



## MATHConnections Correlation to the Arkansas Mathematics Curriculum Framework

<b>Correlation Key:</b> "X" Coverage = Secondary concept of the activity or problem. Students gain a basic understanding or introduction of the concept.	<b>MATH Connections 1A</b>				<b>MATH Connections 1B</b>				<b>MATH Connections 2A</b>			<b>MATH Connections 2B</b>			<b>MATH Connections 3A</b>				<b>MATH Connections 3B</b>			
<b>"XX"</b> In-depth coverage = Primary concept that is the focus of the activity or problem. Students gain thorough understanding of the concept.	Chapter 1	Chapter 2	Chapter 3	Chapter 4	Chapter 5	Chapter 6	Chapter 7	Chapter 8	Chapter 1	Chapter 2	Chapter 3	Chapter 4	Chapter 5	Chapter 6	Chapter 1	Chapter 2	Chapter 3	Chapter 4	Chapter 5	Chapter 6	Chapter 7	Chapter 8

**ALGEBRA I**

These are the SLEs that must be mastered in Algebra I. Other algebraic properties should be taught to adequately prepare students for Geometry and Algebra II. Students should be able to describe and translate among graphic, algebraic, numeric, tabular, and verbal representations of relations and use those representations to solve problems. The process of collecting and analyzing data should be embedded throughout this course. Appropriate technology and manipulatives should be used regularly for instruction and assessment. Students should be able to judge the meaning, utility, and reasonableness of the results of symbol manipulations, including those carried out by technology.

**Content Standard 1. Students will develop the language of algebra including specialized vocabulary, symbols, and operations.**

Evaluate algebraic expressions, including radicals, by applying the order of operations		XX	X	X	X	XX				XX	X	X	X	XX	XX	XX	XX	X		XX	X	XX	
Translate word phrases and sentences into expressions, equations, and inequalities, and vice versa		XX	XX	X	XX	XX			XX	X	X	XX	XX	XX	XX	XX	XX	X	XX	XX	XX		
Apply the laws of (integral) exponents		XX			X											XX							
Solve problems involving scientific notation		XX						X															
Perform polynomial operations (addition, subtraction, multiplication) with and without manipulatives		X							XX							XX	X						
Simplify algebraic fractions by factoring																							
Recognize when an expression is undefined		X	X																				X
Simplify radical expressions such as $\frac{3}{\sqrt{7}}$																X							
Add, subtract, and multiply simple radical expressions like $3\sqrt{20} + 7\sqrt{5}$ and $4\sqrt{5} * 2\sqrt{3}$																							X

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<b>Content Standard 2. Students will write, with and without appropriate technology equivalent forms of equations, inequalities, and systems of equations and solve with fluency.</b>																								
Solve multi-step equations and inequalities with rational coefficients • numerically (from a table or guess and check) • algebraically (including the use of manipulatives) • graphically • technologically		XX	XX	X	XX	XX				XX	X	X	X	XX	XX	XX	XX	XX	XX	X		XX	XX	X
Solve systems of two linear equations • numerically (from a table or guess and check) • algebraically (including the use of manipulatives) • graphically • technologically		X	X		XX									XX								XX		
Solve linear formulas and literal equations for a specified variable (Ex. Solve for p in $l = prt$ .)			X		XX	XX			X	X									X			XX		
Solve and graph simple absolute value equations and inequalities Ex. $ x  = 5$ , $ x  \leq 5$ , $ x  > 5$																			X					
Solve real world problems that involve a combination of rates, proportions and percents		XX	XX	X	X	X		XX	XX	XX	XX			X	X	X	X	X	X	X	X			
Solve problems involving direct variation and indirect (inverse) variation to model rates of change									XX	XX														
Use coordinate geometry to represent and/or solve problems (midpoint, length of a line segment, and Pythagorean Theorem)									XX	XX	X	XX	XX	X	X									
Communicate real world problems graphically, algebraically, numerically and verbally	X	XX	XX	XX	XX	XX	X	X	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	X	X

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<b>Content Standard 3. Students will analyze functions by investigating rates of change, intercepts, and zeros.</b>																							
Distinguish between functions and non-functions/relations by inspecting graphs, ordered pairs, mapping diagrams and/or tables of data		X	X			X														XX	XX	X	
Determine domain and range of a relation from an algebraic expression, graphs, set of ordered pairs, or table of data						XX														XX	XX	XX	
Know and/or use function notation, including evaluating functions for given values in their domain						XX														XX	XX	XX	
Identify independent variables and dependent variables in various representational modes: words, symbols, and/or graphs		XX	XX	X	X	X														XX	X	X	
Interpret the rate of change/slope and intercepts within the context of everyday life (Ex. telephone charges based on base rate (y-intercept) plus rate per minute (slope))		XX	XX	XX	XX	XX				XX	XX									XX	XX	XX	
Calculate the slope given • two points • the graph of a line • the equation of a line			XX	XX	X	XX				X	X									XX			X
Determine by using slope whether a pair of lines are parallel, perpendicular, or neither			XX										XX										
Write an equation in slope-intercept form given • two points • a point and y-intercept • x-intercept and y-intercept • a point and slope • a table of data • the graph of a line			XX	X	X	XX				X	X			XX	XX	XX					XX		
Describe the effects of parameter changes, slope and/or y-intercept, on graphs of linear functions and vice versa			XX			XX									XX	X							

