

MATH HANDBOOKS

correlated to

Arkansas

Mathematics Curriculum

Framework

Grade 1 - Geometry



EDUCATION GROUP



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JIM & DEBRA SIMPSON

800-289-4490, option 4

Jim_Simpson@hmco.com

Math Handbooks

correlated to

Arkansas Mathematics Curriculum Framework

Grades 1 - Geometry

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Math to Learn © 2002

correlated to

Arkansas Mathematics Curriculum Framework Grade 1

Number and Operations

Standard 1: Number Sense

Students shall understand numbers, ways of representing numbers, relationships among numbers and number systems.

Student Learning Expectations, Grade 1	Math to Learn
Whole Numbers NO.1.1.1 Use efficient <i>strategies</i> to count a given set of objects in groups of 10 up to 100	Handbook: 9, 10-11, 12-13
NO.1.1.2 Represent a <i>whole number</i> less than 15 in all possible ways using <i>composition</i> and <i>decomposition</i>	Handbook: 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 15, 17, 18, 19, 20, 21, 22, 23, 24, 25, 54, 55, 56, 57, 58, 59, 62, 63, 64, 65, 66, 67, 72, 73, 74, 75, 76, 78, 79, 80, 81, 82, 84, 85, 86, 87
NO.1.1.3 Connect various physical models and representations to the quantities they represent using number names, numerals and number words to 20 with and without appropriate <i>technology</i>	Handbook: 3, 4, 5, 6, 7, 8, 9, 10, 299
NO.1.1.4 Represent numbers to 20 in various forms	Handbook: 3, 4, 5, 6, 7, 8, 9, 10
NO.1.1.5 Use multiple models to develop understandings of <i>place value</i> including tens and ones	Handbook: 8, 9, 10, 11, 12, 13, 15
NO.1.1.6 Recognize the number or quantity of sets up to 10 without counting, regardless of arrangement	Handbook: 3, 4-5
NO.1.1.7 <i>Estimate</i> the results of <i>whole number</i> addition and subtraction problems and judge the reasonableness	Handbook: 158, 159, 160, 161, 296

Student Learning Expectations, Grade 1	Math to Learn
NO.1.1.8 Determine relative position using <i>ordinal numbers</i> (first through twelfth)	Handbook: 35
NO.1.1.9 Compare 2 numbers, with less than 12 in each set, using objects and pictures with and without appropriate <i>technology</i>	Handbook: 26, 27, 33
NO.1.1.10 Compare 2 numbers, less than 100 using mathematical language of greater than, equal to (same amount as), less than	Handbook: 26, 27, 28, 29, 30, 31, 33
Rational Numbers NO.1.1.11 Communicate the relative position of any number less than 20 (18 is less than 20 and greater than 12)	Handbook: 32, 33, 34
NO.1.1.12 Represent commonly used fractions using words and physical models for halves, thirds and fourths	Handbook: 42, 43, 44, 45, 46, 47, 48, 49

Standard 2: Properties of Number Operations

Students shall understand meanings of operations and how they relate to one another.

Student Learning Expectations, Grade 1	Math to Learn
Number Theory NO.2.1.1 Count on (forward) and back (backward) using physical models or a number line starting at any <i>whole number</i> up to fifty	Handbook: 2, 60, 61, 76, 77
NO.2.1.2 Develop an understanding of the <i>commutative</i> (turn around facts) and <i>identity</i> (add 0) <i>properties of addition</i> using objects	Handbook: 58, 59, 60, 82, 262
NO.2.1.3 Apply <i>number theory</i> : <ul style="list-style-type: none"> • determine if a one-<i>digit</i> number is <i>odd</i> or <i>even</i> • use the terms <i>sum</i> and <i>difference</i> in appropriate context • use conventional symbols (+, -, =) to represent the operations of addition and subtraction 	Handbook: 36, 37, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89

Student Learning Expectations, Grade 1	Math to Learn
Whole Number Operations NO.2.1.4 Use physical, <i>pictorial</i> and symbolic models to demonstrate various meanings of addition and subtraction	Handbook: 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89
NO.2.1.5 Identify and use relationships between addition and subtraction to solve problems in <i>contextual situations</i> involving <i>whole numbers</i>	Handbook: 58, 59, 82, 83, 84, 85, 262
NO.2.1.6 Model and represent division as sharing equally in <i>contextual situations</i>	Handbook: 108, 109, 110, 111

Standard 3: Numerical Operations and Estimation

Students shall compute fluently and make reasonable estimates.

Student Learning Expectations, Grade 1	Math to Learn
Computational Fluency-Addition and Subtraction NO.3.1.1 Develop <i>strategies</i> for basic addition facts: <ul style="list-style-type: none"> • counting all • counting on • one more, two more • doubles • doubles plus one or minus one • make ten • using ten frames • <i>Identity Property</i> (add zero) 	Handbook: 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 262
NO.3.1.2 Develop <i>strategies</i> for basic subtraction facts <ul style="list-style-type: none"> • relating to addition • one less, two less • all but one • using ten frames of the answers 	Handbook: 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 86, 87, 88, 89
Application of Computation NO.3.1.3 Solve problems by using a variety of methods and tools (e.g., objects, mental computation, paper and pencil, and with and without appropriate <i>technology</i>)	Handbook: 69, 81, 84, 85, 89, 114-119, 120-123, 117, 123, 124-125, 128, 132, 134-135, 136-137, 142, 147, 149, 153, 272-273, 287, 302-303

Algebra

Standard 4: Patterns, Relations and Functions

Students shall recognize, describe and develop patterns, relations and functions.

Student Learning Expectations, Grade 1	Math to Learn
Sort and Classify A.4.1.1 Sort and classify objects by one or two <i>attributes</i> in more than one way	Handbook: 242, 243
Recognize, describe, and develop patterns A.4.1.2 Identify and describe <i>patterns</i> in the environment	Handbook: 276, 277
A.4.1.3 Use <i>patterns</i> to count forward and backward when given a number less than or equal to 50	Handbook: 2, 60, 61, 76, 77, 97, 100, 101, 166, 167, 168, 169, 170, 171, 179, 305
A.4.1.4 Identify, describe and extend <i>skip-counting patterns</i> by 2s	Handbook: 97, 100, 101, 166, 167, 168, 169, 170, 171, 179, 305
A.4.1.5 Identify a number that is one more or one less than any <i>whole number</i> less than 100	Handbook: 32, 33, 301
A.4.1.6 Recognize, extend, and create simple repeating and growing <i>patterns</i> using a wide variety of materials and describe them using words, pictures or symbols	Handbook: 100, 101, 166, 167, 168, 169, 170, 171, 179, 276, 277

Standard 5: Algebraic Representations

Students shall represent and analyze mathematical situations and structures using algebraic symbols.

Student Learning Expectations, Grade 1	Math to Learn
Expressions, Equations, and Inequalities A.5.1.1 Select and/or write number sentences to find the unknown in problem-solving contexts involving single- <i>digit</i> addition and subtraction using appropriate labels	Handbook: 69, 70, 84, 85, 89, 260, 261, 286, 287, 288, 289, 295

Student Learning Expectations, Grade 1	Math to Learn
A.5.1.2 Recognize that “=” indicates a relationship in which the quantities on each side of an <i>equation</i> are equal	Handbook: 26, 55, 56, 57, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 93, 94, 95, 96, 97, 98, 99, 102, 103, 104, 105, 106, 107, 111, 115, 116, 118, 119, 120, 121, 122, 123, 129, 131, 137, 138, 141, 145, 146, 148, 150, 152, 154, 156, 157, 158, 159, 160, 161, 175, 177, 178, 257, 258, 259, 260, 261, 262, 263, 273, 279, 286, 287, 288, 289, 291, 295, 296
A.5.1.3 Recognize that symbols such as $_$, Δ and \diamond in an addition or subtraction equation, represent a missing value that will make the statement true	Handbook: 57, 59, 60, 61, 64, 65, 68, 69, 70, 71, 76, 77, 83, 84, 85, 88, 89, 114, 116, 117, 118, 119, 120, 121, 122, 123, 129, 130, 137, 138, 141, 143, 145, 146, 147, 148, 149, 150, 152, 153, 154, 156, 157, 258, 259, 260, 261, 262

Standard 6: Algebraic Models

Students shall develop and apply mathematical models to represent and understand quantitative relationships.

Student Learning Expectations, Grade 1	Math to Learn
Algebraic Models and Relationships A.6.1.1 Explore the use of a chart or table to organize information and to understand relationships	Handbook: 100, 101, 234, 235, 257, 282, 283, 284

Standard 7: Analysis of Change

Students shall analyze change in various contexts.

Student Learning Expectations, Grade 1	Math to Learn
Analyze Change A.7.1.1 Interpret <i>qualitative change</i>	Handbook: 100-101, 256-257, 282-283

G e o m e t r y

S t a n d a r d 8 : G e o m e t r i c P r o p e r t i e s

Students shall analyze characteristics and properties of 2 and 3 dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Student Learning Expectations, Grade 1	Math to Learn
Characteristics and Properties-Three Dimensional G.8.1.1 Compare <i>three-dimensional</i> solids (<i>sphere, cube, rectangular prism, cone, and cylinder</i>) by investigating their physical characteristics	Handbook: 204, 205
G.8.1.2 Investigate the presence of <i>three-dimensional</i> objects in the environment	Handbook: 204
Characteristics and Properties-Two Dimensional G.8.1.3 Compare and make geometric figures (triangle, rectangle [including square] and circle) by investigating their physical characteristics independent of position or size	Handbook: 196, 197

S t a n d a r d 9 : T r a n s f o r m a t i o n o f S h a p e s

Students shall apply transformations and the use of symmetry to analyze mathematical situations.

Student Learning Expectations, Grade 1	Math to Learn
Symmetry and Transformations G.9.1.1 Identify a <i>line</i> or <i>lines of symmetry</i> in <i>two-dimensional</i> figures and justify by folding	Handbook: 198-199
G.9.1.2 Manipulate <i>two-dimensional</i> figures through <i>slides, flips</i> and <i>turns</i>	Handbook: 202-203

S t a n d a r d 10 : C o o r d i n a t e G e o m e t r y

Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Student Learning Expectations, Grade 1	Math to Learn
Coordinate Geometry G.10.1.1 Extend the use of location words to include distance (near, far, close to) and direction (left and right)	Handbook: 264-265, 300

Standard 11: Visualization and Geometric Models

Students shall use visualization, spatial reasoning and geometric modeling.

Student Learning Expectations, Grade 1	Math to Learn
Spatial Visualization and Models G.11.1.1 Replicate a simple <i>two-dimensional</i> figure from a briefly displayed example or from a description	Handbook: 199, 201
G.11.1.2 Recognize that new figures can be created by combining and subdividing models of existing figures	Handbook: 198

Strand: Measurement

Standard 12: Physical Attributes

Students shall use attributes of measurement to describe and compare mathematical and real-world objects.

Student Learning Expectations, Grade 1	Math to Learn
Time: Calendar M.12.1.1 Recognize the number of days in a week and the number of days in a month using a calendar	Handbook: 190, 191
M.12.1.2 Orally sequence the months of the year	Handbook: 191
Time: Clock M.12.1.3 Recognize that an hour is longer than a minute and a minute is longer than a second	Handbook: 181
Money M.12.1.4 Recognize and identify <i>attributes</i> of penny, nickel, dime, quarter and dollar bill	Handbook: 164-165
M.12.1.5 State the values of a penny, nickel, dime, and quarter and dollar bill	Handbook: 164-165

Student Learning Expectations, Grade 1	Math to Learn
M.12.1.6 Compare the value of coins (pennies, nickels, dimes and quarters)	Handbook: 164-165, 178
Temperature M.12.1.7 Distinguish between hot and cold temperatures on a thermometer	Handbook: 226-229
Tools and Attributes M.12.1.8 Recognize <i>attributes</i> of measurement (length, weight, <i>capacity</i> and <i>mass</i>) and identify appropriate tools used to measure each attribute	Handbook: 208, 209, 210, 211, 212, 213, 218, 219, 220, 221, 222, 223, 224, 225, 230, 231

Standard 13: Systems of Measurement

Students shall identify and use units, systems and processes of measurement.

Student Learning Expectations, Grade 1	Math to Learn
Calendar M.13.1.1 Use a calendar to determine <i>elapsed time</i> involving a time period of one week	Handbook: 190
Clock M.13.1.2 Tell time to the half-hour	Handbook: 183
Elapsed Time M.13.1.3 Determine <i>elapsed time</i> (to the hour) in <i>contextual situations</i>	Handbook: 187, 188-189
Money M.13.1.4 Determine the value of a small collection of coins (with a total value up to one dollar) using one or two different types of coins, including pennies, nickels, dimes and quarters	Handbook: 166, 167, 168, 169, 170, 171
M.13.1.5 Represent and write the value of money using the cent sign	Handbook: 164, 165, 166, 167, 168, 169, 170, 171, 172, 174, 176, 178, 179

Student Learning Expectations, Grade 1	Math to Learn
M.13.1.6 Show different combination of coins that have the same value	Handbook: 171
Applications M.13.1.7 Select the appropriate <i>non-standard</i> measurement tools for length, <i>capacity</i> and <i>mass</i>	Handbook: 209, 210, 211, 212, 213, 218, 219, 220, 221, 222, 224, 225
M.13.1.8 <i>Estimate</i> and measure length, <i>capacity/volume</i> and <i>mass</i> with <i>non-standard units</i>	Handbook: 209, 210, 211, 212, 213, 218, 219, 220, 221, 222, 224, 225
Perimeter M.13.1.9 Surround a figure with objects and tell how many it takes to go around	Handbook: 214
Area M.13.1.10 Cover a figure with squares and tell how many it takes	Handbook: 216, 217

Data Analysis and Probability

Standard 14: Data Representation

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

Student Learning Expectations, Grade 1	Math to Learn
Collect, Organize, and Display Data DAP.14.1.1 Identify the purpose for data collection and collect, organize and display physical objects for describing the results	Handbook: 233, 234, 235, 236, 237, 238, 239, 240-241, 242-243

Standard 15: Data Analysis

Students shall select and use appropriate statistical methods to analyze data.

Student Learning Expectations, Grade 1	Math to Learn
Data Analysis DAP.15.1.1 Analyze and interpret concrete and <i>pictorial graphs</i> (i.e. <i>bar graphs, pictographs, Venn diagrams, T-chart</i>)	Handbook: 234, 235, 236, 237, 238, 239, 240, 241, 242, 243

Student Learning Expectations, Grade 1	Math to Learn
DAP.15.1.2 Make a true statement about the data displayed on a graph or chart (i.e. 5 people ride the bus)	Handbook: 235, 236, 237, 238, 240, 243

S t a n d a r d 1 6 : I n f e r e n c e s a n d P r e d i c t i o n s

Students shall develop and evaluate inferences and predictions that are based on data.

Student Learning Expectations, Grade 1	Math to Learn
Inferences and Predictions DAP.16.1.1 Explore making simple predictions for a given set of data	Handbook: 251

S t a n d a r d 1 7 : P r o b a b i l i t y

Students shall understand and apply basic concepts of probability.

Student Learning Expectations, Grade 1	Math to Learn
Probability DAP.17.1.1 Describe the <i>probability</i> of an event as being more, less, or equally likely to occur	Handbook: 246-247, 248-249

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Grade 2

Number and Operations

Standard 1: Number Sense

Students shall understand numbers, ways of representing numbers, relationships among numbers and number systems.

Student Learning Expectations, Grade 2	Math to Learn
Whole Numbers NO.1.2.1 Use efficient <i>strategies</i> to count a given set of objects in groups of 2s and 5s to 100 and in groups of 3s to 30	Handbook: 97, 100, 101, 166, 167, 170, 171, 179, 305
NO.1.2.2 Represent a <i>whole number</i> in <i>multiple</i> ways using <i>composition</i> and <i>decomposition</i>	Handbook: 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 15, 17, 18, 19, 20, 21, 22, 23, 24, 25, 54, 55, 56, 57, 58, 59, 62, 63, 64, 65, 66, 67, 72, 73, 74, 75, 76, 78, 79, 80, 81, 82, 84, 85, 86, 87, 114, 116, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 130, 138, 134, 135, 142, 144, 145, 146, 148, 149, 151, 152
NO.1.2.3 Connect various physical models and representations to the quantities they represent using number names, numerals and number words to 100 with and without appropriate <i>technology</i>	Handbook: 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 299
NO.1.2.4 Represent numbers to 100 in various forms	Handbook: 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23
NO.1.2.5 Use multiple models to represent understanding of <i>place value</i> including hundreds	Handbook: 8, 9, 10, 11, 12, 13, 15, 16, 17, 20, 21, 22, 23
NO.1.2.6 Determine relative position using <i>ordinal numbers</i> (first through eighteenth)	Handbook: 35

Student Learning Expectations, Grade 2	Math to Learn
NO.1.2.7 Compare 2 numbers, less than 100 using numerals and =, <, > with and without appropriate <i>technology</i>	Handbook: 26, 27, 28, 29, 30, 31
Rational Numbers NO.1.2.8 Communicate the relative position of any number less than 100 (27 is greater than 25 and less than 30)	Handbook: 32, 33, 34
NO.1.2.9 Represent fractions (halves, thirds, fourths, sixths and eighths) using words, numerals, and physical models	Handbook: 42, 43, 44, 45, 46, 47, 48, 49
NO.1.2.10 Utilize models to recognize that a fractional part can mean different amounts depending on the original quantity	Handbook: 43, 44, 46

Standard 2: Properties of Number Operations

Students shall understand meanings of operations and how they relate to one another.

