

## SMUSD Math Courses 2021-2022 School Year

*While SMUSD is an open access district, this is the suggested sequence for mathematics.*

6th	7th	8th	9th	10th	11th	12th
Math 6	Math 7 Accelerated 7/8	Math 8 Accelerated Algebra	Algebra 1* Computer Science Essentials  <i>**Any 10th grade math course</i>	AP Computer Science Computer Science Essentials Geometry* Honors Geometry*  <i>**Any 11th grade math course</i>	Algebra 2 Algebra 2 for Strategic Business AP Computer Science Computer Science Essentials Data Science Honors Algebra 2 Palomar 56  <i>**Any 12th grade math course</i>	AP Calculus AB AP Calculus BC AP Computer Science AP Statistics Calculus Computer Science Essentials Data Science Statistics

*(Click the [blue text](#) to link to grade level or courses)*

*\*SMUSD Graduation Requirement*

*\*\*It is recommended that student has completed Accelerated Algebra course in 8th grade*

### Important Information

- Graduating class of 2022 needs 2 years of math to graduate ([see Board Policy](#))
- Graduating class of 2023 and beyond need 3 years of math to graduate ([see Board Policy](#))
- [CSU/UC "C - Mathematics" Course Criteria and Guidance](#)
- Classes are listed alphabetically

# COURSE DESCRIPTIONS

## 6TH GRADE

### **Math 6**

Students will focus on four critical areas of study: 1) connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems; 2) completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers; 3) writing, interpreting, and using expressions, equations and inequalities; and 4) developing understanding of statistical thinking. Students also work towards fluency in multi-digit division and multi-digit decimal operations, and build on their work with area, surface area, and volume. Collaborative mathematical talk is emphasized.

*This class will prepare you for -- [Math 7](#) and [Accelerated 7-8](#)*

*Recommended next course -- [Math 7](#) or [Accelerated 7-8](#)*

## 7TH GRADE

### **Math 7**

Students will focus on four critical areas of study: 1) developing understanding of and applying proportional relationships, including percentages; 2) developing understanding of operations with rational numbers and working with expressions and linear equations; 3) solving problems including scale drawings and informal geometric constructions and working with 2- and 3-dimensional shapes to solve problems involving area, surface area and volume; and 4) drawing inferences about populations based on samples. Students also work towards fluently solving equations of the form  $px + q = r$  and  $p(x + q) = r$ . Collaborative mathematical talk is emphasized

*Recommended class to take prior -- [Math 6](#)*

*This class will prepare you for -- [Math 8](#)*

*Recommended next course -- [Math 8](#)*

### **Accelerated 7-8**

Accelerated 7-8 students' progress at a rigorous pace to cover all the 7th grade Common Core standards and half the 8th grade Common Core standards while focusing on the 8 Standards for Mathematical Practices. Within the 8th grade material, students will cover exponents, scientific notation, roots, Pythagorean Theorem, volume of geometric shapes, transformations, angles and triangles. Collaborative mathematical talk is emphasized. Refer to 7th grade math and 8th grade math descriptions for more information on these standards.

*Recommended class to take prior -- [Math 6](#)*

*This class will prepare you for -- [Math 8](#) and Accelerated Algebra*

*Recommended next course -- [Math 8](#) or Accelerated Algebra*

## 8TH GRADE

### **Math 8**

Students will focus on four critical areas of study: 1) formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations; 2) grasping the concept of a function and using functions to describe quantitative relationships; 3) analyzing 2- and 3-dimensional space and figures using distance, angle, similarity, and congruence and understanding and applying the Pythagorean Theorem. Students also work towards fluency using exponents to simplify numerical expressions, finding volume of 3-dimensional figures, and various ways to display statistical data. Collaborative mathematical talk is emphasized.

*Recommended class to take prior -- [Math 7](#)*

*This class will prepare you for -- [Algebra 1](#)*

*Recommended next course -- [Algebra 1](#)*

### **Accelerated Algebra**

Accelerated Algebra students will engage in half of the California State Mathematical standards for 8th grade Math and all of the California State Mathematical standards for Algebra 1. Students will also develop and utilize the 8 Standards for Mathematical Practices. During the academic year students will cover solving, graphing, and writing linear equations, systems of linear equations, quadratic equations, and linear inequalities. Students will also be solving and graphing exponential and quadratic functions. Lastly, students will learn and apply the properties of integer exponents and polynomials. Collaborative mathematical talk is emphasized.

