

2019 – 2020

<b>Math Practices</b>	<b>Online Resources</b>
<p>The Oklahoma Academic Standards for Mathematics are developed around four main content strands, <u>Algebraic Reasoning and Algebra</u>, <u>Number and Operations</u>, <u>Geometry and Measurement</u>, and <u>Data and Probability</u> organize the content standards throughout PK-7 and Pre-Algebra. The standards for Algebra I, Algebra II, and Geometry are fundamentally organized around these strands as well. The process standards are defined as the Mathematical Actions and Processes and are comprised of the skills and abilities students should develop and be engaged in throughout their PK-12 mathematics education. Among these are the ability to problem solve, communicate, and reason about mathematics which will help students be ready for the mathematics expectations of college and the skills desired by many employers. While the process and content standards work in concert to create clear, concise, and rigorous mathematics standards and expectations for Oklahoma students with the aim of helping them be college and career ready, it is not intended that each mathematical action and process will be utilized or developed with each standard. Certainly some standards and objectives can be achieved more readily with particular mathematics actions and processes.</p>	<p><b>DAN MEYER’S TED TALK ABOUT TEACHING MATH :</b> <a href="https://youtu.be/qocAoN4jNwc">https://youtu.be/qocAoN4jNwc</a></p> <p>KHAN ACADEMY ONLINE LESSONS  <a href="HTTPS://WWW.KHANACADEMY.ORG/MATH/ALGEBRA">HTTPS://WWW.KHANACADEMY.ORG/MATH/ALGEBRA</a></p> <p><b>ONLINE TEXTBOOK:</b>  <a href="https://bim.easyaccessmaterials.com/index.php?location_user=ok">https://bim.easyaccessmaterials.com/index.php?location_user=ok</a></p> <p>Oklahoma Academic Vocabulary:  <a href="http://sde.ok.gov/sde/building-academic-vocabulary#Math">http://sde.ok.gov/sde/building-academic-vocabulary#Math</a></p>
<p><b>For more:</b>  Elaboration on each practice from the Oklahoma State Education website: <a href="http://sde.ok.gov/sde/sites/ok.gov.sde/files/OAS-Math-Final%20Version_3.pdf">http://sde.ok.gov/sde/sites/ok.gov.sde/files/OAS-Math-Final%20Version_3.pdf</a></p>	<p><b>Other online resources</b></p> <p>Online Scientific Calculator  <a href="https://web2.0calc.com/">https://web2.0calc.com/</a></p>
<p><b>PLEASE NOTE:</b> This course is designed for Freshmen who need Algebra 1 to graduate. It is assumed that students will take the initiative to refresh Pre-Algebra skills.</p>	

# 1<sup>st</sup> Nine Weeks: 40 Days

## Number concepts/ Pre-Algebra Review

Standards		Text	Days
Mathematics College & Career Readiness Standards (ACT)	Oklahoma Academic Standards		
<p>N.401 Exhibit knowledge of elementary number concepts such as rounding, the ordering of decimals, pattern identification, primes, and greatest common factor</p> <p>N. 402 Write positive powers of 10 by using exponents</p> <p>N. 403 Comprehend the concept of length on the number line</p> <p>AF. 402 Perform straightforward word-to-symbol translations</p> <p>N. 501 Order fractions</p> <p>N. 502 Find and use the least common multiple</p> <p>N. 503 Work with numerical factors</p> <p>A. 511 Work with scientific notation</p> <p>AF. 502 Build functions and write expressions, equations, or inequalities with a single variable for common pre-algebra settings (e.g., rate and distance problems and problems that can be solved by using proportions)</p> <p>AF. 601 Solve word problems containing several rates, proportions, or percentages.</p> <p>G. 404 Find the length of the hypotenuse of a right triangle when only very simple computation is involved</p> <p>G. 405 Use geometric formulas when all necessary information is given</p> <p>G. 406 Locate points in the coordinate plane</p> <p>G. 505-507 Compute the perimeter or area of composite geometric figures, triangles, rectangles, or circles after identifying necessary information when one or more additional simple steps are required.</p> <p>N. 701 Analyze and draw conclusions based on number concepts</p> <p>N. 702 Apply properties of rational numbers and the rational number system</p> <p>N. 703 Apply properties of real numbers and the real number system, including properties of irrational numbers</p>	<p>A1.A.4.4 Translate between a graph and a situation described qualitatively.</p> <p>A1.F.3.1 Identify and generate equivalent representations of linear equations, graphs, tables, and real-world situations.</p> <p>A1.A.3.3 Factor common monomial factors from polynomial expressions</p> <p>A1.A.1.1 Use knowledge of solving equations with rational values to represent and solve mathematical and real-world problems and interpret the solutions in the original context</p> <p>A1.F.3.2 Use function notation; evaluate a function, including nonlinear, at a given point in its domain algebraically and graphically. Interpret the results in terms of real-world and mathematical problems.</p>	<p>Pre- Alg</p> <p>Ch. 1</p>	

