WASHINGTON
MathScape: Seeing and Thinking Mathematically
Course 2 © 2005

GLE Grade 7	MathScape Course 2 Page References
1. The student understands and applies the concepts and procedures of mathematics.	
1.1. Understand and apply concepts and procedures from number sense.	
Number and numeration	
1.1.1. Understand the concept of rational numbers (integers, decimals, fractions).	96-135 Math Handbook: 90-161
• Create a model when given a symbolic representation of a rational number.	Math Handbook: 101
• Write the rational number when given a model (e.g., number line, area model, situation, diagram, picture).	16, 38 Mat6h Handbook: 100-107, 109
• Identify and convert between equivalent forms of rational numbers (e.g., fractions to decimals, percents to fractions).	Math Handbook: 102-109, 152-161
• Identify prime, square, or composite numbers.	86, 106-113, 118-123, 128-131, 133-135 Math Handbook: 85, 89, 167
• Explain the meaning of rational numbers and give examples.	Opportunity to address this objective: 90-161
1.1.2. Understand the relative values of rational numbers.	6-7, 9-11, 34, 36 Math Handbook: 73-75, 110-113, 127-129
• Compare and order rational numbers using physical models or implementing strategies (e.g., like denominators, changing to the same form).	6-7, 9-11, 34, 36 Math Handbook: 73-75, 110-113, 127-129
• Locate symbolic representations of rational numbers on a model (e.g., a number line, fraction line, decimal grid, and circle graph).	28, 43, 54, 58-63, 71, 83-85 Math Handbook: 90-91, 124-125, 138-139, 141, 196-197
• Explain the value of a given digit in a rational number (e.g., 2.3 is 2 ones and 3 tenths).	Math Handbook: 72-75, 124-129
1.1.3. Apply properties of addition and multiplication including inverse properties to the rational number system.	102, 188-189, 214 Math Handbook: 76-79, 280, 282
• Use the inverse relationships between multiplication and division to simplify	102 Math Handbook: 121-123, 284-291

computations and solve problems.	
• Use the inverse properties of addition and multiplication to simplify computations with integers, fractions, and decimals.	96-99, 124 Math Handbook: 91, 121-123
• Identify the inverse elements when using the additive inverse and the multiplicative inverse properties (e.g., 8 + (-8) = 0; $2 \times \frac{1}{2} = 1$).	Math Handbook: 91, 121-123
• Use the additive inverse property to solve problems.	102 Math Handbook: 91, 282-283, 285-291
• Illustrate or explain the additive and multiplicative inverse properties and why they work.	102 Math Handbook: 91, 121-123
1.1.4. Understand the concept of direct proportion.	18-23, 39-41 Math Handbook: 292-295
• Express proportional relationships using objects, pictures, and symbols.	18-23, 39-41 Math Handbook: 292-295
• Explain the meaning of a proportion.	18-20 Math Handbook: 292-293
• Represent a new relationship from a given ratio (e.g., height of a totem pole, May pole).	18-23, 39-41 Math Handbook: 292-295
• Represent percentages less than 1% or greater than 100% using objects, pictures, and symbols.	Course 1: 238-239, 268
• Complete or write a proportion for a given situation.	18-23, 39-41 Math Handbook: 292-295
• Solve problems involving proportions (e.g., determine the number and kinds of baked goods to bring to a bake sale based on proportions of different goods sold at previous bake sales).	18-23, 39-41 Math Handbook: 292-295
• Use ratios to make predictions about proportions in a future situation.	8-9, 12-13, 35, 37
Computation	
1.1.5. Understand the meaning of addition and subtraction on integers.	96-99, 124-125 Math Handbook: 91, 93
• Explain the meaning of addition and subtraction of integers using real-world models (e.g., reducing debt, temperature increase or decrease, yards gained and lost, movement of a hot-air balloon).	Course 1: 244, 272-273, 275
• Create a problem situation involving	Course 1: 244, 272-273, 275

