



IMPACT MATHEMATICS

Algebra and More

Course 2
© 2004

STANDARDS		PAGE REFERENCES
<u>GRADE 7</u>		
<u>Standard 1: Number and Operation</u>		
Students in Grade 7 read, write, compare, order, and place on a number line: rational numbers, including integers, fractions, and decimals, and absolute values. Students solve problems requiring the conversion between simple decimals, fractions, and percents. Students add, subtract, multiply, and divide whole numbers, fractions, and decimals and students evaluate numerical expressions using the order of operations with whole numbers and decimals. Students explain when estimation is appropriate and describe the usefulness of an estimate as opposed to an exact answer.		
Goal 1.1: Understand and use numbers.		
Objective(s): By the end of Grade 7, the student will be able to:		
7.M.1.1.1	Compare magnitudes and relative magnitudes of rational numbers, including integers, fractions, and decimals. (327.01.a , 327.01.c)	Student Edition: 209 #42, #43, 211 #62, 225 #9, #10, 231, 239 #42-#44, 261, 339 #19, 630-631, 649 Teacher's Guide: 217a
7.M.1.1.2	Solve problems requiring the conversion between simple decimals, fractions, ratios, and percents. (327.01.b)	Student Edition: 140 #36, 311 #5, #6, 520-521, 527-528, 532 #1, 536 #25, #28, 565 #5-#7, 581 #34, 587

STANDARDS		PAGE REFERENCES
7.M.1.1.3	Locate the position of rational numbers on a number line. (327.01.e)	Student Edition: 222-227, 255 Teacher's Guide: T222
7.M.1.1.4	Rewrite multiple factors using exponents. (327.02.c)	Student Edition: 13, 15, 25 #19, #21, 90 #19-#21, 158 #1-#6, 215 #18, #19, 240 #62-#73 Teacher's Guide: T13
7.M.1.1.5	Apply the number theory concepts of primes, composites, and prime factorization and find the Least Common Multiple (LCM) and the Greatest Common Factor (GCF). (327.01.d)	Student Edition: 51 #29, 73 #55, 107 #39, 108 #40-#43, 148 #56, 163 #59, 175 #81-#83, 343 #52-#54
7.M.1.1.6	Recognize pertinent information for problem solving. (328.01.b)	Student Edition: 31 #67, 88 #14, 124 #9, 241 #80, 292 #85, 513 #36, 619 #8
7.M.1.1.7	Describe the use of integers in real-world situations.	Student Edition: 222-227, 230 #5, #6, 249 #1, #2, 257-258
7.M.1.1.8	Use appropriate vocabulary.	Student Edition: 13, 107 #39, 149, 163 #59, 175 #81-#83, 343 #52-#55, 427, 521 Teacher's Guide: 217a
Goal 1.2: Perform computations accurately.		
Objective(s): By the end of Grade 7, the student will be able to:		
7.M.1.2.1	Recall the common equivalent fractions, decimals, and percents of halves, fourths, and tenths.	Student Edition: 51 #30, 126 #24, 418 #44, 496 #24
7.M.1.2.2	Add, subtract, multiply, and divide whole numbers, fractions and decimals; and add, multiply, and divide integers. (327.02.a, 327.02.d)	Student Edition: 51 #19-#22, 73 #56-#61, 90 #28-#33, #34-#37, 163 #62-#70, 212 #76-#81, 225 #9, 250 #21-#24, 342 #40-#42, 394 #19-#22
7.M.1.2.3	Evaluate whole numbers in exponential form.	Student Edition: 192, 198 #9-#15, 211 #61
7.M.1.2.4	Evaluate numerical expressions using the order of operations with whole numbers and decimals. (327.02.b)	Student Edition: 14, 15 #8-#12, 155

