Kyrene School District Mathematics Standards
Strand 1: Number and Operations

Concept 1: Number Sense Understand and apply numbers, ways of representing numbers, and the relationships among numbers and different number systems.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
PO 1. Express whole numbers, fractions, decimals, and percents using and connecting multiple representations.	PO 1. Determine equivalence by converting between benchmark fractions, decimals, and percents.	PO 1. Convert between expressions for positive rational numbers, including fractions, decimals, percents, and ratios.	PO 1. Recognize and convert between expressions for positive and negative rational numbers, including fractions, decimals, percents, and ratios.	
PO 2. Compose and decompose whole numbers using factors and multiples.	PO 2. Differentiate between prime and composite numbers; differentiate between factors and multiples for whole numbers.	PO 2. Use prime factorization to • express a whole number as a product of its prime factors and • determine the greatest common factor and least common multiple of two whole numbers.	PO 2. Find or use factors, multiples, or prime factorization within a set of numbers.	
PO 3. Express fractions as fair sharing, parts of a whole, parts of a set, and locations on a real number line.	PO 3. Locate **positive and negative** integers on a number line.	PO 3. Demonstrate an understanding of fractions as rates, division of whole numbers, parts of a whole, parts of a set, and locations on a real number line.		
PO 4. Compare and order decimals to hundredths.	PO 4. Compare and order positive fractions, decimals, and percents.	PO 4. Compare and order integers; and positive fractions, decimals, and percents.	PO 3. Compare and order rational numbers using various models and representations.	PO 1. Compare and order real numbers including very large and small integers, and decimals and fractions close to zero.
				PO 2. Classify real numbers as rational or irrational.

Kyrene School District Mathematics Standards
Strand 1: Number and Operations

Concept 1: Number Sense Understand and apply numbers, ways of representing numbers, and the relationships among numbers and different number systems.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
				PO 3. Model the relationship between the subsets of the real number system.
PO 5. Use simple ratios to describe problems in context.	PO 5. Use ratios and unit rates to model, describe and extend problems in context.	**PO 7.** **Use proportional relationships to model, describe, and extend problems in and out of context.**	**PO 5.** ***Use proportional relationships to model, describe, and extend problems in and out of context.***	**PO5.** ***Use proportional relationships to model, describe, and extend problems in and out of context.***
	PO 6. Express or interpret positive and negative numbers in context.			
		PO 5. Express that a number's distance from zero on the number line is its absolute value.	PO 4. Model and solve simple problems involving absolute value.	PO 4. Model and solve problems involving absolute value.
		PO 6. Express the inverse relationships between exponents and roots for perfect squares and cubes.		

Kyrene School District Mathematics Standards
Strand 1: Number and Operations

Concept 2: Numerical Operations Understand and apply numerical operations and their relationship to one another.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
PO 1. **Use multiple strategies to** add and subtract decimals through hundredths including money to $1000.00 and fractions with like denominators.	PO 1. **Use multiple strategies to** add and subtract decimals through thousandths and fractions expressing solutions in simplest form.			
PO 7. **Create and solve word problems.**	**PO 6.** ***Create and solve word problems.***	**PO 8.** ***Create and solve word problems using whole numbers, fractions and decimals.***	**PO 6.** ***Create and solve word problems using integers, fractions, decimals, percents and ratios.***	**PO 6.** ***Create and solve word problems using rational and irrational numbers.***
		PO 1. Apply and interpret the concepts of addition and subtraction with integers using models.	PO 1. Add, subtract, multiply, and divide integers.	PO 1. Solve problems with factors, multiples, divisibility or remainders, prime numbers, and composite numbers.
			PO 2. Solve problems with rational numbers and appropriate operations using exact answers or estimates.	
PO 2. Use multiple strategies to multiply whole numbers • two-digit by two-digit and • multi-digit by one-digit.	PO 2. **Use multiple strategies to** multiply multi-digit whole numbers.	PO 2. Multiply multi-digit decimals through thousandths.		PO 2. Describe the effect of multiplying and dividing a rational number by • a number less than zero, • a number between zero and one, • one, and • a number greater than one.

Italics denote repetition of an objective.
Bold *denotes a KSD objective.*

e.g. - means for example. This list is not exclusive.
Other examples may apply.

