Mr: E. Torres Algebra 1 Syllabus 2017-18

Course Rationale: Algebra 1 is the critical element in secondary mathematics education. Topics introduced in Algebra 1 provide the foundation students require for future success in high school mathematics, critical thinking, and problem solving. The primary goal in Algebra 1 is to help students transfer their concrete mathematical knowledge to more abstract algebraic generalizations. Course

Description: Algebra 1 topics include recognizing and developing patterns using tables, graphs and equations. In addition, students will explore operations on algebraic expressions, apply mathematical properties to algebraic equations. Students will solve problems using equations, graphs and tables to investigate linear relationships. Technology will be used to introduce and expand upon the areas of study listed above. Use of computers and graphing calculators will be incorporated into each module.

Course Objectives

The student will:

- **Apply and demonstrate the different way numbers are represented and used in the real world**
- **Determine the effects of operations on numbers and the relationships among these operations**
- **Select appropriate operations, and compute for problem solving**
- **Write and solve single and multi-step equations including real-world applications**
- **Explain how rates and ratios are similar or different**
- **Use rates and ratios to model and solve real-life problems**
- **Articulate under what conditions a relation is a function**
- **Describe, analyze, and generalize a wide variety of patterns, relations, and functions**

- **Display representations of a functions (equations, graphs, and tables)**
- **Connect representations of a function in a real world context and communicate mathematical thinking**
- **Solve systems of equations using various methods**
- **Use inequalities in an applied application to solve/evaluate real world data**
- **Identify, graph and analyze an exponential growth and decay function**
- **Apply various types of factoring methods to solve real-world problems**
- **Graph, analyze and solve quadratic equations**
- **Explain the concept of radical functions as applied to Geometry**
- **Explain the concept of rational functions as applied to a specific real-world situations**
- **Find probabilities of simple and compound events**
- **Analyze, create, display and interpret data using statistical methods**

First Semester:

Unit 1: Basic operations Lesson 01: Order of operations (PEMDAS) Lesson 02: Negative numbers, opposites, absolute values Inequalities Lesson 03: Review of sign rules for arithmetic operations Unit multipliers Lesson 04: Evaluating algebraic expressions Combining like terms Lesson 05: Evaluating expressions that distribute negative numbers Nested groups Lesson 06: *Putting it all together with fractions Unit 1 review Unit 1 test Unit 2: Solving linear equations Lesson 01: Solving one-step linear equations Lesson 02: Solving two-step linear equations Lesson 03: Solving linear equations by combining like terms Solving multiple-step linear equations Lesson 04: Solving linear equations with variables on both sides Unit 2 review Unit 2 test Unit 3: Inequality basics Solving linear, single-variable inequalities Lesson 01: Inequality statements Lesson 02: Solving linear inequalities Cumulative review, unit 3 Unit 3 test Unit 4: Word problems (area, perimeter, percent) Solving abstract equations Lesson 01: Converting word expressions into algebraic expressions Solving simple word problems Lesson 02: Solving perimeter and area word problems Lesson 03: Percent problems Lesson 04: More area, perimeter, and percent problems Lesson 05: Solving abstract equations Cumulative review Unit 4 review Unit 4 test Unit 5: Relations and functions Lesson 01: The coordinate axes, reflections, and translations Lesson 02: Relations: domain and range Lesson 03: Functions: function notation Lesson 04: More practice with functions Lesson 05: Function word problems Constant rates of change Lesson 06: Graphical representations of functions Independent and dependent variables Cumulative review Unit 5 review Unit 5 test Unit 6: Graphing linear functions Lesson 1: Linear function definition Plotting points and verifying with a graphing calculator Lesson 2: Slope Lesson 3: Graphing a line given a point and a slope Slope-intercept form of a linear function Lesson 4: Converting linear functions to y = mx +

