Kindergarten Mathematics Content Standards and Objectives

Standard 1:	Number and Operations	
M.S.K.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.K.1.1	count forward to 20 and backward from 10 with and without manipulatives.	
M.O.K.1.2	read, write, order, and compare numbers to 20 using multiple strategies (e.g. manipulatives, number line).	
M.O.K.1.3	group and count manipulatives by ones, fives, and tens.	#25 Birds and Worms p.111
M.O.K.1.4	model and identify place value of each digit utilizing standard and expanded form through 20.	
M.O.K.1.5	Use ordinal numbers $1^{st} – 10^{th}$ to identify position in a sequence.	
M.O.K.1.6	estimate the number of objects in a group of 20 or less and count to evaluate reasonableness of estimation.	
M.O.K.1.7	identify and name halves and wholes using concrete models.	
M.O.K.1.8	use concrete objects to model addition and subtraction of whole numbers related to sums of 10 or less and write corresponding number sentence.	
M.O.K.1.9	model meanings of operations and the relationship between addition and subtraction (e.g., identity element of addition, commutative property) using manipulatives.	
M.O.K.1.10	create grade-appropriate picture and story problems, solve using a variety of strategies, present solutions and justify results.	
Standard 2:	Algebra	

M.S.K.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.K.2.1	justify the classification of self-selected objects based on attributes.	#2 Get in Touch with Trees p. 20 #4 Sounds Around p. 26 #6 Picture This! p. 34 #16 Pass The Plants, Please p. 77 #36 Pollution Search p.153
M.O.K.2.2	create, describe, and extend a repeating pattern using common objects, sound, and movement.	#4 Sounds Around p. 26
M.O.K.2.3	model and identify patterns of counting by 5's and 10's.	
Standard 3:	Geometry	
M.S.K.3	Through communication, 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 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.K.3.1	use physical materials to construct, identify, and classify basic geometric plane shapes: • circles • ellipses (oval) • rectangles including squares • triangles	#1 The Shape of Things p. 17
M.O.K.3.2	recognize and describe basic geometric shapes in the environment.	#1 The Shape of Things p. 17
M.O.K.3.3	model and describe spatial relationships: • inside/outside • top/bottom • before/after	#47 Are Vacant Lots Vacant? p.200
M.O.K.3.4	identify the separate parts used to make a whole object.	#22 Trees as Habitats p. 102
Standard 4:	Measurement	
M.S.K.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 measurement, and • apply appropriate techniques, tools and formulas to determine measurements.	
Objectives	**Students will**	**PLT Activity and Page**
M.O.K.4.1	estimate the size of an object and compare and order objects with respect to a given attribute.	#6 Picture This! p. 34 #41 How Plants Grow p.179
M.O.K.4.2	use standard and nonstandard units of measure to find the length of an object.	#41 How Plants Grow p.179 #67 How Big is Your Tree? p.288
M.O.K.4.3	compare two objects in nonstandard units of measure, according to one or more of the following attributes: • length • height • weight	#67 How Big is Your Tree? p.288
M.O.K.4.4	use calendar to identify date and the sequence of days of the week.	
M.O.K.4.5	read time to the hour using analog and digital clocks.	

M.O.K.4.6	identify the name and value of coins and explain the relationships between: • penny • nickel • dime	
Standard 5:	Data Analysis and Probability	
M.S.K.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**
M.O.K.5.1	collect, organize, display, and interpret data using a pictograph and bar graph (with and without technology)	#4 Sounds Around p. 26 #21 Adopt A Tree p. 97 #22 Trees as Habitats p.102 #41 How Plants Grow p.179
M.O.K.5.2	conduct a simple probability experiment and use tallies to record results in a table, make predictions based on results.	#4 Sounds Around p. 26

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First Grade Mathematics Content Standards and Objectives

