical problems.	Instructor's Guide: 10, 20, 29, 31, 40, 46, 55, 60, 65, 69, 91, 96, 99, 109, 111, 116, 121, 125, 129, 131, 160

Expectation C

Develop and use strategies to estimate the results of rational-number computations and judge the reasonableness of the results.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Estimate the sums and differences of fractions, describe the method used, and determine the reasonableness of results.	Instructor's Guide: 130

Algebra

Standard I

Understand patterns, relations, and functions.

Expectation A

Represent, analyze, and generalize a variety of patterns with tables, graphs, words, and, when possible, symbolic rules.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
*1. Describe, extend, and write rules for a wide variety of patterns.	Instructor's Guide: 18, 28, 149, 171

Standard II

Represent and analyze mathematical situations and structures using algebraic symbols.

Expectation A

Develop an initial conceptual understanding of different uses of variables.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
*1. Use order of operations to evaluate numerical expressions.	Instructor's Guide: 50, 141, 161, 169

Expectation B

Explore relationships between symbolic expressions and graphs of lines, paying particular attention to the meaning of intercept and slope.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Write simple equations and inequalities accurately to represent relationships.	Instructor's Guide: 13, 18, 27, 28, 67, 68, 88, 98

Expectation D

Recognize and generate equivalent forms for simple algebraic expressions and solve linear equations.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Use commutative, associative, and distributive properties to examine equivalence of a variety of simple algebraic expressions.	Instructor's Guide: 37, 150

Standard III

Use mathematical models to represent and understand quantitative relationships.

Expectation A

Model and solve contextualized problems using various representations, such as graphs, tables, and equations.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Use graphs and tables to solve applied problems.	Instructor's Guide: 18, 28, 98

Geometry

Standard I

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Expectation A

Precisely describe, classify, and understand relationships among types of two- and three-dimensional objects using their defining properties.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Compare and contrast prisms, cylinders, and pyramids with the polygons or circles that constitute their faces.	Instructor's Guide: 90, 101, 170, 180

Expectation B

Understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Describe relationships among angles, side lengths, perimeters, and areas of similar polygons.	Instructor's Guide: 170

Expectation C

Create and critique inductive and deductive arguments concerning geometric ideas and relationships, such as congruence, similarity, and the Pythagorean relationship.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Identify and describe point and line symmetry in two-dimensional shapes.	Instructor's Guide: 94
2. Distinguish between similarity and congruence.	Instructor's Guide: 170

Standard II

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Expectation A

Use coordinate geometry to represent and examine the properties of geometric shapes.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Given the coordinates of three vertices of a rectangle or square oriented horizontally or vertically, use the first quadrant of the rectangular coordinate system to locate the other vertex.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 8.</i>)

Expectation B

Use coordinate geometry to examine special geometric shapes, such as regular polygons or those with pairs of parallel or perpendicular sides.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Plot the vertices of squares and rectangles and determine the relationship among the coordinates.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 8.</i>)

Standard III

Apply transformations and use symmetry to analyze mathematical situations.

Expectation A

Describe sizes, positions, and orientations of shapes under informal transformations such as flips, turns, slides, and scaling.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Describe the transformation used to move a polygon from one location to another in the first quadrant.	Instructor's Guide: 52, 53, 58

Expectation B

Examine the congruence, similarity, and line or rotational symmetry of objects using transformations.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
*1. Apply a transformation to a polygon and describe how it has changed.	Instructor's Guide: 52, 53, 58

Standard IV

Use visualization, spatial reasoning, and geometric modeling to solve problems.

Expectation A

Draw geometric objects with specified properties, such as side lengths or angle measures.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Use symbols for parallel lines and perpendicular lines to describe polygons and figures where appropriate.	Instructor's Guide: 79, 94

Expectation B

Use two-dimensional representations of three-dimensional objects to visualize and solve problems such as those involving surface area and volume.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
*1. Given the top, side, and front views, construct a three-dimensional model using cubes.	Instructor's Guide: 101

Expectation E

Recognize and apply geometric ideas and relationships in areas outside the mathematics classroom, such as art, science, and everyday life.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Identify and apply geometric concepts in a variety of practical contexts.	Instructor's Guide: 85, 87, 88, 90, 97, 98, 107, 108, 115, 126, 152, 170, 176, 180

Measurement

Standard I

Understand measurable attributes of objects and the units, systems, and processes of measurement.