Kyrene School District Mathematics Standards
Strand 1: Number and Operations

Concept 2: Numerical Operations Understand and apply numerical operations and their relationship to one another.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
PO 3. Demonstrate **computational** fluency of multiplication and division facts through 12.				
PO 4. Use multiple strategies to divide whole numbers.	PO 3. **Use multiple strategies to** divide multi-digit whole numbers by whole number divisors with and without	PO 3. Divide multi-digit whole numbers and decimals by decimal divisors with and without remainders.		
		PO 4. Multiply and divide fractions.		
		PO 5. Provide a mathematical argument to explain operations with two or more fractions or decimals.	PO 3. Solve problems involving percentages, ratio and proportion, including tax, discount, tips, and part/whole relationships.	PO 3. Solve problems involving percent increase, percent decrease, and simple interest rates.
			PO 4. Represent and interpret numbers using scientific notation (positive exponents only).	PO 4. Convert standard notation to scientific notation and vice versa (include positive and negative exponents).

Kyrene School District Mathematics Standards
Strand 1: Number and Operations

Concept 2: Numerical Operations Understand and apply numerical operations and their relationship to one another.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
PO 5. Apply associative and distributive properties to solve multiplication and division problems.	PO 4. Apply the associative, commutative, and distributive properties to solve numerical problems.	PO 6. Apply the commutative, associative, distributive, and identity properties to evaluate numerical expressions involving whole numbers, **fractions and decimals**.	**PO 7.** **Apply appropriate mathematical properties to evaluate numerical expressions involving integers, fractions, decimals, percents, and ratios.**	**PO 7.** **Apply appropriate mathematical properties to evaluate numerical expressions involving rational and irrational numbers.**
PO 6. Apply order of operations with whole numbers.	PO 5. Simplify numerical expressions (including fractions and decimals) using the order of operations with or without grouping symbols.	PO 7. Simplify numerical expressions (involving fractions, decimals, and exponents) using the order of operations with or without grouping symbols.	PO 5. Simplify numerical expressions using the order of operations and appropriate mathematical properties.	PO 5. Simplify numerical expressions using the order of operations that include grouping symbols, square roots, cube roots, absolute values, and positive exponents.

Kyrene School District Mathematics Standards
Strand 1: Number and Operations

Concept 3: Estimation Use estimation strategies reasonably and fluently while integrating content from each of the other strands.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
PO 1. Use benchmarks as meaningful points of comparison for whole numbers, decimals, and fractions.		PO 1. Use benchmarks as meaningful points of comparison for rational numbers.	PO 1. Estimate and apply benchmarks for rational numbers and common irrational numbers.	
PO 2. Make estimates appropriate to a given situation or computation with whole numbers and **benchmark** fractions.	PO 1. Make estimates appropriate to a given situation or computation with whole numbers, fractions, and decimals.	PO 2. Make estimates appropriate to a given situation and verify the reasonableness of the results.	PO 2. Make estimates appropriate to a given situation.	PO 1. Make estimates appropriate to a given situation.
			PO 3. Estimate square roots of numbers less than 1000 by locating them between two consecutive whole numbers.	PO 2. Estimate the location of rational and common irrational numbers on a number line.
			PO 4. Estimate the measure of an object in one system of units given the measure of that object in another system and the approximate conversion factor.	

Kyrene School District Mathematics Standards
Strand 2: Data Analysis, Probability, and Discrete Mathematics

Concept 1: Data Analysis (Statistics) Understand and apply data collection, organization, and representation to analyze and sort data.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
PO 1. Collect, record, organize, and display data using double bar graphs, single line graphs, or circle graphs.	PO 1. Collect, record, organize, and display data using multi-bar graphs or double line graphs.	PO 1. Solve problems by selecting, constructing, and interpreting displays of data, including histograms and stem-and-leaf plots.	PO 1. Solve problems by selecting, constructing, and interpreting displays of data including multi-line graphs and scatterplots.	PO 1. Solve problems by selecting, constructing, interpreting, and calculating with displays of data, including box and whisker plots and scatterplots.
PO 2. Formulate and answer questions by interpreting and analyzing displays of data, including double bar graphs, single line graphs, or circle graphs.	PO 2. Formulate and answer questions by interpreting and analyzing displays of data, including multi-bar graphs or double line graphs.	PO 2. Formulate and answer questions by interpreting, analyzing, and drawing inferences from displays of data, including histograms and stem-and-leaf plots.	PO 2. Interpret trends in a data set, estimate values for missing data, and predict values for points beyond the range of the data set.	
				PO 2. Make inferences by comparing the same summary statistic for two or more data sets.
PO 3. Use median, mode, and range to describe the distribution of a given data set.	PO 3. Use mean, median, mode, and range to analyze and describe the distribution of a given data set.	PO 3. Use extreme values, mean, median, mode, and range to analyze and describe the distribution of a given data set.	PO 3. Identify outliers and determine their effect on mean, median, mode, and range.	PO 3. Describe how summary statistics relate to the shape of the distribution.

