



MathScape

Seeing and Thinking Mathematically

Course 1

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STANDARDS

PAGE REFERENCES

Numbers, Number Sense, and Computation

Content Standard 1.0: *To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will accurately calculate, use estimation techniques, number relationships, operation rules, and algorithms; they will determine the reasonableness of answers and the accuracy of solutions.*

By the end of **Grade 6**, students know and are able to do everything required in the previous grades and:

<p>1.6.1 Read, write, add, subtract, multiply, and divide using decimals, fractions, and percents.</p>	I/S	<p>Student Edition: 118-119, 120-121, 122-123, 124-125, 126-127, 132-133, 134-135, 136-137, 140-141, 151, 152, 153, 154, 157, 158, 159, 161, 220-221, 222-223, 224-225, 226-227, 232-233, 234-235, 236, 237, 260, 261, 262, 263, 265, 266, 267</p>
<p>1.6.2 Apply decimals, fractions, and percents to solve mathematical and practical problems.</p>	E/S	<p>Student Edition: 118-119, 120-121, 122-123, 124-125, 126-127, 132-133, 134-135, 136-137, 140-141, 151, 152, 153, 154, 157, 158, 159, 161, 220-221, 222-223, 224-225, 226-227, 232-233, 234-235, 236, 237, 260, 261, 262, 263, 265, 266, 267</p>
<p>1.6.3 Use the concepts of number theory, including prime and composite numbers, factors, multiples, and the rules of divisibility.</p>	I/S	<p>Student Edition: 98-99, 100-101, 114-115, 143, 144, 150, 309 Teacher's Guide: 99A, 99, 100A, 101A, 101</p>

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1.6.6 Compare and order groups of fractions and groups of decimals (e.g., on a number line).	I/S	Student Edition: 112-113, 114-115, 148, 149, 214-215, 216-217, 244-245, 258, 259, 266, 268, 270 Teacher's Guide: 111A, 111, 112A, 113A, 115A, 214A, 214, 216A, 217A
1.6.7 Round to a given decimal place value; estimate using decimals, fractions, and percents.	E/S	Student Edition: 134-135, 138-139, 158, 160, 216-217, 236-237, 259, 267 Teacher's Guide: 134A, 139A, 216A, 234A
1.6.9 Use models and drawings to identify, compare, add, and subtract fractions with unlike denominators; use models to translate among fractions, decimals, and percents.	I/S	Student Edition: 118-119, 120-121, 122-123, 124-125, 126-127, 151, 152, 153, 154, 155, 210-211, 212-213, 232-233, 234-235, 256, 257, 265, 266 Teacher's Guide: 118A, 119A, 120A, 122A, 124A, 210A, 210, 211A, 211, 212A, 213A, 214A, 233A, 234A
Patterns, Functions, and Algebra		
Content Standard 2.0: <i>To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use various algebraic methods to analyze, illustrate, extend, and create numerous representations (words, numbers, tables, and graphs) of patterns, functions, and algebraic relations as modeled in practical situations.</i>		
2.6.1 Use and create tables and charts to extend a pattern in order to describe a rule.	E/S	Student Edition: 332-333, 334-335, 336-337, 342-343, 348-349, 350-351, 352-353, 357, 358, 359, 361, 363, 364, 365 Teacher's Guide: 333A, 334A, 335A, 337A, 342A, 343A, 349A
2.6.2 Identify, model, describe, and evaluate relationships using charts and tables, with and without technology.	I/S	Student Edition: 324-325, 326-327, 336-337, 354-355, 359 Teacher's Guide: 323, 326A, 346-347
2.6.7 Use a rule to create a table and represent the ordered pairs on a coordinate grid .	I/S	Student Edition: 340-341, 342-343, 348-349, 360-361, 362, 363, 364 Teacher's Guide: 340A, 342A

