



**NEW HAMPSHIRE
Mathematics Curriculum Framework
End of Grade 6**

***Mathematics: Applications and Concepts Course 1* © 2004**

OBJECTIVES	PAGE REFERENCES
Problem Solving and Reasoning	
<p>1a. K-12 Broad Goal: Students will use problem-solving strategies to investigate and understand increasingly complex mathematical content.</p> <p>PURPOSE: Problem solving should serve as the organizing feature of the mathematics curriculum as well as other areas of study and be applied to everyday activities. Problem-solving must not be seen as a separate topic, but rather the centerpiece of the mathematics curriculum. Students should have many experiences in posing and solving problems from their world, from data that are meaningful to them, and from mathematical investigations.</p>	
<ul style="list-style-type: none"> Solve problems that require the use of strategies (for example: working backwards; looking for patterns and relationships; guess and check; making tables, charts, and graphs; solving a simpler version of a problem; looking for similar problems; drawing a diagram; or creating a model). 	<p>SE: 6-10, 47 #25, 215 #19, 503 #21 <i>Problem-Solving Strategy</i> 32-33, 54-55, 314-315, 448-449 <i>Web Quest</i> 3, 97, 377</p> <p>TWE: A 231 B 28, 276, 316 PC 216F, 378F PS 93</p>
<ul style="list-style-type: none"> Formulate, solve, and verify problems from every-day and mathematical situations and interpret the results. 	<p>SE: 50-53, 204 #29, 209 #42, 275 #43 <i>Problem-Solving Strategy</i> 32-33, 192-193 <i>Web Quest</i> 3, 97, 291, 377</p> <p>TWE: A 53, 315 B 192 TNT 523</p>
<ul style="list-style-type: none"> Solve multi-step problems, solve problems with multiple solutions, recognize when a problem has no solution, and recognize problems where more information is needed. 	<p>SE: 6-10, 119 #36, 124 #38-#39, 225 #22, 355-357, 487 #28 <i>Problem-Solving Strategy</i> 3, 97, 291, 377</p> <p>TWE: A 359 B 28, 54</p>
<ul style="list-style-type: none"> Solve problems using manipulatives, graphs, charts, diagrams, and calculators. 	<p>SE: 56-59 <i>Graphing Calculator Investigation</i> 84-85 <i>Hands-On Lab</i> 218 <i>Hands-On Mini Lab</i> 14, 62 <i>Problem-Solving Strategy</i> 54-55, 192-193 <i>Spreadsheet Investigation</i> 60-61 <i>Study Skill</i> 38 <i>Web Quest</i> 97, 291</p> <p>TWE: A 231 B 276 DI 11, 19 TNT 220</p>

OBJECTIVES	PAGE REFERENCES
<p>1b. K-12 Broad Goal: Students will use mathematical reasoning. PURPOSE: Students need to recognize that memorized facts, rules, and procedures are only a part of mathematics. They need opportunities to use these facts, rules, and procedures to make conjectures, develop and refine their reasoning abilities, gather evidence, and produce valid rules and generalizations. Students need to be able to justify their thinking through examples and explanations and appreciate that how a problem is solved is as important as the answer.</p>	
<ul style="list-style-type: none"> Continue a pattern involving integers and positive rational numbers. 	SE: 8 (e.g. #2), 10-13, 47 #25, 171 #9 <i>Problem-Solving Strategy</i> 32-33, 156-157, 280-281 TWE: B 66 DI 32, 241 PS 45
<ul style="list-style-type: none"> Solve problems involving two- and three-dimensional geometric shapes and explain one's reasoning. 	SE: 522-525, 544, 564-566, 573 #19 <i>Hands-On Lab</i> 526-527, 537, 567, 574 <i>Problem-Solving Strategy</i> 568-569 TWE: PC 544F
<ul style="list-style-type: none"> Use elementary deductive reasoning to solve word problems. 	SE: <i>Hands-On Mini Lab</i> 219 <i>Problem-Solving Strategy</i> 32-33, 413-414 <i>Study Skill</i> 38 TWE: A 38, 315 B 186 DI 32, 54, 68, 153, 323
<ul style="list-style-type: none"> Use models, known facts, properties, and relationships to explain thinking and to justify answers and solution processes. 	SE: 16 #47, 47 #25, 81 (e.g. #3), 180 #31, 400, 524 #18-#19 <i>Hands-On Mini Lab</i> 450 <i>Problem-Solving Strategy</i> 32-33, 280-281, 568-569 <i>Study Skill</i> 176 TWE: B 28, 66, 102, 194 DI 25 PC 292F
Communication and Connections	
<p>2a. K-12 Broad Goal: Students will communicate their understanding of mathematics. PURPOSE: Reading, writing, talking, listening, and modeling provide students with the opportunity to integrate the language of mathematics into their world, and help them to develop understanding. Actively exploring, investigating, describing, and explaining mathematical ideas promote communication which leads to a greater comprehension of mathematical concepts.</p>	
<ul style="list-style-type: none"> Demonstrate an understanding of mathematical concepts and relationships through a variety of methods (for example: writing, graphing, charts, diagrams, number sentences, or symbols). 	SE: 28-31, 50-53, 95 #14-#15, 185 #33-#35, 194 (WHEN), 298 (Extending the Lesson), 412 (Extending the Lesson) <i>Problem-Solving Strategy</i> 54-55, 358-359, 520-521 <i>Study Skill</i> 120 <i>Web Quest</i> 3, 173, 377, 461 TWE: A 41, 53, 110 B 6, 18, 228 DI 25, 63

