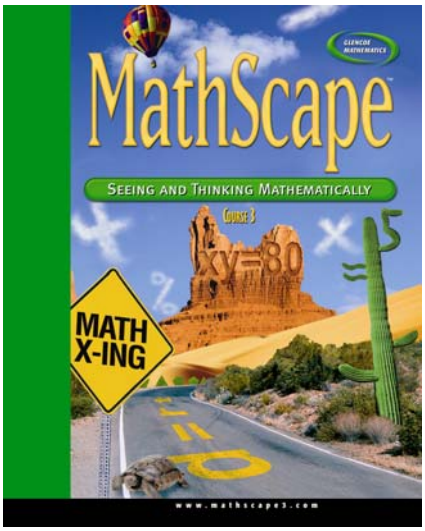
Glencoe

Math Performance Standards
(Grade Level Expectations)
Grade 8



MathScape

Seeing and Thinking Mathematically

Course 3

STANDARDS	PAGE REFERENCES
Content Standard A: Mathematical facts, concepts, principles, and theories **Numeration:** Understand and use numeration **Measurement:** Select and use systems, units, and tools of measurement	
Understanding Numbers	
The student demonstrates understanding • **of real numbers by**	
[8] N-1 ordering real numbers (M1.3.1)	**Student Edition:** 138-139, 162-163, 176 **Teacher's Guide:** 135E, 137, 162A, 163A
[8] N-2 distinguishing between a whole number in scientific notation and real numbers in standard form (M1.3.1)	**Student Edition:** 300-301, 313 **Teacher's Guide:** 269H, 300A
[8] N-3 converting between expanded notation (multiples of ten with exponents) and standard form (M1.3.3)	**Student Edition:** 300-301, 313 **Teacher's Guide:** 269H, 300A
• **of rational numbers (fractions, decimals, or percents including integers) by**	
[8] N-4 identifying, describing, or illustrating equivalent representations (M1.3.4 & M3.3.5)	**Student Edition:** 162-163, 176, 242-243, 246-247, 262, 264, 300-301, 313

Codes used for Teacher's Guide pages are the initial caps of headings on that page.

STANDARDS	PAGE REFERENCES
[8] N-5 expressing products of numbers using exponents (M1.3.1 & M1.3.3)	**Student Edition:** 298-299, 312 **Teacher's Guide:** 295
Understanding Meaning of Operations	
The student demonstrates conceptual understanding of mathematical operations by	
[8] N-6 using models, explanations, number lines, real-life situations, describing or illustrating the effects of arithmetic operations on rational numbers (percents) (M1.2.3)	**Student Edition:** 140-141, 142-143, 144-145, 150-151, 152-153, 158-159, 162-163, 167-169, 171-172, 174, 192-193, 196-197, 214, 216 **Teacher's Guide:** 140A, 144A, 150A, 153A, 192A
[8] N-7 using models, explanations, number lines, real-life situations, describing or illustrating the use of inverse operations (addition/subtraction or multiplication/division) (M1.2.3)	**Student Edition:** 144-145, 148-149, 169, 170, 204-205, 206-207, 208-209, 219, 220, 221 **Teacher's Guide:** 145A, 204A, 207A
Number Theory	
The student demonstrates conceptual understanding of number theory by	
[8] N-8 applying the rules for order of operations to rational numbers (M1.3.5)	**Student Edition:** 196-197, 204-205, 206-207, 208-209, 216, 219, 220 **Teacher's Guide:** 186A, 206A
[8] N-9 identifying or writing the prime factorization of a number using exponents (M1.3.5)	See Glencoe's *MathScape: Seeing and Thinking Mathematically Course 2* © 2005 **Student Edition:** 106-107, 108-109, 118-119, 120-121, 122-123, 128, 129, 133, 134, 135
[8] N-10 [using distributive property with real numbers L] (M1.3.6)	**Student Edition:** 196-197, 198-199, 216, 217 **Teacher's Guide:** 197A

