



Math Connects

Concepts, Skills, and Problem Solving

Course **1**

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STANDARDS

PAGE REFERENCES

Standard 1:

Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.

Grades 5-8

1. demonstrate meanings for integers, rational numbers, percents, exponents, square roots, and pi (π) use physical materials and technology in problem-solving situations;

Student Edition:

32, 121, 225, 365, 529, 572
Concepts and Skills Bank 745
Explore 364
Get Ready for the Lesson 528
Key Concept 365
Mini Lab 32

Teacher Edition:

AP 572; CG 528a; DI 34, 123; FMC 529, 573;
 TNT 365; VOC 32a

STANDARDS	PAGE REFERENCES
<p>2. read, write, and order integers, rational numbers, and common irrational numbers such as $\sqrt{2}$, $\sqrt{5}$, and π;</p>	<p>Student Edition: 121, 138, 220, 225 <i>Check Your Understanding</i> 140, 143, 222, 573 <i>Example</i> 139, 142, 143, 220, 221, 572 <i>Extra Practice</i> 678, 683, 700 <i>Get Ready for the Lesson</i> 142 <i>H.O.T. Problems</i> 145 #33, 575 #30 <i>Mid-Chapter Quiz</i> 161 #1-#14, 591 #1-#7 <i>Mini Lab</i> 220 <i>Practice and Problem Solving</i> 140, 144, 223, 574 <i>Practice Test</i> 191 #1-#8, 243 #13-#16, 625 #1-#4 <i>Real-World Example</i> 573 <i>Start Smart</i> 7 <i>Study Guide and Review</i> 187 #11-#21, 241 #37-#43, 621 #11-#15 <i>Test Example</i> 222 <i>Test Practice</i> 192 #1, #7, #9, 224, 244 #4, 575</p> <p>Teacher Edition: AE 143, 221, 222, 573; CG 138a; DI 138, 144; EG 572a; FMC 221; TNT 221; UG 572a; VC 142a</p> <p>For irrational numbers also see <i>Math Connects: Concepts, Skills, and Problem Solving Course 2</i> © 2009 page 637.</p>
<p>3. apply number theory concepts (for example, primes, factors, multiples) to represent numbers in various ways;</p>	<p>Student Edition: 28, 32-33 <i>Check Your Understanding</i> 30 #5-#9, 34 <i>Example</i> 29, 33, 34, 197, 216 <i>Extra Practice</i> 672 <i>Mid-Chapter Quiz</i> 41 #7-#12 <i>Practice and Problem Solving</i> 30 #22-#33, 35 <i>Practice Test</i> 73 #5 <i>Quick Quiz</i> 195 #6-#10 <i>Real-World Example</i> 33 <i>Study Guide and Review</i> 69 #10-#12, #14-#16 <i>Test Practice</i> 74 #5</p> <p>Teacher Edition: AE 29, 33, 34</p>

STANDARDS	PAGE REFERENCES
4. use the relationships among fractions, decimals, and percents, include the concepts of ratio and proportion, in problem-solving situations;	Student Edition: <i>Mixed Problem Solving</i> 709, 711, 712 <i>Practice and Problem Solving</i> 227 #32-#36, 231 #28-#30, 317-318, 332
5. develop, test, and explain conjectures about properties of integers and rational numbers; and	The following property references can be used during class activities to meet this standard. Student Edition: <i>Concepts and Skills Bank</i> 748 <i>Explore</i> 630-631, 642-643 <i>Key Concept</i> 632, 636, 645, 652 <i>Study Tip</i> 658 Teacher Edition: IO 651a; T 632, 651; TNT 637
6. use number sense to estimate and justify the reasonableness of solutions to problems involving integers, rational numbers, and common irrational numbers such as $\sqrt{2}$, $\sqrt{5}$, and π .	Student Edition: 163, 184, 276 <i>Example</i> 156, 157, 169, 173, 174, 257, 270, 271, 276, 277, 298 <i>H.O.T. Problems</i> 172 #48, 176 #29, 267 #46 <i>Mixed Problem Solving</i> 185 <i>Real-World Example</i> 157 <i>Study Tip</i> 264 Teacher Edition: CG 184a; EA 176, 267; F 184; UR 184a
Standard 2: Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.	
1. represent, describe, and analyze patterns and relationships using tables, graphs, verbal rules, and standard algebraic notation;	Student Edition: 341, 343-348 <i>Check Your Understanding</i> 324, 346 <i>Example</i> 322, 323, 344 <i>Extra Practice</i> 689 <i>Practice and Problem Solving</i> 325-326, 346-347 <i>Practice Test</i> 359 #16, #17 <i>Real-World Example</i> 26, 324, 345 <i>Study Guide and Review</i> 358 #29-#31 <i>Test Example</i> 345 <i>Test Practice</i> 348 Teacher Edition: A 348; AE 26, 344, 345; FMC 343

