



MathScape

Seeing and Thinking Mathematically

Course 2

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STANDARDS	PAGE REFERENCES
<p>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.</p>	
<p>In grade 7, what students know and are able to do include</p>	
<p>1.1 Demonstrating meanings for integers*, rational numbers*, percents, exponents, square roots* and pi (p) using physical materials and technology in problem-solving situations.</p>	
<p>1.1a Recognize and use equivalent representations of positive rational numbers.</p>	<p>Student Edition: 16-17, 18-19, 28-29, 30-31, 38, 39, 42, 43 Teacher's Guide: 3G, 19A, 24, 25 Quick Review Math Handbook Book 2: 152-157, 159</p>
<p>1.1b Use models to represent integers.</p>	<p>Student Edition: 96-97, 98-99, 100-101, 124, 126 Teacher's Guide: 94, 95, 96A 100A Quick Review Math Handbook Book 2: 90, 91, 158</p>
<p>1.1c Use exponents to indicate how many times a base is used as a factor for positive integers.</p>	<p>Student Edition: 106-107, 110-111, 112-113, 128, 130, 131 Teacher's Guide: 93H, 104, 105, 112A Quick Review Math Handbook Book 2: 164, 166, 167, 171</p>

STANDARDS	PAGE REFERENCES
1.2 Reading, writing, and ordering integers, rational numbers, and common irrational numbers* such as $\sqrt{2}$, $\sqrt{5}$, and π .	
1.2a Read, write, order, and compare positive rational numbers and integers.	Student Edition: 6-7, 10-11, 16-17, 18-19, 26-27, 28-29, 30-31, 34, 36, 38, 39, 42-44, 161, 163 Teacher's Guide: 3G, 6A, 10A, 19A, 24, 25, 26A Quick Review Math Handbook Book 2: 73, 90, 112, 128
1.2b Locate positive rational numbers and integers on a number line.	Student Edition: 26-27, 186-187, 213 Teacher's Guide: 24, 186A Quick Review Math Handbook Book 2: 90, 126, 139
1.3 Applying number theory concepts (for example, primes, factors, multiples) to represent numbers in various ways.	
1.3a Describe numbers by their characteristics (for example, even, odd, prime, composite, divisibility, square).	Student Edition: 86, 106-107, 108-109, 110-111, 112-113, 116-117, 118-119, 120-121, 128-133 Teacher's Guide: 104, 105, 106A, 109A, 114, 115, 119A Quick Review Math Handbook Book 2: 84, 85, 172-176
1.4 Using the relationships among fractions, decimals, and percents, including the concepts of ratio and proportion, in problem-solving situations*.	
1.4a Use the relationships among fractions, decimals, and percents including the concepts of ratio and proportion in problem-solving situations.	Student Edition: 16-17, 18-19, 20-21, 22-23, 28-29, 39-41, 140-141, 142-143, 144-145, 168-170 Teacher's Guide: 14, 15, 16A, 20A, 138, 139 Quick Review Math Handbook Book 2: 138, 142-144, 153-156, 292-294
1.5 Developing, testing, and explaining conjectures* about properties of integers* and rational numbers.	Student Edition: 98-99, 100-101, 102-103, 127, 188-189, 214, 238-239, 262 Teacher's Guide: 93G, 99A, 102A, 103A, 183, 189A Quick Review Math Handbook Book 2: 76-78

STANDARDS	PAGE REFERENCES
1.6 Using 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 .	
1.6a Estimate, solve and justify the reasonableness of solutions to problems involving positive rational numbers or integers.	<p>Student Edition: 10-11, 12-13, 26-27, 146-147, 154-155, 160-161, 162-163, 171, 176, 177, 298-299, 312</p> <p>Teacher's Guide: 10A, 26A, 27A, 146A, 154A, 161A, 162A, 298A, 299A</p> <p>Quick Review Math Handbook Book 2: 132, 134, 139-140, 149, 173-175</p>
<p>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.</p> <hr/> <p>In grade 7, what students know and are able to do include</p> <hr/>	
2.1 Representing, describing, and analyzing patterns* and relationships using tables, graphs, verbal rules, and standard algebraic notation.	
2.1a Represent, describe, and analyze numeric or geometric patterns involving common positive rational numbers or integers using tables, graphs, rules, or symbols.	<p>Student Edition: 39 #6, 86, 106-107, 112-113, 116-117, 120-121, 127, 132</p> <p>Teacher's Guide: 104, 107A, 112A, 114, 115</p> <p>Quick Review Math Handbook Book 2: 303</p>
2.2 Describing patterns using variables, expressions, equations, and inequalities in problem-solving situations.	
2.2a Solve problems by representing and analyzing patterns involving positive rational numbers or integers using tables, graphs, or rules.	<p>Student Edition: 86, 106-107, 112-113, 116-117, 120-121, 127, 132, 184-185, 186-187, 198, 210, 213, 218</p> <p>Teacher's Guide: 104, 107A, 112A, 114, 115</p> <p>Quick Review Math Handbook Book 2: 303</p>
2.3 Analyzing 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).	
2.3a Predict and describe how a change in one quantity results in a change in another quantity in a linear relationship.	<p>Student Edition: 196-202, 217-219 (linear graph)</p> <p>Also see <i>MathScape: Seeing and Thinking Mathematically Course 3</i> © 2005</p> <p>138-139, 158-159, 160-161, 162-163, 174</p>

