TechPaths
A Curriculum Mapping System

Landscape Map

Teacher: CORE MCAS MATH **Year:** 2007-2008
Course: MCAS MATH

August

number sense

Essential Questions	Content	Skills	Assessments	Exit Outcomes	Standards
Can I independently apply the arithmetic concepts of real numbers, fractions, decimals, percents, exponents and radicals. Can I independently, recognize, interpret, and answer questions that require a reasonable understanding of our number system on the MCAS exam?	Reviewing order of operation Reviewing real numbers and their sub-sets Number lines and absolute value Approximately values of rational and irrational numbers	Will apply "the order of operations, PEMDAS, to solve problems involving multiple operations. Will verbally identify rational and irrational numbers under a timed situation. Will place real numbers on a number line Will approximate values of given rational and irrational numbers	Quiz 8/31/2007 Quiz - 01 8/31/2007 Regents Prep Website 8/31/2007		M.09-10.N.01 ~ Number Sense and Operations ~ Identify and use the properties of operations on real numbers, including the associative, commutative, and distributive properties; the existence of the identity and inverse elements for addition and multiplication; the existence of nthroots of positive real numbers for any positive integer n; and the inverse relationship between taking the nth root of and the nth power of a positive real number. M.09-10.N.02 ~ Number Sense and Operations ~ Simplify numerical expressions, including those involving positive integer exponents or the absolute value, e.g., 3(24–1) = 45, 4|3 – 5| + 6 = 14; apply such simplifications in the solution of problems. M.09-10.N.03 ~ Number Sense and Operations ~ Find the approximate value for solutions to problems involving square roots and cube roots without the use of a calculator, e.g., Ö 32 - 1 » 2.8.

number sense

September

Essential Questions	Content	Skills	Assessments	Exit Outcomes	Standards
Can I independently apply the arithmetic concepts of real numbers, fractions, decimals, percents, exponents and radicals. Can I independently, recognize, interpret, and answer questions that require a reasonable understanding of our number system on the MCAS exam?	Reviewing order of operation Reviewing real numbers and their sub-sets Number lines and absolute value Approximately values of rational and irrational numbers	Will apply "the order of operations, PEMDAS, to solve problems involving multiple operations. Will verbally identify rational and irrational numbers under a timed situation. Will place real numbers on a number line Will approximate values of given rational and irrational numbers	Quiz 9/12/2007 Quiz - 01 9/1/2007 Regents Prep Website 9/1/2007	Students will know and be able to: *apply order of operation to solve a problem *define rational and irrational numbers *state the approximate value of an irrational number *understand the values on a number line	M.09-10.N.01 ~ Number Sense and Operations ~ Identify and use the properties of operations on real numbers, including the associative, commutative, and distributive properties; the existence of the identity and inverse elements for addition and multiplication; the existence of nthroots of positive real numbers for any positive integer n; and the inverse relationship between taking the nth root of and the nth power of a positive real number. M.09-10.N.02 ~ Number Sense and Operations ~ Simplify numerical expressions, including those involving positive integer exponents or the absolute value, e.g., 3(24–1) = 45, 4|3 – 5| + 6 = 14; apply such simplifications in the solution of problems. M.09-10.N.03 ~ Number Sense and Operations ~ Find the approximate value for solutions to problems involving square roots and cube roots without the use of a calculator, e.g., Ö 32 - 1 » 2.8.

