



MAINE
Mathematics
Middle Grades 5-8 and Secondary Grades
Mathematics: Applications and Concepts Course 1, 2, and 3 © 2004

| OBJECTIVES | PAGE REFERENCES | | |
|---|--|--|--|
| | COURSE 1 | COURSE 2 | COURSE 3 |
| A. NUMBERS AND NUMBER SENSE | | | |
| Students will understand and demonstrate a sense of what numbers mean and how they are used. Students will be able to: | | | |
| MIDDLE GRADES 5-8 | | | |
| 1. Use numbers in a variety of equivalent and interchangeable forms (e.g., integer, fraction, decimal, percent, exponential, and scientific notation) in problem-solving. | SE: 18-21, 136 Example 5, 182 Example 1, 202-205, 206-209, 400-403, 404-406 TWE: A 138 PC 174 F | SE: 210-213, 216-219, 220-223, 229 #2, #9-#10 <i>Study Guide and Review</i> 233 5-4, 234 5-5, 5-6 TWE: A 223 B 210 IE 211 <i>Practice: Word Problems</i> 213, 219 | SE: 64 Example 3, 65 #40, 67 Example 1, 68 Example 3, 75 #28-#30, 107 #37-#41, 125, 129 #49-#50 <i>The Game Zone</i> 33 TWE: A 66 IE 64 <i>Practice: Word Problems</i> 66, 75, 107 |
| 2. Demonstrate understanding of the relationships among the basic arithmetic operations on different types of numbers. | SE: 7 Example 1, 24-27, 121-124, 135-138, 141-143, 152-155, 228-231, 261-264, 300-303, 304-307, 316-319 TWE: DI 229 ICE 25, 122 PC 216 F, 254 F | SE: 30-33, 120-124, 134-137, 138-141, 150-152, 156-159, 160-163, 244-251 TWE: IE 31, 121 <i>Practice: Skills</i> 33 | SE: 23, 26 #29-#32, 30-31, 82-84, 126, 127 Example 7 TWE: A 27 DI 24, 35 IE 25 <i>Practice: Word Problems</i> 27 |

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| | COURSE 1 | COURSE 2 | COURSE 3 |
| 3. Apply concepts of ratios, proportions, percents, and number theory (e.g., primes, factors, and multiples) in practical and other mathematical situations. | SE: 14-17, 177-180, 194-197, 380-383, 386-389, 395-397 <i>Spreadsheet Investigation</i> 390 <i>The Game Zone</i> 399 TWE: A 179 B 14 DI 195 | SE: 217 Example 5, 220-223, 288-291, 292-295, 297-300, 312-315 <i>Hands-On Lab</i> 296 TWE: B 216 DI 317 <i>Practice: Word Problems</i> 219 | SE: 156-159, 160-164, 170-173, 184-187, 188-191 <i>Hands-On Lab</i> 183 <i>Prerequisite Skills</i> 609, 612 <i>Spreadsheet Investigation</i> 165 TWE: A 173 IE 157 <i>Practice: Word Problems</i> 159 |
| 4. Represent numerical relationships in graphs, tables, and charts. | SE: 15 Example 3, 21 #42-#47, 47 #14 & #15, 50-53, 75 #30-32, 102-105 <i>Hands-On Mini Lab</i> 14, 18 <i>Problem-Solving Strategy</i> 54-55 <i>Spreadsheet Investigation</i> 60-61 <i>Study Skill</i> 176 TWE: DI 54 ICE 51 | SE: 21 #41-#42, 179 Example 3, 203 Example 1, 229, 314 <i>Hands-On Lab</i> 37, 176 <i>Hands-On Mini Lab</i> 78 <i>Spreadsheet Investigation</i> 90-91, 361 | SE: 24 #49-#50, 52 #36-#39, 125, 163 #11-#14, 515 #28-#32 <i>Hands-On Lab</i> 22 <i>Hands-On Mini Lab</i> 216 <i>Problem-Solving Strategy</i> 123-124 <i>Spreadsheet Investigation</i> 165 TWE: IE 123 |
| B. COMPUTATION | | | |
| Students will understand and demonstrate computation skills. Students will be able to: | | | |
| MIDDLE GRADES 5-8 | | | |
| 1. Compute and model all four operations with whole numbers, fractions, decimals, sets of numbers, and percents, applying the proper order of operations. | SE: 24-27, 121-124, 141-143, 235-238, 276-279, 395-397 <i>Hands-On Lab</i> 134, 139-140, 259-260, 407-408 <i>Hands-On Mini Lab</i> 144, 228 TWE: A 27, 279 B 135 | SE: 14-17, 21 #15-#53, 27 #51-#53, 30-33, 140 #30, #32, #34 TWE: A 17 B 14 <i>Practice: Skills</i> 17 <i>Practice: Word Problems</i> 17 <i>Study Guide and Intervention</i> 17 | SE: 13, 23-24, 34-38, 72-75, 76-80, 82-85, 88-91, 574-577, 580-583, 584-587 <i>Hands-On Mini Lab</i> 28, 71 |