STANDARDS	PAGE REFERENCES
2.4 Distinguishing between linear and nonlinear functions* through informal investigations.	<p>Student Edition: 196-202, 217-219 (linear graph) Also see <i>MathScape: Seeing and Thinking Mathematically Course 3</i> © 2005 138-139, 158-159, 160-161, 162-163, 174</p> <p>Teacher's Guide: Quick Review Math Handbook Book 2: 302-319</p>
2.5 Solving simple linear equations in problem-solving situations using a variety of methods (informal, formal, and graphical) and a variety of tools (physical materials, calculators, and computers).	
2.5a Solve simple linear equations in problem-solving situations using a variety of methods (informal, formal, or graphic).	<p>Student Edition: 194-195, 196-197, 204-205, 208-209, 220-222</p> <p>Teacher's Guide: 197A, 202, 203, 204A, 209A</p> <p>Quick Review Math Handbook Book 2: 276-289</p>
2.5b Translate written words to algebraic expressions/equations and conversely, algebraic expressions/equations to words.	<p>Student Edition: 184-185, 188-189, 190-191, 198-199, 215, 218, 219</p> <p>Teacher's Guide: 182, 183, 184A, 188A, 192, 193</p> <p>Quick Review Math Handbook Book 2: 260-267</p>
<p>Standard 3: Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning and processes used in solving these problems.</p> <hr/> <p>In grade 7, what students know and are able to do include</p> <hr/> <p>3.1 Reading and constructing displays of data using appropriate techniques (for example, line graphs, circle graphs, scatterplots*, box plots*, stem-and-leaf plots*) and appropriate technology.</p>	
3.1a Construct a histogram or stem-and-leaf plot from a set of given data.	<p>See <i>MathScape: Seeing and Thinking Mathematically Course 3</i> © 2005</p> <p>Student Edition: 12-13, 16-17, 37, 38</p> <p>Quick Review Math Handbook Book 2: 200, 203, 204, 205, 208</p>

STANDARDS	PAGE REFERENCES
3.1b Read, interpret, and draw conclusions from histograms, circle graphs, stem-and-leaf plots, and scatterplots.	Student Edition: 28-29, 32-33, 43, 244-245, 264 Teacher's Guide: 3H, 24, 25, 242 Quick Review Math Handbook Book 2: 200, 203, 204, 205, 208
3.2 Displaying and using measures of central tendency*, such as mean, median, and mode, and measures of variability*, such as range and quartiles.	
3.2a Given a display of data (for example, line plot, stem-and-leaf plot, list of data), determine the mean, mode, median and range.	Student Edition: 74-75, 76-77, 90, 91, 163, 177 Teacher's Guide: 76A Quick Review Math Handbook Book 2: 210, 213, 214, 215
3.3 Evaluating arguments that are based on statistical claims.	
3.3a Evaluate arguments that are based on measures of central tendency or data displays.	Student Edition: 74-75, 76-77, 90, 91, 163, 177 Teacher's Guide: 76A Quick Review Math Handbook Book 2: 210, 213, 214, 215
3.4 Formulating hypotheses, drawing conclusions, and making convincing arguments based on data analysis.	
3.4a Analyze data and draw conclusions to predict future outcomes based on data displays such as histograms and stem-and-leaf plots.	Student Edition: 28, 43 Also see <i>MathScape: Seeing and Thinking Mathematically Course 3</i> © 2005 12-13, 16-17, 37, 38 Quick Review Math Handbook Book 2: 200, 203, 204, 205, 208
3.5 Determining probabilities through experiments or simulations.	Student Edition: 52-53, 54-55, 66-67, 70-71, 74-75, 76-77, 78-79, 89-91 Teacher's Guide: 48, 49, 64, 65, 67A, 72, 73, 74A, 75A, 76A Quick Review Math Handbook Book 2: 190, 193, 225, 235

