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A+LS™ MATHEMATICS CURRICULUM

The *A+LS*™ Mathematics curriculum is a comprehensive, completely integrated curriculum for grade levels 1-12. A sequence of 18 titles provides an extensive, e-learning solution ideal for schools that want to use technology to improve their instructional process. The *A+LS* program consists of an Internet-based instructional management system with student assessment tools built in and educators can test students on national, state, district, or local objectives because any set of standards can be added to the system.

In addition to a complete mathematics curriculum that is appropriate at each grade level, each title contains exercises that require the student to choose operations and develop strategies to solve real-world problems. Students learn to use common sense, mental math, estimation, and other methods to solve problems and check answers for reasonableness.

The Mathematics titles develop skills with mathematics and their use in practical situations by utilizing a *Four-Step Approach*: *Study Guide, Practice Test, Mastery Test, and Essay* modules are used to define the instructional environment.

- The *Study Guide* module provides a text- and graphics-based delivery of material that is reinforced by pictures and diagrams supported by a wealth of content. *Study Guides* teach the concepts and skills associated with each lesson. A number of the *Study Guide* pages have specific, interactive feedback that will assist students in solving problems or understanding concepts.

- The *Practice Test* module provides the students, to practice the skills learned in the *Study Guide* section. The student has instant access to the study material for reference.

- In the *Mastery Test* module, the student takes a scored examination, and then the electronically "turns in" the test and the results are recorded in the *A+LS Management System.*

- The *Essay* module allows the student to compose individual, free-form answers to a wide variety of questions and problems.

The *A+LS* product line features a unique multimedia authoring system that enables educators to create and modify curriculum content. Through this feature, it is a simple process to add new text, graphics, video, or voice to any *A+LS* lesson to ensure that the lesson content never becomes outdated.

A+LS MATHEMATICS CURRICULUM

		ALGEBRA I, PART 1 GRADE LEVELS 8-10

#	LESSON	LESSON CONTENT
1	Expressions & Equations	Students identify variables, numerical expressions, algebraic expressions and equations, coefficients and constants. Students evaluate algebraic expressions and calculate numerical expressions and identify open equations.
2	Exponents & Factors	Students evaluate expressions with exponents and expressions with repeated factors in exponential form. Students identify base, exponent, and use zero as exponent. Students write numbers in exponential form.
3	Properties	Identification and examples of commutative properties of addition and multiplication, identity properties of addition and multiplication, associative properties of addition and multiplication, and distributive property of multiplication over addition.
4	Order of Operations	Students use standard and scientific calculators to perform operations and compare answers. Students identify order of operations and practice simplifying expressions using order of operations.
5	Numbers & Sets	Identification and examples of whole numbers, integers, rational numbers, real numbers, odd and even numbers, and the number line. Students use set notation and Venn diagrams to answer questions and solve problems. Students identify intersection and union of sets, empty sets, subsets, natural numbers, and positive and negative numbers.
6	Absolute Values	Students identify absolute value and use number lines to find opposites. Students simplify and evaluate expressions with absolute values and solve for variables.
7	Problem Solving 1	Apply algebra to real world problems. Introduction of steps to solve word problems, students write let statements and use labeled diagrams as let statements. Students identify known information to solve problem.
8	Adding Real Numbers	Students use the number line to add real numbers (positive and negative). Review of additive identity and opposites. Students use additive inverse, the addition property of zero, addition property of opposites, and opposite of opposites properties to solve problems.
9	Subtracting Real Numbers	Students subtract real numbers, simplify expressions that include both sums and differences. Introduction of algebraic definition of subtraction. Students rewrite and simplify problems and evaluate expressions with given values.
10	Distributive Property	Students use distributive property to simplify expressions. Comparison of solving problems by using the distributive property and by using order of operations.
11	Like Terms	Identification and examples of like terms and solving expressions by collecting like terms. Students identify single numbers, numbers containing products of variables, and similar terms.
12	Multiplying Real Numbers	Students multiply positive and negative numbers, negative and negative numbers, multiply by zero, and use reciprocals to solve problems. Students discover products of problems containing both odd and even numbers of negatives.

#	LESSON	LESSON CONTENT
13	Dividing Real Numbers	Division of real numbers by using multiplication of reciprocals. Introduction of rules for dividing positive and negative numbers. Using zero in division.
14	Evaluating Expressions	Students evaluate expressions using order of operations, distributive property, addition, subtraction, multiplication, and division of real numbers and solving for unknowns.
15	From Words to Equations	Students use words to write equations. Students identify terms used in equations and use alternative methods to solve problems.
16	Properties of Equality 1	Students solve problems using addition property of equality, equivalent equations, and isolating variables by using additive inverses. Students choose operations to solve for variables.
17	Solving Equations 1	Students use addition property of equality and inverse operations to solve problems and compare results. Students check work by substituting values for variables.
18	Properties of Equality 2	Students solve equations using multiplicative property of equality to isolate both positive and negative variables. Students solve problems using inverse operations and choose the operation to isolate variables and solve problems.
19	Solving Equations 2	Students solve equations using multiplication and division of constants and check solutions by collecting like terms.
20	Properties of Equality 3	Students solve equations involving multiple operations. Review of steps for solving equations. Importance of balance in equations.
21	Eliminating Fractions	Introduction to new concept of eliminating fractions from equations to simplify problems. Students examine both traditional and fraction elimination methods to solve equations and compare results. Students determine lowest common denominators and write equivalent equations.
22	Solving Word Problems	Students solve equations using addition, subtraction, multiplication, and division, parentheses, and fractions. Students find correct information needed to solve problems. Importance of relative value in solving problems.
23	Review Test 1	Test covering concepts and problems taught in previous lessons.
24	The Coordinate Plane	Identification and examples of x and y axes, quadrants, origin, ordered pairs, x and y coordinates, abscissa and ordinates. Students locate points on a plane.
25	Linear Equations	Definition and examples of linear equations. Students determine if an ordered pair is a solution to an equation. Determining if an equation is linear.
26	Graphing with the T-table	Given linear equations, students determine multiple solutions and graph equations. T-tables. Introduction of steps for determining solutions.
27	The x and y Intercepts	Students locate x and y intercepts for linear equations from graphs and from equations. Students graph by determining x and y intercepts. Graphing with constants.

#	LESSON	LESSON CONTENT
28	Slope of a Line	Definition and examples of positive, negative, and zero slope. Given 2 points in a line, students find slope. Students find slope of line when line is graphed on a coordinate plane. Definition and examples of positive and negative rise and run, importance of order of graphing points.
29	Slope-Intercept Equations	Slope-intercept form of linear equations. Students rewrite linear equations in slope-intercept form and use slope-intercept equations to solve problems. Given 2 points on a line, students find equation.
30	Fitting Equations to Data	Students study and identify mathematical relationships between 2 variables as used in real world situations. Students find equations of a line that models given data. Identification and examples of dependent and independent events. Use linear equations to make predictions.
31	Rules of Exponents	Multiplication and division in exponential form. Students determine powers of products and quotients. Multiplying and dividing powers with like bases. Students identify patterns in exponents and express numbers in exponential form. Rules for raising a power to a power, a product to a power, and a quotient to a power.
32	Polynomial Types	Identification and examples of polynomials, binomials, and trinomials. Students determine degree of terms and degree of polynomials and write polynomials in descending order.
33	Polynomial Operations 1	Finding opposites of polynomials. Students add and subtract polynomials by collecting like terms and by inverse operations.
34	Polynomial Operations 2	Multiplying and dividing monomials by using properties of rational numbers and properties of exponents.
35	Scientific Notation	Students convert numbers in scientific form to standard form and vice versa. Students use scientific notation in multiplication and division. Relating decimals to scientific notation in positive and negative numbers.
36	Polynomial Operations 3	Students use the distributive property to multiply polynomials by using rules of multiplying variables with exponents.
37	Polynomial Operations 4	Using the FOIL method for multiplying a binomial by a binomial. Relating the distributive property to polynomial multiplication. Students multiply binomials by trinomials and arrange polynomials in descending order.
38	Equations & Polynomials	Students use polynomials to solve word equations. Review of guidelines for solving word problems.
39	Factoring Out Monomials	Guidelines for factoring polynomials by determining greatest common factors. Factoring monomials from polynomials.
40	Difference of Squares	Review of guidelines for factoring polynomials. Importance of number of terms in factors. Determining square terms. Factoring binomials. Determining difference of squares. Students choose terms that are difference of squares.
41	Trinomial Squares	Students factor trinomials by factoring out monomials. Identification and traits of trinomial squares. Patterns in trinomial factoring. Students write trinomials in factored form.
42	Factoring Trinomials	Factoring trinomials that are not square. Quadratic trinomials with positive or negative constants. Factoring quadratic trinomials with coefficient integers other than one.

ALGEBRA I, PART 1, continued

#	LESSON	LESSON CONTENT
43	Factoring by Grouping	Rules for factoring polynomials with more than three terms by grouping. Students use distributive property to factor polynomials and check work.
44	Methods of Factoring	Students determine steps to take in factoring and solve problems by factoring polynomials in descending order.
45	Solving by Factoring	Identification and examples of quadratic equations. Solving quadratic equations by factoring. Zero product rule in factoring.
46	Factoring Word Problems	Students solve word problems by writing and factoring quadratic equations. Students identify viable solutions in polynomial equations.
47	Comprehensive Exam	Comprehensive test covering content of entire course.

