Eighth Grade Mathematics Content Standards and Objectives

Standard 1:	perations	
M.S.8.1	Through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics, students will • 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.8.1.1	analyze, describe and compare the characteristics of rational and irrational numbers.	
M.O.8.1.2	analyze and solve application problems with • powers, • squares, • square roots, • scientific notation, and verify solutions using estimation techniques.	
M.O.8.1.3	analyze and solve grade-appropriate real-world problems with • whole numbers, • decimals, • fractions, • percents, percent increase and decrease, • integers, and • including, but not limited to, rates, tips, discounts, sales tax and interest and verify solutions using estimation techniques.	#27 Every Tree for Itself p.117 #66 Germinating Giants p.279
Standard 2:	Algebra	
M.S.8.2	Through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics, students will • 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 contexts.	
Objectives	**Students will**	**PLT Activity and Page**

M.O.8.2.1	use a variety of strategies to solve one and two-step linear equations and inequalities with rational solutions; defend the selection of the strategy; graph the solutions and justify the reasonableness of the solution.	
M.O.8.2.2	identify proportional relationships in real-world situations, then find and select an appropriate method to determine the solution; justify the reasonableness of the solution.	#66 Germinating Giants p.279
M.O.8.2.3	add and subtract polynomials limited to two variables and positive exponents.	
M.O.8.2.4	use systems of linear equations to analyze situations and solve problems.	
M.O.8.2.5	apply inductive and deductive reasoning to write a rule from data in an input/output table, analyze the table and the rule to determine if a functional relationship exists.	
M.O.8.2.6	graph linear equations and inequalities within the Cartesian coordinate plane by generating a table of values (with and without technology).	
M.O.8.2.7	formulate and apply a rule to generate an arithmetic, geometric and algebraic pattern.	
M.O.8.2.8	determine the slope of a line using a variety of methods including • graphing • change in y over change in x • equation	
M.O.8.2.9	represent and solve real-world grade-appropriate problems using multiple strategies and justify solutions.	
M.O.8.2.10	identify a real life problem involving change over time; 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 results of the investigation; present the project using words, graphs, drawings, models, or tables.	#16 Pass the Plants, Please p. 77 #27 Every Tree for Itself p.117
Standard 3:	Geometry	
M.S.8.3	unication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics, students will: • 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 transformation and use symmetry to analyze mathematical situations, and • solve problems using visualization, spatial reasoning, and geometric modeling.	
Objectives	**Students will**	**PLT Activity and Page**

	justify the relationships among corresponding, alternate interior, alternate exterior and vertical angles when parallel lines are cut by a transversal using models, pencil/paper, graphing calculator, and technology.	
M.O.8.3.2	classify polyhedrons according to the number and shape of faces; use inductive reasoning to determine the relationship between vertices, faces and edges (edges + 2 = faces + vertices).	
M.O.8.3.3	identify, apply, and construct perpendicular and angle bisectors with and without technology) given a real-world situation,.	
M.O.8.3.4	create geometric patterns including tiling, art design, tessellations and scaling using transformations (rotations, reflections, translations) and predict results of combining, subdividing, and changing shapes of plane figures and solids.	
M.O.8.3.5	create scale models of similar figures using ratio, proportion with pencil/paper and technology and determine scale factor	
M.O.8.3.6	make and test a conjecture concerning • regular polygons, • the cross section of a solid such as a cylinder, cone, and pyramid, • the intersection of two or more geometric figures in the plane (e.g., intersection of a circle and a line), and • justify the results.	
Standard 4:	Measurement	
M.S.8.4	Through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics, students will • demonstrate understanding of measurable attributes of objects and the units, systems, and processes of measurements, and • apply appropriate techniques, tools, and formulas to determine measurements.	
Objectives	**Students will**	**PLT Activity and Page**
M.O.8.4.1	select and apply an appropriate method to solve; justify the method and the reasonableness of the solution of problems involving volume of • prisms • cylinders • cones • pyramids • spheres given real-world problem solving situations.	
	solve problems involving missing measurements in plane and solid geometric figures using formulas and drawings including irregular figures, models or definitions.	

M.O.8.4.3	solve right triangle problems where the existence of triangles is not obvious using the Pythagorean Theorem and indirect measurement in real-world problem solving situations.	
Standard 5:	Data Analysis and Probability	
M.S.8.5	Through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics, students will: • 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**
	determine and explain whether a real-world situation involves permutations or combinations, then use appropriate technology to solve the problem.	#12 Invasion Species p. 59
	compare the experimental and theoretical probability of a given situation (including compound probability of a dependent and independent event).	
	create and extrapolate information from multiple-bar graphs, box and whisker plots, and other data displays using appropriate technology.	#4 Sounds Around p. 26 #16 Pass the Plants Please p. 77
	analyze problem situations, games of chance, and consumer applications using random and non-random samplings to determine probability, make predictions, and identify sources of bias.	
M.O.8.5.5	draw inferences, make conjectures and construct convincing arguments involving • different effects that changes in data values have on measures of central tendency • misuses of statistical or numeric information, based on data analysis of same and different sets of data.	