addition or subtraction of integers.	
• Explain or show the meaning of addition or subtraction of integers.	96, 98
• Use technology to demonstrate addition and subtraction with integers.	Opportunity to address this objective: 96-99, 124-125 Math Handbook: 91, 93
1.1.6. Apply computational procedures with fluency for multiplication and division on non-negative rational numbers.	6-7, 10-13, 34, 36-37, 146-147, 160-163, 165, 168, 174-177, 179, 236-241, 260-263, 310-313 Math Handbook: 120-123, 132-137
• Find the product or quotient using non-negative decimals and fractions with unlike denominators.	6-7, 10-13, 34, 36-37, 146-147, 160-163, 165, 168, 174-177, 179, 236-241, 260-263, 310-313 Math Handbook: 120-123, 132-137
• Apply percentages to solve a problem in a variety of situations (e.g., taxes, discounts, interest).	26-33, 42-45, 162, 177 Math Handbook: 141, 145-151
• Use multiplication and division to solve real-world problems involving non-negative rational numbers.	6-7, 10-13, 34, 36-37, 146-147, 160-163, 165, 168, 174-177, 179, 236-241, 260-263, 310-313 Math Handbook: 123, 137
• Multiply non-negative decimal numbers to the hundredths place.	12, 36, 146-147, 160-162, 165, 168, 174-177, 236-241, 260-263, 310-313 Math Handbook: 132-135, 137
• Divided non-negative decimals numbers to the thousandths place by non-negative decimal numbers to the hundredths place.	6-7, 10-13, 34, 37, 163, 179 Math Handbook: 135-137
1.1.7. Understand and apply strategies and tools to complete tasks involving addition and subtraction on integers and the four basic operations on non-negative rational numbers.	6-7, 10-13, 26-34, 36-37, 42-45, 96-99, 124-125, 146-147, 160-163, 171, 176-179, 236-241, 258-264, 267-269, 310-313 Math Handbook: 91, 93, 114-123, 130-137
• 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.	6-7, 10-13, 26-34, 36-37, 42-45, 96-103, 124-127, 146-147, 160-163, 171, 176-179, 236-241, 267-269, 310-313 Math Handbook: 119, 123, 129, 135
• Convert between fractions, decimals, whole numbers, and percents mentally, on paper, or with a calculator.	26-27 Math Handbook: 152-159
• Use calculators to add and subtract with integers of two or more digits.	Opportunity to address this objective: 96-99
• Use calculators to compute with decimal numbers with precision from the thousandths place and beyond.	6, 11, 28-30, 34, 42-45

Estimation	
1.1.8. Apply estimation strategies to predict or determine the reasonableness of answers in situations involving addition and subtraction of integers and the four basic operations on non-negative rational numbers.	26-30, 34, 42 Math Handbook: 132, 134-135, 137, 139-141, 149, 151
• Identify when an approximation is appropriate in situations.	Opportunity to address this objective: 146-147, 160-163, 177, 179 Math Handbook: 141
• Use estimation strategies prior to operations on non-negative rational numbers to approximate an answer.	27-30, 34, 42 Math Handbook:132, 134-136, 139-141, 149, 151
• Justify why estimation would be used rather than an exact computation.	Opportunity to address this objective: 146-147, 160-163, 177, 179 Math Handbook: 141
• Describe a situation where estimation is sufficient in real life contexts.	146-147, 160-163, 177, 179 Math Handbook: 141
• Use estimation to verify the reasonableness of calculated results.	27-30, 34
• Evaluate the appropriateness of estimation in a situation and support the evaluation.	27-30, 34
1.2. Understand and apply concepts and procedures from measurement.	
Attributes, units, and systems	
1.2.1. Analyze how a change in a linear dimension affects other linear measurements (perimeter, circumference) and area measurements.	147, 163, 167, 178, 219, 294-295, 310 Math Handbook: 279, 377
• Describe the relationships among linear dimensions (e.g., radius of a circle, length of a side or base, changes in the diameter affects the amount of deer hide needed to cover a drum face) and area of the figure (e.g., change the radius or length of a side, and check the change in area; describe that change).	147, 163, 167, 178 Math Handbook: 377, 410-411
• Explain changing one, two, or three dimensions in a rectangular prism and how it affects the surface area and volume; give three examples.	Course 3: 98-101, 124-125, 128
• Solve problems involving the effects of changes in one dimension on area (e.g., given a garden with certain dimensions, make the area of the garden x square	147, 163, 167, 178 Math Handbook: 377, 410-411