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| | COURSE 1 | COURSE 2 | COURSE 3 |
| 2. Create, solve, and justify the solution for multi-step, real-life problems including those with ratio and proportion. | SE: 75 #34, 119 #36, 193 #12, 124 #36-39, 336 #44, 380-383, 386-389, 396 #3 <i>Hands-On Lab</i> 390 TWE: A 382 DI 387 | SE: 15 Example 6 <i>Hands-On Lab</i> 73 <i>Problem-Solving Strategy</i> 22, 132, 164, 338, 469 | SE: 7-8, 73 Example 5 <i>Problem-Solving Strategy</i> 43-44 |
| C. DATA ANALYSIS AND STATISTICS | | | |
| Students will understand and apply concepts of data analysis. Students will be able to: | | | |
| MIDDLE GRADES 5-8 | | | |
| 1. Organize and analyze data using mean, median, mode, and range. | SE: 76-78, 80-83, 92, 95 #13, 105 #51, 131 #12, 313 #52, 459 #11 <i>Spreadsheet Investigation</i> 79 TWE: A 83 DI 76 ICE 77, 81 | SE: 65 Example 2, 66 #8, #11, 69-72, 79 #26-#28, 93 Example 2 <i>The Game Zone</i> 75 <i>Hands-On Lab</i> 73 TWE: B 69 IE 70 <i>Practice: Skills</i> 68, 72 <i>Reading to Learn Mathematics</i> 69 | SE: 36 Example 8, 38 #66, 69 #32, 435-438, 442 <i>Spreadsheet Investigation</i> 439 TWE: DI 436 IE 36, 436 <i>Practice: Skills</i> 438 <i>Practice: Word Problems</i> 438 <i>Study Guide and Intervention</i> 438 |
| 2. Assemble data and use matrices to formulate and solve problems. | The following examples of data could be used in matrices. SE: 50 Example 1, 66 TWE: A 83 ICE 51 | SE: 54, 62 #8, #10, 64, 76, 80, 85 <i>Hands-On Mini Lab</i> 60 TWE: B 60 IE 55 <i>Practice: Word Problems</i> 57, 83 | SE: 420-424, 426-429, 430-433, 454-457 <i>Graphing Calculator Investigation</i> 425 <i>Hands-On Lab</i> 434 TWE: IE 455 <i>Practice: Skills</i> 457 <i>Practice: Word Problems</i> 457 <i>Study Guide and Intervention</i> 457 |

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| | COURSE 1 | COURSE 2 | COURSE 3 |
| 3. Construct inferences and convincing arguments based on data. | SE: 66-69, 86-89, 95 #14 <i>Hands-On Mini Lab 62</i> <i>Problem-Solving Strategy</i> 54-55, 192-193 TWE: DI 63, 87 ICE 51, 88 | SE: 57 #19, 60-63, 67 #21, 68 #24, 89 #17 <i>Hands-On Lab 73</i> <i>Problem-Solving Strategy</i> 58 TWE: A 63 IE 58, 61 | SE: 423-424 #9-#23, 426, 429 #11, #13, 442, 447 Example 2, 453 #12 <i>Problem-Solving Strategy</i> 418-419 TWE: B 426 DI 418 <i>Practice: Word Problems 429</i> |
| D. PROBABILITY Students will understand and apply concepts of probability. Students will be able to: | | | |
| MIDDLE GRADES 5-8 | | | |
| 1. Find the probability of simple events and make predictions by applying the theories of probability. | SE: 428-431, 438-441, 450-453, 458 #8 & #10, 459 #15 <i>Hands-On Lab 426-427, 432, 437</i> TWE: B 421 DI 438 | SE: 370-373, 393-396, 398-401, 501-503 <i>Hands-On Mini Lab 374</i> TWE: A 373 IE 370, 375 <i>Practice: Skills 373</i> <i>Practice: Word Problems 373</i> <i>Study Guide and Intervention 373</i> | SE: 374-377, 381 Example 3, 385 Example 4, 398, 400-403, 424 #27 <i>Study Guide and Review</i> 410-411 TWE: IE 375 <i>Practice: Skills 377</i> <i>Practice: Word Problems 377</i> <i>Study Guide and Intervention 377</i> |
| 2. Explain the idea that probability can be represented as a fraction between and including zero and one. | SE: 429 | SE: 371, 372 #3 <i>Study Guide and Intervention 373</i> This concept can be emphasized throughout Chapter 9. | SE: 374, 376 #2 This concept can be emphasized throughout Chapter 8. |
| 3. Use simulations to estimate probabilities. | SE: <i>Hands-On Lab 426-427, 432</i> <i>Problem-Solving Strategy</i> 489 #5 TWE: DI 429 PS 457 | SE: 393-396 <i>Hands-On Lab 397</i> <i>Problem-Solving Strategy</i> 391 TWE: IE 391 <i>Reading to Learn Mathematics</i> 393 | SE: <i>The Game Zone 395</i> <i>Graphing Calculator Investigation 404-405</i> <i>Hands-On Mini Lab 400</i> TWE: A 377, 403 DI 400 <i>Practice: Word Problems 377, 383</i> |