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<b>Content Standard 4. Students will compare the properties in the family of functions.</b>																						
Factoring polynomials • greatest common factor • binomials (difference of squares) • trinomials									X						X							
Determine minimum, maximum, vertex, and zeros, given the graph															XX							
Solve quadratic equations using the appropriate methods with and without technology • factoring • quadratic formula with real number solutions									X						XX							
Recognize function families and their connections including vertical shift and reflection over the x-axis • quadratics • absolute value • exponential functions			XX			XX									XX	XX						
Communicate real world problems graphically, algebraically, numerically and verbally	X	XX	XX	XX	XX	XX	XX	X	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
<b>Content Standard 5. Students will compare various methods of reporting data to make inferences or predictions.</b>																						
Construct and use scatter plots and line of best fit to make inferences in real life situations				XX	XX							X				X						
Use simple matrices in addition, subtraction, and scalar multiplication														XX								
Construct simple matrices for real life situations														XX								
Determine the effects of changes in the data set on the measures of central tendency	XX																					
Use two or more box-and-whisker plots to compare data sets	XX																					
Construct and interpret a cumulative frequency histogram in real life situations																		X				
Recognize linear functions and non-linear functions by using a table or a graph		X	XX	XX	X	XX									XX	XX						
Compute simple probability with and without replacement								XX										XX				
Recognize patterns using explicitly defined and recursively defined linear functions		XX	X	X		XX									XX						XX	
Communicate real world problems graphically, algebraically, numerically and verbally	X	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

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<b>GEOMETRY</b>																							
This course will help students develop communication skills, enhance reasoning, and make connections within mathematics to other disciplines and the real world. Students will use physical models and appropriate technology to investigate geometric concepts in problem solving situations. In this course, students are engaged in problematic situations in which they form conjectures, determine the validity of these conjectures, and defend their conclusions to classmates.																							
<b>Content Standard 1. Students will develop the language of geometry including specialized vocabulary, reasoning, and application of theorems, properties, and postulates.</b>																							
Define, compare and contrast inductive reasoning and deductive reasoning for making predictions based on real world situations • venn diagrams • matrix logic • conditional statements (statement, inverse, converse, and contrapositive)							XX		X	X		XX	XX								XX	XX	XX
Represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays, and angles									XX	XX		XX	XX	XX							X		XX
Describe relationships derived from geometric figures or figural patterns									XX	XX		XX	XX								X		XX
Apply, with and without appropriate technology, definitions, theorems, properties, and postulates related to such topics as complementary, supplementary, vertical angles, linear pairs, and angles formed by perpendicular lines										XX	X	X	X								X		XX
Explore, with and without appropriate technology, the relationship between angles formed by two lines cut by a transversal to justify when lines are parallel										XX													X
Give justification for conclusions reached by deductive reasoning										XX		XX	XX								XX		XX

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<b><u>Content Standard 2. Students will identify and describe types of triangles and their special segments. They will use logic to apply the properties of congruence, similarity, and inequalities. The students will apply the Pythagorean Theorem and trigonometric ratios to solve problems in real world situations.</u></b>																							
Apply congruence (SSS ...) and similarity (AA ...) correspondences and properties of figures to find missing parts of geometric figures and provide logical justification										XX	X												
Investigate the measures of segments to determine the existence of triangles (triangle inequality theorem)									XX	XX	X												
Identify and use the special segments of triangles (altitude, median, angle bisector, perpendicular bisector, and midsegment) to solve problems									X	XX	X	X											
Apply the Pythagorean Theorem and its converse in solving practical problems									XX	X	X	X	XX										
Use the special right triangle relationships (30°-60°-90° and 45°-45°-90°) to solve problems										X	X	X					X						
Use trigonometric ratios (sine, cosine, tangent) to determine lengths of sides and measures of angles in right triangles including angles of elevation and angles of depression										X	XX	X	X				X						
<b><u>Content Standard 3. Students will measure and compare, while using appropriate formulas, tools, and technology to solve problems dealing with length, perimeter, area and volume.</u></b>																							
Calculate probabilities arising in geometric contexts (Ex. Find the probability of hitting a particular ring on a dartboard.)								X															
Apply, using appropriate units, appropriate formulas (area, perimeter, surface area, volume) to solve application problems involving polygons, prisms, pyramids, cones, cylinders, spheres as well as composite figures, expressing solutions in both exact and approximate forms						X			XX	XX	X	XX	XX		X							XX	
Relate changes in the measurement of one attribute of an object to changes in other attributes (Ex. How does changing the radius or height of a cylinder affect its surface area or volume?)									XX	XX			XX										
Use (given similar geometric objects) proportional reasoning to solve practical problems (including scale drawings)									X	XX	X	X	X										
Use properties of parallel lines and proportional reasoning to find the lengths of segments										XX													

