



**WASHINGTON**  
**MathScape: Seeing and Thinking Mathematically**  
**Course 1 © 2005**

GLE Grade 6	MathScape Course 1 Page References
<b>1. The student understands and applies the concepts and procedures of mathematics.</b>	
<b>1.1. Understand and apply concepts and procedures from number sense.</b>	
<b>Number and Numeration</b>	
1.1.1. Understand the concept of integers as the set of natural numbers (1, 2, 3, ...), their opposites (-1, -2, -3, ...), and 0.]	244-255, 270-275
<ul style="list-style-type: none"> <li>• Illustrate integer values using models and pictures (e.g., temperature, elevators, net worth/debt, riding a bus or subway).</li> </ul>	244, 246-253, 271-275
<ul style="list-style-type: none"> <li>• Apply rules of divisibility to show if a quotient is an integer.</li> </ul>	96-98, 142-143 Math Handbook: 82, 87
<ul style="list-style-type: none"> <li>• Explain the meaning of integers and give examples.</li> </ul>	244
<ul style="list-style-type: none"> <li>• Identify the opposite of a given integer.</li> </ul>	246, 249
1.1.2. Understand the relative values of integers and non-negative rational numbers.	110-112, 114-115, 148-150, 214-215, 217, 244, 258-259, 270
<ul style="list-style-type: none"> <li>• Compare different representations of non-negative rational numbers by implementing strategies (e.g., like denominators, changing to the same form).</li> </ul>	110-112, 114-115, 148-150, 214-215, 217, 258-259, 270 Math Handbook: 108-111, 129-131
<ul style="list-style-type: none"> <li>• Identify equivalence between non-negative integers, fractions, percents, and decimals.</li> </ul>	110-111, 113-114, 122, 148-149, 210-213, 232-234, 241, 256-257, 264-265, 312, 316-317 Math Handbook: 89-107, 154-161
<ul style="list-style-type: none"> <li>• Compare and order integer values and explain which is greater and why (e.g., place the integers on a number line).</li> </ul>	244, 270
<ul style="list-style-type: none"> <li>• Represent and identify integers on a model (e.g., number line, fraction line, or decimal grid).</li> </ul>	113-114, 118, 122, 131, 149, 211, 216, 232, 234, 244, 246, 253, 256, 258, 271-274
1.1.3. Apply properties of addition and multiplication to non-negative rational numbers.	104, 147 Math Handbook: 76-77

<ul style="list-style-type: none"> <li>• Illustrate and explain the commutative and associative properties and why they work (e.g., use physical models, pictures).</li> </ul>	104, 146 Math Handbook: 74, 77
<ul style="list-style-type: none"> <li>• Use addition and multiplication properties to assist in computations (e.g., <math>5 \cdot 7 \cdot 6</math> can be rewritten as <math>5 \cdot 6 \cdot 7</math> which is <math>30 \cdot 7</math> or 210).</li> </ul>	104 Math Handbook: 76-77
<ul style="list-style-type: none"> <li>• Determine whether a solution is accurate based on application commutative, associative, and identity properties of addition and/or multiplication.</li> </ul>	104, 147 Math Handbook: 74-77
1.1.4. Understand the concepts of ratio and percent.	232-241, 265-269, 280-319 Math Handbook: 140-158, 274-277
<ul style="list-style-type: none"> <li>• Write ratios in part/part and part/whole relationships using objects, pictures, and symbols (e.g., using /, :, or “to” as representations for ratios).</li> </ul>	108-111, 147-148, 280-283, 302-303, 308-311 Math Handbook: 274-277
<ul style="list-style-type: none"> <li>• Represent equivalent ratios using objects, pictures, or symbols.</li> </ul>	110-114, 148-149, 309-311, 314-317 Math Handbook: 274-277
<ul style="list-style-type: none"> <li>• Represent equivalent percentages using objects, pictures, and symbols.</li> </ul>	232-234, 237-239, 265 Math Handbook: 140-141, 143
<ul style="list-style-type: none"> <li>• Identify percent as 100 equal size parts of a set (e.g., 1% of 200 items is 2 items).</li> </ul>	235, 237-239
<ul style="list-style-type: none"> <li>• Explain ratio and percents and give examples of each.</li> </ul>	233, 235, 237, 265-266, 268-269, 287, 301, 308
<b>Computation</b>	
1.1.5. Understand the meaning of multiplication and division on non-negative rational numbers.	130-141, 156-161, 222-229, 261-264 Math Handbook: 120-125, 134-139
<ul style="list-style-type: none"> <li>• Explain the meaning of multiplying and dividing non-negative fractions and decimals using words, visual, or physical models (e.g., sharing a restaurant bill, cutting a board into equal-sized pieces, drawing a picture of an equation or situation).</li> </ul>	130-141, 156-161 Math Handbook: 120-125
<ul style="list-style-type: none"> <li>• Explain why multiplication of fractions can be done by multiplying denominators while addition of fractions requires finding common denominators.</li> </ul>	118-120, 130-133, 156-157 Math Handbook: 113, 115-116, 120, 123-124
<ul style="list-style-type: none"> <li>• Use technology to demonstrate how multiplication and division with decimals affects place value.</li> </ul>	222-224, 226 Math Handbook: 138-139

