Student Course Descriptions
Grades 5 through 8 Mathematics

Nantucket New School

Grade 5 Mathematics

Grade 5 math introduces you to the way we think about problems in the upper school at Nantucket New School. You will still practice the core skills of whole number arithmetic, but you will also begin to see how mathematicians look for patterns, explain ideas, and solve challenging problems.

You will

- strengthen your skills with addition, subtraction, multiplication, and division

- explore exponents and powers, and learn how to work with squares

- study factors, multiples, and prime numbers

- build a deep understanding of fractions and how to multiply them

- see variables and simple equations for the first time

- work with basic angles, shapes, and measurements

We will use the Art of Problem Solving book Prealgebra for structure and problems. We will also use Brilliant for interactive activities and puzzles that let you see patterns and test ideas in a visual way. You will explain your thinking often and learn that making progress on a hard problem is just as important as getting the final answer.

Grade 6 Mathematics

Grade 6 math focuses on fractions, ratios, equations, and geometry. This year prepares you for full algebra by helping you connect arithmetic skills to more formal mathematical thinking.

You will

- become fluent with all fraction operations

- work with equations and inequalities that include fractions and decimals

- learn how to use ratios, unit rates, and percents in real situations

- connect decimals, fractions, and percents

- study angles, polygons, circles, and area for a variety of shapes

- explore right triangles and the Pythagorean theorem

- interpret data and think about counting and probability

Art of Problem Solving Prealgebra is again the main text, and Brilliant provides visual supports and real world style problems. You will regularly move between pictures, numbers, and words to show that you truly understand what the math means.

Grade 7 Mathematics

Grade 7 math is your first full year of formal algebra. You will move beyond arithmetic and into symbolic reasoning, where letters and symbols help you describe patterns and solve many kinds of problems.

You will

- write and simplify algebraic expressions

- solve one step, two step, and multi step linear equations

- evaluate expressions with several variables

- use ratios and percents in more advanced contexts

- work with direct and inverse proportion

- graph lines on the coordinate plane and understand slope

- begin to use inequalities to describe ranges of solutions

We will use Art of Problem Solving Introduction to Algebra as the main text. Brilliant will give you visual tools for equation solving and graphing, and will help you connect equations, tables, and graphs. This course builds the algebra foundation you will need for the more advanced work in Grade 8 and in high school.

Grade 8 Mathematics

Grade 8 math completes the Introduction to Algebra book and is an advanced algebra course. You will study quadratics, functions, and exponential growth in depth, and you will develop strong symbolic skills that prepare you for high school mathematics.

You will

- solve quadratic equations in several ways, including factoring and using the quadratic formula

- use special factorization patterns and identities

- work with complex numbers at an introductory level

- graph quadratic functions and analyze their key features

- solve inequalities that involve both linear and quadratic expressions

- study functions, including transformations and basic inverse ideas

- work with polynomials, exponentials, and sequences

Art of Problem Solving Introduction to Algebra is again the core text. Brilliant supports your understanding with interactive graphs, function transformations, and growth models. By the end of this course you will have seen much of the algebra that appears in a first high school algebra course, and you will be ready for an honors level path.