Murrieta Valley Unified School District **Board Submission: May 2016**
HIGH SCHOOL COURSE OUTLINE

Course Title: Math I Basic B

Department: Special Education

Course #: 8127

Grade Level: 11-12

Course Length: 1 year

Prerequisite/s: Math I Basic A. Open to all diploma-bound students with an IEP with Counselor, parent and teacher approval

Brief Course Description: Math I Basic B is open to all diploma bound students. This course meets the state and district Algebra 1/Math 1 requirement for graduation. The purpose of Math I Basic B is to continue to develop students' ability to think mathematically and develop their conceptual understanding of mathematics and procedural fluency in mathematics. Math I Basic B will extend the mathematics students learned in Math Basic A and begin the development of concepts in Number and Quantity, Algebra, Functions, Modeling, Geometry, and Probability and Statistics. The critical topics of this course are: Relations and Functions, Linear Equations and Inequalities, Systems of Equations and Inequalities, Arithmetic and Geometric Sequences, Polynomial Expressions, Exponential Functions, Geometric Properties and Congruence, and Modeling Data. Extensive use of models (or real-world situations), manipulatives, graphs and diagrams will help students view how mathematics is a set of related topics as opposed to a set of discrete topics. In addition, students will solve problems graphically, numerically, algebraically, and to make verbal connections between these representations. Students routinely use the standards for mathematical practice to make sense of problems, justify solutions and conclusions, model with mathematics, and strategically use technology to analyze and solve real-world problems.

I. GOALS

Engage and support all students in learning. Provide Specially Designed Academic Instruction to meet the unique needs of our students in accordance with their Individualized Educational Plan (IEP). Help students develop needed skills to meet or exceed the rigor of Algebra I or Mathematics I as aligned to the content standards of Section 512224.5 of the Ed Code.

Course Title: Math I Basic B

The students will:

A. Reason quantitatively and use units to solve problems

B. Interpret the structure of expressions

C. Create equations that describe numbers or relationships

D. Understand solving equations as a process of reasoning and explain the reasoning

E. Solve equations and inequalities in one variable

F. Solve systems of equations

G. Represent and solve equations and inequalities graphically

H. Understand the concept of a function and use function notation

I. Interpret functions that arise in applications in terms of the context

J. Analyze functions using different representations

K. Build a function that models a relationship between two quantities

L. Build new functions from existing functions

M. Construct and compare linear and exponential models and solve problems

N. Interpret expressions for functions in terms of the modeled situation

O. Make geometric constructions

P. Experiment with transformations in the plane

Q. Understand congruence in terms of rigid motions

R. Use coordinates to prove simple geometric theorems algebraically

S. Summarize, represent, and interpret data on a single count measurement variable, as well as, on two categorical and quantitative variables

T. Interpret linear models

These goals are aligned with the California State Standards, including the Standards Mathematical Practices. Coursework is IEP driven. More or less time will be spent on individual units depending on student needs.

II. OUTLINE OF CONTENT FOR MAJOR AREAS OF STUDY

A. Features of Functions
1. Use a story context to graph and describe key features of functions t (F.IF. 4)
2. Use tables and graphs to interpret key features of functions (F.IF. 4, F.IF. 5)
3. Analyze features of functions using various representations (F.IF. 4, F.IF. 5)
4. Interpret functions using notation (F.IF.2, F.IF.4, F.IF. 5, F.IF.7, A.REI.11, A.CED.3)
5. Combine functions and analyzing contexts using functions (F.BF.1b, F.IF.2, F.IF.4, F.IF. 5, F.IF.7, A.REI.11, A.CED.3)
6. Use graphs to solve problems given in function notation (F.BF.1b, F.IF.2, F.IF.4, F.IF.5, F.IF.7, A.REI.11, A.CED.3)
7. Define a function (F.IF.1)
8. Identify whether or not a relation is a function given various representations (F.IF.1, F.IF.3)
9. Match features and representations of a specific function (F.IF.2, F.IF.4, F.IF. 5, F.IF.7, A.REI.11, A.CED.3)

B. Congruence, Constructions and Proof
1. Develop the definitions of rigid motion transformations: translations, reflections and rotations (G.CO.1, G.CO.4, G.CO.5)
2. Examine the slope of perpendicular lines (G.CO.1, G.GPE.5)
3. Determine which rigid motion transformations carry one image onto another congruent image (G.CO.4, G.CO.5)
4. Write and apply formal definitions of the rigid motion transformations: translations, reflections and rotations (G.CO.1, G.CO.2, G.CO.4, G.GPE.5)
5. Determine rotational symmetry and lines of symmetry in special types of quadrilaterals (G.CO.3, G.CO.6)
6. Examine characteristics of regular polygons that emerge from rotational symmetry and lines of symmetry (G.CO.3, G.CO.6)
7. Make and justify properties of quadrilaterals using symmetry transformations (G.CO.3, G.CO.4, G.CO.6)
8. Describe a sequence of transformations that will carry congruent images onto each other (G.CO.5)
9. Establish the ASA, SAS and SSS criteria for congruent triangles (G.CO.6, G.CO.7, G.CO.8)
10. Explore compass and straightedge constructions to construct rhombuses, squares, parallelograms, equilateral triangles and inscribed hexagons (G.CO.12, G.CO.13)
11. Examine how compass and straightedge constructions produce desired objects (G.CO.12, G.CO.13)
12. Write procedures for compass and straightedge constructions (G.CO.12, G.CO.13)