STANDARDS	PAGE REFERENCES
Measurable Attributes	
The student demonstrates understanding of measurable attributes by	
[8] MEA-1 converting measurements within the same system (English or metric) (M2.3.2)	**Student Edition:** 16-17, 50-51, 52, 53, 79, 118-119, 124, 132, 246-247 **Teacher's Guide:** 47E, 48, 51A, 52A
Content Standard A: Mathematical facts, concepts, principles, and theories **Measurement:** Select and use systems, units, and tools of measurement **Estimation and Computation:** Perform basic arithmetic functions, make reasoned estimates, and select and use appropriate methods or tools **Functions and Relationships:** Represent, analyze, and use patterns, relations, and functions	
Measurement Techniques	
The student uses measurement techniques by	
[8] MEA-2 using scale drawings involving indirect measurement (determining the scale factor and applying it to find missing dimension) (M2.3.4)	**Student Edition:** 230-231, 236-237, 238-239, 246-247, 250-251, 258, 261, 264, 265
[8] MEA-3 [modeling the conversion within the same system L] (M2.3.2)	**Student Edition:** 16-17, 50-51, 52, 53, 79, 118-119, 124, 132, 246-247 **Teacher's Guide:** 47E, 48, 51A, 52A
Estimation	
The student solves problems (including real-world situations) using estimation by	
[8] E&C-1 [applying and assessing the appropriateness of a variety of estimation strategies L] (M3.3.1)	**Student Edition:** 52-53, 79, 120-121, 133, 138-139, 140-141, 144-145, 150-151, 160-161, 166, 167, 169, 171, 176 **Teacher's Guide:** 52A, 137, 138A, 145A, 160A

STANDARDS	PAGE REFERENCES
Computation	
The student accurately solves problems (including real-world situations) involving	
[8] E&C-2 adding, subtracting, multiplying or dividing integers or positive rational numbers (M3.3.3 & M3.3.4)	**Student Edition:** 52-53, 79, 144-145, 160-161, 162-163, 169, 176, 186-187, 188-189, 196-197, 212, 213, 216, 242-243, 246-247, 262, 264 **Teacher's Guide:** 53A, 160A, 162A, 163A, 181, 186A, 196A, 197A, 241
[8] E&C-3 percents and percentages (e.g., tax, discount) (M3.3.3 & M3.3.4)	See Glencoe's *MathScape: Seeing and Thinking Mathematically Course 2* © 2005 **Student Edition:** 30-31, 44, 228-229, 230, 231, 232-233, 246-247, 248-249, 254-255, 256-257, 258-260, 265, 266, 268, 269 **Teacher's Guide:** 30A, 226, 227, 233A, 246A, 249A
[8] E&C-4 converting between equivalent fractions, decimals, or percents (M3.3.5)	**Student Edition:** 162-163, 176, 242-243, 246-247, 262, 264
[8] E&C-5 ratio and proportion (M3.3.6)	**Student Edition:** 120-121, 133, 242-243, 244-245, 246-247, 250-251, 262, 263, 264, 265 **Teacher's Guide:** 240, 241, 248
Describing Patterns and Functions	
The student demonstrates conceptual understanding of functions, patterns, or sequences including those represented in real-world situations by	
[8] F&R-1 describing or extending patterns (linear), up to the nth term, represented in, tables, sequences, graphs, or in problem situations (M4.3.1)	**Student Edition:** 140-141, 142-143, 144, 148-149, 152, 154, 158, 160, 167-169, 175, 188-189, 198-199, 213, 280-281, 282-283, 284-285, 305-307 **Teacher's Guide:** 135E, 136, 137, 142A, 146, 147, 156, 278-279, 280A
[8] F&R-2 generalizing relationships (linear) using a table of ordered pairs, a graph, or an equation (M4.3.4)	**Student Edition:** 54-55, 80, 152-153, 172, 204-209, 219-221, 280-281, 282-283, 284-285, 305-307 **Teacher's Guide:** 152A, 204A, 210, 278, 279

