Math Teachers Press, Inc.

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NEW YORK STATE LEARNING STANDARDS FOR MATHEMATICS CORRELATED TO *MOVING WITH MATH® EXTENSIONS GRADE 7*

		Student Book	Skill Builders
	PROBLEM SOLVING		
	Students will build new mathematical knowledge through problem solving.		
7.PS.1	Use a variety of strategies to understand new mathematical content and to develop more efficient methods	13-16	43-1 to 43-6
7.PS.2	Construct appropriate extensions to problem situations.	13-16	43-1 to 43-6
7.PS.3	Understand and demonstrate how written symbols represent mathematical ideas	13-16	43-1 to 43-6
	Students will solve problems that arise in mathematics and in other contexts.		
7.PS.4	Observe patterns and formulate generalizations	T.G. p. 6	42-1
7.PS.5	Make conjectures from generalizations		
7.PS.6	Represent problem situations verbally, numerically, algebraically, and graphically	13, 14, 78-80	43-1, 43-2, 43-5, 47-2, 47-3
	Students will apply and adapt a variety of appropriate strategies to solve problems.		
7.PS.7	Understand that there is no one right way to solve mathematical problems but that different methods have advantages and disadvantages	13-16	43-1 to 43-6
7.PS.8	Understand how to break a complex problem into simpler parts or use a similar problem type to solve a problem	15	43-4
7.PS.9	Work backwards from a solution		
7.PS.10	Use proportionality to model problems	50, 51	27-1, 46-1
7.PS.11	Work in collaboration with others to solve problems	13, 14, Cooperative groups throughout	

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	Students will monitor and reflect on the process of mathematical problem solving.		
7.PS.12	Interpret solutions within the given constraints of a problem	14	43-1 to 43-4
7.PS.13	Set expectations and limits for possible solutions		43-1
7.PS.14	Determine information required to solve the problem	13-16	43-1 to 43-6
7.PS.15	Choose methods for obtaining required information	13-16	43-1 to 43-6
7.PS.16	Justify solution methods through logical argument		
7.PS.17	Evaluate the efficiency of different representations of a problem	T.G. p. 11	
	REASONING AND PROOF		
	Students will recognize reasoning and proof as fundamental aspects of mathematics.		
7.RP.1	Recognize that mathematical ideas can be supported by a variety of strategies	14	
	Students will make and investigate mathematical conjectures		
7.RP.2	Use mathematical strategies to reach a conclusion	14	43-4
7.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.		
7.RP.4	Provide supportive arguments for conjectures		
7.RP.5	Develop, verify, and explain an argument, using appropriate mathematical ideas and language	Vocabulary Glossary (14a - 14c)	
	Students will select and use various types of reasoning and methods of proof.		
7.RP.6	Support an argument by using a systematic approach to test more than one case		
7.RP.7	Devise ways to verify results or use counterexamples to refute incorrect statements		
7.RP.8	Apply inductive reasoning in making and supporting mathematical conjectures		

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	COMMUNICATION			
	Students will organize and consolidate their mathematical thinking through communication.			
7.CM.1	Provide a correct, complete, coherent, and clear rationale for though process used in problem solving		T.G. p. 13	
7.CM.2	Provide an organized argument which explains rationale for strategy selection		T.G. p. 14	
7.CM.3	Organize and accurately label work		13, 14	
	Students will communicate their mathematical thinking coherently and clearly to peers, teachers, and others.			
7.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		Manipulatives used throughout. 78-80 T.G. pp. 27, 28 (examples)	47-2, 47-3
7.CM.5	Answer clarifying questions from others			
	Students will analyze and evaluate the mathematical thinking and strategies of others.			
7.CM.6	Analyze mathematical solutions shared by others		Scripted questions	
7.CM.7	Compare strategies used and solutions found by others in relation to their work		T.G. p. 14	
7.CM.8	Formulate mathematical questions that elicit, extend, or challenge strategies, solutions, and/or conjectures of others		Writing word problems - T.G. p. 16 (one example)	
	Students will use the language of mathematics to express mathematical ideas precisely.			
7.CM.9	Increase their use of mathematical vocabulary and language when communicating with others		Glossary (14a - 14c)	
7.CM.10	Use appropriate language, representations, and terminology when describing objects, relationships, mathematical solutions, and rationale		Glossary (14a - 14c)	
7.CM.11	Draw conclusions about mathematical ideas through decoding, comprehension, and interpretation of mathematical visuals, symbols, and technical writing		Using manipulatives leads to discovery of patterns and conclusions - throughout	