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| | COURSE 1 | COURSE 2 | COURSE 3 |
| 4. Find all possible combinations and arrangements involving a limited number of variables. | SE: 433-436, 441 #19, 442 #9, 459 #18 <i>Hands-On Lab 432</i> TWE: A 436 B 438 ICE 429, 434 | SE: 374-377, 383 #24, 387-390 <i>Hands-On Lab 386</i> TWE: IE 388 <i>Practice: Skills 377, 390</i> <i>Practice: Word Problems 377, 390</i> <i>Study Guide and Intervention 377, 390</i> | SE: 380-383, 388-391 <i>Hands-On Lab 392-393</i> <i>Problem-Solving Strategy 378-379</i> TWE: A 377 DI 378 IE 378, 381 <i>Practice: Skills 383</i> <i>Study Guide and Intervention 383</i> |
| E. GEOMETRY | | | |
| Students will understand and apply concepts from geometry. Students will be able to: | | | |
| MIDDLE GRADES 5-8 | | | |
| 1. Compare, classify, and draw two dimensional shapes and three dimensional figures. | SE: 522-525, 544, 564-566, 576, 578 (Ext. the Lesson) <i>Hands-On Lab 567, 574</i> <i>Hands-On Mini Lab 575</i> TWE: A 565 DI 564 TNT 576 | SE: 414 Example 3, 428-431, 434-437, 446-449, 514-517 <i>Hands-On Lab 488</i> TWE: IE 429, 435 <i>Practice: Skills 431, 437, 450</i> | SE: 267-269, 272-275, 331-334, 337 <i>The Game Zone 341</i> <i>Hands-On Lab 283, 330, 346</i> TWE: B 314, 331 IE 332 |
| 2. Apply geometric properties to represent and solve real-life problems involving regular and irregular shapes. | SE: 504, 522-525, 535 Example 3-4, 536 #28 <i>Hands-On Lab 537, 568-569</i> <i>Problem-Solving Strategy 520-521</i> TWE: A 525 DI 534 ICE 534 ICS 504 C | SE: 414 #8, 418, 428 Example 1, 472 #36, 498 <i>Problem-Solving Strategy 444</i> <i>Spreadsheet Investigation 523</i> TWE: A 415 DI 499 <i>Practice: Word Problems 431</i> | SE: 316 Example 4, 327 Example 3, 329 #17-#20, 348 Example 2 <i>When 279, 290, 326</i> TWE: IE 292 |

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| | COURSE 1 | COURSE 2 | COURSE 3 |
| 3. Use a coordinate system to define and locate position. | SE: 320-323, 327, 342 #47-49, 366-369, 477 #10 TWE: A 323 PS 327 | SE: 451 Example 1, 452 Example 2, 453 #3, #6-#7, 454 #19, 457 Example 4, Example 5 <i>Hands-On Lab</i> 460 <i>Spreadsheet Investigation</i> 455 <i>Study Guide and Review</i> 464 10-8 Example 8, 10-9 Example 9 TWE: IE 457 | SE: 142-145, 296 Example 1, 301 Example 1, 322 #19- #22 TWE: A 145 B 143 DI 143 IE 143 <i>Practice: Skills</i> 145 <i>Practice: Word Problems</i> 145 <i>Study Guide and Intervention</i> 145 |
| 4. Use the appropriate geometric tools and measurements to draw and construct two and three dimensional figures. | SE: 524 #1, #13-15, 525 #30, 565 #5 <i>Hands-On Lab</i> 526-527, 532-533, 567 <i>Hands-On Mini Lab</i> 522 TWE: A 565 DI 510, 564 PS 327, 541 | SE: 414 Example 3 <i>Hands-On Lab</i> 412, 416- 417, 426-427, 432-433, 478, 488, 530 <i>Hands-On Mini Lab</i> 440 | SE: <i>Hands-On Lab</i> 271, 283, 330, 346 <i>Hands-On Mini Lab</i> 314, 319, 335, 342 |
| SECONDARY GRADES | | | |
| 1. Draw coordinate representations of geometric figures and their transformations. | SE: <i>Hands-On Lab</i> 532-533, 543 #19 TWE: PS 541 | SE: 451-454, 456-459 <i>Hands-On Lab</i> 460, 461, 536 <i>Spreadsheet Investigation</i> 455 TWE: IE 452, 457 <i>Practice: Skills</i> 459 | SE: 287-289, 290-294, 296- 299, 300-303 <i>Hands-On Lab</i> 304-305 <i>Hands-On Mini Lab</i> 286 TWE: DI 291 IE291, 297, 301 |