Expectation C

Understand, select, and use units of appropriate size and type to measure angles, perimeter, area, surface area, and volume.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Estimate angle measure using 45 degrees, 90 degrees, 180 degrees, 270 degrees, and 360 degrees as referents and use the appropriate tools to measure any angle.	Instructor's Guide: 147
2. Use appropriate units of measure to label angles, perimeter, and area.	Instructor's Guide: 19, 85, 147

Standard II

Apply appropriate techniques, tools, and formulas to determine measurements.

Expectation A

Use common benchmarks to select appropriate methods for estimating measurements.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
*1. Using standard and nonstandard units of measure, estimate and then determine length, weight/mass, area, and volume/capacity.	Instructor's Guide: 85, 87, 88, 97, 98, 107, 108, 115, 126, 142, 147, 152, 176
2. Estimate and justify estimates of perimeter and area of irregular shapes.	Instructor's Guide: 87, 88

Expectation B

Select and apply techniques and tools to accurately find length, area, volume, and angle measures to appropriate levels of precision.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Select and use appropriate tools and units to measure to the degree of accuracy required in a particular situation.	Instructor's Guide: 142, 147

Expectation C

Develop and use formulas to determine the circumference of circles and the area of triangles, parallelograms, trapezoids, and circles and develop strategies to find the area of more-complex shapes.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Investigate and describe the relationship between areas of rectangles and triangles or other quadrilaterals.	Instructor's Guide: 85, 87, 88, 97, 98, 107, 108, 115, 126, 152, 176
*2. Develop and apply the formulas for the area of triangles and parallelograms.	Instructor's Guide: 85, 115, 176

Expectation E

Solve problems involving scale factors, using ratio and proportion.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Use a scale to find distance.	Instructor's Guide: 180

Data Analysis and Probability

Standard I

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

Expectation A

Formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Given a problem situation involving one population, collect, analyze, and interpret data.	Instructor's Guide: 130, 135, 140

Expectation B

Select, create, and use appropriate graphical representations of data, including histograms, box plots, and scatterplots.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Organize and display data in a variety of ways including frequency tables, histograms, and stem-and-leaf plots.	Instructor's Guide: 122, 132, 133, 135, 140

Standard II

Select and use appropriate statistical methods to analyze data.

Expectation A

Find, use, and interpret measures of center and spread, including mean and interquartile range.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Create and solve problems involving the mean, median, mode, and range of a set of data.	Instructor's Guide: 91, 130, 132, 133, 135, 143

Expectation B

Discuss and understand the correspondence between data sets and their graphical representations, especially histograms, stem-and-leaf plots, box plots, and scatterplots.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Interpret histograms and stem-and-leaf plots.	Instructor's Guide: 135
*2. Describe the relationship between a data set and its corresponding histogram or stem-and-leaf plot.	Instructor's Guide: 135

Standard III

Develop and evaluate inferences and predictions that are based on data.

Expectation A

Use observations about differences between two or more samples to make conjectures about the populations from which the samples were taken.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Analyze and list the differences between two data sets.	Instructor's Guide: 135

Standard IV

Understand and apply basic concepts of probability.

Expectation A

Understand and use appropriate terminology to describe complementary and mutually exclusive events.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Identify and describe complementary events.	Instructor's Guide: 132, 133

Expectation B

Use proportionality and a basic understanding of probability to make and test conjectures about the results of experiments and simulations.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Create a sample space for one- or two-stage events and represent it in the form of a list, chart, picture, or tree diagram.	Instructor's Guide: 123, 128
*2. From a given sample space, determine, and interpret the probability of an event.	Instructor's Guide: 122, 123, 127, 128, 132, 133

Expectation C

Compute probabilities for simple compound events, using such methods as organized lists, tree diagrams, and area models.

Grade 6 Standards	Afterschool Achievers: Math Club, Grade 6
1. Making a tree diagram or using models, determine the number of possible outcomes in two-stage events.	Instructor's Guide: 128



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Grade 7

Number and Operations

Standard I

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

Expectation A

Work flexibly with fractions, decimals, and percents to solve problems.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Write and use the appropriate equivalent forms of whole numbers, fractions, decimals, and percents.	Instructor's Guide: 26, 54, 61, 76

Expectation B

Compare and order fractions, decimals, and percents efficiently and find their approximate locations on a number line.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Identify, represent, and find the approximate location of fractions, decimals, percents, and square roots of perfect squares on a number line and then justify the reasoning used.	Instructor's Guide: 119
2. Use order symbols to compare fractions, decimals, percents, and square roots of perfect squares and then justify the reasoning used.	Instructor's Guide: 26, 156

Expectation C

Develop meaning for percents greater than 100 and less than 1.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Use models to represent percents less than 1 percent and solve problems involving them.	No specific lesson addresses this standard. (See <i>Math on Call</i> .)