A+LS MATHEMATICS CURRICULUM

ALGEBRA I, PART 2
GRADE LEVELS 8-10

#	LESSON	LESSON CONTENT
1	Solving by Graphing	Determining if an ordered pair is a solution of a system of linear equations; finding solutions of linear systems of equations by graphing
2	Solving by Substitution	Solving systems of equations by substituting for a variable
3	Addition & Subtraction	Solving systems of linear equations by using addition and subtraction; eliminating variables by adding and subtracting
4	Multiplication & Addition	Solving linear systems of equations by first multiplying one or both equations by a constant and then using the addition method
5	Using Two Variables	Solving word problems related to real life situations using a variety of methods, writing let statements
6	Motion Problems	Solving problems involving uniform motion; formula for motion
7	Coin & Digit Problems	Solving linear systems of equations involving digits and coins
8	Rational Expressions 1	Review of definition of rational expressions; simplifying rational expressions
9	Using -1 as a Factor	Factoring negative one from a polynomial in order to simplify rational expressions
10	Rational Expressions 2	Multiplying rational expressions to simplify products
11	Rational Expressions 3	Dividing two rational expressions and simplifying the answer
12	Rational Expressions 4	Addition and Subtraction of rational expressions with like denominators
13	Rational Expressions 5	Identifying the least common multiple of expressions; adding and subtracting rational expressions with unlike denominators by converting rational expressions to equivalent rational expressions with common denominators
14	Dividing Polynomials	Dividing one polynomial by another using long division; introduction to synthetic division
15	Complex Rationals	Identifying complex rational expressions and simplifying them
16	Rational Equations 1	Identify and solve rational equations; skills necessary for solving rational equations
17	Rational Equations 2	Solving word problems by using rational equations
18	Mixture Problems	Solving word problems with rational equations which relate to mixtures
19	Work Problems	Solving word problems relating to work being done by two or more individuals working separately and together; using rational equations
20	Ratio & Proportion	Solving problems that require the use of ratios and proportions
21	Investment Problems	Solving problems dealing with investments; solving for future worth of present amounts
22	Graphing Inequalities	Graphing inequalities on a number line
23	Solving Inequalities	Solving inequalities using the addition method; solving inequalities by adding and subtracting from both sides of the inequality
24	Using Inequalities	Solving inequalities by using the multiplication method; multiplying and/or dividing both sides of the inequality by a constant
25	Problem Solving	Using inequalities in word problems to solve problems

ALGEBRA I, PART 2, continued

#	LESSON	LESSON CONTENT
26	Intersections & Unions	Review of terminology of sets, unions, and intersections, identifying sets finding union and intersection of sets
27	Compound Inequalities	Reading, writing, and solving compound inequalities
28	Equations/Absolute Value	Solving equations that contain absolute values
29	Linear Inequalities 1	Inequalities and the coordinate plane and solving for absolute value
30	Linear Inequalities 2	Graphing inequalities that contain two variables on the coordinate plane
31	Linear Inequalities 3	Graphing systems of linear inequalities on the coordinate plane; using shading to identify requirements of both inequalities
32	Square Root & Irrationals	Finding square roots of perfect squares; determining if numbers are rational or irrational; using calculators to give approximations for irrational numbers
33	Radical Expressions 1	Simplifying radical expressions.
34	Radical Expressions 2	Multiplying two or more radical expressions
35	Radical Expressions 3	Dividing radical expressions by another radical expression; rationalizing the denominator
36	Radical Expressions 4	Adding and subtracting radical expressions.
37	The Pythagorean Theorem 1	Introduction to the Pythagorean Theorem; solving triangles using the Pythagorean Theorem
38	The Distance Formula	Finding the distance between any two points on the coordinate plane
39	The Pythagorean Theorem 2	Using the Pythagorean Theorem to solve problems.
40	Radical Equations	Solving equations that contain a radical term
41	Relations & Functions	Definition of relation; determining domain and range of relations; definition of function; determining if a relation is a function; finding the value of functions
42	Function Graphs	Graphing functions; recognizing the graph of function; learning to use function notation
43	Quadratic Functions	Graphing quadratic functions; using vertex and axis of symmetry or the T-table
44	Direct Variation	Giving equations of direct variation and solving problems involving direct variation
45	Inverse Variation	Finding equations of inverse variation; solving problems involving inverse variations
46	Variations	Problem solving involving joint and combined variation
47	Quadratic Equations	Solving quadratic equations in three different forms involving exponents
48	Completing the Square	Solving quadratic equations by completing the square
49	The Quadratic Formula 1	Defining the quadratic formula; using the quadratic formula to solve quadratic equations
50	The Discriminant	Identifying and evaluating the discriminant of a quadratic equation; using the discriminant to determine the number of solutions to an equation
51	The Quadratic Formula 2	Solving word problems by utilizing the quadratic formula

A+LS MATHEMATICS CURRICULUM

ALGEBRA II, PART 1
GRADE LEVELS 10-12

#	LESSON	LESSON CONTENT
1	Rules of Algebra	Review of the real number system including rational numbers, integers, whole numbers, counting numbers, and irrational numbers; rules for combining and multiplying real numbers, and order of operations.
2	Real Number Properties	Review of properties of real numbers; associative property of multiplication and division, distributive property, substitution property; terms associated with real number properties and operations, and review of inequalities.
3	Algebraic Expressions	Connecting words and numbers through expressions, students practice writing and simplifying expressions.
4	Algebraic Equations	Difference between expressions and equations, symbols used in writing equations, identifying unknowns.
5	Solving Equations	Rules for solving equations, combining like terms, step-by-step examples of simplifying and solving equations.
6	Problem Solving 1	Developing equations to solve for unknowns, developing a plan to solve problems, and working related problems that develop from one original problem and checking answers for reasonability.
7	Rewriting Formulas	Solving for variables with more than one unknown, converting Celsius to Fahrenheit and vice versa, isolating variables, multiplying by reciprocals.
8	Solving & Graphing	Definition and examples of ordered pairs, x and y axes, and the coordinate plane, students write equations from information on grids, positive and negative slope.
9	Properties of Inequality	Rules and properties of inequalities, review of divisibility and multiplication properties.
10	Inequalities	Relating inequalities to variables, intersection and union, examples of solving and graphing inequalities.
11	Absolute Value Equations	Review of absolute values, determining absolute values as related to equations, comparing absolute values as solutions to equations, checking answers for reasonableness.
12	Absolute Value Inequality	Examples of positive and negative numbers in inequalities, inequalities having no solution.
13	Problem Solving 2	Converting words in problems into symbols, converting answers to similar terms, various problem solving examples and strategies.
14	Relations & Functions	Review of coordinate plane, quadrants, identifying origin, abscissa, ordinate, domain, range, and function, representing relations on graphs.
15	Graph Linear Functions	Defining linear equations, rise, run, slope, writing linear equations in standard form, graphs as linear functions, constant functions, x and y intercepts.
16	Slope of a Line	Identification of positive, negative, zero, and undefined slopes, rise, run, relating slope to graphs.
17	Graph Linear Inequalities	Half planes and boundaries, writing equations and graphing in slope-intercept form, double-checking linear equality graphs.
18	Parallel & Perpendicular	Defining and graphing parallel and perpendicular lines on the coordinate plane, solving for parallel lines from points and slope, negative reciprocals as slopes.
19	Identify Linear Equations	Difference of slope-intercept form and standard form for linear equations, determining when to use point-slope, slope-intercept, x-intercept or y-intercept to graph linear equations, review of relations and functions,

ALGEBRA II, PART 1, continued

#	LESSON	LESSON CONTENT
20	Problem Solving 3	Identifying relationships between variables, checking answers for reasonableness, using equations to solve problems, using charts or other visual tools as aids in solving problems.
21	Direct Variation	Definition of direct variations and examples of graphs of direct variations, proportionality constants, means as a product of extremes, using proportions to solve problems.
22	Graphing Equation Systems	Characteristics of intersecting, coinciding, and parallel planes and systems of equations for each, comparing equations that have same slope, different slope, and different intercepts,
23	Graphing Systems	Solving equations by graphing intersecting, coinciding, and parallel lines in planes, equations with infinite solutions, equations that have no solution.
24	Addition & Substitution	Solving linear systems by addition and substitution, comparing solutions to problems worked using both methods, practicing using linear equations to solve everyday problems, hints for evaluating problems to find the best way to solve.
25	Solving Inequalities	Illustrating inequalities with graphs and using them to find solutions, the effect of absolute value on graphs, adding and subtracting numbers inside and outside absolute value symbols.
26	Linear Programming	Identifying variables, various constraints, and feasible regions in graphs, determining maximum and minimum values within feasible regions, the importance of linear programming as it relates to various careers,
27	Three-Variable Equations	Using matrices, Cramer's rule, and/or addition to solve equations with three variables, graphing ordered triples, three-dimensional thinking in solving problems.
28	Data in Matrices	Identifying and labeling data in matrices, performing operations using matrices, dimensions of matrices.
29	Matrix Multiplication	Checking the dimensions of matrices before multiplication, products of matrices, step-by-step examples of multiplying matrices.
30	Size & Reflections	Changes in size or magnitude and scale factor, examples using matrices in everyday life situations, coordinates of reflected images, graphing reflections.
31	Transformation	Definition of transformation, formula, point, and matrix transformations, commutative, associative, and identity properties with matrix multiplication, closed sets.
32	Rotation	Definition and examples of rotation, relating rotation to angles, negative and positive magnitude, algebraic formulas for rotation, finding the images of rotations.
33	Matrix Addition	Discussion of rules of matrix addition and subtraction of elements, addition properties in matrices, adding three matrices, multiplying elements in matrices, subtracting matrices, using matrices to solve problems in everyday life.
34	Exponents	How to utilize exponents as a shortcut method when multiplying variables and simplifying fractions.
35	Polynomial Types	Definition and examples of monomials, binomials and polynomials, examples of like and unlike terms, determining the degree of polynomials.
36	Polynomial Operations	Graphing and factoring quadratic trinomials, linear terms, ascending and decreasing order of polynomials.