STANDARDS	PAGE REFERENCES
<p>2. describe patterns using variables, expressions, equations, and inequalities in problem-solving situations;</p>	<p>The following references can be used during teacher/class discussion of patterns to meet this standard.</p> <p>Student Edition: 341 <i>Check Your Understanding</i> 51, 351 <i>Example</i> 349, 350 <i>Mixed Problem Solving</i> 342 <i>Practice and Problem Solving</i> 51-52, 352 <i>Real-World Example</i> 350, 351</p> <p>Teacher Edition: AE 50, 350, 351</p>
<p>3. analyze functional relationships to explain how a change in one quantity results in a change in another (for example, how the area of a circle changes as the radius increases, or how a person’s height changes over time);</p>	<p>The following references can be extended to meet this standard.</p> <p>Student Edition: <i>Analyze the Results</i> 520, 521 <i>H.O.T. Problems</i> 95 #17, 533 #36, 552 #32, 558 #26, LA19 #28</p> <p>Teacher Edition: CU 49a; PR 522a</p>
<p>4. distinguish between linear and nonlinear functions through informal investigations; and</p>	<p>The following function references can be used during class discussion and activities to meet this standard.</p> <p>Student Edition: 49-52, 233-236, 349-353 <i>Explore</i> 47-48 <i>Extend</i> 354</p>
<p>5. solve simple linear equations in problem-solving situations using a variety of methods (informal, formal, graphical) and a variety of tools (physical materials, calculators, computers).</p>	<p>Student Edition: 57 <i>Practice and Problem Solving</i> 59 #29-#32, 647 #18, #19, #30, 653 #20, #30, #31, 659 #20, #21, #33-#35 <i>Real-World Example</i> 58, 646, 652, 658 Also see <i>Math Connects: Concepts, Skills, and Problem Solving Course 2</i> © 2009 pages 68, 69, 164, 168.</p>

STANDARDS	PAGE REFERENCES
<p>Standard 3: Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning used in solving these problems.</p>	
<p>1. read and construct displays of data using appropriate techniques (for example, line graphs, circle graphs, scatter plots, box plots, stem-and-leaf plots) and appropriate technology;</p>	<p>Student Edition: 81, 92, 96, 370, LA25 <i>Check Your Understanding</i> 83, 93, 98, 373, LA26 <i>Example</i> 82, 83, 92, 96, 97, 371, LA25, LA26 <i>Extend</i> 86-87 <i>Extra Practice</i> 675, 676, 690 <i>H.O.T. Problems</i> 94 #16, #17, 99 #19, 374 #15 <i>Mid-Chapter Quiz</i> 101, 388 #8-#10 <i>Practice and Problem Solving</i> 84, 90 #17, 94, 98-99, 373-374, LA27-LA28 <i>Practice Test</i> 131 #1-#3, #5-#9, 411 #8, #9 <i>Real-World Example</i> 93 <i>Study Guide and Review</i> 127 #11, #12, 128, 129 #20-#22, 407 #14-#17 <i>Test Practice</i> 85, 95, 132 #2, #3, 375, 412 #6</p> <p>Teacher Edition: A 95, 375; AE 82, 93, 97, 371, 372; FMC 82, 97, 371</p>
<p>2. display and use measures of central tendency, such as mean, median, and mode, and measures of variability, such as range and quartiles;</p>	<p>Student Edition: 102, 108, 109 <i>Check Your Understanding</i> 104, 111 <i>Example</i> 102, 103, 108, 109 <i>Extra Practice</i> 676, 677 <i>Key Concept</i> 102, 108 <i>Practice and Problem Solving</i> 104-105, 111-112 <i>Practice Test</i> 131 #4, #10, #11 <i>Real-World Example</i> 109 <i>Study Guide and Review</i> 129 #23-#28 <i>Study Tip</i> 103 <i>Test Example</i> 110 <i>Test Practice</i> 113, 132 #1, #6</p> <p>Teacher Edition: A 106; AE 103, 109, 110; FMC 103; KL 102a; PS 102a; T 102, 108; TNT 109</p>