Expectation D

Understand and use ratios and proportions to represent quantitative relationships.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
*1. Create and write ratios and proportions from applied situations and explain the reasoning used.	Instructor's Guide: 10, 78, 104, 170

Expectation E

Develop an understanding of large numbers and recognize and appropriately use exponential, scientific, and calculator notation.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Translate to standard form a number written in exponential form, in scientific notation, and in calculator notation.	Instructor's Guide: 1, 32, 33, 39, 49, 115, 127, 128, 175

Expectation F

Use factors, multiples, prime factorization, and relatively prime numbers to solve problems.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Apply primes, composites, factors, multiples, and relatively prime numbers in a variety of applied and mathematical situations and explain the reasoning used.	Instructor's Guide: 1, 14, 18, 47, 48, 57, 66, 74

Expectation G

Develop meaning for integers and represent and compare quantities with them.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Compare and order integers.	Instructor's Guide: 119, 156, 161

Standard II

Understand meanings of operations and how they relate to one another.

Expectation A

Understand the meaning and effects of arithmetic operations with fractions, decimals, and integers.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Explain the meaning and effects of arithmetic operations with integers.	Instructor's Guide: 31, 34, 56, 65, 67, 72, 81, 139, 141, 150

Expectation B

Use the associative and commutative properties of addition and multiplication and the distributive property of multiplication over addition to simplify computations with integers, fractions, and decimals.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Apply the associative, commutative, and distributive properties for operations on integers, fractions, and decimals.	Instructor's Guide: 71

Expectation C

Understand and use the inverse relationships of addition and subtraction, multiplication and division, and squaring and finding square roots to simplify computations and solve problems.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Using models and numbers, explain the inverse relationships between squaring and finding square roots of perfect squares.	Instructor's Guide: 39, 97, 98, 118

Standard III

Compute fluently and make reasonable estimates.

Expectation A

Select appropriate methods and tools for computing with fractions and decimals from among mental computation, estimation, calculators or computers, and paper and pencil, depending on the situation, and apply the selected methods.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Applying all operations to fractions, decimals, and integers, select appropriate methods and tools to solve problems.	Instructor's Guide: 16, 25, 35, 40, 44, 46, 55, 80, 95, 96, 99, 105, 109, 111, 120, 139, 150, 159, 160, 177

Expectation B

Develop and analyze algorithms for computing with fractions, decimals, and integers and develop fluency in their use.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
*1. Use models and numbers to develop and analyze the algorithms for computing with integers.	Instructor's Guide: 31, 34, 56, 65, 67, 72, 81, 139, 141, 150
*2. Add, subtract, multiply, and divide integers to solve a variety of applied and mathematical problems.	Instructor's Guide: 31, 34, 56, 65, 67, 72, 81, 139, 141, 150

Expectation C

Develop and use strategies to estimate the results of rational-number computations and judge the reasonableness of the results.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Estimate the products, and quotients of fractions and decimals, describe the method used, and determine the reasonableness of results.	Instructor's Guide: 35, 40, 55, 80, 105, 111, 160
2. Estimate the sums and differences of integers, describe the method used, and determine the reasonableness of results.	No specific lesson addresses this standard. (See <i>Math on Call</i> .)

Expectation D

Develop, analyze, and explain methods for solving problems involving proportions, such as scaling and finding equivalent ratios.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Explain the equivalent ratio method of solving problems involving proportions.	Instructor's Guide: 10, 78, 104, 170

Algebra

Standard I

Understand patterns, relations, and functions.

Expectation A

Represent, analyze, and generalize a variety of patterns with tables, graphs, words, and, when possible, symbolic rules.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Describe, extend, analyze, and create a wide variety of patterns to investigate relationships and to solve problems.	Instructor's Guide: 7, 8, 12, 13, 18, 22, 27, 28, 32, 33, 38, 48, 52, 53, 57, 58, 63, 68, 73, 74, 77, 78, 83, 88, 92, 93, 108, 127, 128, 132, 133, 143, 147, 148, 157, 158, 163, 166, 167, 168, 173, 177, 178

Expectation B

Relate and compare different forms of representations for a relationship.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Use different forms of representing information (e.g., graphical, symbolic, tabular).	Instructor's Guide: 13, 17, 18, 38, 52, 53, 57, 63, 88, 114, 122, 127, 133, 138, 148, 155, 158, 163, 165, 168, 172, 173

Expectation C

Identify functions as linear or nonlinear and contrast their properties from tables, graphs, or equations.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Examine tables and graphs to determine if there is a constant rate of change between the quantities.	Instructor's Guide: 67, 72, 83, 155, 157–158

Standard II

Represent and analyze mathematical situations and structures using algebraic symbols.

