



**MAINE**  
**Learning Results -- Mathematics**  
**Middle Grades 5-8**

***MathScape: Seeing and Thinking Mathematically Courses 1, 2, 3 © 2005***

OBJECTIVES	PAGE REFERENCES		
	COURSE 1	COURSE 2	COURSE 3
<b>A. NUMBERS AND NUMBER SENSE</b>			
<b>Students will understand and demonstrate a sense of what numbers mean and how they are used. Students will be able to:</b>			
<b>MIDDLE GRADES 5-8</b>			
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: 122, 153, 210-211, 212-213, 217, 232-233, 256, 257, 259, 319	SE: 17, 18-19, 20-21, 28-29, 38 #1-#8, 40 #1-#4 TG: 18A, 28A, 29A	SE: 163, 264, 298-299, 300-301, 312, 313 TG: 135E
2. Demonstrate understanding of the relationships among the basic arithmetic operations on different types of numbers.	SE: 138-139, 140-141, 160, 161, 229, 254-255, 275	SE: 96-97, 98-99, 100-101, 102-103, 124 #9-#13, 125 #1-#8, 126 #1-#10, 127 #1-#6, 130 #1-#6, 131 #1-#19	SE: 192-193, 214 TG: 135E, 190
3. Apply concepts of ratios, proportions, percents, and number theory (e.g., primes, factors, and multiples) in practical and other mathematical situations.	SE: 96-97, 98-99, 100-101, 234-235, 236-237, 240-241, 282-283, 284-285, 300-301, 302-303	SE: 16-17, 18-19, 20-21, 22-23, 26-27, 28-29, 30-31, 32-33, 38, 39	SE: 120-121, 162-163, 176, 228-229, 242-243, 246-247, 250-251, 262, 264, 265
4. Represent numerical relationships in graphs, tables, and charts.	SE: 6-7, 14-15, 22-23, 24-25, 26-27, 281, 291, 303, 342-343, 344-345	SE: 186-187, 194-195, 196-197, 198-199, 200-201, 213 #18-#19, 216, 217 #7-#12, 218, 221 #22-#25	SE: 60-61, 63, 64-65, 73, 77, 152-153, 154-155, 172, 298, 300

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	COURSE 1	COURSE 2	COURSE 3
<b>B. COMPUTATION</b>			
<b>Students will understand and demonstrate computation skills. Students will be able to:</b>			
<b>MIDDLE GRADES 5-8</b>			
1. Compute and model all four operations with whole numbers, fractions, decimals, sets of numbers, and percents, applying the proper order of operations.	SE: 102-103, 104-105, 118-119, 124-125, 132-133, 135, 136-137, 220-221, 224-225, 226-227	SE: 96-97, 98-99, 100-101, 102-103, 124 #9-#13, 125 #1-#8, 126 #1-#10, 127 #1-#6, 130 #1-#6, 131 #1-#19	SE: 140-141, 142-143, 144-145, 162-163, 167, 168, 176, 192-193, 214, 298
2. Create, solve, and justify the solution for multi-step, real-life problems including those with ratio and proportion.	SE: 105, 125, 127, 146, 155, 156, 309, 310, 312, 318	SE: 20-21, 22-23, 38 #16, 39 #3-#4, 40 #9-#12, 41 #8, 204-205, 210-211, 220 #7-#8, 223 #1-#5	SE: 208-209, 221, 229, 238-239, 246-247, 257, 258, 261, 264, 292-293
<b>C. DATA ANALYSIS AND STATISTICS</b>			
<b>Students will understand and apply concepts of data analysis. Students will be able to:</b>			
<b>MIDDLE GRADES 5-8</b>			
1. Organize and analyze data using mean, median, mode, and range.	SE: 6-7, 8-9, 11, 22-23, 27, 36, 37, 38, 42, 44	SE: 74-75, 76-77, 78-79, 90 #8 TG: 75A, 76A, 78A, 79A	SE: 6-7, 8-9, 10-11, 12-13, 17, 34, 35, 36, 37, 38
2. Assemble data and use matrices to formulate and solve problems.	See <i>MathScope: Seeing and Thinking Mathematically Courses 2, 3</i>	SE: 74-75, 76-77, 78-79, 90 #5-#6 TG: 75A, 76A, 78A, 79A	SE: 6, 16-17, 276
3. Construct inferences and convincing arguments based on data.	SE: 16, 18, 22-23, 24-25, 43	SE: 74-75, 76-77, 78-79, 90 #5-#6 TG: 75A, 76A, 78A, 79A	SE: 9, 12-13, 35, 138-139, 166 TG: 12A, 13A