units by changing only one dimension of the garden).	
1.2.3. Understand how the unit of measure affects the precision of measurement.	Opportunity to address this objective: 140-145, 294-299, 310
• Select the appropriate measurement tool to match the precision needed (e.g., if needing measurement to the nearest $\frac{1}{16}$ inch, select a ruler that has $\frac{1}{32}$ increments).	Opportunity to address this objective: 140-145, 294-299, 310
• Explain how the unit selected for a situation can affect the precision of the measurement (e.g., when you have a ruler that has only $\frac{1}{10}$ increments, you cannot measure something to the nearest hundredth with confidence of precision).	Opportunity to address this objective: 140-145, 294-299, 310
• Explain how measurement systems allow for different levels of precision (e.g., millimeters give more precise measurement than centimeters).	Opportunity to address this objective: 140-145, 294-299, 310
Procedures, precision, and estimation	
1.2.5. Apply formulas to find measurements of circles, triangles, and rectangular prisms.	154, 174, 276-277, 295, 299, 303, 310, 312 Math Handbook: 331-332, 359, 361-363, 365-366, 371, 373-377
• Apply formulas to determine missing measurements for circles, rectangular prisms, and triangles.	154, 174, 276-277, 295, 299, 303, 310, 312 Math Handbook: 331-332, 359, 361-363, 365-366, 371, 373-377
• Explain how to use a formula for finding the area and circumference of a circle (e.g., calculate the area needed to cover a drum face).	294-295, 298-299, 310, 312 Math Handbook: 373-374, 376-377
• Find and compare the volumes of 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).	Math Handbook: 366-367, 371
• Justify the standard formula for finding the area of a right triangle (e.g., $\frac{1}{2}$ of a rectangle).	154 Math Handbook: 359
• Use given dimensions to determine surface area and volume.	154-157, 175 Math Handbook: 362-371
1.2.6. Understand and apply strategies to	154, 274, 295, 302, 310

obtain reasonable estimates of circle measurements, right triangles, and surface area for rectangular prisms.	Math Handbook: 373
• Identify situations in which estimated measures are sufficient.	Opportunity to address this objective: 154, 274, 295, 302, 310
• Estimate circle and triangle measurements.	154, 274, 294, 298, 302 Math Handbook: 373
• Use common approximations of pi (3.14; $\frac{22}{7}$) to calculate the approximate circumference and the area of circles.	294-295, 298, 310, 312 Math Handbook: 373-374, 376-377
• Use or describe a process to find a reasonable estimate of circle measurements (e.g., wrap a string around it).	274, 294-295, 298-299 Math Handbook: 373
• Explain why estimation or precise measurement is appropriate in a given situation.	Opportunity to address this objective: 154, 274, 295, 302, 310
1.3. Understand and apply concepts and procedures from geometric sense.	
Properties and relationships	
1.3.1. Understand the concept of similarity.	39, 140-145, 168-170, 280-281, 305 Math Handbook: 408-411
• Identify corresponding sides and angles of two similar figures.	281, 305
• Determine and justify if two figures are similar using the definition of similarity.	280-281, 305
• Differentiate between similar and congruent figures, either geometric figures or real-world objects, and justify the conclusion.	280-281, 288, 305, 308
• Explain how a scale drawing is an example of similarity.	39, 140-145, 168-170
1.3.2. Apply understanding of the characteristics of rectangular prisms and circles.	294-295, 298-299, 310, 312 Math Handbook: 340-341, 343, 362-363, 366-367, 371-377
• Identify, describe, compare, and sort figures.	150, 172, 284-285, 288-291, 294, 304-306, 308-310 Math Handbook: 337-338, 340-343
• Draw rectangular prisms and circles with specified properties (e.g., circumference of an 18 centimeter quadrilateral having equal sides but no right angles; a triangle with no equal sides).	298, 310 See also Course 1: 188
• Use the properties of rectangular prisms and circles to solve problems (e.g.,	295, 310, 312 See also Course 3: 99, 120-121, 124-126,