Expectation A

Develop an initial conceptual understanding of different uses of variables.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Explain the use of a variable as a quantity that can change its value, as a quantity on which other values depend, and as generalization of patterns.	Instructor's Guide: 5, 16, 29, 56, 67, 72, 83, 88, 155

Expectation B

Explore relationships between symbolic expressions and graphs of lines, paying particular attention to the meaning of intercept and slope.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Analyze quantitative changes by comparing and contrasting numerical patterns in tables with their respective graphs in the coordinate plane.	Instructor's Guide: 67, 72, 83, 88
2. State the coordinates of the x and y intercepts from a graph.	Instructor's Guide: 67, 72, 83, 88

Expectation C

Use symbolic algebra to represent situations and to solve problems, especially those that involve linear relationships.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Use variables to describe numerical expressions and relationships.	Instructor's Guide: 5, 16, 29, 56, 67, 72, 83, 88, 155

Expectation D

Recognize and generate equivalent forms for simple algebraic expressions and solve linear equations.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Recognize and apply the additive and multiplicative inverses.	Instructor's Guide: 16, 44, 56, 83, 144
2. Use models and numbers to solve one-step linear equations and inequalities in one variable.	Instructor's Guide: 16, 56, 83

Standard III

Use mathematical models to represent and understand quantitative relationships.

Expectation A

Model and solve contextualized problems using various representations, such as graphs, tables, and equations.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
*1. Use graphs, tables, and equations to solve applied problems involving tips, discounts, sales tax, and simple interest.	Instructor's Guide: 10, 99, 110, 120, 131, 151

Standard IV

Analyze change in various contexts.

Expectation A

Use graphs to analyze the nature of changes in quantities in linear relationships.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. From a graph, describe a linear relationship as positive or negative.	Instructor's Guide: 67, 72

Geometry

Standard I

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Expectation A

Precisely describe, classify, and understand relationships among types of two- and three-dimensional objects using their defining properties.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Classify polygons as regular or nonregular and investigate relationships between the number of diagonals and the number of sides of a regular polygon.	Instructor's Guide: 21, 94, 116, 117, 126, 128, 169

Expectation B

Understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
*1. Describe relationships between the edge lengths and the volume of similar prisms.	Instructor's Guide: 79

Expectation C

Create and critique inductive and deductive arguments concerning geometric ideas and relationships, such as congruence, similarity, and the Pythagorean relationship.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
*1. Compare and contrast attributes of similar figures and the attributes of congruent figures.	Instructor's Guide: 77, 78, 170

Standard II

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Expectation A

Use coordinate geometry to represent and examine the properties of geometric shapes.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Identify and graph ordered pairs in the four quadrants of a coordinate plane.	Instructor's Guide: 29, 67, 72, 83, 114, 155

Expectation B

Use coordinate geometry to examine special geometric shapes, such as regular polygons or those with pairs of parallel or perpendicular sides.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
*1. State relationships among the coordinates of the vertices of rectangles, squares, parallelograms, trapezoids, and rhombuses oriented horizontally.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 8.</i>)

Standard III

Apply transformations and use symmetry to analyze mathematical situations.

Expectation A

Describe sizes, positions, and orientations of shapes under informal transformations such as flips, turns, slides, and scaling.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Describe the transformation used to move a polygon in one quadrant to another quadrant in the coordinate plane.	Instructor's Guide: 7, 15, 42, 43, 164

Expectation B

Examine the congruence, similarity, and line or rotational symmetry of objects using transformations.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Determine the type of symmetry (point or line) found in a reflection or a rotation.	Instructor's Guide: 94, 101, 179

Standard IV

Use visualization, spatial reasoning, and geometric modeling to solve problems.

