

Learning Plan Document for Course Description and WINGS

Grade Level	High School
Class Title	Algebra 1 (First Year Algebra)
Subject	Math
Class Description	<p>This course will introduce students to the fundamentals of algebra. Algebra 1 is a full-year class that will include a study of operations on signed numbers, linear equations and inequalities, properties of polynomials, graphing linear equations and inequalities, and an introduction to absolute value. The second half of the course involves solving systems of equations, polynomials in more than one variable, radicals and radical expressions, rational algebraic expressions, and a brief introduction to quadratic equations. The foundations of algebra and its relationship to geometry will also be explored. An introduction to various principles of probability will be studied as well.</p> <p>This class meets the graduation requirement for the State of Washington and Kennewick School District and meets at least one Common Core Standard. This course is a yearlong course. Students who successfully complete the course have the potential to earn 1.0 credit.</p> <p>The estimated instructional hours for this class are ___ per week.</p>
Learning Materials	List off site materials
Learning Goals/Performance Objectives	<p>The content is based on the National Curriculum area of Mathematics: Teachers Association and is aligned to state standards.</p> <p>A1.1. Core Content: Solving Problems (Algebra)</p> <p>Students learn to solve many new types of problems in Algebra 1, and this first core content area highlights the types of problems students will be able to solve after they master the concepts and skills in this course. Students are introduced to several types of functions, including exponential and functions defined piecewise, and they spend considerable time with linear and quadratic functions. Each type of function included in Algebra 1 provides students a tool to solve yet another class of problems. They learn that specific functions model situations described in word problems, and so functions are used to solve various types of problems. The ability to determine functions and write equations that represent problems is an important mathematical skill in itself. Many problems that initially appear to be very different from each other can actually be represented by identical equations. Students encounter this important and unifying principle of algebra—that the same algebraic techniques can be applied to a wide variety of different situations.</p> <p>A1.2. Core Content: Numbers, expressions, and operations (Numbers, Operations, Algebra)</p>

Students see the number system extended to the real numbers represented by the number line. They work with integer exponents, scientific notation, and radicals, and use variables and expressions to solve problems from purely mathematical as well as applied contexts. They build on their understanding of computation using arithmetic operations and properties and expand this understanding to include the symbolic language of algebra. Students demonstrate this ability to write and manipulate a wide variety of algebraic expressions throughout high school mathematics as they apply algebraic procedures to solve problems.

A1.3. Core Content: Characteristics and behaviors of functions (Algebra)

Students formalize and deepen their understanding of functions, the defining characteristics and uses of functions, and the mathematical language used to describe functions. They learn that functions are often specified by an equation of the form $y = f(x)$, where any allowable x -value yields a unique y -value. While Algebra 1 has a particular focus on linear and quadratic equations and systems of equations, students also learn about exponential functions and functions that contain the absolute value of an expression. Students learn about the representations and basic transformations of these functions and the practical and mathematical limitations that must be considered when working with functions and when using functions to model situations.

A1.4. Core Content: Linear functions, equations, and inequalities (Algebra)

Students understand that linear functions can be used to model situations involving a constant rate of change. They build on the work done in middle school to solve sets of linear equations and inequalities in two variables, learning to interpret the intersection of the lines as the solution. While the focus is on solving equations, students also learn graphical and numerical methods for approximating solutions to equations. They use linear functions to analyze relationships, represent and model problems, and answer questions. These algebraic skills are applied in other Core Content areas across high school courses.

A1.5. Core Content: Quadratic functions and equations (Algebra)

Students study quadratic functions and their graphs, and solve quadratic equations with real roots in Algebra 1. They use quadratic functions to represent and model problems and answer questions in situations that are modeled by these functions. Students solve quadratic equations by factoring and computing with polynomials. The important mathematical technique of completing the square is developed enough so that the quadratic formula can be derived.

A1.6. Core Content: Data and distributions (Data/Statistics/Probability)

Students select mathematical models for data sets and use those models to represent, describe, and compare data sets. They analyze data to determine the relationship between two variables and make and defend appropriate predictions, conjectures, and generalizations. Students understand limitations of conclusions based on results of a study or experiment and recognize common misconceptions and misrepresentations in interpreting conclusions.

	<p>A1.7. Additional Key Content: (Algebra)</p> <p>Students develop a basic understanding of arithmetic and geometric sequences and of exponential functions, including their graphs and other representations. They use exponential functions to analyze relationships, represent and model problems, and answer questions in situations that are modeled by these nonlinear functions. Students learn graphical and numerical methods for approximating solutions to exponential equations. Students interpret the meaning of problem solutions and explain limitations related to solutions.</p> <p>A1.8. Core Processes: Reasoning, problem solving, and communication</p> <p>Students formalize the development of reasoning in Algebra 1 as they use algebra and the properties of number systems to develop valid mathematical arguments, make and prove conjectures, and find counterexamples to refute false statements, using correct mathematical language, terms, and symbols in all situations. They extend the problem-solving practices developed in earlier grades and apply them to more challenging problems, including problems related to mathematical and applied situations. Students formalize a coherent problem-solving process in which they analyze the situation to determine the question(s) to be answered, synthesize given information, and identify implicit and explicit assumptions that have been made. They examine their solution(s) to determine reasonableness, accuracy, and meaning in the context of the original problem. The mathematical thinking, reasoning, and problem-solving processes students learn in high school mathematics can be used throughout their lives as they deal with a world in which an increasing amount of information is presented in quantitative ways and more and more occupations and fields of study rely on mathematics.</p> <p>A team of certificated teachers who are highly qualified in this subject matter has reviewed this WSLP.</p>
Learning Activities	Daily students will check homework, practice new lessons learned, discuss learning strategies with partners, use appropriate tools to solve problems, ask questions, and apply learning.
Progress Criteria/Methods of Evaluation	<p>Monthly assessments will be completed by the consultant/certified teacher. Monthly Progress will be marked satisfactory or unsatisfactory based on the professional judgment of the certified teacher using parent input, work samples, and monthly assessments.</p> <p>Final Grading: Course grades are <u>weighted towards summative tests in the courses.</u> 90-100 A [93-100=4.0, 90-92=3.7] 89-80 B [B+ 87-89=3.3, B 83-86 = 3.0, B- 80-82=2.7] 79-70 C [C+ 77-79=2.3, C 73-76=2.0 C-70-72=1.7] Online courses for a proficient passing grade may vary according to course completion. Your APEX/Aleks and off site HQ will work to establish norms per on line product.</p>

