



Math Teachers Press, Inc.

4850 Park Glen Road, Minneapolis, MN 55416
 phone (800) 852-2435 fax (952) 546-7502

NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS CORRELATED TO *MOVING WITH MATH® EXTENSIONS GRADE 8*

		Student Book	Skill Builders
PROBLEM SOLVING			
Students will build new mathematical knowledge through problem solving.			
8 .PS.1	Use a variety of strategies to understand new mathematical content and to develop more efficient methods	9-11, 25	43-1 to 43-3
8.PS.2	Construct appropriate extensions to problem situations	9-11, 25	43-1 to 43-3
8.PS.3	Understand and demonstrate how written symbols represent mathematical ideas	9-11, 25	43-1 to 43-3
Students will solve problems that arise in mathematics and in other contexts.			
8.PS.4	Observe patterns and formulate generalizations	9-11, 25	43-1 to 43-3
8.PS.5	Make conjectures from generalizations	9-11, 25	43-1 to 43-3
8.PS.6	Represent problem situations verbally, numerically, algebraically, and graphically	9-11, 25	43-1 to 43-3
Students will apply and adapt a variety of appropriate strategies to solve problems			
8.PS.7	Understand that there is no one right way to solve mathematical problems but that different methods have advantages and disadvantages	9-11, 25	43-1 to 43-3
8.PS.8	Understand how to break a complex problem into simpler parts or use a similar problem type to solve a problem	9-11, 25	43-1 to 43-3
8.PS.9	Work backwards from a solution	9-11, 25	43-1 to 43-3
8.PS.10	Use proportionality to model problems	35, 36, 40	26-1, 26-2, 46-1 to 46-3

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8.PS.11	Work in collaboration with others to solve problems	9-11, 25	43-1 to 43-3
	Students will monitor and reflect on the process of mathematical problem solving.		
8.PS.12	Interpret solutions within the given constraints of a problem	9-11, 25	43-1 to 43-3
8.PS.13	Set expectations and limits for possible solutions	9-11, 25	43-1 to 43-3
8.PS.14	Determine information required to solve the problem	9-11, 25	43-1 to 43-3
8.PS.15	Choose methods for obtaining required information	9-11, 25	43-1 to 43-3
8.PS.16	Justify solution methods through logical argument	9-11, 25	43-1 to 43-3
8.PS.17	Evaluate the efficiency of different representations of a problem	9-11, 25	43-1 to 43-3
	REASONING AND PROOF		
	Students will recognize reasoning and proof as fundamental aspects of mathematics.		
8.RP.1	Recognize that mathematical ideas can be supported by a variety of strategies	9-11	43-2
	Students will make and investigate mathematical conjectures.		
8.RP.2	Use mathematical strategies to reach a conclusion	10	43-2
8.RP.3	Evaluate conjectures by distinguishing relevant from irrelevant information to reach a conclusion or make appropriate estimates		
	Students will develop and evaluate mathematical arguments and proofs.		
8.RP.4	Provide supportive arguments for conjectures		
8.RP.5	Develop, verify, and explain an argument, using appropriate mathematical ideas and language	Math Glossary (15a - 15c)	
	Students will select and use various types of reasoning and methods of proof.		
8.RP.6	Support an argument by using a systematic approach to test more than one case		

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8.RP.7	Devise ways to verify results or use counterexamples to refute incorrect statements		
8.RP.8	Apply inductive reasoning in making and supporting mathematical conjectures		
	COMMUNICATION		
	Students will organize and consolidate their mathematical thinking through communication		
8.CM.1	Provide a correct, complete, coherent, and clear rationale for thought process used in problem solving	9	43-1
8.CM.2	Provide an organized argument which explains rationale for strategy selection		
8.CM.3	Organize and accurately label work		
	Students will communicate their mathematical thinking coherently and clearly to peers, teachers, and others.		
8.CM.4	Share organized mathematical ideas through the manipulation of objects, numerical tables, drawings, pictures, charts, graphs, tables, diagrams, models and symbols in written and verbal form	Cooperative groups with manipulatives throughout.	
8.CM.5	Answer clarifying questions from others		
	Students will analyze and evaluate the mathematical thinking and strategies of others.		
8.CM.6	Analyze mathematical solutions shared by others	Cooperative groups with manipulatives throughout.	
8.CM.7	compare strategies used and solutions found by others in relation to their own work	Cooperative groups with manipulatives throughout.	
8.CM.8	Formulate mathematical questions that elicit, extend, or challenge strategies, solutions, and/or conjectures of others		
	Students will use the language of mathematics to express mathematical ideas precisely.		