Expectation A

Draw geometric objects with specified properties, such as side lengths or angle measures.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
*1. Draw two-dimensional objects from a geometric description and write a description of geometric properties for a given object.	Instructor's Guide: 84, 94, 101

Expectation B

Use two-dimensional representations of three-dimensional objects to visualize and solve problems such as those involving surface area and volume.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Construct nets for three-dimensional figures.	Instructor's Guide: 42, 43
2. Compare and contrast the number of faces, vertices, and edges of three-dimensional figures.	Instructor's Guide: 79

Expectation C

Use visual tools such as networks to represent and solve problems.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Given a network with up to six vertices, determine the number of paths.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 8.</i>)

Expectation E

Recognize and apply geometric ideas and relationships in areas outside the mathematics classroom, such as art, science, and everyday life.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Identify transformations in tessellations, use transformations to draw tessellations, and describe relationships among figures that tessellate.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 8.</i>)

Measurement

Standard I

Understand measurable attributes of objects and the units, systems, and processes of measurement.

Expectation A

Understand both metric and customary systems of measurement.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Explain the relationship between the metric system and the base-ten number system.	No specific lesson addresses this standard.

Expectation B

Understand relationships among units and convert from one unit to another within the same system.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Compare and convert units of measure for length, weight/mass, and volume within the U.S. customary system and the metric system.	Instructor's Guide: 11, 86
2. Add and subtract mixed units of measure and express answers in appropriate form.	Instructor's Guide: 19, 50, 162, 163, 177

Expectation C

Understand, select, and use units of appropriate size and type to measure angles, perimeter, area, surface area, and volume.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Use appropriate units of measure to label surface area and volume.	Instructor's Guide: 130, 145, 176

Standard II

Apply appropriate techniques, tools, and formulas to determine measurements.

Expectation A

Use common benchmarks to select appropriate methods for estimating measurements.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Use appropriate methods to approximate the surface area and volume of irregular figures.	No specific lesson addresses this standard.

Expectation B

Select and apply techniques and tools to accurately find length, area, volume, and angle measures to appropriate levels of precision.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Analyze a variety of measurement situations to determine the necessary degree of accuracy and precision.	Instructor's Guide: 82, 157, 158

Expectation C

Develop and use formulas to determine the circumference of circles and the area of triangles, parallelograms, trapezoids, and circles and develop strategies to find the area of more-complex shapes.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Use measurements and formulas to solve real-world and mathematical problems.	Instructor's Guide: 12, 50, 92, 93, 126, 130, 145, 171, 176, 180
2. Using concrete materials or computer models, derive approximations for pi from measurements for circumference and diameter.	Instructor's Guide: 45
*3. Create and solve problems by finding the circumference and/or area of a circle when given the diameter or radius.	Instructor's Guide: 45, 87, 92, 93, 171

Expectation D

Develop strategies to determine the surface area and volume of selected prisms, pyramids, and cylinders.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
*1. Investigate and describe the relationship between the area of the base and the volume of a prism, pyramid, and cylinder.	Instructor's Guide: 145, 176

Expectation E

Solve problems involving scale factors, using ratio and proportion.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
*1. Determine the unit rate.	Instructor's Guide: 159

Expectation F

Solve simple problems involving rates and derived measurements for such attributes as velocity and density.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Apply rates to solve problems in real-world situations.	Instructor's Guide: 159

Data Analysis and Probability

Standard I

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

Expectation A

Formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Given a problem situation involving two populations, collect, analyze, and interpret data.	Instructor's Guide: 2, 72, 83, 90, 122, 137, 165

Expectation B

Select, create, and use appropriate graphical representations of data, including histograms, box plots, and scatterplots.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Organize, display, and interpret data in a variety of ways including box-and-whisker plots.	Instructor's Guide: 2, 30, 75, 82, 90, 165
2. Construct circle graphs and interpret the meaning.	Instructor's Guide: 135, 140

Standard II

Select and use appropriate statistical methods to analyze data.

Expectation A

Find, use, and interpret measures of center and spread, including mean and interquartile range.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Compute, describe, and interpret the interquartile range.	Instructor's Guide: 90

Expectation B

Discuss and understand the correspondence between data sets and their graphical representations, especially histograms, stem-and-leaf plots, box plots, and scatterplots.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
*1. Describe the relationship between a data set and its corresponding box plot or circle graph.	Instructor's Guide: 90, 135, 140

Standard III

Develop and evaluate inferences and predictions that are based on data.

Expectation A

Use observations about differences between two or more samples to make conjectures about the populations from which the samples were taken.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Make inferences and predictions based on the analysis of sample data.	Instructor's Guide: 103, 165

Standard IV

Understand and apply basic concepts of probability.