ALGEBRA II, PART 1, continued

#	LESSON	LESSON CONTENT
37	Factoring Quadratics	Graphing and factoring quadratic trinomials, linear terms, ascending and decreasing order of polynomials.
38	Polynomial Equations	Solving problems using polynomials equations. 5-step approach to solving problems. Formulas and computations for solving problems.
39	Negative Exponents	Review of exponents and their uses, zero as an exponent, negative exponents, simplifying problem using positive and negative exponents.
40	Scientific Notation	Definition and examples of scientific notation, using negative and positive exponents. Converting expressions from decimal form to scientific notation, significant digits.
41	Rational Operations 1	Common denominators, finding higher variables, step by step factoring and solving, adding subtracting, rationals by simplifying.
42	Rational Operations 2	Products of rational expressions, factoring numerators, and denominators of polynomials solving problems using rational expressions to solve practical problems.
43	Simplifying Rationals	Formula for quotient of 2 polynomial, factoring polynomials review of ACF, quadratic trinomials, perfect squares and difference of squares.
44	Complex Rationals	Definition and examples of complex rationals using shortcuts to simplify and solve complex rationals.

A+LS MATHEMATICS CURRICULUM

ALGEBRA II, PART 2
GRADE LEVELS 10-12

#	LESSON	LESSON CONTENT
1	Roots and Radicals	Review of square roots and perfect squares and radicals; solving problems containing radicals; inverse of squaring numbers, irrational numbers, principal square roots
2	Real Number Properties 1	Multiplication and division of radicals, simplifying radical expressions, radical exponents, irrational numbers, product property of rationals
3	Real Number Properties 2	Addition and subtraction of radicals, like radicals and like terms, using the distributive property to solve problems
4	Rational Exponents	Using addition, subtraction, multiplication, and division and combinations of operations to solve problems with rational exponents
5	Equations	Identify radicals and solving equations with radicals
6	Imaginary Numbers	Identification and problem solving using imaginary numbers
7	Complex Numbers 1	Solving addition and subtraction problems of complex pure and imaginary numbers
8	Complex Numbers 2	Multiplication and division of complex numbers, using the commutative property to solve problems, the FOIL method of factoring and solving
9	Quadratic Equations 1	Solving quadratic equations by completing the square, solving and factoring, completing the square to solve equations
10	Quadratic Equations 2	Using the quadratic formula to solve problems, checking for reasonableness of all solutions
11	The Discriminant	Identifying and evaluating the discriminant of a quadratic equation; using the discriminant to determine the number of solutions to an equation
12	Roots	Equations involving the sum and products of roots and their connection to the coordinate plane
13	Quadratic Equations 3	Rewriting equations in quadratic form to solve
14	Problem Solving	Solving problems using quadratic equations
15	Quadratic Relations	Identifying and illustrating distance and midpoint, solving problems with number lines, absolute value, the Pythagorean Theorem
16	Parabolas	Characteristics and definition of parabola
17	Graphing Parabola	Plotting parabola on the coordinate plane
18	Circles	Circle characteristics; solving problems involving identification of circle parts and formulas
19	Ellipses	Characteristics of ellipses; plotting ellipses on the coordinate plane, identification and illustration of fixed points
20	Hyperbola	Characteristics of hyperbola, visual illustrations of hyperbola, intersection of planes and cones, identifying the difference between ellipses and hyperbola
21	Graphing Relations	Identifying relations; identifying functions; graphing quadratic relations and inequalities
22	Graphing Inequalities	Intersections of graphs of quadratic relations, graphing conic inequalities and intersections
23	Variations	Inverse and joint variations of linear functions; combined variation

ALGEBRA II, PART 2, continued

#	LESSON	LESSON CONTENT
24	Exponential Functions	Different strategies for simplifying and solving equations and expressions with rational positive and negative exponents
25	Inverse Functions	Ordered pairs, coordinates, the domain, identification and illustrations of the inverse function
26	Logarithmic Functions	Identification and explanation of logarithmic functions, the exponential/logarithmic scale, definition and examples of logarithms
27	Exponential Equations	Definition and examples of exponential equations, solving problems using the graphing calculator, properties of logarithms, significant digits, compound interest problems
28	Arithmetic Sequence	Definition and examples of arithmetic sequences, difference of numbers, finite sequences of numbers
29	Arithmetic Series	Definition and examples of arithmetic series in real world situations, identification of sigma, solving problems using arithmetic series
30	Geometric Sequence	Definition and examples of geometric sequence, geometric progression, terms of geometric sequences
31	Geometric Series	Definition and examples of geometric series, formulas for solving problems with geometric series
32	Infinite Geometric Series	Examples and definition of common ratios, formulas, convergent geometric series, solving problems with geometric series
33	Binomial Theorem	Identification of patterns and integral powers, finite series, coefficients, variable powers, factorials, solving factorial problems

A+LS MATHEMATICS CURRICULUM

CALCULUS I
GRADE LEVEL 12

#	LESSON	LESSON CONTENT
1	Limits	Calculating x-values and corresponding values, approaching function values, limits, and notation.
2	Continuous Functions	Definition of continuous function, continuous graphs of polynomial functions, sine, and cosine, evaluating the limits of continuous function.
3	Discontinuous Functions 1	Examining various types of discontinuities: holes, asymptotes, and jumps and their graphs
4	Discontinuous Functions 2	Approaching negative and positive infinities
5	Discontinuous Functions 3	One-sided limits
6	Special Trig Functions	Trigonometric limits of sine and cosine functions, graphing tangents, cotangents, secants, cosecants
7	Limits at Infinity	Polynomials as they approach infinity, negative infinity, and infinity squared, definition of infinity squared, examples of how changing the argument of the function changes the limit.
8	Limit Unit Review	Review of limit lessons.
9	Derivatives	Derivatives and determining the slope of a tangent at a given point, using the derivative as a velocity, the derivative as a function; Liebniz notation
10	Derivative Shortcuts 1	Using the mathematical definition of a derivative to find general pattern, constant functions and derivatives; the Power Rule and coefficients of sums and differences
11	Derivative Shortcuts 2	Negative exponents, derivatives of sine and cosine, derivatives at specific points
12	Some Derivative Rules	Functions that are products, the Product Rule, rational functions and the Quotient Rule, the derivative as a reciprocal of sine.
13	The Chain Rule	Derivatives of composite functions, definition of the chain rule, extending the chain rule.
14	Higher Derivatives	Acceleration as a derivative of velocity, notation and use of higher derivatives.
15	Implicit Differentiation	Examples of finding the derivative implicitly without solving for y.
16	Derivative Unit Review	Review of derivatives.
17	Maximum / Minimum Values 1	Determining maximum and minimum values of given functions on closed intervals
18	Maximum / Minimum Values 2	Using zero-slope to determine maximum and minimum values, critical points and relative extrema.
19	Maximum / Minimum Tests 1	The first derivative tests, increasing and decreasing slopes, finding relative extrema
20	Maximum / Minimum Tests 2	Second derivative tests, finding relative extrema
21	The Second Derivative	Concavity and inflection points of graphs, definition and determination of inflection points, sign graphs
22	Application Review 1	Review of maximum and minimum values and tests
23	Applications of Extrema	Determining need to find maximum and minimum values in real life situations
24	Related Rates 1	Problems with derivatives that are related; problems involving related rates and spheres
25	Related Rates 2	Using related rates to determine the volume of cones; using the Pythagorean relationship in related rate problems

CALCULUS I, continued

#	LESSON	LESSON CONTENT
26	Graphing Using Extremes 1	Understanding the nature of graphing, determining graphing data
27	Graphing Using Extremes 2	Asymptotes as related to graphs
28	Application Review 2	Review of related rates and graphing
29	Antiderivatives	Determining the original function from the derivative, definition of antiderivatives, proving antiderivatives, antiderivatives with negative exponents.
30	Comprehensive Exam	Review of all material presented in Calculus I

A+LS MATHEMATICS CURRICULUM

CALCULUS II
GRADE LEVEL 12

#	LESSON	LESSON CONTENT
1	Definite Integrals	Definition of integral, discussion of finding integrals, notations for integrals, discussion of definite integrals
2	Fundamental Theorem	Implications of the fundamental theorem of calculus, evaluating definite integrals, addition property
3	Indefinite Integrals	The integral as a function; antiderivatives, integrating a constant multiple of a function
4	Integrals by Substitution	Inverse of the chain rule, determining u and du, integrals of the squares of sine and cosine; substitution for definite integrals/change limits
5	Natural Logarithms	Definition of natural logarithm as an integral; review of laws of logarithms; derivatives of natural logarithms; finding the integral of tangent using logarithms
6	Area Between Two Graphs	Discussion of implications of areas between graphs; points of intersection for region; comparing functions for subtraction direction
7	Integral Unit Review	Review of integrals, antiderivatives, chain rule, logarithms, laws of logarithms and other material covered in previous lessons
8	Volumes 1	Volumes of rotation of F(x) about the x-Axis; the disc method; the washer method (two functions)
9	Volumes 2	Volumes of rotation of F(x) about the y-Axis; the shell method, the shell method with two functions
10	Arclength	Definition and examples of arclength, finding the length of a curve
11	Surface Area	Finding the area of a rotational surface
12	Work	Definition of work; finding work with a variable force; work to empty a tank
13	Application Unit Review	Review of volumes, surface area, work, and hydrostatic force
14	Exponent Function	The natural exponent function; inverse of the natural logarithm; laws of exponents; derivative of the natural exponent; integral of the natural exponent
15	Exponents and Logarithms	Exponential and logarithmic functions of other bases; rewriting exponentials with the natural exponential; derivative of general exponential functions; logarithms of different bases; derivative of general logarithms
16	Growth and Decay	Exponential growth and decay; function of exponential growth and decay; half-lives and doubling times
17	Inverse Trig Functions	Arcsine and arccosine; arctangent and arccotangent; arcsecant and arccosecant; derivatives and integrals of all six functions
18	Inverse Functions Review	Review of exponents, logarithms, and inverse trig functions
19	Integration by Parts	Breaking up the function to be integrated; nth powers of sine and cosine
20	Trigonometric Integrals	Integrals involving trigonometric functions; products of sines and cosines; products of tangents and secants; changing to sines and cosines; using trig identities
21	Trig Substitutions	Substitution trig functions in for x; forms containing square roots and x squared
22	Partial Fractions	Preparing the fraction; division; factoring; breaking the fraction into its component parts
23	Approximations	Using trapezoidal rule to approximate area; using Simpson's rule to approximate area
24	Improper Integrals	Unbounded integrands; unbounded intervals; convergent or divergent integrals
25	Techniques Unit Review	Review of previous materials

