

Seventh Grade Mathematics Content Standards and Objectives

Standard 1:	Number and Operations	
M.S.7.1	Through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics, students will <ul style="list-style-type: none"> • demonstrate understanding of numbers, ways of representing numbers, and relationships among numbers and number systems, • demonstrate meanings of operations and how they relate to one another, and • compute fluently and make reasonable estimates. 	
Objectives	Students will	PLT Activity and Page
M.O.7.1.1	compare, order, and differentiate among integers, decimals, fractions, and irrational numbers using multiple representations (e.g., symbols, manipulatives, graphing on a number line).	
M.O.7.1.2	model the relationship between perfect squares and square roots using physical representations; estimate square root and evaluate using technology.	
M.O.7.1.3	using simple computation and problem-solving situations, demonstrate fluency and justify solutions in performing operations with rational numbers including negative numbers for <ul style="list-style-type: none"> • adding • subtracting • multiplying • dividing 	
M.O.7.1.4	justify the use of the commutative, associative, distributive, identity and inverse properties to simplify numeric expressions.	
M.O.7.1.5	analyze and solve grade-appropriate real-world problems with whole numbers, integers, decimals, fractions and percents including problems involving <ul style="list-style-type: none"> • discounts, • interest, • taxes, • tips, • percent increase or decrease, and • justify solutions including using estimation and reasonableness. 	#27 Every Tree for Itself p.117 #66 Germinating Giants p.279 #85 In the Driver's Seat p.370
M.O.7.1.6	use inductive reasoning to find and justify the laws of exponents with numeric bases	
M.O.7.1.7	solve problems using numbers in scientific notation (positive and negative exponents) with and without technology, and interpret from real life contexts.	

Standard 2:	Algebra	
M.S.7.2	<p>Through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics, students will</p> <ul style="list-style-type: none"> • demonstrate understanding of patterns, relations and functions, • represent and analyze mathematical situations and structures using algebraic symbols, • use mathematical models to represent and understand quantitative relationships, and • analyze change in various contents. 	
Objectives	Students will	PLT Activity and Page
M.O.7.2.1	use inductive reasoning to find missing elements in a variety of arithmetic and geometric patterns including algebraic sequences and series.	
M.O.7.2.2	evaluate algebraic expressions with whole numbers, integers, absolute value and exponents using the order of operations.	
M.O.7.2.3	solve problems by creating an input/output function table(including, but not limited to, spreadsheets) to predict future values, given a real-world situation involving rational numbers.	
M.O.7.2.4	analyze proportional relationships in real-world situations, select an appropriate method to determine the solution and justify reasoning for choice of method to solve.	
M.O.7.2.5	solve one-step linear equations and inequalities using a variety of strategies containing rational numbers with integer solutions; graph solutions, and justify the selection of the strategy and the reasonableness of the solution.	#37 Reduce, Reuse, Recycle p.159 #67 How big is your tree? p.284
M.O.7.2.6	plot lines within the Cartesian coordinate plane from a table of values to solve mathematical real-world problems.	
M.O.7.2.7	determine the slope of a line from its graphical representation.	
M.O.7.2.8	represent algebraically and solve real-world application problems and justify solutions.	#38 Every Drop Counts p.163

M.O.7.2.9	identify a real life problem involving proportionality; make a hypothesis as to the outcome; develop, justify, and implement a method to collect, organize, and analyze data; generalize the results to make a conclusion; compare the hypothesis and the conclusion; present the project using words, graphs, drawings, models, or tables.	#16 Pass the Plants, Please p. 77 #21 Adopt a Tree p. 97 #27 Every Tree for Itself p.117 #29 Rain Reasons p.123 #32 A Forest of Many Uses p.135 #35 Loving It Too Much p.147 #37 Reduce, Reuse, Recycle p.159 #38 Every Drop Counts p.163 #47 Are Vacant Lots Vacant? p.200 #50 400-Acre Wood p.217 #53 On the Move p.232 #77 Trees in Trouble p.332 #80 Nothing Succeeds Like Succession p.345 #84 The Global Climate p.363 #85 In the Driver's Seat p.370
Standard 3:	Geometry	
M.S.7.3	Through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics, students will: <ul style="list-style-type: none"> analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships, specify locations and describe spatial relationships using coordinate geometry and other representational systems, apply transformations and use symmetry to analyze mathematical situations, and solve problems using visualization, spatial reasoning, and geometric modeling. 	
Objectives	Students will	PLT Activity and Page
M.O.7.3.1	identify and construct <ul style="list-style-type: none"> angle-pairs adjacent, complementary, supplementary, vertical congruent segments and angles perpendicular bisectors of segments angle-bisectors 	
M.O.7.3.2	apply line symmetry to classify plane figures.	
M.O.7.3.3	apply rotations, reflections, translations to plane figures and determine the coordinates of its transformation and compare and contrast the new figure with the original.	
M.O.7.3.4	pose and solve ratio and proportion problems including scale drawings and similar polygons.	#50 400-Acre Wood p.217 #67 How Big is Your Tree? p.284 #69 Forest for the Trees p.291

M.O.7.3.5	<p>solve problems and explain the relationships among scale factor and area and volume including</p> <ul style="list-style-type: none"> • square of a scale factor • cube of a scale factor 	
M.O.7.3.6	solve mathematical real-world problems using compound geometric figures.	
Standard 4:	Measurement	
M.S.7.4	<p>Through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics, students will:</p> <ul style="list-style-type: none"> • demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurements, and <p>apply appropriate techniques, tools and formulas to determine measurements.</p>	
Objectives	Students will	PLT Activity and Page
M.O.7.4.1	<p>select and apply an appropriate method to solve (including, but not limited to, formulas) justify the method and the reasonableness of the solution, given a real-world problem solving situation involving</p> <ul style="list-style-type: none"> • perimeter • circumference • area • surface area of prisms (rectangular and triangular) • volume of prisms and cylinders • distance and temperature (Celsius, Fahrenheit) 	
M.O.7.4.2	use the Pythagorean Theorem to find the length of any side of a right triangle and apply to problem solving situations.	<p>#4 Sounds Around p. 26</p> <p>#16 Pass the Plants Please p. 77</p> <p>#22 Trees as Habitats p.102</p>
M.O.7.4.3	convert units of measurement, linear, area and volume, within customary and metric systems.	
Standard 5:	Data Analysis and Probability	
M.S.7.5	<p>Through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics, students will:</p> <ul style="list-style-type: none"> • formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them, • select and use appropriate statistical methods to analyze data, • develop and evaluate inferences and predictions that are based on models, and • apply and demonstrate an understanding of basic concepts of probability 	
Objectives	Students will	PLT Activity and Page
M.O.7.5.1	determine theoretical probability of an event, make and test predictions through experimentation.	

M.O.7.5.2	determine combinations and permutations by constructing sample spaces (e.g., listing, tree diagrams, frequency distribution tables).	
M.O.7.5.3	collect, organize, graphically represent, and interpret data displays including frequency distributions, line-plots, scatter plots, box and whiskers, and multiple-line graphs.	
M.O.7.5.4	analyze and solve application problems involving measures of central tendency (mean, median, mode) and dispersion (range) from data, graphs, tables, and experiments using appropriate technology to compare two sets of data.	#38 Every Drop Counts p.163