OBJECTIVES	PAGE REFERENCES
<ul style="list-style-type: none"> Explain, analyze, and evaluate mathematical arguments and conclusions presented by others. 	SE: 12 #30, 31 #52, 37 (Extending the Lesson), 180 #34, 185 #33-#35 <i>Problem-Solving Strategy</i> 413-414 TWE: B 6 BBS 132C FSO 133
<ul style="list-style-type: none"> Explain conclusions, thought processes, and strategies in problem-solving situations. 	SE: 12 #30, 37 (Extending the Lesson), 95 #14, 131 #17, 197 #30 <i>Hands-On Lab</i> 139-140 <i>Problem-Solving Strategy</i> 32-33, 54-55, 192-193, 280-281, 413-414 <i>Web Quest</i> 3, 97, 377 TWE: A 315 B 54
<ul style="list-style-type: none"> Make conjectures and defend generalizations. 	SE: 111 (WHEN), 205 #34 <i>Graphing Calculator Investigation</i> 84-85 <i>Hands-On Lab</i> 100-101, 134, 139-140, 150-151, 218, 299 TWE: A 315
<ul style="list-style-type: none"> Evaluate the validity of a mathematical statement. 	SE: 37 (Extending the Lesson), 180 #34, 197 #30 <i>Problem-Solving Strategy</i> 32-33 <i>Study Skill</i> 120 TWE: A 315 B 28, 186
<p>2b. K-12 Broad Goal: Students will recognize, develop, and explore mathematical connections. PURPOSE: Mathematical topics, ideas, and procedures must be connected to each other and to the students' everyday experiences, both in and out of school. In particular, mathematics must be connected to all other curriculum areas. Mathematical connections will help students become aware of the usefulness of mathematics, serve to bridge the concrete and the abstract, and enable deeper understanding of important ideas.</p>	
<ul style="list-style-type: none"> Identify the relationships among the four basic operations on rational numbers. 	SE: 24-27, 124 #33-#35, 143 #29-#30, 252 #2, 304-305, 333-335 <i>Hands-On Lab</i> 234 <i>Study Skill</i> 239 TWE: A 239 FSO 293 PC 254F, 330F TNT 262, 277
<ul style="list-style-type: none"> Identify the relationship among the basic operations as applied to whole numbers and to positive rational numbers. 	SE: 24-27, 124 #33-#35, 131 #17, 252 #2, 304 (KEY), 310 (KEY), 333-335 <i>Hands-On Lab</i> 270-271 TWE: A 185 DI 122, 229, 266 PC 292F, 330F TNT 262, 277

