Algebra 1B (#0596)

Description: This course will study some of the major algebra readiness topics as a continuation to Algebra 1A. Emphasis will be placed on algebraic symbols and properties, mathematical expressions and statements, functions and graphs, and real-world applications. Students who successfully complete Algebra 1A and Algebra 1B can enroll in Geometry.

Credits: 1

Prerequisites: Algebra 1A(#0595)

Textbook/Resources: Larson, R. and Boswell, *Big Ideas Math Algebra 1.* Big Ideas Learning, *2015.* (ISBN 9781608408382)

Required Assessments:

Board Approved:8/18/16

AASD Mathematics Goals for K-12 Students

- **Become mathematical problem solvers.**
- **Learn to reason mathematically.**
- **Learn to communicate mathematically.**
- **Make mathematical connections.**
- **Develop conceptual understanding of mathematics.**
- **Develop procedural fluency.**
- **Learn to use technology app**

AASD Mathematics Standards for Students in Algebra Mathematical Practice Standards

1. Make Sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

	Essential Learning Objective (big Rocks) Domain	Performance Indicators	Assessment
7.EE.B Tasks	Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	7. EE.B.3: Solve multi-step and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.	Rubrics

		7. EEB.4: Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.	
7.SP.A Tasks	**Use random sampling to draw inferences about a population**	7. SP.A.1: Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. 7. SP.A.2: Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.	**Rubrics**

7. SP.C	**Investigate chance processes and develop, use, and evaluate probability models.**	**7. SP.C.5: Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. There are no tasks currently to this standard.** **7. SP.C.6: Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.** **7. SP.C.7: Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.** **7.SP.C.8: Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.**	**Rubrics**

8.EE.A	**Work with radicals and integer exponents.**	**8. EE.A.1Know** and apply the properties of integer exponents to generate equivalent numerical expressions. For example, 3 2 ×3 −5 =3 −3 =1/3 3 =1/27 **8. EE.A.2 Use square root and cube root symbols to represent solutions to equations of the form x 2 =p and x 3 =p , where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that 2 √ is irrational.** **8. EE.A.3 Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3×10 8 and the population of the world as 7×10 9, and determine that the world population is more than 20 times larger.** **8. EE.A.4 Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.**	**Rubrics**

8.EE.B	**Understand the connections between proportional relationships, lines, and linear equations.**	8. EE.B.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed. 8.EE.B.6 Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y=mx for a line through the origin and the equation y=mx+b for a line intercepting the vertical axis at b .	**Rubrics**
8. EE.C.	**Analyze and solve linear equations and pairs of simultaneous linear equations**.	**8.EE.C.7** Solve linear equations in one variable **8. EE.C.8** Analyze and solve pairs of simultaneous linear equations.	**Rubrics**

8.F.A	**8. F.A Define, evaluate, and compare functions.**	8. F.A.1. Define, evaluate, and compare functions. 8. F.A.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change. 8. F.A.3 Interpret the equation y=mx+b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function A=s 2 giving the area of a square as a function of its side length is not linear because its graph contains the points (1, 1), (2, 4) and (3, 9), which are not on a straight line.	**Rubrics**
8.F.B.	**8. F.B Use functions to model relationships between quantities.**	8. F.B.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x,y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	**Rubrics**

		8. F.B.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	
A.SSE.2	**Use Structure of an expression to identify ways to rewrite**	Rewrite algebraic expression in different equivalent forms such as factoring or combining like terms. • Use factoring techniques such as common factors and the difference of two squares • Simplify expressions including combining like terms, using the distributive property and other operations with polynomials	**Rubrics**
A.SSE.3	**Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression**	A.SSE.3c: Use properties of exponents (such as power of a power, product of powers, power of a product, and rational exponents, etc.) to write an equivalent form of an exponential function o reveal and explain specific information about its approximate rate of growth or decay.	**Rubrics**
A.APR.1	**Understand that polynomials form a stem analogous to the**	• Understand the definition of a polynomial • Understand the concepts of combining like terms and closure.	**Rubrics**

	integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	• Add, Subtract, and multiply polynomials and understand how closure applies under these operations.	
A.REI.5	**Prove that, given a system of two equations in two variables, replacing one equations by the sum of that equation and multiple of the other produces a system with the same solutions.**	• Solve systems of equations using the elimination method (sometimes called linear combinations) • Solve a system of equations by substitution (solving for one variable in the first equation and substitution it into the second equation).	**Rubrics**
A.REI.6	**Solve systems of linear equations exactly and approximately (e.g. with graphs), focusing on pairs of linear equations in two variables**	• Solve systems of equations using graphs.	**Rubrics**

A.REI.10	**Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could also be a line)**	• Understand that all solutions to an equation in two variables are contained on the graph of that equation.	**Rubrics**