Standard 1	Number and Operations
M.S.1.1	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.1.1.1	count forward to 100 and backward from 20 with and without manipulatives.	
M.O.1.1.2	read, write, order, and compare numbers to 100 using multiple strategies (e.g. manipulatives, number line, symbols).	
M.O.1.1.3	identify odd and even numbers to 20 and determine if a set of objects has an odd or even number of elements.	
M.O.1.1.4	group and count manipulatives by ones, fives, and tens to 100.	#25 Birds and Worms p.111
M.O.1.1.5	model and identify place value of each digit utilizing standard and expanded form to 100.	
M.O.1.1.6	round any two-digit number to the nearest 10.	
M.O.1.1.7	use ordinal numbers 1st - 20th to identify position in a sequence .	
M.O.1.1.8	estimate the number of objects in a group of 100 or less and count to evaluate reasonableness of estimate.	#2 Get in Touch with Trees p. 20
M.O.1.1.9	identify, name, and explain why a given part is a half, third or fourth of a whole or part of a group, using concrete models.	
M.O.1.1.10	use concrete objects to model the addition of two or three addends and subtraction of whole numbers related to sums less than 18 and write the corresponding number sentence.	
M.O.1.1.11	model operations, addition and subtraction, and the relationship between addition and subtraction (e.g., identity element of addition, commutative property, fact families, inverse operations) using concrete objects.	
M.O.1.1.12	quick recall of basic addition facts with sums to 10 and corresponding subtraction facts.	
M.O.1.1.13	model and solve 2-digit addition and subtraction without regrouping.	
M.O.1.1.14	create grade-appropriate picture and story problems using a variety of strategies (with and without technology), present solutions and justify results.	

Standard 2:	Algebra	
M.S.1.2	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.1.2.1	sort and classify objects by more than one attribute, using various strategies, including Venn Diagrams.	#25 Birds and Worms p.111 #32 A Forest of Many Uses p.135
M.O.1.2.2	determine the rule or give the output given an input/output model using addition or subtraction.	
M.O.1.2.3	identify and write number patterns by 2's, 5's, and 10's.	
M.O.1.2.4	create and analyze number patterns based on real-life situations using words, AB form, and T-charts and present results.	
M.O.1.2.5	use concrete materials to demonstrate that the quantities on both sides of a grade-appropriate number sentence are equivalent.	
Standard 3:	Geometry	
M.S.1.3	Through communication, 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 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.1.3.1	draw, label, and sort • circle, • rectangles including squares, • triangles according to sides and vertices.	#1 The Shape of Things p. 17

M.O.1.3.2	use physical materials to construct, identify, and classify three-dimensional figures: • cube • cone • sphere • rectangular solid • pyramid • cylinder	
M.O.1.3.3	recognize three-dimensional shapes in the environment.	#1 The Shape of Things p. 17 #2 Get in Touch with Trees p. 20 #25 Birds and Worms p.111
M.O.1.3.4	draw and identify • open and closed figures • congruent plane shapes	
M.O.1.3.5	create and describe simple symmetrical designs	
M.O.1.3.6	describe spatial relationships: over/under, left/right.	#2 Get in Touch with Trees p. 20 #32 A Forest of Many Uses p.135 #48 Field, Forest, and Stream p.203
M.O.1.3.7	find and name locations on a first-quadrant grid.	
M.O.1.3.8	predict the result of combining or decomposing two or more two-dimensional/three-dimensional shapes.	
Standard 4	Measurement	
M.S.1.4	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 measurement, and apply appropriate techniques, tools and formulas to determine measurements.	
Objectives	**Students will**	**PLT Activity and Page**
M.O.1.4.1	estimate, measure, compare and order using customary, metric, and nonstandard units to determine length to nearer whole unit.	#4 Sounds Around p. 26 #71 Watch on Wetlands p.303

M.O.1.4.2	select appropriate units and tools to measure and compare two objects or events according to one or more of the following attributes: length height weight temperature volume justify selection of units and tools used to measure the attributes and present results.	#27 Every Tree for Itself p.117 #36 Pollution Search p.153 #41 How Plants Grow p.179 #47 Are Vacant Lots Vacant? p.200 #67 How Big is Your Tree? p.288 #70 Soil Stories p.297
M.O.1.4.3	use calendar to identify date, sequence of days of the week, and months of the year.	
M.O.1.4.4	explain time concept in context of personal experience.	
M.O.1.4.5	read time to the half hour using an analog and digital clock.	
M.O.1.4.6	identify, count, trade and organize the following coins and bill to display a variety of price values from real-life examples with a total value of 100 cents or less. • penny • nickel • dime • quarter • dollar bill	
Standard 5	Data Analysis and Probability	
M.S.1.5	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**
M.O.1.5.1	identify a real life situation to gather data over time; make a hypothesis as to the outcome; design and implement a method to collect, organize, and analyze the results to make a conclusion; evaluate the validity of the hypothesis based upon collected data; design a mode of presentation using a pictograph and a bar graph (with and without technology).	#16 Pass The Plants, Please p. 77 #48 Field, Forest, and Stream p.203
M.O.1.5.2	conduct simple experiments, record data on a tally chart or table and use the data to predict which of the events is more likely or less likely to occur if the experiment is repeated.	#16 Pass The Plants, Please p. 77