October

Percents and Decimals

Essential Questions	Content	Skills	Assessments	Exit Outcomes	Standards
Can I independently apply the concepts of percents and percent change to solve real world problems, as presented on the MCAS exam	Decimals Percents Percent equations Percent Change	Will compare values of fractions Will compute simple interest using percent formula	Shopping quiz 10/6/2007 Statistics Project 10/1/2007 Simulation MCAS 10/1/2007	Students will be able to apply: *the percent formula *the percent change formula	A.3 ~ Students will use creative, analytical, and critical thinking skills. A.4 ~ Students will be independent learners. M.09-10.D.02 ~ Data Analysis, Statistics, and Probability ~ Approximate a line of best fit (trend line) given a set of data (e.g.,

and can I judge the reasonableness of my answers. Can I create charts and graphs given a set of data and draw conclusions and make reasonable prediction based on that data. Will demonstrate their knowledge of area and volume by applying and manipulating the formulas to solve for individual components.	Measures of central Tendency Make and interpret tally charts, circle graphs, line plots and graphs, bar graphs, stem-and leaf graphs, and box and whiskers graphs. Area and perimeter of polygons. Area and volume of solids Given area will solve formula for individual components.	Will all percent change formula to determine the percent of increase of decrease Will determine the appropriate chart or graph for a given set of data. Will interpret information presented on a variety of graphs. Will evaluate the significance of data to make reasonable predictions. Obtain data published on the Internet regarding statistical information. Will find area when given volume Will find volume when given area	Open Response 10/1/2007	Students will be able to: *create a graph given a certain set of data *interpret a variety of graphs * draw conclusions from data and a graph * make comparisons between graphs Students will apply: *area and volume formula *solve every day problems with given formulas	scatterplot). Use technology when appropriate. M.09-10.M.01 ~ Measurement ~ Calculate perimeter, circumference, and area of common geometric figures such as parallelograms, trapezoids, circles, and triangles. M.09-10.M.02 ~ Measurement ~ Given the formula, find the lateral area, surface area, and volume of prisms, pyramids, spheres, cylinders, and cones, e.g., find the volume of a sphere with a specified surface area.

Test Countdown - Really focus on MCAS questions related to topics covered in class. Search for any question given since 2000.

Essential Questions	Content	Skills	Assessments	Exit Outcomes	Standards
					M.D.A1.01 ~ Algebra I ~ Data Analysis,

November	Will students be able to independently apply algebraic and geometric formulas and strategies to solve complex problems? Can students use their knowledge of linear equations to interpret and make predictions regarding important information used in the business world. Will see the relationship and importance of the percent proportion in their daily lives: interest, taxes, discounts, inflation and etc.		Independently simplify numerical expressions Solve multi-step equations and equations with variables on both sides of the equatin Be able to combine like terms and solve equations when looking for perimeter. Calculate the mean, median, and mode of a set of data. Construct a variety of graphs: Line plots stem and leaf plots box and whisker plots bar graphs line graphs	MCAS Marathon 11/1/2007 Business Forecast 11/15/2007	Students will be able to: *sketch a linear equation *write a linear equation *find solutions to linear equations *students will be able to find solutions to systems of equations Students will be able to: * read a standard paycheck and understand the deductions To independently pass the MCAS re-take exam.	Statistics, and Probability ~ Select, create, and interpret an appropriate graphical representation (e.g., scatter-plot, table, stem-and-leaf plots, circle graph, line graph, and line plot) for a set of data and use appropriate statistics (e.g., mean, median, range, and mode) to communicate information about the data. Use these notions to compare different sets of data. (10.D.1) M.G.G.07 ~ Geometry ~ Geometry ~ Solve simple triangle problems using the triangle angle sum property, and/or the Pythagorean theorem. (10.G.5) M.G.G.08 ~ Geometry ~ Geometry ~ Use the properties of special triangles (e.g., isosceles, equilateral, 30°–60°–90°, 45°–45°–90°) to solve problems. (10.G.6) M.M.G.02 ~ Geometry ~ Measurement ~ Given the formula, find the lateral area, surface area, and volume of prisms, pyramids, spheres, cylinders, and cones, e.g., find the volume of a sphere with a specified surface area. (10.M.2) M.N.A1.01 ~ Algebra I ~ Number Sense and Operations ~ Identify and use the properties of operations on real numbers, including the associative, commutative, and distributive properties; the existence of the identity and inverse elements for addition and multiplication; the existence of nthroots of positive real numbers for any positive integer n; and the inverse relationship between taking the nth root of and the nth power of a positive real number.(10.N.1) M.N.A1.02 ~ Algebra I ~ Number Sense and Operations ~ Simplify numerical expressions, including those involving positive integer exponents or the absolute value, e.g., 3(24–1) = 45, 4|3 – 5| + 6 = 14; apply such simplifications in the solution of problems.

