



**ARIZONA**  
**Mathematics Standard Articulated by Grade Level**  
**Grade 6**  
**Mathematics: Applications and Concepts Course 1 © 2006**

CONTENT STANDARDS	PAGE REFERENCES
<b>Strand 1: Number Sense and Operations</b>	
<b>Concept 1: Number Sense</b> Understand and apply numbers, ways of representing numbers, the relationships among numbers and different number systems.	
PO 1. Express fractions as ratios, comparing two whole numbers. (e.g., $\frac{3}{4}$ is equivalent to 3:4 and 3 to 4)	SE: 380-383 <i>Hands-on Lab</i> 384-385 TWE: DI 381 I-CE 381 A 382
PO 2. Compare two proper fractions, improper fractions or mixed numbers.	SE: 198-201 <i>Study Guide and Review</i> 212 #35-41 TWE: DI 199 I-CE 199
PO 3. Order three or more proper fractions, improper fractions or mixed numbers.	SE: 198-201 <i>Study Guide and Review</i> 212 #39-40 <i>Practice Test</i> 213 #20 TWE: I-CE 199
PO 4. Determine the equivalency between and among fractions, decimals, and percents in contextual situations.	SE: 202, 205, 206-209, 400-403, 404-406 TWE: A 205 B 400 DI 401, 404 I-CE 405
PO 5. Identify the greatest common factor for two whole numbers.	SE: 177-180, 185 # 42-44, 189 #55-58 <i>The Game Zone</i> 191 TWE: DI 178 I-CE 178 TNT 178 A 179
PO 6. Determine the least common multiple for two whole numbers.	SE: 194-197, 198 <i>Study Guide and Review</i> 211 #29-34 TWE: DI 195 I-CE 195 A 197 B 198
PO 7. Express a whole number as a product of its prime factors using exponents when appropriate.	SE: 14-17, 18-21 TWE: DI 15 A 17, 21 I-CE 19

CONTENT STANDARDS	PAGE REFERENCES
<b>Concept 2: Numerical Operations</b> Understand and apply numerical operations and their relationship to one another.	
PO 1. Select the grade level appropriate operation to solve word problems.	SE: 6-9 <i>Problem-Solving Strategy</i> 32-33, 125-126, 280-281, 358-359 <i>Study Skill</i> 38 TWE: A 9, 126 DI 125
PO 2. Solve word problems using grade level appropriate operations and numbers.	SE: <i>Problem-Solving Strategy</i> 125-126, 156-157, 314-315, 358-359 TWE: DI 125 A 157 I-CE 314
PO 3. Apply grade level appropriate properties to assist in computation.	SE: 333-336, 339-342, 344-347 <i>Hands-on Lab</i> 332 TWE: B 333 TNT 334 A 336
PO 4. Apply the symbols for “...” or “—” to represent repeating decimals and “.” to represent ratios, superscripts as exponents.	SE: 18-21, 206-209, 282-284, 380-383 TWE: B 18, 282 DI 207
PO 5. Use grade level appropriate mathematical terminology.	SE: <i>Study Skills</i> 38, 239 TWE: B 18 DI 25, 29, 63 A 209, 239
PO 6. Simplify fractions to lowest terms.	SE: 182-185, 189 #54 <i>Hands-on Lab</i> 181 <i>Mid-Chapter Practice Test</i> 190 #9-11 TWE: I-CE 183 A 185
PO 7. Add or subtract proper fractions and mixed numbers with unlike denominators with regrouping.	SE: 228-231, 235-238, 240-243, 244-247 TWE: A 231, 238 DI 236
PO 8. Demonstrate the process of multiplication of proper fractions using models.	SE: 261-264 <i>Hands-on Lab</i> 259-260 <i>The Game Zone</i> 269 TWE: TT 259 TNT 262 A 264
PO 9. Multiply proper fractions.	SE: 261-264, 267 #34-38 <i>Hands-on Lab</i> 259-260 <i>Mid-Chapter Practice Test</i> 268 #9-13 TWE: I-CE 262 DI 262 A 264
PO 10. Multiply mixed numbers.	SE: 265-267, 275 #48-51, 279 #44-47 <i>Mid-Chapter Practice Test</i> 268 #14-18 TWE: I-CE 266 DI 266 A 267