determine which of two rectangular prism-shaped boxes will hold the most cans of food at the food drive and explain how the geometric characteristics affect capacity).	133
• Compare two rectangular prisms based on their characteristics (e.g., compare the geometric characteristics of two rectangular prisms with different dimensions and the same volume).	Course 3: 98, 121, 124-125, 133
Locations and transformations	
1.3.3. Understand the location of points on a coordinate grid in any of the four quadrants.	194-195, 216 Math Handbook: 301-304, 307
• Identify the coordinates of the fourth point to make a rectangle given three points.	Opportunity to address this objective: 194-195
• Plot and label ordered pairs in any of the four quadrants.	194-195, 216 Math Handbook: 302-304, 307
• Name the coordinates of a given point in any of the four quadrants.	216 Math Handbook: 301, 307
• Identify objects or the location of objects on a coordinate grid using coordinates or labels.	194-195, 216 Math Handbook: 301-304, 307
• Use technology to locate objects on a two-dimensional grid.	Opportunity to address this objective: 194-197
• Use ordered pairs to describe the location of objects on a grid.	216 Math Handbook: 301, 307
1.3.4. Understand and apply combinations of translations (slides) and reflections (flips) to two-dimensional figures.	289, 308 Math Handbook: 344-345, 347-349
• Identify and explain whether a shape has been translated (slid) or reflected (flipped) with or without a grid.	289, 308 Math Handbook: 344, 347-349
• Use transformations to create congruent figures and shapes in multiple orientations.	289, 308 Math Handbook: 345, 347
• Find the coordinate pairs for a translation or a reflection across an axis given a shape on a coordinate grid.	289, 308
• Match a shape with its image following one or two transformations (sliding or flipping).	289
• Use combinations of translations and reflections to draw congruent figures.	Math Handbook: 348-349

• Use ordered pairs to describe the location of an object on a coordinate grid after a translation and reflection.	289, 308
1.4. Understand and apply concepts and procedures from probability and statistics.	
Probability	
1.4.1. Understand the concepts of complementary, independent, and mutually exclusive events.	66-69, 82, 86-88 Math Handbook: 228-229, 232-235
• Determine and explain when events are mutually exclusive (e.g., your grade on a test is an A, B, or C).	Opportunity to address this objective: 50-91
• Determine and explain when events are complementary (e.g., a person awake or asleep, you pass or fail a test, coin throw ─ heads or tails).	Opportunity to address this objective: 50-91
• Identify or explain when events are complementary, mutually exclusive, or neither (e.g., spinning a 4 or a 5 but with the possibility of spinning 1, 2, 3, or 6) and explain.	Opportunity to address this objective: 50-91
1.4.2. Understand and apply the procedures for determining the probabilities of multiple trials.	50-91 Math Handbook: 224-235
• Calculate the probabilities of independent or mutually exclusive outcomes or events.	66-69 Math Handbook: 232-233, 235
• Calculate the probability of an event given the probability of its complement.	82, 88
• Create a game that has an equal probability for all players to win.	67, 69
• Revise a game with unequal probabilities for all players and make it a fair game.	67, 69
• Determine, interpret, or express probabilities in the form of a fraction, decimal, or percent.	53-55, 59-60, 62, 66, 68-71, 75, 77, 81-91 Math Handbook: 224-235
• Predict the probability of outcomes of experiments and test the predictions.	51-53, 70-71, 80, 88
• Predict the probability of future events based on empirical data.	51-53, 70-71, 80, 88
Statistics	
1.4.3. Apply data collection processes to inform, persuade, or answer questions.	Math Handbook: 188-193
• Formulate a question and collect data from a population, describing how the questions, collection method, and sample	Math Handbook: 188-193