CALCULUS II, continued

#	LESSON	LESSON CONTENT
26	Comprehensive Exam	

A+LS MATHEMATICS CURRICULUM

GEOMETRY
GRADE LEVELS 9-11

#	LESSON	LESSON CONTENT
1	Foundation of Geometry	Introduces basic geometric terms commonly used throughout the course. Postulates, theorems, hypotheses, and other definitions. Review of geometric problems.
2	Geometric Concepts	A review of geometric concepts including all types of angles, intersecting, perpendicular and parallel lines, rays and transversals.
3	Geometric Measurement	The use of a protractor in the measurement of angles and circles is discussed. A review of the measurement of line segments utilizing a pop up ruler that can be displayed in inches or centimeters.
4	Points, Lines and Planes	Definition of points, lines, and plans, collinear points, points and lines as intersections.
5	Segments, Rays and Angles	Number lines and corresponding points, identification of segments, congruency and segments, averaging endpoints, definition and examples of rays, bisectors.
6	Angles	Identification of sides and vertices of angles, interior and exterior angle points, adjacent angles, acute, obtuse, and right angles, complementary and supplementary angles, linear pairs, vertical angles.
7	Transversals	Parallel and skew lines, parallel segments and planes, identification and examples of transversals, corresponding angles and transversals, alternate interior and exterior angles.
8	Parallelism	Rules for congruency in corresponding angles, alternate exterior and interior angles, transversals and parallelism.
9	Triangles	Identification and examples of acute, obtuse, and right triangles, scalene, isosceles, equilateral and equiangular triangles, determining angles in triangles.
10	Congruent Triangles	Definition and examples of congruent triangles, comparing lines and angles in triangles, order in labeling angles and triangles, congruence statements, side-side-side, side-angle-side, angle-side-angle, angle-angle-side congruent triangles.
11	Triangles Inside and Out	Identification and examples of vertices, base angles, and congruent sides in isosceles triangles, comparing isosceles and equilateral triangles, exterior angles and remote interior angles in triangles, comparing angles and drawing conclusions about measurement.
12	Review 1	Review of previous lessons.
13	Right Triangles 1	Parts of right triangles, legs, hypotenuse. Focus on 45-45-90 degree right triangles. Using the Pythagorean Theorem to solve geometric problems.
14	Right Triangles 2	Common right triangles, 30-60-90 degree right triangles, patterns in calculating the hypotenuse of a right triangle.
15	Quadrilaterals	An examination of the properties of quadrilaterals including the concept of opposite, consecutive and adjacent sides, angles and vertices.
16	Parallelograms	Definition and examples of quadrilaterals and parallelograms.
17	Special Parallelograms	Rectangles, rhombuses, squares, rectangle diagonals, rhombus diagonals, trapezoids, isosceles trapezoids, base angles and diagonals in trapezoids, finding parallels in triangles, finding medians in trapezoids.

GEOMETRY, continued

#	LESSON	LESSON CONTENT
18	Trapezoids	Examples of various trapezoids and rhombuses; angles and sides; calculating perimeters, examples of parallelism in trapezoids.
19	Areas of Polygons	Formulas for measuring the perimeter and volume and area of trapezoids, measuring surface area.
20	Conditional Statements	An examination of statements that can be derived from the manipulation of conditional statements. Topics include converse, inverse, contrapositive and biconditional statements.
21	Review 2	Review of previous lessons.
22	Similar Polygons	Testing for congruency of quadrilaterals, similarity in polygons, proportional ratios, determining scale factors, proportionality, perimeters of polygons.
23	More About Polygons	Definition and examples of regular and irregular polygons. Identification of vertices and sides. Students identify polygons.
24	Area Revisited	Area of squares and rectangles, parallelograms and triangles, trapezoids, and regular polygons.
25	Solids 1	Prisms, pyramids and determining the areas and volumes
26	Solids 2	Cylinders, cones, spheres; areas and volumes of similar solids
27	Circles	Arcs, chords, and central angles; circumference and area
28	Circles & Angles	Inscribed and interior angles, tangents, and angle measurement
29	Circles, Arcs, & Sectors	Arc lengths and sector area
30	Trigonometric Functions	The focus of this lesson is the basic principles of trigonometry and its relation to geometry, definition and examples of sine, cosine, tangent, and other trigonometric terms.
31	Review 3	Review of previous lessons
32	Comprehensive Exam	Test covering entire unit.

A+LS MATHEMATICS CURRICULUM

#	LESSON	LESSON CONTENT
1	Numbers & Counting 1	Students identify number sets in everyday life. Count numbers up to five. Group objects in number sets.
2	Numbers & Counting 2	Students identify number sets in everyday life. Count numbers 6 - 10. Group objects in sets of numbers.
3	Number Sets	Students group objects in groups from 1 - 10. Compare size as to greater and lesser.
4	Numbers & Counting 3	Introduction of numbers through 19. Counting everyday objects.
5	Ordering Numbers	Students write numbers in order. Concept of greater than and addition.
6	Counting Review	Students count objects and write numbers.
7	Number Sets Review	Students identify objects that are greater or less than given number.
8	Ordinal Numbers 1	Introduction of concept of ordinals using first through fifth.
9	Ordinal Numbers 2	Introduction of ordinal numbers through tenth.
10	Strategy 1	Two kinds of objects mixed together. Students count each kind of object and answer questions about more and less.
11	Addition Readiness	Introduction to concept of addition. Students identify how many in all.
12	Number Lines 1	Students use number lines to add.
13	Vertical Addition	Students add numbers vertically.
14	Subtraction Readiness	Introduction to concept of subtraction. Students identify how many are left.
15	Number Sense	Students solve problems using number sense using three objects with three different colors.
16	Number Lines 2	Students use number lines to subtract.
17	Vertical Subtraction	Students subtract vertically.
18	Fact Families	Given two numbers, students add and subtract in all combinations.
19	Counting On	Students solve addition story problems.
20	Patterns 1	Students look for patterns when adding or subtracting the same number.
21	Addition Sentences	Students write problems using given information and answer questions about how many, etc.
22	Adding Three Numbers	Vertical addition problems using three numbers.
23	Patterns 2	Students continue a given pattern.
24	Subtraction Sentences	Students write subtraction sentences using numbers in problem.
25	Missing Numbers	Students complete math sentences having blanks in all positions.
26	Story Problems 1	Students read information and solve problems.
27	Skip Counting 1	Students group object in groups of ten. Students count tens and ones. Concept of twenty, thirty, etc.
28	Choosing Operations 1	Students identify operation needed to solve problems.
29	Numbers to 100	Students match written number to fact sentence.
30	Ordering Numbers 2	Students write number that comes before, after, or in between given numbers.
31	Skip Counting 2	Students count by twos, fives, and tens.

MATHEMATICS I, continued

#	LESSON	LESSON CONTENT
32	Graphs 1	Students answer questions about graph.
33	Graphs 2	Students complete graphs using given information.
34	Money 1	Students count nickels and pennies.
35	Money 2	Students look at groups of coins and select the written number to solve the problem.
36	Extra Information	Students read information and identify facts that are not needed to solve problem.
37	Money 3	Students see objects with price tags and groups of coins. Students decide if they have enough money to purchase the item.
38	Strategy 2	Students are given an amount of money and shown several objects with price tags. Students decide which items to purchase with money.
39	Estimating & Measuring 1	Students estimate length and use rulers.
40	Estimating & Measuring 2	Students estimate more or less in weight and length.
41	Estimating & Measuring 3	Students show temperature on thermometers.
42	Story Problems 2	Students read information and solve problems.
43	Choosing Operation 2	Students decide when to add or subtract.
44	Sums and Differences	Students write addition and subtraction facts from groups of objects.
45	Time 1	Students tell time on different types of clocks.
46	Time 2	Students tell time by hour and half hour.
47	Strategy 3	Students write all combinations of several objects.
48	Time 3	Students complete calendar and answer questions.
49	Three Dimensional Figures	Students identify objects that have the same shape.
50	Symmetry	Students look at objects and identify those that have two parts that match.
51	Fractions 1	Introduction of concept of halves, thirds, and quarters. Students see partially shaded figures and match fraction name to figure.
52	Strategy 4	Students decide how to share objects.
53	Codes	Letters are assigned numbers. Students solve problems using numbers and letters.
54	Test 1	Review test of counting and order.
55	Test 2	Review test of addition.
56	Test 3	Review test of subtraction.
57	Test 4	Review test of skip counting.
58	Test 5	Review test of money.
59	Test 6	Review test of time.
60	Test 7	Review test of geometric shapes.
61	Test 8	Comprehensive test covering unit.