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| | COURSE 1 | COURSE 2 | COURSE 3 |
| 2. Use inductive and deductive reasoning to explore and determine the properties of and relationships among geometric figures. | SE: 284 #19, 524 #18-19, 544 <i>Hands-On Lab</i> 526-527, 532, 555, 567 <i>Problem-Solving Strategy</i> 568-569 TWE: A 531 DI 529 PS 541 | SE: 415 #23, 425 #29, 431 #26, 436 #32, 443 #16-#17, 459 #19, 535 #24, 541 #21 <i>Hands-On Lab</i> 426-427, 461 <i>Problem-Solving Strategy</i> 444-445 | SE: 275 #31-#34, 282 #24, 289 #21-#22, 294 #9, 318 #27-#28, 339 #33-#36, 345 #24, 351 #24-#28 <i>Problem-Solving Strategy</i> 276-277 |
| 3. Apply trigonometry to problem situations involving triangles and periodic phenomena. | See <i>Mathematics: Applications and Concepts Course 2</i> page 479 and <i>Mathematics: Applications and Concepts Course 3</i> page 192. | SE: 428-431, 479-482 <i>Hands-On Lab</i> 478 TWE: DI 429, 480 IE 480 <i>Practice: Skills</i> 431, 482 <i>Practice: Word Problems</i> 482 | SE: 188-191 <i>Hands-On Lab</i> 192-193 TWE: DI 189 IE 189 <i>Practice: Skills</i> 191 <i>Practice: Word Problems</i> 191 <i>Study Guide and Intervention</i> 191 |
| F. MEASUREMENT | | | |
| Students will understand and demonstrate measurement skills. Students will be able to: | | | |
| MIDDLE GRADES 5-8 | | | |
| 1. Demonstrate the structure and use of systems of measurement. | SE: 465-468, 470-473, 476-479, 484-487, 490-493 <i>Hands-On Lab</i> 474-475 <i>The Game Zone</i> 483 <i>Web Quest</i> 461 TWE: A 473 B 470 PC 462 F PS 501 | SE: 38-39, 267-269, 542-545 TWE: A 545 B 38, 267, 542 DI 39 <i>Practice: Skills</i> 545 <i>Practice: Word Problems</i> 545 <i>Reading to Learn Mathematics</i> 542 <i>Study Guide and Intervention</i> 545 | SE: 73 Example 5, 78 Example 6, 173 #39-#42, 184, 358-362 <i>Prerequisite Skills</i> 604-607 TWE: IE 185, 359 |

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| | COURSE 1 | COURSE 2 | COURSE 3 |
| 2. Develop and use concepts that can be measured directly, or indirectly (e.g., the concept of rate). | SE: 378, 381-383 535 #8, 536 #19 could be used for indirect measurement TWE: DI 381 ICE 381 | SE: 161 Example 3, 162 #29, 292-295, 304-308, 441 Example 2, 442 #5, 542-545 <i>Hands-On Lab</i> 296 TWE: A 295 B 292 IE 293 | SE: 184-187, 188-191 <i>Study Guide and Review</i> 199 4-6, 4-7 TWE: B 188 DI 189 IE 189 <i>Practice: Skills</i> 191 <i>Practice: Word Problems</i> 191 <i>Study Guide and Intervention</i> 191 |
| 3. Demonstrate an understanding of length, area, volume, and the corresponding units, square units, and cubic units of measure. | SE: 17 #53, 21 #40-41, 39-41, 465-466, 476-479, 544, 546-549, 551-554, 570-573 <i>Hands-On Lab</i> 464, 474-475, 550 <i>Spreadsheet Investigation</i> 469 TWE: B 18 PC 462 F, 544 F | SE: 267, 271 Example 3, 543, 544 #13-#17, 545 #22-#24 <i>Hands-On Mini Lab</i> 520 <i>Spreadsheet Investigation</i> 523 TWE: B 60 IE 543 <i>Study Guide and Intervention</i> 545 | SE: 315-316, 320, 335-336, 342-343, 347, 349 <i>Hands-On Mini Lab</i> 314, 319, 335 <i>Prerequisite Skills</i> 604-607 <i>Practice: Word Problems</i> 362 |
| G. PATTERNS, RELATIONS, FUNCTIONS | | | |
| Students will understand that mathematics is the science of patterns, relationships, and functions. Students will be able to: | | | |
| MIDDLE GRADES 5-8 | | | |
| 1. Describe and represent relationships with tables, graphs, and equations. | SE: 21 #42-46, 47 #25, 171 #9, 194 <i>Hands-On Lab</i> 360-361 <i>Problem-Solving Strategy</i> 156-157, 280-281 <i>Spreadsheet Investigation</i> 60-61 <i>The Game Zone</i> 71 <i>Web Quest</i> 291 TWE: A 59, 284 B 280 TNT 434 | SE: 177 Example 1, 178-181, 182-185 <i>When</i> 10, 177 TWE: A 181 IE 178-179 <i>Practice: Skills</i> 181 <i>Practice: Word Problems</i> 181 <i>Reading to Learn Mathematics</i> 177 <i>Study Guide and Intervention</i> 181 | SE: 42 #22-#24, 518 Example 3, 522-525, 534 Example 4, 536 #34-#37 <i>Hands-On Lab</i> 22, 521 <i>Hands-On Mini Lab</i> 11 #1 <i>Spreadsheet Investigation</i> 165 <i>When</i> 517 |