CONTENT STANDARDS	PAGE REFERENCES
PO 11. Demonstrate that division is the inverse of multiplication of proper fractions.	SE: 272-275 <i>Hands-on Lab</i> 270-271 <i>Study Guide and Review</i> 286 #26-29 TWE: I-CE 273 A 275
PO 12. Divide proper fractions.	SE: 272-275 <i>Hands-on Lab</i> 270-271 <i>Study Guide and Review</i> 286 #26-29 TWE: I-CE 273 DI 273 A 275
PO 13. Divide mixed numbers.	SE: 276-279, 284 #22 <i>Study Guide and Review</i> 286 #30-32 TWE: B 276 I-CE 277 DI 277
PO 14. Solve problems involving fractions or decimals (including money) in contextual situations.	SE: 111-113, 138 #49-50 <i>Mid-Chapter Practice Test</i> 114 #15 <i>Practice Test</i> 129 #25
PO 15. Simplify numerical expressions using the order of operations with grade appropriate operations on number sets.	SE: 24-27, 28-31 <i>Extra Practice</i> 595 TWE: B 24 I-CE 25
<b>Concept 3: Estimation</b> Use estimation strategies reasonably and fluently.	
PO 1. Solve grade level appropriate problems using estimation.	SE: 116-119, 256-257 <i>Prerequisite Skills</i> 592-593 <i>Extra Practice</i> 600 TWE: DI 116 I-CE 117 A 119
PO 2. Use estimation to verify the reasonableness of a calculation. (e.g., Is $5/9 \times 3/7$ more than 1?)	SE: 116-119, 223-225 <i>Problem-Solving Strategy</i> 156-157 TWE: A 157, 225
PO 3. Round to estimate quantities in contextual situations. (e.g., round up or round down)	SE: 111-113, 116-119, 256-257 TWE: DI 25 A 112 B 223
PO 4. Estimate and measure for the area and perimeter of polygons using a grid.	SE: 39-41, 158-160, 546-549, 551-554 <i>Hands-On Lab</i> 464, 550 <i>Spreadsheet Investigation</i> 469 <i>Problem-Solving Strategy</i> 488-489 #4 TWE: B 158
PO 5. Verify the reasonableness of estimates made from calculator results within a contextual situation.	SE: 223-225, 256-258 <i>Problem-Solving Strategy</i> 156-157 TWE: DI 256

CONTENT STANDARDS	PAGE REFERENCES
<b>Strand 2: Data Analysis, Probability, and Discrete Mathematics</b>	
<b>Concept 1: Data Analysis (Statistics)</b> 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>Spreadsheet Investigation</i> 60-61 TWE: B 50 DI 51, 73
PO 2. Construct a histogram, line graph, scatter plot, or stem-and-leaf plot with appropriate labels and title from organized data.	SE: 56-59, 72-75, 222 #39-40 TWE: A 59, 75 B 72 DI 73
PO 3. Interpret simple displays of data including double bar graphs, tally charts, frequency tables, circle graphs, and line graphs.	SE: 50-53, 56-59, 62-65 <i>Spreadsheet Investigation</i> 60-61 TWE: A 53 DI 54, 63
PO 4. Answer questions based on simple displays of data including double bar graphs, tally charts, frequency tables, circle graphs, and line graphs.	SE: 50-53, 56-59, 62-65, 66-69 <i>Mid-Chapter Practice Test</i> 70 TWE: I-CE 55 A 55 B 56
PO 5. Find the mean, median (odd number of data points), mode, range, and extreme values of a given numerical data set.	SE: 76-78, 80-83 <i>Spreadsheet Investigation</i> 79 TWE: B 80 I-CE 81 A 83
PO 6. Identify a trend (variable increasing, decreasing, remaining constant) from displayed data.	SE: 66-69 <i>Mid-Chapter Practice Test</i> 70 #8-9 TWE: B 66 I-CE 67 DI 68 A 69
PO 7. Compare trends in data related to the same investigation.	SE: 56-59, 86-89 <i>Spreadsheet Investigation</i> 60-61 TWE: DI 57 A 59
PO 8. Solve contextual problems using bar graphs, tally charts, and frequency tables.	SE: 50-53, 56-59 <i>Problem-Solving Strategy</i> 54-55 TWE: DI 54 B 56 A 59
<b>Concept 2: Probability</b> Understand and apply the basic concepts of probability.	
PO 1. Name the possible outcomes for a probability experiment.	SE: 428-431, 433-436, 450-453 <i>Hands-on Lab</i> 426-427, 432 TWE: DI 429 I-CE 429 A 430