Kyrene School District Mathematics Standards
Strand 2: Data Analysis, Probability, and Discrete Mathematics

Concept 1: Data Analysis (Statistics) Understand and apply data collection, organization, and representation to analyze and sort data.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
PO 4. Compare two sets of related data.		PO 4. Compare two or more sets of data by identifying trends.	PO 4. Distinguish between a simple random and non-random sample.	PO 4. Determine whether information is represented effectively and appropriately given a graph or a set of data by identifying sources of bias and compare and contrast the effectiveness of different representations of data.
				PO 5. Evaluate the design of an experiment.

Kyrene School District Mathematics Standards
Strand 2: Data Analysis, Probability, and Discrete Mathematics

Concept 2: Probability Understand and apply the basic concepts of probability.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
PO 1. Describe elements of theoretical probability by listing or drawing all possible outcomes of a given event and predicting the outcome using word and number benchmarks.	PO 1. Describe the theoretical probability of events and represent the probability as a fraction, decimal, or percent.	PO 1. Use data collected from multiple trials of a single event to form a conjecture about the theoretical probability.	PO 1. Determine conditional probabilities (experimental) in compound probability experiments.	PO 1. Determine theoretical and experimental conditional probabilities in compound probability experiments.
	PO 2. Explore probability when performing experiments by • predicting the outcome, • recording the data, • comparing outcomes of the experiment to predictions, and • comparing the results of multiple repetitions of the experiment.	PO 2. Use theoretical probability to • predict experimental outcomes, • compare the outcome of the experiment to the prediction, and • replicate the experiment and compare results.		PO 2. Interpret probabilities within a given context and compare the outcome of an experiment to predictions made prior to performing the experiment.
		PO 3. Determine all possible outcomes (sample space) of a given situation using a systematic approach.	PO 2. Experiment with two different events to determine whether the two events are dependent or independent of each other.	PO 3. Use all possible outcomes (sample space) to determine the probability of dependent and independent events.
			PO 3. Compare the results of multiple repetitions of the same probability experiment to the theoretical probability.	

Mathematics Standard Articulated by Grade Level
Strand 2: Data Analysis, Probability, and Discrete Mathematics

Concept 2: Probability Understand and apply the basic concepts of probability.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
			PO 4. Compare probabilities to determine fairness in experimental situations.	

Kyrene School District Mathematics Standards
Strand 2: Data Analysis, Probability, and Discrete Mathematics

Concept 3: Systematic Listing and Counting Understand and demonstrate the systematic listing and counting of possible outcomes.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
PO 1. Construct tree diagrams to solve problems in context by • representing all possibilities for a variety of counting problems, • explaining how its properties relate to the problem, • representing the same counting problem in multiple ways, and • drawing conclusions.	PO 1. Analyze relationships among representations and make connections to the multiplication principle of counting.	PO 1. Build and explore tree diagrams where items repeat.	PO 1. Analyze relationships among the tree diagrams where items repeat and do not repeat; make numerical connections to the multiplication principle of counting.	PO 1. Represent, analyze, and solve counting problems with or without ordering and repetitions.
PO 2. Justify that all possibilities have been enumerated without duplication.	PO 2. Solve a variety of counting problems and explain the multiplication principle of counting.	PO 2. Explore counting problems with Venn diagrams using three attributes.	PO 2. Solve counting problems using Venn diagrams and represent the answer algebraically.	PO 2. Solve counting problems and represent counting principles algebraically including factorial notation.