Expectation A

Understand and use appropriate terminology to describe complementary and mutually exclusive events.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Identify and describe mutually exclusive events.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 8.</i>)

Expectation B

Use proportionality and a basic understanding of probability to make and test conjectures about the results of experiments and simulations.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Investigate and describe the difference between the probability of an event found through simulation and the theoretical probability of that same event.	Instructor's Guide: 137, 138

Expectation C

Compute probabilities for simple compound events, using such methods as organized lists, tree diagrams, and area models.

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
1. Using the fundamental counting principle or other techniques, determine the number of possible outcomes in a multistage event.	Instructor's Guide: 85

Grade 7 Standards	Afterschool Achievers: Math Club, Grade 7
*2. Compute the probability of two independent events.	No specific lesson addresses this standard. (See <i>Afterschool Achievers: Math Club, Grade 8.</i>)



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correlated to
South Carolina Mathematics Curriculum Standards
Grade 8

Number and Operations

Standard I

Understand numbers, ways of representing numbers, relationships among numbers, and number systems.

Expectation A

Work flexibly with fractions, decimals, and percents to solve problems.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Solve real-world problems involving fractions, decimals, and percents	Instructor's Guide: 99, 106, 110, 119, 151, 156

Expectation B

Compare and order fractions, decimals, and percents efficiently and find their approximate locations on a number line.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Compare and order rational and irrational numbers and find their approximate locations on a number line.	Instructor's Guide: 26, 30, 65

Expectation C

Develop meaning for percents greater than 100 and less than 1.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Solve real-world problems involving the use of percents greater than 100 percent or less than 1 percent.	No specific lesson addresses this standard. (See <i>Math on Call</i> .)

Expectation E

Develop an understanding of large numbers and recognize and appropriately use exponential, scientific, and calculator notation.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Use scientific notation to write very large numbers and numbers less than one.	Instructor's Guide: 66

Standard II

Understand meanings of operations and how they relate to one another.

Expectation B

Use the associative and commutative properties of addition and multiplication and the distributive property of multiplication over addition to simplify computations with integers, fractions, and decimals.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Apply the associative, commutative, and distributive properties to simplify expressions.	Instructor's Guide: 25, 71, 90, 149

Expectation C

Understand and use the inverse relationships of addition and subtraction, multiplication and division, and squaring and finding square roots to simplify computations and solve problems.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Approximate to the nearest tenth the square root of a number that falls between two perfect squares.	Instructor's Guide: 49, 50

Standard III

Compute fluently and make reasonable estimates.

Expectation A

Select appropriate methods and tools for computing with fractions and decimals from among mental computation, estimation, calculators or computers, and paper and pencil, depending on the situation, and apply the selected methods.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Select appropriate methods and tools to solve problems requiring the use of rational numbers.	Instructor's Guide: 34, 35, 37, 69, 70, 95, 100, 109, 111, 115, 117, 118, 124, 135, 140, 141, 159, 160, 161

Expectation B

Develop and analyze algorithms for computing with fractions, decimals, and integers and develop fluency in their use.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
*1. Compute with rational numbers to solve a variety of applied and mathematical problems.	Instructor's Guide: 34, 35, 37, 69, 70, 95, 100, 109, 111, 115, 117, 118, 124, 135, 140, 141, 159, 160, 161

Expectation C

Develop and use strategies to estimate the results of rational-number computations and judge the reasonableness of the results.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Justify the reasonableness of an estimate of rational number computations.	Instructor's Guide: 35, 45, 56, 115, 135

Expectation D

Develop, analyze, and explain methods for solving problems involving proportions, such as scaling and finding equivalent ratios.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
*1. Analyze and explain each method for solving a proportion (equivalent ratios, unit rates, and cross-multiplying).	Instructor's Guide: 10, 47, 48, 104, 157
*2. Use proportional reasoning to solve applied problems and then justify the solution.	Instructor's Guide: 10, 47, 48, 104, 157

Algebra

Standard I

Understand patterns, relations, and functions.

Expectation B

Relate and compare different forms of representations for a relationship.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Describe the merits and limitations of graphical, symbolic, and tabular representations.	Instructor's Guide: 22, 23, 29, 80, 97, 98, 110, 146, 150, 164

Expectation C

Identify functions as linear or nonlinear and contrast their properties from tables, graphs, or equations.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Examine tables, graphs, or simple equations to classify relationships as linear or nonlinear.	Instructor's Guide: 17, 18, 22, 23, 29, 37, 38, 97, 98, 127, 146, 164

Standard II

Represent and analyze mathematical situations and structures using algebraic symbols.