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8.CM.9	Increase their use of mathematical vocabulary and language when communicating with others	Math Glossary (15a - 15c)	
8.CM.10	Use appropriate language, representations, and terminology when describing objects, relationships, mathematical solutions, and rationale	Math Glossary (15a - 15c)	
8.CM.11	Draw conclusions about mathematical ideas through decoding, comprehension, and interpretation of mathematical visuals, symbols, and technical writing		
CONNECTIONS			
Students will recognize and use connections among mathematical ideas.			
8.CN.1	Understand and make connections among multiple representations of the same mathematical idea	34, 39	25-1, 25-2
8.CN.2	Recognize connections between subsets of mathematical ideas	1, 2 connected to 7	
8.CN.3	Connect and apply a variety of strategies to solve problems	10	43-2
Students will understand how mathematical ideas interconnect and build on one another to produce a coherent whole.			
8.CN.4	Model situations mathematically, using representations to draw conclusions and formulate new situations	Manipulatives used throughout.	
8.CN.5	Understand how concepts, procedures, and mathematical results in one area of mathematics can be used to solve problems in other areas of mathematics	71-75 used in 76-80	
Students will recognize and apply mathematics in contexts outside of mathematics.			
8.CN.6	Recognize and provide examples of the presence of mathematics in their daily lives	9-11, 33, 38-40	43-1 to 43-3
8.CN.7	Apply mathematical ideas to problem situations that develop outside of mathematics	13	45-1
8.CN.8	Investigate the presence of mathematics in careers and areas of interest		

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8.CN.9	Recognize and apply mathematics to other disciplines, areas of interest, and societal issues		47-2
REPRESENTATION			
Students will create and use representations to organize, record, and communicate mathematical ideas.			
8.R.1	Use physical objects, drawings, charts, tables, graphs, symbols, equations, or objects created using technology as representations		
8.R.2	Explain, describe, and defend mathematical ideas using representations	Manipulatives used throughout.	
8.R.3	Recognize, compare, and use an array of representational forms	Manipulatives, pictures, and symbols used throughout.	
8.R.4	Explain how different representations express the same relationship	34, 39	25-1, 25-2
8.R.5	Use standard and non-standard representations with accuracy and detail		
Students will select, apply, and translate among mathematical representations to solve problems.			
8.R.6	Use representations to explore problem situations	Manipulatives, pictures used throughout.	
8.R.7	Investigate relationships between different representations and their impact on a given problem	34, 39	25-1, 25-2
8.R.8	Use representation as a tool for exploring and understanding mathematical ideas	Manipulatives and drawings used throughout.	
Students will use representations to model and interpret physical, social, and mathematical phenomena.			
8.R.9	Use mathematics to show and understand physical phenomena (e.g., make and interpret scale drawings of figures or scale models of objects)	53	46-3

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8.R.10	Use mathematics to show and understand social phenomena (e.g, determine profit from sale of yearbooks)	38, 39	28-1, 51-1
8.R.11	Use mathematics to show and understand mathematical phenomena (e.g., use tables, graphs, and equations to show a pattern underlying a function)	T.G. pp. 40, 56, 57	42-1
NUMBER SENSE AND OPERATIONS			
Students will understand meanings of operations and procedures, and how they relate to one another.			
8.N.1	Develop and apply the laws of exponents for multiplication and division	5	6-1, 6-2, 57-1, 57-2
8.N.2	Evaluate expressions with integral exponents	5	6-1, 6-2, 57-1, 57-2
8.N.3	Read, write, and identify percents less than 1% and greater than 100%		
8.N.4	Apply percents to:		
	• Tax		
	• Percent increase/decrease		28-1
	• Simple interest	38	27-1
	• Sale price		28-1
	• Commission		
	• Interest rates	38	27-1
	• Gratuities		
Students will compute accurately and make reasonable estimates.			
8.N.5	Estimate a percent of quantity, given an application		
8.N.6	Justify the reasonableness of answers using estimation	2	5-1
ALGEBRA			
Students will represent and analyze algebraically a wide variety of problem solving situations.			
8.A.1	Translate verbal sentences into algebraic inequalities	75-77	