STANDARDS	PAGE REFERENCES
<p>3. evaluate arguments that are based on statistical claims;</p>	<p>This standard can be met using the following analyzing references during class discussion.</p> <p>Student Edition: <i>Analyze the Results</i> 120 #3-#6, #9 <i>Example</i> 80, 83, 97 <i>Real-World Example</i> 93 <i>Test Example</i> 110 <i>Test Practice</i> 113</p>
<p>4. formulate hypotheses, draw conclusions, and make convincing arguments based on data analysis;</p>	<p>The following page references can be expanded to meet this standard.</p> <p>Student Edition: <i>Analyze the Results</i> 87 #1 <i>Example</i> 97 <i>H.O.T. Problems</i> 95 #17, 99 #19 <i>Practice and Problem Solving</i> 90 #7, #10-#16, 94 #11, #13, #15, 98 #10, 99 #13, #15 <i>Practice Test</i> 131 #3, #9 <i>Real-World Example</i> 93</p> <p>Teacher Edition: GD 78a; VKL 96a</p>
<p>5. determine probabilities through experiments or simulations;</p>	<p>The following references can be extended through class activities to meet this standard.</p> <p>Student Edition: 381-383 <i>Check Your Understanding</i> 384 <i>Example</i> 382 <i>Extend</i> 387 <i>Practice and Problem Solving</i> 384</p> <p>Teacher Edition: ACT 381a; AE 383; AP 384</p>

STANDARDS	PAGE REFERENCES
<p>6. make predictions and compare results using both experimental and theoretical probability drawn from real-world problems; and</p>	<p>Student Edition: 395 <i>Check Your Understanding</i> 396 <i>Example</i> 395 <i>Extend</i> 387 <i>Extra Practice</i> 691 <i>H.O.T. Problems</i> 397 #17 <i>Practice and Problem Solving</i> 396-397 <i>Practice Test</i> 411 #20, #21 <i>Study Guide and Review</i> 409 #43, #44 <i>Test Practice</i> 398 <i>Writing in Math</i> 397</p> <p>Teacher Edition: ACT 381a; AE 395; AP 395</p>
<p>7. use counting strategies to determine all the possible outcomes from an experiment (for example, the number of ways students can line up to have their picture taken).</p>	<p>Student Edition: 389-390 <i>Check Your Understanding</i> 391 <i>Example</i> 389, 390 <i>Extra Practice</i> 691 <i>Get Ready for the Lesson</i> 389 <i>H.O.T. Problems</i> 392 #23 <i>Practice and Problem Solving</i> 391-392 <i>Practice Test</i> 411 #17, #18 <i>Real-World Example</i> 390 <i>Study Guide and Review</i> 409 #37-#42 <i>Test Practice</i> 393, 413 #11, #12</p> <p>Teacher Edition: AE 390; KL 389a; LR 389a; T 389</p>
<p>Standard 4: Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.</p>	
<p>1. construct two- and three-dimensional models using a variety of materials and tools;</p>	<p>Student Edition: <i>Explore</i> 485, 493, 520-521, 527, 539, 554 <i>Extend</i> 508 <i>Mini Lab</i> 486, 534, 548, 555</p> <p>Teacher Edition: AP 553; DI 525, 536; EXT 548a; FP 555a; KL 502a; M 540a; RWC 486a; TNT 495</p>

STANDARDS	PAGE REFERENCES
<p>2. describe, analyze, and reason informally about the properties (for example, parallelism, perpendicularity, congruence) of two- and three-dimensional figures ;</p>	<p>Student Edition: 486, 528, 534, 548, LA20, LA21 <i>Concepts and Skills Bank</i> 755-756 <i>H.O.T. Problems</i> 498 #27-#30 <i>Key Concept</i> 487, 494, 495 <i>Reading Math</i> 495 <i>Writing in Math</i> 491, 498</p> <p>Teacher Edition: EC 494a; FMC 495; RET 494a; T 494; TNT 495; VA 534a</p>
<p>3. apply the concepts of ratio, proportion, and similarity in problem-solving situations;</p>	<p>Student Edition: 315, 329, 334 <i>Check Your Understanding</i> 316 #7, 336 #4-#7 <i>Example</i> 315, 330, 331, 335, 336 <i>Extra Practice</i> 688 <i>Mid-Chapter Quiz</i> 340 #6, #7, #11, #16, #17 <i>Practice and Problem Solving</i> 317 #14-#17, 318 #22-#27, 332 #14-#21, 337 #16-#21, #25-#28 <i>Practice Test</i> 359 #7, #15, #16 <i>Study Guide and Review</i> 356 #15, 357 #21, #26 <i>Test Practice</i> 319, 333, 339, 360 #2, #11, #13</p> <p>Teacher Edition: AE 315, 316, 330, 335, 336; PS 329a; T 334</p>
<p>4. solve problems using coordinate geometry;</p>	<p>Student Edition: 599 <i>H.O.T. Problems</i> 603 #43 <i>Mixed Problem Solving</i> 716 #7-#11 <i>Practice and Problem Solving</i> 236 #32-#34, 602 #30-#40 <i>Real-World Example</i> 234 <i>Study Guide and Review</i> 242 #67 <i>Test Practice</i> 237, 603</p> <p>Teacher Edition: AE 234; DI 602; TNT 234</p>

