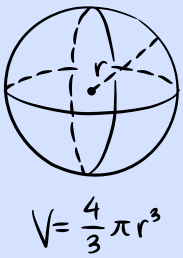
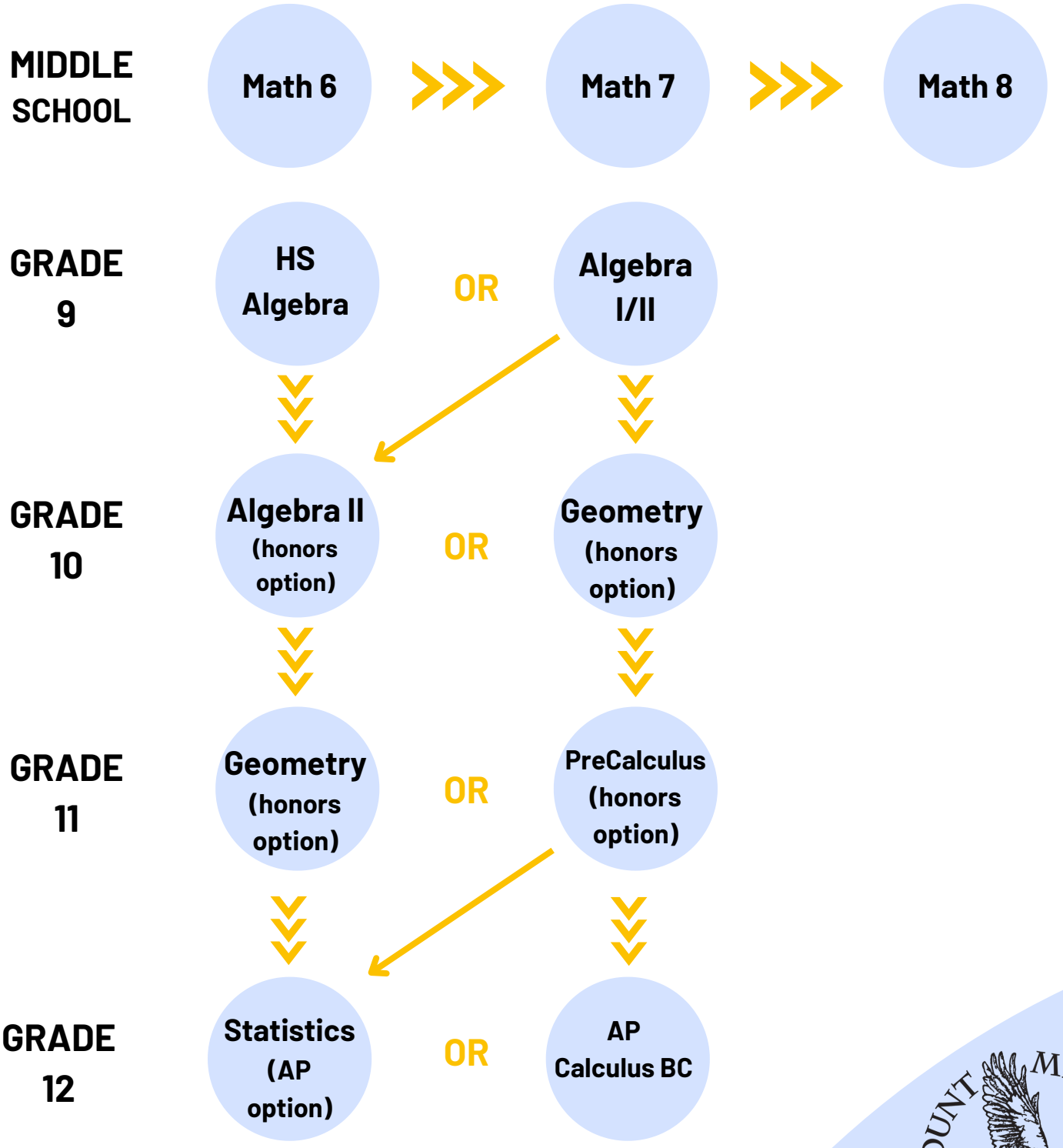


Middle and High School

Math Path Overview

Mount Madonna School's middle and high school math path allows students to complete through AP Calculus BC or AP Statistics. Our primary goal is to ensure that all students receive a solid foundation in Algebra, which is the underpinning of nearly all higher-level math, science, engineering and computer science courses and fields. Our math path trajectory allows space for differentiation in the classroom, while also providing challenge and maintaining rigor.