					(10.N.2) M.P.A1.05 ~ Algebra I ~ Patterns, Relations and Algebra ~ Demonstrate an understanding of the relationship between various representations of a line. Determine a line's slope and x- and y-intercepts from its graph or from a linear equation that represents the line. Find a linear equation describing a line from a graph or a geometric description of the line, e.g., by using the "point-slope" or "slope y-intercept" formulas. Explain the significance of a positive, negative, zero, or undefined slope. (10.P.2) M.P.A1.06 ~ Algebra I ~ Patterns, Relations and Algebra ~ Find linear equations that represent lines either perpendicular or parallel to a given line and through a point, e.g., by using the "point-slope" form of the equation. (10.G.8)

December

Algebra Blitz

Essential Questions	Content	Skills	Assessments	Exit Outcomes	Standards
Student will recognize the importance of knowing and applying the associative, commutative, and distributive properties. Can student use the concepts of ratio and proportions to determine scale	oder of operation Percent equations Ratios and Proportions Similar Polygons	evaluating math problems applying multi-step procedures Will apply "the order of operations, PEMDAS, to solve problems involving multiple operations. Determine if two ratios are proportional by	Properties Quiz 12/7/2007 Ratio and Proportions 12/1/2007	Students will be able to: *use ratio and proportions to solve to find missing measurements *use ratio and proportions to determine distance	M.09-10.G.04 ~ Geometry ~ Apply congruence and similarity correspondences (e.g., DABC @ DXYZ) and properties of the figures to find missing parts of geometric figures, and provide logical justification. M.09-10.N.02 ~ Number Sense and Operations ~ Simplify numerical expressions, including those involving positive integer exponents or the absolute value, e.g., 3(24–1) = 45, 4|3 – 5| + 6 = 14; apply such simplifications in the solution of problems. M.09-10.P.02 ~ Patterns, Relations and Algebra ~ Demonstrate an understanding of the relationship between various

factor, distance on a map, and etc. Can I describe how ratio and proportion are used to compare quantities, measurements, and rates?	Ratio and Proportions	simpliying each fraction and also using cross products Use Cross Production to solve proportion problems			representations of a line. Determine a line's slope and x- and y-intercepts from its graph or from a linear equation that represents the line. Find a linear equation describing a line from a graph or a geometric description of the line, e.g., by using the "point-slope" or "slope y-intercept" formulas. Explain the significance of a positive, negative, zero, or undefined slope.

January

polynomials

Essential Questions	Content	Skills	Assessments	Exit Outcomes	Standards
Am I able to exchange mathematical ideas effectively with others ? Can I model real life situations with linear equations	Linear equations slope intercept form Graphing linear equations	Demonstrate how linear modeling is used in real life situations Recognize positive and negative slope Graphing a line when given slope and y intercept When given a real life situation, students will graph it and write and equation of the line.	Linear equations 1/10/2008	Students will use mathematical ideas to: * make important financial decisions * make predictions * detemine sound investment and business decisions *to make profitable decisions	M.P.A1.05 ~ Algebra I ~ Patterns, Relations and Algebra ~ Demonstrate an understanding of the relationship between various representations of a line. Determine a line's slope and x- and y-intercepts from its graph or from a linear equation that represents the line. Find a linear equation describing a line from a graph or a geometric description of the line, e.g., by using the "point-slope" or "slope y-intercept" formulas. Explain the significance of a positive, negative, zero, or undefined slope. (10.P.2)