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	CONNECTIONS		
	Students will recognize and use connections among mathematical ideas.		
7.CN.1	Understand and make connections among multiple representations of the same mathematical ideas		
7.CN.2	Recognize connections between subsets of mathematical ideas		
7.CN.3	Connect and apply a variety of strategies to solve problems	T.G. p. 14	
	Students will understand how mathematical ideas interconnect and build on one another to produce a coherent whole.		
7.CN.4	Model situations mathematically, using representations to draw conclusions and formulate new situations	Manipulatives, drawing pictures, abstract symbols - throughout	
7.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	pp. 7, 8 related to p. 1	
	Students will recognize and apply mathematics in contexts outside of mathematics.		
7.CN.6	Recognize and provide examples of the presence of mathematics in their daily lives	31, 53	28-1
7.CN.7	Apply mathematical ideas to problem situations that develop outside of mathematics	31, 53	28-1
7.CN.8	Investigate the presence of mathematics in careers and areas of interest	31, 53	28-1
7.CN.9	Recognize and apply mathematics to other disciplines, areas of interest, and societal issues	31, 53	28-1
	REPRESENTATION		
	Students will create and use representations to organize, record, and communicate mathematical ideas.		

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7.R.1	Use physical objects, drawings, charts, tables, graphs, symbols, equations, or objects created using technology as representations	16	
7.R.2	Explain, describe, and defend mathematical ideas using representations	Journal Prompts throughout	
7.R.3	Recognize, compare, and use an array of representational forms	Manipulative, pictures, symbols used throughout	
7.R.4	Explain how different representations express the same relationship	37, 38	20-1
7.R.5	Use standard and non-standard representations with accuracy and detail		
	Students will select, apply, and translate among mathematical representations to solve problems.		
7.R.6	Use representations to explore problem situations		
7.R.7	Investigate relationships between different representations and their impact on a given problem	37, 38	20-1
7.R.8	Use representations as a tool for exploring and understanding mathematical ideas	46-49	25-1, 25-2
	Students will use representations to model and interpret physical, social, and mathematical phenomena.		
7.R.9	Use mathematics to show and understand physical phenomena (e.g., make and interpret scale drawings of figures or scale models of objects)		46-1, 46-2
7.R.10	Use mathematics to show and understand social phenomena (e.g., determine profit from sale of yearbooks)	53	28-1
7.R.11	Use mathematics to show and understand mathematical phenomena (e.g., use tables, graphs, and equations to show a pattern underlying a function)	16	
	NUMBER SENSE AND OPERATIONS		
	Students will understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems.		
7.N.1	Distinguish between the various subsets of real numbers (counting/natural numbers, whole numbers, integers, rational numbers, and irrational numbers)	1	4-1, 4-2

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7.N.2	Recognize the difference between rational and irrational numbers (e.g., explore different approximations of π)		
7.N.3	Place rational and irrational numbers (approximations) on a number line and justify the placement of the numbers		
7.N.4	Develop the laws of exponents for multiplication and division	6	6-1,
7.N.5	Write numbers in scientific notation		
7.N.6	Translate numbers from scientific notation into standard form		
7.N.7	Compare numbers written in scientific notation		
7.N.8	Find the common factors and greatest common factor of two or more numbers	T.G.. p. 28 4	3-1
7.N.9	Determine multiples and least common multiple of two or more numbers	27	
7.N.10	Determine the prime factorization of a given number and write in exponential form	4	3-1, 6-2
	Students will understand meaning of operations and procedures, and how they relate to one another.		
7.N.11	Simplify expressions using order of operations *Note: Expressions may include absolute value and/or integral exponents greater than 0.*	5	2-1,2-2
7.N.12	Add, subtract, multiply, and divide integers	7-11	7-1, 8-1, 10-1, 10-2
7.N.13	Add and subtract two integers (with and without the use of a number line)	7, 8	7-1, 8-1
7.N.14	Develop a conceptual understanding of negative and zero exponents with a base of ten and relate to fractions and decimals (e.g., $10^{-2} = 0.1 = 1/100$)		
7.N.15	Recognize and state the value of the square root of a perfect square (up to 225)	6	6-1, 6-2
7.N.16	Determine the square root of non-perfect squares using a calculator		
7.N.17	Classify irrational numbers as non-repeating/non-terminating decimals		
	Students will compute accurately and make reasonable estimates.		