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	COURSE 1	COURSE 2	COURSE 3
<b>D. PROBABILITY</b>			
<b>Students will understand and apply concepts of probability. Students will be able to:</b>			
<b>MIDDLE GRADES 5-8</b>			
1. Find the probability of simple events and make predictions by applying the theories of probability.	SE: 30-31, 32-33, 35, 45, 46, 47	SE: 52-53, 54-55, 58-59, 68-69, 81, 82, 83 #5 TG: 54A, 55A, 69A	SE: 26-27, 31, 42, 44, 45 TG: R4
2. Explain the idea that probability can be represented as a fraction between and including zero and one.	See <i>MathScope: Seeing and Thinking Mathematically Course 2</i>	SE: 54-55, 71 #3, 82 TG: 54A, 55A	See <i>MathScope: Seeing and Thinking Mathematically Course 2</i>
3. Use simulations to estimate probabilities.	See <i>MathScope: Seeing and Thinking Mathematically Courses 2, 3</i>	SE: 50-51, 58-59, 60-61, 62-63, 68-69, 74-75, 76-77, 78-79, 89, 90	SE: 26
4. Find all possible combinations and arrangements involving a limited number of variables.	See <i>MathScope: Seeing and Thinking Mathematically Courses 2, 3</i>	SE: 66-67, 68-69, 86 #1-#2, 87 #1-#4 TG: 65, 66A	SE: 27, 28-29, 30-31, 32-33, 43, 44, 45
<b>E. GEOMETRY</b>			
<b>Students will understand and apply concepts from geometry. Students will be able to:</b>			
<b>MIDDLE GRADES 5-8</b>			
1. Compare, classify, and draw two dimensional shapes and three dimensional figures.	SE: 167, 168-169, 176-177, 179, 180-181, 188-189, 193, 198, 203, 205	SE: 150-151, 152-153, 172, 173, 284-285, 286-287, 288-289, 290-291, 294-295, 296-297	SE: 94-95, 96-97, 109, 122, 123 TG: 91E, 94A, 104A, 114A
2. Apply geometric properties to represent and solve real-life problems involving regular and irregular shapes.	See <i>MathScope: Seeing and Thinking Mathematically Courses 2, 3</i>	SE: 150-151, 152-153, 154-155, 156-157, 160-161, 164-165, 175, 176, 178 TG: 161A	SE: 109, 111, 120-121, 125, 127, 252-253, 254-255, 259, 266, 267