STANDARDS		PAGE REFERENCES
Measurement		
Content Standard 3.0: <i>To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use appropriate tools and techniques of measurement to determine, estimate, record, and verify direct and indirect measurements.</i>		
3.6.1 Estimate and convert, units of measure for length, weight, and capacity , within the same measurement system (customary or metric).	E/S	Student Edition: 149, 292-293, 313
3.6.2 Explain how the size of the unit used affects the precision ; given two measurements of the same object, select the one that is more precise.	E/S	Student Edition: 282-283, 284-285, 286-287 Teacher's Guide: 281A, 282A, 283A, 287A
3.6.3 Estimate, measure to the required degree of accuracy, derive, and apply formulas to find the perimeter, circumference, and area of plane figures .	E/S	Student Edition: 182-183, 201, 284-285, 334-335, 358 Teacher's Guide: 182A, 183A, 184-185
3.6.5 Use ratios to describe and compare relationships between various objects.	I/S	Student Edition: 280-281, 282-283, 284-285, 286-287, 300-301, 302-303, 308, 309, 310, 316, 317 Teacher's Guide: 281A, 282A, 287A, 288-289, 291A, 300A, 302A
Spatial Relationships and Geometry		
Content Standard 4.0: <i>To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will identify, represent, explain, verify, and apply spatial relationships and geometric properties.</i>		
4.6.1 Measure angles; identify, describe by properties, classify, compare, and draw regular and irregular quadrilaterals; find the sum of the interior angles of triangles and quadrilaterals.	E/S	Student Edition: 178-179, 180-181, 182-183, 199, 200, 201 Teacher's Guide: 178A, 179A, 180A

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4.6.2 Determine actual measurements represented on scale drawings (e.g., maps, blueprints, houseplans).	I/S	Student Edition: 280-281, 282-283, 284-285, 286-287, 290-291, 300-301, 302-303, 304-305, 306-307, 308, 309, 310, 311, 312, 316, 317, 318 Teacher's Guide: 280A, 281A, 282A, 283A, 285A, 288-289, 290A, 298-299, 301A, 302A
4.6.3 Using a coordinate grid, identify coordinates for a given point and locate points of given coordinates; plot geometric shapes in all four quadrants.	I/S	Student Edition: 340-341, 342-343, 344-345, 348-349, 360, 361, 362 Teacher's Guide: 340A, 341A, 342A, 343A, 344A, 349
4.6.4 Make a model of a three-dimensional prism from a two-dimensional drawing and make a two-dimensional drawing of a three-dimensional prism.	I/L	Student Edition: 190-191, 192-193, 204, 205 Teacher's Guide: 190A, 192A
4.6.5 Model slope (pitch, angle of inclination) using concrete objects and practical examples.	I/L	Teacher's Guide: 21 Also see Glencoe's <i>MathScape: Seeing and Thinking Mathematically Course 3</i> © 2005 Once the definition of <i>angle of inclination</i> is given, the following page references can be used to meet this standard. Student Edition: 226-227, 228-229, 257, 258 Teacher's Guide: 223H
4.6.6 Draw complementary and supplementary angles ; identify and find measures of complementary and supplementary angles using arithmetic and geometric methods.	I/S	Once the definitions of the terms are given, the following page references can be used to meet this standard. Student Edition: 178-179, 199
4.6.7 Determine the measures of missing angles of triangles based on the Triangle Sum Theorem (the sum of the interior angles of a triangle equals 180 degrees).	I/L	See Glencoe's <i>MathScape: Seeing and Thinking Mathematically Course 2</i> © 2005 Student Edition: 276-277, 278-279, 303, 304 Teacher's Guide: 271G, 273, 274, 276A

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4.6.8 Construct circles, angles, and triangles based on given measurements using a variety of methods (e.g., protractor, paper folding).	W/L	Student Edition: 178-179, 199 Teacher's Guide: 178A, 179A
Data Analysis		
Content Standard 5.0: <i>To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will collect, organize, display, interpret, and analyze data to determine statistical relationships and probability projections.</i>		
5.6.1 Interpret data using various formats including circle graphs.	I/S	Student Edition: 14-15, 16-17, 18-19, 22-23, 24-25, 26-27, 39, 40, 41, 42, 43, 44 Teacher's Guide: 14A, 16A, 17A, 19A, 22A, 25, 26A
5.6.2 Conduct simple probability experiments using concrete materials and represent the results using decimals, percents, and ratios.	I/L	Student Edition: 30-31, 32-33, 34-35, 45, 46, 47 Teacher's Guide: 28-29, 30A, 31A, 32A, 33A, 34A, 35A
5.6.3 Solve probability problems using a variety of methods including constructing sample spaces and tree diagrams.	E/S	Student Edition: 30-31, 32-33, 34-35, 45, 46, 47 Teacher's Guide: 28-29, 30A, 31A, 32A, 33A, 34A, 35A
5.6.5 Analyze the effect a change of format will have on interpretation of statistical charts and graphs.	I/L	Student Edition: 10-11, 14-15, 18-19, 22-23, 26-27, 38, 39, 41, 42, 44 Teacher's Guide: 14A, 15A, 18A, 22A
5.6.6 Analyze data in a variety of formats to draw conclusions and make predictions	E/S	Student Edition: 22-23, 24-25, 26-27, 30-31, 42, 43, 44 Teacher's Guide: 24A, 25A, 27A, 30A, 31A