OBJECTIVES	PAGE REFERENCES
<ul style="list-style-type: none"> Use mathematical skills, concepts, and applications in other disciplines (for example: graphs in social studies, patterns in art, or music and geometry in technology education). 	SE: 31 #49-#51, 39-41, 136 (e.g. #5) <i>Problem-Solving Strategy</i> 32-33, 54-55, 125-126, 280-281 <i>Real-Life Math</i> 19, 142, 266 <i>Spreadsheet Investigation</i> 79 <i>Web Quest</i> 97 TWE: A 59, 155 DI 63, 183, 192, 273 MIC 97, 173 TT 174D UM 48G
Numbers, Numeration, Operations, and Number Theory	
3a. K-12 Broad Goal: Students will develop number sense and an understanding of our numeration system. PURPOSE: Students must understand numbers if they are to make sense of the ways numbers are used in their everyday world. Numbers are used to describe and interpret real-world phenomena. Students need to use numbers to quantify, to identify location, to identify a specific object in a collection, to name, to measure, and to model real-world situations. They need to understand relative magnitude in order to make sense of everyday situations.	
<ul style="list-style-type: none"> Name and identify a fraction or decimal, given a physical representation. 	SE: 102-105, 202-205, 206-209 <i>Hands-On Lab</i> 100-101 TWE: A 105 TNT 203
<ul style="list-style-type: none"> Given a decimal representation in tenths or hundredths, write an equivalent fraction. 	SE: 202-205, 209 #46-#47, 212 #42-#50 TWE: B 202 PC 174F PS 213
<ul style="list-style-type: none"> Given an integer or a positive rational number, represent the number with the use of physical models or diagrams. 	SE: 102-105, 186-187, 215 #8, 294-298 <i>Hands-On Lab</i> 100-101, 134, 181 <i>Problem-Solving Strategy</i> 520-521 <i>Study Skill</i> 176 TWE: DI 103
<ul style="list-style-type: none"> Explain the use of numbers in various everyday contexts (for example: calendars, clocks, signs, or literature). 	SE: 31 #49-#51, 216, 230 #28, 296 #18, 494-497 <i>Hands-On Lab</i> 480-481 <i>Web Quest</i> 3, 97, 173, 461 TWE: A 138 DI 29, 145 MIC 3, 97, 173 TNT 203
<ul style="list-style-type: none"> Given a set of fractional models, name and write those that represent equivalent fractions. 	SE: 182-185, 198, 200 #3 <i>Hands-On Lab</i> 181 TWE: A 185
<ul style="list-style-type: none"> Given a pair of fractions, determine which is larger by using physical models or illustrations. 	SE: 182-185, 198, 200 #3 <i>Hands-On Lab</i> 181 TWE: A 185 DI 183

OBJECTIVES	PAGE REFERENCES
<ul style="list-style-type: none"> Develop and use order relations for integers and positive rational numbers. 	SE: 24-27, 46 #8-#9, 108-110, 170 #3, 198-201, 294-298, 328 #7 TWE: A 110 DI 108 ICE 199
<ul style="list-style-type: none"> Apply number theory to the factoring of whole numbers and the equivalency of positive rational numbers. 	SE: 10-13, 14-17, 18-21, 33 #5, 46, 177-180, 194-197, 209 #43 TWE: A 17 DI 15, 195 PC 4F
3b. K-12 Broad Goal: Students will understand the concepts of number operations. PURPOSE: Students need to build an awareness of the properties of an operation, see relationships among operations, and acquire insight into the effects of operations on real numbers. Students need to recognize conditions in real-world situations where the use of these operations is indicated and useful.	
<ul style="list-style-type: none"> Apply the associative, commutative, and distributive properties in a problem-solving situation. 	SE: 333-336, 342 #37-#39 <i>Hands-On Lab</i> 270-271 TWE: TNT 334
<ul style="list-style-type: none"> Apply the multiplicative and additive properties of zero and the multiplicative property of one. 	SE: 333-336 <i>Prerequisite Skills</i> 589, 591 TWE: A 337 PC 330F TNT 334
<ul style="list-style-type: none"> Demonstrate an understanding of multiplication as repeated addition and of division as repeated subtraction. 	SE: <i>Hands-On Lab</i> 134 could be used to show multiplication as repeated addition. <i>Hands-On Mini Lab</i> 144 could be an explanation for division as repeated subtraction.
<ul style="list-style-type: none"> Demonstrate an understanding that the product of two whole numbers greater than 1 is greater than either of the factors. 	SE: 146 #3, 155 #41 <i>Hands-On Lab</i> 134 #1, 140 #5 <i>Prerequisite Skills</i> 590
<ul style="list-style-type: none"> Demonstrate an understanding that when dividing two whole numbers that are greater than one, the quotient will be smaller than the dividend. 	SE: 146 #3 <i>Hands-On Lab</i> 271 #1-#4 <i>Prerequisite Skills</i> 591
3c. K-12 Broad Goal: Students will compute. PURPOSE: The purpose of computation is to solve problems. While computation remains important in mathematics and in everyday life, advances of technology require us to rethink how computation is done today. Students must recognize that estimation, mental computation, use of calculators, and paper and pencil calculation are all appropriate ways to compute solutions to problems. Basic fact memorization should be incorporated into a rich curriculum rather than be its primary focus.	
<ul style="list-style-type: none"> Demonstrate mastery of the multiplication facts with factors less than or equal to 10. 	SE: 185 (Extending the Lesson), 194 (WHEN) TWE: DI 195
<ul style="list-style-type: none"> Select an appropriate computational technique in the solution of problems and check the reasonableness of results through mental computation and estimation strategies. 	SE: 7 (e.g. #1), 8 (e.g. #2), 116-119, 136, 206, 207, 256-258 <i>Prerequisite Skills</i> 592, 593 <i>Problem-Solving Strategy</i> 125-126, 156-157 <i>Study Skill</i> 38 <i>Study Tip</i> 262 TWE: A 38, 119