Second Grade Mathematics Content Standards and Objectives

Standard 1:	Number and Operations

M.S.2.1	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.2.1.1	read, write, order, and compare numbers to 1,000 using multiple strategies (e.g. symbols, manipulatives, number line).	
M.O.2.1.2	justify any number as odd or even and determine if a set has an odd or even number of elements.	
M.O.2.1.3	count and group concrete manipulatives by ones, tens, and hundreds to 1,000.	
M.O.2.1.4	model and identify place value of each digit utilizing standard and expanded form through 1000.	
M.O.2.1.5	identify and read any ordinal number to identify position in a sequence.	
M.O.2.1.6	round any 3-digit number to both the nearer 10 and 100.	
M.O.2.1.7	Identify and explain fractions as part of a whole and as part of a set/group using models.	
M.O.2.1.8	model and justify the relationship between addition and subtraction (e.g., identity element of addition, associative property, commutative property, inverse operations, fact families).	
M.O.2.1.9	demonstrate quick recall of basic addition facts with sums to 18 and corresponding subtraction facts.	
M.O.2.1.10	model 2- and 3-digit addition and subtraction with regrouping using multiple strategies.	
M.O.2.1.11	add and subtract 2- and 3-digit numbers without regrouping.	
M.O.2.1.12	use rounding to analyze the reasonableness of a sum or a difference.	
M.O.2.1.13	create story problems that require one or two-step procedures, using a variety of strategies explain the reasoning used , justify the procedures selected and present the results.	
Standard 2:	Algebra	

M.S.2.2	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.2.2.1	analyze, describe, extend and create a growing pattern using objects or numbers.	
	e variable produces a change in another variable	
	lete and extend a variety of counting patterns, according to a given rule.	
	l models to demonstrate equivalency of two numerical expressions written as a grade-appropriate number sentence.	
Standard 3:	Geometry	
M.S.2.3	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 transformations and use symmetry to analyze mathematical situations, and using visualization, spatial reasoning, and geometric modeling.	
Objectives	**Students will**	**PLT Activity and Page**
	identify and describe the following geometric solids according to the number of faces and edges: • rectangular solid • cube • cylinder • cone • pyramid	
	compare and contrast plane and solid geometric shapes.	
	identify and draw congruent shapes that have been rotated or reflected	
	model and draw line segments and angles.	
	plot and describe the path between locations on a grid.	

M.O.2.3.6	identify similar shapes.	#1 The Shape of Things p. 17 #6 Picture This! p. 34

Standard 4:	Measurement	
M.S.2.4	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 measurement, and apply appropriate techniques, tools and formulas to determine measurements.	

Objectives	Students will	PLT Activity and Page
M.O.2.4.1	• identify a real life situation to use appropriate measurement tools; over time make a hypothesis as to the change overtime using whole units: • length in centimeters and inches, • temperature in Celsius and Fahrenheit, • weight/mass in pounds and kilograms, and design and implement a method to collect, organize, and analyze data; analyze the results to make a conclusion evaluate the validity of the hypothesis based upon collected data; design a mode of presentation (with and without technology).	#4 Sounds Around p. 26 #16 Pass The Plants, Please p. 77 #47 Are Vacant Lots Vacant? p.200 #67 How Big is Your Tree? p.288 #71 Watch on Wetlands p.303
M.O.2.4.2	estimate and determine the perimeter of squares, rectangles and triangles.	
M.O.2.4.3	estimate and count the number of square units needed to cover a given area using manipulatives.	
M.O.2.4.4	order events in relation to time.	
M.O.2.4.5	determine past and future days of the week and identify specific dates, given a calendar.	
M.O.2.4.6	read time to the quarter hour using an analog and digital clock.	
M.O.2.4.7	identify, count and organize coins and bills to display a variety of price values from real-life examples with a total value of one dollar or less and model making change using manipulatives.	