February — Area

Essential Questions	Content	Skills	Assessments	Exit Outcomes	Standards
Will demonstrate their knowledge of area and volume by applying and manipulating the formulas to solve for individual components. Will demonstrate knowledge of a variety of formulas and strategies by independently solving multiple choice, short answer and open response questions that require application of a variety of mathematical approaches.	Three dimensional figures and their properties Surface area of cubes and prisms Surface area of cylinders and cones Surface area of Pyramids Volume of all solids Practice taking past MCAS re-take exams. Focusing on simple algebra and number sense problems.	Knowledge of order of operation How to manipulate a formula to solve for missing information. Test taking skills To identify different polygons and solids.	Surface area and Volume 2/1/2008	Students will use prior knowledge: *to take exams such as, MCAS, PSATs, SATs, ASVAB Students will use their understanding of mathematics to: *apply given formulas on a exam *make reasonable estimate	A.3 ~ Students will use creative, analytical, and critical thinking skills. A.4 ~ Students will be independent learners. M.M.G.02 ~ Geometry ~ Measurement ~ Given the formula, find the lateral area, surface area, and volume of prisms, pyramids, spheres, cylinders, and cones, e.g., find the volume of a sphere with a specified surface area. (10.M.2)

March — Re-Take Madness

Essential Questions	Content	Skills	Assessments	Exit Outcomes	Standards
Can I create	MCAS Packets	All skills	MCAS Test	Students will	M.09-10.D.01 ~ Data Analysis, Statistics,

	charts and graphs given a set of data and draw conclusions and make reasonable prediction based on that data. Can I independently, recognize, interpret, and answer questions that require a reasonable understanding of our number system on the MCAS exam? Will students be able to independently apply algebraic and geometric formulas and strategies to solve complex problems?	Number Sense Geometry and Measurement Patterns, Relations, and Algebra Data Analysis,Statistics, and Probability	necessary to pass MCAS	Portfolios 3/1/2008	use their understanding of algebraic and geometric concepts to solve a variety of problems, as given on the MCAS exam To independently pass the MCAS re-take exam.	and Probability ~ Select, create, and interpret an appropriate graphical representation (e.g., scatter-plot, table, stem-and-leaf plots, box-and-whisker plots, circle graph, line graph, and line plot) for a set of data and use appropriate statistics (e.g., mean, median, range, and mode) to communicate information about the data. Use these notions to compare different sets of data. M.09-10.D.02 ~ Data Analysis, Statistics, and Probability ~ Approximate a line of best fit (trend line) given a set of data (e.g., scatterplot). Use technology when appropriate. M.09-10.D.03 ~ ta Analysis, Statistics, and Probability ~ Describe and explain how the relative sizes of a sample and the population affect the validity of predictions from a set of data. M.09-10.G.01 ~ Geometry ~ Identify figures using properties of sides, angles, and diagonals. Identify the figures' type(s) of symmetry. M.09-10.G.02 ~ Geometry ~ Draw congruent and similar figures using a compass, straightedge, protractor, and other tools such as computer software. Make conjectures about methods of construction. Justify the conjectures by logical arguments. M.09-10.G.03 ~ Geometry ~ Recognize and solve problems involving angles formed by transversals of coplanar lines. Identify and determine the measure of central and inscribed angles and their associated minor and major arcs. Recognize and solve problems associated with radii, chords, and arcs within or on the same circle. M.09-10.G.04 ~ Geometry ~ Apply congruence and similarity correspondences (e.g., DABC @ DXYZ) and properties of the