population affect the results.	
• Present collected data to support an opinion to inform or persuade an identified audience.	29 Math Handbook: 194-209
• Determine whether given data provides useful information for a situation (e.g., given a set of data, decide whether all of the information provided is necessary).	Math Handbook: 194-209
• Determine whether data support a given opinion and explain the decision.	Math Handbook: 194-209
• Identify a sample relevant to a given question and population.	Math Handbook:188-193
• Determine and use range and measures of central tendency to describe a set of data.	132, 163 Math Handbook: 210-215
1.4.4. Understand how variations in data may affect the choice of data analysis techniques used.	Opportunity to address this objective: Math Handbook: 210-215
• Describe the effects of extreme values on means in a population.	Opportunity to address this objective: Math Handbook: 210-215
• Explain the difference between median or mean as a measure of central tendency in a given situation (e.g., when an extreme value skews the mean).	Math Handbook: 215
• Describe how additional data added to data sets may affect the result of measures of central tendency.	Opportunity to address this objective: Math Handbook: 210-215
• Find the range of a set of data.	Math Handbook: 214-215
• Explain what the range adds to measures of central tendency.	Opportunity to address this objective: Math Handbook: 214-215
1.4.5. Understand and apply various data display techniques including box-and-whisker plots.	28-29, 43, 245, 247-249, 265-266, 268 Math Handbook: 194-209
• Read and interpret various data displays.	28, 43, 245, 247, 265-266, 268 Math Handbook: 194-209
• Determine the appropriate representation for given data.	Opportunity to address this objective: Math Handbook: 194-205
• Construct bar graphs, circle graphs, line graphs, box-and-whisker and scatter plots using collected data.	29, 43, 245, 247-249, 265-266, 268 Math Handbook: 195-207
• Use scatter plots to describe trends and interpret relationships.	Math Handbook: 206-207, 209
• Read and interpret data from box-and-whisker plots and determine when using this type of graph is appropriate.	Math Handbook: 195, 205

• Describe statistical information given a box-and-whisker plot (e.g., median, range, interquartile range).	Math Handbook: 195, 205
• Compare different graphical representations of the same data.	Opportunity to address this objective: 29, 43 Math Handbook: 194-205
• Make and justify an inference drawn from a sample.	Math Handbook: 189-193
1.4.6. Evaluate how different representations of the same set of data can support different points of view.	Course 1: 15
• Critique the use of data and data displays for univariate data.	245, 247-249, 265-266, 268 Math Handbook: 194-205
• Judge the reasonableness of conclusions drawn from a set of data and support that position with evidence (e.g., from newspapers, web sites, opinion polls).	Math Handbook: 189-205
• Determine the accuracy and completeness of the data in a table or graph.	Course 1: 39
• Explain how different representations of the same set of data can support different points of view.	Course 1: 15
• Describe how statistics or graphics have been used or misused to support a point of view.	Course 1: 15
1.5. Understand and apply concepts and procedures from algebraic sense.	
Patterns, functions, and other relations	
1.5.1. Apply understanding of linear relationships to analyze patterns, sequences, and situations.	8-9, 35, 190-191, 195-201, 215-220, 236-237, 240-241, 245-249, 261-265
• Identify patterns that are linear relations and provide missing terms.	8-9, 35, 190-191, 215, 217, 220
• Describe the relationship between the terms in a sequence and their positions in the sequence.	Course 3: 148-155, 170-175
• Identify, extend, or represent patterns and sequences using tables, graphs, or expressions.	8-9, 35, 190-191, 215, 217-220, 236-237, 240-241, 245-249, 261-265
• Use technology to generate graphic representations of linear relationships.	Opportunity to address this objective: 197, 217, 245-249
• Make predictions using linear relationships in situations.	8-9, 35, 190-191, 215-216, 219-220
• Identify a linear relationship that has the same pattern as another linear	217, 219

