



ARIZONA
Mathematics Standard Articulated by Grade Level
Grade 7
***Mathematics: Applications and Concepts Course 2* © 2006**

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.	SE: 210-213, 214 #13-#15, 219 #57-#59, 233 #28-#33, 235 #7, #8, #10, #11 <i>Extra Practice Lesson 5-4</i> 575 #7-#18 <i>Mixed Problem Solving</i> 600 #7, #8 TWE: A 213 T 211
PO 2. Identify the greatest common factor for a set of whole numbers.	SE: 203-206, 213 #53, 233 #15-#18, 235 #4 <i>Extra Practice Lesson 5-2</i> 574 #1-#18 <i>Mixed Problem Solving</i> 600 #4, #5 <i>Standardized Test Practice</i> 214 #19, 237 #18 TWE: T 204
PO 3. Determine the least common multiple for a set of whole numbers.	SE: 224-226, 231 #60, 234 #58-#63 <i>Extra Practice Lesson 5-7</i> 576 <i>Mixed Problem Solving</i> 600 #18 <i>Standardized Test Practice</i> 237 #16, #18 TWE: DI 225 T 225 A 226
PO 4. Choose the appropriate signed real number to represent a contextual situation.	SE: 106-108, 111 #36, #37, 141 #48, 142 #11-#14, 145 #3-#5 <i>Extra Practice Lesson 3-1</i> 569 #1-#6 <i>Mixed Problem Solving</i> 598 #1, #2 TWE: T 107 #1, #2 A 108
PO5. Recognize the absolute value of a number used in contextual situations.	SE: 106-108, 115 #51, 142 #15-#19 <i>Standardized Test Practice</i> 116 #15, 146 #6 TWE: DI 106
PO 6. Locate integers on a number line.	SE: 106, 108 #30-#33, #37, 109-111, 131 #46, #48 <i>Extra Practice Lesson 3-1</i> 569 #19-#22, TWE: A 108, 111
PO 7. Order integers.	SE: 110, 111 #29-#32, #34, 143 #26-#29, 145 #9, 146 #7, 147 #16 <i>Extra Practice Lesson 3-2</i> 570 #17-#22 <i>Mixed Problem Solving</i> 598 #3 TWE: T 110

CONTENT STANDARDS	PAGE REFERENCES
PO 8. Classify rational numbers as natural, whole, or integers.	SE: <i>Key Concept</i> 229 TWE: T 229
Concept 2: Numerical Operations Understand and apply numerical operations and their relationship to one another.	
PO 1. Add integers.	SE: 120-124, 137 #54-#57, 144 #38-#42, 145 #13, #14 <i>Hands-On Lab</i> 118-119 <i>Extra Practice Lesson 3-4</i> 570 #1-#12 <i>Mixed Problem Solving</i> 598 #9 <i>Standardized Test Practice</i> 190 #7 TWE: A 124 DI 121 T 121-122
PO 2. Subtract integers.	SE: 128-131, 144 #43-#46 <i>Hands-On Lab</i> 126-127 <i>Extra Practice Lesson 3-5</i> 571 #1-#15 <i>Mixed Problem Solving</i> 598 #10-#12 <i>Standardized Test Practice</i> 147 #18 TWE: A 130 T 129
PO 3. Select the grade level appropriate operation to solve word problems.	SE: 6-9 <i>Problem-Solving Strategy</i> 22-23, 132-133, 164-165, 201-202, 252-253, 302-303, 391-392, 444-445, 496-497
PO 4. Solve word problems using grade level appropriate operations and numbers.	SE: 6-9 <i>Problem-Solving Strategy</i> 22-23, 132-133, 164-165, 201-202, 252-253, 302-303, 391-392, 444-445, 496-497
PO 5. Multiply integers.	SE: 14 #43-#46, 134-137, 144 #47-#50, 145 #24 <i>Extra Practice Lesson 3-6</i> 571 #1-#12 <i>Mixed Problem Solving</i> 598 #13, #14 TWE: A 137 T 135
PO 6. Divide integers.	SE: 138-141, 144 #55-#58 <i>Extra Practice Lesson 3-7</i> 571 #1-#20 <i>Mixed Problem Solving</i> 598 #15, #16 TWE: A 141, T 139
PO 7. Apply grade level appropriate properties to assist in computation.	SE: 30-33, 48 #40-#43, 121-124 <i>Extra Practice Lesson 1-6</i> 565 #1-#24 <i>Mixed Problem Solving</i> 596 #10, #11
PO 8. Apply the symbols + and – to represent positive and negative, and “ ” to represent absolute value.	SE: 106-108, 111 #32, 141 #48, 142 #11-#19, 145 #3-#5 <i>Extra Practice Lesson 3-1</i> 569 #1-#18 <i>Mixed Problem Solving</i> 598 #1, #2 TWE: DI 106 T 107