STANDARDS	PAGE REFERENCES
3.6 Making predictions and comparing results using both experimental and theoretical probability drawn from real-world problems*.	
3.6a Report the probability of an event in fraction, decimal and percent form.	<p>Student Edition: 54-55, 58-59, 60-61, 62-63, 68-69, 70-71, 74-75, 78-79, 90-91</p> <p>Teacher's Guide: 49, 54A, 58A, 75A, 77A</p> <p>Quick Review Math Handbook Book 2: 227, 229, 230, 235</p>
3.6b Determine the probability of simple independent events (for example, tossing a coin and rolling a die).	<p>Student Edition: 50-51, 52-53, 54-55, 58-59, 60-61, 62-63, 66-67, 68-69, 80, 81, 83, 86, 87</p> <p>Teacher's Guide: 50A, 52A, 54A, 56, 57, 64</p> <p>Quick Review Math Handbook Book 2: 228, 229, 232</p>
3.6c Make predictions based on theoretical probability.	<p>Student Edition: 52-53, 54-55, 66-67, 68-69, 70-71, 81 #9, 82, 86-88</p> <p>Teacher's Guide: 48, 49, 57, 58, 64, 65</p> <p>Quick Review Math Handbook Book 2: 224, 225, 226, 235</p>
3.7 Using 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).	
3.7a Determine the number of possible outcomes for a given event using a variety of strategies, such as tree diagrams or organized lists.	<p>See <i>MathScape: Seeing and Thinking Mathematically Course 3</i> © 2005</p> <p>Student Edition: 28-29, 33, 43, 45</p> <p>Teacher's Guide: 24-25</p> <p>Quick Review Math Handbook Book 2: 216, 217, 218-221, 226</p>

STANDARDS	PAGE REFERENCES
<p>Standard 4: Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.</p> <hr/> <p>In grade 7, what students know and are able to do include</p>	
<p>4.1 Constructing two- and three-dimensional models using a variety of materials and tools.</p>	<p>Student Edition: 144-145, 150-151, 152-153, 164-165, 166-167, 172, 179, 278-279, 280-281, 284-285, 288-289, 296-297, 300-301</p> <p>Teacher's Guide: 144A, 150A, 290A, 300A</p> <p>Quick Review Math Handbook Book 2: 338, 345</p>
<p>4.2 Describing, analyzing, and reasoning informally about the properties (for example, parallelism, perpendicularity, congruence) of two- and three-dimensional figures.</p>	
<p>4.2a Describe, analyze and reason informally about the attributes of two- and three-dimensional shapes (for example, angles, sides, edges, faces, vertices).</p>	<p>Student Edition: 150-151, 152-153, 164-165, 166-167, 170, 179, 276-277, 278-279, 284-285, 288-289, 290-291, 300-301</p> <p>Teacher's Guide: 137G, 152A, 284A, 285A, 291A, 301A</p> <p>Quick Review Math Handbook Book 2: 327-330, 334-339</p>
<p>4.3 Applying the concept of ratio, proportion, and similarity* in problem-solving situations.</p>	
<p>4.3a Identify and compare similar shapes using ratio, proportion, or scale factor.</p>	<p>Student Edition: 140-141, 142-143, 144-145, 164-165, 168, 169, 170, 178, 280-281, 300-301, 305, 313</p> <p>Teacher's Guide: 138, 139, 140A, 141A, 143A, 280A, 300A</p> <p>Quick Review Math Handbook Book 2: 408-411</p>
<p>4.4 Solving problems using coordinate geometry*.</p>	
<p>4.4a Construct a coordinate graph and plot ordered integer pairs in all four quadrants.</p>	<p>Student Edition: 194-195, 216, 244-245, 264, 288-289, 308</p> <p>Teacher's Guide: 194A, 288A</p> <p>Quick Review Math Handbook Book 2: 300-302, 307</p>