Student Learning Expectations, Grade 2	Math to Learn
Number Theory NO.2.2.1 Count on (forward) and back (backward) on a number line and a 100's chart starting at any <i>whole number</i> up to 100	Handbook: 2, 60, 61, 76, 77
NO.2.2.2 <i>Model</i> and use the <i>commutative property for addition</i>	Handbook: 58, 60, 82, 262
NO.2.2.3 Develop an understanding of the <i>associative property</i> of addition using objects	Handbook: 70, 71, 262
NO.2.2.4 <i>Apply number theory</i> <ul style="list-style-type: none"> • determine if a two-digit number is <i>odd</i> or <i>even</i> • use the terms <i>sum</i>, <i>addends</i>, and <i>difference</i> in an appropriate context ($2 + 3 = 5$, 2 and 3 are <i>addends</i>; 5 is a <i>sum</i>) 	Handbook: 36, 37, 55, 73
Whole Number Operations NO.2.2.5 Demonstrate various meanings of addition and subtraction	Handbook: 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89

Student Learning Expectations, Grade 2	Math to Learn
NO.2.2.6 Demonstrate various addition and subtraction relationships (property) to solve problems in <i>contextual situations</i> involving <i>whole numbers</i>	Handbook: 58, 59, 82, 83, 84, 85, 262
NO.2.2.7 Model, represent and explain division as sharing equally and repeated subtraction in <i>contextual situations</i>	Handbook: 108, 109, 110, 111

Standard 3: Numerical Operations and Estimation

Students shall compute fluently and make reasonable estimates.

Student Learning Expectations, Grade 2	Math to Learn
Computational Fluency-Addition and Subtraction NO.3.2.1 Develop <i>strategies</i> for basic addition facts <ul style="list-style-type: none"> • counting all • counting on • one more, two more • doubles • doubles plus one or minus one • make ten • using ten frames • <i>Identity Property</i> (add zero) 	Handbook: 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 262
NO.3.2.2 Demonstrate multiple <i>strategies</i> for adding or subtracting <i>two-digit whole numbers</i> <ul style="list-style-type: none"> • <i>Compatible Numbers</i> • <i>compensatory numbers</i> • informal use of <i>commutative</i> and <i>associative properties of addition</i> 	Handbook: 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 141, 262
NO.3.2.3 Demonstrate <i>computational fluency</i> (accuracy, efficiency and flexibility) in addition facts with addends through 9 and corresponding subtractions	Handbook: 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 76, 77, 78, 79, 80, 81, 82, 83, 86, 87, 88, 89
Application of Computations NO.3.2.4 Solve problems using a variety of methods and tools (e.g., objects, mental computation, paper and pencil, and with and without appropriate <i>technology</i>)	Handbook: 69, 81, 84, 85, 89, 114-119, 120-123, 117, 123, 124-125, 128, 132, 134-135, 136-137, 142, 147, 149, 153, 272-273, 287, 302-303

Student Learning Expectations, Grade 2	Math to Learn
Estimation NO.3.2.5 Use <i>estimation strategies</i> to solve addition and subtraction problems and judge the reasonableness of the answer	Handbook: 158, 159, 160, 161, 296

Algebra

Standard 4: Patterns, Relations and Functions

Students shall recognize, describe and develop patterns, relations and functions.

Student Learning Expectations, Grade 2	Math to Learn
Sort and Classify A.4.2.1 Sort, classify, and label objects by three or more <i>attributes</i> in more than one way	Handbook: 242, 243
Recognize, describe and develop patterns A.4.2.2 Describe repeating and growing <i>patterns</i> in the environment	Handbook: 276, 277
A.4.2.3 Use <i>patterns</i> to count forward and backward when given a number less than or equal to 100	Handbook: 2, 60, 61, 76, 77, 97, 100, 101, 166, 167, 168, 169, 170, 171, 179, 305
A.4.2.4 Identify, describe and extend <i>skip counting patterns</i> from any given number	Handbook: 97, 100, 101, 166, 167, 168, 169, 170, 171, 179, 305
A.4.2.5 Identify a number that is more or less than any <i>whole number</i> less than 100 using <i>multiples</i> of ten	Handbook: 32, 33, 301
A.4.2.6 Recognize, describe, extend, and create repeating and growing <i>patterns</i> using a wide variety of materials to solve problems	Handbook: 100, 101, 166, 167, 168, 169, 170, 171, 179, 276, 277

Standard 5: Algebraic Representations

Students shall represent and analyze mathematical situations and structures using algebraic symbols.

Student Learning Expectations, Grade 2	Math to Learn
<p>Expressions, Equations, and Inequalities A.5.2.1 Select and/or write number sentences to find the unknown in problem-solving contexts involving two-digit addition and subtraction using appropriate labels</p>	<p>Handbook: 69, 70, 84, 85, 89, 117, 147, 149, 153, 260, 261, 286, 287, 288, 289, 295</p>
<p>A.5.2.2 Express mathematical relationships using <i>equalities</i> and <i>inequalities</i> ($>$, $<$, $=$, \neq)</p>	<p>Handbook: 26, 27, 28, 29, 30, 31, 50, 51, 55, 56, 57, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 93, 94, 95, 96, 97, 98, 99, 102, 103, 104, 105, 106, 107, 111, 115, 116, 118, 119, 120, 121, 122, 123, 129, 131, 137, 138, 141, 145, 146, 148, 150, 152, 154, 156, 157, 158, 159, 160, 161, 175, 177, 178, 257, 258, 259, 260, 261, 262, 263, 273, 279, 286, 287, 288, 289, 291, 295, 296</p>
<p>A.5.2.3 Recognize that symbols such as $_$, Δ and \diamond in an addition or subtraction equation, represent a missing value that will make the statement true</p>	<p>Handbook: 57, 59, 60, 61, 64, 65, 68, 69, 70, 71, 76, 77, 83, 84, 85, 88, 89, 114, 116, 117, 118, 119, 120, 121, 122, 123, 129, 130, 137, 138, 141, 143, 145, 146, 147, 148, 149, 150, 152, 153, 154, 156, 157, 258, 259, 260, 261, 262</p>

Standard 6: Algebraic Models

Students shall develop and apply mathematical models to represent and understand quantitative relationships.

Student Learning Expectations, Grade 2	Math to Learn
<p>Algebraic Models and Relationships A.6.2.1 Use a chart or table to organize information and to understand relationships</p>	<p>Handbook: 100, 101, 234, 235, 257, 282, 283, 284</p>

Standard 7: Analysis of Change

Students shall analyze change in various contexts.

Student Learning Expectations, Grade 2	Math to Learn
<p>Analyze Change A.7.2.1 Interpret and compare <i>quantitative change</i></p>	<p>Handbook: 100-101, 256-257, 282-283</p>

G e o m e t r y

S t a n d a r d 8 : G e o m e t r i c P r o p e r t i e s

Students shall analyze characteristics and properties of 2 and 3 dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Student Learning Expectations, Grade 2	Math to Learn
Characteristics and Properties-Three Dimensional G.8.2.1 Identify, name, sort and describe <i>three-dimensional</i> solids (<i>cube, sphere, rectangular prism, cone, and cylinder</i>) according to the shapes of <i>faces</i>	Handbook: 204, 205
G.8.2.2 Match <i>three-dimensional</i> objects to their <i>two-dimensional faces</i>	Handbook: 205
Characteristics and Properties-Two Dimensional G.8.2.3 Identify, classify and describe <i>two-dimensional</i> geometric figures (rectangle [including square], triangle and circle) using concrete objects drawings, and computer graphics	Handbook: 196, 197

S t a n d a r d 9 : T r a n s f o r m a t i o n o f S h a p e s

Students shall apply transformations and the use of symmetry to analyze mathematical situations.

Student Learning Expectations, Grade 2	Math to Learn
Symmetry and Transformations G.9.2.1 Use <i>lines of symmetry</i> to demonstrate and describe <i>congruent</i> figures within a <i>two-dimensional</i> figure	Handbook: 198-199
G.9.2.2 Demonstrate the motion of a single <i>transformation</i>	Handbook: 202-203

S t a n d a r d 10 : C o o r d i n a t e G e o m e t r y

Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Student Learning Expectations, Grade 2	Math to Learn
Coordinate Geometry G.10.2.1 Extend the use of directional words to include rows and columns	Handbook: 264-265

Standard 11: Visualization and Geometric Models

Students shall use visualization, spatial reasoning and geometric modeling.

Student Learning Expectations, Grade 2	Math to Learn
Spatial Visualization and Models G.11.2.1 Replicate a simple geometric design from a briefly displayed example or from a description	Handbook: 199, 201
G.11.2.2 Create new figures by combining and subdividing models of existing figures	Handbook: 198, 199

Measurement

Standard 12: Physical Attributes

Students shall use attributes of measurement to describe and compare mathematical and real-world objects.

Student Learning Expectations, Grade 2	Math to Learn
Time: Calendar M.12.2.1 Recognize that there are 12 months in a year and that each month has a specific number of days	Handbook: 191
Time: Clock M.12.2.2 Recognize that there are 24 hours in a day	Handbook: 181
Money M.12.2.3 State the value of all coins and a dollar	Handbook: 164-165
M.12.2.4 Compare the value of all coins	Handbook: 164-165, 178
Temperature M.12.2.5 Compare temperatures using the Fahrenheit scale on a thermometer	Handbook: 226-227

Student Learning Expectations, Grade 2	Math to Learn
Tools and Attributes M.12.2.6 Make simple comparisons within units of like dimension (units of length, <i>mass/weight</i> and <i>capacity</i>)	Handbook: 208, 210, 211, 212, 213, 218, 219, 220, 221, 222, 223, 224, 225, 231

Standard 13: Systems of Measurement

Students shall identify and use units, systems and processes of measurement.

Student Learning Expectations, Grade 2	Math to Learn
Clock M.13.2.2 Tell time to the nearest five-minute interval	Handbook: 184
Elapsed Time M.13.2.3 Determine <i>elapsed time</i> in <i>contextual situations</i> in hour increments regardless of starting time:	Handbook: 188-189
Money M.13.2.4 Determine the value of a combination of coins up to the dollar	Handbook: 166, 167, 168, 169, 170, 171
M.13.2.5 Demonstrate a given value of money up to \$1.00 using a variety of coin combinations	Handbook: 171, 174, 175, 176, 177
M.13.2.6 Demonstrate a given value of money up to \$1.00 using the fewest coins possible	Handbook: 171
M.13.2.7 Represent and write the value of money using the cent sign and in decimal form when using the dollar sign	Handbook: 165, 166, 167, 168, 169, 170, 171
M.13.2.8 Calculate the amount of money, spent with and without <i>regrouping</i> in a <i>contextual situation</i>	Handbook: 174, 175, 176, 177
Temperature M.13.2.9 Read temperatures on a Fahrenheit scale in intervals of ten	Handbook: 226-227

Student Learning Expectations, Grade 2	Math to Learn
Applications M.13.2.10 Select appropriate customary measurement tools (rulers, balance scale, cup and thermometer) for situations involving length, <i>capacity</i> , and <i>mass</i>	Handbook: 230
M.13.2.11 <i>Estimate</i> and measure length, <i>capacity/volume</i> and <i>mass</i> with <i>non-standard units</i> to recognize the need for <i>standard units</i>	Handbook: 209, 210, 211, 212, 213, 218, 219, 220, 221, 222, 224, 225
Perimeter M.13.2.12 Determine <i>perimeter</i> using physical materials (paper clips, craft sticks or grids) and by using measurement tools (rulers)	Handbook: 214-215
Area M.13.2.13 Find the <i>area</i> of a region by counting squares on a grid	Handbook: 216-217

Data Analysis and Probability

Standard 14: Data Representation

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

Student Learning Expectations, Grade 2	Math to Learn
Collect, Organize and Display Data DAP.14.2.1 Identify the purpose for data collection and collect, organize, record and display the data using physical materials (<i>pictographs</i> , <i>Venn diagrams</i> and vertical and horizontal <i>bar graphs</i>)	Handbook: 233, 234, 235, 236, 237, 238, 239, 240-241, 242-243

Standard 15: Data Analysis

Students shall select and use appropriate statistical methods to analyze data.

Student Learning Expectations, Grade 2	Math to Learn
Data Analysis DAP.15.2.1 Analyze and make predictions from data represented in charts and graphs	Handbook: 234, 235, 236, 237, 238, 240, 242, 243

Student Learning Expectations, Grade 2	Math to Learn
DAP.15.2.2 Make true statements comparing data displayed on a graph or chart	Handbook: 235, 236, 237, 238, 240, 243

S t a n d a r d 1 6 : I n f e r e n c e s a n d P r e d i c t i o n s

Students shall develop and evaluate inferences and predictions that are based on data.

Student Learning Expectations, Grade 2	Math to Learn
Inferences and Predictions DAP.16.2.1 Make simple predictions for a given set of data	Handbook: 251

S t a n d a r d 1 7 : P r o b a b i l i t y

Students shall understand and apply basic concepts of probability.

Student Learning Expectations, Grade 2	Math to Learn
Probability DAP.17.2.1 Describe the <i>probability</i> of an event as being more, less, and equally likely to occur	Handbook: 246-247, 248-249

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Grade 3

N u m b e r a n d O p e r a t i o n s

S t a n d a r d 1 : N u m b e r S e n s e

Students shall understand numbers, ways of representing numbers, relationships among numbers and number systems.

Student Learning Expectations, Grade 3	Math to Know
Whole Numbers NO.1.3.1 Recognize <i>equivalent</i> representations for the same <i>whole number</i> and generate them by <i>composing</i> and <i>decomposing</i> numbers	Handbook: 3, 5, 6, 7, 36, 37, 38, 40, 41, 42, 43, 44, 45, 48, 49, 50, 51, 52, 53, 54, 56, 57, 58, 59, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117
NO.1.3.2 Use the <i>place value</i> structure of the base ten number system and be able to represent and compare <i>whole numbers</i> including thousands (using models, illustrations, symbols, <i>expanded notation</i> and problem solving)	Handbook: 2, 3, 5, 6, 7, 12, 13, 14, 15
NO.1.3.3 Use mathematical language and symbols to compare and order <i>four-digit</i> numbers with and without appropriate <i>technology</i> (<, >, =)	Handbook: 12, 13, 14, 15
Rational Numbers NO.1.3.4 Represent fractions (halves, thirds, fourths, sixths and eighths) using words, numerals and physical models	Handbook: 30, 210, 211, 212, 213, 214, 215, 216
NO.1.3.5 Utilize models to recognize that the size of the whole determines the size of the fraction depending on the original quantity	Handbook: 225

Student Learning Expectations, Grade 3	Math to Know
NO.1.3.6 Use the <i>place value</i> structure of the base ten number system and be able to represent and compare decimals to hundredths in money (using models, illustrations, symbols, <i>expanded notation</i> and problem solving)	Handbook: 23, 24, 25, 26, 27, 28
NO.1.3.7 Write a fraction that is <i>equivalent</i> to a given fraction with the use of models	Handbook: 220, 221, 222, 223, 430

Standard 2: Properties of Number Operations

Students shall understand meanings of operations and how they relate to one another.

Student Learning Expectations, Grade 3	Math to Know
Number Theory NO.2.3.1 Develop an understanding of the <i>commutative</i> and <i>identity properties</i> of <i>multiplication</i> using objects	Handbook: 66, 67, 68, 70, 77, 82, 83, 241, 246
NO.2.3.2 Apply <i>number theory</i> : <ul style="list-style-type: none"> • determine if a three-<i>digit</i> number is <i>even</i> or <i>odd</i> • use the terms <i>multiple</i>, <i>factor</i>, <i>product</i> and <i>quotient</i> in an appropriate context (Since $3 \times 4 = 12$, 3 and 4 are <i>factors</i>; 12 is the <i>product</i>, 3, 6, 9, 12 are <i>multiples</i> of 3; 4, 8, 12, 16 are <i>multiples</i> of 4; $12 \div 4 = 3$, the <i>quotient</i>) 	Handbook: 62, 76, 77, 81, 84, 85, 88, 89, 90, 91, 92, 93, 94, 95
Whole Number Operations NO.2.3.3 Use conventional mathematical symbols to write <i>equations</i> for <i>contextual problems</i> involving multiplication	Handbook: 64-65, 68, 72-73, 172, 174
NO.2.3.4 Model, represent and explain division as measurement and partitive division including equal groups, related <i>rates</i> , price, <i>rectangular arrays</i> (<i>area model</i>), combinations and multiplicative comparison	Handbook: 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85

Standard 3: Numerical Operations and Estimation

Students shall compute fluently and make reasonable estimates.

Student Learning Expectations, Grade 3	Math to Know
<p>Computational Fluency-Addition and Subtraction NO.3.3.1</p> <p>Develop, with and without appropriate <i>technology</i>, <i>computational fluency</i>, in multi-digit addition and subtraction through 999 using contextual problems</p> <ul style="list-style-type: none"> • <i>strategies</i> for adding and subtracting numbers • <i>estimation</i> of sums and <i>differences</i> in appropriate situations • relationships between operations 	<p>Handbook: 148, 149, 150, 151, 152, 160, 161, 162,-163, 164, 167</p>
<p>Computational Fluency-Multiplication and Division NO.3.3.2</p> <p>Develop, with and without appropriate <i>technology</i>, fluency with basic number combinations for multiplication and division facts (10 x 10)</p>	<p>Handbook: 66, 67, 68, 69, 70, 71, 72, 73, 82, 83, 84, 85, 86, 87, 118, 119, 120, 121, 122, 123, 124, 126, 127</p>
<p>NO.3.3.3</p> <p>Develop, with and without appropriate <i>technology</i>, <i>computational fluency</i> in multiplication and division up to two-digit by one-digit numbers using two-digit by one-digit number <i>contextual problems</i> using</p> <ul style="list-style-type: none"> • <i>strategies</i> for multiplying and dividing numbers • performance of operations in more than one way • <i>estimation</i> of <i>products</i> and <i>quotients</i> in appropriate situations • relationships between operations 	<p>Handbook: 77, 81, 82-83, 84, 119, 123, 125, 136, 137, 138, 139, 140, 174-175, 185, 188-189, 194-195, 196-197, 202, 204, 205</p>
<p>Application of Computation NO.3.3.4</p> <p>Solve simple problems using one operation involving addition and subtraction using a variety of methods and tools (e.g., objects, mental computation, paper and pencil and with and without appropriate <i>technology</i>)</p>	<p>Handbook: 38-39, 46-47, 50-51, 52, 150-151, 155, 156-157, 158, 161, 162-163, 164, 167</p>
<p>Estimation NO.3.3.5</p> <p>Use <i>estimation strategies</i> to solve problems and judge the reasonableness of the answer</p>	<p>Handbook: 132-135, 136-138, 139-140</p>

Algebra

Standard 4: Patterns, Relations and Functions

Students shall recognize, describe and develop patterns, relations and functions.