1.1.6. Apply computational procedures with fluency for addition and subtraction on non-negative rational numbers.	118-121, 123-127, 151-155, 220-221, 260 Math Handbook: 112-119, 132-133
<ul style="list-style-type: none"> <li>Find the sums or differences of non-negative fractions or decimals.</li> </ul>	118-121, 123-127, 151-155, 220-221, 260 Math Handbook: 112-119, 132-133
<ul style="list-style-type: none"> <li>Write and solve real-world problem situations to find sums or differences of decimals or fractions.</li> </ul>	125, 127, 151, 154-155, 260 Math Handbook: 119, 139
<ul style="list-style-type: none"> <li>Use the least common multiple and the greatest common factor of whole numbers to solve problems with fractions (e.g., to find a common denominator, to add two fractions, or to find the simplified form for a fraction).</li> </ul>	114, 119-120, 126, 150, 309-310 Math Handbook: 103, 108-110, 113
<ul style="list-style-type: none"> <li>Use addition and subtraction to solve real-world problems involving non-negative rational numbers.</li> </ul>	125, 127, 151, 154-155, 260 Math Handbook: 119, 139
<ul style="list-style-type: none"> <li>Solve multiple-step computations requiring one, two, or more different operations.</li> </ul>	121, 125, 127, 151-156, 158, 161, 229, 260
1.1.7. Understand and apply strategies and tools to complete tasks involving addition and subtraction on non-negative rational numbers.	118-121, 123, 127, 151-155, 220-221, 260 Math Handbook: 112-119, 132-133
<ul style="list-style-type: none"> <li>Select and justify the selection of appropriate strategies and tools (e.g., mental computation, estimation, calculators, and paper and pencil) to compute in a problem situation.</li> </ul>	121, 125, 127, 151-155, 221, 260 Math Handbook: 118-119, 139
<ul style="list-style-type: none"> <li>Describe strategies for mentally solving problems involving fractions and decimals.</li> </ul>	154, 220, 260 Math Handbook: 117, 119, 133, 139
<ul style="list-style-type: none"> <li>Use calculators to add and subtract with decimal numbers with precision to the thousandths place and beyond.</li> </ul>	Opportunity to address this objective: 260 Math Handbook: 132-133, 139
<b>Estimation</b>	
1.1.8. Apply estimation strategies to predict or determine the reasonableness of answers in situations involving addition and subtraction on non-negative rational numbers.	220, 260, 263 Math Handbook: 117
<ul style="list-style-type: none"> <li>Identify when an approximation is appropriate.</li> </ul>	260, 263
<ul style="list-style-type: none"> <li>Apply estimation strategies prior to computation on whole numbers,</li> </ul>	260, 263 Math Handbook: 117, 119, 133

decimals, and fractions to approximate an answer.	
<ul style="list-style-type: none"> <li>• Use estimation to verify the reasonableness of calculated results.</li> </ul>	220
<ul style="list-style-type: none"> <li>• Identify appropriate estimated answers for a given situation.</li> </ul>	220, 263
<ul style="list-style-type: none"> <li>• Describe various strategies used during estimation involving fractions and decimals.</li> </ul>	Math Handbook: 117, 133
<b>1.2. Understand and apply concepts and procedures from measurement.</b>	
<b>Attributes, units, and systems</b>	
1.2.1. Understand the concepts of volume and extend the concept of area to surface area of rectangular prisms.	285, 295, 304-307 Math Handbook: 330-339
<ul style="list-style-type: none"> <li>• Compare the relative capacity of two containers and explain the differences (e.g., paper cylinders formed horizontally and vertically and filled with popcorn).</li> </ul>	305
<ul style="list-style-type: none"> <li>• Represent the volume for given rectangular prisms using pictures or models.</li> </ul>	305, 316 Math Handbook: 334
<ul style="list-style-type: none"> <li>• Compare the surface area of two different rectangular prisms.</li> </ul>	305
<ul style="list-style-type: none"> <li>• Describe and provide examples for surface area measurement (e.g., gift wrapping, painting a room, amount of material needed to build a box).</li> </ul>	305 Math Handbook: 333
<ul style="list-style-type: none"> <li>• Explain and give examples of how the area and surface area are related (e.g., surface area is the sums of the areas of all the sides of a rectangular prism).</li> </ul>	305
<ul style="list-style-type: none"> <li>• Describe and compare the use of area and volume (e.g., covering and filling).</li> </ul>	295, 304-307
1.2.2. Understand the differences between square and cubic units.	304-307
<ul style="list-style-type: none"> <li>• Identify cubic units to measure volume (e.g., linking cubes, cubic centimeter).</li> </ul>	305 Math Handbook: 334-339, 361
<ul style="list-style-type: none"> <li>• Identify and read incremental units for capacity (e.g., milliliters, cups, ounces).</li> </ul>	295 Math Handbook: 362-365
<ul style="list-style-type: none"> <li>• Use the appropriate units when describing a situation (e.g., five square meters of carpet, five cubic meters of water).</li> </ul>	158, 182, 201, 262, 305, 318-319, 360-361
<ul style="list-style-type: none"> <li>• Explain why volume is measured in cubic units.</li> </ul>	304-305