						figures to find missing parts of geometric figures, and provide logical justification. M.09-10.G.05 ~ Geometry ~ Solve simple triangle problems using the triangle angle sum property and/or the Pythagorean theorem. M.09-10.G.06 ~ Geometry ~ Use the properties of special triangles (e.g., isosceles, equilateral, 30°–60°–90°, 45°–45°–90°) to solve problems. M.09-10.G.07 ~ Geometry ~ Using rectangular coordinates, calculate midpoints of segments, slopes of lines and segments, and distances between two points, and apply the results to the solutions of problems. M.09-10.G.08 ~ Geometry ~ Find linear equations that represent lines either perpendicular or parallel to a given line and through a point, e.g., by using the “point-slope” form of the equation. M.09-10.G.09 ~ Geometry ~ Draw the results, and interpret transformations on figures in the coordinate plane, e.g., translations, reflections, rotations, scale factors, and the results of successive transformations. Apply transformations to the solutions of problems. M.09-10.G.10 ~ Geometry ~ Demonstrate the ability to visualize solid objects and recognize their projections and cross sections. M.09-10.G.11 ~ Geometry ~ Use vertex-edge graphs to model and solve problems. M.09-10.M.01 ~ Measurement ~ Calculate perimeter, circumference, and area of common geometric figures such as parallelograms, trapezoids, circles, and

						triangles. M.09-10.M.02 ~ Measurement ~ Given the formula, find the lateral area, surface area, and volume of prisms, pyramids, spheres, cylinders, and cones, e.g., find the volume of a sphere with a specified surface area. M.09-10.M.03 ~ Measurement ~ Relate changes in the measurement of one attribute of an object to changes in other attributes, e.g., how changing the radius or height of a cylinder affects its surface area or volume. M.09-10.M.04 ~ Measurement ~ Describe the effects of approximate error in measurement and rounding on measurements and on computed values from measurements. M.09-10.N.01 ~ Number Sense and Operations ~ Identify and use the properties of operations on real numbers, including the associative, commutative, and distributive properties; the existence of the identity and inverse elements for addition and multiplication; the existence of nthroots of positive real numbers for any positive integer n; and the inverse relationship between taking the nth root of and the nth power of a positive real number. M.09-10.N.02 ~ Number Sense and Operations ~ Simplify numerical expressions, including those involving positive integer exponents or the absolute value, e.g., 3(24–1) = 45, 4|3 – 5| + 6 = 14; apply such simplifications in the solution of problems. M.09-10.N.03 ~ Number Sense and Operations ~ Find the approximate value for solutions to problems involving square roots and cube roots without the use of a calculator, e.g., Ö 32 - 1 » 2.8.

						M.09-10.N.04 ~ Number Sense and Operations ~ Use estimation to judge the reasonableness of results of computations and of solutions to problems involving real numbers. M.09-10.P.01 ~ Patterns, Relations and Algebra ~ Describe, complete, extend, analyze, generalize, and create a wide variety of patterns, including iterative, recursive (e.g., Fibonacci Numbers), linear, quadratic, and exponential functional relationships. M.09-10.P.02 ~ Patterns, Relations and Algebra ~ Demonstrate an understanding of the relationship between various representations of a line. Determine a line's slope and x- and y-intercepts from its graph or from a linear equation that represents the line. Find a linear equation describing a line from a graph or a geometric description of the line, e.g., by using the "point-slope" or "slope y-intercept" formulas. Explain the significance of a positive, negative, zero, or undefined slope. M.09-10.P.03 ~ Patterns, Relations and Algebra ~ Add, subtract, and multiply polynomials. Divide polynomials by monomials. M.09-10.P.04 ~ Patterns, Relations and Algebra ~ Demonstrate facility in symbolic manipulation of polynomial and rational expressions by rearranging and collecting terms; factoring (e.g., a2– b2= (a + b)(a – b), x2+ 10x + 21 = (x + 3)(x + 7), 5x4+ 10x3– 5x2= 5x2(x2+ 2x – 1)); identifying and canceling common factors in rational expressions; and applying the properties of positive integer exponents. M.09-10.P.05 ~ Patterns, Relations and Algebra ~ Find solutions to quadratic equations (with real roots) by factoring,