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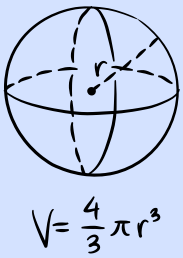

High School Math

HS Algebra
This course provides students with a strong foundation for further studies of mathematics. Students learn to recognize and apply advanced tools for attacking word problems, increase their ability to use observation and reasoning skills. Topics covered include rational expressions, manipulating and factoring polynomials, linear equations, inequalities, rational and irrational numbers, including radical expressions and the quadratic formula.

Algebra I/II
Students will progress rapidly through Algebra 1 in the first semester. In the second semester, students review, perfect and expand their skills through the Algebra II concepts. Concepts are explored through direct instruction and discussions that explore the purpose and value of learning the given skills. Math is presented as a tool to explore and describe our world. Students have regular homework assignments, occasional quizzes and summative assessments at the end of each chapter. They are encouraged to work together and also develop independent problem solving skills and regularly reflect their progress, looking at what is supporting their progress and what they want to change in order to grow.

Algebra II with honors option
In this class, students build on what they have learned in their Algebra I course and deepen their interaction with the fundamentals of mathematics. Topics include linear equations and functions, polynomials, rational and irrational numbers, quadratic functions and graphing, geometry and exponential and logarithmic functions. Honors students reach deeper into the material and explore more challenging applications of the material being presented.

Geometry with honors option
In Geometry, students maintain and use their Algebra skills while applying those skills to geometric problems and reasoning. Students practice proofs and advanced problem-solving skills. All the basic postulates of Euclidean Geometry are covered; students also study the Pythagorean Theorem, coordinate geometry, surface area, perimeter and volume and solid geometry. Honors students take a more theoretical approach; non-honors students follow more hands-on learning, media and blogs.

Precalculus with honors option
This class covers the knowledge and skills necessary to prepare students for a college-level calculus class. Some major topics include transformation of functions, solving and graphing advanced and inverse trigonometric functions, polar coordinates and vectors, analytical geometry, early linear algebra with matrices, solid geometry treated as coordinate geometry, probability, sequences and series and the concepts of limits and rates of change. Honors students are expected to show a deeper knowledge of all material and take more challenging weekly exams.

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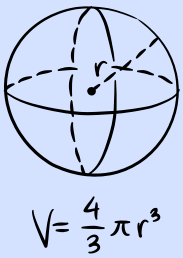

High School Math continued

Statistics with AP option
Curriculum for this course follows AP Statistics curriculum approved by the College Board and is designed to introduce students to the uses of analytical data. This course draws connections between all aspects of the statistical process, including exploring data, sampling and experimentation, anticipating patterns and statistical inference. Additionally, using the vocabulary of statistics, this course will teach students how to use and communicate statistical methods, results and interpretations using a year-long project of their own design. The year-long project includes creating a survey on a topic if their choice, administering it to students and sometimes faculty and staff at the school, and then using spreadsheet tools to analyze the results. They ultimately draw conclusions from the data using methods and tools learned throughout the year, create a rigorous written summary of their project, as well as orally present their findings. The AP and non-AP classes are taught in the same classroom as one course. Students electing not to take the Advanced Placement course have different expectations on homework and take different exams, although the same material is presented to all the students.

AP Calculus BC
This course is a college-level mathematics course focused on preparing students to take the Advanced Placement exam. It follows curriculum currently recommended by the College Board. Topics include functions, limits, derivatives and their applications, techniques of integration and applications of integrals and infinite series. The course revisits many of the precalculus topics with more complex applications and interpretations and focuses on advanced integration methods, calculus of parametric equations and infinite series. Students use technology to plot and analyze functions, and to program basic coding languages. Students apply concepts to physics, chemistry, biology and engineering problem. This curriculum is designed to prepare students for college-level math, science and engineering courses.

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