STANDARDS		PAGE REFERENCES
7.M.1.2.5	Select and use an appropriate method of computation from mental math, paper and pencil, calculator, or a combination of the three. (327.02.e)	Student Edition: 39 #5, 47 #10, 171 #15, 237 #29-#32, 251 #32-#37, 427, 623 #14-#16 Teacher's Guide: T561
7.M.1.2.6	Use a variety of strategies including common mathematical formulas to compute problems drawn from real life situations. (328.01.a)	Student Edition: 9, 32-33, 37-39, 49 #16, 79, 191 #2-#4, 261, 407 #15, 413 #9, 420 #2, 522 <i>Lab Investigation</i> 42-45, 119-121
7.M.1.2.7	Use appropriate vocabulary and notations. (327.02.f)	Student Edition: 5-6, 14, 37, 149, 155, 196, 251 #30
Goal 1.3: Estimate and judge reasonableness of results.		
Objective(s): By the end of Grade 7, the student will be able to:		
7.M.1.3.1	Estimate to predict computation results. (327.03.a)	Student Edition: 33, 190-192, 292 #85, 327 #1-#6, 424 #1, #2, 594 #10, 630, 721 #10e
7.M.1.3.2	Explain when estimation is appropriate and describe the usefulness of an estimate as opposed to an exact answer. (327.03.b)	Student Edition: 48 #11, 191 #4, 269, 292 #85, 327 #1-#6, 536 #28, 588 #1-#4, 589, 591 #5, 592 #6, 594 #10, 597 #4, 630, 637 #8
7.M.1.3.3	Identify whether a given estimate is an overestimate or underestimate. (327.03.c)	Student Edition: 327 #1-#6, 588 #1-#4, 589, 591 #5, 592 #6, 594 #10, 637 #8 Teacher's Guide: T588
7.M.1.3.4	Use a four-function calculator to solve complex grade-level problems.	The following pages can be used to help meet this standard. Student Edition: 47 #10, 88 #14, 578 #25, 582 #37
7.M.1.3.5	Formulate conjectures and discuss why they must be or seem to be true. (328.02.c)	Student Edition: 47 #10, 48 #12, 292 #85, 327, 336, 588-589, 594 #10, 637 #8
7.M.1.3.6	Use appropriate vocabulary and notations. (327.03.d)	Student Edition: 422, 588 (1-4), 594 #10, 630 #2, #3

STANDARDS		PAGE REFERENCES
Standard 2: Concepts and Principles of Measurement		
Students in Grade 7 select and use appropriate units and tools to make formal measurements in both systems. Students apply given formulas for perimeter, circumference, or area of triangles, circles, and quadrilaterals. Students solve problems involving perimeter and area of rectangles and squares. Students compare units and explain their relationship to one another and to real-world applications.		
Goal 2.1: Understand and use U.S. customary and metric measurements.		
Objective(s): By the end of Grade 7, the student will be able to:		
7.M.2.1.1	Select and use appropriate units and tools to make formal measurements in both systems. (329.01.a)	Student Edition: 4, 48 #11, 49 #16, 201 #6, 244 #2, 251 #30, 291 #73, 539 #48, 621 #10, 633, 636 #6
7.M.2.1.2	Apply estimation of measurement to real-world and content problems using standard measuring devices. (329.01.b)	Student Edition: 31 #66, 89 #16, 211 #62, 269, 317 #6, 321, 327, 495 #16, 588-589, 591 #5, 594 #10, 629-630, 637 #8 <i>Lab Investigation</i> 551-553
7.M.2.1.3	Explain the differences between perimeter, area, and volume (capacity) and their measures within both systems. (329.01.c)	Student Edition: 342 #36, 483 #2, #3, 484, 661 #3
7.M.2.1.4	Given the formulas, find the perimeter, circumference, or area of triangles, circles, and quadrilaterals. (331.01.e)	Student Edition: 39 #5, 73 #72, #73, 113 #3, 320 #17, 433 #67, #68, 486 #1a, 488 #2, 489, 636 #6
7.M.2.1.5	Convert units of measurement within each system. (329.01.e)	Student Edition: 135, 181, 289 #52, 315 #3g, 318, 340, 643 #29-#32 <i>Lab Investigation</i> 119-121 Teacher's Guide: T302
7.M.2.1.6	Solve problems involving perimeter and area of rectangles and triangles. (329.01.d)	Student Edition: 29 #45, 89 #17, 267 #17, 357, 483 #2, #3, 484, 493 #7
7.M.2.1.7	Use appropriate vocabulary and notations. (329.01.f)	Student Edition: 314 #1, 482-484, 495 #16, 539 #48, 588, 629 #3, 636 #6