CONTENT STANDARDS	PAGE REFERENCES
PO2. Express probabilities of a single event as a decimal.	SE: 428-431, 433-436 <i>Mid-Chapter Practice Test 442 #3-6</i> TWE: I-CE 429
PO 3. Predict the outcome of a grade level appropriate probability experiment.	SE: 428-431, 433-436, 438-441, 444-447, 450-453 TWE: DI 438 B 438 TNT 439 A 441
PO 4. Record the data from performing a grade level appropriate probability experiment.	SE: 433-436 <i>Hands-on Lab 432</i> <i>Problem-Solving Strategy 448-449</i> <i>Study Guide and Review 455 #16-18</i> <i>Standardized Test Practice 458 #9-10</i>
PO 5. Compare the outcome of an experiment to predictions made prior to performing the experiment.	SE: 438-441 <i>Study Guide and Review 455 #22-24</i> TWE: DI 438 TNT 439 A 441
PO 6. Make predictions from the results of student-generated experiments using objects (e.g., coins, spinners, number cubes, and cards).	SE: 428-431, 433-436, 438-441, 444-447, 450-453 <i>Hands-on Lab 432</i> <i>The Game Zone 443</i> TWE: DI 438 A 453
PO 7. Compare the results of two repetitions of the same grade level appropriate probability experiment.	SE: 428-431, 433-436, 444-447 <i>Hands-on Lab 426-427, 432</i> TWE: DI 429 B 433 A 447
<b>Concept 3: Discrete Mathematics – Systematic Listing and Counting</b> Understand and demonstrate the systematic listing and counting of possible outcomes.	
PO 1. Determine all possible outcomes involving a combination of 3 sets of 3 items, using a systematic approach. (e.g., 3 different shirts, 3 different pairs of pants, and 3 different belts)	SE: 433-436 <i>Mid-Chapter Practice Test 442 #7-9</i> TWE: TNT 434 I-CE 434 A 436
PO 2. Determine all possible arrangements given a set with four or fewer objects using a systematic list, table or tree diagram when order is not important.	SE: 433-436 <i>Hands-on Lab 432</i> <i>Study Guide and Review 455 #16-18</i> TWE: DI 433 B 433 I-CE 434
<b>Concept 4: Vertex-Edge Graphs</b> Understand and apply vertex-edge graphs.	
PO 1. Find the shortest route on a map from one site to another (vertex-edge graph).	SE: 479 #28