A+LS MATHEMATICS CURRICULUM

	MATHEMATICS II GRADE LEVEL 2

#	LESSON	LESSON CONTENT
1	Numbers & Counting 1	Introduction of five steps to solving problems. Building place-values. Numbers to 100.
2	Numbers & Counting 2	Regrouping using place-value models. Story problems. Nonstandard methods of keeping count.
3	Numbers & Counting 3	Skip counting by ones, twos, fives, and tens. Introduction of odd-even concept. Number lines.
4	Odds and Evens	Students write odd numbers and even numbers. Students continue odd-even patterns. Students start with various numbers and count by odd or even numbers.
5	Money 1	Placing value to groups of coins. and bills. Given certain dollar amounts, students decide what combination of money will give the amount.
6	Money 2	Subtraction concepts. Making change with money. Concept of more and less. Students determine which costs more or less.
7	Story Problems 1	Students read information and determine solution.
8	Number Sense	Given numbers, students determine which number comes before, between, or after. Students place numbers in order from least to greatest and greatest to least.
9	Money Strategy	Students choose items that cost a given amount. Students decide which items to buy given a certain amount to spend.
10	Story Problems 2	Students read information and determine solution.
11	Ordinal Numbers	Students use ordinal numbers to identify order. Odd and even numbers.
12	Graphing 1	Students answer questions about graphs and complete graphs with information.
13	Graphing 2	Definition and examples of bar graphs, tables, lists, pictures. Students answer questions and solve problems using graphs.
14	Addition & Subtraction 1	Definition of addend, sum, and difference. Students write addition and subtraction number sentences.
15	Addition & Subtraction 2	Using double numbers to add and subtract with sums through 18. Story problems. Regrouping in addition.
16	Fact Families	Students identify fact families. Students complete problems with various elements missing.
17	Story Problems 3	Students read information and determine solution.
18	Choosing Operations 1	Students choose the correct operation needed to solve problems.
19	Using a Calculator	Instruction on use of calculator. Students practice working problems on calculators.
20	Adding Three Numbers	Vertical and horizontal addition problems using three and four addends.
21	Extra Information	Students read information and identify facts that are not needed to solve problem.
22	Choosing Operations 2	Students read information, determine operation, and solve problems.
23	Measurement 1	Using nonstandard measuring instruments. Students estimate length. Measurement in centimeters and inches. Students choose appropriate units of measurement.
24	Measurement 2	Students measure mass and weight. Students read and write temperature in Celsius and Fahrenheit. Measurement problems.

MATHEMATICS II, continued

#	LESSON	LESSON CONTENT
25	Measurement 3	Student's estimate and measure capacity in liters, cups and other units of measurement. Students compare sizes.
26	Measurement 4	Students estimate and measure mass. Students compare mass measurements. Story problems.
27	Estimating	Students estimate sums and measurements. Using front digits to estimate. Estimating greater than and less than. Checking answers for reasonableness.
28	Time 1	Review of reading time on digital and analog clocks. Clock addition and subtraction.
29	Time 2	Estimating length of time for certain activities. Choosing units of time measurement. Writing time in words. Hours, half hours, and quarter hours.
30	Time 3	Students complete calendar and answer questions. Order of days of week and months of year. Students use time lines to show time relationships.
31	Story Problems 4	Addition and subtraction story problems. Students choose correct operations and solve problems.
32	Geometry 1	Students identify, describe, and compare two- and three-dimensional figures, including square, triangle, rectangle, cube, sphere, and cone. Students measure perimeters of objects.
33	Geometry 2	Definition and examples of concepts of congruence and symmetry. Students identify symmetrical and congruent figures.
34	Probability 1	Definition of probability. Students gather data and create graphs from information.
35	Probability 2	Students gather data and write probability statements. Students predict outcomes based on probability statements.
36	Patterns 1	Students recognize patterns in addition and subtraction. Students find missing numbers in patterns.
37	Patterns 2	Students extend patterns. Students create patterns. Introduction to ordered pairs.
38	Patterns 3	Student's sort and order objects according to different attributes. Students find patterns.
39	Strategy	Using different strategies to solve the same problem. Students solve problem, then use another strategy to check answers.
40	Logic	Introduction of logical reasoning. Students read information and use logic to solve problems.
41	Fractions 1	Students identify halves, thirds, fourths, and sixths.
42	Fractions 2	Students identify fractional parts of a whole.
43	Test 1	Review test of number sense operations.
44	Test 2	Review test of money operations.
45	Test 3	Review test of time problems.
46	Test 4	Review test of addition.
47	Test 5	Review test of subtraction.
48	Test 6	Review test of geometry.
49	Test 7	Review test of fractions.

MATHEMATICS II, continued

#	LESSON	LESSON CONTENT
50	Test 8 (Comprehensive)	Comprehensive test covering unit.

A+LS MATHEMATICS CURRICULUM

MATHEMATICS III
GRADE LEVEL 3

#	LESSON	LESSON CONTENT
1	Addition & Subtraction 1	Addition and subtraction of two-digit numbers. Regrouping in subtraction.
2	Understanding Numbers 1	Counting Numbers to 100,000. Odd and even numbers. Skip counting by 2, 3, 4, 5, and 10. Using ordinal numbers to show order.
3	Money 1	Counting bills and coins. Rounding money.
4	Money 2	Comparing and ordering money amounts. Adding and subtracting money amounts.
5	Ordering Numbers	Using a number line to show order and greater and less than. Rounding numbers to the nearest ten and nearest hundred. Roman numerals.
6	Fact Families	Students identify fact families and missing members of them.
7	Using Mental Math	Examples of different methods of computation using mental math.
8	Choosing the Operation	Students decide which operation to use and solve problems.
9	Addition & Subtraction 2	Students add three and four addends vertically and horizontally. Regrouping numbers using parentheses.
10	Extra Information	Students read problems, identify unneeded information, and solve problems.
11	Measuring 1	Students measure length using nonstandard and standard measurements. Students estimate length and apply appropriate units of length to measurement.
12	Graphing 1	Students gather information and apply to bar graphs. Students solve problems using bar graphs.
13	Addition & Subtraction 3	Students add two-digit numbers regrouping ones. Students add two-digit numbers regrouping tens. Students add three-digit numbers including zeros and compare sums using greater than or less than.
14	Story Problems 1	Students are given information to formulate into problem. Students check for reasonableness of answers.
15	Measuring 2	Measuring perimeters of given objects. Number palindromes. Estimating by using front digits.
16	Addition & Subtraction 4	Subtraction problems using two-digit whole numbers and regrouping. Subtraction problems using three-digit numbers. Estimating differences.
17	Using a Calculator	Students use calculators to repeat and extend patterns. Students follow multiple steps of instructions on the calculator.
18	Story Problems 2	Defining steps used in solving multiple-step problems. Students choose operations and solve two-step problems.
19	Addition & Subtraction 5	Subtracting three-digit numbers regrouping once. Subtracting three-digit numbers regrouping twice. Subtracting using zeros.
20	Understanding Numbers 2	Introduction of mean, median, mode, and range.
21	Measuring 3	Estimating and measuring time, capacity, and mass. Students choose the best unit of measurement. Students write time.
22	Measuring 4	Students read temperature in Celsius and Fahrenheit. Student's estimate and measure capacity and mass.
23	Finding Needed Facts	Students read information and identify missing information.

MATHEMATICS III, continued

#	LESSON	LESSON CONTENT
24	Multiplication 1	Definition and introduction to multiplication. Students write addition sentences and convert to multiplication sentences. Properties of multiplication.
25	Multiplication 2	Multiplication sentences using 2, 3, 4, and 5 as factors. Using a number line to multiply.
26	Multiplication 3	Multiplication using 6, 7, 8, and 9 as factors. Students identify patterns in multiplication table. Multiplying by tens and hundreds.
27	Multiplication 4	Multiplication using three factors. Grouping numbers using parentheses. Students solve problems with missing elements in all positions.
28	Multiplication 5	Introduction to area. Students estimate and calculate area of rectangles.
29	Division 1	Definition and introduction to division. Students place numbers in equal groups. Students write division sentences.
30	Division 2	Relating multiplication and division. Dividing by tens and hundreds.
31	Division 3	Students divide using 2, 3, 4, and 5. Students complete division tables. Students identify fact families.
32	Story Problems 3	Students read information, form plan, choose the correct operation, and solve problems having more than one step.
33	Division 4	Students divide using 6, 7, 8, and 9. Students complete division tables. Students write multiplication and division sentences, make comparisons, and identify patterns. Division with remainders.
34	Division 5	Dividing larger numbers. Students divide three and four digit numbers by a one digit number. Different methods of solving division problems.
35	Graphing 2	Students gather information and solve problems using pictographs.
36	Understanding Numbers 3	Addition, subtraction, multiplication and results when using even and odd numbers.
37	Graphing 3	Students gather information from chart, map, or graph and complete another graph with that information.
38	Fractions 1	Definition and examples of fractions. Relating fractions to a whole.
39	Fractions 2	Finding parts of a set. Working backward from a whole to parts.
40	Fractions 3	Equivalent fractions. Students make list of equivalent fractions. Students compare and order size of fractions having the same denominator as to greater than or less than.
41	Fractions 4	Adding and subtracting fractions with like denominators.
42	Fractions 5	Introduction to mixed numbers. Comparing mixed numbers.
43	Decimals 1	Introduction and definition of decimals. Relating fractions to decimals. Decimal place value. Tenths and hundredths.
44	Decimals 2	Adding and subtracting decimals. Zeros and decimals. Students write decimal sentences. Students complete problems with missing elements in all areas.
45	Probability	Definition and examples of probability. Graphing the results of probability experiments. Making predictions based on probability statistics.

MATHEMATICS III, continued

#	LESSON	LESSON CONTENT
46	Geometry 1	Introduction and examples of lines, line segments, rays, and angles.
47	Geometry 2	Plane figures. Sliding, flipping, and turning geometric shapes. Congruence and lines of symmetry. Tessellations. Students identify polygons with up to six sides.
48	Geometry 3	Three-dimensional shapes. Identifying faces, edges, and corners. Finding volume.
49	Ordered Pairs	Using ordered pairs to locate points on a grid.
50	Logical Reasoning	Students use logic to solve problems. Students check for reasonability of answers.
51	Test 1	Review test of addition.
52	Test 2	Review test of subtraction.
53	Test 3	Review test of multiplication.
54	Test 4	Review test of division.
55	Test 5	Review test of fractions.
56	Test 6	Review test of decimals.
57	Test 7	Review test of measurement.
58	Test 8	Review test of geometry.
59	Comprehensive Test	Comprehensive test covering unit.