OBJECTIVES	PAGE REFERENCES
<ul style="list-style-type: none"> Use calculators in appropriate problem-solving situations. 	SE: 206, 207 <i>Graphing Calculator Investigation</i> 85 <i>Hands-On Lab</i> 134, 139 <i>Web Quest</i> 3, 97
<ul style="list-style-type: none"> Add integers using models or representations. 	SE: 300-303, 307 #40-#42, 313 #48-#51, 325 <i>The Game Zone</i> 309 <i>Hands-On Lab</i> 299 TWE: A 302 DI 301
<ul style="list-style-type: none"> Multiply three digit whole numbers by two digit whole numbers. 	SE: <i>Prerequisite Skills</i> 591 <i>Web Quest</i> 3, 97
<ul style="list-style-type: none"> Divide three digit whole numbers by two digit whole numbers. 	SE: <i>Prerequisite Skills</i> 591 <i>Web Quest</i> 3, 97
<ul style="list-style-type: none"> Multiply and divide two and three digit decimals. 	SE: 141-143, 152-155 <i>Hands-On Lab</i> 134, 139-140, 150-151 TWE: ICE 142, 153
<ul style="list-style-type: none"> Using physical models and illustrations, determine the sum or difference of fractions with like and unlike denominators (using only halves, fourths, and eighths). 	SE: 228-231, 235-238 <i>Hands-On Lab</i> 234 TWE: A 238 PC 174F, 216F
<ul style="list-style-type: none"> Using physical models, illustrations, and calculators, determine the sum or difference of decimals. 	SE: 131 #17 <i>Hands-On Lab</i> 101 TWE: B 121 PC 98F
<p>3d. K-12 Broad Goal: Students will use mental computation and estimation skills and strategies and know when it is appropriate to do so.</p> <p>PURPOSE: Students should know what is meant by estimation and mental computation, when they are appropriate, and how close an estimate is required in a given situation. Students should be encouraged to estimate the solution of problems before computation or measurement is done, and to use estimation to determine the reasonableness of answers, and to recognize when an estimate is sufficient as an answer.</p>	
<ul style="list-style-type: none"> Use estimation and mental computation to determine the reasonableness of answers obtained from the four basic operations on rational numbers. 	SE: 116-119, 223-225, 256-258, 335, 415-417 <i>Problem-Solving Strategy</i> 125-126 <i>Study Skill</i> 38 <i>Study Tip</i> 262, 276, 404 TWE: A 119, 258
<ul style="list-style-type: none"> Select and use appropriate mental computation and estimation strategies in problem situations when exact answers are not needed. 	SE: 7, 116-119, 223-225, 256-258, 415-417 <i>Prerequisite Skills</i> 592, 593 <i>Problem-Solving Strategy</i> 125-126 <i>Study Tip</i> 116, 276, 404, 410 TWE: A 119, 222