## Solving Linear Equations and Inequalities and Absolute Value

Standards		Text	Days
Mathematics College & Career Readiness Standards (ACT)	Oklahoma Academic Standards		
<p>N. 404 Understand absolute value in terms of distance</p> <p>AF. 401 solve routine two-step or three-step arithmetic problems involving concepts such as rate and proportion, tax added, percentage off, and estimating by using a given average value in place of actual values</p> <p>AF 402 Perform straightforward word-to-symbol translations</p> <p>A 401 Evaluate algebraic expressions by substituting integers for unknown quantities</p> <p>A. 403 Solve routine first-degree equations</p> <p>A. 405 Match simple inequalities with their graphs on the number line</p> <p>F. 401 Evaluate linear and quadratic functions, expressed in function notation, at integer values</p> <p>G. 403 Compute the area and perimeter of triangles and rectangles in simple problems</p> <p>AF. 501 Solve multistep arithmetic problems that involve planning or converting common derived units of measure.</p> <p>A. 501 Recognize that when numerical quantities are reported in real-world contexts, the numbers are often rounded (e.g., people, money)</p> <p>A. 502 Solve real-world problems by using first-degree equations</p> <p>A. 503 Solve first-degree inequalities with their graphs on the number line</p> <p>A. 504 Match compound inequalities with their graphs on the number line</p> <p>F. 501 Evaluate polynomial functions, expressed in function notation, at integer values</p> <p>N. 602-603 Apply number properties involving even/ odd numbers, factors/ multiples, and positive/ negative numbers.</p> <p>AF. 601 Solve word problems containing several rates, proportions, or percentages.</p> <p>AF. 602 Build functions and write expressions, equations, and inequalities for common algebra settings</p> <p>A. 601 Manipulate expressions and equations</p> <p>A. 602 Solve linear inequalities when the method involves reversing the inequality</p> <p>A. 603 Match linear inequalities with their graphs on the number line</p> <p>A. 606 Solve absolute value equations</p> <p>AF. 701 Solve complex arithmetic problems involving percent of increase or decrease or requiring integration of several concepts</p> <p>A. 701 Solve simple absolute value inequalities</p>	<p>A1.A.1.1 Use knowledge of solving equations with rational values to represent and solve mathematical and real-world problems and interpret the solutions in the original context</p> <p>A1.A.1.2 Solve absolute value equations and interpret the solutions in the original context</p> <p>A1.A.3.1 Solve equations involving several variables for one variable in terms of the others</p> <p>A1. A.3.4 Evaluate linear, absolute value, rational, and radical expressions. Include applying a nonstandard operation such as <math>a \ominus b = 2a + b</math></p> <p>A1.A.2.1 Represent relationships in various contexts with linear inequalities; solve the resulting inequalities, graph on a coordinate plane, and interpret the solutions</p> <p>A1.A.2.2 Represent relationships in various contexts with compound and absolute value inequalities and solve the resulting inequalities by graphing and interpreting the solutions on a number line.</p> <p>A1.A.4.4 Translate between a graph and a situation described qualitatively</p> <p>A1.F.3.1 Identify and generate equivalent representations of linear equations, graphs, tables, and real-world situations.</p> <p>A1.F.3.2 Use function notation; evaluate a function, including nonlinear, at a given point in its domain algebraically and graphically. Interpret the results in terms of real-world and mathematical problems.</p>	<p>Ch. 1</p> <p>Ch. 2</p>	