Standard 5:	Data Analysis and Probability	
M.S.2.5	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.	

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Objectives	Students will	PLT Activity and Page
M.O.2.5.1	create, read, and interpret a pictograph with each picture representing greater than or equal to a single unit.	#67 How Big is Your Tree? p.288
M.O.2.5.2	conduct simple experiments with more than two outcomes and use the data to predict which event is more, less, or equally likely to occur if the experiment is repeated.	
M.O.2.5.3	analyze data represented on a graph using grade-appropriate questions.	
M.O.2.5.4	formulate questions, collect data, organize and display as a chart, table or bar graph.	#4 Sounds Around p. 26 #25 Birds and Worms p.111 #47 Are Vacant Lots Vacant? p.200 #67 How Big is Your Tree? p.288

Third Grade Mathematics Content Standards and Objectives

Standard 1:	Number and Operations	
M.S.3.1	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.3.1.1	read, write, order, and compare numbers to 10,000 using a variety of strategies (e.g., symbols, manipulatives, number line).	
M.O.3.1.2	read, write, order, and compare decimals to hundredths, with manipulatives.	
M.O.3.1.3	identify place value of each digit utilizing standard and expanded form to 10,000.	
M.O.3.1.4	apply estimation skills (rounding, benchmarks, compatible numbers) to solve and evaluate reasonableness of an answer.	
M.O.3.1.5	demonstrate an understanding of fractions as part of a whole/one and as part of a set/group using models and pictorial representations.	
M.O.3.1.6	create concrete models and pictorial representations to • compare and order fractions with like and unlike denominators, • add and subtract fractions with like denominators, • and verify results.	
M.O.3.1.7	use concrete models and pictorial representations to demonstrate an understanding of equivalent fractions, proper and improper fractions, and mixed numbers.	
M.O.3.1.8	add and subtract 2- and 3-digit whole numbers and money with and without regrouping.	
M.O.3.1.9	demonstrate and model multiplication (repeated addition, arrays) and division (repeated subtraction, partitioning).	
M.O.3.1.10	use and explain the operations of multiplication and division including the properties (e.g., identity element of multiplication, commutative property, property of zero, associative property, inverse operations).	
M.O.3.1.11	recall basic multiplication facts and the corresponding division facts.	
M.O.3.1.12	model the distributive property in multiplication of 2- and 3-digit numbers by a 1-digit number.	
M.O.3.1.13	use models to demonstrate division of 2- and 3-digit numbers by a 1-digit number.	

M.O.3.1.14	create grade-appropriate real-world problems involving any of the four operations using multiple strategies, explain the reasoning used, and justify the procedures selected when presenting solutions.	
Standard 2:	Algebra	
M.S.3.2	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.3.2.1	analyze and extend geometric and numeric patterns.	
M.O.3.2.2	create an input/output model using addition, subtraction, multiplication or division.	
M.O.3.2.3	analyze a given pattern and write the rule.	
M.O.3.2.4	write equivalent numerical expressions and justify equivalency.	
M.O.3.2.5	use symbol and letter variables to represent an unknown quantity and determine the value of the variable.	
Standard 3:	Geometry	
M.S.3.3	Through communication, 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 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.3.3.1	identify and create new polygons by transforming, combining and decomposing polygons.	
M.O.3.3.2	identify, describe, and classify the following geometric solids according to the number of faces, edges, and vertices: cube rectangular solid cylinder cone pyramid	#1 The Shape of Things p.17