STANDARDS		PAGE REFERENCES
Goal 2.2: Apply the concepts of rates, ratios, and proportions.		
Objective(s): By the end of Grade 7, the student will be able to:		
7.M.2.2.1	Explain rates and their relationship to ratios, and use proportions to solve problems represented with a diagram. (329.02.a, 329.03.a)	Student Edition: 305-308, 309-311, 316 #4, 317 #6, 318 #11, 378, 456-460, 520-524, 527-528, 540-542, 545-548 <i>Family Letter</i> 519 Teacher's Guide: TG 519
7.M.2.2.2	Reduce rates to unit rates.	Student Edition: 301, 305-308, 316 #5, 529-531, 535, 538, 691 #30 Teacher's Guide: T530
Goal 2.3: Apply dimensional analysis.		
Objective(s): By the end of Grade 7, the student will be able to:		
7.M.2.3.1	Identify properly constructed dimensional analysis conversions. (329.04.a)	After providing the definition, the following pages can be used to illustrate this standard. Student Edition: 49 #16, 331, 334 #1d, 339 #19, 630
Standard 3: Concepts and Language of Algebra and Functions		
Students in Grade 7 use variables in simple expressions and equations and students use symbols "<," ">," "=", "≠," "≤," and "≥" to express relationships. Students use the order of operations in evaluating simple algebraic expressions and students solve one-step equations. Students extend patterns involving rational numbers and describe the rule that generates the pattern.		
Goal 3.1: Use algebraic symbolism as a tool to represent mathematical relationships.		
Objective(s): By the end of Grade 7, the student will be able to:		
7.M.3.1.1	Use variables in simple expressions and equations. (330.01.a)	Student Edition: 4-9, 23 #9, 29 #45, 34-36, 167 #1-#6, 339 #19, 434
7.M.3.1.2	Translate simple word statements into algebraic expressions and equations. (330.01.b)	Student Edition: 10-12, 23-24, 28 #40, 29 #45, 37-41, 46 #1, 49 #16, 386-387, 417 #33, 446 #5 <i>Family Letter</i> 383 <i>Lab Investigation</i> 42-45
7.M.3.1.3	Use symbols "<," ">," "=", "≠," "≤," and "≥" to express relationships. (330.01.c)	Student Edition: 49, 163, 232, 357, 580 #31

