



ARIZONA
Academic Content Standards Grade 7
MathScape: Seeing and Thinking Mathematically
Course 2 © 2005

CONTENT STANDARDS	PAGE REFERENCES
Strand 1: Number Sense and Operations	
Concept 1: Number Sense	
Understand and apply numbers, ways of representing numbers, the relationships among numbers and different number systems.	
PO 1. Express fractions as terminating or repeating decimals.	See Glencoe's <i>MathScape: Seeing and Thinking Mathematically Course 1</i> © 2005 SE: 212-213, 228-229, 264 TG: 212A, 228A
PO 2. Identify the greatest common factor for a set of whole numbers.	SE: 116-117, 118-119, 120-121, 132, 133 TG: 93E, 118A, 119A
PO 3. Determine the least common multiple for a set of whole numbers.	SE: 118-119, 120-121, 133 TG: 93E, 118A
PO 4. Choose the appropriate signed real number to represent a contextual situation.	SE: 96-97, 98-99, 100-101, 102-103, 126, 127 TG: 96A, 99A, 100A
PO5. Recognize the absolute value of a number used in contextual situations.	If the definition and the symbol are given, then the following examples could be used. SE: 186-187, 194-195, 213 TG: 186A, 194A
PO 6. Locate integers on a number line.	SE: 186-187, 194-195, 213, 216 TG: 186A, 195A
PO 7. Order integers.	SE: 186-187, 188-189, 213, 214 TG: 183, 186A, 188A
PO 8. Classify rational numbers as natural, whole, or integers.	A limited explanation is found on pages: TG: 93C, 93E
Concept 2: Numerical Operations	
Understand and apply numerical operations and their relationship to one another.	
PO 1. Add integers.	SE: 96-97, 98-99, 124, 125 TG: 93G, 94, 98A
PO 2. Subtract integers.	SE: 96-97, 98-99, 124, 125 TG: 93G, 95, 98A
PO 3. Select the grade level appropriate operation to solve word problems.	SE: 96, 98, 99, 102, 103, 124, 125 TG: 97A, 98A, 99A, 102A
PO 4. Solve word problems using grade level appropriate operations and numbers.	SE: 96, 98-99, 102-103, 124, 125 TG: 97A, 98A, 99A, 102A
PO 5. Multiply integers.	SE: 100-101, 102-103 TG: 100A, 102A, 103A
PO 6. Divide integers.	SE: 100-101, 102-103 TG: 101A, 102A, 103A
PO 7. Apply grade level appropriate properties to assist in computation.	SE: 100-101, 188-189, 214 TG: 100A, 183, 188D

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PO 8. Apply the symbols + and – to represent positive and negative, and “ ” to represent absolute value.	The following page references cover signed symbols. SE: 96-97, 98-99, 100-101, 102-103, 124-127, 194-195, 216 TG: 93G, 94, 95, 96A, 98A, 100A, 102A, 103A, 194A
PO 9. Use grade level appropriate mathematical terminology.	TG: 93E, 97A, 99A, 102A, 103A, 194A, 196A
PO10. Calculate the percent of a given number.	SE: 162-163, 177 TG: 162A, 163A
PO 11. Convert numbers expressed in standard notation to scientific notation and vice versa. (positive exponents only)	See Glencoe’s <i>MathScape: Seeing and Thinking Mathematically Course 3</i> © 2005 SE: 300-301, 313 TG: 300A
PO 12. Simplify numerical expressions using the order of operations with grade appropriate operations on number sets.	SE: 184-185, 188-189, 212, 214 TG: 183, 185A, 188A
Concept 3: Estimation Use estimation strategies reasonably and fluently.	
PO 1. Solve grade level appropriate problems using estimation.	SE: 10-11, 12-13, 26-27, 36, 42, 160-161, 162-163, 170, 171, 177 TG: 10A, 26A, 27A, 162A
PO 2. Use estimation to verify the reasonableness of a calculation. (e.g., Is -2.5×18 about -50 ?)	SE: 6-7, 8-9, 10-11, 12-13, 26-27, 34, 36, 42, 129, 162-163, 177 TG: 9A, 12A, 13A, 27A
PO 3. Determine whether an estimation of an area is approximately equal to the actual measure.	SE: 140-141, 146-147, 154-155, 156-157, 160-161, 168, 171, 174, 175, 176 TG: 146A, 154A, 157A
PO 4. Determine whether an estimation of an angle is approximately equal to the actual measure.	SE: 274-275, 302 TG: 274A
PO 5. Determine whether an estimation of the circumference of a circle is approximately equal to the actual measure.	SE: 294-295, 310 TG: 294A, 295A
PO 6. Verify the reasonableness of estimates made from calculator results within a contextual situation.	SE: 6-7, 8-9, 10-11, 12-13, 28-29, 30-31, 34, 42, 44, 129 TG: 3C, 9A, 28A
Strand 2: Data Analysis, Probability, and Discrete Mathematics	
Concept 1: Data Analysis (Statistics) Understand and apply data collection, organization and representation to analyze and sort data.	
PO 1. Formulate questions to collect data in contextual situations.	SE: 232-233, 234-235, 236-237, 246-247, 248-249, 252-253, 254-255, 260, 261, 264, 265, 266 TG: 236A, 237A, 253A, 254A
PO 2. Construct a circle graph with appropriate labels and title from organized data.	SE: 24-25, 28-29, 32-33, 43 TG: 3H, 28A, 29A, 33A
PO 3. Determine when it is appropriate to use histograms, line graphs, double bar graphs and stem-and-leaf plots.	SE: 8-9, 35, 41, 246-247, 248-249, 265, 266 TG: 242, 243, 247A, 248A
PO 4. Interpret data displays including histograms, stem-and-leaf plots, circle graphs and double line	SE: 8-9, 28-29, 35, 41, 43, 248-249 TG: 242, 243, 248A