<ul style="list-style-type: none"> <li>• Explain how the selected unit of length affects the size of cubic units (e.g., centimeter versus inch).</li> </ul>	304-305
<b>Procedures, precision, and estimation</b>	
1.2.4. Understand and apply systematic procedures to measure volume and capacity for solid shapes.	142, 304-305, 316, 318-319 Math Handbook: 334-339, 361-363
<ul style="list-style-type: none"> <li>• Identify the attribute to be measured in the situation (e.g., volume or capacity).</li> </ul>	142, 304-307, 316 Math Handbook: 339, 336
<ul style="list-style-type: none"> <li>• Choose the appropriate standard unit for measuring volume or capacity (e.g., cubic inches vs. cubic feet, cups vs. gallons).</li> </ul>	142, 307, 319 Math Handbook: 334-339, 361-363
<ul style="list-style-type: none"> <li>• Select and use tools that match the unit.</li> </ul>	319
<ul style="list-style-type: none"> <li>• Count or compute to obtain the volume or capacity and label the measurement.</li> </ul>	142, 304-307, 316, 318-319 Math Handbook: 334-339, 361-363
<ul style="list-style-type: none"> <li>• Use volume and capacity to describe and compare figures (e.g., fill containers with cubes to find which has a greater volume).</li> </ul>	304-307 Math Handbook: 334-339, 361-363
<ul style="list-style-type: none"> <li>• Measure the capacity of containers using appropriate tools and label (e.g., graduated cylinders, measuring cups, tablespoons).</li> </ul>	Opportunity to address this objective: Math Handbook: 362-363
<ul style="list-style-type: none"> <li>• Evaluate whether measurement has been done correctly.</li> </ul>	306-307
1.2.6. Understand and apply strategies to obtain reasonable estimates of volume or capacity.	285, 295, 304
<ul style="list-style-type: none"> <li>• Identify situations in which estimated measures are sufficient.</li> </ul>	285, 295
<ul style="list-style-type: none"> <li>• Estimate volume or capacity.</li> </ul>	285, 295, 304
<ul style="list-style-type: none"> <li>• Use estimation to justify reasonableness of a volume of a rectangular prism.</li> </ul>	Opportunity to address this objective: Course 3: 109, 111, 115, 117, 127-133
<ul style="list-style-type: none"> <li>• Estimate a measurement of volume or capacity using standard or non-standard units (e.g., estimate the capacity of a bowl in cups and handfuls).</li> </ul>	285, 295. 304
<ul style="list-style-type: none"> <li>• Use or describe a process to find a reasonable estimate of volume or capacity (e.g., fill a container with rice or popcorn).</li> </ul>	285, 295
<b>1.3. Understand and apply concepts and procedures from geometric sense.</b>	
<b>Properties and relationships</b>	
1.3.1. Understand the characteristics of	97, 188, 203-205

circles and rectangular prisms.	Math Handbook: 310-311, 313, 340-345 See also Course 2: 294-295, 298-299, 310-311
<ul style="list-style-type: none"> <li>Name and sort circles or rectangular prisms according to their attributes (faces, edges, radii, base, parallel faces).</li> </ul>	188, 203-205 Math Handbook: 310-311, 313, 340
<ul style="list-style-type: none"> <li>Draw a figure with given characteristics (e.g., the set of points equidistant from a given point).</li> </ul>	Math Handbook: 340
<ul style="list-style-type: none"> <li>Identify lines of symmetry in rectangular prisms.</li> </ul>	Opportunity to address this objective: 188
<ul style="list-style-type: none"> <li>Explain lines of symmetry for circles.</li> </ul>	Math Handbook: 316
<ul style="list-style-type: none"> <li>Describe the relationship between the diameter and the radius of a circle.</li> </ul>	Math Handbook: 340, 345
1.3.2. Apply understanding of angles and polygons.	176-183, 198-201 Math Handbook: 297-310, 312-313
<ul style="list-style-type: none"> <li>Identify geometric figures and concepts in nature and art (e.g., triangle in architecture, rhombus in beadwork, culturally relevant textiles, quilts).</li> </ul>	186-187, 191-193, 198, 203 Math Handbook: 313
<ul style="list-style-type: none"> <li>Combine polygons to create given two-dimensional figures and represent them on grid paper (e.g., use all pieces of tangrams to create a square).</li> </ul>	177
<ul style="list-style-type: none"> <li>Create a three-dimensional shape given its net or draw the net of a given three-dimensional shape.</li> </ul>	187, 191-193, 205 See also Course 2: 151-153
<ul style="list-style-type: none"> <li>Find the missing measure of an angle using the properties of parallel lines, perpendicular lines, vertical and corresponding angles.</li> </ul>	Beyond the scope of this course
<ul style="list-style-type: none"> <li>Find the missing angle given all but one of the angles of a polygon.</li> </ul>	Math Handbook: 301-303, 312 See also Course 2: 276, 303
<b>Locations and transformations</b>	
1.3.3. Understand the relative location of integers on a number line.	244, 246-247, 250, 271, 273 Math Handbook: 88-89
<ul style="list-style-type: none"> <li>Show the order of a given set of integers on a number line.</li> </ul>	244, 270
<ul style="list-style-type: none"> <li>Identify the point of final destination given directions for movement on a number line including positive and negative numbers (vertical or horizontal) (e.g., temperature variation at different times of the day, bank accounts, gain and loss of weight).</li> </ul>	245-247, 250, 270-273 Math Handbook: 88-89