relationship.	
• Create a representation of a linear relationship given a rule.	190-191, 215, 217, 219-220
1.5.2. Apply understanding of linear patterns in a table, graph, or situation to develop a rule.	190-191, 215, 219-220
• Describe the rule and/or construct a table to represent a pattern with combinations of two arithmetic operations in the rule.	215, 119-220
• Write an expression or equation with a single variable representing a situation or real-world problem.	190-191, 215, 219-220
• Write a story about a situation that represents a given linear equation, expression, or graph.	Opportunity to address this objective: 197, 201, 217
• Describe the rule or construct a table to represent a pattern with combinations of two arithmetic operations in the rule.	215, 119-220
• Use technology to determine the rule for a linear relationship.	Opportunity to address this objective: 245, 247, 265
Symbols and representations	
1.5.3. Understand relationships between quantities using squares and square roots.	106-113, 128-131 Math Handbook: 167, 171-175, 177
• Represent relationships between quantities using exponents (squares) and radicals (roots).	106-113, 128-131 Math Handbook: 166-177
• Simplify square roots of square numbers (e.g., the square root of 9 is 3).	107, 111, 128, 131 Math Handbook: 172-175, 177
• Demonstrate understanding of square roots with physical models and examples.	106-107, 128
• Use exponents (squares) and radicals (square roots) to represent relationships (e.g., finding the area of a square with a side of 5 could be represented by 52).	106-113, 128-131 Math Handbook: 166-177
1.5.4. Apply understanding of equations, tables, and graphs to represent situations involving linear relationships.	8-9, 35, 190-191, 195-201, 215-220, 236-237, 240-241, 245-249, 261-265
• Represent linear relationships through expressions, equations, tables, and graphs of situations involving non-negative rational numbers.	8-9, 35, 190-191, 195-201, 215-220, 236-237, 240-241, 245-249, 261-265

• Graph data to demonstrate relationships in familiar contexts (e.g., conversions, perimeter, area, volume, and scaling).	8-9, 35, 199-201, 218-220, 245, 247-249, 264-265
• Develop a situation that corresponds to a given equation or expression.	Opportunity to address this objective: 197, 201, 217
• Create a table or graph given a description of, or an equation for, a situation involving a linear relationship.	199-201, 218-220
• Describe a situation involving a linear or non-linear relationship that matches a given graph (e.g., time-distance, time-height).	9, 200-201, 245, 247, 265-266, 268
• Explain the meaning of a variable in a formula, expression, or equation.	200
Evaluating and solving	
1.5.5. Understand and apply procedures to evaluate expressions and formulas considering order of operations.	154-155, 174-176, 185, 191 Math Handbook: 80-81, 276-279
• Substitute non-negative rational values for variables in order to evaluate expressions and formulas (e.g., length x width when length = 3 and width = 4).	154-155, 174-176, 185, 191 Math Handbook: 276-279
• Explain the simplification of expressions and equations using order of operations.	188-189, 214 Math Handbook: 268-275
• Evaluate expressions and formulas considering order of operations.	154-155, 174-176, 185, 191 Math Handbook: 80-81, 276-279
• Determine the expression that represents a given situation.	21, 40, 185, 187-188, 190-191, 201, 204, 212-215, 219-223, 238-239, 262, 295, 297, 299 Math Handbook: 260-267
• Describe a situation that fits with a given expression.	184-185, 187, 201, 212-213, 262
• Write expressions or equations for a situation.	21, 40, 185, 187-188, 190-191, 201, 204, 212-215, 219-223, 238-239, 262, 295, 297, 299 Math Handbook: 260-267
1.5.6. Understand and apply a variety of strategies to solve two-step equations with one variable.	204-206, 208-209, 220-222 Math Handbook: 285-291
• Explain and justify the solution to a problem in a given context.	205-206, 209, 220-221 Math Handbook: 282-288
• Solve two-step equations with one variable on only one side of the equal	204-206, 208-209, 220-222 Math Handbook: 285-291