STANDARDS	PAGE REFERENCES
[8] F&R-3 describing in words how a change in one variable in a formula affects the remaining variables (how changing the length affects the area of quadrilaterals or volume of a rectangular prism) (M4.3.2)	**Student Edition:** 104-105, 110-111, 126, 129 **Teacher's Guide:** 91H, 102
[8] F&R-4 [using a calculator as a tool when describing, extending, or representing patterns L] (M4.3.3)	**Student Edition:** 140-141, 142-143, 144-145, 148-149, 150-151, 160-161, 167-169, 170-171, 175 **Teacher's Guide:** 135E, 135G, 140A, 146, 147, 151A
Content Standard A: Mathematical facts, concepts, principles, and theories **Functions and Relationships:** Represent, analyze, and use patterns, relations, and functions **Geometry:** Construct, transform, and analyze geometric figures	
Modeling and Solving Equations and Inequalities	
The student demonstrates algebraic thinking by	
[8] F&R-5 translating a written phrase to an algebraic expression (M4.3.5)	**Student Edition:** 54-55, 80, 182-183, 188-189, 196-197, 198-199, 210, 211, 215-217 **Teacher's Guide:** 180, 181, 190
[8] F&R-6 solving or identifying solutions to two-step linear equations of the form ax±b =c, where a, b and c are rational numbers, and a≠0, translating a story problem into an equation of similar form, or translating a story problem into an equation of similar form and solving it (M4.3.5)	**Student Edition:** 204-205, 206-207, 208-209, 219-221, 274-275, 284-285, 303, 307 **Teacher's Guide:** 200, 206A, 279
Geometric Relationships	
The student demonstrates an understanding of geometric relationships by	
[8] G-1 [using the attributes and properties of regular polygons to sketch regular or irregular polygons L] (M5.3.1)	**Student Edition:** 120-121, 133, 228-229, 230-231, 238-239, 257, 258, 261
[8] G-2 using the attributes and properties of solid figures (vertices, length and alignment of edges, shape and number of bases) to identify and describe cylinders and cones (M5.3.2)	**Student Edition:** This standard can be met using a specific activity with each of the following pages: 94-95, 108-109, 116-117, 128, 131 **Teacher's Guide:** 103, 113

STANDARDS	PAGE REFERENCES
[8] G-3 using two-dimensional nets to create three-dimensional objects (prisms and cylinders) (M5.3.2)	**Student Edition:** 94-95, 108-109, 104-105, 114-115, 122, 126, 128 **Teacher's Guide:** 91G, 94A, 102, 103
Transformation of Shapes	
The student demonstrates conceptual understanding of similarity, congruence, symmetry, or transformations of shapes by	
[8] G-4 using proportionality to solve real-world problems involving similar shapes (e.g., two real-world objects casting shadows) (M5.3.3)	**Student Edition:** 120-121, 133, 228-229, 257
[8] G-5 identifying the results of applying transformations (translations, rotations, reflections, dilations) to figures on a coordinate plane (M5.3.5)	See Glencoe's *MathScape: Seeing and Thinking Mathematically Course 2* © 2005 **Student Edition:** 288-289, 291, 308 **Teacher's Guide:** 272, 283
Perimeter, Area, and Volume	
The student solves problems (including real-world situations) by	
[8] G-6 determining the volume of right triangular prisms or cylinders (M5.3.4)	**Student Edition:** 106-107, 127 **Teacher's Guide:** 102
[8] G-7 determining the surface area of cylinders or triangular prisms (M5.3.4)	**Student Edition:** 106-107, 108-109, 127, 128 **Teacher's Guide:** 103
[8] G-8 determining the circumference and area of a circle (M5.3.4)	See Glencoe's *MathScape: Seeing and Thinking Mathematically Course 2* © 2005 **Student Edition:** 294-295, 298-299, 310, 312 **Teacher's Guide:** 292, 293

STANDARDS	PAGE REFERENCES
Content Standard A: Mathematical facts, concepts, principles, and theories **Geometry:** Construct, transform, and analyze geometric figures **Statistics and Probability:** Formulate questions, gather and interpret data, and make predictions	
Position and Direction	
The student demonstrates understanding of position and direction by	
[8] G-9 graphing or identifying relationships of variables on a coordinate plane (e.g., length/width, area/diameter, cost/pound) (M5.3.6)	**Student Edition:** 20-21, 274-275, 276-277, 282, 303, 304 **Teacher's Guide:** 269E
Construction	
The student demonstrates a conceptual understanding of geometric drawings or constructions by	
[8] G-10 [drawing, measuring, or constructing geometric figures (polygons, perpendicular bisectors, or perpendicular or parallel lines) L] (M5.3.7)	**Student Edition:** 94-95, 120-121, 228-229, 230-231, 257, 258, 267
Data Display	
The student demonstrates an ability to classify and organize data by	
[8] S&P-1 [designing, collecting L], organizing, displaying, or explaining the classification of data in real-world problems (e.g., science or humanities, peers or community), using histograms, scatter plots, or box and whisker plots with appropriate scale [or with technology L] (M6.3.1)	**Student Edition:** 6-7, 18-19, 20-21, 22-23, 34, 39-41 **Teacher's Guide:** 3H, 6A, 14, 15
Analysis and Central Tendency	
The student demonstrates an ability to analyze data (comparing, explaining, interpreting, evaluating, making predictions, or describing trends; or drawing, formulating, or justifying conclusions) by	
[8] S&P-2 using information from a variety of displays or analyzing the validity of statistical conclusions found in the media (M6.3.2)	**Student Edition:** 6-7, 8-9, 16-17, 34, 35, 36 #8, 38 **Teacher's Guide:** 6A
[8] S&P-3 determining or justifying a choice of range, mean, median, or mode as the best representation of data for a practical situation (M6.3.3)	**Student Edition:** 6-7, 8-9, 10-11, 12-13, 34, 35, 36, 37 **Teacher's Guide:** 3G, 4, 5, 12A, 13A