C. Connecting Algebra and Geometry
1. Use coordinates to find distances and determine the perimeter of geometric shapes (G.GPE.7)
2. Prove slope criteria for parallel and perpendicular lines (G.GPE.5)
3. Use coordinates to algebraically prove geometric theorems (G.GPE.4)
4. Write the equation $f(t) = m(t) + k$ by comparing parallel lines and finding k (F.BF.3, F.BF.1, F.IF.9)

5. Determine the transformation from one function to another (F.BF.3, F.BF.1, F.IF.9)
6. Translate linear and exponential functions using multiple representations (F.BF.3, F.BF.1, F.IF.9)

D. Linear and Exponential Functions
1. Understand continuous linear and exponential functions (F.IF.3)
2. Define linear and exponential functions based upon the pattern of change (F.LE.1, F.LE.2)
3. Identify rates of change in linear and exponential functions (F.LE.1, F.LE.2)
4. Distinguish between linear and exponential functions using various representations (F.LE.3, F.LE.5)
5. Compare the growth of linear and exponential functions (F.LE.2, F.LE.3, F.LE.5, F.IF.7)
6. Compare linear and exponential models of population (F.BF.1, F.BF.2, F.LE.1, F.LE.2, F.LE.3)
7. Interpret equations that model linear and exponential functions (A.SSE.1, A.CED.2, F.LE.5)
8. Evaluate the use of various forms of linear and exponential equations (A.SSE.1, A.SSE.3, A.CED.2, F.LE.5)
9. Understand and interpret formulas for exponential growth and decay (A.SSE.1, A.CED.2, F.LE.5, F.IF.7)
10. Solve exponential and linear equations (A.REI.3)

III. ACCOUNTABILITY DETERMINANTS

Coursework is IEP driven. More or less time will be spent on individual units depending on student needs.

A. Key Assignments
1. In the task "To Function Or Not To Function" from Features of Functions Unit, students determine whether or not each situation is a function, then justify their answer.
2. In the task "More Things Under Construction" from Congruence, Constructions and Proof Unit, students create additional construction strategies that are based on the properties of quadrilaterals, congruent triangles, and rigid-motion transformations such as constructing an equilateral triangle, a parallelogram and a hexagon inscribed in a circle. Students are able to construct all other prior basic constructions on segments, angles, parallel and perpendicular lines.
3. In the task "Shifting Functions" from Connecting Algebra and Geometry Unit, students solidify their understanding of vertical transformations of exponential functions then practice shifting linear and exponential functions by writing function transformations using function notation.
4. In the task "Making More $" from the Modeling Data Unit, students use graphing calculators (or the GeoGebra software) to estimate and calculate correlation coefficients. They estimate lines of best fit and then compare them to the calculated linear regression. This task will demonstrate the dangers of using a linear model to extrapolate well beyond the actual data and use the correlation coefficient and scatter plot to determine the appropriateness of a linear model.

B. Assessment Methods
   1. Daily Student Observations, Classroom Participation, Effort and Achievement
   2. Classwork/Homework, Attendance and Participation
   3. Performance Tasks and Computer Adaptive Programs
   4. Projects
   5. Quizzes
   6. End of Unit Tests
   7. Semester Final Exams
   8. District-wide Benchmark Exams

IV. INSTRUCTIONAL MATERIALS AND METHODOLOGIES

A. Required Textbook(s)
   Bellman, Allan, et al. California Algebra 1. Boston: Pearson Prentice Hall, 2009

B. Supplementary Materials
   1. Hendrickson, Honey, et al. Secondary One Mathematics: An Integrated Approach. Mathematics Vision Project, 2013. This is an e-book located at http://www.mathematicsvisionproject.org
   2. Holt McDougal, Explorations in CORE Math for Common Core Algebra 1. Houghton Mifflin Harcourt Publishing Company, 2010
   3. www.geogebra.org
   4 www.illustrativemathematics.org
   5. www.bigideasmath.com
   6. Instructional resources available on Haiku Learning Management System.

C. Instructional Methodologies
   1. Guided Inquiry
   2. Direct Instruction
   3. Cooperative Learning
   4. Discourse
   5. Problem-Based Learning
   6. Visual Representations and Concrete Models