Student Learning Expectations, Grade 3	Math to Know
Recognize, Describe, and Develop Patterns A.4.3.1 Count forward and backward when given a number less than or equal to 1000	Handbook: 39, 52
A.4.3.2 Relate <i>skip-counting patterns</i> to multiplication	Handbook: 64, 80, 90
A.4.3.3 Identify a number that is more or less than any <i>whole number</i> up to 1000 using <i>multiples</i> of ten and/or 100	Handbook: 12, 14
A.4.3.4 Use repeating and growing numeric or geometric <i>patterns</i> to solve problems	Handbook: 374-376
Patterns, Relations, and Functions A.4.3.5 Determine the relationship between sets of numbers by selecting the rule (1 step rule in words)	Handbook: 260-261

Standard 5: Algebraic Representations

Students shall represent and analyze mathematical situations and structures using algebraic symbols.

Student Learning Expectations, Grade 3	Math to Know
Expressions, Equations, and Inequalities A.5.3.1 Select and/or write number sentences (<i>equations</i>) to find the unknown in problem-solving contexts involving two-digit times one-digit multiplication using appropriate labels	Handbook: 255, 256, 257
A.5.3.2 Express mathematical relationships using <i>equalities</i> and <i>inequalities</i> ($>$, $<$, $=$, \neq)	Handbook: 12, 15, 27, 224, 225, 226, 255, 256, 257

Student Learning Expectations, Grade 3	Math to Know
A.5.3.3 Use a symbol to represent an unknown quantity in a number sentence involving <i>contextual situations</i> and find the value	Handbook: 51, 77, 251, 252, 255, 256, 257

Standard 6: Algebraic Models

Students shall develop and apply mathematical models to represent and understand quantitative relationships.

Student Learning Expectations, Grade 3	Math to Know
Algebraic Models and Relationships A.6.3.1 Complete a chart or table to organize given information and to understand relationships and explain the results	Handbook: 261, 267, 268, 272

Standard 7: Analysis of Change

Students shall analyze change in various contexts.

Student Learning Expectations, Grade 3	Math to Know
Analyze Change A.7.3.1 Identify the change over time	Handbook: 261

Geometry

Standard 8: Geometric Properties

Students shall analyze characteristics and properties of 2 and 3 dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Student Learning Expectations, Grade 3	Math to Know
Characteristic Properties-Three Dimensional G.8.3.1 Compare, contrast and build <i>three-dimensional</i> solids by investigating the number of <i>faces</i> , <i>edges</i> , and <i>vertices</i> on models	Handbook: 327, 328-329, 330-331
Characteristic Properties-Two Dimensional G.8.3.2 Identify regular <i>polygons</i> with at least 4 sides (square, pentagon, hexagon and octagon)	Handbook: 311, 312-313, 314-315

Student Learning Expectations, Grade 3	Math to Know
Characteristic Properties-One Dimensional G.8.3.3 Identify and draw <i>line</i> , <i>line segment</i> and <i>ray</i> using appropriate labels	Handbook: 302, 303-305, 306
Geometric Relationships G.8.3.4 Identify and draw <i>intersecting</i> and <i>parallel lines</i>	Handbook: 303-304

Standard 9: Transformation of Shapes

Students shall apply transformations and the use of symmetry to analyze mathematical situations.

Student Learning Expectations, Grade 3	Math to Know
Symmetry and Transformations G.9.3.1 Draw one or more <i>lines of symmetry</i> in a <i>polygon</i>	Handbook: 322, 323
G.9.3.2 Describe the motion (<i>transformation</i>) of a <i>two-dimensional</i> figure as a <i>flip (reflection)</i> , <i>slide (translation)</i> or <i>turn (rotation)</i>	Handbook: 318-319

Standard 10: Coordinate Geometry

Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Student Learning Expectations, Grade 3	Math to Know
Coordinate Geometry G.10.3.1 Locate and identify points on a <i>coordinate grid</i> and name the <i>ordered pair (quadrant one only)</i> using common language and geometric vocabulary (horizontal and vertical)	Handbook: 258-259

Standard 11: Visualization and Geometric Models

Students shall use visualization, spatial reasoning and geometric modeling.

Student Learning Expectations, Grade 3	Math to Know
Spatial Visualization and Models G.11.3.1 Replicate a <i>three-dimensional</i> model composed of <i>cubes</i> when given a physical model	Handbook: 354-355

Student Learning Expectations, Grade 3	Math to Know
G.11.3.2 Determine which new figure will be formed by combining and subdividing models of existing figures	Handbook: 324-325

M e a s u r e m e n t

S t a n d a r d 1 2 : P h y s i c a l A t t r i b u t e s

Students shall use attributes of measurement to describe and compare mathematical and real-world objects.

Student Learning Expectations, Grade 3	Math to Know
Time: Calendar M.12.3.1 Determine the number of days in a month, days in a year and identify the number of weeks in a year	Handbook: 341-344
Time: Clock M.12.3.2 Recognize that 60 minutes equals 1 hour and that a day is divided into A.M. and P.M.	Handbook: 335, 337
Temperature M.12.3.3 Distinguish the temperature in contextual problems using the Fahrenheit scale on a thermometer	Handbook: 360
Tools and Attributes M.12.3.4 Demonstrate the relationship among different <i>standard units</i>	Handbook: 346, 347, 356, 357, 358, 359
M.12.3.5 Create and complete a conversion table (from larger unit to smaller unit) to show relationships between units of measurement in the same system	Handbook: 346, 347, 356, 357, 358, 359, 362, 363, 431, 432, 433

S t a n d a r d 1 3 : S y s t e m s o f M e a s u r e m e n t

Students shall identify and use units, systems and processes of measurement.

Student Learning Expectations, Grade 3	Math to Know
Calendar M.13.3.1 Use a calendar to determine <i>elapsed time</i> from month to month	Handbook: 341

Student Learning Expectations, Grade 3	Math to Know
Clock M.13.3.2 Tell time to the nearest one-minute intervals	Handbook: 336
M.13.3.3 Express time to the half hour and quarter hour using the terms half-past, quarter after, quarter -until	Handbook: 335
Elapsed Time M.13.3.4 Determine <i>elapsed time</i> in <i>contextual situations</i> to five-minute intervals	Handbook: 338-339
Money M.13.3.5 Determine the value of money up to \$10	Handbook: 17, 18-19
M.13.3.6 Apply money concepts in <i>contextual situations</i> up to \$10.00	Handbook: 18-19, 20-21, 158, 179, 192-193
Temperature M.13.3.7 Read temperatures on Fahrenheit and Celsius scales in intervals of two and five	Handbook: 360, 361
Applications M.13.3.8 Use appropriate customary measurement tools for length, <i>capacity</i> and <i>mass</i>	Handbook: 346, 347, 356, 357
M.13.3.9 <i>Estimate</i> and measure length, <i>capacity/volume</i> and <i>mass</i> using appropriate customary units	Handbook: 346, 356, 358
Perimeter M.13.3.10 Find the <i>perimeter</i> of a figure by measuring the length of the sides	Handbook: 349, 353
Area M.13.3.11 Find the <i>area</i> of any region counting squares and half-squares	Handbook: 352, 353

Student Learning Expectations, Grade 3	Math to Know
Volume M.13.3.12 Develop <i>strategies</i> for finding the <i>volume</i> (cubic units) of <i>rectangular prisms</i> and <i>cubes</i> using models	Handbook: 354-355

Data Analysis and Probability

Standard 14: Data Representation

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

Student Learning Expectations, Grade 3	Math to Know
Collect, Organize and Display Data DAP.14.3.1 Design a survey question after being given a topic and collect, organize, display and describe simple data using <i>frequency tables</i> or <i>line plots</i> , <i>pictographs</i> , and <i>bar graphs</i>	Handbook: 266, 267, 268, 269, 270-271, 272, 273-274, 276-277

Standard 15: Data Analysis

Students shall select and use appropriate statistical methods to analyze data.

Student Learning Expectations, Grade 3	Math to Know
Data Analysis DAP.15.3.1 Read and interpret <i>pictographs</i> and <i>bar graphs</i> in which symbols or intervals are greater than one	Handbook: 270-271, 273-274, 276-277
DAP.15.3.2 Match a set of data with a graphical representation of the data	Handbook: 270-271, 272, 274, 276-277

Standard 16: Inferences and Predictions

Students shall develop and evaluate inferences and predictions that are based on data.

Student Learning Expectations, Grade 3	Math to Know
Inferences and Predictions DAP.16.3.1 Make predictions for a given set of data	Handbook: 297

Standard 17: Probability

Students shall understand and apply basic concepts of probability.

Student Learning Expectations, Grade 3	Math to Know
Probability DAP.17.3.1 Use fractions to predict <i>probability</i> of an event	Handbook: 291, 292, 294-295, 297
DAP.17.3.2 Conduct simple <i>probability</i> experiments, record the data and draw conclusions about the likelihood of possible <i>outcomes</i> (roll number <i>cubes</i> , pull tiles from a bag, spin a spinner, or determine the fairness of games)	Handbook: 293, 297
DAP.17.3.3 Use physical models, pictures, and organized lists to find combinations of two sets of objects	Handbook: 298-299

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Grade 4

N u m b e r a n d O p e r a t i o n s

S t a n d a r d 1 : N u m b e r S e n s e

Students shall understand numbers, ways of representing numbers, relationships among numbers and number systems.

Student Learning Expectations, Grade 4	Math to Know
<p>Whole Numbers NO.1.4.1 Recognize <i>equivalent</i> representations for the same <i>whole number</i> and generate them by <i>composing</i> and <i>decomposing</i> numbers</p>	<p>Handbook: 3, 5, 6, 7, 36, 37, 38, 40, 41, 42, 43, 44, 45, 48, 49, 50, 51, 52, 53, 54, 56, 57, 58, 59, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117</p>
<p>NO.1.4.2 Use the <i>place value</i> structure of the base ten number system and be able to represent and compare <i>whole numbers</i> to millions (using models, illustrations, symbols, <i>expanded notation</i> and problem solving)</p>	<p>Handbook: 2, 3, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15</p>
<p>NO.1.4.3 Use mathematical language and symbols to compare and order any <i>whole numbers</i> with and without appropriate <i>technology</i> (<, >, =)</p>	<p>Handbook: 12, 13, 14, 15</p>
<p>Rational Numbers NO.1.4.4 Write a fraction to name part of a whole, part of a set, a location on a number line, and the division of <i>whole numbers</i>, using models up to 12/12</p>	<p>Handbook: 30, 210, 211, 212, 213, 214, 215, 216</p>
<p>NO.1.4.5 Utilize models, benchmarks, and <i>equivalent</i> forms to recognize that the size of the whole determines the size of the fraction</p>	<p>Handbook: 225</p>

Student Learning Expectations, Grade 4	Math to Know
NO.1.4.6 Use the <i>place value</i> structure of the base ten number system and be able to represent and compare decimals to hundredths (using models, illustrations, symbols, <i>expanded notation</i> and problem solving)	Handbook: 23, 24, 25, 26, 27, 28
NO.1.4.8 Write a fraction that is <i>equivalent</i> to a given fraction with the use of models	Handbook: 220, 221, 222, 223, 430

Standard 2: Properties of Number Operations

Students shall understand meanings of operations and how they relate to one another.

Student Learning Expectations, Grade 4	Math to Know
Number Theory NO.2.4.1 Develop an understanding of the <i>associative</i> and zero properties of multiplication using objects	Handbook: 243, 247
NO.2.4.2 <i>Apply number theory</i> <ul style="list-style-type: none"> • determine if any number is <i>even</i> or <i>odd</i> • use the terms <i>multiple</i>, <i>factor</i>, and <i>divisible</i> by in an appropriate context • generate and use <i>divisibility</i> rules for 2, 5, and 10 • demonstrate various multiplication & division relationships 	Handbook: 62, 66, 67, 77, 81, 82, 83, 84, 88, 89, 90, 91, 92, 93, 94, 95, 206, 207
Whole Number Operations NO.2.4.3 Use conventional mathematical symbols to write <i>equations</i> for <i>contextual problems</i> involving multiplication	Handbook: 64-65, 68, 72-73, 172, 174
NO.2.4.4 Represent and explain division as measurement and partitive division including equal groups, related <i>rates</i> , price, <i>rectangular arrays</i> (<i>area model</i>), combinations and multiplicative comparison	Handbook: 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85

Standard 3: Numerical Operations and Estimation

Students shall compute fluently and make reasonable estimates.

Student Learning Expectations, Grade 4	Math to Know
<p>Computational Fluency-Addition and Subtraction NO.3.4.1 Demonstrate, with and without appropriate <i>technology</i>, <i>computational fluency</i> in multi-digit addition and subtraction in <i>contextual problems</i></p>	<p>Handbook: 148, 149, 150, 151, 152, 160, 161, 162,-163, 164, 167</p>
<p>Computational Fluency-Multiplication and Division NO.3.4.2 Demonstrate fluency with combinations for multiplication and division facts (12 x 12) and use these combinations to mentally compute related problems</p>	<p>Handbook: 66, 67, 68, 69, 70, 71, 72, 73, 82, 83, 84, 85, 86, 87, 118, 119, 120, 121, 122, 123, 124, 126, 127</p>
<p>NO.3.4.3 Attain, with and without appropriate <i>technology</i>, <i>computational fluency</i> in multiplication and division using <i>contextual problems</i> using</p> <ul style="list-style-type: none"> • two-digit by two-digit multiplication (larger numbers with <i>technology</i>) • up to three-digit by two-digit division (larger numbers with <i>technology</i>) • <i>strategies</i> for multiplication and dividing numbers • performance of operations in more than one way • <i>estimation</i> of <i>products</i> and <i>quotients</i> in appropriate situations • relationships between operations 	<p>Handbook: 77, 81, 82-83, 84, 119, 123, 125, 136, 137, 138, 139, 140, 180-181, 185, 186-187, 188-189, 190-191, 194-195, 196-197, 198-199, 202-203, 204, 205</p>
<p>Application of Computation NO.3.4.4 Solve simple problems using operations involving addition, subtraction, and multiplication using a variety of methods and tools</p>	<p>Handbook: 38-39, 46-47, 50-51, 52, 60-61, 64-65, 66, 72, 74-75, 78-79, 80, 82, 150-151, 155, 156-157, 158, 161, 162-163, 164, 167, 172-173, 174-175, 176-177, 179, 180-181</p>
<p>Estimation NO.3.4.5 Use <i>estimation strategies</i> to solve problems and judge the reasonableness of the answer</p>	<p>Handbook: 132-135, 136-138, 139-140</p>

Algebra

Standard 4: Patterns, Relations and Functions

Students shall recognize, describe and develop patterns, relations and functions.

Student Learning Expectations, Grade 4	Math to Know
<p>Recognize, Describe and Develop Patterns A.4.4.1 Identify a number that is more or less than any <i>whole number</i> using <i>multiples</i> of 10, 100 and/or 1000</p>	<p>Handbook: 12, 14</p>
<p>A.4.4.2 Use repeating and growing numeric and geometric <i>patterns</i> to make predictions and solve problems</p>	<p>Handbook: 374-376</p>
<p>Patterns, Relations and Functions A.4.4.3 Determine the relationship between sets of numbers by selecting the rule</p>	<p>Handbook: 260-261</p>

Standard 5: Algebraic Representations

Students shall represent and analyze mathematical situations and structures using algebraic symbols.

Student Learning Expectations, Grade 4	Math to Know
<p>Expressions, Equations and Inequalities A.5.4.1 Select and/or write number sentences (<i>equations</i>) to find the unknown in problem-solving contexts involving <i>two-digit</i> by <i>one-digit</i> division using appropriate labels</p>	<p>Handbook: 255, 256, 257</p>
<p>A.5.4.2 Express mathematical relationships using simple <i>equations</i> and <i>inequalities</i> ($>$, $<$, $=$, \neq)</p>	<p>Handbook: 12, 15, 27, 224, 225, 226, 255, 256, 257</p>
<p>A.5.4.3 Use a <i>variable</i> to represent an unknown quantity in a number sentence involving <i>contextual situations</i> and find the value</p>	<p>Handbook: 251, 252, 255, 256, 257</p>

Standard 6: Algebraic Models

Students shall develop and apply mathematical models to represent and understand quantitative relationships.

Student Learning Expectations, Grade 4	Math to Know
Algebraic Models and Relationships A.6.4.1 Create a chart or table to organize given information and to understand relationships and explain the results	Handbook: 261, 267, 268, 272

Standard 7: Analysis of Change

Students shall analyze change in various contexts.