<ul style="list-style-type: none"> <li>Determine the distance between any two integers on a number line.</li> </ul>	275
<ul style="list-style-type: none"> <li>Describe relative location of points and objects on a number line with both positive and negative numbers.</li> </ul>	244-245, 270 Math Handbook: 88-89
<ul style="list-style-type: none"> <li>Identify objects on a number line based on given numeric locations.</li> </ul>	244, 246-247, 250, 271, 273 Math Handbook: 88-89
1.3.4. Apply understanding of rotations (turns) to two-dimensional figures.	Math Handbook: 317, 319 See also Course 2: 289, 291, 308
<ul style="list-style-type: none"> <li>Apply rotations (turns) of <math>90^\circ</math> or <math>180^\circ</math> to a simple two-dimensional figure.</li> </ul>	Math Handbook 317, 319
<ul style="list-style-type: none"> <li>Create a design using (<math>90^\circ</math>, <math>180^\circ</math>, <math>270^\circ</math>, <math>360^\circ</math>) rotations (turns) of a shape.</li> </ul>	Opportunity to address this objective: Course 2: 289, 291, 308
<ul style="list-style-type: none"> <li>Show how a shape has been rotated by <math>90^\circ</math> or <math>180^\circ</math>.</li> </ul>	Math Handbook: 317, 319
<ul style="list-style-type: none"> <li>Describe a rotation so that another person could draw it.</li> </ul>	Opportunity to address this objective: Course 2: 289, 291, 308
<ul style="list-style-type: none"> <li>Identify the coordinates of objects that have been rotated <math>90^\circ</math>, <math>180^\circ</math>, or <math>270^\circ</math> on a coordinate grid.</li> </ul>	Opportunity to address this objective: Course 2: 289, 291, 308
<ul style="list-style-type: none"> <li>Determine whether an object has been translated or rotated on a coordinated grid.</li> </ul>	Math Handbook: 319
<b>1.4. Understand and apply concepts and procedures from probability and statistics.</b>	
<b>Probability</b>	
1.4.1. Understand probability as a ratio between and including 0 and 1.	30-35, 45-47 Math Handbook: 218-229
<ul style="list-style-type: none"> <li>Determine whether a real-life event has zero probability, 50% probability, or 100% probability of occurring.</li> </ul>	30-31, 45 Math Handbook: 225
<ul style="list-style-type: none"> <li>Express probabilities as fractions or decimals between 0 and 1 and percents between 0 and 100.</li> </ul>	31-35, 45-47 Math Handbook: 218-229
<ul style="list-style-type: none"> <li>Translate between representations of probability (e.g., translate a probability of 6 out of 16 to <math>\frac{3}{8}</math> or 37.5%).</li> </ul>	Math Handbook: 221
1.4.2. Understand various ways to determine outcomes of events or situations.	Math Handbook: 210-217 See also Course 3: 27-33, 42-45
<ul style="list-style-type: none"> <li>Determine and use the probabilities of the outcome of a single event.</li> </ul>	30-35, 45-47 Math Handbook: 218-222
<ul style="list-style-type: none"> <li>Represent or describe all possible outcomes of experiments (e.g., an organized list, a table, a tree diagram, or a sample space).</li> </ul>	Math Handbook: 210-212, 214, 217 See also Course 3: 27-33, 42-45

<ul style="list-style-type: none"> <li>• Calculate probability for an event (e.g., pulling colored or numbered balls from a bag, drawing a card, rolling a six on a number cube, spinning a spinner, etc.).</li> </ul>	30-35, 45-47 Math Handbook: 210-217
<ul style="list-style-type: none"> <li>• Determine all possible outcomes (sample space) of an experiment or event (e.g., all different choices a person has to wear one top and one skirt from three different tops and two different skirts).</li> </ul>	Math Handbook: 210-217 See also Course 3: 27-33, 42-45
<b>Statistics</b>	
1.4.3. Analyze how data collection methods affect the data collected.	11 Math Handbook: 184-186, 189
<ul style="list-style-type: none"> <li>• Evaluate how a question or data collection method may affect the data.</li> </ul>	11 Math Handbook: 184-186, 189
<ul style="list-style-type: none"> <li>• Determine whether a sampling method will result in a representative sample.</li> </ul>	11, 19 Math Handbook: 185, 189
<ul style="list-style-type: none"> <li>• Describe a data collection method that will provide an unbiased sample.</li> </ul>	11, 19
<ul style="list-style-type: none"> <li>• Compare data collection methods for a given situation to determine fairness of the method (e.g., compare a phone survey, a web survey, and a personal interview survey).</li> </ul>	Math Handbook: 185-186, 189
<ul style="list-style-type: none"> <li>• Identify different ways of selecting a sample (e.g., convenience sampling, response to a survey, random sampling) and explain which method makes a sample more representative for a population.</li> </ul>	Math Handbook: 185, 189
1.4.4. Apply measures of central tendency to interpret a set of data.	6-9, 11, 36-38 Math Handbook: 204-207, 209
<ul style="list-style-type: none"> <li>• Determine when it is appropriate to use mean, median, or mode and why a specific measure provides the most useful information in a given context.</li> </ul>	9 Math Handbook: 209
<ul style="list-style-type: none"> <li>• Use mean, median, and mode to explain familiar situations (e.g., the heights of students in the class, the hair color of students in the class).</li> </ul>	6-9, 11, 36-38 Math Handbook: 204-207, 209
<ul style="list-style-type: none"> <li>• Find the missing number given a mean for a data set with a missing element (e.g., given a set of homework scores and the desire to earn an average score of 80%, determine what score the student must earn on the next assignment).</li> </ul>	Opportunity to address this objective: 8-9, 37