M.O.3.3.3	construct and identify a solid figure from a plane drawing.	
M.O.3.3.4	identify, describe and draw lines of symmetry in two-dimensional shapes.	
M.O.3.3.5	model, describe, and draw • lines • rays • angles including right, obtuse, and acute angles.	
M.O.3.3.6	draw an example of a flip, slide and turn (reflection, translation, and rotation) given a model.	
M.O.3.3.7	name the location of a point on a first-quadrant grid, represent using ordered pairs.	
Standard 4:	Measurement	
M.S.3.4	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 measurement, and • apply appropriate techniques, tools and formulas to determine measurements.	
Objectives	**Students will**	**PLT Activity and Page**
M.O.3.4.1	Within a project based investigation, identify a real life situation, consider a number of variables and use appropriate measurement tools, overtime, make a hypothesis as to the change overtime; with more precision than whole units; • length in centimeters and inches, temperature in Celsius and Fahrenheit weight/mass in pounds and kilograms, and design and implement a method to collect, organize, and analyze data; • analyze results to make a conclusion; • evaluate the validity of the hypothesis upon collected data; • design a mode of presentation (with and without technology)	#4 Sounds Around p. 26 #41 How Plants Grow p.179 #48 Field, Forest, and Stream p.203 #67 How Big is Your Tree? p.288 #73 Waste Watchers p.314
M.O.3.4.2	estimate and find the perimeter and area of familiar geometric shapes, using manipulatives, grids, or appropriate measuring tools.	
M.O.3.4.3	determine the formula the area of a rectangle and explain reasoning through modeling.	
M.O.3.4.4	read time to 5-minute intervals (am and pm) using analog and digital clocks, compute elapsed time to the quarter-hour using a clock.	
M.O.3.4.5	identify, count and organize coins and bills to display a variety of price values from real-life examples with a total value of $100 or less and model making change using manipulatives.	
Standard 5:	Data Analysis and Probability	

M.S.3.5	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**
M.O.3.5.1	collect and organize grade-appropriate real-world data from observation, surveys, and experiments, and identify and construct appropriate ways to display data.	#6 Picture This! p. 34 #16 Pass The Plants, Please p. 77 #25 Birds and Worms p.111
M.O.3.5.2	develop and conduct grade-appropriate experiments using concrete objects (e.g. counters, number cubes, spinners) to determine the likeliness of events and list all outcomes.	
M.O.3.5.3	analyze real-world data represented on a graph using grade-appropriate questions.	

Fourth Grade Mathematics Content Standards and Objectives

Standard 1:	Number and Operations	
M.S.4.1	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.4.1.1	read, write, order, and compare whole numbers to the millions place and decimals to thousandths place using a variety of strategies (e.g. symbols, manipulatives, number line, pictorial representations).	
M.O.4.1.2	demonstrate an understanding of the place value of each digit utilizing standard and expanded form through 1,000,000 with multiples of 10 [(5 X 10,000) + (3 X 1,000) + (4 X 10) + 2].	
M.O.4.1.3	estimate solutions to problems including rounding, benchmarks, compatible numbers and evaluate the reasonableness of the solution, justify results.	
M.O.4.1.4	using concrete models, benchmark fractions, number line • compare and order fractions with like and unlike denominators • add and subtract fractions with like and unlike denominators • model equivalent fractions • model addition and subtraction of mixed numbers with and without regrouping.	
M.O.4.1.5	analyze the relationship of fractions to decimals using concrete objects and pictorial representations.	
M.O.4.1.6	round decimals to the nearest whole, 10th, or 100th place.	
M.O.4.1.7	add and subtract whole numbers(up to five –digit number) and decimals to the 1000th place, multiply (up to three digits by two-digits, and divide(up to a three digit number with a one and two-digit number) .	
M.O.4.1.8	solve multi-digit whole number multiplication problems using a variety of strategies, including the standard algorithm, justify methods used.	
M.O.4.1.9	quick recall of basic multiplication facts and corresponding division facts.	
M.O.4.1.10	create grade-level real-world appropriate story problems using multiple strategies including simple ratios, justify the reason for choosing a particular strategy and present results.	#70 Soil Stories p.297 #73 Waste Watchers p.314

Standard 2:	Algebra	
M.S.4.2	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.4.2.1	determine the rule and explain how change in one variable relates to the change in the second variable, given an input/output model using two operations.	
M.O.4.2.2	recognize and describe relationships in which quantities change proportionally.	
M.O.4.2.3	represent the idea of a variable as an unknown quantity using a letter, write an expression using a variable to describe a real-world situation.	
M.O.4.2.4	solve real-world problems involving order of operations including grouping symbols and the four operations,	
Standard 3:		
M.S.4.3	Through communication, 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 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.4.3.1	identify, classify, compare and contrast two-dimensional (including quadrilateral shapes) and three-dimensional geometric figures according to attributes.	
M.O.4.3.2	recognize and describe three-dimensional objects from different perspectives.	
M.O.4.3.3	identify, draw, label, compare and contrast, and classify • lines (intersecting, parallel, and perpendicular) • angles (acute, right, obtuse, and straight)	
M.O.4.3.4	identify and create a two-dimensional design with one line of symmetry.	