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| | COURSE 1 | COURSE 2 | COURSE 3 |
| 2. Analyze relationships to explain how a change in one quantity can result in a change in another. | SE: 159 #2, 164 #24 <i>Hands-On Lab</i> 360-361, 464 <i>Spreadsheet Investigation</i> 469 | SE: 177-181 <i>Hands-On Lab</i> 176 #5, 274 <i>Standardized Test Practice</i> 191 #14 TWE: IE 178-179 <i>Practice: Word Problems</i> 181 <i>Reading to Learn Mathematics</i> 177 | SE: 518 Example 4, 534 Example 5, 544-547 <i>Hands-On Lab</i> 22 #3, 521 <i>Hands-On Mini Lab</i> 11 #3 <i>Spreadsheet Investigation</i> 165 <i>Reading to Learn Mathematics</i> 11 |
| 3. Use patterns and multiple representations to solve problems. | SE: 21 #42-47, 46 #2, 47 #25, 185 (Extending the Lesson), 193 #13, 194, 197 #29, 282-284 <i>Problem-Solving Strategy</i> 280-281 TWE: A 284 B 66, 282 DI 351 | SE: 13 #62, 34-36 <i>Hands-On Lab</i> 37, 176, 274 <i>Hands-On Mini Lab</i> 18, 34 <i>Standardized Test Practice</i> 171 #20 <i>When</i> 10 TWE: B 10 | SE: 7 Example 1, 10 #16, #18, 100 #41 <i>Hands-On Lab</i> 516 <i>Hands-On Mini Lab</i> 6, 11 <i>Problem-Solving Strategy</i> 96-97 TWE: DI 96 IE 96 |
| H. ALGEBRA CONCEPTS | | | |
| Students will understand and apply algebraic concepts. Students will be able to: | | | |
| MIDDLE GRADES 5-8 | | | |
| 1. Use the concepts of variables and expressions. | SE: 28-31, 44 #38-47, 122 Example 5, 236 Example 4, 263 #11 & #29-32, 318 #24-25 | SE: 18-21, 24-27, 150-152 TWE: A 21 IE 19, 151 <i>Practice: Skills</i> 21, 152 <i>Practice: Word Problems</i> 21, 152 <i>Reading to Learn Mathematics</i> 150 <i>Study Guide and Intervention</i> 21, 152 | SE: 11-15, 19 Example 8, 39-42, 89 Example 4, 469-473, 518 Example 4, Example 5 TWE: IE 12-13, 40, 470-471 <i>Practice: Skills</i> 15 <i>Study Guide and Intervention</i> 15 |

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| | COURSE 1 | COURSE 2 | COURSE 3 |
| 2. Solve linear equations using concrete, informal, and formal methods which apply the order of operations. | SE: A limited reference is found on page 323 (Critical Thinking). This graph would fulfill informal application. See <i>Mathematics: Applications and Concepts Course 2</i> page 177-181 and 182-185 for give further information. | SE: 20 #40, 21 Example 1, 25-27, 156-159, 160-163, 168 <i>Hands-On Lab</i> 154-155 TWE: IE 25, 157, 161 | SE: 46-49, 50-53, 92 Example 1, Example 2, 117 Example 3, 474-477, 484-487 <i>Hands-On Mini Lab</i> 45 TWE: A 477 IE 46-47, 475-476 <i>Practice: Skills</i> 49 <i>Study Guide and Intervention</i> 49 |
| 3. Analyze tables and graphs to identify properties and relationships in a practical context. | SE: 333-336, 339, 342 #42-43, 344, 370 <i>Hands-On Lab</i> 332, 337-338 TWE: A 336 B 339 ICE 334 PC 330 F | SE: 169 40-#41, 177, 179 Example 3, 180 #29-#34 <i>Hands-On Lab</i> 176 <i>Hands-On Mini Lab</i> 18 <i>Problem-Solving Strategy</i> 132 | SE: 42 #22-#24, 164, 528 #9 <i>Hands-On Lab</i> 22, 521 <i>Hands-On Mini Lab</i> 539 #2 <i>Problem-Solving Strategy</i> 537 <i>Spreadsheet Investigation</i> 165 <i>When</i> 517 |
| 4. Use graphs to represent two-variable equations. | SE: 366-369, 372 | SE: 177-181 <i>Hands-On Lab</i> 176 <i>Study Guide and Review</i> 188 4-6 <i>When</i> 24 TWE: A 181 IE 178-179 <i>Practice: Skills</i> 181 <i>Practice: Word Problems</i> 181 <i>Reading to Learn Mathematics</i> 24 <i>Study Guide and Intervention</i> 181 | SE: 525 #28 <i>Graphing Calculator Investigation</i> 532 <i>Hands-On Lab</i> 531 Graphs can be used to represent the following two-variable equations. SE: 518 Example 4, Example 5, 520 #21, #23 TWE: DI 518 IE 518 |
| 5. Demonstrate an understanding of inequalities and non-linear equations. | SE: 37, 323 (Critical Thinking) #38-39 <i>Hands-On Lab</i> 354 #1 & #3 | SE: 172-175, 181 #41-#46, #49 TWE: A 175 IE 173 | SE: 492-495, 496-499, 500-504, 548-551, 558, 560-563, 565-568 <i>Graphing Calculator Investigation</i> 564 TWE: A 568 |