## Second Nine Weeks- 35 days

### Linear Functions

Standards		Text	Days
Mathematics College & Career Readiness Standards (ACT)	Oklahoma Academic Standards		
<p>AF. 403 Relate a graph to a situation described in terms of a starting value and an additional amount per unit</p> <p>G. 510 Determine the slope of a line from points or a graph</p> <p>AF. 503 Match linear equations with their graphs in the coordinate plane</p> <p>A. Determine when a function is undefined</p> <p>A. 504 Attend to the difference between a function modeling a situation and the reality of the situation</p> <p>F. 505 Understand the concept of a function as having a well-defined output value at each valid input value</p> <p>F. 506 Understand the concept of domain and range in terms of function graphs</p> <p>F. 507 Interpret statements that use function notation in terms of their context</p> <p>F.511 Use function notation for simple functions of two variables</p> <p>G. 510 Determine the slope of a line from points or a graph</p> <p>AF. 603 Interpret and use information from graphs in the coordinate plane</p> <p>AF. 604 Given an equation or function, find an equation or function whose graph is translation by a specified amount up or down</p> <p>F. 601 Relate a graph to a situation described qualitatively in terms of faster change or slower change</p> <p>AF. 703 Analyze and draw conclusions based on properties of algebra and/or functions</p> <p>AF. 704 Analyze and draw conclusions based on information from graphs in the coordinate plane</p> <p>AF. 705 Identify characteristics of graphs based on a set of conditions or on a general equation</p> <p>AF. 706 Given an equation or function, find an equation or function whose graph is translation by a specified amounts in horizontal or vertical directions</p>	<p>A1.A.4.1 Calculate and interpret slope and the x- and y-intercepts of a line using a graph, an equation, two points, or a set of data points to solve real-world and mathematical problems</p> <p>A1.F.1.1 Distinguish between relations and functions</p> <p>A1.F.1.2 Identify the dependents and independent variables as well as the domain and range given a function, equation or graph. Identify restrictions on the domain and range in real-world contexts.</p> <p>A1.F.1.4 Given a graph modeling a real- world situation, read and interpret the linear piecewise function (excluding step functions)</p> <p>A1.F.2.1 Distinguish between linear and nonlinear (including exponential) functions arising from real-world and mathematical situations that are represented in tables, graphs, and equations. Understand that linear functions grow by equal intervals and that exponential functions grow by equal factors over equal intervals</p> <p>A1.F.2.2 Recognize the graph of functions <math>f(x) = x</math> and <math>f(x) =  x </math> and predict the effects of transformations [<math>f(x + c)</math> and <math>f(x) + c</math>, where <math>c</math> is a real number] algebraically and graphically using various methods and tools.</p>	Ch. 3	

## Writing Linear Functions

Standards		Text	Days
Mathematics College & Career Readiness Standards (ACT)	Oklahoma Academic Standards		
<p>AF. 402 Perform straightforward word-to-symbol translations</p> <p>AF. 403 Relate a graph to a situation described in terms of a starting value and an additional amount per unit</p> <p>AF. 502 Build functions and write expressions, equations, or inequalities with a single variable for common pre-algebra settings</p> <p>AF. 503 Match linear equations with their graphs in the coordinate plane</p> <p>A. 514 Determine the slope of a line from an equation</p> <p>F.503 Build functions and use quantitative information to identify graphs for relations that are proportional or linear</p> <p>AF. 602 Build functions and write expressions, equations, and inequalities for common algebra settings</p> <p>F. 602 Build functions for relations that are inversely proportional</p> <p>G. 606 Use properties of parallel and perpendicular lines to determine an equation of a line or coordinates of a point</p> <p>AF. 702 Build functions and write expressions, equations, and inequalities when the process requires planning and/ or strategic manipulation</p> <p>AF. 703 Analyze and draw conclusions based on properties of algebra and/or functions</p> <p>AF. 704 Analyze and draw conclusions based on information from graphs in the coordinate plane</p> <p>F. 701 Compare actual values and the values of modeling function to judge model fit and compare models</p> <p>F. 502 Find the next term in a sequence described recursively</p> <p>F. 603 Find a recursive expression for the general term in a sequence described reclusively</p>	<p>A1.A.2.1 Represent relationships in various contexts with linear inequalities; solve the resulting inequalities, graph on a coordinate plane, and interpret the solutions</p> <p>A1.A.4.2 Solve mathematical and real-world problems involving lines that are parallel, perpendicular, horizontal, or vertical</p> <p>A1.A.4.3 Express linear equations in slope-intercept, point-slope, and standard forms and convert between these forms. Given sufficient information, write the equation of a line.</p> <p>A1.A.4.4 translate between a graph and a situation described qualitatively</p> <p>A1.F.1.3 Write linear functions, using function notation, to model real-world and mathematical situations.</p> <p>A1.F.3.1 Identify and generate equivalent representations of linear equations, graphs, tables, and real-world situations</p> <p>A1.A.3.5 Recognize that arithmetic sequences are linear using equations, tables, graphs, and verbal descriptions. Use the pattern, find the next term.</p>	Ch. 4	

## Third Nine Weeks: 45 Days

### Semester 1 Review

Standards		Text	Days
Utilize the first 2 weeks of Semester 2 to analyze, reteach, or strengthen any standards from IA 1 and IA 2 that need improvement.		Ch. 1-4	