1.4.5. Understand how to organize, display, and interpret data in text from single line graphs and scatter plots.	6-27, 36-44 See also Course 2: 244-249
<ul style="list-style-type: none"> <li>Justify a choice of a graph type for a given situation using information about the type of data.</li> </ul>	Opportunity to address this objective: 14-27, 39-44
<ul style="list-style-type: none"> <li>Read and interpret data from single line graphs and scatter plots and determine when the use of these graphs is appropriate.</li> </ul>	22-27, 42-44
<ul style="list-style-type: none"> <li>Use an appropriate representation to display data (e.g., table, graphs) given a particular situation and audience.</li> </ul>	6-27, 36-44
<ul style="list-style-type: none"> <li>Make inferences based on a set of data.</li> </ul>	7, 17-19, 22-27, 36, 38-41, 43-44
<ul style="list-style-type: none"> <li>Use data from a table, graph, or chart to support an interpretation.</li> </ul>	7, 17-19, 22-27, 36, 38-41, 43-44
<ul style="list-style-type: none"> <li>Use technology to generate bar graphs, line graphs, and scatter plots from tables of data.</li> </ul>	Opportunity to address this objective: 14-27, 38-44
1.4.6. Evaluate a data set to determine how it can be, or has been, used to support a point of view.	7, 10, 14-27, 39-44
<ul style="list-style-type: none"> <li>Compare graphs to data sets (e.g., given unlabeled graphs and data sets, match the appropriate data to a graph).</li> </ul>	26, 36, 38, 43-44
<ul style="list-style-type: none"> <li>Judge the appropriateness of inferences made from a set of data and support the judgment.</li> </ul>	7, 10, 16-25, 39-44
<ul style="list-style-type: none"> <li>Identify claims based on statistical data and assess the validity of the claims.</li> </ul>	7, 10, 16-25, 39-44
<ul style="list-style-type: none"> <li>Explain whether the scale on a graph accurately represents the data.</li> </ul>	14-15, 39
<ul style="list-style-type: none"> <li>Compare or evaluate two or more interpretations of the same set of data for accuracy.</li> </ul>	Opportunity to address this objective: 7, 10, 16-25, 39-44
<b>1.5. Understand and apply concepts and procedures from algebraic sense.</b>	
<b>Patterns, functions, and other relations</b>	
1.5.1. Apply rules for number patterns based on two arithmetic operations.	324-337, 342-359, 361-365
<ul style="list-style-type: none"> <li>Recognize or extend patterns and sequences using operations that alternate between terms.</li> </ul>	Opportunity to address this objective: 324-337, 342-359, 361-365
<ul style="list-style-type: none"> <li>Create, explain, or extend number patterns involving two related sets of numbers and two operations including</li> </ul>	324-325, 333-337, 350-351, 354, 357-359

addition, subtraction, multiplication, or division.	
<ul style="list-style-type: none"> <li>• Use rules for generating number patterns (e.g., Fibonacci sequence, bouncing ball) to model real-life situations.</li> </ul>	324-329, 334-337, 344-345, 348-353, 354-359, 362-365 See also Course 2: 86
<ul style="list-style-type: none"> <li>• Use technology to generate patterns based on two arithmetic operations.</li> </ul>	Opportunity to address this objective: 324-337, 342-359, 361-365
<ul style="list-style-type: none"> <li>• Supply missing elements in a pattern based on two operations.</li> </ul>	Course 3: 144-145, 148-155, 166, 169-175
<ul style="list-style-type: none"> <li>• Select or create a pattern that is equivalent to a given pattern.</li> </ul>	333-335
1.5.2. Apply understanding of patterns involving two arithmetic operations to develop a rule.	324-337, 342-359, 361-365
<ul style="list-style-type: none"> <li>• Describe the rule for a pattern with combinations of two arithmetic operations in the rule.</li> </ul>	324-325, 333, 337, 354
<ul style="list-style-type: none"> <li>• Identify patterns involving combinations of operations in the rule, including exponents (e.g., 2, 5, 11, 23).</li> </ul>	324-325, 333, 337, 352-354, 357-358, 365
<ul style="list-style-type: none"> <li>• Represent a situation with a rule involving a single operation (e.g., presidential elections occur every four years; when will the next three elections occur after a given year).</li> </ul>	326-329, 332, 334-335, 344-345, 350-351, 355, 362-365
<ul style="list-style-type: none"> <li>• Create a pattern involving two operations using a given rule.</li> </ul>	332-337, 357-358
<b>Symbols and representations</b>	
1.5.3. Apply understanding of equalities and inequalities to interpret and represent relationships between quantities.	110-114, 149-150, 258
<ul style="list-style-type: none"> <li>• Express relationships between quantities (decimals, percents, and integers) using =, ≠, &lt;, &gt;, ≤, and ≥.</li> </ul>	110-114, 149-150, 258
<ul style="list-style-type: none"> <li>• Match a given situation to the correct inequality or equality.</li> </ul>	Math Handbook: 260-261, 278-281
<ul style="list-style-type: none"> <li>• Express relationships between non-negative rational numbers using symbols.</li> </ul>	110-114, 149-150, 258
<ul style="list-style-type: none"> <li>• Write an inequality with a single variable to match a particular situation.</li> </ul>	Math Handbook: 278-281
1.5.4. Apply understanding of tables, graphs, expressions, equations, or inequalities to represent situations involving two arithmetic operations.	332-353, 357-365
<ul style="list-style-type: none"> <li>• Translate a situation involving multiple</li> </ul>	332-337, 342-353, 357-359, 361-365