STANDARDS		PAGE REFERENCES
Problem Solving		
Process Standard 6.0: <i>Students will develop their ability to solve problems by engaging in developmentally appropriate problem-solving opportunities in which there is a need to use various approaches to investigate and understand mathematical concepts in order to: formulate their own problems; find solutions to problems from everyday situations; develop and apply strategies to solve a wide variety of problems; and integrate mathematical reasoning, communication and connections.</i>		
6.1 Select, modify, develop, and apply strategies to solve a variety of mathematical and practical problems and to investigate and understand mathematical concepts. S 1.2.3; S 1.5.1; S 1.8.1; S 1.8.4; S 1.12.2; S 1.12.4; S 2.12.1; S 3.2.3; S 10.5.2; S 14.8.6; S 19.12.2; S 21.3.1	E/S	Student Edition: 324-325, 326-327, 328-329, 348-349, 354, 355, 356, 363 Teacher's Guide: 348A, 349A
6.2 Apply previous experience and knowledge to new problem-solving situations.	E/S	Student Edition: 26-27, 36 #8, 37 #13-14, 41 #7, 45 #15-20, 146 #13-16, 158 #21-22
6.5 Verify, interpret, and evaluate results with respect to the original problem situation, determining an efficient strategy for the given situation. S 21.5.3; S 21.12.3	E/S	Student Edition: 348-349, 350-351, 352-353, 363, 364, 365 Teacher's Guide: 348A, 349A, 351A, 352A, 353A
6.6 Try more than one strategy when the first strategy proves to be unproductive.	E/L	Student Edition: 324-325, 326-327, 328-329, 348-349, 352-353, 355, 363, 365 Teacher's Guide: 327A, 328A
6.7 Apply multi-step, integrated, mathematical problem-solving strategies, persisting until a solution is found or until it is clear that no solution exists. S 19.12.2	E/S	Student Edition: 324-325, 328-329, 334-335, 348-349, 350-351, 356, 358 Teacher's Guide: 325A, 349A, 351A
6.9 Generalize solutions and strategies from earlier problems to new problem situations.	E/L	Student Edition: 348-349, 352-353, 363, 365 Teacher's Guide: 349A, 353A

STANDARDS		PAGE REFERENCES
6.10 Interpret and solve a variety of mathematical problems by paraphrasing, identifying necessary and extraneous information, selecting and justifying efficient methods and/or strategies, and ensuring the answer is reasonable.	E/S	Student Edition: 104-105, 134-135, 138-139, 158, 216-217, 220-221, 259, 267, 284-285, 290-291 Teacher's Guide: 134A, 139A, 216A, 219
6.13 Use technology, including calculators, to solve problems and verify solutions. S 24.5.5; S 24.8.5	E/L	Student Edition: 43 #5, 213, 222-223, 224, 226-227, 228-229 Teacher's Guide: 222A, 224A, 228A, 229A
6.14 Use technology, including calculators, to investigate, define, and describe quantitative relationships such as patterns and functions. G 7.12.3; S 1.5.1; S 1.12.2; S 1.12.4; S 14.8.6; S 24.5.5; S 24.8.5	E/L	See Glencoe's <i>MathScape: Seeing and Thinking Mathematically Course 1</i> © 2005 Teacher's Guide: 321G
Mathematical Communication		
Process Standard 7.0: <i>Students will develop their ability to communicate mathematically by solving problems in which there is a need to obtain information from the real world through reading, listening, and observing in order to: translate this information into a mathematical language and symbols; process this information mathematically; and present results in written, oral and visual formats.</i>		
7.1 Discuss and exchange ideas about mathematics as a part of learning. E 10.2.3; E 10.3.3; E 10.5.3; E 10.3.1; E 10.5.1; E 10.12.1; S 23.5.2	E/L	Student Edition: 324-325, 328-329, 332-333, 335, 344-345, 355 #7, 356, 359 #11, 362 #13 Teacher's Guide: 325A, 329A, 344A, 345A
7.2 Use inquiry techniques (e.g., discussion, questioning, research, data gathering) to solve mathematical problems. E 4.2.3; E 10.2.2; E 10.3.2; E 10.5.2; E 10.8.2; E 11.2.1; E 11.3.1; E 11.5.1; E 11.8.1; E 11.12.1; E 11.2.2; S 1.5.1; S 1.8.1; S 1.8.4; S 1.12.4; S 10.5.2; S 14.8.6; S 21.3.1	E/L	Student Edition: 6-7, 8-9, 10-11, 24-25, 26-27, 30-31, 34-35, 58-59, 78-79, 172-173, 192-193 Teacher's Guide: 27A