### System of Linear Equations

Standards		Text	Days
Mathematics College & Career Readiness Standards (ACT)	Oklahoma Academic Standards		
A. 604 Solve systems of two linear equations	<p>A1.1.3 Analyze and solve real-world and mathematical problems involving systems of linear equations with a maximum of two variables by graphing, substitution, and/ or elimination. Interpret the solutions in the original context</p> <p>A1.A.2.3 Solve systems of linear inequalities with a maximum of two variables, graph and interpret the solutions on a coordinate plane.</p> <p>A1.A.4.2 Solve mathematical and real-world problems involving lines that are parallel, perpendicular, horizontal, or vertical</p>	Ch. 5	

## Radical Functions and Rational Exponents

Standards		Text	Days
Mathematics College & Career Readiness Standards (ACT)	Oklahoma Academic Standards		
<p>N. Exhibit some knowledge of the complex numbers</p> <p>A. 509 Work with squares and square roots</p> <p>A. 510 Work with cubes and cube roots of number</p> <p>N. 601 Apply number properties involving prime factorization</p> <p>N. 604 Apply the facts that <math>\pi</math> is irrational and that the square root of an integer is rational only if that integer is a perfect square</p> <p>N. 605 Apply properties of rational exponents</p> <p>G. 605 Use the distance formula</p> <p>F. 702 Build functions for relations that are exponential</p> <p> </p> <p>*Geometric Sequences*</p> <p>F. 502 Find the next term in a sequence described recursively</p> <p>F. 603 Find a recursive expression for the general term in a sequence described recursively</p> <p>F. 703 Exhibit knowledge of geometric sequences</p>	<p>A1. N.1.1 Write square roots and cube roots of monomial algebraic expressions in simplest radical form</p> <p>A1.N.1.2 Add, subtract, multiply and simplify square roots of monomial algebraic expressions and divide square roots of whole numbers, rationalizing the denominator when necessary</p> <p>A1. A.3.4 Evaluate linear, absolute value, rational, and radical expressions. Include applying a nonstandard operation such as <math>a \odot b = 2a + b</math></p> <p>A1.A.3.6 Recognize that geometric sequences are exponential using equations, tables, graphs and verbal descriptions. Given the formula <math>f(x) = a(r)^x</math>, find the next term and define the meaning of <math>a</math> and <math>r</math> within the context of the problem</p> <p>A1.F.1.2 Identify the dependents and independent variables as well as the domain and range given a function, equation or graph. Identify restrictions on the domain and range in real-world contexts.</p> <p>A1.F.2.1 Distinguish between linear and nonlinear (including exponential) functions arising from real-world and mathematical situations that are represented in tables, graphs, and equations. Understand that linear functions grow by equal intervals and that exponential functions grow by equal factors over equal intervals</p> <p>A1.F.3.2 Use function notation; evaluate a function, including nonlinear, at a given point in its domain algebraically and graphically. Interpret the results in terms of real-world and mathematical problems.</p>	Ch. 6	

# Fourth Nine Weeks: 40 Days

## Polynomial Functions

Standards		Text	Days
Mathematics College & Career Readiness Standards (ACT)	Oklahoma Academic Standards		
<p>A. 402 Add and subtract simple algebraic expressions</p> <p>A. 404 Multiply two binomials</p> <p>A. 505 Add, subtract, and multiply polynomials</p> <p>A. 510 Work with cubes of numbers</p> <p>F. 501 Evaluate polynomial functions, expressed in function notation, at integer values</p> <p>F. 506 Understand the concept of domain and range in terms of valid input and output, and in terms of function graphs</p> <p>F. 508 Find the domain of polynomial and rational functions</p> <p>F. 509 Find the range of polynomial functions</p> <p>F. 604 Evaluate composite functions at integer values</p> <p>G. 607 Find the coordinates of a point reflected across a vertical, horizontal, or linear identity function</p> <p>F. 708 Write an expression for the composite of two simple functions</p>	<p>A1.A.3.2 Simplify polynomial expressions by adding, subtracting, or multiplying</p> <p>A1.A.3.3 Factor common monomial factors from polynomial expressions and factor quadratic expressions with a leading coefficient of 1</p> <p>A1.F.1.1 Distinguish between relations and functions</p> <p>A1.F.1.2 Identify the dependents and independent variables as well as the domain and range given a function, equation or graph. Identify restrictions on the domain and range in real-world contexts.</p> <p>A1.F.2.1 Distinguish between linear and nonlinear (including exponential) functions arising from real-world and mathematical situations that are represented in tables, graphs, and equations. Understand that linear functions grow by equal intervals and that exponential functions grow by equal factors over equal intervals</p> <p>A1.F.2.2 Recognize the graph of functions <math>f(x) = x</math> and <math>f(x) =  x </math> and predict the effects of transformations <math>[f(x + c)</math> and <math>f(x) + c</math>, where <math>c</math> is a real number] algebraically and graphically using various methods and tools.</p> <p>A1.F.3.2 Use function notation; evaluate a function, including nonlinear, at a given point in its domain algebraically and graphically. Interpret the results in terms of real-world and mathematical problems.</p> <p>A1.F.3.3 Add, subtract, and multiply functions using function notation</p>	Ch. 7	