OBJECTIVES	PAGE REFERENCES		
	COURSE 1	COURSE 2	COURSE 3
3. Use a coordinate system to define and locate position.	SE: 340-341, 342-343, 360, 361	SE: 194-195, 196-197, 216, 217, 218 #15-#16, 223 #6-#7 TG: 194A, 195A, 196A, 198A	SE: 280-281, 282-283, 284-285, 305, 306, 307
4. Use the appropriate geometric tools and measurements to draw and construct two and three dimensional figures.	SE: 168-169, 170-171, 176-177, 179, 180-181, 188-189, 195, 196, 199, 203	SE: 152-153, 173 #1-#6 TG: 137G, 152A, 153A	SE: 94-95, 96-97, 122, 123 TG: 223E
<b>F. MEASUREMENT</b>			
<b>Students will understand and demonstrate measurement skills. Students will be able to:</b>			
<b>MIDDLE GRADES 5-8</b>			
1. Demonstrate the structure and use of systems of measurement.	SE: 149, 151, 178-179, 199, 259, 292-293, 294-295, 302, 313, 314	SE: 140, 168 #1-#4	SE: 16, 50, 52-53, 78, 79, 118-119, 132 TG: 47E, 50A, 118A
2. Develop and use concepts that can be measured directly, or indirectly (e.g., the concept of rate).	SE: 182-183, 201, 292-293, 294-295, 296-297, 314, 315	SE: 146-147, 154-155, 171 TG: 146A, 147A, 154A, 155A	SE: 16, 52-53, 226-227, 228-229, 238-239, 247, 250-251, 254-255 TG: 47E
3. Demonstrate an understanding of length, area, volume, and the corresponding units, square units, and cubic units of measure.	SE: 182-183, 201, 304-305, 306-307, 312, 313, 314, 315, 318, 319	SE: 146-147, 154-155, 171 TG: 146A, 147A, 154A, 155A	SE: 16, 52-53, 98-99, 104-105, 106-107, 108-109, 110-111, 114-115, 116-117, 118-119
<b>G. PATTERNS, RELATIONS, FUNCTIONS</b>			
<b>Students will understand that mathematics is the science of patterns, relationships, and functions. Students will be able to:</b>			
<b>MIDDLE GRADES 5-8</b>			
1. Describe and represent relationships with tables, graphs, and equations.	SE: 326-327, 328-329, 332-333, 334-335, 342-343, 344-345, 350-351, 352-353, 356, 365	SE: 186-187, 194-195, 196-197, 198-199, 200-201, 213 #18-#19, 216, 217 #7-#12, 218, 221 #22-#25	SE: 18-19, 21, 101, 272-273, 274-275, 282-283, 284-285, 288-289, 298-299, 301-302

OBJECTIVES	PAGE REFERENCES		
	COURSE 1	COURSE 2	COURSE 3
2. Analyze relationships to explain how a change in one quantity can result in a change in another.	See <i>MathScape: Seeing and Thinking Mathematically Courses 2, 3</i>	SE: 190-191 TG: 137G	SE: 229, 257, 276, 283, 288, 291, 292-293, 306
3. Use patterns and multiple representations to solve problems.	SE: 222-223, 226, 254, 326-327, 328-329, 332-333, 344-345, 348-349, 350-351, 352-353	SE: 116-117, 118-119, 120-121, 122-123, 132, 133, 134 TG: 120A, 121A	SE: 55, 56-57, 81, 101, 142-143, 148-149, 152-153, 154-155, 168-172, 198-199
<b>H. ALGEBRA CONCEPTS</b>			
<b>Students will understand and apply algebraic concepts. Students will be able to:</b>			
<b>MIDDLE GRADES 5-8</b>			
1. Use the concepts of variables and expressions.	SE: 332-333, 334-335, 336-337, 348-349, 357, 358, 359	SE: 184-185, 186-187, 188-189, 212, 214 TG: 184A, 185A, 186A, 188A, 189A	SE: 182-183, 184-185, 186-187, 188-189, 194-195, 196-197, 198-199, 202-203 TG: 179E, R2-R3
2. Solve linear equations using concrete, informal, and formal methods which apply the order of operations.	See <i>MathScape: Seeing and Thinking Mathematically Courses 2, 3</i>	SE: 204-205, 206-207, 208-209, 210-211, 220, 221, 222, 223 TG: 204A, 205A	SE: 204-205, 206-207, 208-209, 219, 220, 221 TG: R4
3. Analyze tables and graphs to identify properties and relationships in a practical context.	SE: 22-23, 24-25, 26-27, 39, 43, 44, 344-345, 362	SE: 186-187, 194-195, 196-197, 198-199, 200-201, 213 #18-#19, 216, 217 #7-#12, 218, 221 #22-#25	SE: 18-19, 20-21, 22-23, 39-41, 66-67, 72-73, 74-75, 86-87, 158-159, 174
4. Use graphs to represent two-variable equations.	Creating and analyzing graphs is covered on the following pages: SE: 14-15, 16-17, 18-19, 22-23, 24-25, 26-27, 340-341, 342-343, 344-345	SE: 194-195, 196-197, 198-199, 200-201, 216, 217 #7-#12, 218, 221 #22-#25 TG: 181H	SE: 76-77, 89, 282-283, 290-291, 297, 299, 309, 311 TG: 283A, 286-287