arithmetic operations into algebraic form using equations, tables, and graphs.	Math Handbook: 254-261
<ul style="list-style-type: none"> <li>Identify or describe a situation involving two arithmetic operations that matches a given graph.</li> </ul>	342-345, 350, 362-363
<ul style="list-style-type: none"> <li>Represent an equation, expression, or inequality using a variable in place of an unknown number.</li> </ul>	332-337, 342-353, 357-359, 362-365 Math Handbook: 254-261
<ul style="list-style-type: none"> <li>Represent or evaluate algebraic expressions involving a single variable.</li> </ul>	332-337, 342-353, 357-359, 362-365 Math Handbook: 254-261
<ul style="list-style-type: none"> <li>Represent an equation or expression using a variable in place of an unknown number.</li> </ul>	332-337, 342-353, 357-359, 362-365 Math Handbook: 254-261
<ul style="list-style-type: none"> <li>Identify a situation that corresponds to a given equation or expression.</li> </ul>	332-337, 344-353, 357-359, 362-365
<b>Evaluating and solving</b>	
1.5.5. Understand and apply procedures to evaluate expressions and formulas.	332-337, 344-353, 357-359, 362-364 Math Handbook: 270-273
<ul style="list-style-type: none"> <li>Evaluate simple expressions and formulas using pictures and/or symbols.</li> </ul>	332-337, 344-353, 357-359 Math Handbook: 270-273
<ul style="list-style-type: none"> <li>Represent and evaluate algebraic expressions involving a single variable.</li> </ul>	332-335, 344-353, 357-359 Math Handbook: 270-273
<ul style="list-style-type: none"> <li>Evaluate an expression by substituting non-negative values for variables (e.g., find the value of <math>3y + 2</math> when <math>y = 3</math>).</li> </ul>	332-337, 344-353, 357-359 Math Handbook: 270-273
<ul style="list-style-type: none"> <li>Determine the expression that represents a given situation.</li> </ul>	332-337, 344-353, 357-359 Math Handbook: 254-259, 261
<ul style="list-style-type: none"> <li>Describe a situation that fits with a given expression.</li> </ul>	332-337, 344-353, 357-359
1.5.6. Understand and apply a variety of strategies to solve one-step equations.	Course 2: 206, 221
<ul style="list-style-type: none"> <li>Solve one-step equations using pictures and symbols.</li> </ul>	Course 2: 206
<ul style="list-style-type: none"> <li>Solve one-step single variable equations using any strategy (e.g., what number goes in the mystery box).</li> </ul>	Course 2: 206
<ul style="list-style-type: none"> <li>Solve real-world situations involving single variable equations.</li> </ul>	Course 2: 222
<ul style="list-style-type: none"> <li>Explain a strategy for solving a single variable equation.</li> </ul>	Course 2: 206, 208-209, 221-222
<ul style="list-style-type: none"> <li>Write and solve one-step single variable equations for a given situation.</li> </ul>	Course 2: 206, 221
<b>2. The student uses mathematics to define and solve problems.</b>	
<b>2.1. Understand problems.</b>	
2.1.1. Analyze a situation to define a	Throughout course

problem.	
<ul style="list-style-type: none"> <li>• Use strategies to become informed about the situation (e.g., listing information, asking questions).</li> </ul>	Throughout course
<ul style="list-style-type: none"> <li>• Summarize the situation (e.g., there is 100 feet of fencing and we want to enclose as much land, in the shape of a rectangle, as possible).</li> </ul>	Throughout course
<ul style="list-style-type: none"> <li>• Determine whether enough information is given to find a solution (e.g., list what is needed to find the area of a rectangle and compare to the list of known things).</li> </ul>	Throughout course
<ul style="list-style-type: none"> <li>• Determine whether information is missing or extraneous (e.g., compare the list of known things to the list of needed things to see if there are things that are not needed).</li> </ul>	Throughout course
<ul style="list-style-type: none"> <li>• Define the problem (e.g., find the rectangle with largest area with a perimeter of 100 feet).</li> </ul>	Throughout course
<b>2.2. Apply strategies to construct solutions.</b>	
2.2.1. Apply strategies, concepts, and procedures to devise a plan to solve the problem.	Throughout course
<ul style="list-style-type: none"> <li>• Organize relevant information from multiple sources to devise a plan (e.g., create a list of known and unknown information; create a table of values for length, width, and area of rectangles with perimeter of 100).</li> </ul>	Throughout course
<ul style="list-style-type: none"> <li>• Select and apply appropriate mathematical tools for a situation (e.g., guess and check, creating tables of values [with or without technology], examine relationships between sides of a rectangle and area).</li> </ul>	Throughout course
2.2.2. Apply mathematical tools to solve the problem.	Throughout course
<ul style="list-style-type: none"> <li>• Implement the plan devised to solve the problem (e.g., in a table of values of lengths, widths, and areas find the one that shows the largest area; check smaller increments to see if this is the largest that works).</li> </ul>	Throughout course
<ul style="list-style-type: none"> <li>• Identify when an approach is</li> </ul>	Throughout course