					completing the square, or using the quadratic formula. Demonstrate an understanding of the equivalence of the methods. M.09-10.P.06 ~ Patterns, Relations and Algebra ~ Solve equations and inequalities including those involving absolute value of linear expressions (e.g., |x – 2| > 5) and apply to the solution of problems. M.09-10.P.07 ~ Patterns, Relations and Algebra ~ Solve everyday problems that can be modeled using linear, reciprocal, quadratic, or exponential functions. Apply appropriate tabular, graphical, or symbolic methods to the solution. Include compound interest, and direct and inverse variation problems. Use technology when appropriate. M.09-10.P.08 ~ Patterns, Relations and Algebra ~ Solve everyday problems that can be modeled using systems of linear equations or inequalities. Apply algebraic and graphical methods to the solution. Use technology when appropriate. Include mixture, rate, and work problems.

April

Properties of Real Numbers

Essential Questions	Content	Skills	Assessments	Exit Outcomes	Standards
Can I use proportions to solve real world problems such as, percents, percent change, and scale factor. Can I use polynomials and	Working with unit rate. Solving proportions. Scale factor with maps. Similar figures and scale factor	Solving equations. Working fractions Simplifying	Internet and Fat Calories 4/10/2008 Polynomials 4/1/2008	Students will be to apply * addition property of polynomials to find perimeter Students will	M.09-10.N.04 ~ Number Sense and Operations ~ Use estimation to judge the reasonableness of results of computations and of solutions to problems involving real numbers. M.P.A1.07 ~ Algebra I ~ Patterns, Relations and Algebra ~ Add, subtract, and multiply polynomials. Divide polynomials by monomials. (10.P.3)

their properties to solve problems and different working environments.	Working with adding, subtracting and multiplying polynomials.	fractions Simplify an complex algebraic expression Combine like terms		use prior knowledge: *to take exams such as, MCAS, PSATs, SATs, ASVAB	

May

Reality - Modeling realistic situations that use mathematics.

Essential Questions	Content	Skills	Assessments	Exit Outcomes	Standards
When am I ever going to use this math? How does is mathematics used in different jobs? How is the application similar and how are they different/	Examining percent of market share for the top 10 fast food restaurants. Using baseball players' statistics to formulate a batting order. Using Percent rates to make decisions, such as where to take a vacation. How to make forecasts about manufacturing levels using percent of increase and	To be able to use decimals and percents to make decisions, draw conclusions, and make forecasts. Be able to use percent of increase/decrease to the worth of a given item.	Real World 5/25/2008	Students will be able to apply: *the percent formula *the percent change formula Students will use mathematical ideas to: * make important financial decisions * make predictions * detemine sound investment and business decisions *to make profitable decisions	M.09-10.N.04 ~ Number Sense and Operations ~ Use estimation to judge the reasonableness of results of computations and of solutions to problems involving real numbers.

	decrease.			Students will use mathematical concepts and strategies to make important financial decisions.	

June

Math and Me

Essential Questions	Content	Skills	Assessments	Exit Outcomes	Standards
How does what I learned this year help me in real life? How can I use my knowledge of circles to find arc measure, arc length, and area of a sector?	Shopping Bargain hunting Purchasing a Car Renting an Apartment Formulas for: arc length arc measure area of a secotr	To apply knowledge of estimation and percents to determine better deal To buy a car that has reasonable payments based on one wages Determine if you can afford a rent or if you will need roommate	Math and Me 6/13/2008 Cirlces 6/5/2008	Students will have an understanding how circles are used in the real world, such as, finding the time difference between cities and designing a logo.	M.09-10.P.08 ~ Patterns, Relations and Algebra ~ Solve everyday problems that can be modeled using systems of linear equations or inequalities. Apply algebraic and graphical methods to the solution. Use technology when appropriate. Include mixture, rate, and work problems.