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<b>Content Standard 4. Students will analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships.</b>																						
Explore and verify the properties of quadrilaterals										XX	X										X	
Solve problems using properties of polygons: • sum of the measures of the interior angles of a polygon • interior and exterior angle measure of a regular polygon or irregular polygon • number of sides or angles of a polygon										X	XX											
Identify and explain why figures tessellate										X	X											
Identify the attributes of the five Platonic Solids													X									
Investigate and use the properties of angles (central and inscribed) arcs, chords, tangents, and secants to solve problems involving circles													XX									
Solve problems using inscribed and circumscribed figures										X	X		X									
Use orthographic drawings ( top, front, side) and isometric drawings (corner) to represent three-dimensional objects													XX									
Draw, examine, and classify cross-sections of three-dimensional objects													XX									
<b>Content Standard 5. Students will specify locations, apply transformations and describe relationships using coordinate geometry.</b>																						
Use coordinate geometry to find the distance between two points, the midpoint of a segment, and the slopes of parallel, perpendicular, horizontal, and vertical lines			XX	X	X	X				XX	X	X		XX								
Write equations of lines in slope-intercept form and use slope to determine parallel and perpendicular lines			XX	X	X	X					X			X	XX						X	
Determine, given a set of points, the type of figure based on its properties (parallelogram, isosceles triangle, trapezoid)										X	XX	X										
Write, in standard form, the equation of a circle given a graph on a coordinate plane or the center and radius of a circle													XX									
Draw and interpret the results of transformations and successive transformations on figures in the coordinate plane • translations • reflections • rotations (90°, 180°, clockwise and counterclockwise about the origin) • dilations (scale factor)											XX		XX									

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<b>ALGEBRA II</b>																							
Algebra II is designed for students who have successfully completed Algebra I (or its equivalent). Algebra II will build on the basic concepts presented in Algebra I to encourage higher order thinking. Algebra II students will represent and analyze mathematical situations. The students will analyze and apply a variety of methods to model and graph linear and nonlinear equations and inequalities. Students will also use algebraic, graphical, and numerical methods for analysis of quadratic equations and functions and polynomials and rational functions. Exponential functions, logarithmic functions, data analysis, and probability will be explored in Algebra II. Arkansas teachers are responsible for integrating appropriate																							
<b>CONTENT STANDARD 1. Students will represent and analyze mathematical situations and properties using patterns, relations, functions and algebraic symbols.</b>																							
Determine, with or without technology, the domain and range of a relation defined by a graph, a table of values, or a symbolic equation including those with restricted domains and whether a relation is a function						XX										XX	XX	XX	X				
Evaluate, add, subtract, multiply, divide and compose functions and give appropriate domain and range restrictions						XX										XX							
Determine the inverse of a function (Graph, with and without appropriate technology, functions and their inverses)																XX	XX	XX					
Analyze and report, with and without appropriate technology, the effect of changing coefficients, exponents, and other parameters on functions and their graphs (linear, quadratic, and higher degree polynomial)			XX													XX	XX						
Determine, with and without appropriate technology, whether a function is even, odd or neither to analyze the behavior of a graph																							
Graph, with and without appropriate technology, functions defined as piece-wise and step						XX																	
Apply the concepts of functions to real world situations						XX										XX	XX	XX	X	X			