A+LS MATHEMATICS CURRICULUM

	MATHEMATICS IV GRADE LEVEL 4

#	LESSON	LESSON CONTENT
1	Story Problems 1	The five-step process for problem solving.
2	Number Sense 1	Order of addends in relation to the sum. Adding zero. Students rewrite addition facts in inverse order. Grouping addends.
3	Number Sense 2	Rounding numbers and money amounts to nearest 10, 100, and 1000.
4	Addition & Subtraction 1	Given an addition fact, students write a related subtraction fact. Given a subtraction fact, students write a related addition fact.
5	Addition & Subtraction 2	Addition and subtraction fact families. Students complete fact families using missing elements. Students read story problems and choose the correct operation to solve the problem.
6	Patterns	Odd and even numbers. Students recognize the relationships between numbers to determine patterns.
7	Ordinal Numbers	Cardinal and ordinal numbers.
8	Money 1	Review counting bills and coins. Addition and subtraction problems using money. Students make change for dollar amounts up to $20 and coin change. Students are given a dollar amount to spend and choose which items they could purchase.
9	Money 2	Multiplication and division problems using money. Locating the dollar sign and decimal points when multiplying and dividing money.
10	Measurement 1	Estimating, determining, and measuring time to the nearest minute. Finding elapsed time. Using the appropriate time units to measure time. Writing time using AM or PM. Adding and subtracting time.
11	Measurement 2	Using a calendar. Looking for patterns on a calendar. Learning the number of days in each month.
12	Measurement 3	Estimating and measuring capacity, mass, and temperature, and distance. Using customary units of measurement. Standard and Metric measurements.
13	Fractions 1	Review of fractions. Reading, writing, and renaming mixed numbers. Comparing and ordering fractions and mixed numbers.
14	Fractions 2	Addition and subtraction of fractions and mixed numbers. Equivalent fractions. Students read story problems, choose strategies, and solve problems.
15	Decimals 1	Students read and write decimals to tenths and hundredths positions. Relating decimals and fractions. Relating decimals and money. Writing mixed numbers as decimals.
16	Decimals 2	Adding and subtracting decimals of the same place value. The use of zero in decimals. Writing decimals as fractions.
17	Geometry 1	Identifying faces, edges, and corners of solid and plane figures. Comparing solid figures. Comparing plane figures. Differences in solid and plane figures.
18	Geometry 2	Line segments and angles. Identifying right angles. Using greater than and less than with right angles. Definition and examples of intersecting lines, parallel lines, and perpendicular lines.

MATHEMATICS IV, continued

#	LESSON	LESSON CONTENT
19	Geometry 3	Definition and examples of congruence and symmetry. Open and closed figures. Identifying parts of angles. Identifying and continuing patterns using geometrical shapes.
20	Geometry 4	Measuring perimeter and area of polygons. Finding the volume of solid figures. Difference in area and volume.
21	Graphs 1	Students locate and name ordered pairs on a coordinate grid. Comparing maps and grids. Students locate points by writing ordered pairs.
22	Graphs 2	Students gather data from visual aid and complete bar graph. Students make predictions from bar graph information. Students complete line graph.
23	Graphs 3	Using tables and pictographs. Gathering information with a pictograph. Using pictograph information to create line and bar graphs. Comparing graph types. Students decide what type graph to use.
24	Probability	Definition and examples of probability. Identifying possible outcomes. The probability equation. Students predict if outcome of given situation is probable, certain, or impossible. Using graphs to chart probability and predict outcomes.
25	Using Mental Math	Examples of different methods of computation using mental math.
26	Choosing the Operation	Students decide which operation to use and solve problems.
27	Extra Information	Students read problems, identify unneeded information, and solve problems.
28	Story Problems 2	Students are given information to formulate into problem. Students check for reasonableness of answers.
29	Finding Needed Facts	Students read information and identify missing information.
30	Story Problems 3	Students read information, form plan, choose the correct operation, and solve problems having more than two steps.
31	Logical Reasoning	Students use logic to solve problems. Students check for reasonability of answers.
32	Test 1	Review test over number operations.
33	Test 2	Review test over fractions.
34	Test 3	Review test over measurement.
35	Test 4	Review test over geometry.
36	Test 5	Review test over probability.
37	Test 6 (Comprehensive)	Comprehensive test covering unit.

A+LS MATHEMATICS CURRICULUM

	MATHEMATICS V GRADE LEVEL 5

#	LESSON	LESSON CONTENT
1	Whole Numbers 1	Place value through millions. Exponents. Standard, expanded, and word forms of numbers.
2	Whole Numbers 2	Comparing and ordering whole numbers. Rounding through millions.
3	Decimals 1	Place value through thousandths. Zero in decimals. Writing decimals.
4	Decimals 2	Comparing and ordering decimals. Patterns in decimals. Rounding decimals.
5	Properties of Addition	Commutative, associative, and zero properties of addition.
6	Addition & Subtraction 1	Inverse operations. Estimating sums.
7	Addition & Subtraction 2	Addition and subtraction across zeros. Regrouping with zeros.
8	Addition & Subtraction 3	Addition and subtraction of decimals. Clustering.
9	Review Test 1	Review test of whole number place values, addition, and subtraction.
10	Review Test 2	Review test of decimals, addition, and subtraction.
11	Problem Solving 1	The five step thinking plan. Using inverse operations.
12	Organizing Data 1	Using tables to organize, analyze, and solve problems.
13	Problem Solving 2	Multi-step problems. Using the five step thinking plan.
14	Multiplication 1	Commutative, associative, zero, one, and distributive multiplication properties. Mental math techniques. Estimating.
15	Multiplication 2	Multiplication by two and three digit numbers. Multiplication problems with missing factors.
16	Multiplication 3	Estimation. Mental math. Decimal multiplication. Zero in decimals.
17	Division 1	Dividing whole numbers by one and two digit numbers. Estimating quotients.
18	Division 2	Short division. Dividing larger numbers. Using zeros in division. Identifying patterns. Checking division.
19	Division 3	Dividing decimals. Estimation and mental math.
20	Review Test 3	Multiplication and division.
21	Organizing Data 2	Surveys. Sample groups. Range, mode, mean, median.
22	Bar Graphs & Pictographs	Parts of a bar graph. Selecting a scale. Displaying data on bar graph. Displaying data on pictograph. Reading data. Analyzing data. Making inferences.
23	Line Graphs	Uses of line graphs. Parts of line graphs. Displaying data.
24	Circle Graphs	Circle graphs. Venn diagrams. Analyzing data.
25	Ordered Pairs	Ordered pairs. Graphing on a grid.
26	Fractions 1	Fraction parts. Equivalent fractions. Prime numbers. Composite numbers. Greatest common factors. Simplest form. Least common multiples.
27	Fractions 2	Comparing fractions. Reducing fractions. Improper fractions. Mixed numbers.
28	Fractions 3	Estimation. Adding and subtracting like fractions. Adding and subtracting unlike fractions. Adding and subtracting mixed numbers.
29	Fractions 4	Multiplying fractions and mixed numbers.

MATHEMATICS V, continued

#	LESSON	LESSON CONTENT
30	Review Test 4	Fractions.
31	Metric Measurement	Units of length. Units of capacity. Units of mass. Changing metric units.
32	Customary Measurement	Units of length. Units of capacity. Units of weight.
33	Time Measurement	Time. Elapsed time. Schedules.
34	Review Test 5	Measurement.
35	Lines & Angles	Point, line, line segment, ray, angle, plane. Intersecting lines. Parallel lines. Perpendicular lines. Acute, obtuse, and right angles. Angle measurement.
36	Polygons	Plane figures. Triangles. Classifying by sides. Classifying by angles. Quadrilaterals. Classifying quadrilaterals. Symmetry. Congruent figures. Similar figures.
37	Circles	Circles. Circle parts. Circumference, diameter, radius, chord. Compass. Relationships of parts. Pi.
38	Space Figures	Faces, vertices, edges. Prisms. Pyramids. Cones. Cylinders. Spheres.
39	Geometric Measurement	Perimeter. Circumference. Area of rectangles, triangles, parallelograms, circles. Area of irregular shapes. Volume of space figures.
40	Review Test 6	Geometry and Measurement.
41	Ratios	Meaning of ratio. Equivalent ratios. Use of ratio in scale drawings.
42	Percent	Ratio. Percent of decimals. Finding percent of a numbers.
43	Probability	Definition and examples of probability. Prediction of outcomes. Fractions and probability.
44	Comprehensive Test	Level 5 Mathematics

A+LS MATHEMATICS CURRICULUM

MATHEMATICS VI
GRADE LEVEL 6

#	LESSON	LESSON CONTENT
1	Number Values	Place value through billions. Decimal place value through thousandths. Word form. Standard form. Expanded form.
2	Number Sense 1	Rounding numbers. Number Ranges. Estimation.
3	Number Operations	Order of operations. Exponents and powers of numbers.
4	Number Sense 2	Square numbers and square roots.
5	Review Test 1	Place value, comparison, and number operations.
6	Review Test 2	Squares and Square Roots
7	Problem Solving 1	Five step thinking plan. Strategies solving problems.
8	Problem Solving 2	Review of 5 step plan. Selecting relevant information. Working with misleading or unnecessary data. Finding strategy in patterns. Choosing strategy to solve problems.
9	Multiplication 1	Estimating products, Commutative, zero, associative, and one properties.
10	Multiplication 2	Multiplying decimals. Zeros in multiplication.
11	Division	Estimating quotients. Multiplying and dividing by powers of ten. Dividing by one-digit numbers. Dividing by two-digit numbers. Dividing decimals.
12	Review Test 3	Multiplication and division.
13	Number Sense 3	Factors. Divisibility. Prime numbers. Composite numbers. Factor trees. Prime factorization. Greatest common factors. Multiples. Least common multiples.
14	Fractions 1	Equivalent fractions. Comparing fractions. Simplest form. Relating fractions to decimals.
15	Fractions 2	Estimating sums and differences. Adding and subtracting like fractions. Adding and subtracting unlike fractions. Adding and subtracting mixed numbers.
16	Fractions 3	Estimating products. Multiplying fractions and mixed numbers. Simplifying. Dividing fractions and mixed numbers.
17	Review Test 4	Fractions and fraction operations.
18	Organizing Data	Collecting data. Tallies, frequency tables. Mean, median, mode, and range.
19	Graphing Data	Bar graphs. Pictographs, histograms, circle graphs, and stem and leaf plots. Analyzing graphed information.
20	Variables & Equations	Identifying variables. Numerical expressions. Algebraic expressions. Addition and subtraction equations. Multiplication and division equations.
21	Equations & Inequalities	Rational numbers in equations. Solving equations. Solving Inequalities.
22	Review Test 5	Algebraic concepts.
23	Metric Measures	Metric place value. Comparing metric units. Length units. Capacity units. Mass units.
24	Customary Measures	Length units. Capacity units, weight units.
25	Other Measures	Time and temperature.
26	Review Test 6	Measurement.