STANDARDS		PAGE REFERENCES
Goal 3.2: Evaluate algebraic expressions.		
Objective(s): By the end of Grade 7, the student will be able to:		
7.M.3.2.1	Evaluate simple numeric and algebraic expressions using commutative, associative, identity, zero, inverse, distributive, and substitution properties. (330.02.a)	Student Edition: 11 #3, 13-17, 25 #24-#26, 29 #42, 52-54, 62, 65, 71 #40, 75 #10-#15, 155, 239 #47-#49, 427, 485 Teacher's Guide: T32, T52, T418
7.M.3.2.2	Use the order of operations in evaluating simple algebraic expressions. (330.02.b)	Student Edition: 14, 155
Goal 3.3: Solve algebraic equations and inequalities.		
Objective(s): By the end of Grade 7, the student will be able to:		
7.M.3.3.1	Solve one-step equations. (330.03.a)	This text covers multi-step problems. Student Edition: 20-21, 30 #47, 382-421, 545-548
Goal 3.4: Understand the concept of functions.		
Objective(s): By the end of Grade 7, the student will be able to:		
7.M.3.4.1	Extend patterns involving rational numbers and describe the rule that generates the pattern. (333.01.a)	Student Edition: 69 #8, #9, 71 #38, 86 #9, 87 #10, 242, 301-302, 307 #1-#4, 337, 346, 349 #1, 358-359, 365, 644
7.M.3.4.2	Explain how a change in one quantity impacts a change in another quantity. (333.01.b)	Student Edition: 86 #9, 87 #10, 149-151, 160 #11, 162 #51, #52, 164-165, 265 #6, 303, 304 #2, 364, 602-605, 632 #3, 641 #14
7.M.3.4.3	Use appropriate vocabulary and notations. (333.01.c)	Student Edition: 20, 162 #51, #52, 303
Goal 3.5: Represent equations, inequalities and functions in a variety of formats.		
Objective(s): By the end of Grade 7, the student will be able to:		
7.M.3.5.1	Represent a simple set of data in a table, as a graph, and as a mathematical relationship. (333.02.a)	Student Edition: 58, 69, 181 #4, 188 #23, 302 #4, 304 #3, 365, 632, 644, 648-649, 653 #5
Goal 3.6: Apply functions to a variety of problems.		
Objective(s): By the end of Grade 7, the student will be able to:		
7.M.3.6.1	Use patterns and linear functions to represent and solve simple problems. (333.03.a)	Student Edition: 345-347, 348-350, 351-353, 362-364, 365-367

STANDARDS		PAGE REFERENCES
Standard 4: Concepts and Principles of Geometry		
Students in Grade 7 describe and classify relationships among types of one-, two-, and three-dimensional geometric figures using their defining properties. Students draw and measure various angles and shapes using appropriate tools and students identify congruence, similarities, and line symmetry of shapes. Students identify and plot points on a coordinate plane.		
Goal 4.1: Apply concepts of size, shape, and spatial relationships.		
Objective(s): By the end of Grade 7, the student will be able to:		
7.M.4.1.1	Classify relationships among types of one- and two-dimensional geometric figures, using their defining properties. (331.01.a)	Student Edition: 373 #13, 467 #21
7.M.4.1.2	Draw and measure various angles and shapes using appropriate tools. (331.01.b)	Student Edition: 292 #83, 471, 474 <i>Lab Investigation</i> 551-553, 608-609
7.M.4.1.3	Apply fundamental concepts, properties, and relationships among points, lines, rays, planes, and angles. (331.01.c)	Student Edition: 187 #20, 276-277, 444 #18, 450-453, 454-455, 457-458, 461-463, 475
7.M.4.1.4	Explain and model the effects of reflections, translations, and rotations on various shapes. (331.01.g)	Dilations are covered on the following pages. Student Edition: 482, 485, 490-491, 493
7.M.4.1.5	Identify congruence, similarities, and line symmetry of shapes. (331.01.d)	Student Edition: 444 #18, 450-453, 454-455, 457-458, 461-463, 464, 466, 471, 559 #22, 560 #39-#42 <i>Family Letter</i> 449
7.M.4.1.6	Describe the concept of surface area and volume (capacity). (331.01.f)	Student Edition: 42, 98-99, 109-111, 118, 126 #17, 132, 134-135, 137 #9, 139 #20, 515 #7, 583 #54, #55 Teacher's Guide: T98, T135
7.M.4.1.7	Use appropriate vocabulary and symbols. (331.01.h)	Student Edition: 98, 187, 292, 451, 482, 583