CONTENT STANDARDS	PAGE REFERENCES
<b>Strand 3: Patterns, Algebra, and Functions</b>	
<b>Concept 1: Patterns</b> Identify patterns and apply pattern recognition to reason mathematically.	
PO 1. Communicate a grade level appropriate recursive pattern, using symbols or numbers.	SE: 282-284 <i>Problem-Solving Strategy</i> 280-281 TWE: DI 282 I-CE 283 A 284
PO 2. Extend a grade level appropriate iterative pattern.	SE: 10-13, 27 #47, 282-284 <i>Standardized Test Practice</i> 46 #2 TWE: DI 282
PO 3. Solve grade level appropriate iterative pattern problems.	SE: 10-13, 282-284 <i>Problem-Solving Strategy</i> 280-281 <i>Extra Practice</i> 594 #4-6 TWE: B 10 A 281
<b>Concept 2: Functions and Relationships</b> 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: 362-365, 366-369 TWE: B 362 I-CE 363 DI 363 A 365
<b>Concept 3: Algebraic Representations</b> Represent and analyze mathematical situations and structures using algebraic representations.	
PO 1. Evaluate expressions involving the four basic operations by substituting given fractions for the variable. (e.g., $n+3$ , when $n= \frac{1}{2}$ )	SE: 236 ex 4, 237 #9, #30, #31, 241 ex 4, 242 #10, 243 #30-33, 247 #32-35, 262 ex 4, 263 #29-32, 276 ex 2, 278 #28-33
PO 2. Use variables in contextual situations.	SE: 28-31 <i>Problem-Solving Strategy</i> 358-359 TWE: B 28, 358 DI 359
PO 3. Translate a written phrase to an algebraic expression. (e.g., The quotient of $m$ and 5 is $\frac{m}{5}$ or $m \div 5$ .)	SE: <i>Problem-Solving Strategy</i> 358-359 TWE: DI 29
PO 4. Translate a phrase written in context into an algebraic expression. (e.g., Write an expression to describe the situation: John has $x$ pieces of candy and buys three more. $x + 3$ )	SE: 28-31 <i>Problem-Solving Strategy</i> 358-359 TWE: DI 29
PO 5. Solve one-step equations with one variable represented by a letter or symbol, using inverse operations with whole numbers.	SE: 339-342, 344-347, 350-353, 355-357 <i>Hands-on Lab</i> 354 TWE: A 347, 353
<b>Concept 4: Analysis of Change</b> Analyze change in a variable over time and in various contexts.	
PO 1. Identify values on a given line graph or scatter plot. (e.g., Given a line showing wages earned per hour, what is the wage at five hours?)	SE: 56-59, 75 #30-32, 366-369 TWE: A 59

CONTENT STANDARDS	PAGE REFERENCES
<b>Strand 4: Geometry and Measurement</b>	
<b>Concept 1: Geometric Properties</b> Analyze the attributes and properties of two- and three-dimensional shapes and develop mathematical arguments about their relationships.	
PO 1. Classify polygons by their attributes. (e.g., number of sides, length of sides, angles, parallelism, perpendicularity)	SE: 522-525, 564-566 <i>Hands-on Lab</i> 526-527, 555, 567 TWE: B 522 I-CE 523 DI 564 A 565
PO 2. Draw a geometric figure showing specified properties, such as parallelism and perpendicularity.	SE: 513-514, 515-517, 546-549 TWE: I-CE 516 A 517
PO 3. Classify prisms, pyramids, cones, and cylinders by base shape and lateral surface shape.	SE: 564-566 <i>Hands-on Lab</i> 567, 574 TWE: B 564 DI 564 I-CE 565
PO 4. Classify three-dimensional figures by their attributes.	SE: 564-566 <i>Hands-on Lab</i> 574 #4 <i>Practice Test</i> 581 #8-10 TWE: B 564 I-CE 565
PO 5. Compare attributes of two-dimensional figures with three-dimensional figures.	SE: 564-566 <i>Hands-on Lab</i> 574 #4 <i>Practice Test</i> 581 #8-10 TWE: B 564 I-CE 565
PO 6. Draw triangles with appropriate labels.	SE: 522-525 <i>Hands-on Lab</i> 526-527 TWE: A 527
PO 7. Identify supplementary or complementary angles.	SE: 506-509 <i>Mid-Chapter Practice Test</i> 518 #5
PO 8. Identify the diameter, radius, and circumference of a circle or sphere.	SE: 161-164 <i>Study Guide and Review</i> 168 #48-53 TWE: B 161 DI 162 A 164
PO 9. Draw a two-dimensional shape with a given number of lines of symmetry.	SE: 528-531 TWE: B 528 DI 529 I-CE 529 A 531
<b>Concept 2: Transformation of Shapes</b> Apply spatial reasoning to create transformations and use symmetry to analyze mathematical situations.	
PO 1. Identify reflections and translations using pictures.	SE: <i>Hands-on Lab</i> 532-533 TWE: A 533
PO 2. Perform elementary transformations to create a tessellation.	SE: <i>Hands-on Lab</i> 537

