MT. DIABLO UNIFIED SCHOOL DISTRICT
COURSE OF STUDY

COURSE TITLE:	**Algebra Readiness**
COURSE NUMBER:	**1306**
CBEDS CODE:	
DEPARTMENT:	**Mathematics**
LENGTH OF COURSE:	**One Year**
CREDITS PER SEMESTER:	**5**
GRADE LEVEL(S):	**8**
REQUIRED OR ELECTIVE:	**This course fulfills one year of the middle school mathematics requirement.** **This course does not fulfill the Algebra I graduation requirement.**
PREREQUISITES:	**Pre-Algebra**

BOARD OF EDUCATION ADOPTION:

COURSE DESCRIPTION:

This course is aligned with the California Common Core Standards for 8th grade mathematics. The emphasis is on transitioning from concrete, basic math skills to abstract algebraic, geometric and statistical concepts. Students collect, model, and analyze data and patterns in real-world and career-related situations. They develop the ability to communicate, understand, and critique mathematical reasoning through reading, writing and speaking. Students focus on math specific study skills, perseverance, attention to precision, and preparation for success in Algebra I.

COURSE OUTLINE:

1. **MAJOR GOALS**

   1.1 To build a strong foundational understanding of basic algebraic, geometric and statistical concepts
   1.2 To apply mathematical models to solve problems
   1.3 To synthesize multiple mathematical concepts to solve real world problems
   1.4 To develop skills for learning and studying mathematics and communicating mathematically
   1.5 To improve mathematical reasoning necessary to be successful in various careers

2. PERFORMANCE OBJECTIVES:

- 2.1 The Real Number System
  - 2.1.1 Identify rational and irrational numbers
  - 2.1.2 Understand and use decimal expansion
  - 2.1.3 Use rational approximations to compare irrational numbers
  - 2.1.4 Use rational approximations to estimate the value of expressions

- 2.2 Expressions and Equations
  - 2.2.1 Work with radicals and integer exponents
    - 2.2.1.1 Apply the properties of integer exponents
    - 2.2.1.2 Use square root and cube root symbols to represent expressions and solutions to equations
    - 2.2.1.3 Express numbers and perform operations using scientific notation
  - 2.2.2 Understand the connections between proportional relationships, lines, and linear equations
    - 2.2.2.1 Graph and compare proportional relationships, interpreting the unit rate as the slope of the graph
    - 2.2.2.2 Derive and understand the equation $y=mx + b$
  - 2.2.3 Analyze and solve linear equations and pairs of simultaneous linear equations and apply to real world and career-related situations
    - 2.2.3.1 Solve multi-step linear equations in one variable
    - 2.2.3.2 Analyze and solve pairs of simultaneous linear equations
    - 2.2.3.3 Solve systems of linear equations by graphing
- 2.3 Functions
  - 2.3.1 Define, evaluate, and compare functions
    - 2.3.1.1 Interpret a function as a rule that assigns exactly one output value to each input value
    - 2.3.1.2 Represent and describe functions algebraically, graphically, numerically in tables, and verbally
    - 2.3.1.3 Identify relations as linear functions, nonlinear functions, or non-functions
  - 2.3.2 Use functions to model relationships between quantities including career-integrated examples
    - 2.3.2.1 Construct and interpret a function that models a linear relationship using rate of change and initial value
    - 2.3.2.2 Sketch a graph that exhibits the qualitative features that has been described verbally
- 2.4 Geometry
  - 2.4.1 Understand congruence and similarity using physical models, transparencies, or geometry software
    - 2.4.1.1 Verify experimentally the properties of rotations, reflections, dilations, and translations

2.4.1.2 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates

2.4.1.3 Use transformations to illustrate and model congruence and similarity

2.4.1.4 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles

2.4.2 Understand and apply the Pythagorean Theorem

2.4.2.1 Explain a proof of the Pythagorean Theorem and its converse

2.4.2.2 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real world and career-related mathematical problems in two and three dimensions

2.4.2.3 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system

2.4.3 Solve real world and mathematical problems involving volume of cylinders, cones, and spheres

2.4.3.1 Use the formulas for the volumes of cones, cylinders, and spheres to solve real world and career-related mathematical problems

2.5 Statistics and Probability

2.5.1 Investigate patterns of association in data using two variables

2.5.1.1 Construct and interpret scatter plots using appropriate vocabulary such as clustering, outliers, positive or negative correlation, linear and nonlinear association

2.5.1.2 Create an approximate line of best fit, write its equation, and informally assess the model fit by judging the closeness of the data points to the line

2.5.1.3 Design or create an experiment to determine if there is a correlation between two measurable quantities (e.g., years of math education versus salary)

2.6 Mathematical Learning and Study Skills

2.6.1 Participate as an active learner during class by taking meaningful notes, asking questions and engaging in class activities

2.6.2 Display persistence by completing assignments, checking answers, and reworking problems

2.6.3 Access mathematical resources to support learning and understanding

2.6.4 Prepare for assessments by completing practice problems, reviewing notes, and accessing appropriate resources

3. CONTENT OUTLINE:

- 3.1 The Real Number System (2.1.1 – 2.1.4)
- 3.2 Expressions and Equations
  - 3.2.1 Radicals, integer exponents, and scientific notation (2.2.1)
  - 3.2.2 Linear equations and graphing (2.2.2)
  - 3.2.3 Systems of linear equations (2.2.3)
- 3.3 Functions
  - 3.3.1 Linear and nonlinear functions and non-functions (2.3.1 -2.3.2)
- 3.4 Geometry
  - 3.4.1 Transformations (dilations, translations, rotations, and reflections) (2.4.1.1 – 2.4.1.3)
  - 3.4.2 Congruency and transformation of two-dimensional figures (2.4.1.2 – 2.4.1.3)
  - 3.4.3 Angle sum and exterior angles of triangles (2.4.1.4)
  - 3.4.4 Parallel lines cut by a transversal (2.4.1.4)
  - 3.4.5 Angle-angle similarity of triangles (2.4.1.4)
  - 3.4.6 Pythagorean Theorem (2.4.2)
  - 3.4.7 Volumes of cones, cylinders, and spheres (2.4.3)
- 3.5 Statistics and Probability
  - 3.5.1 Scatter plots and real world experiments (2.5.1)
- 3.6 Mathematical Learning and Study Skills (2.6)

4. TIME ESTIMATES:

- 4.1 Instructional sequences vary in length from a few days to several weeks.

5. INSTRUCTIONAL MATERIALS:

- 5.1 District adopted textbooks
- 5.2 Supplementary and teacher-created materials that may include a career focus
- 5.3 Multi-media materials
- 5.4 Technology materials
- 5.5 Real-world and career-related fieldtrips (as appropriate)
- 5.6 Speakers (as appropriate)

6. EVALUATION OF STUDENT PROGRESS

- 6.1 Teacher observation
- 6.2 Written assignments and projects
- 6.3 Quizzes and tests or alternative assessments

Committee Members:

Diablo View Middle	Cheryl Johnson
El Dorado Middle	Jodi Masongsong
Foothill Middle	Barbara Moser
Oak Grove Middle	Vanessa Garcia
Pine Hollow Middle	Lilian McGlothlen
Pleasant Hill Middle	Tony Gallardo
Riverview Middle	Sharon Simone
Sequoia Middle	Pat Yoshiwara
Valley View Middle	Christina Tkachuk
Mt Diablo High	Susan Seeley
Ygnacio Valley High	Mary Ditkof
Student Achievement & School Support Dept	Hellena Postrk