sign (e.g., $2x + 4 = 12$).	
2. The student uses mathematics to define and solve problems.	
2.1. Understand problems.	
2.1.1. Analyze a situation to define a problem.	Throughout course
• Use strategies to become informed about the situation (e.g., listing information, asking questions).	Throughout course
• Summarize the situation (e.g., two people are shooting free throws, one shot 18, the other 25; we are trying to find the percentage made for each).	Throughout course
• Determine whether enough information is given to find a solution (e.g., list what is needed to find the percentage of free throws made).	Throughout course
• 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 ─ names, location).	Throughout course
• Define the problem (e.g., find the smallest number of free throws Bonita needs to make out of 25 attempts in order to top Juan's percentage).	Throughout course
2.2. Apply strategies to construct solutions.	
2.2.1. Apply strategies, concepts, and procedures to devise a plan to solve the problem.	Throughout course
• Organize relevant information from multiple sources (e.g., describe how to calculate percents, set limits on the number that Bonita could make).	Throughout course
• Select and apply appropriate mathematical tools for a situation (e.g., guess and check, calculate Juan's percentage and create a table of values [with or without technology] for Bonita's percentage).	Throughout course
2.2.2. Apply mathematical tools to solve the problem.	Throughout course
• Implement the plan devised to solve the problem or answer the question posed (e.g., in a table of values of percentages for Bonita's possible results and	Throughout course

percentages, find the range of values that yield a percentage larger than Juan's; find the smallest of those and use that number).	
• Identify when an approach is unproductive and modify or try a new approach (e.g., if a result is larger than 25, return to see if the percentage computation is accurate and if it is computed correctly).	Throughout course
• Check the solution to see if it works (e.g., if the solution is larger than 25, it makes no sense in the given problem).	Throughout course
3. The student uses mathematical reasoning.	
3.1. Analyze information.	
3.1.1. Analyze information from a variety of sources to interpret and compare information.	Throughout course
• Explain and compare conclusions reached from data (e.g., from newspapers, web sites, opinions polls).	29, 210-211, 230-237, 240-241, 244-269
• Use graphs to describe trends, compare, and interpret relationships from data (e.g., from newspapers, web sits, opinion polls).	28-29, 33, 43, 177, 211, 245, 247-249, 265-266, 268 Math Handbook: 195-199, 201-209
3.2. Make predictions, inferences, conjectures, and draw conclusions.	
3.2.1. Apply prediction and inference skills to make or evaluate conjectures.	Throughout course
• Predict the probability of future events based on empirical data.	51-53, 55, 75, 77-79
• Predict the probability of outcomes of experiments and test the predictions.	53, 55, 59, 68, 80
3.2.2. Apply the skill of drawing conclusions and support those conclusions using evidence.	Throughout course
• Draw conclusions from displays, texts, or oral discussions and justify those conclusions with logical reasoning or other evidence (e.g., read a newspaper article that includes data, draw a conclusion, and support that conclusion with evidence from the article or elsewhere).	Throughout course
3.2.3. Analyze procedures and results in various situations.	Throughout course

• Describe how additional data added to data sets may affect the computations of measures of central tendency in various situations.	Opportunity to address this objective: Math Handbook: 210-215
3.3. Verify results.	
3.3.1. Analyze procedures and information used to justify results using evidence.	Throughout course
• Justify the reasonableness of an estimate.	26-28, 42-43, 129
• Apply a process that can be used to find a reasonable estimate of circle measurements (e.g., wrap a string around the circle).	294-295, 298-299, 212
• Apply estimation strategies prior to computing addition and subtraction of integers and operations on non-negative rational numbers to determine reasonableness of answers.	26-28, 42-43, 129, 312
3.3.2. Analyze thinking and mathematical ideas using models, known facts, patterns, relationships, or counter examples.	Throughout course
• Explain how different representations of the same set of data can support different points of view.	Throughout course
4. The student communicates knowledge and understanding in both everyday and mathematical language.	
4.1. Gather information.	
4.1.1. Apply a planning process to collect information for a given purpose.	Throughout course
• Formulate a question and collect data from a population considering how the questions, collection method, and sample population affect the results.	Math Handbook: 188-193
4.1.2. Understand how to extract information from multiple sources using reading, listening, and observation.	Throughout course
• Create a table or graph given a description of, or an equation for, a situation involving a linear or non-linear relationship.	112, 131, 185, 190, 195-201, 216-220 Math Handbook: 303-307
4.2. Organize, represent, and share information.	
4.2.1. Apply organizational skills for a given purpose.	Throughout course
• Identify, determine, interpret, or express probabilities in the form of a fraction, decimal, or percent.	53-55, 68, 70-71, 75, 77-78, 81-82, 86-91 Math Handbook: 224-235