M.O.4.3.5	graph/plot ordered pairs on a first-quadrant grid and use the coordinate system to specify location and describe path.	
M.O.4.3.6	ntify parts of a circle: center point, diameter, and radius.	
M.O.4.3.7	ze and justify appropriate use of transformations (translations, rotations, flips) to solve geometric problems including congruency and tiling (tessellations).	
Standard 4:	**Measurement**	
M.S.4.4	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 unites, systems, and processes of measurement, and • apply appropriate techniques, tools and formulas to determine measurements.	
Objectives	**Students will**	**PLT Activity and Page**
M.O.4.4.1	select appropriate measuring tools, apply and convert standard units within a system to estimate, measure, compare and order real-world measurements including: • lengths using customary (to the nearest one-fourth inch) and metric units, • weight, • capacity, • temperature, and • justify and present results.	#4 Sounds Around p. 26 #65 Bursting Buds p.279 #66 Germinating Giants p.284 #67 How Big is Your Tree? p.288 #77 Trees in Trouble p.332
M.O.4.4.2	Quantify area by finding the total number of same sized units that cover a shape, develop a rule and justify the formula for the area of a rectangle using the area model representing multiplication.	
M.O.4.4.3	read time to the minute, calculate elapsed time in hours/minutes within a 24-hour period.	
M.O.4.4.4	given real-world situations, count coins and bills and determine correct change.	
Standard 5:	**Data Analysis and Probability**	
M.S.4.5	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**

M.O.4.5.1	read and interpret information represented on a circle graph.	#6 Picture This!	p. 34
M.O.4.5.2	pose a grade-appropriate question that can be addressed with data, collect, organize, display, and analyze data in order to answer the question.	#6 Picture This! #16 Pass The Plants, Please #21 Adopt A Tree #22 Trees as Habitats #25 Birds and Worms #27 Every Tree for Itself #28 Air Plants #36 Pollution Search #38 Every Drop Counts #41 How Plants Grow #48 Field, Forest, and Stream #53 On the Move #80 Nothing Succeeds Like 　　　　Succession	p. 34 p. 77 p. 97 p.102 p.111 p.117 p.120 p.153 p.163 p.179 p.203 p.232 p.345
M.O.4.5.3	design and conduct a simple probability experiment using concrete objects, examine and list all possible combinations using a tree diagram, represent the outcomes as a ratio and present the results.		
M.O.4.5.4	solve real world problems using mean, median and mode.		

Fifth Grade Mathematics Content Standards and Objectives

Standard 1:	Number and Operations
M.S.5.1	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.5.1.1	read, write, order and compare all whole numbers, fractions, mixed numbers and decimals using multiple strategies (e.g., symbols, manipulatives, number line).	
M.O.5.1.2	demonstrate an understanding of place value of each digit utilizing standard and expanded form in any whole number using powers of 10 [$(3 \times 10^5) + (4 \times 10^3) + 7 \times 10^2) + (1 \times 10^1) + 6$].	
M.O.5.1.3	estimate solutions to problems involving whole numbers, decimals, fractions, and percents to determine reasonableness using benchmarks.	
M.O.5.1.4	use inductive reasoning to identify the divisibility rules of 2, 3, 5, 9 and 10 and apply the rules to solve application problems.	
M.O.5.1.5	determine and apply greatest common factor and lowest common multiple to write equivalent fractions and to real-world problem situations.	
M.O.5.1.6	model and write equivalencies of fractions decimals, percents, and ratios.	#85 In the Driver's Seat p.370
M.O.5.1.7	analyze and solve application problems and justify reasonableness of solution in problems involving addition and subtraction of: • fractions and mixed numbers • decimals.	
M.O.5.1.8	apply the distributive property as it relates to multiplication over addition.	
M.O.5.1.9	solve multi-digit whole number division problems using a variety of strategies, including the standard algorithm and justify the solutions.	
M.O.5.1.10	demonstrate fluency in addition, subtraction, multiplication and division of whole numbers.	#85 In the Driver's Seat p.370
M.O.5.1.11	solve real-world problems involving whole numbers, decimals and fractions using multiple strategies and justify the reasonableness by estimation.	#67 How Big is Your Tree? p.288 #85 In the Driver's Seat p.370
Standard 2:	Algebra	