Expectation A

Develop an initial conceptual understanding of different uses of variables.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
*1. Evaluate simple algebraic expressions for given values of variables by using the substitution principle and the rules for order of operations.	Instructor's Guide: 29, 41, 64, 121, 146, 149, 161

Expectation B

Explore relationships between symbolic expressions and graphs of lines, paying particular attention to the meaning of intercept and slope.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Explain the impact of coefficients and constants on linear equations as they reflect simple applications.	Instructor's Guide: 16, 18, 20, 29, 56, 114, 131

Expectation C

Use symbolic algebra to represent situations and to solve problems, especially those that involve linear relationships.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Write or model a linear equation to solve a simple applied problem.	Instructor's Guide: 5, 77, 102, 103, 133, 153

Expectation D

Recognize and generate equivalent forms for simple algebraic expressions and solve linear equations.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
*1. Simplify a variety of algebraic expressions using properties of real numbers and rules for order of operations.	Instructor's Guide: 29, 41, 64, 121, 146, 149, 161
*2. Using strategies that involve inverse operations, solve one- and two-step linear equations and inequalities in one variable.	Instructor's Guide: 16, 18, 20, 56, 144

Standard III

Use mathematical models to represent and understand quantitative relationships.

Expectation A

Model and solve contextualized problems using various representations, such as graphs, tables, and equations.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
*1. Use one or more representations to model and to analyze the relationship in applied problems to determine if it is linear or nonlinear.	Instructor's Guide: 98

Standard IV

Analyze change in various contexts.

Expectation A

Use graphs to analyze the nature of changes in quantities in linear relationships.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Use tables and graphs to model and analyze linear relationships between variables.	Instructor's Guide: 22, 23, 29, 97, 98, 146, 164

Geometry

Standard I

Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Expectation A

Precisely describe, classify, and understand relationships among types of two- and three-dimensional objects using their defining properties.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Identify the necessary and sufficient properties that characterize quadrilaterals.	Instructor's Guide: 134

Expectation B

Understand relationships among the angles, side lengths, perimeters, areas, and volumes of similar objects.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
*1. Describe how a change in the edge length affects the angle measures, perimeters, and areas of similar regular polygons.	Instructor's Guide: 74, 112, 113, 126, 171

Expectation C

Create and critique inductive and deductive arguments concerning geometric ideas and relationships, such as congruence, similarity, and the Pythagorean relationship.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Given the length of three segments, determine and explain whether or not they can form a triangle.	Instructor's Guide: 50
2. Apply the Pythagorean relationship to determine if a triangle is a right triangle.	Instructor's Guide: 21, 50, 112, 113, 152, 153
*3. Apply the Pythagorean theorem to find the missing length of a side of a right triangle.	Instructor's Guide: 21, 50, 112, 113, 152, 153

Standard II

Specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Expectation A

Use coordinate geometry to represent and examine the properties of geometric shapes.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
*1. Given the coordinates of a vertex and the length of adjacent sides of a polygon, use the rectangular coordinate system to locate other vertices of a square, rectangle, or right triangle.	Instructor's Guide: 137, 138

Standard III

Apply transformations and use symmetry to analyze mathematical situations.

Expectation A

Describe sizes, positions, and orientations of shapes under informal transformations such as flips, turns, slides, and scaling.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Apply dilations and describe their results.	Instructor's Guide: 15

Expectation B

Examine the congruence, similarity, and line or rotational symmetry of objects using transformations.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Determine the equivalence, if any, between multiple applications of one transformation and the application of a different transformation.	Instructor's Guide: 15, 22, 23, 57, 58, 82, 83, 87, 88, 137, 138

Standard IV

Use visualization, spatial reasoning, and geometric modeling to solve problems.

Expectation A

Draw geometric objects with specified properties, such as side lengths or angle measures.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Identify the congruent and supplementary relationships of the angles formed by parallel lines and a transversal.	No specific lesson addresses this standard. (See <i>Math on Call</i> .)

Expectation B

Use two-dimensional representations of three-dimensional objects to visualize and solve problems such as those involving surface area and volume.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Use isometric drawings of three-dimensional figures to build the model with cubes.	Instructor's Guide: 79
*2. Determine the changes in volume and surface area of three-dimensional figures that can be built with cubes when one or more measurements are changed.	Instructor's Guide: 92, 93

Expectation C

Use visual tools such as networks to represent and solve problems.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Construct a network to solve a problem situation.	Instructor's Guide: 67, 68

Expectation D

Use geometric models to represent and explain numerical and algebraic relationships.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Use an area model to analyze probability.	No specific lesson addresses this standard.