STANDARDS	PAGE REFERENCES
<p>5. solve problems involving perimeter and area in two dimensions, and involving surface area and volume in three dimensions; and</p>	<p>Student Edition: <i>Mid-Chapter Quiz</i> 545 #3, #18 <i>Mixed Problem Solving</i> 715 <i>Practice and Problem Solving</i> 66 #18, #19, #24, #25, 524 #5, #6, #13, 525 #17-#19, 537 #14, #15, #18, 542 #13-#15, 551 #13, #14, #20, #21, 552 #24-#26, 557 #11, #12, #21-#24, LA24 #17, #18 <i>Practice Test</i> 73 #20, 565 #8-#10, #13 <i>Test Practice</i> 67, 74 #7, 526, 538, 553, 559, 567 #11, #12</p> <p>Teacher Edition: AE 64, 523, 536, 541, 550, 556; T 522</p>
<p>6. transform geometric figures using reflections, translations, and rotations to explore congruence.</p>	<p>Student Edition: 604-605, 610, 615 <i>Check Your Understanding</i> 606, 612, 617 #1-#4 <i>Example</i> 604, 605, 610, 611, 616 <i>Extra Practice</i> 702, 703 <i>Get Ready for the Lesson</i> 604, 610 <i>Key Concept</i> 605, 611 <i>Mini Lab</i> 615 <i>Practice and Problem Solving</i> 607 #5-#16, 612, 613 #11-#15, #17-#19, 618 #7-#13 <i>Practice Test</i> 625 #28, #30, #32 <i>Study Guide and Review</i> 623 #54-#56, 624 #58-#64 <i>Study Tip</i> 605 <i>Test Practice</i> 609, 614, 627 #12</p> <p>Teacher Edition: AE 605, 611, 616; UM 610a; UT 604a, 615a</p>

STANDARDS	PAGE REFERENCES
<p>Standard 5: Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems.</p>	
<p>1. estimate, use, and describe measures of distance, perimeter, area, volume, capacity, weight, mass, and angle comparison;</p>	<p>Student Edition: 418, 432, 437 <i>Check Your Understanding</i> 434, 439 #1-#6, 475 #1-#5 <i>Example</i> 432, 437, 438, 474, 549 <i>Explore</i> 430-431, 520-521 <i>Mini Lab</i> 418, 474 <i>Practice and Problem Solving</i> 422 #37-#41, 427 #30-#33, 428 #36, #37, 434-435, 440 #10-#21, 476 #9-#14, 543 #17, 538 #21, 552 #27 <i>Practice Test</i> 465 #15-#17, #19, #20 <i>Real-World Example</i> 433, 550 <i>Study Guide and Review</i> 462 #23-#27, 463 #28-#32, 510 #13-#15 <i>Test Practice</i> 436, 441, 478</p> <p>Teacher Edition: AE 433, 438, 475; DI 435; RM 432a; TNT 433</p>
<p>2. estimate, make, and use direct and indirect measurements to describe and make comparisons;</p>	<p>Student Edition: <i>Check Your Understanding</i> 421 #3, #4, 434 #5, #6, 439 #1-#6, 472 #1-#3, 475 #1-#5 <i>Example</i> 437, 438, 470, 474 <i>Explore</i> 430-431, 520-521, 527, 539 <i>Extend</i> 560 <i>H.O.T. Problems</i> 525 #23, #25, 544 #26 <i>Key Concept</i> 418, 424, 425, 432, 437, 471 <i>Mini Lab</i> 522, 534, 548 <i>Practice and Problem Solving</i> 421 #14-#19, 422 #37-#41, 434 #15-#20, 435 #23-#28, 440, 472 #5-#10, #16, 476 #9-#14, 524 #6, #13 <i>Real-World Example</i> 419, 433</p> <p>Teacher Edition: CG 528a; DI 435; EC 418a; O 432a</p>