Student Learning Expectations, Grade 4	Math to Know
Analyze Change A.7.4.1 Identify, describe and generalize relationships in which quantities change proportionally	Handbook: 261

Geometry

Standard 8: Geometric Properties

Students shall analyze characteristics and properties of 2 and 3 dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Student Learning Expectations, Grade 4	Math to Know
Characteristics and Properties-Three Dimensional G.8.4.1 Identify, describe and classify <i>three-dimensional</i> solids by properties including the number of <i>vertices</i> , <i>edges</i> , and shapes of <i>faces</i> using models	Handbook: 327, 328-329, 330-331
Characteristics and Properties-Two Dimensional G.8.4.2 Identify regular and <i>irregular polygons</i> including octagon	Handbook: 311, 312-313, 314-315
Characteristics and Properties-One Dimensional G.8.4.3 Identify, draw, and describe a <i>line</i> , <i>line segment</i> , a <i>ray</i> , an angle, <i>intersecting</i> , <i>perpendicular</i> , and <i>parallel lines</i>	Handbook: 302, 303-305, 306
Geometric Relationships G.8.4.4 Identify and describe <i>intersecting</i> , <i>perpendicular</i> and <i>parallel lines</i> in problem solving context	Handbook: 303-304

Student Learning Expectations, Grade 4	Math to Know
G.8.4.5 Classify angles relative to 90° as more than, less than or equal to	Handbook: 308-309

Standard 9: Transformation of Shapes

Students shall apply transformations and the use of symmetry to analyze mathematical situations.

Student Learning Expectations, Grade 4	Math to Know
Symmetry and Transformations G.9.4.1 Determine the result of a <i>transformation</i> of a <i>two-dimensional</i> figure as a <i>slide (translation)</i> , <i>flip (reflection)</i> or <i>turn (rotation)</i> and justify the answer	Handbook: 318-319

Standard 10: Coordinate Geometry

Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Student Learning Expectations, Grade 4	Math to Know
Coordinate Geometry G.10.4.1 Locate and identify points on a <i>coordinate grid</i> and name the <i>ordered pair (quadrant one only)</i> using common language and geometric vocabulary (horizontal and vertical)	Handbook: 258-259

Standard 11: Visualization and Geometric Models

Students shall use visualization, spatial reasoning and geometric modeling.

Student Learning Expectations, Grade 4	Math to Know
Spatial Visualization and Models G.11.4.1 Construct a <i>three-dimensional</i> model composed of <i>cubes</i> when given an illustration	Handbook: 354-355
G.11.4.2 Create new figures by combining and subdividing models of existing figures in multiple ways and record results in a table	Handbook: 324-325

Measurement

Standard 12: Physical Attributes

Students shall use attributes of measurement to describe and compare mathematical and real-world objects.

Student Learning Expectations, Grade 4	Math to Know
Time: Clock M.12.4.1 Recognize that 60 seconds equals 1 minute	Handbook: 335, 336
Temperature M.12.4.2 Distinguish the temperature in contextual problems using the Fahrenheit scale on a thermometer	Handbook: 360, 361
Tools and Attributes M.12.4.3 Use the relationship among units of measurement	Handbook: 346, 347, 356, 357, 358, 359
M.12.4.4 Create and complete a conversion table to show relationships between units of measurement in the same system	Handbook: 346, 347, 356, 357, 358, 359, 362, 363, 431, 432, 433

Standard 13: Systems of Measurement

Students shall identify and use units, systems and processes of measurement.

Student Learning Expectations, Grade 4	Math to Know
Calendar M.13.4.1 Using a calendar to determine <i>elapsed time</i> from month to month	Handbook: 341
Clock M.13.4.2 Solve problems involving conversions between minutes and hours	Handbook: 339
M.13.4.3 Restate the time in multiple ways given an <i>analog</i> clock to the nearest one-minute	Handbook: 334, 335, 336

Student Learning Expectations, Grade 4	Math to Know
<p>Elapsed Time M.13.4.4 Determine <i>elapsed time</i> in <i>contextual situations</i> to five-minute intervals with beginning time unknown</p>	<p>Handbook: 338-339</p>
<p>Money M.13.4.5 Apply money concepts in <i>contextual situations</i></p>	<p>Handbook: 18-19, 20-21, 158, 179, 192-193</p>
<p>Temperature M.13.4.6 Read temperatures on Fahrenheit and Celsius scales</p>	<p>Handbook: 360, 361</p>
<p>Applications M.13.4.7 Use appropriate customary and metric measurement tools for length, <i>capacity</i> and <i>mass</i></p>	<p>Handbook: 346, 347, 356, 357</p>
<p>M.13.4.8 <i>Estimate</i> and measure length, <i>capacity/volume</i> and <i>mass</i> using appropriate customary and metric units</p>	<p>Handbook: 346, 347, 356, 357, 358, 359</p>
<p>Perimeter M.13.4.9 Use <i>strategies</i> for finding the <i>perimeter</i> of a rectangle</p>	<p>Handbook: 349, 353</p>
<p>Area M.13.4.10 Use <i>strategies</i> for finding the <i>area</i> of a rectangle</p>	<p>Handbook: 352, 353</p>
<p>Volume M.13.4.11 Use <i>strategies</i> to find the <i>volume</i> (cubic units) of <i>rectangular prisms</i> and <i>cubes</i></p>	<p>Handbook: 354-355</p>

Data Analysis and Probability

Standard 14: Data Representation

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

Student Learning Expectations, Grade 4	Math to Know
<p>Collect, Organize and Display Data DAP.14.4.1 Create a data collection plan after being given a topic and collect, organize, display, describe and interpret simple data using <i>frequency tables</i> or <i>line plots</i>, <i>pictographs</i> and <i>bar graphs</i></p>	<p>Handbook: 266, 267, 268, 269, 270-271, 272, 273-274, 276-277</p>

Standard 15: Data Analysis

Students shall select and use appropriate statistical methods to analyze data.

Student Learning Expectations, Grade 4	Math to Know
<p>Data Analysis DAP.15.4.1 Represent and interpret <i>data</i> using <i>pictographs</i>, <i>bar graphs</i> and <i>line graphs</i> in which symbols or intervals are greater than one</p>	<p>Handbook: 270-271, 273-274, 276-277, 280-281</p>
<p>DAP.15.4.2 Match a set of data with a graphical representation of the data</p>	<p>Handbook: 270-271, 272, 274, 276-277</p>

Standard 16: Inferences and Predictions

Students shall develop and evaluate inferences and predictions that are based on data.

Student Learning Expectations, Grade 4	Math to Know
<p>Inferences and Predictions DAP.16.4.1 Make predictions for a given set of data</p>	<p>Handbook: 297</p>

Standard 17: Probability

Students shall understand and apply basic concepts of probability.

Student Learning Expectations, Grade 4	Math to Know
<p>Probability DAP.17.4.1 Use fractions to predict <i>probability</i> of an event</p>	<p>Handbook: 291, 292, 294-295, 297</p>

Student Learning Expectations, Grade 4	Math to Know
<p>DAP.17.4.2 Conduct simple <i>probability</i> experiments, record the data and draw conclusions about the likelihood of possible <i>outcome</i> (roll number <i>cubes</i>, pull tiles from a bag, spin spinner, or determine the fairness of the game)</p>	<p>Handbook: 293, 297</p>
<p>DAP.17.4.3 Find all possible combinations of two or three sets of objects</p>	<p>Handbook: 298-299</p>

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Grade 5

Number and Operations

Standard 1: Number Sense

Students shall understand numbers, ways of representing numbers, relationships among numbers and number systems.

Student Learning Expectations, Grade 5	Math at Hand
<p>Rational Numbers NO.1.5.1 Use models and visual representations to develop the concepts of the following: <u>Fractions:</u></p> <ul style="list-style-type: none"> • parts of unit wholes • parts of a collection • locations on number lines • locations on ruler (<i>benchmark fractions</i>) • divisions of whole numbers <p><u>Ratios:</u></p> <ul style="list-style-type: none"> • part-to-part (2 boys to 3 girls) • part-to-whole (2 boys to 5 people) <p><u>Percents:</u></p> <ul style="list-style-type: none"> • part-to-100 	<p>Handbook: 020, 028, 029, 030, 031, 033, 035, 037, 038, 040, 044, 098, 178, 179, 189, 190</p>
<p>NO.1.5.2 Develop understanding of decimal <i>place value</i> using models</p>	<p>Handbook: 004, 005, 012, 013, 121, 131, 147, 148</p>
<p>NO.1.5.3 Identify decimal and <i>percent equivalents</i> for <i>benchmark fractions</i></p>	<p>Handbook: 019, 020, 043, 044, 483</p>
<p>NO.1.5.4 Round and compare decimals to a given <i>place value</i> (<i>whole number, tenths, hundredths</i>)</p>	<p>Handbook: 012, 015, 016, 017, 096</p>

Student Learning Expectations, Grade 5	Math at Hand
NO.1.5.5 Use <i>models of benchmark fractions</i> and their <i>equivalent forms</i> : <ul style="list-style-type: none"> • to analyze the size of fractions • to determine that simplification does not change the value of the fraction • to convert between mixed numbers and improper fractions 	Handbook: 034, 037, 040, 098
NO.1.5.6 Use models to differentiate between <i>perfect squares</i> up to 100 and other numbers	Handbook: 067, 068, 069, 070, 484

Standard 2: Properties of Number Operations

Students shall understand meanings of operations and how they relate to one another.

Student Learning Expectations, Grade 5	Math at Hand
Number Theory NO.2.5.1 Use <i>divisibility rules</i> to determine if a number is a <i>factor</i> of another number (2, 3, 5, 10)	Handbook: 062
NO.2.5.2 Identify <i>commutative</i> and <i>associative properties</i>	Handbook: 123, 141, 216-219, 220-223
NO.2.5.3 Identify the <i>distributive property</i> by using physical models to solve computation and real world problems	Handbook: 224, 225
NO.2.5.4 Apply rules (conventions) for <i>order of operations</i> to <i>whole numbers</i> where the left to right computations are modified only by the use of parentheses	Handbook: 212, 213, 214
Understand Operations NO.2.5.5 Model addition, subtraction, and multiplication of fractions with like and unlike denominators and decimals	Handbook: 158, 159, 160, 161, 163, 164, 165, 168, 169, 170

Standard 3: Numerical Operations and Estimation

Students shall compute fluently and make reasonable estimates.

Student Learning Expectations, Grade 5	Math at Hand
<p>Computational Fluency NO.3.5.1 Develop and use a variety of <i>algorithms</i> with <i>computational fluency</i> to perform <i>whole number</i> operations using addition and subtraction (up to five-<i>digit</i> numbers), multiplication (up to three-<i>digit</i> x two-<i>digit</i>), division (up to two-<i>digit</i> divisor) interpreting remainders, including real world problems</p>	<p>Handbook: 118-124, 127-134, 136-141, 144-152</p>
<p>NO.3.5.2 Develop and use <i>algorithms</i>:</p> <ul style="list-style-type: none"> • to add and subtract numbers containing decimals (up to thousandths place) • to multiply decimals (hundredths x tenths) • to divide decimals by <i>whole number</i> divisors • to add and subtract fractions with like denominators 	<p>Handbook: 125-126, 135, 142-143, 153-154, 158, 159, 163, 164, 448, 450, 451</p>
<p>NO.3.5.3 Solve, with and without appropriate <i>technology</i>, two-step problems using a variety of methods and tools (i.e. objects, mental computation, paper and pencil)</p>	<p>Handbook: 399, 404, 406, 409, 410</p>
<p>Estimation NO.3.5.4 Develop and use <i>strategies</i> to <i>estimate</i> the results of <i>whole number</i> computations and to judge the reasonableness of such results</p>	<p>Handbook: 093, 094, 095, 101, 103, 104, 105, 106, 107, 109, 110, 111, 112, 113, 114</p>
<p>Application of Computations NO.3.5.5 Use <i>factors</i> of numbers:</p> <ul style="list-style-type: none"> • to introduce exponents • to find common <i>factors</i> of two numbers • to simplify fractions to the lowest terms 	<p>Handbook: 035, 037, 050, 051, 056, 057, 058, 065</p>

Algebra

Standard 4: Patterns, Relations and Functions

Students shall recognize, describe and develop patterns, relations and functions.

Student Learning Expectations, Grade 5	Math at Hand
Patterns, Relations and Functions A.4.5.1 Solve problems by finding the next term or missing term in a <i>pattern</i> or <i>function</i> table using real world situations	Handbook: 244, 245, 494-498
A.4.5.2 Interpret and write a rule for a one operation <i>function</i> table	Handbook: 244

Standard 5: Algebraic Representations

Students shall represent and analyze mathematical situations and structures using algebraic symbols.

Student Learning Expectations, Grade 5	Math at Hand
Expressions, Equations, and Inequalities A.5.5.1 Model and solve simple <i>equations</i> by informal methods using manipulatives and appropriate <i>technology</i>	Handbook: 241, 242, 243
A.5.5.2 Write <i>expressions</i> containing one <i>variable</i> (a letter representing an unknown quantity) using rules for addition and subtraction	Handbook: 238
A.5.5.3 Select, write and evaluate <i>algebraic expressions</i> with one <i>variable</i> by substitution	Handbook: 238, 239

Standard 6: Algebraic Models

Students shall develop and apply mathematical models to represent and understand quantitative relationships.

Student Learning Expectations, Grade 5	Math at Hand
Algebraic Models and Relationships A.6.5.1 Draw conclusions and make predictions, with and without appropriate <i>technology</i> , from models, tables and <i>line graphs</i>	Handbook: 244, 245, 265, 266

Standard 7: Analysis of Change

Students shall analyze change in various contexts.

Student Learning Expectations, Grade 5	Math at Hand
Analyze Change A.7.5.1 Model and describe quantities that change using real world situations	Handbook: 185, 244, 245

Geometry

Standard 8: Geometric Properties

Students shall analyze characteristics and properties of 2 and 3 dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Student Learning Expectations, Grade 5	Math at Hand
Characteristics of Geometric Shapes G.8.5.1 Identify and model regular and <i>irregular polygons</i> including decagon	Handbook: 357, 358, 361, 362, 364, 365
G.8.5.2 Identify and draw <i>congruent, adjacent, obtuse, acute, right</i> and <i>straight</i> angles (Label parts of an angle: <i>vertex, rays, interior</i> and <i>exterior</i>)	Handbook: 345, 347, 349, 353, 373
G.8.5.3 Model and identify circle, <i>radius, diameter, center, circumference</i> and <i>chord</i>	Handbook: 367
G.8.5.4 Model and identify the properties of <i>congruent</i> figures	Handbook: 349, 372, 373, 374

Standard 9: Transformation of Shapes

Students shall apply transformations and the use of symmetry to analyze mathematical situations.

Student Learning Expectations, Grade 5	Math at Hand
Symmetry and Transformations G.9.5.1 Predict and describe the results of <i>translation (slide), reflection (flip), rotation (turn)</i> , showing that the transformed shape remains unchanged	Handbook: 375, 376, 377, 378, 379

Standard 10: Coordinate Geometry

Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Student Learning Expectations, Grade 5	Math at Hand
Coordinate Geometry G.10.5.1 Use geometric vocabulary (horizontal/x-axis, vertical/y-axis, <i>ordered pairs</i>) to describe the location and plot points in <i>Quadrant I</i>	Handbook: 265, 266

Standard 11: Visualization and Geometric Models

Students shall use visualization, spatial reasoning and geometric modeling.

Student Learning Expectations, Grade 5	Math at Hand
Spatial Visualization and Models G.11.5.1 Using grid paper, draw and identify <i>two-dimensional patterns (nets)</i> for <i>cubes</i>	Handbook: 384

Measurement

Standard 12: Physical Attributes

Students shall use attributes and tools of measurement to describe and compare mathematical and real-world objects.

Student Learning Expectations, Grade 5	Math at Hand
Attributes and Tools M.12.5.1 Identify and select appropriate units and tools to measure	Handbook: 294, 314, 315, 317, 318, 465, 468
M.12.5.2 Make conversions within the customary measurement system in real world problems	Handbook: 294, 314, 317, 327, 329, 330, 331, 485, 486, 487
M.12.5.3 Establish through experience benchmark prefixes of milli-, centi-, and kilo-	Handbook: 294, 315, 318, 485

Student Learning Expectations, Grade 5	Math at Hand
M.12.5.4 Understand when to use linear units to describe <i>perimeter</i> , square units to describe <i>area</i> or <i>surface area</i> , and cubic units to describe <i>volume</i> , in real world situations	Handbook: 295, 296, 297, 299, 300, 301, 302, 303, 304, 305, 307, 308, 309, 310, 311, 312
M.12.5.5 Model the differences between covering the <i>faces</i> (<i>surface area/nets</i>) and filling the <i>interior</i> (<i>volume of cubes</i>)	Handbook: 306, 307, 309, 310, 312

Standard 13: Systems of Measurement

Students shall identify and use units, systems and processes of measurement.

Student Learning Expectations, Grade 5	Math at Hand
Attributes and Tools M.13.5.1 Solve real world problems involving one <i>elapsed time</i> , counting forward (calendar and clock)	Handbook: 324
M.13.5.2 Determine which unit of measure or measurement tool matches the context for a problem situation	Handbook: 294, 314, 315, 316, 317, 318, 319, 320, 321, 322, 465, 467, 468
M.13.5.3 Draw and measure distance to the nearest cm and 1/4 inch accurately	Handbook: 465
M.13.5.4 Develop and use <i>strategies</i> to solve real world problems involving <i>perimeter</i> and <i>area</i> of rectangles	Handbook: 296, 297, 299, 300, 301
M.13.5.6 Use benchmark angles to estimate the measure of angles	Handbook: 346, 347

Data Analysis and Probability

Standard 14: Data Representation

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

Student Learning Expectations, Grade 5	Math at Hand
Collect, organize and display data DAP.14.5.1 Develop appropriate questions for surveys	Handbook: 248, 249
DAP.14.5.2 Collect <i>numerical</i> and <i>categorical data</i> using surveys, observations and experiments that would result in <i>bar graphs, line graphs, line plots</i> and <i>stem-and-leaf plots</i>	Handbook: 248, 249, 250, 251, 252, 253, 254, 272, 277, 281
DAP.14.5.3 Construct and interpret <i>frequency tables</i> , charts, <i>line plots, stem-and-leaf plots</i> and <i>bar graphs</i>	Handbook: 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284

Standard 15: Data Analysis

Students shall select and use appropriate statistical methods to analyze data.