STANDARDS		PAGE REFERENCES
7.3 Read expository text to learn about mathematics. E 1.8.3; E 1.12.3; E 2.12.3; E 4.8.1; E 4.8.2; E 4.8.3	I/L	Student Edition: 279, 280-281, 282-283, 284-285, 286-287, 288, 290-291, 292-293, 294-295, 296-297, 298, 306
7.6 Interpret and solve word problems without the necessity of key words or phrases.	E/S	Student Edition: 328-329, 348-349, 350-351, 352-353, 356, 358 #20, 364, 365 Teacher's Guide: 328A, 329A, 332A, 349A, 350A
7.8 Use physical material, diagrams , and tables to represent and then communicate mathematical ideas through oral, verbal, and written formats. E 11.5.5; G 1.5.4; G 7.5.3; G 7.5.5; H 1.5.1; S 1.5.1; S 20.5.1; S 22.5.2; S 23.5.2	E/S	Student Edition: 6-7, 8-9, 10-11, 24-25, 26-27, 30-31, 34-35, 58-59, 78-79, 104-105, 172-173, 192-193, 287, 297 Teacher's Guide: 27A, 35A, 105A
7.10 Evaluate the effectiveness of written and oral presentations of mathematics. S 21.5.3; S 23.5.2	I/L	Student Edition: 34-35, 36 #9, 37 #15, 42 #9, 43 #12, 47 #9, 78-79, 87 #17, 91 #14-17, 192-193, 194 #14, 201 #7 Teacher's Guide: 35A, 79A, 193A
7.11 Make conjectures and present arguments in discussions of mathematical ideas. S 21.5.3; S 23.5.3	E/L	Student Edition: 78-79, 190-191, 192-193, 196 #7, 324-325, 352-353 Teacher's Guide: 79A, 190A, 325A, 353A
7.13 Explain and evaluate thinking about mathematical ideas and solutions. E 10.8.2; E 10.12.4; S 21.5.3	I/L	Student Edition: 280-281, 282-283, 284-285, 290-291, 292-293, 294-295, 307, 308 #13, 312 #18, 317 #15 Teacher's Guide: 283A, 286A, 287A, 291A, 293A
7.15 Use everyday language to explain thinking about strategies and solutions to mathematical problems. S 21.5.3; S 23.5.3	E/L	Student Edition: 34-35, 36 #9, 37 #15, 42 #9, 43 #12, 47 #9, 78-79, 87 #17, 91 #14-17, 192-193, 194 #14, 201 #7 Teacher's Guide: 35A, 79A, 193A