STANDARDS	PAGE REFERENCES
<p>3. read and interpret various scales including those based on number lines, graphs, and maps;</p>	<p>Student Edition: 81 <i>Concepts and Skills Bank</i> 747 <i>Example</i> 82 <i>H.O.T. Problems</i> 85 #12 <i>Practice and Problem Solving</i> 84 #7</p> <p>Teacher Edition: MC 81a; T 114</p>
<p>4. develop and use formulas and procedures to solve problems involving measurement;</p>	<p>Student Edition: 418, 445 <i>Example</i> 470 <i>Explore</i> 430, 527, 539 <i>Get Ready for the Lesson</i> 528 <i>Key Concept</i> 522, 523, 529, 535, 540, 548, LA20, LA21, LA22, LA23 <i>Mini Lab</i> 522, 534, 548</p> <p>Teacher Edition: CG 528a; DI 426, 428, 550; M 540a; TNT 420</p>
<p>5. describe how a change in an object's linear dimensions affects its perimeter, area, and volume; and</p>	<p>Student Edition: <i>Analyze the Results</i> 520, 521 <i>H.O.T. Problems</i> 533 #36, 552 #32, 558 #26, LA19 #28</p> <p>Teacher Edition: PR 522a</p>
<p>6. select and use appropriate units and tools to measure to the degree of accuracy required in a particular problem-solving situation.</p>	<p>Student Edition: <i>Check Your Understanding</i> 434 #1-#4, 439 #1-#6 <i>Example</i> 432, 437, 438 <i>Practice and Problem Solving</i> 434 #7-#14, 440 #10-#21 <i>Test Practice</i> 441</p> <p>Teacher Edition: DI 426; SQ 418; T 432; TNT 433, 534, 550</p>

STANDARDS	PAGE REFERENCES
<p>Standard 6: Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.</p>	
<p>1. use models to explain how ratios, proportions, and percents can be used to solve real-world problems;</p>	<p>The following references can be modeled to meet this standard.</p> <p>Student Edition: 315 <i>Example 315</i> <i>Extend 328, 354</i> <i>Get Ready for the Lesson 322</i></p> <p>Teacher Edition: AP 336; DI 331, 366; PS 329a; RET 329a; RWE 334a; SQ 334; T 349, 365, 401</p>
<p>2. construct, use, and explain procedures to compute and estimate with whole numbers, fractions, decimals, and integers;</p>	<p>Student Edition: <i>Analyze the Results 155, 281 #4</i> <i>Concept Summary 152</i> <i>Example 142, 156, 163, 263, 264, 288, 294, 298</i> <i>Key Concept 146, 257, 263, 270, 282, 287, 293, 578, 582, 587, 595</i> <i>Mini Lab 256</i> <i>Quick Review 17, 23</i> <i>Writing in Math 160, 166, 172, 260, 290, 301</i></p> <p>Teacher Edition: T 142, 163; UVR 293a</p>
<p>3. develop, apply, and explain a variety of different estimation strategies in problem-solving situations, and explain why an estimate may be acceptable in place of an exact answer; and</p>	<p>Student Edition: 150-151, 249, 276, 401 <i>Concept Summary 152</i> <i>Concepts and Skills Bank 741-742</i> <i>Example 150, 276, 277</i> <i>H.O.T. Problems 404 #29</i> <i>Real-World Example 402</i> <i>Study Tip 264</i> <i>Test Example 151, 403</i> <i>Test Practice 279, 405</i> <i>Writing in Math 154, 404</i></p> <p>Teacher Edition: AE 151, 403; CM 249; FMC 152, 277, 402; RWA 146a; UC 150a; UG 150a</p>

STANDARDS	PAGE REFERENCES
<p>4. select and use appropriate algorithms for computing with commonly used fractions and decimals, percents, and integers in problem-solving and determine whether the results are reasonable.</p>	<p>Student Edition: 210, 256, 263, 298 <i>Example</i> 156, 163, 164, 169, 173, 179, 180, 257, 258, 264, 270, 271, 282, 287, 294, 298 <i>Key Concept</i> 257, 263, 270, 282, 287, 293, 401, 578, 582, 587, 595 <i>Writing in Math</i> 172, 290, 301, 404</p> <p>Teacher Edition: CN 209a; DI 180; F 184; FMC 170, 174, 180, 210, 264, 271, 287, 294, 578, 583, 595; O 270a; SP 263a; TNT 157, 166, 210, 598; UP 169a; UVR 293a</p>