OBJECTIVES	PAGE REFERENCES
Geometry, Measurement, and Trigonometry	
<p>4a. K-12 Broad Goal: Students will name, describe, model, classify, and compare geometric shapes and their properties with an emphasis on their wide applicability in human activity. PURPOSE: Geometry helps students represent and describe the world in which they live. Students need to investigate, experiment, and explore geometric properties using both technology and hands-on materials.</p>	
<ul style="list-style-type: none"> Identify, describe, and name properties of triangles, quadrilaterals, and other polygons. 	SE: 504, 522-525, 534-536 <i>Hands-On Lab 526-527</i> TWE: DI 535 ICE 523 PC 504F
<ul style="list-style-type: none"> Identify point and line symmetry in given polygons. 	SE: 528-531, 543 #18, 549 #30-#32 TWE: DI 529
<ul style="list-style-type: none"> Measure and classify angles. 	SE: 506-509 TWE: DI 507, 523
<ul style="list-style-type: none"> Identify and draw congruent and similar figures using graph paper. 	SE: Note: <i>Hands-On Lab 526-527</i> could be used for this objective. Use dot paper rather than graph. TWE: T 526
<p>4b. K-12 Broad Goal: Students will develop spatial sense. PURPOSE: We live in a three dimensional world. To interpret, understand, and appreciate that world, students need to develop an understanding of space. Research suggests that there is a high correlation between spatial abilities and success in mathematics. Spatial skills include making and interpreting drawings, forming mental images, visualizing changes, and generalizing about perceptions in the environment.</p>	
<ul style="list-style-type: none"> Tessellate (tile) a plane with a given figure and create a figure that will tile the plane. 	SE: <i>Hands-On Lab 537</i>
<ul style="list-style-type: none"> Describe the shadow of certain figures. 	TWE: DI 564 Note: This example is to include drawings, characteristics and uses of the objects. So the objective could be completed from this example.
<p>4c. K-12 Broad Goal: Students will develop an understanding of measurement and systems of measurement through experiences which enable them to use a variety of techniques, tools, and units of measurement to describe and analyze quantifiable phenomena. PURPOSE: Measurement is used in many ways throughout our lives. Students must be introduced to the standard units of measure used in both the metric and English systems. Students should estimate and measure length, area, capacity, volume, weight, time and temperature, as well as discover practical uses of these skills. High school students must develop more mature insights into the essential role of measurement as a link between the abstractions of mathematics and the concreteness of the real world. By using various techniques and tools, we describe and analyze quantifiable phenomena to understand and organize our world.</p>	
<ul style="list-style-type: none"> Find and/or estimate the perimeter and area of a given quadrilateral or triangle. 	SE: 39-41, 158-160, 171 #16, 225 #20, 287 #13-#14, 423 #10, 554 #20-#21 <i>Hands-On Lab 464, 469</i>
<ul style="list-style-type: none"> Demonstrate an understanding of the use of maps, scale drawings, and timelines. 	SE: 131 #15, 264 #35, 278 #34, 296 #18, 391-393, 479 #28, 554 #18-#19 <i>Hands-On Lab 394</i> <i>Web Quest 3, 291, 461</i>

OBJECTIVES	PAGE REFERENCES
<ul style="list-style-type: none"> Compare the relationship between similar figures and their areas. 	SE: 215 #9, 414 #12
<p>4d. K-12 Broad Goal: Students will know the basic concepts of trigonometry and apply these concepts to real-world problems. PURPOSE: All students should explore real-world phenomena which involve right triangle trigonometry. These experiences should include the use of the sine, cosine, and tangent ratios. Technology should be used to facilitate the learning of trigonometry, allowing students more time and power to explore realistic applications.</p>	
<ul style="list-style-type: none"> Make scale drawings, keeping sides in proportion. (Scale factor to be kept to a small whole number or fraction with denominator less than 6.) 	SE: 391-394 <i>Hands-On Lab</i> 394
Data Analysis, Statistics, and Probability	
<p>5a. K-12 Broad Goal: Students will use data analysis, statistics and probability to analyze given situations and the outcomes of experiments. PURPOSE: Collecting, organizing, displaying, and interpreting data, as well as using the information to make decisions and predictions, have become very important in our society. Statistical instruction should be carried out in a spirit of investigation and exploration so students can answer questions about data. Probability must be studied in familiar contexts encouraging students to model situations. Students need to investigate fairness, chances of winning, and uncertainty. Technology should be used as a tool throughout the investigation process.</p>	
<ul style="list-style-type: none"> Construct and interpret line plots, stem and leaf plots, frequency distributions, and graphs. 	SE: 50-53, 72-75, 93 #7, 94 #3, 95 #11 <i>Problem-Solving Strategy</i> 54-55 <i>Web Quest</i> 3, 97, 291 TWE: A 53, 83 PC 48F
<ul style="list-style-type: none"> Use multiple representations to display equivalent data. 	SE: 75 #27, 88 #2 <i>Web Quest</i> 3, 97, 291
<ul style="list-style-type: none"> Select appropriate data to solve simulations and real-world problems. 	SE: <i>Problem-Solving Strategy</i> 226-227, 426-427 <i>Web Quest</i> 3, 97, 291 TWE: A 227
<ul style="list-style-type: none"> Simulate, display, graph and analyze data in a variety of mediums. 	SE: 48, 56-59, 86-89 <i>Problem-Solving Strategy</i> 226-227, 426-427
<ul style="list-style-type: none"> Determine and explore various uses of mean, median, and mode. 	SE: 76-78, 80-83, 87 (e.g. #3), 88 #8-#10, 89 #15-#18, 95 #12 TWE: ICE 77
<ul style="list-style-type: none"> Use sampling techniques to make predictions. 	SE: 424, 438-441, 442 #10, 455 #22-#24, 457 #16 TWE: A 441 DI 438 ICE 439
<ul style="list-style-type: none"> Given a sample space, find probabilities of events. 	SE: 424, 433-436, 442 #9, 455 #16-#21 TWE: A 436 DI 433 PS 457