CONTENT STANDARDS	PAGE REFERENCES
PO 9. Use grade level appropriate mathematical terminology.	SE: Each lesson highlights new vocabulary. <i>Study Skill</i> 125, 474 TWE: Key Chapter Objectives using mathematical terminology are highlighted at the beginning of every chapter. B 18, 80, 177, 270, 275, 338, 393, 446, 493, 538 VB 4, 194, 410
PO10. Calculate the percent of a given number.	SE: 319-321, 325 #26, #27, 328 #50-#53 <i>Extra Practice Lesson 7-7</i> 582 <i>Mixed Problem Solving</i> 602 #15 TWE: A 321 T 320
PO 11. Convert numbers expressed in standard notation to scientific notation and vice versa. (positive exponents only)	SE: 43-45, 48 #53-#59, 49 #22-#24, 50 #9 <i>Extra Practice Lesson 1-9</i> 566 <i>Mixed Problem Solving</i> 596 #15 <i>WebQuest</i> 3 TWE: DI 43 T 44 A 45
PO 12. Simplify numerical expressions using the order of operations with grade appropriate operations on number sets.	SE: 14-17, 21 #50-#53, 47 #17-#24, 49 #5, #6 <i>Extra Practice Lesson 1-3</i> 564 <i>Mixed Problem Solving</i> 596 #5, #6 <i>Standardized Test Practice</i> 100 #2, 147 #19 TWE: B 14 T 15 DI 16
Concept 3: Estimation Use estimation strategies reasonably and fluently.	
PO 1. Solve grade level appropriate problems using estimation.	SE: 21 #43, 240-243, 295 #23, 334-337, 475-477 <i>Hands-On Lab</i> 301 <i>Prerequisite Skills</i> 558 <i>Standardized Test Practice</i> 366 #5 TWE: B 240 DI 476 T 241-242, 335-336, 476
PO 2. Use estimation to verify the reasonableness of a calculation. (e.g., Is -2.5×18 about -50 ?)	SE: <i>Problem-Solving Strategy</i> 338-339 <i>Standardized Test Practice</i> 508 #9 TWE: T 338
PO 3. Determine whether an estimation of an area is approximately equal to the actual measure.	SE: 483 example 1-2, 489 example 1 <i>Teaching Tip</i> 493 <i>Problem-Solving Strategy</i> 496 TWE: DI 497
PO 4. Determine whether an estimation of an angle is approximately equal to the actual measure.	The following pages can be used to meet this content standard. SE: 413-315 <i>Hands-on Lab</i> 412

CONTENT STANDARDS	PAGE REFERENCES
PO 5. Determine whether an estimation of the circumference of a circle is approximately equal to the actual measure.	The following pages can be used to meet this content standard. SE: 275-577
PO 6. Verify the reasonableness of estimates made from calculator results within a contextual situation.	SE: 475 example #1 <i>Problem-Solving Strategy</i> 338-339 TWE: A 339 DI 211, 313
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: <i>Hands-on Lab</i> 73 TWE: A 79
PO 2. Construct a circle graph with appropriate labels and title from organized data.	SE: 418-421, 463 #11 <i>Extra Practice Lesson 10-2</i> 587 <i>Mixed Problem Solving</i> 605 #3, #4 TWE: T 419
PO 3. Determine when it is appropriate to use histograms, line graphs, double bar graphs and stem-and-leaf plots.	SE: 74 #1-#3 <i>Hands-on Lab</i> 73 step 4 TWE: A 73, 88, 421 B 64 PS 99 T 87 #3
PO 4. Interpret data displays including histograms, stem-and-leaf plots, circle graphs and double line graphs.	SE: 60-63, 76-79, 85-89, 92-95, 418-421 <i>Problem-Solving Strategy</i> 58-59 TWE: T 87
PO 5. Answer questions based on data displays including histograms, stem-and-leaf plots, circle graphs and double line graphs.	SE: 63 #14, 76-79, 86-89, 419 example 3, 420-421 #5, #6, #12 <i>Problem Solving Strategy</i> 59 TWE: B 418 T 61 #1, 86, 420
PO 6. Find the mean, median, mode and range of a given numerical data set.	SE: 66 #8, 67 #17, #20, 69-72, 74 #9, #10, 94 #9, 97 #16-#19, 129 example #6 <i>Standardized Test Practice</i> 100 #6, 146 #4 <i>Extra Practice Lesson 2-4</i> 568 <i>Mixed Problem Solving</i> 597 #6-#9, #10, #15 TWE: T 70 PC 52F
PO 7. Interpret trends from displayed data.	SE: 60-63, 72 #23, 85-87, 101 #15, 191 #20, 345-347 <i>Extra Practice Lesson 2-2</i> 567 <i>Mixed Problem Solving</i> 597 #5 <i>Problem-Solving Strategy</i> 58-59 <i>WebQuest</i> 3, 103 TWE: A 59 DI 59, 346 T 58, 61