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| | COURSE 1 | COURSE 2 | COURSE 3 |
| 6. Find solutions for unknown quantities in linear equations and in simple equations and inequalities. | SE: 34-37, 339-342, 344-347, Pages 366-369 could be used to illustrate linear equations. <i>Hands-On Lab</i> 354, 360-361 | SE: 20 #40, 21 #45, 24 Example 1, 26-27, 156-159, 168, 172-175, 181 #49 <i>Practice: Skills</i> 169 <i>Practice: Word Problems</i> 21 | SE: 45-49, 50-53, 496-499, 500-504 <i>Study Guide and Review</i> 56 1-8, 1-9 TWE: IE 51, 501-502 <i>Practice: Skills</i> 53 <i>Practice: Word Problems</i> 53 <i>Study Guide and Intervention</i> 53 |
| SECONDARY GRADES | | | |
| 1. Use tables, graphs, and spreadsheets to interpret expressions, equations, and inequalities. | SE: 366-369 shows graphing for equations | SE: 152 #26-#27, 172-173, 177-181, 182-185 <i>Hands-On Lab</i> 274 <i>Problem-Solving Strategy</i> 132-133 <i>Spreadsheet Investigation</i> 309 <i>Standardized Test Practice</i> 237 #14 <i>Practice: Skills</i> 175 <i>Study Guide and Intervention</i> 175 | SE: 493 Example 7, Example 8, 495 #45, 497 Example 3, 518 Example 3 <i>When</i> 34, 39, 50, 517 TWE: IE 518 #3 <i>Practice: Skills</i> 499 |
| 2. Investigate concepts of variation by using equations, graphs, and data collection. | See <i>Mathematics: Applications and Concepts Course 2</i> pages 69-70 and <i>Mathematics: Applications and Concepts Course 3</i> page 439. | SE: 177-181 TWE: A 181 DI 177-178 IE 178 <i>Practice: Skills</i> 181 <i>Practice: Word Problems</i> 181 <i>Reading to Learn Mathematics</i> 177 <i>Study Guide and Intervention</i> 181 | SE: 504 Examples 3 & 5, 518 Example 4, Example 5, 520 #21-#23 <i>Graphing Calculator Investigation</i> 543 <i>Hands-On Lab</i> 22, 521 <i>Hands-On Mini Lab</i> 539 <i>When</i> 517 TWE: IE 540 |