graphs.	
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PO 5. Answer questions based on data displays including histograms, stem-and-leaf plots, circle graphs and double line graphs.	SE: 8-9, 28-29, 35, 41, 43, 248-249, 265 TG: 242, 243, 248A
PO 6. Find the mean, median, mode and range of a given numerical data set.	The definition of <i>mean</i> is on page SE: 132
PO 7. Interpret trends from displayed data.	SE: 244-245, 246-247, 248-249, 252-253, 264, 265, 266, 267 TG: 242, 243, 245A, 247A, 252A
PO 8. Compare trends in data related to the same investigation.	SE: 210-211, 223, 244-245, 246-247, 248-249, 256-257, 264, 265, 266, 269 TG: 245A, 247A, 256A
PO 9. Solve contextual problems using histograms, line graphs of continuous data, double bar graphs, and stem-and-leaf plots.	SE: 8-9, 35, 41, 200-201, 244-249, 264-266 TG: 200A
Concept 2: Probability Understand and apply the basic concepts of probability.	
PO 1. Determine the probability that a specific event will occur in a single stage probability experiment. (e.g., Find the probability of drawing a red marble from a bag with 3 red, 5 blue, and 9 black marbles)	SE: 50-51, 52-53, 54-55, 66-67, 80, 81, 83, 86 TG: 47E, 49, 50A, 52A, 54A
PO 2. Compare probabilities to determine the fairness of a contextual situation. (e.g., If John wins when two or greater shows after a six-sided number cube is rolled and Joaquin wins otherwise, is this a fair game?)	SE: 50-51, 54-55, 58-59, 66-67, 68-69, 70-71, 86 TG: 50A, 55A, 56, 57, 58A, 64, 65, 67A, 69A, 70A
PO 3. Predict the outcome of a grade level appropriate probability experiment.	SE: 50-51, 52-53, 74, 75, 80, 81 TG: 50A, 51A, 52A, 56, 57, 72, 73, 74A
PO 4. Record the data from performing a grade level appropriate probability experiment.	SE: 50-51, 52-53, 54-55, 76, 77, 78, 79 TG: 54A, 76A, 78A
PO 5. Compare the outcome of an experiment to predictions made prior to performing the experiment.	SE: 52-53, 54-55, 76, 77, 89, 90 TG: 48, 49, 54A, 56, 57, 65, 72, 77A
PO 6. Make predictions from the results of student-generated experiments using objects (e.g., coins, spinners, number cubes, and cards).	SE: 50-51, 52-53, 58-59, 60-61, 62-63, 68-69, 80, 84, 85 TG: 53A, 56, 57, 58A, 61A, 62A, 64, 65, 68A
PO 7. Compare the results of two repetitions of the same grade level appropriate probability experiment.	SE: 52-53, 58-59, 60-61 TG: 52A, 53A, 56, 57, 60A, 61A
Concept 3: Discrete Mathematics – Systematic Listing and Counting Understand and demonstrate the systematic listing and counting of possible outcomes.	
PO 1. Determine all possible outcomes involving the combination of up to three sets of objects. (e.g., How many outfits can be made with 3 pants, 2 tee-shirts and 2 pairs of shoes?)	See Glencoe's <i>MathScape: Seeing and Thinking Mathematically Course 3</i> © 2005 SE: 28-29, 43
PO 2. Determine all possible arrangements of a given set, using a systematic list, table, tree diagram or other representation.	Outcome grids are used on the following pages. SE: 66-67, 68-69, 86, 87, 88 Venn diagram is used on page SE: 285 TG: 64, 66A, 68A, 69A