CONTENT STANDARDS	PAGE REFERENCES
PO 8. Compare trends in data related to the same investigation.	SE: 60-63, 79 #23, 85-87, 94 #7 <i>Extra Practice Lesson 2-2</i> 567 <i>Mixed Problem Solving</i> 597 #5 <i>Problem-Solving Strategy</i> 58-59 TWE: A 59, 88 DI 59 T 58, 61
PO 9. Solve contextual problems using histograms, line graphs of continuous data, double bar graphs, and stem-and-leaf plots.	SE: 60-63, 76-79, 85-89, 92-95, 97 #11, 98 #28-#30, 101 #4, #7 <i>Problem-Solving Strategy</i> 59 #6 <i>WebQuest</i> 3, 103 TWE: A 79 T 77-78, 86-87, 93
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: 370-373, 402 #11-#16 <i>Extra Practice Lesson 9-1</i> 584 <i>Mixed Problem Solving</i> 604 #1-#3 <i>Standardized Test Practice</i> 407 #12 TWE: T 371
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: 374 example 1, 377 #21, #22 <i>Hands-on Mini Lab</i> 374
PO 3. Predict the outcome of a grade level appropriate probability experiment.	SE: 370-373, 374-377, 378-380, 393-396, 398-401, 402 #11-#16 <i>Hands-on Lab</i> 397 <i>Extra Practice Lesson 9-1</i> 584, <i>Lesson 9-6</i> 586, <i>Lesson 9-7</i> 586 #4-#7
PO 4. Record the data from performing a grade level appropriate probability experiment.	SE: <i>Hands-on Lab</i> 397 <i>Hands-on Mini Lab</i> 393 <i>Problem-Solving Strategy</i> 391-392 TWE: DI 371
PO 5. Compare the outcome of an experiment to predictions made prior to performing the experiment.	SE: <i>Hands-on Mini Lab</i> 374 TWE: DI 394
PO 6. Make predictions from the results of student-generated experiments using objects (e.g., coins, spinners, number cubes, and cards).	SE: <i>Hands-on Mini Lab</i> 393
PO 7. Compare the results of two repetitions of the same grade level appropriate probability experiment.	SE: <i>The Game Zone</i> 385 TWE: DI 371

CONTENT STANDARDS	PAGE REFERENCES
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?)	SE: 374-377, 378-380, 403 #17-#24 <i>Extra Practice Lesson 9-2 585, Lesson 9-3 585</i> <i>Mixed Problem Solving 604 #4-#8</i> <i>Standardized Test Practice 406-407 #6, #13, #18a</i> TWE: B 374 T 375
PO 2. Determine all possible arrangements of a given set, using a systematic list, table, tree diagram or other representation.	SE: 374-377, 378-380, 381-383, 387-390 <i>Extra Practice Lesson 9-2 585, Lesson 9-3 585, Lesson 9-4 585, Lesson 9-5 586</i> <i>Mixed Problem Solving 604 #4-#10</i> <i>Standardized Test Practice 406-407 #6, #7, #13-#15</i>
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).	SE: 453 #12 <i>When am I ever going to use this? 112</i> <i>Hands-On Mini Lab 304</i>
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: 34-36, 41 #47-#50, 48 #44-#47 <i>Hands-on Lab 37</i> <i>Extra Practice Lesson 1-7 #1-#24</i> <i>Standardized Practice Test 50 #7, 51 #17</i> TWE: B 34 T 35
PO 2. Extend a grade level appropriate recursive pattern.	SE: 33 #52-#57, 34-36, 41 #47-#50, 48 #44-#47 <i>Extra Practice Lesson 1-7 #10-#24</i> <i>Standardized Test Practice 50 #7, 51 #17</i> TWE: B 34
PO 3. Solve grade level appropriate recursive pattern problems.	SE: <i>Mixed Problem Solving 596 #12</i> <i>Standardized Test Practice 50 #7, 51 #17</i> TWE: A 36
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: 36 #25, #26, 181 #37-#40 <i>Standardized Test Practice 191 #20b</i> TWE: T 178
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: 18-21, 27 #50, 28 #12, 47 #25-#31 <i>Extra Practice Lesson 1-4 565</i> TWE: T 19