Kyrene School District Mathematics Standards
Strand 2: Data Analysis, Probability, and Discrete Mathematics

Concept 4: Vertex-Edge Graphs Understand and apply vertex-edge graphs.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
PO 1. Demonstrate the connection between map coloring and vertex coloring.				
PO 2. Construct vertex-edge graphs to represent concrete situations and identify paths and circuits.	PO 1. Investigate properties of vertex-edge graphs • Euler paths, • Euler circuits, and • degree of a vertex.	PO 1. Investigate properties of vertex-edge graphs • Hamilton paths, • Hamilton circuits, and • shortest route.	PO 1. Use vertex-edge graphs and algorithmic thinking to represent and find solutions to practical problems related to Euler/Hamilton paths and circuits.	
PO 3. Solve conflict problems by constructing and coloring vertex-edge graphs.	PO 2. Solve problems related to Euler paths and circuits.	PO 2. Solve problems related to Hamilton paths and circuits.		PO 1. Use directed graphs to solve problems.

Mathematics Standard Articulated by Grade Level
Strand 3: Patterns, Algebra, and Functions

Concept 1: Patterns Identify patterns and apply pattern recognition to reason mathematically while integrating content from each of the other strands.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
PO 1. Recognize, describe, create, extend, and find missing terms in a numerical sequence involving whole numbers using all four basic operations.	PO 1. Recognize, describe, create, and analyze a numerical sequence involving fractions and decimals using addition and subtraction.	PO 1. Recognize, describe, create, and analyze a numerical sequence involving fractions and decimals using all four basic operations.	PO 1. Recognize, describe, create, and analyze numerical and geometric sequences using tables or graphs; make conjectures about these sequences.	PO 1. Recognize, describe, create, and analyze numerical and geometric sequences using tables, graphs, words, or symbols; make conjectures about these sequences.
PO 2. Explain the rule for a given numerical sequence, verify that the rule works, and use the rule to make predictions.				

Kyrene School District Mathematics Standards
Strand 3: Patterns, Algebra, and Functions

Concept 2: Functions and Relationships Describe and model functions and their relationships.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
				PO 1. Sketch and interpret a graph that models a given context; describe a context that is modeled by a given graph.
		PO 1. Recognize and describe a relationship between two quantities, given by a chart, table, or graph, using words and expressions.		PO 2. Determine if a relationship represented by a graph or table is a function.
				PO 3. Write the rule for a simple function using algebraic notation.
				PO 4. Identify functions as linear or nonlinear and contrast distinguishing properties of functions using equations, graphs, or tables.
			PO 1. Use a table of values to graph an equation or proportional relationship; describe the graph's characteristics.	PO 5. Demonstrate that proportional relationships are linear using equations, graphs, or tables.

Kyrene School District Mathematics Standards
Strand 3: Patterns, Algebra, and Functions

Concept 3: Algebraic Representations Represent and analyze mathematical situations and structures using algebraic representations.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
			PO 1. Write a single variable algebraic expression or one-step equation given a contextual situation.	PO 1. Write or identify algebraic expressions, equations, or inequalities that represent a situation.
PO 1. Use a symbol to represent an unknown quantity in a simple algebraic expression involving all operations.		PO 1. Use an algebraic expression to represent a quantity in a given context.	PO 2. Evaluate an expression containing one or two variables by substituting numbers for the variables.	PO 2. Evaluate an expression containing variables by substituting rational numbers for the variables.
PO 2. Create and solve one-step equations that can be solved using addition, subtraction, multiplication, and division of whole numbers.	PO 1. Create and solve two-step equations that can be solved using inverse operations with whole numbers.	PO 2. Create and solve two-step equations that can be solved using inverse properties with fractions and decimals.	PO 3. Solve multi-step equations using inverse properties with rational numbers.	PO 3. Analyze situations, simplify, and solve problems involving linear equations and inequalities using the properties of the real number system.
		PO 3. Translate both ways between a verbal description and an algebraic expression or equation.	PO 4. Translate between graphs and tables that represent a linear equation.	PO 4. Translate between different representations of linear equations using symbols, graphs, tables, or written descriptions.
		PO 4. Evaluate an expression involving the four basic operations by substituting given fractions and decimals for the variable.	PO 5. Create and solve two-step equations that can be solved using inverse operations with rational numbers.	
			PO 6. Create and solve one-step inequalities with whole numbers.	PO 5. Graph an inequality on a number line.

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Other examples may apply.