unproductive and modify or try a new approach (e.g., while guess and check may give some sense of a neighborhood of values, it is less efficient than a more organized method).	
<ul style="list-style-type: none"> <li>• Check the solution to see if it works (e.g., if the solution gives a perimeter that is not 100, it makes no sense in the given problem).</li> </ul>	Throughout course
<b>3. The student uses mathematical reasoning.</b>	
<b>3.1. Analyze information.</b>	
3.1.1. Analyze information from a variety of sources to interpret and compare information.	Throughout course
<ul style="list-style-type: none"> <li>• Identify claims based on statistical data and evaluate the validity of the claims.</li> </ul>	7, 9-27, 39-44
<ul style="list-style-type: none"> <li>• Read and interpret data from single line graphs and scatter plots and determine when the use of these graphs is appropriate.</li> </ul>	22-27, 42-44
<ul style="list-style-type: none"> <li>• Use volume and capacity to describe and compare figures (e.g., fill containers with cubes to find which has a greater volume).</li> </ul>	304-307
<b>3.2. Make predictions, inferences, conjectures, and draw conclusions.</b>	
3.2.1. Apply prediction and inference skills to make or evaluate conjectures.	7, 9-27, 39-44, 332-337, 345, 348-353, 357-359, 362-365
<ul style="list-style-type: none"> <li>• Identify claims based on statistical data and evaluate the validity of the claims.</li> </ul>	7, 9-27, 39-44
<ul style="list-style-type: none"> <li>• Predict a future element in a relation (e.g., find the fifteenth term in a pattern).</li> </ul>	332-337, 345, 348-353, 357-359, 362-365
3.2.2. Apply the skill of drawing conclusions and support those conclusions using evidence.	Throughout course
<ul style="list-style-type: none"> <li>• Draw conclusions from displays, texts, or oral discussions and justify those conclusions with logical reasoning or other evidence (e.g., read a newspaper article or ad; draw a conclusion and support that conclusion with evidence from the article or elsewhere).</li> </ul>	Throughout course
3.2.3. Analyze procedures and results in various situations.	Throughout course
<ul style="list-style-type: none"> <li>• Represent and interpret all possible outcomes of experiments (e.g., an</li> </ul>	Math Handbook: 210-212, 214, 217

organized list, a table, a tree diagram, or a sample space).	
<b>3.3. Verify results.</b>	
3.3.1. Analyze procedures and information used to justify results using evidence.	Throughout course
<ul style="list-style-type: none"> <li>Find and compare rectangular prisms that have a given volume (e.g., if two rectangular prisms have the same volume and one has twice the height of the other, determine how the areas of their bases compare).</li> </ul>	Opportunity to address this objective: 304-307, 318-319 Math Handbook: 335, 339
<ul style="list-style-type: none"> <li>Apply estimation strategies prior to computation of whole numbers, decimals, and fractions to determine reasonableness of answers.</li> </ul>	134, 139, 158, 160, 220, 236, 267 Math Handbook: 117, 119, 133, 135-136, 139, 141-143, 151
<ul style="list-style-type: none"> <li>Identify different ways of selecting a sample (e.g., convenience sampling, response to a survey, random sampling) and which method makes a sample more representative for a population.</li> </ul>	Opportunity to address this objective: 11, 19, 41 Math Handbook: 185, 189
3.3.2. Analyze thinking and mathematical ideas using models, known facts, patterns, relationships, or counter examples.	Throughout course
<ul style="list-style-type: none"> <li>Identify claims based on statistical data and evaluate the validity of the claims.</li> </ul>	7, 9-27, 39-44
<b>4. The student communicates knowledge and understanding in both everyday and mathematical language.</b>	
<b>4.1. Gather information.</b>	
4.1.1. Apply a planning process to collect information for a given purpose.	Throughout course
<ul style="list-style-type: none"> <li>Use mean, median, and mode to explain familiar situations (e.g., the heights of students in the class; the hair color of students in the class).</li> </ul>	6-9, 11, 19, 36-40, 42-44 Math Handbook: 204-207, 209
<ul style="list-style-type: none"> <li>Decide on information needed to create a report on a mathematical topic (e.g., compare the predicted rainfall in a given period with the actual rainfall).</li> </ul>	Throughout course
4.1.2. Understand how to extract information from multiple sources using reading, listening, and observation.	Throughout course
<ul style="list-style-type: none"> <li>Use mean, median, and mode to explain situations (e.g., the heights of students in the class; hair color of students in the class; favorite movie of students in the</li> </ul>	6-9, 11, 19, 36-40, 42-44 Math Handbook: 204-207, 209