CONTENT STANDARDS	PAGE REFERENCES
PO 2. Use variables in contextual situations.	SE: 25 example 3, 27 #42-#46, 150-152, 159 #37, #38, 163 #38, 168-169 #38, #39, 174-175 #34, #35, #40, 189 #11 <i>Mixed Problem Solving</i> 599 #1, #2 <i>Study Skill</i> 153
PO 3. Translate a written sentence into a one-step, one-variable algebraic equation.	SE: 25 example 3, 27 #42, #45, 150-152, 186 #15-#18 <i>Extra Practice Lesson 4-1</i> 572 #19-#30 <i>Mixed Problem Solving</i> 599 #1, #2, #10 <i>Study Skill</i> 153
PO 4. Translate a sentence written in context into an algebraic equation involving one operation.	SE: 25 example 3, 27 #42-#46, 150-152, 159 #36, #37, 163 #38, 168-169 #38, #39, 186, 189 #11 <i>Mixed Problem Solving</i> 599 #1, #2, #10 <i>Study Skill</i> 153
PO 5. Solve one-step equations using inverse operations with positive rational numbers. (e.g., $\frac{2}{3}n = 6$)	SE: 156-159, 160-163, 169 #45-#48, 187 #19-#36, 189 #5-#7 <i>Hands-on Lab</i> 154-155 <i>Extra Practice Lesson 4-2</i> 572, <i>Lesson 4-3</i> 572 TWE: T 157, 161
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.	SE: 177-181, 182-185, 188 <i>Hands-On Lab</i> 296 <i>Extra Practice Lesson 4-6</i> 573, <i>Lesson 4-7</i> 574 TWE: T 178-179, 183
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: 430 #2, 437 #29-#31, 442 #2, 448 #2, 465 #15, 481 #2, 484 #2, 491 #2, #16-#19, 494 #1 TWE: DI 434 A 450 B 483
PO 2. Classify three-dimensional solids by their configuration and properties. (e.g., parallelism, perpendicularity and congruency)	SE: 520, 524
PO 3. Identify the net (two-dimensional representation) that corresponds to a rectangular prism, cone, or cylinder.	SE: 530, 531 #7, #8, 532 example 1 <i>Hands-on Mini Lab</i> 538 #1 TWE: PS 549
PO 4. Distinguish between length, area, and volume, using two- and three-dimensional geometric figures.	SE: 270-273, 283 #15, 483-485, 489-492, 498-500, 505, 509 #15, #20, 520-522 <i>Hands-on Lab</i> 488 TWE: B 520 DI 271, 490 T 490

CONTENT STANDARDS	PAGE REFERENCES
PO 5. Draw polygons with appropriate labels.	SE: 448 #2, 430 #2, 481 #2, 491 #2
PO 6. Identify the angles created by two lines and a transversal.	SE: <i>Hands-on Lab</i> 426-427
PO 7. Recognize the relationship between central angles and intercepted arcs.	SE: 277 #24
PO 8. Identify arcs and chords of a circle.	This objective can be met during teacher/class discussion. Also see <i>Mathematics: Applications and Concepts Course 3</i> © 2005.
PO 9. Model the triangle inequality theorem using manipulatives.	This objective can be met during teacher/class discussion. Also see <i>Mathematics: Applications and Concepts Course 3</i> © 2005.
PO 10. Identify corresponding parts of congruent polygons as congruent.	SE: 440 defines corresponding parts TWE: TT 440 directs teachers to explain the relationship between congruent and similar figures.
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: <i>Hands-on Lab</i> 460-461
PO 2. Recognize simple single rotations, translations or reflections on a coordinate grid.	SE: 451-454, 456-459 <i>Hands-on Lab</i> 460-461 <i>Spreadsheet Investigation</i> 455 <i>Standardized Test Practice</i> 467 #17, #18e, 509 #14, 551 #15 TWE: T 452, 457 DI 456
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: 112-115 <i>Extra Practice Lesson</i> 3-3 570 <i>The Game Zone</i> 117 <i>Mixed Problem Solving</i> 598 #4-#8 <i>Standardized Test Practice</i> 146-147 #8, #9, #20, 190 #6
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: <i>Standardized Test Practice</i> 191 #13