Kyrene School District Mathematics Standards
Strand 3: Patterns, Algebra, and Functions

Concept 4: Analysis of Change Analyze how changing the values of one quantity corresponds to change in the values of another quantity.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
PO 1. Identify the change in a quantity over time and make simple predictions.	PO 1. Describe patterns of change including constant rate and increasing or decreasing rate.	PO 1. Determine a pattern to predict missing values on a line graph or scatterplot.	PO 1. Use graphs and tables to model and analyze change.	PO 1. Interpret the relationship between a linear equation and its graph, identifying and computing slope and intercepts.
				PO 2. Solve problems involving simple rates.

Kyrene School District Mathematics Standards
Strand 4: Geometry and Measurement

Concept 1: Geometric Properties Analyze the attributes and properties of 2- and 3- dimensional figures and develop mathematical arguments about their relationships.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
PO 1. Draw and describe the relationships between points, lines, line segments, rays, and angles including parallelism and perpendicularity.	PO 1. Draw and label 2-dimensional figures given specific attributes including angle measure and side length.			
PO 2. Justify which objects in a collection match a given geometric description.	PO 2. Solve problems by understanding and applying the property that the sum of the interior angles of a triangle is 180°.	PO 1. Define π (pi) as the ratio between the circumference and diameter of a circle and explain the relationship among the diameter, radius, and circumference.	PO 1. Recognize the relationship between central angles and intercepted arcs; identify arcs and chords of a circle.	PO 1. Identify the attributes of circles: radius, diameter, chords, tangents, secants, inscribed angles, central angles, intercepted arcs, circumference, and area.
				PO 2. Predict results of combining, subdividing, and changing shapes of plane figures and solids.
PO 3. Describe and classify triangles by angles and sides.	PO. 3 Classify quadrilaterals by their properties.			
PO 4. Recognize which attributes (such as shape or area) change and which do not change when 2-dimensional figures are cut up or rearranged.				

Kyrene School District Mathematics Standards
Strand 4: Geometry and Measurement

Concept 1: Geometric Properties Analyze the attributes and properties of 2- and 3- dimensional figures and develop mathematical arguments about their relationships.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
PO 5. Recognize and draw congruent figures, and match them in a given collection.				
PO 6. Draw right, acute, obtuse, and straight angles and identify these angles in other geometric figures.		PO 2. Solve problems using properties of supplementary, complementary, and vertical angles.	PO 2. Analyze and determine relationships between angles created by parallel lines cut by a transversal.	
PO 7. Recognize the relationship between a 3-dimensional figure and its corresponding net(s).			PO 3. Draw and classify 3-dimensional figures with appropriate labels showing specified attributes of parallelism, congruence, perpendicularity, and symmetry.	
	PO 4. Compare attributes of 2-dimensional figures with 3-dimensional figures by drawing and constructing nets and models.		PO 4. Describe the relationship between the number of sides in a regular polygon and the sum of its interior angles.	
			PO 5. Identify corresponding parts of congruent figures.	PO 3. Use proportional reasoning to determine congruence and similarity of triangles.
				PO 4. Use the Pythagorean Theorem to solve problems.

Kyrene School District Mathematics Standards
Strand 4: Geometry and Measurement

Concept 2: Transformation of Shapes Apply spatial reasoning to create transformations and use symmetry to analyze mathematical situations.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
		PO 1. Identify a simple translation or reflection and model its effect on a 2-dimensional figure on a coordinate plane using all four quadrants.	PO 1. Model the result of a double transformation (translations or reflections) of a 2-dimensional figure on a coordinate plane using all four quadrants.	PO 1. Model the result of rotations in multiples of 45 degrees of a 2-dimensional figure about the origin.
		PO 2. Draw a reflection of a polygon in the coordinate plane using a horizontal or vertical line of reflection.		PO 2. Describe the transformations that create a given tessellation.
				PO 3. Identify lines of symmetry in plane figures or classify types of symmetries of 2-dimensional figures.

Kyrene School District Mathematics Standards
Strand 4: Geometry and Measurement

Concept 3: Coordinate Geometry Specify and describe spatial relationships using rectangular and other coordinate systems while integrating content from each of the other strands.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
PO 1. Name, locate, and graph points in the first quadrant of the coordinate plane using ordered pairs.		PO 1. Graph ordered pairs in any quadrant of the coordinate plane.		PO 1. Make and test a conjecture about how to find the midpoint between any two points in the coordinate plane.
PO 2. Plot line segments in the first quadrant of the coordinate plane using a set of ordered pairs in a table.				
PO 3. Construct geometric figures with vertices at points on the coordinate plane.		PO 2. State the missing coordinate of a given figure on the coordinate plane using geometric properties to justify the solution.		PO 2. Use the Pythagorean Theorem to find the distance between two points in the coordinate plane.