b form Verifying solutions to linear equations Lesson 5: Finding function rules given points in a chart Special cases of linear functions (vert., horiz., b =0) Lesson 6: Putting it all together: interpreting linear graphs Lesson 7: Comparing linear graphs using a graphing calculator Evaluating linear functions with a calculator Cumulative review Unit 6 review Unit 6 test Unit 7: More on writing linear functions Lesson 1: Writing the equation of a line given the slope and one other piece of information Lesson 2: Writing the equation of a line given two points Writing the equations of horizontal & vertical lines Lesson 3: Perpendicular and parallel lines Lesson 4: Linear function word problems Calculator tables Cumulative review Unit 7 review Unit 7 test Unit 8: Lines of best-fit, correlation Interpreting data Lesson 1: Manual scatter plots, correlation Lesson 2: Scatter plots and linear regression on a graphing calculator Lesson 3: Interpretation of linear data using a graphing calculator www.bluepelicanmath.com Cumulative review Unit 8 review Unit 8 test Unit 9: Systems of linear equations Lesson 1: The meaning of the solution to a system of linear equations Lesson 2. Solving two linear equations by graphing Lesson 3: Solving two linear equations by substitution Lesson 4: Solving two linear equations by elimination Lesson 5: Graphing calculator solutions of linear systems Lesson 6: Solving for two variables in word problems Cumulative review Unit 9 review Unit 9 test Unit 10: Direct and indirect variation Lesson 1: Direct variation Lesson 2. Indirect variation Unit 10 test Semester summary Semester review Semester test Enrichment Topics Topic A: Commutative, distributive, and associative properties Topic B: Inequality conjunctions and disjunctions Topic C: Two dimensional inequalities Topic D: Combining direct and indirect variations Topic E: Scientific notation Topic F: Greatest common factor (GCF) and least common multiple (LCM) Topic G: Derivation of the Quadratic Formula Topic H: Completing the square Topic I: Statistics Topic J: Real-world applications of parabolas and the other three conic sections.

Second Semester:

Unit 10: Exponential functions Lesson 1: Exponential functions (variables in the exponent) Lesson 2: Exponential functions; the natural number e; exponential inequalities Lesson 3: *Applications of exponential functions Unit 10 cumulative review Unit 10 review Unit 10 test Unit 11: *Logarithms Lesson 1: Logarithm fundamentals Lesson 2: Inverse of exponential function, log function, log graphs Lesson 3: Logarithm theorems Lesson 4: Solving log equations Lesson 5: Change of base Using logs to solve exponential equations & inequalities Lesson 6: *Logarithm inequalities Lesson 7: *Applications

of logarithms Unit 11 cumulative review Unit 11 review Unit 11 test Unit 12: Rational expressions Lesson 1: Dividing polynomials; the remainder theorem Lesson 2: Simplifying rational expressions (multiplying & dividing) Lesson 3: Adding and subtracting rational expressions Lesson 4: *Factoring a3 – b3 , more rational expressions Lesson 5: Complex fractions www.bluepelicanmath.com Lesson 6: Direct and inverse variation Lesson 7: *Rational and irrational numbers; classifying roots Unit 12 cumulative review Unit 12 review Unit 12 test Unit 13: Regression Lesson 1: Linear regression Lesson 2: Higher order regression Unit 13 cumulative review Unit 13 test

Grading Policy

Your grade consists of tests, quizzes, homework, class work, journal writing and projects which are assigned a point value. Grades will be calculated by dividing the total number of points that you have earned by the maximum number of points that you could have earned and calculating a percent.

Common Core Standards:

A.CED.1 Create equations and inequalities in one variable and use them to solve problems. (Include equations arising from linear and quadratic functions, and simple rational and exponential functions.) o A.REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

F.IF.4 For a function that models a relationship between two quantities, interpret key features of the graph and the table in terms of the quantities, and sketch the graph showing key features given a verbal description of the relationship. ★ F.IF.9 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). ♣ Includes understanding functions, domain, range, intercepts, rate of change, graphing linear and exponential functions, and properties with rational exponents.

CED.2 Create linear and exponential equations in two variables to represent relationships between quantities, graph equations on coordinate axes with labels and scales. REI.6 Solve systems of linear equations exactly and approximately, focusing on pairs of linear equations in two variables. ● Writing F.BF.1 Combine standard function types using arithmetic operations. F.LE.2 Construct linear and exponential functions, including arithmetic and geometric sequences. F.LE.1 Distinguish between situations that can be modeled with linear functions and with exponential functions.

S.ID.5 Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. S.ID.6 Represent data on two quantitative variables on a scatter-plot, and describe how the variables are related.

F.IF.7b Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. (note: square root and cube root may be in Algebra II)