CONTENT STANDARDS	PAGE REFERENCES
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)	SE: 520-522, 524-527, 535 #28-#31, 547 #12-#17 <i>Extra Practice Lesson 12-2</i> 593, <i>Lesson 12-3</i> 594 <i>Mixed Problem Solving</i> 607 #3-#5 TWE: A 522 B 520
PO 2. Measure to the appropriate degree of accuracy.	SE: 542-545, 548 #24-#28, 549 #14, #15 <i>Extra Practice Lesson 12-6</i> 595 <i>Mixed Problem Solving</i> 607 #14, #15 TWE T 543
PO 3. Convert a measurement from US customary to metric, and vice versa.	SE: 38-41 Also see the measurement conversions table on the last page of this text.
PO 4. Solve problems involving the circumference of a circle.	SE: 275-277, 280 #66-69, 281 #24, 291 #42, 295 #36 <i>Extra Practice Lesson 6-9</i> 579 <i>Hands-on Lab</i> 274 <i>Mixed Problem Solving</i> 601 #16, #17 <i>Standardized Test Practice</i> 283 #16, 366 #4 TWE: A 276, T 276
PO 5. Solve problems involving the area of a circle.	SE: 493-495, 499-500 #4, #8, #9, 503 #10, #11, #13, #14, #19, 509 #16, #17 <i>Extra Practice Lesson 11-6</i> 591, <i>Lesson 11-7</i> 592 #5-#7, #9 <i>Mixed Problem Solving</i> 606 #8, #11 TWE: A 495 DI 493 T 494, 502
PO 6. Solve problems for the areas of parallelograms, triangles, and circles.	SE: 483-485, 489-491, 493-495, 498-500, 501-503 <i>Extra Practice Lesson 11-7</i> 592 <i>Hands-On Lab</i> 488 <i>Mixed Problem Solving</i> 606 #9, #10 <i>Problem-Solving Strategy</i> 496-497 <i>Standardized Test Practice</i> 509 #15-#18 TWE: B 498 T 484, 499
PO 7. Identify polygons having the same perimeter or area.	SE: 273 #29 <i>Hands-On Mini Lab</i> 483 TWE: A 484 DI 485 PS 281

CONTENT STANDARDS	PAGE REFERENCES
PO 8. Compare estimated to actual lengths based on scale drawings or maps.	SE: 304-308, 327 #32-#35 <i>Extra Practice Lesson 7-4</i> 581 <i>Mixed Problem Solving</i> 602 #7, #8 <i>Standardized Test Practice</i> 330-331 #8, #18b <i>Spreadsheet Investigation</i> 309 TWE: DI 304 T 305-306 A 308
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: 6-9 <i>Problem-Solving Strategy</i> 252-253 TWE: DI 7, 252, 338
PO 2. Analyze algorithms for computing with fractions.	SE: 244-247, 248-251, 254-257, 264-266, 278-280 #7-#37, #45-#53 <i>Extra Practice Lesson 6-2</i> 577, <i>Lesson 6-3</i> 577, <i>Lesson 6-4</i> 578, <i>Lesson 6-6</i> 578 TWE: NS 256
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: <i>Problem-Solving Strategy</i> 444-445 With this reference, students solve problems of varying complexity using logical reasoning. TWE: DI 293, 445

Codes Used for TWE Pages

A	Assess
B	Bellringer
DI	Daily Intervention
NS	Number Sense
PC	Project CRISS
PS	Portfolio Suggestion
T	Teach
TT	Tips for New Teachers
VB	Vocabulary Builder