Kyrene School District Mathematics Standards
Strand 4: Geometry and Measurement

Concept 4: Measurement Understand and apply appropriate units of measure, measurement techniques, and formulas to determine measurements.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
				PO 1. Solve problems involving conversions within the same measurement system.
			PO 1. Solve problems involving the circumference and area of a circle by calculating and estimating.	
			PO 2. Identify polygons having the same perimeter or area.	
			PO 3. Calculate the area and perimeter of composite 2-dimensional figures.	
			PO 4. Determine actual lengths based on scale drawings or maps.	PO 2. Solve geometric problems using ratios and proportions.
			PO 5. Create a net to calculate the surface area of a given solid.	PO 3. Calculate the surface area and volume of rectangular prisms, right triangular prisms, and cylinders.

Kyrene School District Mathematics Standards
Strand 4: Geometry and Measurement

Concept 4: Measurement Understand and apply appropriate units of measure, measurement techniques, and formulas to determine measurements.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
PO 1. Compute elapsed time to the minute.	PO 1. Solve problems using elapsed time.			
PO 2. Apply measurement skills to measure length, mass, and capacity using metric units.	PO 2. State an appropriate measure and degree of accuracy in a given context.	PO 1. Determine the appropriate unit of measure for a given context and the appropriate tool to measure to the needed precision (including length, capacity, angles, time, and mass).	PO 6. Identify the appropriate unit of measure to compute the volume of an object and justify reasoning.	
	PO 3. Measure angles between 0 and 360 degrees.			
PO 3. Solve problems involving conversions within the same measurement system.		PO 2. Solve problems involving conversion within the U.S. Customary and within the metric system.		
		PO 3. Estimate the measure of objects using a scale drawing or map.	PO 7. Measure to the appropriate degree of accuracy and justify reasoning.	
	PO 4. Solve problems involving the area of 2-dimensional figures by using the properties of parallelograms and triangles.	PO 4. Solve problems involving the area of simple polygons using formulas for rectangles and triangles.		

Kyrene School District Mathematics Standards
Strand 4: Geometry and Measurement

Concept 4: Measurement Understand and apply appropriate units of measure, measurement techniques, and formulas to determine measurements.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
PO 4. Solve problems involving perimeter of 2-dimensional figures and area of rectangles.	PO 5. Solve problems involving area and perimeter of regular and irregular polygons using reallotment of square units.	PO 5. Solve problems involving area and perimeter of regular and irregular polygons.		
PO 5. Describe the change in perimeter or area when one attribute (length or width) of a rectangle changes.				
		PO 6. Describe the relationship between the volume of a figure and the area of its base.		

Kyrene School District Mathematics Standards
Strand 5: Structure and Logic

Concept 1: Algorithms and Algorithmic Thinking Use reasoning to solve mathematical problems.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
PO 1. Analyze common algorithms for computing (adding, subtracting, multiplying, and dividing) with whole numbers using the associative, commutative, and distributive properties.	PO 1. Analyze common algorithms for adding and subtracting fractions and decimals using the associative, commutative, and distributive properties.	PO 1. Analyze algorithms for multiplying and dividing fractions and decimals using the associative, commutative, and distributive properties.	PO 1. Create an algorithm to determine the area of a given composite figure.	PO 1. Create an algorithm to solve problems involving indirect measurements, using proportional reasoning, dimensional analysis, and the concepts of density and rate.
	PO 2. Develop an algorithm or formula to calculate areas and perimeters of simple polygons.	PO 2. Create and justify an algorithm to determine the area of a given compound figure using parallelograms and triangles.		

Kyrene School District Mathematics Standards
Strand 5: Structure and Logic

Concept 2: Logic, Reasoning, Problem Solving, and Proof

Evaluate situations, select problem-solving strategies, draw logical conclusions, develop and describe solutions, and recognize their applications.

Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
PO 1. Analyze a problem situation to determine the question(s) to be answered.	PO 1. Analyze a problem situation to determine the question(s) to be answered.	PO 1. Analyze a problem situation to determine the question(s) to be answered.	PO 1. Analyze a problem situation to determine the question(s) to be answered.	PO 1. Analyze a problem situation to determine the question(s) to be answered.
PO 2. Identify relevant, missing, and extraneous information related to the solution to a problem.	PO 2. Identify relevant, missing, and extraneous information related to the solution to a problem.	PO 2. Identify relevant, missing, and extraneous information related to the solution to a problem.	PO 3. Identify relevant, missing, and extraneous information related to the solution to a problem.	PO 3. Identify relevant, missing, and extraneous information related to the solution to a problem.
PO 3. Select and use one or more strategies to efficiently solve the problem and justify the selection.	PO 3. Select and use one or more strategies to efficiently solve the problem and justify the selection.	PO 3. Analyze and compare mathematical strategies for efficient problem solving; select and use one or more strategies to solve a problem.	PO 2. Analyze and compare mathematical strategies for efficient problem solving; select and use one or more strategies to solve a problem.	PO 2. Analyze and compare mathematical strategies for efficient problem solving; select and use one or more strategies to solve a problem.
PO 4. Determine whether a problem to be solved is similar to previously solved problems, and identify possible strategies for solving the problem.	PO 4. Determine whether a problem to be solved is similar to previously solved problems, and identify possible strategies for solving the problem.	PO 4. Apply a previously used problem-solving strategy in a new context.	PO 5. Apply a previously used problem-solving strategy in a new context.	PO 5. Apply a previously used problem-solving strategy in a new context.
PO 5. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.	PO 5. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols.	PO 5. Represent a problem situation using multiple representations, describe the process used to solve the problem, and verify the reasonableness of the solution.	PO 4. Represent a problem situation using multiple representations, describe the process used to solve the problem, and verify the reasonableness of the solution.	PO 4. Represent a problem situation using multiple representations, describe the process used to solve the problem, and verify the reasonableness of the solution.

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Kyrene School District Mathematics Standards
Strand 5: Structure and Logic

Concept 2: Logic, Reasoning, Problem Solving, and Proof Evaluate situations, select problem-solving strategies, draw logical conclusions, develop and describe solutions, and recognize their applications.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
		PO 6. Communicate the answer(s) to the question(s) in a problem using appropriate representations, including symbols and informal and formal mathematical language.	PO 6. Communicate the answer(s) to the question(s) in a problem using appropriate representations, including symbols and informal and formal mathematical language.	PO 6. Communicate the answer(s) to the question(s) in a problem using appropriate representations, including symbols and informal and formal mathematical language.
PO 6. Summarize mathematical information, explain reasoning, and draw conclusions.	PO 6. Summarize mathematical information, explain reasoning, and draw conclusions.	PO 7. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.	PO 7. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.	PO 7. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.
				PO 8. Describe when to use proportional reasoning to solve a problem.
PO 7. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question.	PO 7. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question.			

Kyrene School District Mathematics Standards
Strand 5: Structure and Logic

Concept 2: Logic, Reasoning, Problem Solving, and Proof Evaluate situations, select problem-solving strategies, draw logical conclusions, develop and describe solutions, and recognize their applications.				
Grade 4	**Grade 5**	**Grade 6**	**Grade 7**	**Grade 8**
PO 8. Make and test conjectures based on data (or information) collected from explorations and experiments.	PO 8. Make and test conjectures based on data or information collected from explorations and experiments.	PO 8. Make and test conjectures based on information collected from explorations and experiments.	PO 8. Make and test conjectures based on information collected from explorations and experiments.	PO 9. Make and test conjectures based on information collected from explorations and experiments.
	PO 9. Identify simple valid arguments using *if…then* statements based on graphic organizers.	PO 9. Solve simple logic problems, including conditional statements, and justify solution methods and reasoning.	PO 9. Solve logic problems using multiple variables and multiple conditional statements using words, pictures, and charts.	PO 10. Solve logic problems involving multiple variables, conditional statements, conjectures, and negation using words, charts, and pictures.
	PO 10. Construct *if… then* statements to generalize rules for computation, geometric properties and algebraic functions.			PO 11. Identify simple valid arguments using if… then statements.
			PO 10. Demonstrate and explain that the process of solving equations is a deductive proof.	PO 12. Make, validate, and justify conclusions and generalizations about linear relationships.
			PO 11. Use manipulatives and other modeling techniques to defend π (pi) as a ratio of circumference to diameter.	PO 13. Verify the Pythagorean Theorem using a valid argument.