OBJECTIVES	PAGE REFERENCES
Functions, Relations and Algebra	
<p>6a. K-12 Broad Goal: Students will recognize patterns and describe and represent relations and functions with tables, graphs, equations and rules, and analyze how a change in one element results in a change in another.</p> <p>PURPOSE: One of the central themes of mathematics is the study of patterns, relations, and functions. This study requires students to recognize, describe, and generalize patterns and build mathematical models to predict the behavior of real-world phenomena that exhibit the observed pattern. This study of patterns leads to an exploration of functions, a concept which is an important unifying idea in all aspects of mathematics.</p>	
<ul style="list-style-type: none"> Generalize simple patterns using words. 	SE: 8 #3, 12 #29, 21 #42-#47, 47 #25, 66-69 <i>Problem-Solving Strategy</i> 32-33, 280-281 <i>Spreadsheet Investigation</i> 165 <i>Web Quest</i> 291 TWE: B 66, 280, 282
<ul style="list-style-type: none"> Extend a pattern using models. 	SE: 8 (e.g. #2), 10-13, 27 #47, 46 #2, 171 #9, 185 (Extending the Lesson), 194 (WHEN), 282-284, 543 #19 <i>Web Quest</i> 3, 291 TWE: A 284 DI 351
<ul style="list-style-type: none"> Identify properties and relationships related to prime numbers, composite numbers, rational numbers, multiples, factors, and exponents. 	SE: 14-17, 18-21, 22, 27 #42-#43, 136 (e.g. #5), 177-180, 194-197, 210, 211 TWE: A 17 B 14 DI 178, 195 PC 216F
<ul style="list-style-type: none"> Determine how a change in length or width affects perimeter, area, and volume of two- and three-dimensional figures. 	SE: 41 #21, 159 #2, 171 #16, 193 #8, 573 #24 <i>Hands-On Lab</i> 464 <i>Spreadsheet Investigation</i> 469 TWE: DI 40, 159 TNT 571
<ul style="list-style-type: none"> Solve simple linear equations by using concrete materials, tables, or graphs. 	A linear equation as a function can be solved through graphing in the following examples. SE: 366-369, 373 #22-#24
<ul style="list-style-type: none"> Apply the following properties when appropriate: commutative, associative, distributive, inverse, and identity elements. 	SE: 333-336, 339, 348 #7-#10, 353, 370 #7-#14 <i>Hands-On Lab</i> 270-271, 332 TWE: DI 334 PC 330F