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<b>CONTENT STANDARD 2. Students will analyze and apply various methods to model, graph and solve linear and absolute value equations and inequalities.</b>																							
Translate linear equations from one form (slope-intercept, point-slope, and standard) to another			XX	X	XX	XX														XX			XX
Develop, write, and graph, with and without appropriate technology, equations of lines in slope-intercept, point-slope, and standard forms given <ul style="list-style-type: none"> <li>a point and the slope</li> <li>two points</li> <li>real world data</li> </ul>			XX	XX	XX	XX				X	X			XX	X							X	
Develop, write and graph (given the point and the slope, two points, or a point and a line) equations of <ul style="list-style-type: none"> <li>a parallel line</li> <li>a perpendicular line</li> <li>a perpendicular bisector of a segment</li> </ul>			X							X												X	
Solve, with and without appropriate technology, absolute value equations and inequalities written in one or two variables, and graph solutions															X								
Solve, with and without appropriate technology, systems of linear equations and systems of linear inequalities with two or more variables through the use of graphs, tables, matrices, and other algebraic methods		X	X		XX															XX			XX
Develop and apply, with and without appropriate technology, the basic operations and properties of matrices (associative, commutative, identity, and inverse)																				XX			
Apply, with or without technology, the concepts of linear and absolute value equations and inequalities and systems of linear equations and inequalities to model real world situations including linear programming		X	X	X	XX	X														XX			XX

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<b>CONTENT STANDARD 3: Students will use algebraic, graphical, and numerical methods to analyze, compare, translate, and solve quadratic equations.</b>																							
Perform computations with radicals <ul style="list-style-type: none"> <li>simplify radicals with different indices</li> <li>add, subtract, multiply and divide radicals</li> <li>rationalize denominators</li> <li>solve equations that contain radicals or radical expressions</li> </ul>					X											X							
Extend the number system to include the complex numbers <ul style="list-style-type: none"> <li>evaluate powers of <math>i</math></li> <li>add, subtract, multiply, and divide complex numbers</li> <li>rationalize denominators</li> </ul>																							
Solve quadratic equations with and without appropriate technology by <ul style="list-style-type: none"> <li>extracting the square root</li> <li>graphing</li> <li>factoring</li> <li>completing the square</li> <li>using the quadratic formula</li> </ul>									X								XX						
Develop and analyze, with and without appropriate technology, quadratic relations <ul style="list-style-type: none"> <li>graph a parabolic relationship when given its equation</li> <li>write an equation when given its roots (zeros or solutions) or graph</li> <li>determine the nature of the solutions graphically and by evaluating the discriminant</li> <li>determine the maximum or minimum values and the axis of symmetry both graphically and algebraically</li> </ul>																	XX						
Apply the concepts of quadratic equations and functions to model real world situations by using appropriate technology when needed																	XX						

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<b>CONTENT STANDARD 4: Students will use algebraic, graphical, and numerical methods to analyze, compare, translate, and solve polynomial and rational equations.</b>																							
Determine the factors of polynomials by <ul style="list-style-type: none"> <li>using factoring techniques including grouping and the sum or difference of two cubes</li> <li>using long division</li> <li>using synthetic division</li> </ul>																							
Develop and analyze, with and without appropriate technology, polynomial functions from their roots, graphs, or equations <ul style="list-style-type: none"> <li>write an equation when given its factors or roots (zeros or solutions)</li> <li>determine the x- and y- intercepts</li> <li>describe the end behaviors</li> <li>sketch the graph</li> </ul>																							
Solve, with and without appropriate technology, polynomial equations, including real world situations, graphically, numerically (using tables), and algebraically																							
Simplify, add, subtract, multiply, and divide with rational expressions																							
Graph, with and without appropriate technology, rational functions of the form $y = 1/x$ and $y = 1/x^2$ and their transformations and identify x- and y- intercepts, domain restrictions, and vertical asymptotes																							
Solve, with and without appropriate technology, problems using rational equations, including proportions, rate, and variation (direct, inverse(indirect), or joint) and real world problems																							
Establish the relationship between radical expressions and expressions containing rational exponents																							
Simplify variable expressions containing rational exponents using the laws of exponents		XX																					

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<b>CONTENT STANDARD 5. Students will graph exponential functions and relate them to logarithms. They will solve real world problems using exponential functions.</b>																							
Interpret and graph, with and without appropriate technology, exponential functions																XX							
Solve, with and without appropriate technology, exponential equations, including real world problems																XX							
Establish the relationship between exponential and logarithmic functions																XX							
Evaluate simple logarithms using the definition (Ex. $\log_3 81$ )																XX							
<b>CONTENT STANDARD 6. Students will evaluate and interpret data, make predictions based on data, and apply basic understanding of probability to solve real world problems.</b>																							
Interpret and evaluate, with and without appropriate technology, graphical and tabular data displays for <ul style="list-style-type: none"> <li>consistency with the data</li> <li>appropriateness of type of graph or data display</li> <li>scale</li> <li>overall message</li> </ul>	XX			XX															XX				
Calculate, with and without appropriate technology, probabilities of events using the laws of probability <ul style="list-style-type: none"> <li>apply the Fundamental Counting Principle</li> <li>distinguish between and use permutations and combinations</li> <li>calculate conditional probability</li> <li>calculate probabilities of mutually exclusive events, independent events, and dependent events</li> </ul>							XX	X											XX				