STANDARDS		PAGE REFERENCES
Goal 4.2: Apply the geometry of right triangles.		
No objectives at this grade level.		
Goal 4.3: Apply graphing in two dimensions.		
Objective(s): By the end of Grade 7, the student will be able to:		
7.M.4.3.1	Identify and plot points on a coordinate plane.	Student Edition: 254-256, 257, 259-261, 264, 270, 279 #29, 302-304, 443 #88 Teacher's Guide: T257
Standard 5: Data Analysis, Probability, and Statistics		
Students in Grade 7 read and interpret tables, charts, and graphs, including frequency tables, scatter plots, line graphs, line plots, bar graphs, histograms, circle graphs, and stem-and-leaf plots. Students collect, organize and display data with appropriate notation in tables, charts and graphs, including scatter plots, line graphs, line plots, bar graphs, and stem-and-leaf plots. Students determine the measures of central tendency – mean, median and mode – with sets of data and students predict, perform, and record results of simple probability experiments.		
Goal 5.1: Understand data analysis.		
Objective(s): By the end of Grade 7, the student will be able to:		
7.M.5.1.1	Read and interpret tables, charts, and graphs, including frequency tables, scatter plots, broken line graphs, line plots, bar graphs, histograms, circle graphs, and stem-and-leaf plots. (332.01.a)	Student Edition: 188-189 #23, 238 #40, 408 #30, 513 #36, 579 #28, 584 #57, 620, 685 #4, 706 #17, 709 <i>Lab Investigation</i> 312-313, 608-619
7.M.5.1.2	Explain conclusions drawn from tables, charts, and graphs. (332.01.b)	Student Edition: 140 #36, 188-189 #23, 408 #30, 513 #36, 579 #28, 584 #57, 620, 687 #6, 714-717, 722 #13 <i>Lab Investigation</i> 312-313
7.M.5.1.3	Use appropriate vocabulary and notations. (332.01.c)	Student Edition: 188-189 #23, 579 #28, 620 <i>Lab Investigation</i> 312-313
Goal 5.2: Collect, organize, and display data.		
Objective(s): By the end of Grade 7, the student will be able to:		
7.M.5.2.1	Collect, organize, and display data with appropriate notation in tables, charts and graphs, including scatter plots, broken line graphs, line plots, bar graphs, and stem-and-leaf plots. (332.02.a)	Student Edition: 140 #36, 341 #33, 593 #9, 675 #14, 699, 706 #17, 709, 714-717 <i>Lab Investigation</i> 220-222, 312-313, 608-609

STANDARDS		PAGE REFERENCES
Goal 5.3: Apply simple statistical measurements.		
Objective(s): By the end of Grade 7, the student will be able to:		
7.M.5.3.1	Determine the measures of central tendency – mean, median and mode – with sets of data. (332.03.a)	Student Edition: 31 #67, 238 #40, 242, 267 #20, 561, 659 #21, 695, 711 #2, 713 #2, 721 #10
7.M.5.3.2	Discuss distribution of data, including range, frequency, gaps, and clusters. (332.03.b)	Student Edition: 267 #6, 709-711, 713 #4
Goal 5.4: Understand basic concepts of probability.		
Objective(s): By the end of Grade 7, the student will be able to:		
7.M.5.4.1	Predict, perform, and record results of simple probability experiments. (332.04.a)	Student Edition: 188 #22, 253 #65, 267 #20, 418 #20, 668-671, 674, 686 #2, 725 #3 <i>Lab Investigation</i> 220-222, 312-313 Teacher's Guide: T221
7.M.5.4.2	Recognize equally likely outcomes. (332.04.c)	Student Edition: 127 #31, 188 #22, 267 #20, 418 #50, 676-677, 686 #2, 703 #9, 725 #2
7.M.5.4.3	Explain that probability ranges from impossible to certain (0% to 100%).	Student Edition: 127 #31, 253 #65, 418 #20, 672 #3, 703 #9
7.M.5.4.4	Use the language of probability. (332.04.b)	Student Edition: 188 #22, 418 #20, 672 #3, 676-677
Goal 5.5: Make predictions or decisions based on data.		
Objective(s): By the end of Grade 7, the student will be able to:		
7.M.5.5.1	Make predictions based on simple theoretical probabilities. (332.05.a)	Student Edition: 292 #85, 692, 695-696, 703 #9 <i>Lab Investigation</i> 203-205, 220-222, 312-313, 608-609
7.M.5.5.2	Use appropriate vocabulary and notations. (332.05.b)	Student Edition: 695-696, 703 #9 <i>Lab Investigation</i> 220-222, 312-313