MATHEMATICS VI, continued

#	LESSON	LESSON CONTENT
27	Plane Geometry	Points, lines, rays. Angles. Parallel, intersecting, perpendicular, and skew lines. Bisecting lines.
28	Polygons	Triangle classifications. Quadrilateral classifications. Other polygons. Congruence. Similar figures. Symmetry. Motion geometry.
29	Circles	Parts of a circle. Pi. Formulas.
30	Space Figures	Prisms. Pyramids. Faces, edges, and vertices. Bases.
31	Geometric Measurements	Perimeter. Circumference. Area. Surface Area. Volume.
32	Review Test 7	Geometry and measurements.
33	Ratio & Proportion	Ratio. Proportion. Solving proportions. Rates. Using scales.
34	Percent	Percents and decimals. Percents and fractions. Estimation. Finding percents of whole numbers.
35	Probability	Outcomes. Predicting outcomes. Identifying independent events.
36	Integers	Positive integers. Negative integers. Zero. Comparing integers. Adding and subtracting integers.
37	Coordinate Graphing	Ordered pairs. Coordinate planes. X-axis. Y-axis.
38	Review Test 8	Ratio, Proportion, Percent, Probability, Integers, Ordered Pairs
39	Comprehensive Test	

A+LS MATHEMATICS CURRICULUM

MATHEMATICS VII
GRADE LEVEL 7

#	LESSON	LESSON CONTENT
1	Decimal Number Concepts	Place value, exponents, powers of ten, expanded notation, scientific notation.
2	Number Operations	Commutative, associative, zero, one, and distributive properties. Inverse operations, order of operations.
3	Decimal Number Operations	Expanding skills in addition, subtraction, multiplication, and division.
4	Problem Solving 1	Solving practical problems that deal with decimal numbers.
5	Review Test 1	Decimals.
6	Number Theory	Inverse operations. Prime and composite numbers. Divisibility rules, factors, greatest common factor. Multiples, least common multiple. Square numbers, square roots.
7	Problem Solving 2	Practical application of number theory in problem solving.
8	Review Test 2	Number Theory.
9	Fraction Concepts	Simplest form, equivalent fractions. Comparing and ordering fractions. Improper fractions. Mixed numbers, relating fractions to decimals.
10	Fraction Operations	Expanding skills in addition, subtraction, multiplication, and division with fractions and mixed numbers.
11	Problem Solving 3	Practical situations dealing with fractions in problem solving.
12	Review Test 3	Fractions.
13	Ratio & Proportion	Ratios, equivalent ratios, cross products, rates, proportions, and solving proportions.
14	Problem Solving 4	Problem solving with ratios, rates, proportions, scale drawings.
15	Probability	Properties of probability. Making predictions. Outcomes and permutations.
16	Review Test 4	Ratio, Proportion, and Probability.
17	Percent Concepts	Percent, decimals, fractions, finding percents of a whole. Finding parts of a whole, finding the whole.
18	Problem Solving 5	Problem solving with percents. Percent of increase or decrease. Discounts, markups, commissions, interest, and sales tax.
19	Review Test 5	Percent.
20	Algebra Concepts	Numerical expressions, variables, equations, algebraic expressions, inequalities, inverse operations.
21	Expressions & Equations	Replacing variables to evaluate expressions. Steps to solving equations.
22	Problem Solving 6	Writing equations to solve word problems. Solving multi-step equations.
23	Review Test 6	Algebra.
24	Measurement	Measurement of length, capacity, mass/weight, and time dealing with both metric and customary units.
25	Problem Solving 7	Problem solving applications of measurement.
26	Review Test 7	Measurement.
27	Geometric Concepts	Definitions and examples of points, lines, planes, and angles. Bisecting lines and angles. Relationships of lines. Relationships of angles.
28	Plane Figures	Study of polygons and circles. Classifications of triangles and quadrilaterals. Calculation of perimeter, circumference and area.

MATHEMATICS VII, continued

#	LESSON	LESSON CONTENT
29	Motion Geometry	Similar and congruent figures. Rotation, translation, and reflection.
30	Space Figures	Review and expansion of ideas about prisms, pyramids, cones, and cylinders.
31	Geometric Measurement	Length, area, volume, surface area of geometric figures.
32	Review Test 8	Geometry.
33	Statistics	Data collection. Mean, median, mode, and range.
34	Graphing	Bar, circle, and line graphs. Stem and leaf plots, box and whisker plots.
35	Review Test 9	Statistics and Graphing.
36	Integers	Negative and positive numbers, comparing and ordering integers. Using a number line. Absolute value.
37	Addition & Subtraction	Finding sums and differences with integers. Additional properties of integers.
38	Multiplication & Division	Finding products and quotients with integers. Using multiplication properties with integers.
39	Coordinate Graphing	Graphing ordered pairs on a coordinate axis.
40	Review Test 10	Integer Operations and Ordered Pairs
41	Comprehensive Test	

A+LS MATHEMATICS CURRICULUM

	MATHEMATICS VIII GRADE LEVEL 8

#	LESSON	LESSON CONTENT
1	Number Concepts Review	Place value. Rounding. Estimation, Compatible numbers.
2	Properties	Commutative property of addition, associative property of addition, commutative property of multiplication, associative property of multiplication. Identity properties. Distributive property.
3	Problem Solving 1	Five step thinking plan. Problem solving strategies.
4	Basic Operations 1	Positive and negative rational numbers. Equivalent fractions. Cross products. Absolute value. Order of operations. Fractions to decimals. Comparing and ordering.
5	Basic Operations 2	Addition, subtraction, multiplication, division.
6	Review Test 1	Number Concepts, Properties, and Basic Operations.
7	Ratio & Proportion	Ratio, rates. Equivalent ratios. Proportion.
8	Problem Solving 2	Practical problems dealing with ratio, proportion, unit rates, rates, and scale.
9	Percent 1	Percent to decimals. Percent to fractions. Finding percents.
10	Percent 2	Percent of increase or decrease. Scales. Taxes and discounts.
11	Probability	Probability. Finding samples. Randomly occurring events. Compound events. Independent events. Dependent events. Making predictions. Capture and recapture. Method tree diagrams. Counting principle factorials. Venn diagrams.
12	Review Test 2	Ratio, Percent, and Probability
13	Algebra 1	Numerical expressions. Variables. Variable expressions. Order of operations. Equations. Solutions.
14	Algebra 2	Simplifying numerical and variable expressions. Coefficients. Constants. Evaluating algebraic expressions.
15	Algebra 3	Properties of equality. Inverse operations. Inequality. Solving inequalities.
16	Algebra 4	Guides for practice in solving multi-step equations and inequalities.
17	Algebra 5	Translating data into equations and inequalities. Using equations and inequalities to solve practical problems.
18	Review Test 3	Algebra.
19	Geometric Concepts	Point, line, ray. Line relationships. Angles. Angle relationships. Angle measurement and classifications. Bisecting line segments and angles.
20	Plane Figures	Regular polygons. Triangles. Quadrilaterals. Congruent figures. Circles.
21	Space Figures	Polyhedrons. Prisms. Pyramids. Cylinders, cones, and spheres.
22	Geometric Measurement	Perimeter and circumference. Formulas for area of plane figures, surface area of polyhedrons, and volume of space figures.
23	Square Roots & Triangles	Square roots. Principal square roots. Perfect squares. Irrational numbers and real numbers. Pythagorean Theorem. Similar triangles. Special right triangles. Trigonometry.
24	Review Test 4	Geometry.