Student Learning Expectations, Grade 5	Math at Hand
Data Analysis DAP.15.5.1 Interpret graphs such as <i>line graphs, double bar graphs</i> , and <i>circle graphs</i>	Handbook: 274, 276, 277, 278, 279
DAP.15.5.2 Determine, with and without appropriate <i>technology</i> , the <i>range, mean, median</i> and <i>mode</i> (<i>whole number data sets</i>) and explain what each indicates about the set of data	Handbook: 256, 257, 259, 260, 261, 262

Standard 16: Inferences and Predictions

Students shall develop and evaluate inferences and predictions that are based on data.

Student Learning Expectations, Grade 5	Math at Hand
Inferences and Predictions DAP.16.5.1 Make predictions and justify conclusions based on data	Handbook: 256, 257, 258, 260, 261, 262, 263, 288, 289

Standard 17: Probability

Students shall understand and apply basic concepts of probability.

Student Learning Expectations, Grade 5	Math at Hand
Probability DAP.17.5.1 Identify and predict the <i>probability</i> of events within a simple experiment	Handbook: 286, 287, 288, 289
DAP.17.5.2 List and explain all possible <i>outcomes</i> in a given situation	Handbook: 290, 291, 292

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Grade 6

N u m b e r a n d O p e r a t i o n s

S t a n d a r d 1 : N u m b e r S e n s e

Students shall understand numbers, ways of representing numbers, relationships among numbers and number systems.

Student Learning Expectations, Grade 6	Math at Hand
Rational Numbers NO.1.6.1 Demonstrate conceptual understanding to find a specific <i>percent</i> of a number, using models, real life examples, or explanations	Handbook: 192-193
NO.1.6.2 Find decimal and <i>percent equivalents</i> for proper fractions and explain why they represent the same value	Handbook: 019, 020, 043, 044, 483
NO.1.6.3 Round and compare decimals to a given <i>place value</i> including thousandths	Handbook: 012, 015, 016, 017, 096
NO.1.6.4 Convert, compare and order fractions (mixed numbers and improper fractions) decimals and <i>percents</i> and find their approximate locations on a number line	Handbook: 015, 016, 017, 018, 019, 020, 035, 038, 039, 040, 042, 043, 044, 483
NO.1.6.5 Recognize and identify <i>perfect squares</i> and their <i>square roots</i>	Handbook: 067, 068, 069, 070, 484

Standard 2: Properties of Number Operations

Students shall understand meanings of operations and how they relate to one another.

Student Learning Expectations, Grade 6	Math at Hand
<p>Number Theory NO.2.6.1 Use <i>divisibility rules</i> to determine if a number is a <i>factor</i> of another number</p>	<p>Handbook: 062</p>
<p>NO.2.6.2 Apply the <i>distributive property</i> of multiplication over addition to simplify computations with <i>whole numbers</i></p>	<p>Handbook: 224, 225</p>
<p>NO.2.6.3 Apply the addition, subtraction, multiplication and division properties of equality to one-step <i>equations</i> with <i>whole numbers</i></p>	<p>Handbook: 232, 233, 234, 242, 243</p>
<p>NO.2.6.4 Apply rules (conventions) for <i>order of operations</i> to <i>whole numbers</i> with and without parentheses</p>	<p>Handbook: 212, 213, 214</p>
<p>Understand Operations NO.2.6.5 Model multiplication and division of fractions (including mixed numbers) and decimals using pictures and physical objects</p>	<p>Handbook: 168, 169, 170, 173, 174, 175, 176</p>

Standard 3: Numerical Operations and Estimation

Students shall compute fluently and make reasonable estimates.

Student Learning Expectations, Grade 6	Math at Hand
<p>Computational Fluency NO.3.6.1 Apply, with and without appropriate <i>technology</i>, <i>algorithms</i> with <i>computational fluency</i> to perform <i>whole number</i> operations (+, -, x, /)</p>	<p>Handbook: 118-124, 127-134, 136-141, 144-152</p>
<p>NO.3.6.2 Develop and analyze <i>algorithms</i> for computing with fractions (including mixed numbers) and decimals and demonstrate, with and without <i>technology</i>, <i>computational fluency</i> in their use and justify the solution</p>	<p>Handbook: 125-126, 135, 142-143, 153-155, 158-161, 163-166, 167-170, 171-176, 448, 450, 451</p>

Student Learning Expectations, Grade 6	Math at Hand
NO.3.6.3 Solve, with and without appropriate <i>technology</i> , multi-step problems using a variety of methods and tools (i.e., objects, mental computation, paper and pencil)	Handbook: 399, 404, 406, 409, 410
Estimation NO.3.6.4 <i>Estimate</i> reasonable solutions to problem situations involving fractions and decimals	Handbook: 096, 102, 108
Application of Computation NO.3.6.5 Find and use <i>factorization (tree diagram)</i> including <i>prime factorization</i> of composite numbers (expanded and exponential notation) to determine the greatest common factor (<i>GCF</i>) and least common multiple (<i>LCM</i>)	Handbook: 056, 057, 058, 061
NO.3.6.6 Use proportional reasoning and <i>ratios</i> to represent problem situations and determine the reasonableness of solutions with and without appropriate <i>technology</i>	Handbook: 178, 179, 182, 184, 185, 186, 187, 188, 193, 194, 195, 370
NO.3.6.7 Determine the <i>percent</i> of a number and solve related problems in real world situations	Handbook: 193, 196, 197

A l g e b r a

S t a n d a r d 4 : P a t t e r n s , R e l a t i o n s a n d F u n c t i o n s

Students shall recognize, describe and develop patterns, relations and functions.

Student Learning Expectations, Grade 6	Math at Hand
Patterns, Relations and Functions A.4.6.1 Solve problems by finding the next term or missing term in a <i>pattern</i> or <i>function</i> table using real world situations	Handbook: 244, 245, 496, 497, 498
A.4.6.2 Interpret and write an <i>algebraic</i> rule for a one operation <i>function table</i>	Handbook: 244

Standard 5: Algebraic Representations

Students shall represent and analyze mathematical situations and structures using algebraic symbols.

Student Learning Expectations, Grade 6	Math at Hand
Expressions, Equations, and Inequalities A.5.6.1 Model, write and solve one-step <i>equations</i> by informal methods using manipulatives and appropriate <i>technology</i>	Handbook: 241, 242, 243
A.5.6.2 Write simple <i>algebraic expressions</i> using appropriate operations (+, -, x, /) with one <i>variable</i>	Handbook: 238
A.5.6.3 Evaluate <i>algebraic expressions</i> with one <i>variable</i> using appropriate properties and operations (+, -, x, /)	Handbook: 239

Standard 6: Algebraic Models

Students shall develop and apply mathematical models to represent and understand quantitative relationships.

Student Learning Expectations, Grade 6	Math at Hand
Algebraic Models and Relationships A.6.6.1 Complete, with and without appropriate <i>technology</i> , and interpret tables and <i>line graphs</i> that represent the relationship between two <i>variables</i> in <i>quadrant I</i>	Handbook: 244, 245, 265, 266

Standard 7: Analysis of Change

Students shall analyze change in various contexts.

Student Learning Expectations, Grade 6	Math at Hand
Analyze Change A.7.6.1 Identify and compare situations with constant or varying <i>rates</i> of change	Handbook: 185, 244, 245

G e o m e t r y

S t a n d a r d 8 : G e o m e t r i c P r o p e r t i e s

Students shall analyze characteristics and properties of 2 and 3 dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Student Learning Expectations, Grade 6	Math at Hand
<p>Characteristics of Geometric Shapes G.8.6.1 Identify <i>three-dimensional</i> geometric figures using models (<i>rectangular prisms, cylinders, cones, pyramids and spheres</i>)</p>	<p>Handbook: 382, 383, 385, 386, 388, 390, 392</p>
<p>G.8.6.3 Identify, describe, draw, and classify triangles as <i>equilateral, isosceles, scalene, right, acute, obtuse, and equiangular</i></p>	<p>Handbook: 361, 362, 363</p>
<p>G.8.6.4 Draw, label and determine relationships among the <i>radius, diameter, center</i> and <i>circumference</i> (e.g. <i>radius</i> is half the <i>diameter</i>) of a circle</p>	<p>Handbook: 367</p>
<p>G.8.6.5 Identify <i>similar figures</i> and explore their properties</p>	<p>Handbook: 369</p>

S t a n d a r d 9 : T r a n s f o r m a t i o n o f S h a p e s

Students shall apply transformations and the use of symmetry to analyze mathematical situations.

Student Learning Expectations, Grade 6	Math at Hand
<p>Symmetry and Transformations G.9.6.1 Identify and describe <i>line</i> and <i>rotational symmetry</i> in <i>two-dimensional</i> shapes, <i>patterns</i> and designs</p>	<p>Handbook: 375, 377, 378, 380</p>
<p>G.9.6.2 Describe positions and orientations of shapes under <i>transformation</i> (<i>translation, reflection</i> and <i>rotation</i>) recognizing the size and shape do not change</p>	<p>Handbook: 375, 376, 377, 378, 379</p>

Standard 10: Coordinate Geometry

Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Student Learning Expectations, Grade 6	Math at Hand
Coordinate Geometry G.10.6.1 Use <i>ordered pairs</i> to plot points in <i>Quadrant I</i>	Handbook: 265, 266

Standard 11: Visualization and Geometric Models

Students shall use visualization, spatial reasoning and geometric modeling.

Student Learning Expectations, Grade 6	Math at Hand
Spatial Visualization and Models G.11.6.1 Identify <i>two-dimensional patterns (nets)</i> for <i>three-dimensional solids</i> , such as <i>prisms, pyramids, cylinders, and cones</i>	Handbook: 384, 387, 389, 391

Measurement

Standard 12: Physical Attributes

Students shall use attributes and tools of measurement to describe and compare mathematical and real-world objects.

Student Learning Expectations, Grade 6	Math at Hand
Attributes and Tools M.12.6.1 Identify and select appropriate units and tools from both systems to measure	Handbook: 294, 314, 315, 317, 318, 465, 468
M.12.6.2 Make conversions within the same measurement system in real world problems	Handbook: 294, 314, 315, 317, 318, 327, 329, 330, 331, 485, 486, 487
M.12.6.3 Compare and contrast the differences among linear units, square units, and cubic units	Handbook: 294, 300, 309

Standard 13: Systems of Measurement

Students shall identify and use units, systems and processes of measurement.

Student Learning Expectations, Grade 6	Math at Hand
<p>Attributes and Tools M.13.6.1 Solve real world problems involving one <i>elapsed time</i>, counting forward and backward (calendar and clock)</p>	<p>Handbook: 324</p>
<p>M.13.6.2 Determine which unit of measure or measurement tool matches the context for a problem situation</p>	<p>Handbook: 294, 314, 315, 316, 317, 318, 319, 320, 321, 322, 465, 467, 468</p>
<p>M.13.6.3 Draw and measure distance to the nearest mm and 1/8 inch accurately</p>	<p>Handbook: 465</p>
<p>M.13.6.4 Establish and apply formulas to find <i>area</i> and <i>perimeter</i> of triangles, rectangles, and parallelograms</p>	<p>Handbook: 296, 297, 299, 301, 302, 303</p>
<p>Applications M.13.6.6 Use estimation to check the reasonableness of measurements obtained from use of various instruments (including angle measures)</p>	<p>Handbook: 294, 314, 315, 317, 318, 487</p>

Data Analysis and Probability

Standard 14: Data Representation

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

Student Learning Expectations, Grade 6	Math at Hand
<p>Collect, organize and display data DAP.14.6.1 Formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population</p>	<p>Handbook: 248, 249, 250, 251, 252, 253, 254</p>
<p>DAP.14.6.2 Collect data and select appropriate graphical representations to display the data including <i>Venn diagrams</i></p>	<p>Handbook: 267, 268, 272, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284</p>

Student Learning Expectations, Grade 6	Math at Hand
DAP.14.6.3 Construct and interpret graphs, using correct scale, including <i>line graphs</i> and <i>double-bar graphs</i>	Handbook: 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284

Standard 15: Data Analysis

Students shall select and use appropriate statistical methods to analyze data.

Student Learning Expectations, Grade 6	Math at Hand
Data Analysis DAP.15.6.1 Interpret graphs such as <i>double line graphs</i> and <i>circle graphs</i>	Handbook: 273, 274, 275, 276, 278, 279, 282, 283, 284
DAP.15.6.2 Compare and interpret information provided by measures of <i>central tendencies</i> (<i>mean</i> , <i>median</i> and <i>mode</i>) and <i>measures of spread</i> (<i>range</i>)	Handbook: 256, 257, 259, 260, 261, 262

Standard 16: Inferences and Predictions

Students shall develop and evaluate inferences and predictions that are based on data.

Student Learning Expectations, Grade 6	Math at Hand
Inferences and Predictions DAP.16.6.1 Use observations about differences in data to make justifiable inferences	Handbook: 256, 257, 258, 260, 261, 262, 263, 288, 289

Standard 17: Probability

Students shall understand and apply basic concepts of probability.

Student Learning Expectations, Grade 6	Math at Hand
Probability DAP.17.6.1 Distinguish between <i>theoretical</i> and <i>experimental probability</i>	Handbook: 286, 287, 288, 289

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Grade 6

N u m b e r a n d O p e r a t i o n s

S t a n d a r d 1 : N u m b e r S e n s e

Students shall understand numbers, ways of representing numbers, relationships among numbers and number systems.

Student Learning Expectations, Grade 6	Math on Call
Rational Numbers NO.1.6.1 Demonstrate conceptual understanding to find a specific <i>percent</i> of a number, using models, real life examples, or explanations	Handbook: 442, 443, 447, 448, 449, 451, 454, 455
NO.1.6.2 Find decimal and <i>percent equivalents</i> for proper fractions and explain why they represent the same value	Handbook: 012, 017, 022, 024, 026, 030, 043, 044, 045, 442, 538
NO.1.6.3 Round and compare decimals to a given <i>place value</i> including thousandths	Handbook: 018, 019, 020, 021
NO.1.6.4 Convert, compare and order fractions (mixed numbers and improper fractions) decimals and <i>percents</i> and find their approximate locations on a number line	Handbook: 018, 019, 020, 040, 041, 042, 046, 048, 049, 230, 441
NO.1.6.5 Recognize and identify <i>perfect squares</i> and their <i>square roots</i>	Handbook: 076, 077, 079, 083, 540

Standard 2: Properties of Number Operations

Students shall understand meanings of operations and how they relate to one another.

Student Learning Expectations, Grade 6	Math on Call
<p>Number Theory NO.2.6.1 Use <i>divisibility rules</i> to determine if a number is a <i>factor</i> of another number</p>	<p>Handbook: 069</p>
<p>NO.2.6.2 Apply the <i>distributive property</i> of multiplication over addition to simplify computations with <i>whole numbers</i></p>	<p>Handbook: 148, 219, 220, 221</p>
<p>NO.2.6.3 Apply the addition, subtraction, multiplication and division properties of equality to one-step <i>equations</i> with <i>whole numbers</i></p>	<p>Handbook: 227, 228, 229, 241</p>
<p>NO.2.6.4 Apply rules (conventions) for <i>order of operations</i> to <i>whole numbers</i> with and without parentheses</p>	<p>Handbook: 207, 208, 209, 210</p>
<p>Understand Operations NO.2.6.5 Model multiplication and division of fractions (including mixed numbers) and decimals using pictures and physical objects</p>	<p>Handbook: 160, 161, 162, 163, 189, 190, 191, 192</p>

Standard 3: Numerical Operations and Estimation

Students shall compute fluently and make reasonable estimates.

Student Learning Expectations, Grade 6	Math on Call
<p>Computational Fluency NO.3.6.1 Apply, with and without appropriate <i>technology</i>, <i>algorithms</i> with <i>computational fluency</i> to perform <i>whole number</i> operations (+, -, x, /)</p>	<p>Handbook: 087-091, 096-101, 109, 115-119, 125-130, 137, 142-148, 152-157, 165-167, 171-175, 179-183, 194-196</p>
<p>NO.3.6.2 Develop and analyze <i>algorithms</i> for computing with fractions (including mixed numbers) and decimals and demonstrate, with and without <i>technology</i>, <i>computational fluency</i> in their use and justify the solution</p>	<p>Handbook: 093, 095, 102-107, 110-114, 117, 118, 120, 121, 131-135, 138-141, 150, 158-163, 168-170, 177, 184-192, 197-199</p>

Student Learning Expectations, Grade 6	Math on Call
NO.3.6.3 Solve, with and without appropriate <i>technology</i> , multi-step problems using a variety of methods and tools (i.e., objects, mental computation, paper and pencil)	Handbook: 088-091, 096-114, 116-119, 125-141, 143-148, 152-170, 173-175, 179-199, 530
Estimation NO.3.6.4 <i>Estimate</i> reasonable solutions to problem situations involving fractions and decimals	Handbook: 093, 095, 117, 118, 120, 121, 150, 177
Application of Computation NO.3.6.5 Find and use <i>factorization (tree diagram)</i> including <i>prime factorization</i> of composite numbers (expanded and exponential notation) to determine the greatest common factor (<i>GCF</i>) and least common multiple (<i>LCM</i>)	Handbook: 061, 066, 068
NO.3.6.6 Use proportional reasoning and <i>ratios</i> to represent problem situations and determine the reasonableness of solutions with and without appropriate <i>technology</i>	Handbook: 377, 424, 425, 426, 427, 428, 429, 430, 431, 432, 434, 435, 436, 437, 438, 439, 440
NO.3.6.7 Determine the <i>percent</i> of a number and solve related problems in real world situations	Handbook: 442, 443, 444, 445, 446, 447, 448, 449, 451, 454, 455

Algebra

Standard 4: Patterns, Relations and Functions

Students shall recognize, describe and develop patterns, relations and functions.