OBJECTIVES	PAGE REFERENCES
<p>6b. K-12 Broad Goal: Students will use algebraic concepts and processes to represent situations that involve variable quantities with expressions, equations, inequalities, matrices and graphs. PURPOSE: Algebra is the language through which much of mathematics is communicated. It provides a means of representing concepts at an abstract level and then applying those concepts. Students in grades K-6 should explore algebraic concepts in an informal way, emphasizing physical models, data, graphs and other mathematical representations. Formal algebraic manipulation may be deferred to later grades. The understanding of algebraic representation is a prerequisite to formal work in virtually all of mathematics. Algebraic processes are important tools in the study of natural sciences and social sciences.</p>	
<ul style="list-style-type: none"> Plot points on a number line or in the plane. 	SE: 294-298, 304-307, 319 #39-#42, 320-323, 327, 329 TWE: DI 305 ICE 295 PS 327
<ul style="list-style-type: none"> Use trial and error to find a solution to an equation from among a given replacement set. 	SE: 34-37, 41 #24-#27 <i>Problem-Solving Strategy</i> 32-33 TWE: A 37
<ul style="list-style-type: none"> Solve simple linear equations using concrete, informal methods. 	SE: Note: A linear equation can be solved by graphing a function on pgs. 366-369, 372, 373 #22-#24 TWE: A 369
<ul style="list-style-type: none"> Given a table or graph, select a sentence describing the underlying relationship(s). 	SE: 51 (e.g. #3), 57 (e.g. #2), 58 #10, 63 (e.g. #1 & #2), 66-69, 298 #53-#55 <i>Problem-Solving Strategy</i> 54-55, 448-449 TWE: A 69 DI 51, 63 PC 48F
Mathematics of Change	
<p>7a. K-12 Broad Goal: Students will be able to use concepts about mathematical change in analyzing patterns, graphs, and applied situations. PURPOSE: All natural phenomena are characterized by change. Mathematics is a tool for representing and describing this change, and a preliminary understanding of change is an important precursor to the more formal ideas of calculus. Through explorations of patterns, tables, graphs, functions, and situations which focus on the nature of change, representation, understanding, and recognition of types of change can be promoted. Real-world examples of change can be examined. Proportional reasoning and experience with rates should be part of this process.</p>	
<ul style="list-style-type: none"> Recognize and extend sequences of number and geometric patterns. 	SE: 9 #15, 27 #47, 33 #9, 126 #9, 171 #9, 193 #13, 196 #23, 282-284, 359 #10 <i>Problem-Solving Strategy</i> 280-281 TWE: DI 284
<ul style="list-style-type: none"> Describe and interpret change from graphs and/or tables of data. 	SE: 48, 51 (e.g. #3), 57 (e.g. #2), 70 #8-#9, 86 (e.g. #1), 88 #3-#4, 94 #4 <i>Problem-Solving Strategy</i> 54-55 TWE: A 53, 59 DI 54
<ul style="list-style-type: none"> Find averages (for example: batting averages, or grade point averages) and compute rates in familiar contexts (for example: soft drink consumption, distance per unit of time, hourly wages, or paint mixing). 	SE: 30 #46, 31 #48, 47 #14, 381 (e.g. #3), 382 <i>Spreadsheet Investigation</i> 79 <i>Web Quest</i> 377 TWE: A 59

OBJECTIVES	PAGE REFERENCES
Discrete Mathematics	
Discrete mathematics is defined as the study of topics which involve items that can be counted, rather than continuous amounts which can only be measured. Discrete mathematics is actually an umbrella term which includes such topics as: counting techniques, sets, relations, functions, logic and reasoning, patterning (iteration and recursion), algorithms, and induction. Probability, networks, graph theory, social decision making, and matrices should also be included in a discrete mathematics curriculum. Embedded in these areas are the three main themes of discrete mathematics: existence (Is there a solution?), counting (How many solutions are there?), and efficiency (What is the best solution?).	
8a. K-12 Broad Goal: Students will use a variety of tools from discrete mathematics to explore and model real-world situations.	
PURPOSE: Information and communication continue to impact the modern world and require the understanding of discrete mathematics. Decision making involving sets and systems having a countable number of elements needs to be integrated throughout the curriculum. Students should have experiences with finite graphs, matrices, sequences, recursion and the development and testing of algorithms.	
<ul style="list-style-type: none"> Use counting techniques to determine the number of outcomes for situations (for example: handshake problems, menu ordering, or clothes matching). 	SE: 433-436, 521 (#10)
<ul style="list-style-type: none"> Solve problems for finding efficient routes (for example: mail delivery, or snow plowing for two or three streets). 	SE: 447 #16-#17 <i>Hands-On Lab</i> 432
<ul style="list-style-type: none"> Given three statements, organize their content into chart form to investigate their relationships. 	SE: 436 (Extending the Lesson) <i>Hands-On Lab</i> 432 <i>Problem-Solving Strategy</i> 448-449 TWE: A 449 DI 448

Codes Used for TWE Pages

A	Assess
B	Bellringer
BBS	Bulletin Board Starters
DI	Daily Intervention
FSO	Foldables Study Organizer
ICE	In-Class Examples
MIC	More Interdisciplinary Connections
PC	Project Criss
PS	Portfolio Suggestion
T	Teach
TNT	Tips for New Teachers
TT	Team Teaching
UM	Using Models