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Concept 4: Vertex-Edge Graphs	
Understand and apply vertex-edge graphs.	
PO 1. Find the shortest circuit on a map that makes a tour of specified sites (vertex-edge graph).	See Glencoe's <i>MathScape: Seeing and Thinking Mathematically Course 3</i> © 2005 SE: 62-63, 83 TG: 63A
Strand 3: Patterns, Algebra, and Functions	
Concept 1: Patterns	
Identify patterns and apply pattern recognition to reason mathematically.	
PO 1. Communicate a grade level appropriate recursive pattern, using symbols or numbers.	SE: 86, 106-107, 112-113, 127, 128 TG: 112A
PO 2. Extend a grade level appropriate recursive pattern.	SE: 106-107, 112-113, 127, 128 TG: 112A
PO 3. Solve grade level appropriate recursive pattern problems.	SE: 106-107, 112-113, 127, 128
Concept 2: Functions and Relationships	
Describe and model functions and their relationships.	
PO 1. Describe the rule used in a simple grade level appropriate function. (e.g., T-chart, input/output model)	SE: 194-195, 198-199, 200-201, 216-219 TG: 193, 195A, 198A, 200A
Concept 3: Algebraic Representations	
Represent and analyze mathematical situations and structures using algebraic representations.	
PO 1. Evaluate an expression containing two variables by substituting integers for the variable. (e.g., $7x + m$, when $x = -4$ and $m = 12$)	SE: 184-185, 188-189, 204-205, 206-207, 212, 214, 220, 221 TG: 182, 185A, 188A, 204A, 206A
PO 2. Use variables in contextual situations.	SE: 184-185, 188-189, 204-205, 206-207, 212, 220, 221 TG: 181A, 181E, 184A, 204A
PO 3. Translate a written sentence into a one-step, one-variable algebraic equation.	SE: 190-191, 198-199, 215, 218
PO 4. Translate a sentence written in context into an algebraic equation involving one operation.	SE: 190-191, 198-199, 215, 218
PO 5. Solve one-step equations using inverse operations with positive rational numbers. (e.g., $\frac{2}{3}n = 6$)	SE: 206-207, 208-209, 221, 222 TG: 203, 206A, 207A, 209A
Concept 4: Analysis of Change	
Analyze change in a variable over time and in various contexts.	
PO 1. Analyze change in various linear contextual situations.	See Glencoe's <i>MathScape: Seeing and Thinking Mathematically Course 3</i> © 2005 SE: 138-139, 158-159, 160-161, 162-163, 174
Strand 4: Geometry and Measurement	
Concept 1: Geometric Properties	
Analyze the attributes and properties of two- and three-dimensional shapes and develop mathematical arguments about their relationships.	
PO 1. Draw a geometric figure showing specified properties. (e.g., Draw an obtuse triangle.)	SE: 152-153, 173, 278-279, 284-285 TG: 271G, 271H, 279A, 285A
PO 2. Classify three-dimensional solids by their configuration and properties. (e.g., parallelism, perpendicularity and congruency)	SE: 150-151, 164-165, 166-167, 172