Student Learning Expectations, Grade 6	Math on Call
Patterns, Relations and Functions A.4.6.1 Solve problems by finding the next term or missing term in a <i>pattern</i> or <i>function</i> table using real world situations	Handbook: 232, 234, 236, 243, 247, 545, 548
A.4.6.2 Interpret and write an <i>algebraic</i> rule for a one operation <i>function table</i>	Handbook: 232, 234, 243, 244, 545, 548

Standard 5: Algebraic Representations

Students shall represent and analyze mathematical situations and structures using algebraic symbols.

Student Learning Expectations, Grade 6	Math on Call
Expressions, Equations, and Inequalities A.5.6.1 Model, write and solve one-step <i>equations</i> by informal methods using manipulatives and appropriate <i>technology</i>	Handbook: 228, 229, 241, 246, 253, 508
A.5.6.2 Write simple <i>algebraic expressions</i> using appropriate operations (+, -, x, /) with one <i>variable</i>	Handbook: 204, 205
A.5.6.3 Evaluate <i>algebraic expressions</i> with one <i>variable</i> using appropriate properties and operations (+, -, x, /)	Handbook: 206, 208, 209

Standard 6: Algebraic Models

Students shall develop and apply mathematical models to represent and understand quantitative relationships.

Student Learning Expectations, Grade 6	Math on Call
Algebraic Models and Relationships A.6.6.1 Complete, with and without appropriate <i>technology</i> , and interpret tables and <i>line graphs</i> that represent the relationship between two <i>variables</i> in <i>quadrant I</i>	Handbook: 232, 234, 235, 236, 243, 244, 246, 247, 253

Standard 7: Analysis of Change

Students shall analyze change in various contexts.

Student Learning Expectations, Grade 6	Math on Call
Analyze Change A.7.6.1 Identify and compare situations with constant or varying <i>rates</i> of change	Handbook: 232, 234, 235, 236, 243, 244, 247, 248, 250

Geometry

Standard 8: Geometric Properties

Students shall analyze characteristics and properties of 2 and 3 dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Student Learning Expectations, Grade 6	Math on Call
<p>Characteristics of Geometric Shapes G.8.6.1 Identify <i>three-dimensional</i> geometric figures using models (<i>rectangular prisms, cylinders, cones, pyramids and spheres</i>)</p>	<p>Handbook: 393, 394, 395, 399, 403, 404, 406, 409, 414, 419</p>
<p>G.8.6.2 Investigate with manipulatives or grid paper what happens to the <i>perimeter</i> and <i>area</i> of a <i>two-dimensional</i> shape when the dimensions are changed</p>	<p>Handbook: 378</p>
<p>G.8.6.3 Identify, describe, draw, and classify triangles as <i>equilateral, isosceles, scalene, right, acute, obtuse, and equiangular</i></p>	<p>Handbook: 351, 352, 353</p>
<p>G.8.6.4 Draw, label and determine relationships among the <i>radius, diameter, center</i> and <i>circumference</i> (e.g. <i>radius</i> is half the <i>diameter</i>) of a circle</p>	<p>Handbook: 370, 372, 373</p>
<p>G.8.6.5 Identify <i>similar figures</i> and explore their properties</p>	<p>Handbook: 376</p>

Standard 9: Transformation of Shapes

Students shall apply transformations and the use of symmetry to analyze mathematical situations.

Student Learning Expectations, Grade 6	Math on Call
<p>Symmetry and Transformations G.9.6.1 Identify and describe <i>line</i> and <i>rotational symmetry</i> in <i>two-dimensional</i> shapes, <i>patterns</i> and designs</p>	<p>Handbook: 387, 389</p>
<p>G.9.6.2 Describe positions and orientations of shapes under <i>transformation (translation, reflection and rotation)</i> recognizing the size and shape do not change</p>	<p>Handbook: 384, 385, 386, 388</p>

Standard 10: Coordinate Geometry

Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Student Learning Expectations, Grade 6	Math on Call
Coordinate Geometry G.10.6.1 Use <i>ordered pairs</i> to plot points in <i>Quadrant I</i>	Handbook: 232, 234, 247, 252, 319
G.10.6.2 Plot points that form the <i>vertices</i> of a geometric figure and draw, identify and classify the figure.	Handbook: 385

Standard 11: Visualization and Geometric Models

Students shall use visualization, spatial reasoning and geometric modeling.

Student Learning Expectations, Grade 6	Math on Call
Spatial Visualization and Models G.11.6.1 Identify <i>two-dimensional patterns (nets)</i> for <i>three-dimensional solids</i> , such as <i>prisms, pyramids, cylinders, and cones</i>	Handbook: 395, 396, 401, 406, 407, 411, 412, 416, 417

Measurement

Standard 12: Physical Attributes

Students shall use attributes and tools of measurement to describe and compare mathematical and real-world objects.

Student Learning Expectations, Grade 6	Math on Call
Attributes and Tools M.12.6.1 Identify and select appropriate units and tools from both systems to measure	Handbook: 033, 036, 537
M.12.6.2 Make conversions within the same measurement system in real world problems	Handbook: 355, 369, 436, 437, 535, 536, 537
M.12.6.3 Compare and contrast the differences among linear units, square units, and cubic units	Handbook: 346, 347, 354, 355, 356, 357, 365, 366, 367, 368, 369, 375, 396, 397, 398, 401, 402, 407, 408, 412, 413, 417, 418, 421, 422

Standard 13: Systems of Measurement

Students shall identify and use units, systems and processes of measurement.

Student Learning Expectations, Grade 6	Math on Call
Attributes and Tools M.13.6.1 Solve real world problems involving one <i>elapsed time</i> , counting forward and backward (calendar and clock)	Handbook: 536
M.13.6.2 Determine which unit of measure or measurement tool matches the context for a problem situation	Handbook: 033, 036, 331, 357, 512, 535, 536, 537
M.13.6.3 Draw and measure distance to the nearest mm and 1/8 inch accurately	Handbook: 537
M.13.6.4 Establish and apply formulas to find <i>area</i> and <i>perimeter</i> of triangles, rectangles, and parallelograms	Handbook: 356, 365, 366, 367
Applications M.13.6.5 Find the distance between two points on a number line	Handbook: 378
M.13.6.6 Use estimation to check the reasonableness of measurements obtained from use of various instruments (including angle measures)	Handbook: 331, 512, 537

Data Analysis and Probability

Standard 14: Data Representation

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

Student Learning Expectations, Grade 6	Math on Call
Collect, organize and display data DAP.14.6.1 Formulate questions, design studies, and collect data about a characteristic shared by two populations or different characteristics within one population	Handbook: 263, 264, 265, 266, 267, 268, 269

Student Learning Expectations, Grade 6	Math on Call
DAP.14.6.2 Collect data and select appropriate graphical representations to display the data including <i>Venn diagrams</i>	Handbook: 285, 286, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306
DAP.14.6.3 Construct and interpret graphs, using correct scale, including <i>line graphs</i> and <i>double-bar graphs</i>	Handbook: 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306

Standard 15: Data Analysis

Students shall select and use appropriate statistical methods to analyze data.

Student Learning Expectations, Grade 6	Math on Call
Data Analysis DAP.15.6.1 Interpret graphs such as <i>double line graphs</i> and <i>circle graphs</i>	Handbook: 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306
DAP.15.6.2 Compare and interpret information provided by measures of <i>central tendencies (mean, median and mode)</i> and <i>measures of spread (range)</i>	Handbook: 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283

Standard 16: Inferences and Predictions

Students shall develop and evaluate inferences and predictions that are based on data.

Student Learning Expectations, Grade 6	Math on Call
Inferences and Predictions DAP.16.6.1 Use observations about differences in data to make justifiable inferences	Handbook: 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 285, 286, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306

Standard 17: Probability

Students shall understand and apply basic concepts of probability.

Student Learning Expectations, Grade 6	Math on Call
Probability DAP.17.6.1 Distinguish between <i>theoretical</i> and <i>experimental probability</i>	Handbook: 466, 467

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Grade 7

N u m b e r a n d O p e r a t i o n s

S t a n d a r d 1 : N u m b e r S e n s e

Students shall understand numbers, ways of representing numbers, relationships among numbers and number systems.

Student Learning Expectations, Grade 7	Math on Call
Rational Numbers NO.1.7.1 Relate, with and without models and pictures, concepts of <i>ratio</i> , <i>proportion</i> , and <i>percent</i> , including <i>percents</i> less than 1 and greater than 100	Handbook: 379, 441, 442, 443, 444, 445, 446
NO.1.7.2 Demonstrate, with and without appropriate <i>technology</i> , an understanding of <i>place value</i> using powers of 10 and write numbers greater than one in <i>scientific notation</i>	Handbook: 005, 006, 015, 016
NO.1.7.3 Convert between <i>scientific notation</i> and standard <i>notation</i> using numbers greater than one	Handbook: 016
NO.1.7.4 Find decimal and <i>percent equivalents</i> for mixed numbers and explain why they represent the same value	Handbook: 024, 442
NO.1.7.5 Compare and represent <i>integers</i> , fractions, decimals and mixed numbers and find their approximate location on a number line	Handbook: 012, 013, 014, 015, 017, 018, 019, 020, 022, 023, 024, 028, 029, 033, 035, 040, 041, 042, 043, 044, 046, 047, 048, 049
NO.1.7.6 Recognize subsets of the <i>real number system</i> (<i>natural</i> , <i>whole</i> , <i>integers</i> , <i>rational</i> , and <i>irrational numbers</i>)	Handbook: 003, 011, 028, 046, 047, 052

Standard 2: Properties of Number Operations

Students shall understand meanings of operations and how they relate to one another.

Student Learning Expectations, Grade 7	Math on Call
<p>Number Theory NO.2.7.1 Apply the <i>distributive property</i> of multiplication over addition or subtraction to simplify computations with <i>integers</i>, fractions and decimals</p>	<p>Handbook: 148, 219, 220, 221</p>
<p>NO.2.7.2 Apply the addition, subtraction, multiplication and division properties of equality to one-step <i>equations</i> with <i>integers</i>, fractions, and decimals</p>	<p>Handbook: 227, 228, 229, 241</p>
<p>NO.2.7.3 Apply rules (conventions) for <i>order of operations</i> to <i>integers</i> and positive <i>rational numbers</i> including parentheses, brackets or exponents</p>	<p>Handbook: 207, 208, 209, 210</p>
<p>Understand Operations NO.2.7.4 Model and develop addition, subtraction, multiplication and division of <i>integers</i></p>	<p>Handbook: 108, 109, 136, 137, 164, 165, 193, 194</p>

Standard 3: Numerical Operations and Estimation

Students shall compute fluently and make reasonable estimates.

Student Learning Expectations, Grade 7	Math on Call
<p>Computational Fluency NO.3.7.1 Compute, with and without appropriate <i>technology</i>, with <i>integers</i> and positive <i>rational numbers</i> using real world situations to solve problems</p>	<p>Handbook: 106, 107, 108, 109, 110, 112, 113, 134, 135, 136, 137, 138, 140, 141, 160, 161, 162, 163, 164, 165, 168, 169, 170, 187, 189, 190, 191, 192, 193, 194</p>
<p>NO.3.7.2 Solve with and without appropriate <i>technology</i>, multi-step problems using a variety of methods and tools (i.e., objects, mental computation, paper and pencil)</p>	<p>Handbook: 088-091, 096-114, 116-119, 125-141, 143-148, 152-170, 173-175, 179-199, 530</p>
<p>Estimation NO.3.7.3 Determine when an <i>estimate</i> is sufficient and use <i>estimation</i> to decide whether answers are reasonable in problems including fractions and decimals</p>	<p>Handbook: 093, 095, 117, 118, 120, 121, 150, 177</p>

Student Learning Expectations, Grade 7	Math on Call
Application of Computation NO.3.7.4 Apply <i>factorization</i> , <i>LCM</i> , and <i>GCF</i> to solve problems using more than two numbers and explain the solution	Handbook: 056, 061, 062, 063, 064, 065, 066, 068
NO.3.7.5 Represent and solve problem situations that can be modeled by and solved using concepts of <i>absolute value</i> , exponents and <i>square roots</i> (for <i>perfect squares</i>) with and without appropriate <i>technology</i>	Handbook: 050, 051, 071, 072, 073, 074, 075, 076, 077, 079, 080, 081, 082, 083, 540
NO.3.7.6 Solve, with and without <i>technology</i> , real world <i>percent</i> problems	Handbook: 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455

A l g e b r a

S t a n d a r d 4 : P a t t e r n s , R e l a t i o n s a n d F u n c t i o n s

Students shall recognize, describe and develop patterns, relations and functions.

Student Learning Expectations, Grade 7	Math on Call
Patterns, Relations and Functions A.4.7.1 Create and complete a <i>function</i> table (<i>input/output</i>) using a given rule with two operations	Handbook: 232, 234, 236, 243, 247, 252, 545, 548
A.4.7.2 Identify and extend <i>patterns</i> in real world situations	Handbook: 232, 234, 236, 243, 247, 252, 545-550
A.4.7.3 Interpret and write a rule for a two operation <i>function table</i>	Handbook: 232, 234, 236, 243, 244, 247

S t a n d a r d 5 : A l g e b r a i c R e p r e s e n t a t i o n s

Students shall represent and analyze mathematical situations and structures using algebraic symbols.

Student Learning Expectations, Grade 7	Math on Call
Expressions, Equations, and Inequalities A.5.7.1 Solve and graph one-step <i>linear equations</i> and <i>inequalities</i> using a variety of methods (i.e., hands-on, <i>inverse operations</i> , symbolic) with real world application with and without <i>technology</i>	Handbook: 241, 242, 246, 253, 258, 260, 508

Student Learning Expectations, Grade 7	Math on Call
A.5.7.2 Solve simple <i>linear equations</i> using <i>integers</i> and graph on a <i>coordinate plane</i>	Handbook: 241, 245, 246, 247, 250, 253
A.5.7.3 Translate phrases and sentences into <i>algebraic expressions</i> and <i>equations</i> including parentheses and positive and <i>rational numbers</i> and simplify <i>algebraic expressions</i> by combining like terms	Handbook: 204, 205, 206, 239, 240, 241, 244
A.5.7.4 Write and evaluate <i>algebraic expressions</i> using positive <i>rational numbers</i>	Handbook: 204, 205, 206, 241

Standard 6: Algebraic Models

Students shall develop and apply mathematical models to represent and understand quantitative relationships.

Student Learning Expectations, Grade 7	Math on Call
Algebraic Models and Relationships A.6.7.1 Use tables and graphs to represent <i>linear equations</i> by plotting, with and without appropriate <i>technology</i> , points in a <i>coordinate plane</i>	Handbook: 232, 234, 235, 236, 245, 246, 247, 248, 249, 250, 253
A.6.7.2 Represent, with and without appropriate <i>technology</i> , <i>linear equations</i> by plotting and graphing points in the <i>coordinate plane</i> using all four <i>quadrants</i> given data in a table from a real world situation	Handbook: 232, 234, 235, 236, 243, 244, 245, 246, 247, 249, 250, 253, 485
A.6.7.3 Create and complete a <i>function table (input/output)</i> using a given rule with two operations in real world situations	Handbook: 236, 243, 247, 252

Standard 7: Analysis of Change

Students shall analyze change in various contexts.

Student Learning Expectations, Grade 7	Math on Call
Analyze Change A.7.7.1 Use, with and without appropriate <i>technology</i> , tables and graphs to compare and identify situations with constant or varying <i>rates</i> of change	Handbook: 232, 234, 235, 236, 243, 244, 247, 248, 250

G e o m e t r y

S t a n d a r d 8 : G e o m e t r i c P r o p e r t i e s

Students shall analyze characteristics and properties of 2 and 3 dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Student Learning Expectations, Grade 7	Math on Call
<p>Characteristics of Geometric Shapes G.8.7.1 Identify, draw, classify and compare geometric figures using models and real world examples</p>	<p>Handbook: 316, 317, 318, 320, 322, 323, 324, 327, 338, 340, 344, 345, 348, 351, 352, 353, 362, 363, 364, 370, 376, 381, 393, 394, 395, 399, 403, 404, 406, 409, 414, 419</p>
<p>G.8.7.2 Investigate geometric properties and their relationships in one-, two-, and three-dimensional models, including convex and concave <i>polygons</i></p>	<p>Handbook: 316, 317, 321-327, 328-343, 344, 345, 348, 351, 352, 353, 362, 363, 364, 370, 376, 381, 393, 394, 395, 399, 403, 404, 406, 409, 414, 419</p>
<p>G.8.7.3 Recognize the pairs of angles formed and the relationship between the angles including two <i>intersecting lines</i> and <i>parallel lines</i> cut by a <i>transversal</i> (<i>vertical, supplementary, complementary, corresponding, alternate interior, alternate exterior angles</i> and <i>linear pair</i>)</p>	<p>Handbook: 325, 326, 334-338</p>
<p>G.8.7.4 Use paper or physical models to determine the sum of the measures of <i>interior angles</i> of triangles and <i>quadrilaterals</i></p>	<p>Handbook: 341-343</p>
<p>G.8.7.5 Model and develop the concept that <i>pi</i> (π) is the <i>ratio</i> of the <i>circumference</i> to the <i>diameter</i> of any circle</p>	<p>Handbook: 372, 373</p>
<p>G.8.7.6 Develop the properties of <i>similar figures</i> (<i>ratio</i> of sides and <i>congruent</i> angles)</p>	<p>Handbook: 376-379</p>

S t a n d a r d 9 : T r a n s f o r m a t i o n o f S h a p e s

Students shall apply transformations and the use of symmetry to analyze mathematical situations.