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7.N.18	Identify the two consecutive whole numbers between which the square root of a non-perfect square whole number less than 225 lies (with and without the use of a number line)	6	
7.N.19	Justify the reasonableness of answers using estimation	3, 12, 34, 36	5-1, 19-1, 19-2, 44-1, 44-2
	ALGEBRA		
	Students will represent and analyze algebraically a wide variety of problem solving situations.		
7.A.1	Translate two-step verbal expressions into algebraic expressions	21	
	Students will perform algebraic procedures accurately.		
7.A.2	Add and subtract monomials with exponents of one		
7.A.3	Identify a polynomial as an algebraic expression containing one or more terms		
7.A.4	Solve multi-step equations by combining like terms, using the distributive property, or moving variables to one side of the equation		
7.A.5	Solve one-step equalities (positive coefficients only) (See 7.G.10)	21, 22	50-1
7.A.6	Evaluate formulas for given input values (surface area, rate, ad density problems)	70	38-1, 38-2
	Students will recognize, use, and represent algebraically patterns, relations, and functions.		
7.A.7	Draw the graphic representation of a pattern from an equation or from a table of data	19	
7.A.8	Create algebraic patterns using charts/tables, graphs, equations, and expressions	16	42-1
7.A.9	Build a pattern to develop a rule for determining the sum of the interior angles of polygons		
7.A.10	Write an equation to represent a function from a table of values	16	
	GEOMETRY		
	Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes.		

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7.G.1	Calculate the radius or diameter, given the circumference or area of a circle	71, 72	39-1
7.G.2	Calculate the volume of prisms and cylinders, using a given formula and a calculator	75, 76	41-1
7.G.3	Identify the two-dimensional shapes that make up the faces and bases of three-dimensional shapes (prisms, cylinders, cones, and pyramids)		
7.G.4	Determine the surface area of prisms and cylinders, using a calculator and a variety of methods	T.G. p. 75	
	Students will identify and justify geometric relationships, formally and informally		
7.G.5	Identify the right angle, hypotenuse, and legs of a right triangle		
7.G.6	Explore the relationship between the lengths of the three sides of a right triangle to develop the Pythagorean Theorem		
7.G.7	Find a missing angle when given angles of a quadrilateral		
7.G.8	Use the Pythagorean Theorem to determine the unknown length of a side of a right triangle		
7.G.9	Determine whether a given triangle is a right triangle by applying the Pythagorean Theorem and using a calculator		
	Students will apply coordinate geometry to analyze problem solving situations.		
7.G.10	Graph the solution set of an inequality (positive coefficients only) on a number line (See 7.A.5)		
	MEASUREMENT		
	Students will determine what can be measured and how, using appropriate methods and formulas.		
7.M.1	Calculate distance using a map scale		46-2
7.M.2	Convert capacities and volumes within a given system	65, 67	
7.M.3	Identify customary and metric units of mass	65, 68	35-1, 37-1
7.M.4	Convert mass within a given system	67, 68	35-1, 37-1
7.M.5	Calculate unit price using proportions		
7.M.6	Compare unit prices		

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7.M.7	Convert money between different currencies with the use of an exchange rate table and a calculator		
7.M.8	Draw central angles in a given circle using a protractor (circle graphs)		
7.M.9	Determine the tool and technique to measure with an appropriate level of precision: mass		
	Students will develop strategies for estimating measurements.		
7.M.10	Identify the relationships between relative error and magnitude when dealing with large numbers (e.g., money, population)		
7.M.11	Estimate surface area	T.G. p. 75	40-1, 40-2
7.M.12	Determine personal references for customary/metric units of mass	T.G. p. 68	
7.M.13	Justify the reasonableness of the mass of an object		
	STATISTICS AND PROBABILITY		
	Students will collect, organize, display, and analyze data.		
7.S.1	Identify and collect data using a variety of methods	17	47-2, 47-3
7.S.2	Display data in a circle graph	80	47-3
7.S.3	Convert raw data into double bar graphs and double line graphs	79	47-2 47-3
7.S.4	Calculate the range for a given set of data		47-2
7.S.5	Select the appropriate measure of central tendency	18	45-1, 45-2
7.S.6	Read and interpret data represented graphically (pictograph, bar graph, histogram, line graph, double line/bar graphs or circle graph	78, 79	47-3
	Students will make predictions that are based upon data analysis.		
7.S.7	Identify and explain misleading statistics and graphs		
	Students will understand and apply concepts of probability.		
7.S.8	Interpret data to provide the basis for predictions and to establish experimental probabilities	77	47-1, 47-4
7.S.9	Determine the validity of sampling methods to predict outcomes	77	47-1, 47-4

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7.S.10	Predict the outcome of an experiment	77	47-1, 47-4
7.S.11	Design and conduct an experiment to test predictions	77	47-1, 47-4
7.S.12	Compare actual results to predict results	77	47-1, 47-4