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| | COURSE 1 | COURSE 2 | COURSE 3 |
| 3. Formulate and solve equations and inequalities. | SE: 34-37, 339-342, 344-347, 350-353 <i>Hands-On Lab</i> 354 TWE: A 353 | SE: 20 #40, 21 #45, 24 Example 1, 26-27, 156-159, 168, 172-175, 181 #49 <i>Practice: Skills</i> 169 <i>Practice: Word Problems</i> 21 | SE: 45-49, 50-53, 496-499, 500-504 <i>Study Guide and Review</i> 56 1-8, 1-9 TWE: IE 51, 501-502 <i>Practice: Skills</i> 53 <i>Practice: Word Problems</i> 53 <i>Study Guide and Intervention</i> 53 |
| 4. Analyze and explain situations using symbolic representations. | SE: 31 #49-51, 35 Example 3, 39 Example 1, 267 #27-30, 341 #32-33, 412 (Extending the Lesson) <i>Problem-Solving Strategy</i> 358-359 TWE: DI 29 | SE: 18-21, 24-27, 150-152 TWE: A 21 IE 19, 151 <i>Practice: Skills</i> 21, 152 <i>Practice: Word Problems</i> 21, 152 <i>Reading to Learn Mathematics</i> 150 <i>Study Guide and Intervention</i> 21, 152 | SE: 39-42, 51 Example 3, 53 #40-#44 <i>When</i> 50 TWE: DI 40 IE 40 TT 40 <i>Practice: Skills</i> 42 <i>Practice: Word Problems</i> 42 <i>Reading to Learn Mathematics</i> 39 <i>Study Guide and Intervention</i> 42 |
| I. DISCRETE MATHEMATICS | | | |
| Students will understand and apply concepts in discrete mathematics. Students will be able to: | | | |
| MIDDLE GRADES 5-8 | | | |
| 1. Create and use networks to explain practical situations or solve problems. | After the teacher explains networking, see SE: page 564 (3-D figures). Connections can be shown between points and lines. | SE: 115 #41, 434, 453 #12 <i>Problem-Solving Strategy</i> 202 #12 <i>When</i> 112 <i>Practice: Word Problems</i> 115 | SE: 125, 143 Example 2, 145 #22, 273 <i>When</i> 142 TWE: IE 143 |
| 2. Identify patterns in the world and express these patterns with rules. | SE: 194, 366-369, 375 #21 | SE: 20 #39, 21 #44, 162 #30, 177-181 <i>Hands-On Lab</i> 176 <i>Problem-Solving Strategy</i> 132-133 <i>When</i> 10 <i>Practice: Word Problems</i> 36 | SE: 14 #40, 41 #28, 49 #42-#43, 51 Example 3, 515 #28-#32 <i>Hands-On Lab</i> 516 <i>When</i> 34, 39, 50 <i>Practice: Word Problems</i> 515 |

| OBJECTIVES | PAGE REFERENCES | | |
|---|---|---|---|
| | COURSE 1 | COURSE 2 | COURSE 3 |
| SECONDARY GRADES | | | |
| 1. Use linear programming to find optimal solutions to a system. | SE: 369 #19-21 | TWE: DI 183 | This concept can be introduced with the following examples. SE: 549 Example 2, 550-551 #22-#25 |
| 2. Use networks to find solutions to problems. | After the teacher explains networking, see SE: page 564 (3-D figures). Connections can be shown between points and lines. | SE: 115 #41, 434, 453 #12 <i>Problem-Solving Strategy</i> 202 #12 <i>When</i> 112 <i>Practice: Word Problems</i> 115 | SE: 125, 143 Example 2, 145 #22, 273 <i>When</i> 142 TWE: IE 143 |
| 3. Apply strategies from game theory to problem-solving situations. | SE: 341 #34 <i>The Game Zone</i> 349, 399, 443 TWE: PS 457 | SE: <i>The Game Zone</i> 29, 117 | SE: <i>The Game Zone</i> 33, 225, 491 |
| 4. Use matrices as tools to interpret and solve problems. | SE: 50 Example 1, 66 (could be used in a matrix) TWE: A 53 ICE 51 | The following examples could be used in matrix forms. SE: 62 #8, #9, 77 Example 3 TWE: A 63 | SE: 454-457 <i>Practice Test</i> 461 #14-#15 <i>Study Guide and Review</i> 460 8-9 TWE: IE 455 <i>Practice: Skills</i> 457 <i>Practice: Word Problems</i> 457 <i>Study Guide and Intervention</i> 457 |

| OBJECTIVES | PAGE REFERENCES | | |
|---|---|---|--|
| | COURSE 1 | COURSE 2 | COURSE 3 |
| J. MATHEMATICAL REASONING | | | |
| Students will understand and apply concepts of mathematical reasoning. Students will be able to: | | | |
| MIDDLE GRADES 5-8 | | | |
| 1. Support reasoning by using models, known facts, properties, and relationships. | SE: 6-7, 41 #21, 395-397 <i>Hands-On Lab</i> 134, 150-151, 407-408 <i>Problem-Solving Strategy</i> 32-33, 125-126, 156-157, 314-315 TWE: A 27, 185 B 121, 276 DI 87, 142 | SE: 122 #3, 131 #53, 162 #3, 243 #39, 256 #2, 273 #29, 425 #29 <i>Problem-Solving Strategy</i> 391, 444-445 TWE: IE 444 | SE: 13 Example 5, 26 #3, 31 #46-#47, 70 #36, 84 #3, 94 #2, 219 #38-#39, 274 #1, 275 #31 <i>Problem-Solving Strategy</i> 276-277 |
| 2. Demonstrate that multiple paths to a conclusion may exist. | SE: 31 #52, 58 #10, 88 #2, 89 #12, 185 (Critical Thinking & Extending the Lesson) <i>Problem-Solving Strategy</i> 32-33, 156-157 TWE: DI 125, 220 PC 216 F PS 421 | SE: 26 #2, 156-157, 178, 210-211, 227 Example 1, 242 #2, 255 Example 4 <i>Practice: Word Problems</i> 181 | SE: 23 Example 1, 67 Example 1, 211 Example 5, Example 6 <i>Hands-On Mini Lab</i> 28, 45, 71 <i>Problem-Solving Strategy</i> 176 TWE: A 145 B 23 |
| SECONDARY GRADES | | | |
| 1. Analyze situations where more than one logical conclusion can be drawn from data presented. | SE: 89 #12, 95 #14 <i>Problem-Solving Strategy</i> 32-33, 156-157 | SE: 71 #3, 79 #23 TWE: DI 55, 59 | SE: 550 #23, 551 #24, #25 |