Student Learning Expectations, Grade 7	Math on Call
<p>Symmetry and Transformations G.9.7.1 Examine the congruence, similarity, and <i>line</i> or <i>rotational symmetry</i> of objects using <i>transformations</i></p>	<p>Handbook: 384-390</p>

Student Learning Expectations, Grade 7	Math on Call
G.9.7.2 Perform <i>translations</i> and <i>reflections</i> of <i>two-dimensional</i> figures using a variety of methods (paper folding, tracing, graph paper)	Handbook: 384, 385, 386, 388

Standard 10: Coordinate Geometry

Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Student Learning Expectations, Grade 7	Math on Call
Coordinate Geometry G.10.7.1 Plot points in the <i>coordinate plane</i>	Handbook: 232, 234, 247, 252, 319, 320
G.10.7.2 Plot points that form the <i>vertices</i> of a geometric figure and draw, identify and classify the figure.	Handbook: 385

Standard 11: Visualization and Geometric Models

Students shall use visualization, spatial reasoning and geometric modeling.

Student Learning Expectations, Grade 7	Math on Call
Spatial Visualization and Models G.11.7.1 Build <i>three-dimensional</i> solids from <i>two-dimensional patterns (nets)</i>	Handbook: 395, 396, 401, 406, 407, 411, 412, 416, 417
G.11.7.2 Construct a building out of <i>cubes</i> from a set of views (front, top, side)	Handbook: 397, 402, 413

Measurement

Standard 12: Physical Attributes

Students shall use attributes and tools of measurement to describe and compare mathematical and real-world objects.

Student Learning Expectations, Grade 7	Math on Call
<p>Attributes and Tools M.12.7.1 Understand, select and use the appropriate units and tools (metric and customary) to measure length, weight, <i>mass</i> and <i>volume</i> to the required degree of accuracy for real world problems</p>	<p>Handbook: 033, 036, 346, 354, 355, 365, 375, 396, 397, 398, 402, 408, 413, 418, 422</p>
<p>M.12.7.2 Understand relationships among units within the same system</p>	<p>Handbook: 355, 369, 436, 437, 535, 536, 537</p>

Standard 13: Systems of Measurement

Students shall identify and use units, systems and processes of measurement.

Student Learning Expectations, Grade 7	Math on Call
<p>Attributes and Tools M.13.7.1 Solve real world problems involving two or more <i>elapsed times</i>, counting forward and backward (calendar and clock)</p>	<p>Handbook: 536</p>
<p>M.13.7.2 Draw and measure distance to the nearest mm and 1/16 inch accurately</p>	<p>Handbook: 537</p>
<p>M.13.7.3 Develop and use <i>strategies</i> to solve problems involving <i>area</i> of a <i>trapezoid</i> and <i>circumference</i> and <i>area</i> of a circle</p>	<p>Handbook: 368, 372, 373, 375</p>
<p>Applications M.13.7.4 Derive and use formulas for <i>surface area</i> and <i>volume</i> of <i>prisms</i> and <i>cylinders</i> and justify them using geometric models and common materials</p>	<p>Handbook: 396, 397, 401, 402, 412, 413</p>
<p>M.13.7.5 Apply properties (scale <i>factors</i>, <i>ratio</i>, and <i>proportion</i>) of <i>congruent</i> or <i>similar</i> triangles to solve problems involving missing lengths and angle measures</p>	<p>Handbook: 376, 379, 380, 381, 383</p>

Student Learning Expectations, Grade 7	Math on Call
M.13.7.6 Find the distance between two points on a number line and locate the midpoint	Handbook: 378
M.13.7.7 Estimate and compute the <i>area</i> of more complex or irregular <i>two-dimensional</i> shapes by dividing them into more basic shapes	Handbook: 347, 356, 367, 368

Data Analysis and Probability

Standard 14: Data Representation

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

Student Learning Expectations, Grade 7	Math on Call
Collect, organize and display data DAP.14.7.1 Identify different ways of selecting samples and compose appropriate questions	Handbook: 264, 265, 266, 267
DAP.14.7.2 Explain which types of display are appropriate for various data sets (<i>line graph</i> for change over time, <i>circle graph</i> for part-to-whole comparison, <i>scatter plot</i> for trends)	Handbook: 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305
DAP.14.7.3 Construct and interpret <i>circle graphs</i> , <i>box-and-whisker plots</i> , <i>histograms</i> , <i>scatter plots</i> and <i>double line graphs</i> with and without appropriate <i>technology</i>	Handbook: 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306

Standard 15: Data Analysis

Students shall select and use appropriate statistical methods to analyze data.

Student Learning Expectations, Grade 7	Math on Call
Data Analysis DAP.15.7.1 Analyze data displays, including ways that they can be misleading	Handbook: 290, 307, 308, 309, 310, 311, 312, 313

Student Learning Expectations, Grade 7	Math on Call
<p>DAP.15.7.2 Analyze, with and without appropriate <i>technology</i>, a set of data by using and comparing measures of <i>central tendencies (mean, median, mode)</i> and <i>measures of spread (range, quartile, interquartile range)</i></p>	<p>Handbook: 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283</p>

Standard 16: Inferences and Predictions
Students shall develop and evaluate inferences and predictions that are based on data.

Student Learning Expectations, Grade 7	Math on Call
<p>Inferences and Predictions DAP.16.7.1 Make, with and without appropriate <i>technology</i>, <i>conjectures</i> of possible relationships in a <i>scatter plot</i> and approximate the <i>line of best fit (trend line)</i></p>	<p>Handbook: 306, 308, 311, 312, 313</p>

Standard 17: Probability
Students shall understand and apply basic concepts of probability.

Student Learning Expectations, Grade 7	Math on Call
<p>Probability DAP.17.7.1 Understand that <i>probability</i> can take any value between 0 and 1 (events that are not going to occur have <i>probability</i> 0, events certain to occur have <i>probability</i> 1)</p>	<p>Handbook: 461, 462</p>
<p>DAP.17.7.2 Design, with and without appropriate <i>technology</i>, an experiment to test a <i>theoretical probability</i> and explain how the results may vary</p>	<p>Handbook: 466, 467</p>

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correlated to

Arkansas Mathematics Curriculum Framework

Grade 8

Number Sense

Standard 1: Number Sense

Students shall understand numbers, ways of representing numbers, relationships among numbers and number systems.

Student Learning Expectations, Grade 8	Math on Call
<p>Rational Numbers NO.1.8.1 Read, write, compare and solve problems, with and without appropriate <i>technology</i>, including numbers less than 1 in <i>scientific notation</i></p>	<p>Handbook: 001-009, 011-019, 020, 022-024, 026, 027-034, 036-044, 046-049, 086-114, 115-141, 142-170, 171-199</p>
<p>NO.1.8.2 Convert between <i>scientific notation</i> and standard <i>notation</i>, including numbers from zero to one</p>	<p>Handbook: 016</p>
<p>NO.1.8.3 Compare and order <i>real numbers</i> including <i>irrational numbers</i> and find their approximate location on a number line (Use <i>technology</i> when appropriate)</p>	<p>Handbook: 007, 008, 009, 018, 019, 020, 040, 041, 042, 046, 048, 049</p>
<p>NO.1.8.4 Understand and justify classifications of numbers in the <i>real number system</i></p>	<p>Handbook: 003, 011, 028, 046, 047, 052</p>

Standard 2: Properties of Number Operations

Students shall understand meanings of operations and how they relate to one another.

Student Learning Expectations, Grade 8	Math on Call
<p>Number Theory NO.2.8.1 Apply the addition, subtraction, multiplication and division properties of equality to two-step <i>equations</i></p>	<p>Handbook: 227, 228, 229, 241</p>

Student Learning Expectations, Grade 8	Math on Call
NO.2.8.2 Understand and apply the <i>inverse</i> and <i>identity</i> properties	Handbook: 222, 223, 224
NO.2.8.3 Use <i>inverse</i> relationships (addition and subtraction, multiplication and division, squaring and <i>square roots</i>) in problem solving situations	Handbook: 241, 434
NO.2.8.4 Apply rules (conventions) for <i>order of operations</i> to <i>rational numbers</i>	Handbook: 207, 208, 209, 210
Understand Operations NO.2.8.5 Model and develop addition, subtraction, multiplication and division of <i>rational numbers</i>	Handbook: 087-108, 115-136, 142-164, 171-193

Standard 3: Numerical Operations and Estimation

Students shall compute fluently and make reasonable estimates.

Student Learning Expectations, Grade 8	Math on Call
Computational Fluency NO.3.8.1 Compute, with and without appropriate <i>technology</i> , with <i>rational numbers</i> in multi-step problems	Handbook: 087-114, 115-141, 142-170, 171-199
NO.3.8.2 Solve, with and without appropriate <i>technology</i> , multi-step problems using a variety of methods and tools (i.e. objects, mental computation, paper and pencil)	Handbook: 088-091, 096-114, 116-119, 125-141, 143-148, 152-170, 173-175, 179-199, 530
Estimation NO.3.8.3 Use <i>estimation</i> to solve problems involving <i>rational numbers</i> ; including <i>ratio</i> , <i>proportion</i> , <i>percent</i> (increase or decrease) then judge the reasonableness of solutions	Handbook: 093-095, 120-122, 124, 149-151, 176-178
Application of Computation NO.3.8.4 Apply factorization to find <i>LCM</i> and <i>GCF</i> of <i>algebraic expressions</i>	Handbook: 066, 068

Student Learning Expectations, Grade 8	Math on Call
NO.3.8.5 Calculate and find approximations of <i>square roots</i> with appropriate <i>technology</i>	Handbook: 082
NO.3.8.6 Solve, with and without <i>technology</i> , real world <i>percent</i> problems including <i>percent</i> of increase or decrease	Handbook: 443, 444, 445, 446, 447, 448, 449, 450, 451, 452

Algebra

Standard 4: Patterns, Relations and Functions

Students shall recognize, describe and develop patterns, relations and functions.

Student Learning Expectations, Grade 8	Math on Call
Patterns, Relations and Functions A.4.8.1 Find the n^{th} term in a <i>pattern</i> or a <i>function</i> table	Handbook: 232, 234, 236, 243, 247, 252, 545, 548
A.4.8.2 Using real world situations, describe <i>patterns</i> in words, tables, pictures, and symbolic representations	Handbook: 234, 235, 236, 243, 244, 247, 252, 545-550
A.4.8.3 Interpret and represent a two operation <i>function</i> as an <i>algebraic equation</i>	Handbook: 232, 234, 236, 243, 244, 247
A.4.8.4 Use tables, graphs, and <i>equations</i> to identify <i>independent/dependent variables (input/output)</i>	Handbook: 232, 236, 243, 244, 247, 252, 545, 548

Standard 5: Algebraic Representations

Students shall represent and analyze mathematical situations and structures using algebraic symbols.

Student Learning Expectations, Grade 8	Math on Call
Expressions, Equations and Inequalities A.5.8.1 Solve and graph two-step <i>equations</i> and <i>inequalities</i> with one <i>variable</i> and verify the reasonableness of the result with real world application with and without <i>technology</i>	Handbook: 241, 242, 246, 253, 258, 260, 508

Student Learning Expectations, Grade 8	Math on Call
A.5.8.2 Solve and graph <i>linear equations</i> (in the form $y = mx + b$)	Handbook: 241, 245, 246, 247, 250, 253
A.5.8.3 Translate sentences into <i>algebraic equations</i> and <i>inequalities</i> and combine like terms within <i>polynomials</i>	Handbook: 205, 239, 240, 241, 244
A.5.8.4 Write and evaluate <i>algebraic expressions</i> using <i>rational numbers</i>	Handbook: 204, 206, 209

Standard 6 : Algebraic Models

Students shall develop and apply mathematical models to represent and understand quantitative relationships.

Student Learning Expectations, Grade 8	Math on Call
Algebraic Models and Relationships A.6.8.1 Describe, with and without appropriate <i>technology</i> , the relationship between the graph of a line and its equation, including being able to explain the meaning of slope as a constant rate of change (rise/run) and <i>y-intercept</i> in real world problems	Handbook: 232, 234, 235, 245, 246, 247, 248, 249, 250, 253
A.6.8.2 Represent, with and without appropriate <i>technology</i> , <i>linear</i> relationships concretely, using tables, graphs and <i>equations</i>	Handbook: 232, 234, 235, 236, 243, 244, 245, 246, 247, 249, 250, 253, 485
A.6.8.3 Differentiate between <i>independent/dependent variables</i> given a <i>linear relationship</i> in context	Handbook: 232, 236
A.6.8.4 Represent, with and without appropriate <i>technology</i> , simple exponential and/or quadratic <i>functions</i> using verbal descriptions, tables, graphs and formulas and translate among these representations	Handbook: 251, 252, 548

Standard 7: Analysis of Change

Students shall analyze change in various contexts.

Student Learning Expectations, Grade 8	Math on Call
<p>Analyze Change A.7.8.1 Use, with and without <i>technology</i>, graphs of real life situations to describe the relationships and analyze change including graphs of change (cost per minute) and graphs of accumulation (total cost)</p>	<p>Handbook: 234, 235, 243, 244, 247, 248</p>

Geometry

Standard 8: Geometric Properties

Students shall analyze characteristics and properties of 2 and 3 dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Student Learning Expectations, Grade 8	Math on Call
<p>Characteristics of Geometric Shapes G.8.8.1 Form generalizations and validate conclusions about properties of geometric shapes</p>	<p>Handbook: 339, 340, 341, 343, 345, 348, 350, 351, 352, 353, 358, 359, 360, 361, 362, 363, 364, 370, 371, 376, 394, 399, 403, 404, 409, 414, 419</p>
<p>G.8.8.2 Make, with and without appropriate <i>technology</i>, and test <i>conjectures</i> about characteristics and properties between <i>two-dimensional</i> figures and <i>three-dimensional</i> objects</p>	<p>Handbook: 345, 348, 352, 353, 362, 363, 364, 370, 393, 394, 399, 403, 409, 414, 419</p>
<p>G.8.8.3 Determine appropriate application of geometric ideas and relationships, such as <i>congruence</i>, similarity, and the <i>Pythagorean theorem</i>, with and without appropriate <i>technology</i></p>	<p>Handbook: 359, 360, 361, 376, 377, 379, 380, 381, 382, 383</p>

Standard 9: Transformation of Shapes

Students shall apply transformations and the use of symmetry to analyze mathematical situations.

Student Learning Expectations, Grade 8	Math on Call
<p>Symmetry and Transformations G.9.8.1 Determine a <i>transformation's line of symmetry</i> and compare the properties of the figure and its <i>transformation</i></p>	<p>Handbook: 384, 385, 386, 387, 388, 389, 390</p>

Student Learning Expectations, Grade 8	Math on Call
G.9.8.2 Draw the results of <i>translations</i> and <i>reflections</i> about the x- and y-axis and <i>rotations</i> of objects about the origin	Handbook: 385, 386, 388

S t a n d a r d 1 0 : C o o r d i n a t e G e o m e t r y

Students shall specify locations and describe spatial relationships using coordinate geometry and other representational systems.

Student Learning Expectations, Grade 8	Math on Call
Coordinate Geometry G.10.8.1 Use coordinate geometry to explore the links between geometric and algebraic representations of problems (lengths of segments/distance between points, <i>slope/perpendicular-parallel lines</i>)	Handbook: 248, 249, 250, 318, 319, 320

M e a s u r e m e n t

S t a n d a r d 1 2 : P h y s i c a l A t t r i b u t e s

Students shall use attributes and tools of measurement to describe and compare mathematical and real-world objects.

Student Learning Expectations, Grade 8	Math on Call
Attributes and Tools M.12.8.1 Understand, select and use, with and without appropriate <i>technology</i> , the appropriate units and tools to measure angles, <i>perimeter</i> , <i>area</i> , <i>surface area</i> and <i>volume</i> to solve real world problems	Handbook: 330, 331, 346, 347, 354, 355, 356, 357, 365, 366, 367, 368, 369, 375, 396, 397, 398, 401, 402, 407, 408, 412, 413, 417, 418, 421, 422, 512
M.12.8.2 Describe and apply equivalent measures using a variety of units within the same system of measurement	Handbook: 436, 437, 535, 536, 537

S t a n d a r d 1 3 : S y s t e m s o f M e a s u r e m e n t

Students shall identify and use units, systems and processes of measurement.

Student Learning Expectations, Grade 8	Math on Call
Attributes and Tools M.13.8.1 Draw and apply measurement skills with <i>fluency</i> to appropriate levels of precision	Handbook: 330, 331, 346, 347, 354, 355, 356, 357, 365, 366, 367, 368, 369, 375, 396, 397, 398, 401, 402, 407, 408, 412, 413, 417, 418, 421, 422, 512

Student Learning Expectations, Grade 8	Math on Call
Applications M.13.8.2 Solve problems involving <i>volume</i> and <i>surface area</i> of <i>pyramids</i> , <i>cones</i> and composite figures, with and without appropriate <i>technology</i>	Handbook: 396, 397, 398, 401, 402, 407, 408, 412, 413, 417, 418, 421, 422, 512
M.13.8.3 Apply proportional reasoning to solve problems involving indirect measurements, scale drawings or rates	Handbook: 376, 377, 378, 379, 380, 434, 435, 436, 437, 438, 439, 440, 443, 444, 445
M.13.8.5 Estimate and compute the <i>area</i> of irregular <i>two-dimensional</i> shapes	Handbook: 347

Data Analysis and Probability

Standard 14: Data Representation

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

Student Learning Expectations, Grade 8	Math on Call
Collect, organize and display data DAP.14.8.1 Design and conduct investigations which include <ul style="list-style-type: none"> • adequate number of trials • unbiased sampling • accurate measurement • record-keeping 	Handbook: 263, 264, 265, 266, 267, 268, 269
DAP.14.8.2 Explain which types of display are appropriate for various data sets (<i>scatter plot</i> for relationship between two variants and <i>line of best fit</i>)	Handbook: 285, 286, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306
DAP.14.8.3 Interpret or solve real world problems using data from charts, <i>line plots</i> , <i>stem-and leaf plots</i> , <i>double-bar graphs</i> , <i>line graphs</i> , <i>box-and whisker plots</i> , <i>scatter plots</i> , <i>frequency tables</i> or <i>double line graphs</i>	Handbook: 285, 286, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306

Standard 15: Data Analysis

Students shall select and use appropriate statistical methods to analyze data.