*Recommended class to take prior -- [Accelerated 7-8](#)*

*This class will prepare you for -- [Algebra 1](#), [Geometry](#) and [Honors Geometry](#)*

*Recommended next course -- [Algebra 1](#), [Geometry](#) or [Honors Geometry](#)*

## COURSE DESCRIPTIONS

### 9TH GRADE

#### Algebra 1

The Algebra 1 course is the first course in the high school sequence aligned with the Common Core State Standards for Mathematics (CCSS-M). The purpose of this course is to provide opportunities for students to gain fluency with linear, quadratic and exponential functions. Students will engage in contrasting linear, quadratic and exponential functions, in addition to analyzing, solving and using these functions to model real-world situations. Throughout the course, students will gain understanding and use the formal definition of functions and their notation, and will use them to interpret and build functions. Students will also discover the analogous nature of polynomials with integers, and will begin their study of statistics, focusing on interpreting categorical and quantitative data. In addition to the CCSS-M standards content standards for Algebra 1, students will experience and gain fluency with the eight Standards for Mathematical Practice.

*Recommended class to take prior -- [Math 8](#)*

*This class will prepare you for -- any [10th grade math course](#)*

*Recommended next course -- any [10th grade math course](#)*

#### Computer Science Essentials

*\*Note: Computer Science Essentials can be taken in 9th, 10th, 11th or 12th grade.*

**A-G Designation: C - Mathematics**

**(Meets third year math requirement for HS graduation)**

Computer Science Essentials is designed to offer an introduction to computer science. Students will learn the basics of computer programming along with the basics of computer science. Using Python® as a primary tool and incorporating multiple platforms and languages for computation, this course aims to develop computational thinking, generate excitement about career paths that utilize computing, and introduce professional

tools that foster creativity and collaboration. It gives a foundation in the tools used in computer science and prepares students for further study in computer science, including AP Computer Science A.

*This class will prepare you for -- [AP Computer Science A](#)*

*Recommended next course -- [AP Computer Science A](#)*

## 10TH GRADE

### **AP Computer Science**

*\*Note: AP Computer Science can be taken in 10th, 11th or 12th grade.*

**A-G Designation: C - Mathematics**  
**(Meets third year math requirement for HS graduation)**

The AP Computer Science A course introduces students to computer science with fundamental topics that include problem solving, design strategies and methodologies, organization of data (data structures), approaches to processing data (algorithms), analysis of potential solutions, and the ethical and social implications of computing. The course emphasizes both object-oriented and imperative problem solving and design. These techniques represent proven approaches for development solutions that can scale up from small, simple problems to large, complex problems. Concepts are taught using the Java programming language.

*Recommended class to take prior -- [Computer Science Essentials](#)*

### **Geometry**

The Geometry course is the second course in the high school sequence aligned with the California Common Core State Standards for Mathematics (CCSS-M). The purpose of this course is to introduce students to formal geometric proofs and the study of plane figures, culminating in the study of right triangle trigonometry and circles. Throughout the course, students will gain experience in proving results about the plane formally, using previously defined terms and notions. Students will explore transformations, proving geometric theorems, congruence and similarity, right-triangle trigonometry and probability. In addition to the CCSS-M content standards for Geometry, students will experience and gain fluency with the eight Standards for Mathematical Practice.

*Recommended class to take prior -- [Algebra 1](#)  
This class will prepare you for -- any [11th grade math course](#)  
Recommended next course -- any [11th grade math course](#)*

### **Honors Geometry**

This course covers the same topics as listed in Geometry in addition to enhanced (+) standards outlined in the California Mathematics Framework for the Geometry course. Students will gain greater understanding of trigonometry through deriving formulas and proving, using, and understanding the application of laws of sines and cosines. In addition, students in Honors Geometry will gain a deeper understanding of using probability models and probability experiments to make decisions.

*Recommended class to take prior -- [Algebra 1](#)*

*This class will prepare you for -- any [11th grade math course](#)*

*Recommended next course -- any [11th grade math course](#)*



## 11TH GRADE

### **Algebra 2**

The Algebra 2 course is the third course in the high school sequence aligned with the California Common Core State Standards for Mathematics (CCSS-M). The purpose of this course is to extend and deepen students understanding of numbers and functions. Throughout the course, students will explore the systems of polynomial and rational functions, and their relationship to integers and rational numbers respectively. Students will examine the relationship of a function and its inverse, through exponential and logarithmic functions. Students will study trigonometric functions and expand their knowledge of statistics to include understanding of the normal distribution. In addition to the CCSS-M content standards for Algebra 2, students will experience and gain fluency with the eight Standards for Mathematical Practice.

*Recommended class to take prior -- [Geometry](#) or [Honors Geometry](#)*

*This class will prepare you for -- any [12th grade math course](#)*

*Recommended next course -- [Calculus](#), [Data Science](#) or [Statistics](#)*

### **Algebra 2 for Strategic Business**

Students explore and interpret the behavior of different functions (linear, polynomial, exponential, logarithmic, rational) by modeling real-world relationships found in the finance and business sectors. Through lessons based on consumer finance, students deepen their understanding of linear and polynomial functions while comparing income types, investment portfolios, and planning for retirement. Students use real case studies to create, analyze, and interpret functions that influence business decisions. Students investigate the algebra involved in managing a business, using model data from real case studies and applying these findings to create a business of their own.