M.S.5.2	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.5.2.1	use inductive reasoning to find missing elements in a variety of patterns (e.g., square numbers, arithmetic sequences).	
M.O.5.2.2	given an input/output model using two operations, determine the rule, output or input.	
M.O.5.2.3	solve simple equations and inequalities using patterns and models of real-world situations, create graphs on number lines of the equations and interpret the results.	
M.O.5.2.4	model identify and describe square, prime and composite numbers.	
Standard 3:	Geometry	
M.S.5.3	Through communication, 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 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.5.3.1	classify and compare triangles by sides and angles; measure the angles of a triangle using a protractor.	
M.O.5.3.2	construct and analyze three-dimensional shapes using properties (i.e. edges, faces or vertices).	
M.O.5.3.3	create a design with more than one line of symmetry.	
M.O.5.3.4	construct a circle with a given radius or diameter.	#48 Field, Forest, and Stream p.203
M.O.5.3.5	draw a similar figure using a scale, given a real-world situation.	#48 Field, Forest, and Stream p.203

Standard 4:	Measurement	
M.S.5.4	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 measurement, and • apply appropriate techniques, tools and formulas to determine measurements.	
Objectives	**Students will**	**PLT Activity and Page**
M.O.5.4.1	estimate, measure, compare, order and draw lengths of real objects in parts of an inch up to 1/8 of an inch and millimeters.	#41 How Plants Grow p.179 #48 Field, Forest, and Stream p.203 #65 Bursting Buds p.279 #66 Germinating Giants p.284
M.O.5.4.2	model, calculate and compare area of triangles and parallelograms using multiples strategies (including, but not limited to, formulas).	
M.O.5.4.3	develop strategies (i.e. finding number of same sized units of volume)to determine the volume of a rectangular prism; solve application problems involving estimating or measuring volume of rectangular prisms.	
M.O.5.4.4	describe the effects on the measurements of a two-dimensional shape (such as its perimeter and area) when the shape is changed in some way, justify changes.	
M.O.5.4.5	solve real-world problems requiring conversions within a system of measurement.	#53 On the Move p.232 #67 How Big is Your Tree? p.288 #85 In the Driver's Seat p.370
M.O.5.4.6	estimate and/or measure the weight/mass of real objects in ounces, pounds, grams, and kilograms.	
M.O.5.4.7	collect, record, estimate and calculate elapsed times from real-world situations (with and without technology)	
M.O.5.4.8	determine the actual measurements of a figure from a scale drawing, using multiple strategies.	
Standard 5:	Data Analysis and Probability	
M.S.5.5	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
M.O.5.5.1	construct a sample space and make a hypothesis as to the probability of a real life situation overtime, test the prediction with experimentation, and present conclusions (with and without technology).	#80. Nothing Succeeds Like Succession p.345
M.O.5.5.2	construct, read, and interpret tables, charts, and graphs including stem and leaf plots to draw reasonable inferences or verify predictions.	
M.O.5.5.3	collect and organize real-world data to construct a circle graph (with and without technology), present data and draw conclusions.	
M.O.5.5.4	collect and analyze data using mean, median and mode to determine the best statistical measure.	

Sixth Grade Mathematics Content Standards and Objectives

Standard 1:	Number and Operations	
M.S.6.1	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.6.1.1	demonstrate an understanding of large numbers by converting and comparing numbers in scientific notation and standard notation (with and without technology).	
M.O.6.1.2	determine the greatest common factor and least common multiple using multiple strategies to solve real-world problems; find prime factorization of a number.	
M.O.6.1.3	compare and order integers using multiple strategies (e.g., symbols, manipulatives, number line).	
M.O.6.1.4	analyze and solve real-world problems involving addition, subtraction , multiplication and division of • whole numbers, • fractions, mixed numbers, • decimals, • integers, and justify the reasonableness by estimation.	
M.O.6.1.5	apply the distributive, commutative, associative and identity properties to numeric expressions and use to prove equivalency.	
M.O.6.1.6	convert between fractions/ratios, mixed numbers, decimals and percents in appropriate real-world problems.	#85 In the Driver's Seat p.370
M.O.6.1.7	compute the percent of a number to solve application problems and justify the reasonableness by estimation.	
M.O.6.1.8	demonstrate an understanding of the effect of multiplying and dividing, whole numbers, fractions and decimals by numbers including 0, 1 and values between 0 and 1 .	
M.O.6.1.9	develop and test hypotheses to derive the rules for addition, subtraction, multiplication and division of integers, justify by using real-world examples and use them to solve problems.	