STANDARDS	PAGE REFERENCES
4.5 Solving problems involving perimeter and area in two dimensions, and involving surface area and volume* in three dimensions.	
4.5a Solve problems involving the circumference of a circle (formulas not provided).	<p>Student Edition: 294-295, 310</p> <p>Teacher's Guide: 292, 293</p> <p>Quick Review Math Handbook Book 2: 373</p>
4.5b Solve problems involving the areas of circles, triangles, and parallelograms (formulas not provided).	<p>Student Edition: 146-147, 154-155, 164-165, 171, 174, 178, 298-299, 311</p> <p>Teacher's Guide: 138, 139, 148, 149</p> <p>Quick Review Math Handbook Book 2: 338, 357, 359, 376</p>
4.5c Solve problems involving the surface area of rectangular prisms (formulas not provided).	<p>See <i>MathScope: Seeing and Thinking Mathematically Course 3</i> © 2005</p> <p>Student Edition: 104-105, 126</p> <p>Teacher's Guide: 102</p> <p>Quick Review Math Handbook Book 2: 362</p>
4.6 Transforming geometric figures using reflections*, translations*, and rotations* to explore congruence.	
4.6a Use reflections, translations, and/or rotations, to determine congruence between figures.	<p>Student Edition: 278-279, 288-289, 290-291, 300-301, 304, 308, 309, 313</p> <p>Teacher's Guide: 271G, 273, 283, 289A</p> <p>Quick Review Math Handbook Book 2: 344, 345-349</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 involved in solving these problems.</p> <hr/> <p>In grade 7, what students know and are able to do include</p> <hr/> <p>5.1 Estimating, using, and describing measures of distance, perimeter, area, volume, capacity*, weight, mass, and angle comparison.</p>	
<p>5.1a Estimate area of irregular shapes, angle measurement, or weight of common objects.</p>	<p>Student Edition: 6-7, 34, 158-159, 164-165, 168, 178, 274-275, 302</p> <p>Teacher's Guide: 160A, 272, 273, 274A</p> <p>Quick Review Math Handbook Book 2: 328, 404</p>
<p>5.2 Estimating, making, and using direct and indirect measurements to describe and make comparisons.</p>	
<p>5.2a Estimate, make, and use direct and indirect measurements to describe and make comparisons.</p>	<p>Student Edition: 140-141, 142-143, 144-145, 164-165, 168-170, 173, 178, 198-199, 212 #20, 217#16, 218</p> <p>Teacher's Guide: 143A, 158, 159, 199A</p> <p>Quick Review Math Handbook Book 2: 328-330, 353, 379, 392, 393, 395-399</p>
<p>5.3 Reading and interpreting various scales including those based on number lines, graphs, and maps.</p>	
<p>5.3a Read and interpret scales on number lines, graphs, and maps (for example, given a map and a scale, determine the distance between two points on the map).</p>	<p>Student Edition: 140-141, 142-143, 168, 169</p> <p>Teacher's Guide: 141A</p> <p>Quick Review Math Handbook Book 2: 410</p>
<p>5.3b Select the appropriate scale for a given problem (for example, using the appropriate scale when setting up a graph or intervals on a histogram).</p>	<p>Student Edition: 140-141, 142-143, 144, 168, 169, 170</p> <p>Quick Review Math Handbook Book 2: 409, 410</p>

STANDARDS	PAGE REFERENCES
5.4 Developing and using formulas and procedures to solve problems involving measurement.	
5.4a Develop and use procedures or formulas to solve problems involving area of polygons (for example, trapezoids, regular hexagons, regular octagons).	<p>Student Edition: 146-147, 154-155, 160-161, 171, 176, 296-297, 311</p> <p>Teacher's Guide: 138, 139, 146A, 148, 149, 155A, 296A</p> <p>Quick Review Math Handbook Book 2: 356-361</p>
5.5 Describing how a change in an object's linear dimensions affects its perimeter, area, and volume.	
5.5a Describe how a change in an object's linear dimensions affects its perimeter and area (for example, how a change in the radius or diameter will affect the circumference and area of a circle).	<p>Student Edition: 144-145, 146-147, 170, 171, 294-295, 296-297, 298-299, 310, 312</p> <p>Quick Review Math Handbook Book 2: 353-361</p>
5.6 Selecting and using appropriate units and tools to measure to the degree of accuracy required in a particular problem-solving situation.	
5.6a Select and use appropriate units and tools to measure to the degree of accuracy required in a particular problem-solving situation (for example, reconstruct a replica of a given figure).	<p>Student Edition: 140-141, 142-143, 144-145, 146, 152-153, 168-170, 198-199, 212 #20, 217 #16, 218, 280-281, 290-291, 300-301</p> <p>Teacher's Guide: 137E, 140A, 143A, 147, 148</p> <p>Quick Review Math Handbook Book 2: 394</p>
<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 involved in solving these problems.</p>	
<p>-----</p> <p>In grade 7, what students know and are able to do include</p> <p>-----</p>	
6.1 Using models to explain how ratios, proportions, and percents can be used to solve real-world problems.	
6.1a Use concrete materials or pictures to explain how ratios, proportion, and percents can be used to solve real-world problems.	<p>Student Edition: 16-17, 18-19, 20-21, 22-23, 26-27, 30-31, 32-33, 38-42, 44, 45, 140-141, 142-243, 144-145, 162-163, 168-170, 177</p> <p>Teacher's Guide: 14, 15, 17A, 18A, 19A, 20A, 22A, 24, 25, 32A, 139, 140A, 142A, 163A</p> <p>Quick Review Math Handbook Book 2: 142-144</p>

