Course Name: Math Models with Applications
School Year: 2021-2022

Course Purpose and Relevance:

Mathematical Models with Applications is designed to build on the knowledge and skills for mathematics in Kindergarten-Grade 8 and Algebra I. This mathematics course provides a path for students to succeed in Algebra II and prepares them for various post-secondary choices. Students learn to apply mathematics through experiences in personal finance, science, engineering, fine arts, and social sciences. Students use algebraic, graphical, and geometric reasoning to recognize patterns and structure, model information, solve problems, and communicate solutions. Students will select from tools such as physical objects; manipulatives; technology, including graphing calculators, data collection devices, and computers; and paper and pencil and from methods such as algebraic techniques, geometric reasoning, patterns, and mental math to solve problems.

The **process standards** weave the other knowledge and skills together so that students may be successful problem solvers and use mathematics efficiently and effectively in daily life. When possible, students will apply mathematics to problems arising in everyday life, society, and the workplace. Students will use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. Students will select appropriate tools such as real objects, manipulatives, algorithms, paper and pencil, and technology and techniques such as mental math, estimation, number sense, and generalization and abstraction to solve problems. Students will effectively communicate mathematical ideas, reasoning, and their implications using multiple representations such as symbols, diagrams, graphs, computer programs, and language. Students will use mathematical relationships to generate solutions and make connections and predictions. Students will analyze mathematical relationships to connect and communicate mathematical ideas. Students will display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

Overview of Student Outcomes:

- The student studies patterns and analyzes data related to personal finance.
- The student uses algebraic formulas, graphs, and amortization modeling to solve problems involving credit.
- The student uses algebraic formulas, numerical techniques, and graphs to solve problems related to financial planning.
- The student uses algebraic techniques to study patterns and analyze data as it applies to science.
- The student studies patterns and analyze data as it applies to architecture and engineering.
- The student studies patterns and analyze data as it applies to fine arts.
- The students determine the number of elements in a finite sample space and computes the probability of an event.
- The student applies mathematical models to analyze data as it applies to social sciences.
- The student designs a study and uses graphical, numerical, and analytical techniques to communicate the results of the study.

Available Support for Student Learning:

Refer to the teacher's Course Syllabus for resources and course specific opportunities.

Links to Course TEKS and RESOURCES FOR PARENTS on TEA website:

Texas Knowledge and Skills for Math Models with Applications
Resources for Parents

First Grading Period

Unit 1: Linear Equations and Inequalities

Unit 2: Direct and Inverse Variation

Unit 3: Linear Functions and Models

Second Grading Period

Unit 4: Systems of Equations

Unit 5: Quadratic Functions and Models

Semester Review and Campus Exam

Third Grading Period

Unit 6: Data Analysis

Unit 7: Exponential Models

Unit 8: Probability

Fourth Grading Period

Unit 9: Patterns in Fine Arts, Architecture, and Engineering

Unit 10: Personal Finance