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	COURSE 1	COURSE 2	COURSE 3
5. Demonstrate an understanding of inequalities and non-linear equations.	Decimal, fraction, and integer inequalities are covered on the following pages: SE: 112, 114, 149, 150, 217, 244, 258, 259, 270	SE: 186-187, 207, 213 TG: 186A, 187A	SE: 288-289, 290-291, 296-297, 308, 309, 311 TG: 286-287, R4-R5
6. Find solutions for unknown quantities in linear equations and in simple equations and inequalities.	See <i>MathScape: Seeing and Thinking Mathematically Courses 2, 3</i>	SE: 204-205, 206-207, 208-209, 210-211, 220, 221, 222, 223 TG: 204A, 205A	SE: 204-205, 206-207, 219, 220, 277, 297, 304, 311
<b>I. DISCRETE MATHEMATICS</b> Students will understand and apply concepts in discrete mathematics. Students will be able to:			
<b>MIDDLE GRADES 5-8</b>			
1. Create and use networks to explain practical situations or solve problems.	This objective can be met when creating an activity to go with pages 176-177.	This objective can be met when creating an activity to go with pages 290-291.	This objective can be met when creating an activity to go with pages 50-53.
2. Identify patterns in the world and express these patterns with rules.	SE: 56-57, 324-325, 326-327, 328-329, 334-335, 336-337, 354, 355, 356, 359	SE: 116-117, 118-119, 120-121, 122-123, 132, 133, 134 TG: 120A, 121A	SE: 138-139, 144-145, 148-149, 160-161, 166, 169, 175, 188-189, 198-199, 217
<b>J. MATHEMATICAL REASONING</b> Students will understand and apply concepts of mathematical reasoning. Students will be able to:			
<b>MIDDLE GRADES 5-8</b>			
1. Support reasoning by using models, known facts, properties, and relationships.	SE: 16, 18-19, 22-23, 24-25, 287, 291, 295, 297, 303, 305	SE: 96-97, 98-99, 101, 102-103, 108-109, 112-113, 118-119, 120-121, 122-123, 131	SE: 9, 13, 35, 139, 162, 164-165, 166, 189, 213 TG: 188A
2. Demonstrate that multiple paths to a conclusion may exist.	SE: 65, 85, 334-335, 358	SE: 108-109, 111-119, 276-277, 278-279	SE: 105, 107, 145, 238-239, 244

OBJECTIVES	PAGE REFERENCES		
	COURSE 1	COURSE 2	COURSE 3
<b>K. MATHEMATICAL COMMUNICATION</b>			
<b>Students will reflect upon and clarify their understanding of mathematical ideas and relationships. Students will be able to:</b>			
<b>MIDDLE GRADES 5-8</b>			
1. Translate relationships into algebraic notation.	See <i>MathScape: Seeing and Thinking Mathematically Courses 2, 3</i>	SE: 184-185, 186-187, 188-189, 212, 214 TG: 184A, 185A, 186A, 188A, 189A	SE: 55, 149, 158, 160, 170, 175, 198-199, 272, 284, 307
2. Use statistics, tables, and graphs to communicate ideas and information in convincing presentations and analyze presentations of others for bias or deceptive presentation.	See <i>MathScape: Seeing and Thinking Mathematically Courses 2, 3</i>	SE: 232-233, 236-237, 240-241, 244-245, 246-247, 248-249, 252-253, 254-255, 256-257, 265	SE: 9, 13, 28, 35, 159, 164-165