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7.16 Express mathematical ideas and use them to define, compare, and solve problems orally and in writing.	E/S	Student Edition: 166-167, 168-169, 172-173, 190-191, 192-193 Teacher's Guide: 172A, 173A, 191A
7.17 Use mathematical notation to communicate and explain mathematical situations. S 21.2.1	E/L	Student Edition: 172-173, 186-187, 190-191, 192-193, 255, 287, 297 Teacher's Guide: 172A, 173A, 187A, 191A
Mathematical Reasoning		
Process Standard 8.0: <i>Students will develop their ability to reason mathematically by solving problems in which there is a need to investigate significant mathematical ideas and construct their own learning in all content areas in order to justify their thinking; reinforce and extend their logical reasoning abilities; reflect on and clarify their own thinking; and ask questions to extend their thinking.</i>		
8.2 Justify answers and the steps taken to solve problems, with and without manipulatives and physical models. S 1.5.1; S 10.5.2; S 20.5.1	E/S	Student Edition: 334-335, 336-337, 348-349, 352-353 Teacher's Guide: 334A, 336A, 337, 352A, 353A
8.4 Use patterns and relationships to analyze mathematical situations; draw logical conclusions about mathematical problems. Ec 3.8.2; Ec 3.8.3; Ec 9.8.4; Ec 3.12.1; Ec 3.12.2; Ec 3.12.3; Ec 3.12.4; Ec 6.12.6; G 7.12.4; S 17.3.2	E/S	Student Edition: 324-325, 326-327, 328-329, 332-333, 334-335, 336-337, 348-349, 352-353, 354, 355, 356, 359, 365 Teacher's Guide: 325A, 327A, 328A, 329A, 352A, 353A
8.5 Follow a logical argument and judge its validity. E 4.8.4; E 4.12.4	E/L	Student Edition: 10-11, 22-23, 24-25, 26-27, 30-31, 32-33, 34-35 Teacher's Guide: 10A, 11A, 24A, 25A, 31A, 32A, 34A, 35A
8.7 Recognize and apply deductive and inductive reasoning in both concrete and abstract contexts.	E/S	Student Edition: 75, 104-105, 134-135, 138-139, 158, 216-217, 220-221, 259, 267, 284-285, 290-291 Teacher's Guide: 134A, 139A, 216A, 219

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8.8 Ask questions to reflect on, clarify, and extend thinking.	E/L	Student Edition: 14-15, 16-17, 18-19, 22-23, 24-25, 26-27, 30-31, 34-35, 40, 41, 42, 43 Teacher's Guide: 14A, 19A, 30A
8.9 Review and refine the assumptions and steps used to derive conclusions in mathematical arguments.	I/L	Student Edition: 22-23, 24-25, 26-27, 30-31, 42, 43, 44 Teacher's Guide: 24A, 25A, 27A, 30A, 31A
Mathematical Connections		
Process Standard 9.0: <i>Students will develop the ability to make mathematical connections by solving problems in which there is a need to view mathematics as an integrated whole, identifying relationships between context strands, and integrating mathematics with other disciplines, allowing the flexibility to approach problems in a variety of ways within and beyond the field of mathematics.</i>		
9.1 Link new concepts to prior knowledge.	E/L	Student Edition: 52-53, 54-55, 56-57, 66-67, 72-73, 74-75, 76-77, 78-79, 86, 87 Teacher's Guide: 56A, 66A, 72A, 73A, 74A, 76A
9.2 Use mathematical ideas from one area of mathematics to explain an idea from another area of mathematics.	E/S	Student Edition: 228-229, 284-285, 326-327, 334-335, 336-337 Teacher's Guide: 326A, 334A, 335A, 336A
9.3 Use models to explain the relationship of concepts to procedures. S 1.5.1; S 1.8.1; S 1.12.2; S 1.8.4; S 1.12.4; S 10.5.2; S 14.8.6; S 20.5.1	E/S	Student Edition: 244-245, 246-247, 248-249, 250-251, 271, 272, 273, 274 Teacher's Guide: 246A, 247A, 248A, 250, 253A
9.4 Use the connections among mathematical topics to develop multiple approaches to problems. S 20.8.1	I/L	Student Edition: 300-301, 302-303, 304-305, 306-307, 315 #15-16, 316 #12, 317 #15, 318 Teacher's Guide: 300A, 301A, 304A

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9.5 Identify practical applications of mathematical principles that can be applied to other disciplines. S 14.12.5	I/L	Student Edition: 156 #19, 157 #19, 166-167, 172-173, 186, 190-191, 192-193, 196 #7, 199 #8, 318 #18, 319 #12 Teacher's Guide: 190A, 191A, 192A
9.7 Apply mathematical thinking and modeling to solve problems that arise in other disciplines (e.g., rhythm in music and motion in science). S 1.5.1; S 1.8.1; S 1.12.2; S 1.8.4; S 1.12.4; S 10.5.2; S 14.8.6; S 19.12.2	E/L	Student Edition: 161 #19, 199 #8, 237, 244, 267 #27-30, 275 #28-#29, 286-287, 309 #18, 312 #17
9.8 Identify, explain, and use mathematics in everyday life. Ec 2.3.2; Ec 2.12.12; Ec 5.2.1; Ec 5.3.1; S 24.12.2	I/S	Student Edition: 6-7, 10-11, 18-19, 23, 27, 34-35, 52-53, 56-57, 58-59, 172-173, 192-193, 237, 241 Teacher's Guide: 18A, 27A, 58A