

# Mathematical Modeling

2018 - 2019

Mrs. Olson

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2 Trimesters / 1 credit

Prerequisites: Algebra 2

“Unless you try to do something beyond what you have already mastered you will NEVER GROW.”  
-Ronald E. Osborne

## Course Overview

Mathematical Modeling introduces students to the art of mathematical prediction through algebraic modeling and elementary probability theory. Topics support students' understanding of the dual nature of mathematics. First, mathematics is a body of knowledge that relies upon a precise, symbolic means of communication and analysis. This aspect of mathematics is conveyed through a survey of simplification, solving and graphing techniques applied to a range of function types, including linear, polynomial, exponential and logarithmic functions. Students will practice traditional algebraic methods and will learn to develop equations that accurately represent the behavior of real-world data and assess their goodness-of-fit. Second, mathematics provides descriptive and problem-solving tools to address authentic questions in a wide range of disciplines. Models are drawn from a range of disciplines that include science, social sciences and education. Throughout the modeling activities, students are asked to generalize their solutions and to pose and answer related mathematics problems, and to develop precisely-stated algorithms and solution methods. These activities are intended to help students understand their own capacity to use mathematics to answer significant questions and to become lifelong users of mathematics. All models are introduced through small group activities, although most are submitted individually to insure personal feedback for individual student growth

## Course Outline

The following topics will be imbedded into models throughout the year.

1. Functions, Graphs, and Models; Linear Functions
2. Linear Models, Equations, and Inequalities
3. Quadratic and Other Nonlinear Functions
4. Additional Topics with Functions
5. Exponential and Logarithmic Functions
6. Counting and Probability Theory
7. Systems of Equations and Matrices
8. Systems of Inequalities and Linear Programming

## State Standards

Students enrolled in mathematical modeling will review many math standards through the lens of a mathematical model. The level of mathematics each individual student will encounter will depend on the level of mathematical understanding they currently have and their individual problem solving approach.

## Textbook / Resources

**College Algebra in Context**, third edition. Harshbarger and Yocco.

## Recommended Materials:

- 3 ring binder
- Graph paper
- TI-83 Plus or higher graphing calculator

## Homework

Although you are encouraged to work together on homework and seek the instructor's help during work time, your work must be your own. It will not help you to learn if you just copy another person's homework problems. If you are stuck on a problem ask others how they solved it, even look at their work, but then try it on your own, checking for understanding as you work through the steps. **Keep all of your homework in a separate section of a three ring binder.**

- Ask questions about homework that you did not understand
- **Late assignments will be awarded partial points**
- **Assignments will be accepted two days late for an excused absence.**
- Homework is 10% of your grade

## Classwork/Participation

- Teamwork will be completed on most days and will provide you the opportunity to work with many different students through the course, this may include:
  - Working with cooperative groups to solve more complex problems
  - Presenting ideas or problems as a team on the board
- **Excused absence:** check in with Mrs. Olson as to what classwork needs to be made up. Students will receive two days to make up any excused absent work.
- **Unexcused absence will result in a zero.**
- Teamwork is 15% of your grade

## Models

- Models will always begin in class.
- Students will have the opportunity to collaborate with others and work independently.
- Students will be graded on their level of mathematical understanding and written report following the modeling process.
- Models will comprise 75% of your grade.

## Classroom Expectations

Students are expected to follow all school rules in the student handbook

- Be Respectful
  - Be Responsible
  - Be Safe
  - Be Your Best
- #BE AFSA

## Grading scale/criteria:

A+	100%	C+	78% - 79%
A	93% - 99%	C	73% - 77%
A-	90% - 92%	C-	70% - 72%
B+	88% - 89%	D+	68% - 69%
B	83% - 87%	D	63% - 67%
B-	80% - 82%	D-	60% - 62%
		F	59% and below

Questions: Please do not hesitate to ask questions either in or out of class. If any student needs extra help please set up a time to see me either before or after school.

I have read the Mathematical Modeling syllabus and will contact Mrs. Olson with any questions or concerns I may have throughout the course.

Student Signature \_\_\_\_\_ Date \_\_\_\_\_ Student Name \_\_\_\_\_

Guardian Signature \_\_\_\_\_ Date \_\_\_\_\_ Guardian Name \_\_\_\_\_