4.2.2. Apply communication skills to clearly and effectively express or present ideas and situations using mathematical language or notation.	Throughout course
• Identify data that may represent sampling errors and explain why the sample (and the display) might be biased.	Math Handbook: 189-193
• Explain when estimation might be used rather than computation.	Opportunity to address this objective: 26-28, 42-43, 129, 298, 312
• 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.	Throughout course
5. The student understands how mathematical ideas connect within mathematics, to other subject areas, and to real-life situations.	
5.1. Relate concepts and procedures within mathematics.	
5.1.1. Apply concepts and procedures from a variety of mathematical areas in a given problem or situation.	Throughout course
• Write the rational number when given a model (e.g., number line, area model, situation, diagram, picture).	16, 18-19, 38, 54, 62, 70-71, 82, 84, 88-89 Math Handbook: 100-110, 124-125
• Given a set of data, compare various representations (e.g., box-and-whisker, bar, circle graph) for a given situation.	Opportunity to address this objective: 28-29, 43 Math Handbook: 195-205
5.1.2. Apply different mathematical models and representations to the same situation.	Throughout course
• Explain how different representations of the same set of data can support different points of view.	Course 1: 14-15, 39
• Match a situation with a data set or graph.	Course 1: 26, 38, 43-44
5.2. Relate mathematical concepts and procedures to other disciplines.	
5.2.1. Analyze mathematical patterns and ideas to extend mathematical thinking and modeling to other disciplines.	Throughout course
• Evaluate and explain conclusions of plant growth drawn from data (e.g., from magazines, newspapers, web sites).	Opportunity to address this objective: 227-269
• Write a story about a situation that	Opportunity to address this objective:

represents a given linear equation, expression, or graph.	184-185, 195-198, 201, 212, 217-218
• Determine the target heart zone for participation in aerobic activities.	Opportunity to address this objective: 227-269
• Chart a one week physical activity log based on calories expended/minute of activity.	Opportunity to address this objective: 227-269
• Determine adjustments needed to achieve a healthy level of fitness.	Opportunity to address this objective: 227-269
• Create a perspective drawing using vanishing point.	Opportunity to address this objective: 150-151 Math Handbook: 340-241
• Mix paint in the correct proportions to create a particular color.	Opportunity to address this objective: 18-21, 40-41 Math Handbook: 292-295
5.2.2. Know the contributions of individuals and cultures to the development of mathematics.	80, 131, 134, 304, 306, 312
• Recognize the contributions of a variety of people to the development of mathematics (e.g., research and report on the history of pi).	80, 131, 134, 304, 306, 312
5.3. Relate mathematical concepts and procedures to real-world situations.	
5.3.1. Understand that mathematics is used in daily life and extensively outside the classroom.	6-91, 127-128, 131, 134, 140-179, 190-191, 199-201, 204-205, 210-215, 217, 223, 228-269, 280-281, 295, 300-304, 306, 309-310, 312
• Describe a situation where estimation is sufficient in real life contexts.	Opportunity to address this objective: 26-28, 42-43, 129, 312
• Use properties of polygons and circles to solve real-world problems (e.g., find the amount of fencing needed for a pasture).	150-157, 172-173, 175-176, 280-281, 295, 300-304, 306, 309-310, 312 Math Handbook: 333, 352, 355, 375
• Compare the unit prices of various soft drinks.	Opportunity to address this objective: 6-11, 34-37
5.3.2. Understand that mathematics is used within many occupations or careers.	21, 38, 89, 140-179, 228-269, 300-301
• Explain how mathematics is used in careers or occupations of interest (e.g., complete a mathematically-based project).	21, 38, 89, 140-179, 228-269, 300-301