## Quadratic Functions and Equations \*use factored form, graphs, and quadratic formula to solve\*

Standards		Text	Days
Mathematics College & Career Readiness Standards (ACT)	Oklahoma Academic Standards		
<p>F. 401 Evaluate quadratic functions, expressed in function notation, at integer values</p> <p>N. 504 Exhibit some knowledge of the complex numbers</p> <p>A. 506 Identify solutions to simple quadratic equations</p> <p>A. 507 Solve quadratic equations in the form <math>(x + a)(x + b) = 0</math>, where <math>a</math> and <math>b</math> are numbers or variables.</p> <p>A. 508 Factor simple quadratics</p> <p>A. 605 Solve quadratic equations</p>	<p>A1.A.1.1 Use knowledge of solving equations with rational values to represent and solve mathematical and real-world problems and interpret the solutions in the original context</p> <p>A1.A.3.3 Factor common monomial factors from polynomial expressions and factor quadratic expressions with a leading coefficient of 1</p>	<p>Ch. 1</p> <p>Ch. 7</p>	

## Data Analysis and Probability

Standards		Text	Days
Mathematics College & Career Readiness Standards (ACT)	Oklahoma Academic Standards		
<p>S. 401 Calculate the missing data value given the average and all data values by one</p> <p>S. 402 Translate from one representation of data to another (e.g., bar graph to a circle graph; scatterplot to polynomial)</p> <p>S. 403 Determine the probability of a simple event</p> <p>S. 404 Describe events as combinations of other events (e.g., using <i>and</i>, <i>or</i>, and <i>not</i>)</p> <p>S.405 Exhibit knowledge of simple counting techniques</p> <p>F. 504 Attend to the difference between a function modeling a situation and the reality of the situation</p> <p>S. 501 Calculate the average given the frequency counts of all the data values</p> <p>S. 502 Manipulate data from tables and charts</p> <p>S. 503 Compute straightforward probabilities for common situations</p> <p>S. 504 Use Venn diagrams in counting</p> <p>S. 505 recognize that when data summaries are reported in the real world, results are often rounded and must be interpreted as having appropriate precision</p> <p>S. 602 interpret and use information from tables and charts, including two-way frequency tables</p> <p>S. 603 Apply counting techniques</p> <p>S. 604 Compute a probability when the event and/or sample space are not given or obvious</p> <p>S. 605 Recognize the concepts of conditional and joint probability expressed in real-world contexts</p> <p>S. 606 Recognize the concept of independence expressed in real-world contexts</p> <p>F. 701 Compare actual values and the values of a modeling function to judge model fit and compare models.</p> <p>S. 701 Distinguish between mean, median, and mode for a list of numbers</p> <p>S. 702 Analyze and draw conclusions based on information from tables and charts, including two-way frequency tables</p> <p>S. 704 Exhibit knowledge of conditional and joint probability</p>	<p>A1.D.1.1 Describe a data set using displays, describe and compare data sets using summary statistics, including measures of central tendency, location, and spread. Know how to use calculators, spreadsheets, or other appropriate technology to display data and calculate summary statistics.</p> <p>A1.D.1.2 Collect data and use scatterplots to analyze patterns and describe linear relationships between two variables. Using graphing technology determine regression lines and correlation coefficients; use regression lines to make predictions and correlation coefficients to assess the reliability of those predictions</p> <p>A1.D.1.3 Interpret graphs as being discrete or continuous</p> <p>A1.D.2.1 Select and apply counting procedures, such as the multiplication and addition principles and tree diagrams, to determine the size of a sample space (the number of possible outcomes) and to calculate probabilities</p> <p>A1.D.2.2 Describe the concepts of intersections, unions, and complements using Venn diagrams to evaluate probabilities. Understand the relationships between these concepts and the words <i>and</i>, <i>or</i>, and <i>not</i></p> <p>A1.D.2.3 Calculate experimental probabilities by performing simulations or experiments involving a probability model and using relative frequencies of outcomes.</p> <p>A1.D.2.4 Apply probability concepts to real-world situations to make informed decisions</p>	<p>Ch. 8</p> <p>Ch. 9</p>	