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<b>Concept 3: Coordinate Geometry</b>	
Specify and describe spatial relationships using coordinate geometry and other representational systems.	
PO 1. Graph a polygon in the first quadrant using ordered pairs.	Polygons on a coordinate plane are inferred on the following pages: SE: 532-533 <i>Hands-on Lab</i> 532-533.
PO 2. State the missing coordinate of a given figure in the first 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.)	This objective is implied on the following pages: SE: 532-533
<b>Concept 4: Measurement - Units of Measure - Geometric Objects</b>	
Understand and apply appropriate units of measure, measurement techniques, and formulas to determine measurements.	
PO 1. Determine the appropriate measure of accuracy within a system for a given contextual situation. (e.g., Would you measure the length of your bedroom wall using inches or feet?)	SE: 465-468, 470-473, 476-479 <i>Hands-on Lab</i> 474-475, 480-481 TWE: B 465, 470 TNT 471 DI 477
PO 2. Determine the appropriate tool needed to measure to the needed accuracy.	SE: 470-473 <i>Hands-on Lab</i> 480-481 <i>Problem-Solving Strategy</i> 488-489
PO 3. Determine a linear measurement to the appropriate degree of accuracy.	SE: 465-468, 476-479 <i>Hands-on Lab</i> 474-475, 480-481 TWE: DI 477
PO 4. Measure angles using a protractor.	SE: 506-509, 510-512 TWE: I-CE 507 A 509, 512
PO 5. Convert within a single measurement system (US customary or metric). (e.g., How many ounces are equivalent to 2 pounds?)	SE: 465-468, 470-473, 490-493 TWE: A 479, 493 B 490 DI 491
PO 6. Solve problems involving the perimeter of polygons.	SE: 158-160, 479 #30 <i>Hands-on Lab</i> 464 <i>Spreadsheet Project</i> 469 TWE: A 160, 464, 469
PO 7. Determine the area of triangles.	SE: 551-554 <i>Hands-on Lab</i> 550 <i>Mid-Chapter Practice Test</i> 562 #4-5 TWE: B 551 I-CE 552 A 554
PO 8. Distinguish between the perimeter and area in contextual situation.	SE: <i>Hands-on Lab</i> 464 <i>Spreadsheet Investigation</i> 469 TWE: A 464, 469
PO 9. Solve problems for the areas of parallelograms (includes rectangles).	SE: 39-41, 546-549 TWE: DI 40 B 546 I-CE 547 A 549

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PO 10. Identify parallelograms having the same perimeter or area.	SE: 546-549 <i>Spreadsheet Investigation</i> 469
PO 11. Determine the actual measure of objects using a scale drawing or map.	SE: 391-393, 479 #28 <i>Hands-on Lab</i> 394 TWE: I-CE 392 A 393
<b>Strand 5: Structure and Logic</b>	
<b>Concept 1: Algorithms and Algorithmic Thinking</b> 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>Study Skill</i> 38 TWE: TT 6
PO 2. Analyze algorithms for computing with decimals.	SE: 121-124, 135-138, 141-143, 144-147 <i>Hands-on Lab</i> 134, 139 TWE: B 144
<b>Concept 2: Logic, Reasoning, Arguments, and Mathematical Proof</b> Evaluate situations, select problem-solving strategies, draw logical conclusions, develop and describe solutions and recognize their applications.	
PO 1. Solve a simple logic problem from given information. (Which of three different people live in which of three different colored houses?)	SE: <i>Problem-Solving Strategy</i> 32-33, 125-126 TWE: DI 32, 125, 276, 523 A 436

### Codes Used for TWE Pages

A	Assessment
B	Bellringer
DI	Daily Intervention
I-CE	In Class Examples
TNT	Tips for New Teachers
TT	Teaching Tips