MATHEMATICS VIII, continued

#	LESSON	LESSON CONTENT
25	Statistics 1	Samples. Mean, median, mode, and range. Binomial data. Line plots. Bar graphs. Line graphs. Double bar and double line graphs. Circle graphs. Frequency distribution.
26	Statistics 2	Stem and leaf plots. Box and whiskers plots. Histograms. Line plots.
27	Review Test 5	Statistics.
28	Integer Concepts	Positive and negative numbers. Zero. Opposites. Absolute value.
29	Integer Operations	Additions, subtraction, multiplication, and division of integers.
30	Problem Solving 3	Translating word phrases into algebraic expressions with integers. Problem solving strategies.
31	Review Test 6	Integers.
32	Coordinate Graphing 1	Coordinate planes. Ordered pairs. Solutions. Graphing equations. Linear equations. Slope. Slope formula.
33	Coordinate Graphing 2	Using coordinate graphing to solve problems. Solving and graphing equations and inequalities. Quadrants.
34	Polynomials 1	Monomials. Binomials. Trinomials. Operations with polynomials.
35	Polynomials 2	Using the distributive property. FOIL method of multiplying binomials. Squaring binomials.
36	Solving Equation Systems	Matrices. Determinants. Cramer's rule.
37	Review Test 7	Coordinate Graphing, Polynomial, Solving Equations.
38	Comprehensive Test	

A+LS MATHEMATICS CURRICULUM

PRE-ALGEBRA
GRADE LEVEL 7-9

#	LESSON	LESSON CONTENT
1	Number Notation	Writing numbers in standard, written, expanded, and factor form, and scientific notation.
2	Expressions and Equations	Writing numeric expressions, introduction to variables, writing algebraic expressions, evaluating algebraic expressions.
3	Properties	Review of commutative, associative, distributive, zero, and identity properties and examples of steps in solving problems using each one, multiplicative property of zero.
4	Simplifying Expressions	Terms, operational symbols, numerical coefficients, identifying like terms and constants, using various properties to simplify expressions.
5	Solving Equations 1	Properties of equality, using inverse operations, using equivalent equations and inverse operations to solve problems.
6	Solving Equations 2	Inverse operations of multiplication and division, the multiplication and division properties of equality.
7	Review Test 1	Review of number notation and solving equations and simplifying expressions.
8	Integers	Integers and their opposites, using number lines to identify, locate, and compare integers, absolute value of integers, using integers in real life situations.
9	Equations with Integers 1	Rules for solving equations by adding and subtracting integers with the same sign or different signs, examples of strategies to solve equations.
10	Equations with Integers 2	Rules for solving equations by multiplying and dividing integers with the same or different signs, examples of strategies to solve equations.
11	Review Test 2	Review test of integers and operations.
12	Inequalities	Definition and examples of inequalities, signs that indicate inequality.
13	Solving Inequalities 1	Solving inequalities by reversing signs.
14	Solving Inequalities 2	Other strategies for solving inequalities; checking for reasonability.
15	Review Test 3	Review of inequalities and methods for solving.
16	Factors and Exponents	Identifying laws of exponents, writing numbers in exponential form, writing exponents and variables, rules for determining exponents when adding, subtracting, multiplying, and dividing.
17	Rational Numbers	Identifying parts of fractions, relating fractions to rational numbers, locating rational numbers on the number line, comparing rational numbers, writing rational numbers in decimal form, algebraic fractions.
18	Equations/Inequalities 1	Solving equations and inequalities with addition and subtractions, two-step equations, and equations with variables on both sides.
19	Equations/Inequalities 2	Solving equations and inequalities with multiplication and division, two-step equations and solving equations with variables on both sides with combined operations.
20	Graphing	Graphing on the coordinate plane, graphing linear equations, slope and intercept, graphing linear equalities.
21	Review Test 4	Review of rational numbers, factors, exponents, equations, and inequalities.

PRE-ALGEBRA, continued

#	LESSON	LESSON CONTENT
22	Ratio & Proportion	Definition and examples of ratios, writing ratios in lowest terms, rates, unit rates, equivalent ratios, cross products, definition of proportions, solving proportions.
23	Percent	Decimals and percents, figuring percents, place value in percent problems, relating percent to wholes.
24	Problem Solving	Examples of solving percent problems in everyday life, discounts, commission, checking answers for reasonableness, numbers larger than one hundred percent.
25	Review Test 5	Review test of ratio and proportion, percent, and problem solving with ratio, proportion, and percent.
26	Statistics & Graphing	Frequency tables; range, mean, mode, and median; bar, line, and circle graphs; scatter plots; stem and leaf plots.
27	Probability	The counting principle, permutations, combinations, independent events, dependent events.
28	Review Test 6	Review test of graphing, statistics, and probability.
29	Algebra with Geometry	Definitions of basic geometric terms, length, perimeter, circumference, angles, and angle measures, parallel and perpendicular lines.
30	Polygons and Circles	Triangles, quadrilaterals, other polygons, congruent figures, similar triangles, circles.
31	Area and Volume	Finding area of polygons, finding volume and surface area of pyramids, prisms, and cones.
32	Special Triangles	Square roots, Pythagorean theorem, tangents, sine and cosine ratios.
33	Review Test 7	Review test of geometry, polygons, area, volume, similar and right triangles.
34	Comprehensive Exam	

A+LS MATHEMATICS CURRICULUM

REAL WORLD MATH
GRADE LEVELS 9-12

#	LESSON	LESSON CONTENT
1	Introduction	An introduction to the study of Real World Math
2	Graphs and Tables	Introduction to the use of graphs and tables
3	Salaries 1	Calculating income from straight time pay, identification of terms associated with earning an income, calculating wages based on an hourly wage
4	Salaries 2	Formula for salaried pay, deductions, calculating salary per pay period; calculating salary plus commission, gross and net pay
5	Taxes 1	Calculating federal and state taxes; reading tax tables; deducting withholdings from paycheck
6	Taxes 2	Calculating FICA taxes and withholding from paychecks, property taxes, tax assessment and valuation of property
7	Review 1	Review of salaries and taxes
8	Banking 1	Discussion of checking and savings accounts; reading and writing personal checks; maintaining a checkbook register, calculating simple interest
9	Banking 2	Explanation of the process of reconciling bank statements; electronic deposits and automatic deductions; calculating fees
10	Purchasing 1	Configuring sales tax on items purchased, making change to customers, catalog shopping, making bulk purchases, calculating shipping and handling charges
11	Purchasing 2	Determining discount amounts, sale prices, regular prices, inflationary trends
12	Purchasing 3	Making decisions about the better buy, comparison shopping, using unit pricing to determine the amount of savings on purchases, calculating ways to save money through purchasing
13	Review 2	Review of checking and savings accounts and purchasing
14	Budgeting	Spending habits; using percents to create a budget; calculating monthly expenses, occasional expenses, discretionary income, financial responsibility
15	Housing	Calculating housing costs, comparison of buying, renting, leasing; amortization schedules, calculating loan rates and interest amounts
16	Transportation	Reading schedules, calculating travel time, comparing costs of different methods of transportation, reading maps, calculating distance, crossing time zones
17	Utility Costs	Calculating monthly costs for utility services, determining deposits, utility rates, reading utility meters
18	Credit Cards	Responsibility of using credit cards, how to make credit cards work for you, calculating annual finance charges on credit cards
19	Review 3	Review of budgets, transportation, and credit

REAL WORLD MATH, continued

#	LESSON	LESSON CONTENT
20	Loans	The process of obtaining a loan for a home, student loans, calculating interest and monthly payment, principle and interest payments
21	Automobile Costs 1	Identification of terms associated with automobile purchases; depreciation, new versus used cars, calculating APR
22	Automobile Costs 2	Insurance costs associated with automobiles; explanation of categories of insurance, calculating insurance rates
23	Automobile Costs 3	Maintenance costs associated with automobiles, calculating miles per gallon, comparison of repair versus replacement
24	Review 4	Review of automobile costs
25	Travel	Using a map to determine mileage; calculating time and gas usage for trips; calculating and planning trip costs
26	Stocks and Bonds	Investing money into stocks and bonds, identification of terms associated with investments of all types, deferring taxes, capital gains
27	Math on the Job	Identification of skills associated with various careers; income potential for various careers; completing a resume; the interview process
28	Probability	Definition and examples of probability; making predictions based on data gathered from statistics; ratios
29	Formulas and Measurement	Real world applications of formulas for distance and area; standard vs. metric measurement and conversion between them
30	Review 5	Review of travel, investments, economics, and testing
31	Comprehensive Exam	Comprehensive exam covering course content

A+LS MATHEMATICS CURRICULUM

TRIGONOMETRY
GRADE LEVELS 11 & 12

#	LESSON	LESSON CONTENT
1	Angles	Angles, angle terminology, radians, reference angles
2	Sine Cosine and Tangent	The unit circle, finding values from endpoint, definition of sine, cosine, and tangent
3	Values of Sin Cos and Tan	Values of sine, cosine, and tangent of various angles, using the calculator to find values
4	Reciprocal Functions	Definition and value of secant, cosecant, and cotangent
5	The Pythagorean Theorem	The Pythagorean Theorem; calculating sides of right triangles
6	Review 1	
7	Inverse Functions	Definition and value of inverse trig functions
8	Solving Right Triangles	Using trig functions and the Pythagorean Theorem to solve right triangles
9	Trigonometry Applications	Using trig to solve real world problems
10	Law of Sines 1	Definition of law of sines and applications
11	Law of Sines 2	Further application of the Law of Sines; determining the number of triangles, and solving triangles
12	Law of Cosines	Definition of law of cosines and solving triangles
13	Solving Triangles	Using trig functions and the Laws of Sines and Cosines to solve triangles
14	Triangle Applications	Solving triangles in word problems
15	Areas of Triangles	Formulas for area of triangles
16	Review 2	
17	Trigonometric Identities	Definition of identity, reciprocal identities, quotient identities, Pythagorean identities, symmetry identities
18	Verifying Trig Identities	Verifying trigonometric identities and manipulating identities for verification
19	Sum Difference Identities	Sum and difference for sine, cosine, and tangent; using cofunction identities
20	Graphing Trig Functions 1	Graphs of sine, cosine, tangent and reciprocal functions; finding values using graphs
21	Graphing Trig Functions 2	Analyzing amplitude, period, and phase shift; graphing functions and compound functions
22	Graphing Trig Functions 3	Graphs of inverse functions; finding values using graphs
23	Review 3	
24	Double - and Half-Angles	Double-angle and half-angle identities
25	Solving Trig Equations	Solving equations involving trig functions; principal values, solving for principal and all values
26	Central Angle Application	Applications of central angles; arclength, linear and angular velocity, area of circular sectors
27	Simple Harmonic Motion	Writing equations for simple harmonic motion; using equations for information; frequency
28	Review 4	
29	Comprehensive Exam	Comprehensive exam of course content

TEACHER'S LESSON PLANNER

CLASS _____   DATE: _____

STUDENT: _____   PAGE: _____

SUBJECT	LESSON #	LESSON TITLE	LESSON CONTENT

TEACHER'S LESSON PLANNER, continued

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SUBJECT	LESSON #	LESSON TITLE	LESSON CONTENT

TEACHER'S LESSON PLANNER, continued

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