Student Learning Expectations, Grade 8	Math on Call
<p>Data Analysis DAP.15.8.1 Compare and contrast the reliability of data sets with different size populations</p>	<p>Handbook: 265, 266, 267</p>
<p>DAP.15.8.2 Analyze, with and without appropriate <i>technology</i>, graphs by comparing measures of <i>central tendencies</i> and <i>measures of spread</i></p>	<p>Handbook: 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283</p>
<p>DAP.15.8.4 Describe how the inclusion of <i>outliers</i> affects those measures</p>	<p>Handbook: 283</p>

Standard 16: Inferences and Predictions

Students shall develop and evaluate inferences and predictions that are based on data.

Student Learning Expectations, Grade 8	Math on Call
<p>Inferences and Predictions DAP.16.8.1 Use observations about differences between sets of data to make <i>conjectures</i> about the populations from which the data was taken</p>	<p>Handbook: 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 285, 286, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306</p>

Standard 17: Probability

Students shall understand and apply basic concepts of probability.

Student Learning Expectations, Grade 8	Math on Call
<p>Probability DAP.17.8.1 Compute, with and without appropriate <i>technology</i>, probabilities of compound events, using organized lists, <i>tree diagrams</i> and <i>logic grid</i></p>	<p>Handbook: 462, 463, 464</p>
<p>DAP.17.8.2 Make predictions based on <i>theoretical probabilities</i>, design and conduct an experiment to test the predictions, compare actual results to predict results, and explain differences</p>	<p>Handbook: 462, 465, 466, 467, 468, 469, 470</p>



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Arkansas Mathematics Curriculum Framework
Algebra I

L a n g u a g e o f A l g e b r a

C o n t e n t S t a n d a r d 1

Students will develop the language of algebra including specialized vocabulary, symbols, and operations.

Student Learning Expectations, Algebra I	Algebra to Go
LA.1.AI.1 Evaluate <i>algebraic expressions</i> , including radicals, by applying the order of operations	Handbook: 114, 115, 116
LA.1.AI.2 Translate word phrases and sentences into <i>expressions, equations, and inequalities</i> , and vice versa	Handbook: 101, 125, 149, 150, 151, 152, 191, 195, 387
LA.1.AI.3 Apply the laws of (integral) <i>exponents</i>	Handbook: 051, 052, 061, 062, 063, 065, 069, 112
LA.1.AI.4 Solve problems involving <i>scientific notation</i>	Handbook: 065
LA.1.AI.5 Perform <i>polynomial</i> operations (addition, subtraction, multiplication) with and without manipulatives	Handbook: 104, 105, 106, 107, 108, 109, 110, 111
LA.1.AI.6 Simplify <i>algebraic fractions</i> by <i>factoring</i>	Handbook: 181, 182, 188, 189
LA.1.AI.7 Recognize when an expression is undefined	Handbook: 015, 016, 043, 159, 173
LA.1.AI.9 Add, subtract, and multiply simple radical expressions	Handbook: 106, 107, 113

Solving Equations and Inequalities

Content Standard 2

Students will write, with and without appropriate technology, equivalent forms of equations, inequalities and systems of equations and solve with fluency.

Student Learning Expectations, Algebra I	Algebra to Go
<p>SEI.2.AI.1 Solve multi-step equations and inequalities with rational <i>coefficients</i></p> <ul style="list-style-type: none"> • numerically (from a table or guess and check) • algebraically (including the use of manipulatives) • graphically • technologically 	<p>Handbook: 127, 128, 129, 130, 155, 196, 197, 198, 199, 201, 202, 203, 204, 205</p>
<p>SEI.2.AI.2 Solve systems of two linear equations:</p> <ul style="list-style-type: none"> • numerically (from a table or guess and check) • algebraically (including the use of manipulatives) • graphically • technologically 	<p>Handbook: 161, 162, 163, 164, 165, 166, 167, 168</p>
<p>SEI.2.AI.3 Solve linear <i>formulas</i> and <i>literal equations</i> for a specified <i>variable</i></p>	<p>Handbook: 377</p>
<p>SEI.2.AI.4 Solve and graph simple <i>absolute value equations</i> and <i>inequalities</i>.</p>	<p>Handbook: 130, 141, 191, 192, 193, 194, 195, 196, 197, 198, 199</p>
<p>SEI.2.AI.5 Solve real world problems that involve a combination of rates, <i>proportions</i> and percents</p>	<p>Handbook: 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307</p>
<p>SEI.2.AI.6 Solve problems involving <i>direct variation</i> and indirect (<i>inverse</i>) <i>variation</i> to model rates of change</p>	<p>Handbook: 144, 292, 293</p>
<p>SEI.2.AI.7 Use coordinate geometry to represent and/or solve problems (midpoint, length of a line segment, and <i>Pythagorean Theorem</i>)</p>	<p>Handbook: 155, 161, 186, 187, 213, 223, 245, 418</p>

Student Learning Expectations, Algebra I	Algebra to Go
SEI.2.AI.8 Communicate real world problems graphically, algebraically, numerically and verbally	Handbook: 080, 081, 090, 095, 096, 114, 127, 128, 129, 130, 155, 161, 168, 171, 172, 180, 183, 185, 192, 196, 198, 203, 206, 223, 245, 247, 248, 250, 261, 263, 278, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396

Linear Functions

Content Standard 3

Students will analyze functions by investigating rates of change, intercepts, and zeros.

Student Learning Expectations, Algebra I	Algebra to Go
LF.3.AI.1 Distinguish between <i>functions</i> and non-functions/ <i>relations</i> by inspecting graphs, ordered pairs, <i>mapping diagrams</i> and/or <i>tables</i> of data	Handbook: 131, 132, 133, 134, 135, 136
LF.3.AI.2 Determine <i>domain</i> and <i>range</i> of a relation from an algebraic expression, graphs, set of ordered pairs, or table of data	Handbook: 131, 132, 133, 135, 137
LF.3.AI.3 Know and/or use <i>function notation</i> , including evaluating functions for given values in their domain	Handbook: 135, 137, 143
LF.3.AI.4 Identify <i>independent variables</i> and <i>dependent variables</i> in various representational modes: words, symbols, and/or graphs	Handbook: 137
LF.3.AI.5 Interpret the rate of change/ <i>slope</i> and intercepts within the context of everyday life	Handbook: 150, 151, 152, 156, 157, 158, 159, 186, 187, 221, 222, 223, 417
LF.3.AI.6 Calculate the slope given <ul style="list-style-type: none"> • two points • the graph of a line • the equation of a line 	Handbook: 222

Student Learning Expectations, Algebra I	Algebra to Go
LF.3.AI.7 Determine by using slope whether a pair of lines are parallel, perpendicular, or neither	Handbook: 163, 222
LF.3.AI.8 Write an equation in <i>slope-intercept</i> form given <ul style="list-style-type: none"> • two points • a point and y-intercept • <i>x-intercept</i> and y-intercept • a point and slope • a table of data • the graph of a line 	Handbook: 149, 150, 151
LF.3.AI.9 Describe the effects of parameter changes, slope and/or y-intercept, on graphs of linear functions and vice versa	Handbook: 156, 157, 158, 159, 473

Non-linear Functions

Content Standard 4

Students will compare the properties in the family of functions.

Student Learning Expectations, Algebra I	Algebra to Go
NLF.4.AI.1 Factoring polynomials <ul style="list-style-type: none"> • greatest common factor • <i>binomials</i> (difference of squares) • <i>trinomials</i> 	Handbook: 181, 182, 188, 189
NLF.4.AI.2 Determine <i>minimum</i> , <i>maximum</i> , <i>vertex</i> , and <i>zeros</i> , given the graph	Handbook: 142, 176, 177, 178, 179, 186, 187, 445
NLF.4.AI.3 Solve <i>quadratic equations</i> using the appropriate methods with and without technology <ul style="list-style-type: none"> • <i>factoring</i> • <i>quadratic formula</i> with real number solutions 	Handbook: 182, 184, 185
NLF.4.AI.4 Recognize function families and their connections including <i>vertical shift</i> and <i>reflection</i> over the <i>x-axis</i> <ul style="list-style-type: none"> • quadratics • <i>absolute value</i> • <i>exponential functions</i> 	Handbook: 135, 140, 141, 142, 143, 144, 145

Student Learning Expectations, Algebra I	Algebra to Go
NLF.4.AI.5 Communicate real world problems graphically, algebraically, numerically and verbally	Handbook: 080, 081, 090, 095, 096, 114, 127, 128, 129, 130, 155, 161, 168, 171, 172, 180, 183, 185, 192, 196, 198, 203, 206, 223, 245, 247, 248, 250, 261, 263, 278, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396

Data Interpretation and Probability

Content Standard 5

Students will compare various methods of reporting data to make inferences or predictions.

Student Learning Expectations, Algebra I	Algebra to Go
DIP.5.AI.1 Construct and use <i>scatter plots</i> and <i>line of best fit</i> to make <i>inferences</i> in real life situations	Handbook: 361, 362
DIP.5.AI.2 Use simple <i>matrices</i> in addition, subtraction, and <i>scalar multiplication</i>	Handbook: 310, 311, 312, 313, 314, 315
DIP.5.AI.3 Construct simple matrices for real life situations	Handbook: 310, 312, 313, 315
DIP.5.AI.4 Determine the effects of changes in the data set on the measures of <i>central tendency</i>	Handbook: 335, 336, 337, 338, 339, 473
DIP.5.AI.5 Use two or more <i>box-and-whisker plots</i> to compare <i>data sets</i>	Handbook: 357
DIP.5.AI.6 Construct and interpret a cumulative frequency <i>histogram</i> in real life situations	Handbook: 341
DIP.5.AI.7 Recognize <i>linear functions</i> and non-linear functions by using a table or a graph	Handbook: 148, 149, 155, 178, 179
DIP.5.AI.8 Compute simple <i>probability</i> with and without replacement	Handbook: 322, 323, 324, 329, 330, 472

Student Learning Expectations, Algebra I	Algebra to Go
DIP.5.AI.9 Recognize patterns using <i>explicitly</i> defined and <i>recursively</i> defined linear functions	Handbook: 140, 387
DIP.5.AI.10 Communicate real world problems graphically, algebraically, numerically and verbally	Handbook: 080, 081, 090, 095, 096, 114, 127, 128, 129, 130, 155, 161, 168, 171, 172, 180, 183, 185, 192, 196, 198, 203, 206, 223, 245, 247, 248, 250, 261, 263, 278, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396

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 correlated to
Arkansas Mathematics Curriculum Framework
Geometry

L a n g u a g e o f G e o m e t r y

C o n t e n t S t a n d a r d 1

Students will develop the language of geometry including specialized vocabulary, reasoning, and application of theorems, properties, and postulates.

Student Learning Expectations, Geometry	Geometry to Go
LG.1.G.1 Define, compare and contrast <i>inductive reasoning</i> and <i>deductive reasoning</i> for making predictions based on real world situations <ul style="list-style-type: none"> • <i>venn diagrams</i> • <i>matrix logic</i> • <i>conditional statements</i> (statement, <i>inverse</i>, <i>converse</i>, and <i>contrapositive</i>) 	Handbook: 005, 006, 007, 008, 009, 010, 011, 012, 013, 014, 015, 016
LG.1.G.2 Represent <i>points</i> , <i>lines</i> , and <i>planes</i> pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays, and <i>angles</i>	Handbook: 048, 049, 050, 051, 052, 053, 054, 062, 063
LG.1.G.3 Describe relationships derived from geometric figures or figural patterns	Handbook: 052, 056, 057, 058, 059, 060, 061, 062, 065, 067, 068, 069, 070, 071, 072, 073, 074, 075, 076, 077, 078, 079, 080, 081
LG.1.G.4 Apply, with and without appropriate technology, definitions, <i>theorems</i> , properties, and <i>postulates</i> related to such topics as <i>complementary</i> , <i>supplementary</i> , <i>vertical angles</i> , <i>linear pairs</i> , and angles formed by <i>perpendicular lines</i>	Handbook: 056, 068, 069, 070, 071, 072
LG.1.G.5 Explore, with and without appropriate technology, the relationship between angles formed by two lines cut by a <i>transversal</i> to justify when lines are <i>parallel</i>	Handbook: 074, 075, 076, 077, 078, 079, 080

Student Learning Expectations, Geometry	Geometry to Go
LG.1.G.6 Give justification for conclusions reached by deductive reasoning	Handbook: 007

T r i a n g l e s

C o n t e n t S t a n d a r d 2

Students will identify and describe types of triangles and their special segments. They will use logic to apply the properties of congruence, similarity, and inequalities. The students will apply the *Pythagorean Theorem* and trigonometric ratios to solve problems in real world situations.

Student Learning Expectations, Geometry	Geometry to Go
T.2.G.1 Apply <i>congruence</i> (SSS...) and <i>similarity</i> (AA...) correspondences and properties of figures to find missing parts of geometric figures and provide logical justification	Handbook: 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 235
T.2.G.2 Investigate the measures of segments to determine the existence of triangles (<i>triangle inequality theorem</i>)	Handbook: 147, 148, 149
T.2.G.3 Identify and use the special segments of triangles (<i>altitude, median, angle bisector, perpendicular bisector, and midsegment</i>) to solve problems	Handbook: 135, 136, 137, 138, 139, 140, 141
T.2.G.4 Apply the <i>Pythagorean Theorem</i> and its converse in solving practical problems	Handbook: 152, 153, 154
T.2.G.5 Use the <i>special right triangle</i> relationships (30° - 60° - 90° and 45° - 45° - 90°) to solve problems	Handbook: 237, 238, 239
T.2.G.6 Use <i>trigonometric ratios</i> (<i>sine, cosine, tangent</i>) to determine lengths of sides and measures of angles in right triangles including <i>angles of elevation</i> and <i>angles of depression</i>	Handbook: 241, 242, 244, 245, 246

M e a s u r e m e n t

C o n t e n t S t a n d a r d 3

Students will measure and compare, while using appropriate formulas, tools, and technology to solve problems dealing with length, perimeter, area and volume.

Student Learning Expectations, Geometry	Geometry to Go
M.3.G.1 Calculate probabilities arising in geometric contexts	Handbook: 203, 343
M.3.G.2 Apply, using appropriate units, appropriate formulas (<i>area, perimeter, surface area, volume</i>) to solve application problems involving <i>polygons, prisms, pyramids, cones, cylinders, spheres</i> as well as composite figures, expressing solutions in both exact and approximate forms	Handbook: 169, 170, 171, 172, 173, 178, 179, 180, 181, 182, 183, 184, 185, 188, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 204, 205, 207, 208, 209, 210
M.3.G.3 Relate changes in the measurement of one <i>attribute</i> of an object to changes in other attributes	Handbook: 178, 189, 190, 204
M.3.G.4 Use (given similar geometric objects) proportional reasoning to solve practical problems (including scale drawings)	Handbook: 220, 221, 222, 223, 224, 225
M.3.G.5 Use properties of parallel lines and proportional reasoning to find the lengths of segments	Handbook: 060, 232, 233

R e l a t i o n s h i p s b e t w e e n t w o - a n d t h r e e - d i m e n s i o n s

C o n t e n t S t a n d a r d 4

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

Student Learning Expectations, Geometry	Geometry to Go
R.4.G.1 Explore and verify the properties of <i>quadrilaterals</i>	Handbook: 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167

Student Learning Expectations, Geometry	Geometry to Go
R.4.G.2 Solve problems using properties of polygons: <ul style="list-style-type: none"> • sum of the measures of the <i>interior angles of a polygon</i> • interior and <i>exterior angle measure of a regular polygon or irregular polygon</i> • number of sides or angles of a polygon 	Handbook: 129, 130, 131, 132
R.4.G.3 Identify and explain why figures <i>tessellate</i>	Handbook: 296
R.4.G.4 Identify the attributes of the five <i>Platonic Solids</i>	Handbook: 324
R.4.G.5 Investigate and use the properties of angles (<i>central and inscribed</i>) arcs, <i>chords, tangents, and secants</i> to solve problems involving <i>circles</i>	Handbook: 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318
R.4.G.6 Solve problems using inscribed and <i>circumscribed</i> figures	Handbook: 138, 139, 302, 303, 310, 319, 343
R.4.G.7 Use <i>orthographic drawings</i> (top, front, side) and <i>isometric drawings</i> (corner) to represent three-dimensional objects	Handbook: 335
R.4.G.8 Draw, examine, and classify <i>cross-sections</i> of three-dimensional objects	Handbook: 206, 337

Coordinate Geometry and Transformations

Content Standard 5

Students will specify locations, apply transformations and describe relationships using coordinate geometry.

Student Learning Expectations, Geometry	Geometry to Go
CGT.5.G.1 Use <i>coordinate geometry</i> to find the distance between two points, the <i>midpoint of a segment</i> , and the <i>slopes</i> of parallel, perpendicular, horizontal, and vertical lines	Handbook: 089, 090, 098, 099, 100, 101, 102, 387

Student Learning Expectations, Geometry	Geometry to Go
CGT.5.G.2 Write equations of lines in <i>slope-intercept form</i> and use slope to determine parallel and perpendicular lines	Handbook: 105, 106, 107, 108
CGT.5.G.3 Determine, given a set of points, the type of figure based on its properties (<i>parallelogram, isosceles triangle, trapezoid</i>)	Handbook: 107
CGT.5.G.4 Write, in standard form, the equation of a circle given a graph on a coordinate plane or the center and radius of a circle	Handbook: 113, 115
CGT.5.G.5 Draw and interpret the results of transformations and successive <i>transformations</i> on figures in the coordinate plane <ul style="list-style-type: none"> • <i>translations</i> • <i>reflections</i> • <i>rotations</i> (90°, 180°, clockwise and counterclockwise about the origin) • <i>dilations</i> (scale factor) 	Handbook: 274, 275, 276, 277, 278, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293



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