STANDARDS	PAGE REFERENCES
Probability	
The student demonstrates a conceptual understanding of probability and counting techniques by	
[8] S&P-4 determining or comparing the experimental and/or theoretical probability of simple events (M6.3.5)	**Student Edition:** 26-27, 28-29, 30-31, 32-33, 42-45 **Teacher's Guide:** 24, 25, 27A, 28A, 29A, 31A, 33A
[8] S&P-5 using a systematic approach to finding sample spaces or to making predictions about the probability of independent events and using the information to solve real-world problems (M6.3.5)	**Student Edition:** 26-27, 28-29, 30-31, 32-33, 42-45 **Teacher's Guide:** 29A
[8] S&P-6 [designing and conducting a simulation to study a problem and communicate the results L] (M6.3.6)	See Glencoe's *MathScape: Seeing and Thinking Mathematically Course 2* © 2005 **Student Edition:** 74-75, 76-77, 79, 89, 90, 91 **Teacher's Guide:** 72-73
Content Standards B, C, D, and E: Process skills and abilities **Applying conceptual knowledge and skills designated in all strands of Content Standard A by problem solving, communicating, reasoning, and making connections**	
Problem solving: Understand and be able to select and use a variety of problem-solving strategies	
The student demonstrates an ability to problem solve by	
[8] PS-1 selecting, modifying, and applying a variety of problem-solving strategies (e.g., inductive and deductive reasoning, Venn diagrams, making a simpler problem) and verifying the results (M7.3.2)	**Student Edition:** 6-7, 10-11, 34, 36, 83 #10, 133 #6, 171 #15, 219 #11, 264 #13 Also see Glencoe's *MathScape: Seeing and Thinking Mathematically Course 2* © 2005 284-285 (Venn diagrams), 308 (inductive and deductive reasoning)
[8] PS-2 evaluating, interpreting, and justifying solutions to problems (M7.3.3)	**Student Edition:** 81 #7, 89 #11, 125 #13, 129 #8, 166 #10, 167 #8, 175 #14, 217 #16, 258 #5, 267 #7, 304 #15

STANDARDS	PAGE REFERENCES
Communication: Form and use appropriate methods to define and explain mathematical relationships	
The student communicates his or her mathematical thinking by	
[8] PS-3 representing mathematical problems numerically, graphically, and/or symbolically, translating among these alternative representations; or using appropriate vocabulary, symbols, or technology to explain, justify, and defend strategies and solutions (M8.3.1, M8.3.2, & M8.3.3)	**Student Edition:** 125 #13, 133 #6, 167 #8, 173 #8, 214 #13-#15, 216 #16, 217 #16, 219 #11, 258 #5, 261 #10, 264 #13
Reasoning: Use logic and reason to solve mathematical problems	
The student demonstrates an ability to use logic and reason by	
[8] PS-4 generalizing from patterns of observations (inductive reasoning) about mathematical problems and testing using a logical verification (deductive reasoning); or justifying and defending the validity of mathematical strategies and solutions using examples and counterexamples (M9.3.1, M9.3.2, & M9.3.3)	**Student Edition:** 89 #11, 123 #7, 130 #11, 133 #6, 168 #7, 170 #15, #16, 171 #15, 173 #7, 257 #7-#10, 303 #17
Connections: Apply mathematical concepts and processes to situations within and outside of school	
The student understands and applies mathematical skills and processes across the content strands by	
[8] PS-5 using real-world contexts such as science, humanities, peers, community, and careers (M10.3.1 & M10.4.2)	**Student Edition:** 42 #8, 78 #11-13, 82 #11, 123 #7, 126 #18, 130 #11, 168 #8, 170 #16, 213 #8, 256 #8, 261 #10, 312 #31, 313 #19