Expectation E

Recognize and apply geometric ideas and relationships in areas outside the mathematics classroom, such as art, science, and everyday life.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Identify applications of transformations such as tiling, fabric design, art, and scaling.	Instructor's Guide: 168

Measurement

Standard I

Understand measurable attributes of objects and the units, systems, and processes of measurement.

Expectation B

Understand relationships among units and convert from one unit to another within the same system.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Use dimensional analysis to convert from one unit to another.	Instructor's Guide: 11, 55, 165

Standard II

Apply appropriate techniques, tools, and formulas to determine measurements.

Expectation C

Develop and use formulas to determine the circumference of circles and the area of triangles, parallelograms, trapezoids, and circles and develop strategies to find the area of more-complex shapes.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
*1. Find the area of irregular shapes.	Instructor's Guide: 4, 47, 48, 52, 53, 74, 76, 112, 113, 126, 130, 145, 155, 171, 180
2. Find the area of a trapezoid using the formula.	Instructor's Guide: 52, 53, 171

Expectation D

Develop strategies to determine the surface area and volume of selected prisms, pyramids, and cylinders.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Investigate and describe the relationship between the area of the faces and the surface area of prisms, pyramids, and cylinders.	Instructor's Guide: 19, 130, 176

Expectation E

Solve problems involving scale factors, using ratio and proportion.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
*1. Use the properties of similar figures to determine the length of a missing side.	Instructor's Guide: 10, 157, 158

Expectation F

Solve simple problems involving rates and derived measurements for such attributes as velocity and density.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Use measurements and formulas to solve real-world and mathematical problems.	Instructor's Guide: 10, 19, 47, 48, 52, 53, 76, 92, 112, 113, 126, 130, 145, 155, 157, 158, 171, 176, 180

Data Analysis and Probability

Standard I

Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

Expectation B

Select, create, and use appropriate graphical representations of data, including histograms, box plots, and scatterplots.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Use a matrix to organize and describe data.	No specific lesson addresses this standard.
2. Create and use a scatterplot and estimate its line of fit.	No specific lesson addresses this standard. (See <i>Math on Call</i> .)
3. Explain what type of graph would be appropriate for a given data set.	Instructor's Guide: 172, 173

Standard II

Select and use appropriate statistical methods to analyze data.

Expectation A

Find, use, and interpret measures of center and spread, including mean and interquartile range.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Determine which measure of center is the most appropriate for a given situation and explain the reasoning used.	Instructor's Guide: 39, 70

Expectation B

Discuss and understand the correspondence between data sets and their graphical representations, especially histograms, stem-and-leaf plots, box plots, and scatterplots.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Explain how different graphical representations of data can bias the interpretation of these data.	No specific lesson addresses this standard. (See <i>Math on Call</i> .)

Standard III

Develop and evaluate inferences and predictions that are based on data.

Expectation B

Make conjectures about possible relationships between two characteristics of a sample on the basis of scatterplots of the data and approximate lines of fit.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
*1. Use a scatterplot and its line of fit to determine if a positive relationship, a negative relationship, or no relationship exists between two sets of data and then use them to make predictions.	No specific lesson addresses this standard. (See <i>Math on Call</i> .)

Expectation C

Use conjectures to formulate new questions and plan new studies to answer them.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Formulate a hypothesis and then design and carry out an experiment to test it.	Instructor's Guide: 127, 128, 142
2. Formulate new areas of investigation based on the results of prior experiments.	Instructor's Guide: 127, 128, 142

Standard IV

Understand and apply basic concepts of probability.

Expectation B

Use proportionality and a basic understanding of probability to make and test conjectures about the results of experiments and simulations.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
1. Make inferences and convincing arguments based on analysis of theoretical or experimental probability.	Instructor's Guide: 125, 128, 142, 143

Expectation C

Compute probabilities for simple compound events, using such methods as organized lists, tree diagrams, and area models.

Grade 8 Standards	Afterschool Achievers: Math Club, Grade 8
*1. Compute the probability of two dependent events.	Instructor's Guide: 142, 143
2. Determine the odds of a given event.	No specific lesson addresses this standard. (See <i>Math on Call</i> .)



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