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PO 3. Identify the net (two-dimensional representation) that corresponds to a rectangular prism, cone, or cylinder.	SE: 150-151, 152-153, 172, 173 TG: 137C, 150A
PO 4. Distinguish between length, area, and volume, using two- and three-dimensional geometric figures.	Area is discussed on pages SE: 154-155, 160-161, 171, 174, 176, 178, 296-297, 298-299 TG: 137G, 148, 149, 160A, 296A
PO 5. Draw polygons with appropriate labels.	SE: 152-153, 280-281 TG: 152A, 281A
PO 6. Identify the angles created by two lines and a transversal.	SE: 284-285, 306
PO 7. Recognize the relationship between central angles and intercepted arcs.	SE: 274-275, 294-295 TG: 274A, 275A, 294A
PO 8. Identify arcs and chords of a circle.	SE: 294-295 TG: 294A
PO 9. Model the triangle inequality theorem using manipulatives.	SE: 276-277, 303 TG: 277A
PO 10. Identify corresponding parts of congruent polygons as congruent.	SE: 288-289, 308 TG: 283, 284, 288A
Concept 2: Transformation of Shapes Apply spatial reasoning to create transformations and use symmetry to analyze mathematical situations.	
PO 1. Identify rotations about a point, using pictorial models.	SE: 288-289, 300-301, 313 TG: 273, 283, 300A
PO 2. Recognize simple single rotations, translations or reflections on a coordinate grid.	SE: 288-289, 300-301, 313 TG: 289A, 300A
Concept 3: Coordinate Geometry Specify and describe spatial relationships using coordinate geometry and other representational systems.	
PO 1. Graph data points in (x, y) form in any quadrant of a coordinate grid.	SE: 194-195, 288-289, 308 TG: 194A, 288A, 289A
PO 2. State the missing coordinate of a given figure in any quadrant of a coordinate grid using geometric properties. (e.g., find the coordinates of the missing vertex of a rectangle when two adjacent sides are drawn)	SE: 288-289, 308 TG: 289A
Concept 4: Measurement - Units of Measure - Geometric Objects Understand and apply appropriate units of measure, measurement techniques, and formulas to determine measurements.	
PO 1. Identify the appropriate unit of measure for the volume of an object. (e.g., cubic inches or cubic cm)	See Glencoe's <i>MathScape: Seeing and Thinking Mathematically Course 3</i> © 2005 SE: 116-117, 118-119, 131, 132
PO 2. Measure to the appropriate degree of accuracy.	SE: 140-141, 142-143, 144-145, 168, 169, 170 TG: 140A, 143A, 147, 148
PO 3. Convert a measurement from US customary to metric, and vice versa.	See Glencoe's <i>MathScape: Seeing and Thinking Mathematically Course 3</i> © 2005 SE: 52, 79, 118, 132
PO 4. Solve problems involving the circumference of a circle.	SE: 294-295, 310 TG: 292, 293, 294A, 295A
PO 5. Solve problems involving the area of a circle.	SE: 294-295, 298-299, 310 TG: 292, 293, 294A, 295A, 298A, 299A

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PO 6. Solve problems for the areas of parallelograms, triangles, and circles.	SE: 146-147, 154-155, 160-161, 171, 174, 296-297 TG: 138, 139, 146A, 148, 149, 154A, 155A, 158, 160A, 297A
PO 7. Identify polygons having the same perimeter or area.	SE: 144-145, 146-147, 170, 171, 296-297, 311 TG: 137G
PO 8. Compare estimated to actual lengths based on scale drawings or maps.	SE: 140-141, 142-143, 144-145, 168, 169 TG: 140A, 142A, 144A
Strand 5: Structure and Logic	
Concept 1: Algorithms and Algorithmic Thinking	
Use reasoning to solve mathematical problems in contextual situations.	
PO 1. Discriminate necessary information from unnecessary information in a given grade level appropriate word problem.	SE: 246-247 TG: 247A
PO 2. Analyze algorithms for computing with fractions.	See Glencoe's <i>MathScape: Seeing and Thinking Mathematically Course 1</i> © 2005 SE: 118-119, 120-121, 122-123, 124-125, 126-127, 132-133, 134-135, 136-137 TG: 93B, 117, 118A, 119A, 121A, 123A, 124A, 126A, 128, 129, 136A
Concept 2: Logic, Reasoning, Arguments, and Mathematical Proof	
Evaluate situations, select problem-solving strategies, draw logical conclusions, develop and describe solutions and recognize their applications.	
PO 1. Solve a logic problem using multiple variables.	SE: 184-185, 186-187, 188-189, 190-191, 212, 213, 214, 215 TG: 184A, 185A, 186A, 188A, 191A, 204A