*Recommended class to take prior -- [Geometry](#) or [Honors Geometry](#)*

*This class will prepare you for -- any [12th grade math course](#)*

*Recommended next course -- [Calculus](#), [Data Science](#), or [Statistics](#)*

### **Data Science**

*\*Note: Data Science can be taken in 11th or 12th grade.*

Answering real questions in the world involves analyzing data. This course will teach students to think critically about and with data, developing the tools, techniques, and principles for reasoning. Students form their own questions about the world around them, analyze data using multiple methods, and present their findings through project-based units. Students will be introduced to basic computer programming skills using the language, Python and Tableau, during the research. At the end of the course, students will have a portfolio of their data science work to showcase their newly developed knowledge and understanding. Throughout the course, students will experience and gain fluency with the eight Standards for Mathematical Practice.

*Recommended class to take prior -- [Geometry](#) or [Honors Geometry](#)  
This class will prepare you for -- any [12th grade math course](#)  
Recommended next course -- [AP Statistics](#) or [Statistics \(?\)](#)*

## **Honors Algebra 2**

This course covers the same topics as listed in Algebra 2 in addition to enhanced (+) standards outlined in the California Mathematics Framework for the Algebra 2 course. Students will examine polynomial identities to include complex numbers and know and apply the Fundamental Theorem of Algebra and the Binomial Theorem. Students will also extend their knowledge of rational expressions by graphing more complex functions and identifying their key features. Students will gain greater understanding of trigonometry by utilizing additional identities and further investigating patterns of the unit circle. In addition, students in Honors Algebra 2 will extend their understanding of probability by analyzing decisions and strategies in more complex situations.

*Recommended class to take prior -- [Honors Geometry](#)  
This class will prepare you for -- any [12th grade math course](#) [or Data Science?]  
Recommended next course -- [AP Calculus AB](#) or [AP Calculus BC](#)*

## **Palomar 56 - Beginning/Intermediate Algebra**

***\*Important Note: This course (Palomar 56) is non-transferable, which means it is not A-G compliant. Meets prerequisite requirements for Palomar mathematics course numbers 100-120.\****

A review of elementary algebra and in-depth coverage of intermediate algebra intended for the student who has previous experience with algebra. Meets requirement for the A.A. degree.

*Recommended class to take prior -- [Geometry](#)  
This class will prepare you for -- Math 100 or 101 at Palomar  
Recommended next course -- Math 100 or 101 at Palomar*

## 12TH GRADE

### **AP Calculus AB**

This course is an intensive study of differential and integral calculus. Topics include limits, derivatives as functions, computation and applications of derivatives, computation and applications of integrals, and differential equations. Students approach calculus concepts and problems when they are represented graphically, numerically, analytically, and verbally, and to make connections amongst these representations. Students learn how to use technology to help solve problems, experiment, interpret results, and support conclusions.

*Recommended class to take prior -- [Honors Algebra 2](#)*

### **AP Calculus BC**

This course covers the same topics of differential and integral calculus as listed in AP Calculus AB. Additional topics in this course include parametric, polar, and vector functions, additional techniques and applications of integration, and polynomial approximations and series. Students approach calculus concepts and problems when they are represented graphically, numerically, analytically, and verbally, and to make connections amongst these representations. Students learn how to use technology to help solve problems, experiment, interpret results, and support conclusions.

*Recommended class to take prior -- [Honors Algebra 2](#)*

### **AP Statistics**

The AP Statistics course is an intensive study of the major concepts and tools for collecting, organizing, analyzing, and drawing conclusions from data. There are four themes evident in the content, skills, and assessment in the AP Statistics course: exploring data, sampling and experimentation, probability and simulation, and statistical inference. Students use technology, investigations, problem solving, and writing as they build conceptual understanding.

*Recommended class to take prior -- [Data Science](#) (?)*

### **Calculus**

The major purpose of this course is to provide an introduction to calculus. Topics include functions and trigonometry, limits and continuity, differentiation, applications of derivatives, integration, and applications of the integral.

*Recommended class to take prior -- [Algebra 2](#) or [Algebra 2 for Strategic Business](#)*

## **Statistics**

Statistics focuses on the art and science of collecting, organizing, describing, and drawing conclusions from data. The study of statistics emphasizes real-world application, and the topics in this course all require critical reading and problem-solving skills. Specific topics include modeling distributions of data, describing relationships, applying probability, and using statistical inference to make decisions.

*Recommended class to take prior -- [Algebra 2](#), [Algebra 2 for Strategic Business](#), or [Data Science](#)*