Standard 2:	Algebra	
M.S.6.2	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.6.2.1	simplify numerical expressions and evaluate algebraic expressions using order of operations.	
M.O.6.2.2	use inductive reasoning to extend patterns to predict the nth term (e.g., powers and triangular numbers).	
M.O.6.2.3	create algebraic expressions that correspond to real-world situations; use the expressions to solve problems.	#12 Invasive Species p. 59
M.O.6.2.4	determine the rule, output or input; given an input/output model using one operation, write an algebraic expression for the rule and use to identify other input/output values.	
M.O.6.2.5	solve real-world proportion problems involving rates, probability and measurements using multiple strategies, justify selection of strategies.	
M.O.6.2.6	write and solve one-step equations using number sense, properties of operations and the idea of maintaining equality to represent and solve real-world problems.	
Standard 3:	Geometry	
M.S.6.3	Through communication, 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 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.6.3.1	analyze characteristics using defining properties of • lines, • angles, • polygons, • triangles, and compare these geometric figures.	

M.O.6.3.2	use inductive reasoning with the measures of interior angles in polygons and derive the formula to determine the sum of the measures of the interior angles.	
M.O.6.3.3	apply the concepts of parallel, perpendicular, intersecting, and skew lines to real-world situations (i.e. roads and routes).	
M.O.6.3.4	create designs using line and rotational symmetry.	
M.O.6.3.5	predict, describe, and perform transformations on two-dimensional shapes • translations • rotations • reflections	
M.O.6.3.6	use geometric representations to solve real-world problems.	#48 Field, Forest, and Stream p.203
M.O.6.3.7	plot polygons on coordinate grids, determine lengths and areas from the graph.	
Standard 4:	Measurement	
M.S.6.4	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 measurement, and apply appropriate techniques, tools and formulas to determine measurements.	
Objectives	**Students will**	**PLT Activity and Page**
M.O.6.4.1	determine an approximation for pi using actual measurements.	
M.O.6.4.2	develop and test hypotheses to determine formulas for • perimeter of polygons, including composite figures • area of parallelograms • area of triangles • area of composite figures made of parallelograms and triangles • circumference of a circle • area of a circle • volume of a rectangular prism	
M.O.6.4.3	investigate, model and describe surface area of rectangular prisms and cylinders; develop strategies to determine the surface area of rectangular prisms	
M.O.6.4.4	develop strategies to determine volume of cylinders; solve real-world problems involving volume of cylinders, justify the results.	
M.O.6.4.5	given a two-dimensional polygon, construct a scale drawing given the scale factor.	
Standard 5:	Data Analysis and Probability	

	Through communication, representation, reasoning and proof, problem solving, and making connections within and beyond the field of mathematics, students will
M.S.6.5	- 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.6.5.1	collect, organize, display, read, interpret and analyze real-world data using appropriate graphs and tables (with and without technology).	#4 Sounds Around p. 26 #21 Adopt A Tree p. 97 #80 Nothing Succeeds Like Succession p.345
M.O.6.5.2	identify a real life situation using statistical measures (mean, median, mode, range, outliers) overtime, make a hypothesis as to the outcome; design and implement a method to collect, organize and analyze data; analyze the results to make a conclusion; evaluate the validity of the hypothesis based upon collected data, design a mode of presentation using words, graphs, models, and/or tables (with and without technology).	
M.O.6.5.3	perform simple probability events using manipulatives; predict the outcome given events using experimental and theoretical probability; express experimental and theoretical probability as a ratio, decimal or percent.	
M.O.6.5.4	determine combinations and permutations of given real-world situations by multiple strategies, including creating lists.	

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 • 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 • 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 • 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	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 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: • 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 • 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	solve problems and explain the relationships among scale factor and area and volume including • 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	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.7.4.1	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 • 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.	#4 Sounds Around p. 26 #16 Pass the Plants Please p. 77 #22 Trees as Habitats p.102
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	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**
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

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.	