STANDARDS	PAGE REFERENCES
6.2 Constructing, using, and explaining procedures to compute and estimate with whole numbers, fractions, decimals, and integers.	
6.2a Apply order of operations (including exponents) with positive rational numbers.	<p>Student Edition: 100-101, 102-103, 106-107, 127, 128, 238-239, 262</p> <p>Teacher's Guide: 93G, 102A, 103A</p> <p>Quick Review Math Handbook Book 2: 80, 81</p>
6.2b Add, subtract, multiply, and divide positive rational numbers or integers.	<p>Student Edition: 58-59, 78-79, 91, 98, 100-101, 102-103, 125, 126, 127, 156-157, 175, 190-191, 196-197, 215, 217</p> <p>Teacher's Guide: 93G, 94, 95, 102A, 103A</p> <p>Quick Review Math Handbook Book 2: 90-92, 114-118, 120-122, 130-134</p>
6.2c Explain strategies to add, subtract, and multiply positive rational numbers.	<p>Student Edition: 26-27, 42, 98-99, 100-101, 102-103, 124, 125, 127, 131, 236-237, 238-239, 240-241, 261-263</p> <p>Teacher's Guide: 26A, 27A, 28A, 94, 95, 98A, 225E, 237A, 238A</p> <p>Quick Review Math Handbook Book 2: 80, 132, 136, 140, 149</p>
6.3 Developing, applying, and explaining a variety of different estimation strategies in problem-solving situations, and explain why an estimate may be acceptable in place of an exact answer.	
6.3a Explain why an estimate may be acceptable in place of an exact answer.	<p>Student Edition: 10-11, 12-13, 26-27, 36, 37, 42, 146-147, 154-155, 160-161, 162-163, 171, 176, 177, 298-299, 312</p> <p>Teacher's Guide: 26A, 27A, 146A, 161A, 162A</p> <p>Quick Review Math Handbook Book 2: 136, 140, 159</p>
6.3b Solve problems using estimation and justify choice of techniques.	<p>Student Edition: 10-11, 12-13, 26-27, 36, 37, 42, 146-147, 154-155, 160-161, 162-163, 171, 176, 177, 298-299, 312</p> <p>Teacher's Guide: 26A, 27A, 146A, 161A, 162A</p> <p>Quick Review Math Handbook Book 2: 136, 140, 159</p>

STANDARDS	PAGE REFERENCES
6.4 Selecting and using appropriate methods for computing with commonly used fractions and decimals, percents, and integers in problem-solving situations from among mental arithmetic*, estimation, paper-and-pencil, calculator, and computer methods, and determining whether the results are reasonable.	
6.4a Determine what information is necessary or missing in a problem-solving situation.	<p>Student Edition: 108, 109, 112-113, 116-117, 122-123, 129, 131, 132, 135</p> <p>Quick Review Math Handbook Book 2: 188-191 (with Teacher assistance)</p>
6.4b Solve problems involving positive rational numbers and/or integers.	<p>Student Edition: 108, 109, 112-113, 116-117, 122-123, 129, 131, 132, 135</p> <p>Quick Review Math Handbook Book 2: 188-191 (with Teacher assistance)</p>
6.4c Create a situation that matches a given number sentence involving positive rational numbers or integers, excluding division of fractions and decimals.	<p>Student Edition: 98-99, 100-101, 125, 126</p> <p>Teacher's Guide: 98A, 100A, 101A, 103A</p> <p>Quick Review Math Handbook Book 2: 315-318</p>
6.4d Justify the reasonableness of a solution in a problem-solving situation.	<p>Student Edition: 6-7, 8-9, 10-11, 12-13, 28-29, 30-31, 34, 42, 44, 129</p> <p>Teacher's Guide: 9A, 28A</p> <p>Quick Review Math Handbook Book 2: 136, 140, 159</p>