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|--|---|---|--|
| | COURSE 1 | COURSE 2 | COURSE 3 |
| K. MATHEMATICAL COMMUNICATION | | | |
| Students will reflect upon and clarify their understanding of mathematical ideas and relationships. Students will be able to: | | | |
| MIDDLE GRADES 5-8 | | | |
| 1. Translate relationships into algebraic notation. | SE: 28-31, 35 Example 1, 158-159, 341 #32-33, 347 #37 <i>Hands-On Lab</i> 337-338 <i>Problem-Solving Strategy</i> 358-359 TWE: DI 29 | SE: 18, 20 #39, 25 Example 3, 27 #42, #45-#46, 33 #49 <i>When</i> 24 TWE: A 21 DI 19 IE 19 <i>Practice: Word Problems</i> 21 | SE: 39-42, 51 Example 3, 53 #40-#44 <i>When</i> 50 TWE: DI 40 IE 40 TT 40 <i>Practice: Skills</i> 42 <i>Practice: Word Problems</i> 42 <i>Reading to Learn Mathematics</i> 39 <i>Study Guide and Intervention</i> 42 |
| 2. Use statistics, tables, and graphs to communicate ideas and information in convincing presentations and analyze presentations of others for bias or deceptive presentation. | SE: 50-53, 56-59, 62-65, 66-69, 86-89, 95 #14-15 <i>Hands-On Lab</i> 437 <i>Problem-Solving Strategy</i> 54-55 TWE: A 89 DI 276 | SE: 57 #15, 66 #3, 78 #4, 92-95 <i>Hands-On Lab</i> 73 <i>Hands-On Mini Lab</i> 60 <i>Problem-Solving Strategy</i> 58-59 TWE: A 95 DI 55, 92 | SE: 406-409 <i>Study Guide and Review</i> 412 8-7 TWE: A 409 DI 407 IE 407 TT 408 <i>Practice: Skills</i> 409 <i>Practice: Word Problems</i> 409 <i>Study Guide and Intervention</i> 409 |
| SECONDARY GRADES | | | |
| 1. Restate, create, and use definitions in mathematics to express understanding, classify figures, and determine the truth of a proposition or argument. | SE: 28, 117, 206-207 <i>Key Concept</i> 334, 465 <i>Study Skill</i> 38, 239 TWE: B 14, 18, 125 BWW 544 D PC 48 F, 292 F VB 98 | SE: 32 #1-#3, 71 #1-#2, 122 #3, 136 #1-#3, 158 #1, 205 #3, 206 #35-#37, 247 #42, 342 #1-#2, 430 #1-#2 | SE: 65 #1, 100 #1, 135 #1, 168 #1, 208 #1, 218 #1, 243 #1, 349 #1, 402 #1, 486 #1 |

| OBJECTIVES | PAGE REFERENCES | | |
|--|---|--|--|
| | COURSE 1 | COURSE 2 | COURSE 3 |
| 2. Read mathematical presentations of topics within the Learning Results with understanding. | SE: <i>What's Math Got to Do With It?</i> 2 TWE: MIC 97 PS 45 TNT 277 WQ 3, 97, 173 | SE: 57 #15, 318 #40 <i>WebQuest</i> 193 TWE: B 106 DI 109 | SE: <i>Portfolio Suggestion</i> 309 <i>Web Quest</i> 371, 457 TWE: MIC 371 |

Codes Used for TWE Codes

| <i>Course 1</i> | | <i>Course 2</i> | | <i>Course 3</i> | |
|-----------------|------------------------------------|-----------------|--------------------|-----------------|------------------------------------|
| A | Assess | A | Assess | A | Assess |
| B | Bellringer | B | Bellringer | B | Bellringer |
| BWW | Building a Word Wall | DI | Daily Intervention | DI | Daily Intervention |
| DI | Daily Intervention | IE | In-Class Examples | IE | In-Class Examples |
| ICE | In-Class Examples | | | MIC | More Interdisciplinary Connections |
| ICS | In-Class Speaker | | | TT | Teaching Tip |
| MIC | More Interdisciplinary Connections | | | | |
| PC | Project Criss | | | | |
| PS | Portfolio Suggestion | | | | |
| TNT | Tips for New Teachers | | | | |
| VB | Vocabulary Builder | | | | |
| WQ | WebQuest | | | | |