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8.A.2	Write verbal expressions that match given mathematical expressions	75-77	
8.A.3	Describe a situation involving relationships that matches a given graph		
8.A.4	Create a graph given a description or an expression for a situation involving a linear or nonlinear relationship	70	49-1
8.A.5	Use physical models to perform operations with polynomials		
	Students will perform algebraic procedures accurately.		
8.A.6	Multiply and divide monomials	79, 80	50-2,50-3
8.A.7	Add and subtract polynomials (integer coefficients)	78, 80	50-1, 50-3
8.A.8	Multiply a binomial by a monomial or a binomial (integer coefficients)		
8.A.9	Divide a polynomial by a monomial (integer coefficients) <i>Note: The degree of the denominator is less than or equal to the degree of the numerator for all variables.</i>		
8.A.10	Factor algebraic expressions using the GCF		
8.A.11	Factor a trinomial in the form $ax^2 + bx + c$; $a = 1$ and c having no more than three sets of factors		
8.A.12	Apply algebra to determine the measure of angles formed by or contained in parallel lines cut by a transversal and by intersecting lines		
8.A.13	Solve multi-step inequalities and graph the solution set on a number line		
8.A.14	Solve linear inequalities by combining like terms, using the distributive property, or moving variables to one side of the inequality (include multiplication or division of inequalities by a negative number)		
	Students will recognize, use, and represent algebraically patterns, relations, and functions.		
8.A.15	Understand that numerical information can be represented in multiple ways: arithmetically, algebraically, and graphically	70	49-1

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8.A.16	Find a set of ordered pairs to satisfy a given linear numerical pattern (expressed algebraically); then plot the ordered pairs and draw the line	70	49-1
8.A.17	Define and use correct terminology when referring to function (domain and range)		
8.A.18	Determine if a relation is a function	T.G. pp. 40, 56	
8.A.19	Interpret multiple representations using equation, tables of values, and graph		
GEOMETRY			
Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes.			
8.G.0	Construct the following, using a straight edge and compass:		
	• Segment congruent to a segment	41, 52, 53	
	• Angle congruent to an angle	47, 52	
	• Perpendicular bisector		
	• Angle bisector		
Students will identify and justify geometric relationships, formally and informally.			
8.G.1	Identify pairs of vertical angles as congruent	49	33-1
8.G.2	Identify pairs of supplementary and complementary angles	48	33-1
8.G.3	Calculate the missing angle in a supplementary or complementary pair	48	33-1
8.G.4	Determine angle pair relationships when given two parallel lines cut by a transversal		33-2
8.G.5	Calculate the missing angle measurements when given two parallel lines cut by a transversal		33-2
8.G.6	Calculate the missing angle measurements when given two intersecting lines and an angle		33-1

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	Students will apply transformations and symmetry to analyze problem solving situations.		
8.G.7	Describe and identify transformations in the plane, using proper function notation (rotations, reflections, translations, and dilations)	46	
8.G.8	Draw the image of a figure under rotations of 90 and 180 degrees	46	
8.G.9	Draw the image of a figure under a reflection over a given line	46	
8.G.10	Draw the image of a figure under a translation	46	
8.G.11	Draw the image of a figure under a dilation	46	
8.G.12	Identify the properties preserved and not preserved under a reflection, rotation, translation, and dilation	46	
	Students will apply coordinate geometry to analyze problem solving situations.		
8.G.13	Determine the slope of a line from a graph and explain the meaning of slope as a constant rate of change		
8.G.14	Determine the y-intercept of a line from a graph and be able to explain the y-intercept		
8.G.15	Graph a line using a table of values	70	49-1
8.G.16	Determine the equation of a line given the slope and the y-intercept		
8.G.17	Graph a line from an equation in slope-intercept form ($y = mx + b$)		
8.G.18	solve systems of equations graphically (only linear, integral solutions, $y = mx + b$ format, no vertical/horizontal lines)		
8.G.19	Graph the solution set of an inequality on a number line		
8.G.20	Distinguish between linear and nonlinear equations $ax^2 + bx + c$; $a = 1$ (only graphically)		
8.G.21	Recognize the characteristics of quadratics in tables, graphs, equations, and situations		
	MEASUREMENT		

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	Students will determine what can be measured and how, using appropriate methods and formulas.		
8.M.1	Solve equations/proportions to convert to equivalent measurements within metric and customary measurement systems <i>Note: Also allow Fahrenheit to Celsius and vice versa.</i>	56, 57	35-1, 37-1, 37-2