class; most watched movie in a specific time frame).	
<b>4.2. Organize, represent, and share information.</b>	
4.2.1. Apply organizational skills for a given purpose.	Throughout course
<ul style="list-style-type: none"> <li>Show the order of the set of integers on a number line with both positive and negative numbers (e.g., organize the given birth years of the following Arabic kings on a number line).</li> </ul>	244-245, 270 Math Handbook: 88
4.2.2. Apply communication skills to clearly and effectively express or present ideas and situations using mathematical language or notation.	Throughout course
<ul style="list-style-type: none"> <li>Articulate various strategies used during estimation involving fractions and decimals.</li> </ul>	135, 138, 220
<ul style="list-style-type: none"> <li>Clearly explain, describe, or represent mathematical information in a pictorial, tabular, graphical, two- or three-dimensional drawing, or other form as appropriate for the mathematical information (e.g., time, distance, categories), audience, and/or purpose, such as to perform or persuade, with notation and labels as needed.</li> </ul>	Throughout course
<ul style="list-style-type: none"> <li>Use an appropriate representation to display data (e.g., table, graphs) given a particular situation and audience.</li> </ul>	11-27, 39-44
<b>5. The student understands how mathematical ideas connect within mathematics, to other subject areas, and to real-life situations.</b>	
<b>5.1. Relate concepts and procedures within mathematics.</b>	
5.1.1. Apply concepts and procedures from a variety of mathematical areas in a given problem or situation.	Throughout course
<ul style="list-style-type: none"> <li>Translate a situation involving multiple arithmetic operations into algebraic form using equation, table, and graphs.</li> </ul>	332-337, 342-353, 357-359, 361-365
<ul style="list-style-type: none"> <li>Given a set of data, compare various representations (e.g., table, graph, rule) for a given situation.</li> </ul>	14-27, 39-44
5.1.2. Apply different mathematical models and representations to the same situation.	Throughout course
<ul style="list-style-type: none"> <li>Represent equivalent ratios or given percentages using objects, pictures, and</li> </ul>	110-114, 148-150, 232-239, 265-268, 281-283, 287, 291, 300-307 Math Handbook: 140, 145-147, 274-277

symbols.	
• Match a graph with a data set.	26, 38, 43-44
<b>5.2. Relate mathematical concepts and procedures to other disciplines.</b>	
5.2.1. Analyze mathematical patterns and ideas to extend mathematical thinking and modeling to other disciplines.	Throughout course
• Identify geometric figures and concepts in nature and art (e.g., triangle in architecture, rhombus in beadwork).	166-173, 186-187, 191-198, 203
• Show the order of the set of integers on a number line with both positive and negative numbers (e.g., organize and graph on a number line the given birth years of the given Arabic kings).	244-245, 270 Math Handbook: 88
• Read a micrometer to the nearest hundredth of an inch or centimeter, depending on the tool.	Opportunity to address this objective: Math Handbook: 352-355
• Create a physical activity plan that results in 2500 calories expended over the week.	Opportunity to address this objective: 344-345, 362
• Calculate the ratio of various parts of an artwork (length of eyes to ears).	280-293, 296-312, 314-317, 319
• Discuss the difference between $\frac{3}{4}$ time and $\frac{6}{8}$ time and how it relates to a model.	Math Handbook: 104
5.2.2. Know the contributions of individuals and cultures to the development of mathematics.	56-57, 61-65, 77-78, 82, 84-85, 151-152, 173, 186, 191, 196, 259, 354
• Recognize the contributions of a variety of people to the development of mathematics (e.g., research the concept of the golden ratio).	56-57, 61-65, 77-78, 82, 84-85, 151-152, 173, 186, 191, 196, 259, 354
<b>5.3. Relate mathematical concepts and procedures to real-world situations.</b>	
5.3.1. Understand that mathematics is used in daily life and extensively outside the classroom.	6-7, 10-27, 89-90, 127, 141-142, 144, 147-148, 151, 154-159, 161, 166-173, 186-187, 191-198
• Write and solve real-world problem situations to find sums or differences of decimals or fractions (e.g., explain how to find the change received from a \$50.00 bill when a given amount of CD's and tapes with prices are bought).	127, 151, 154-155, 260-262, 272
• Calculate the ratio of bicycle gears.	Opportunity to address this objective: 280-319

5.3.2. Understand that mathematics is used within many occupations or careers.	4-5, 12, 20, 315, 318-319, 344-345, 362
<ul style="list-style-type: none"> <li>• Explain or describe the mathematics necessary to get and perform in a particular job (e.g., complete a project that researches how mathematics is used in careers or occupations of interest).</li> </ul>	4-5, 12, 20, 28, 166-173, 186-187, 190-193
<ul style="list-style-type: none"> <li>• Identify where in a particular career mathematics is used (e.g., police work — looking for patterns in fingerprints or crimes).</li> </ul>	4-5, 12, 20, 28, 166-173, 186-187, 190-193