Ninth - Twelfth Grade Course Options

With the emphasis on students understanding mathematical concepts and achieving deeper learning, educators teach mathematics differently than in the past. Students learn to "do math" through real-world situations and focus on connecting topics presented in a logical progression that leads to readiness for college, careers, and civic life.

All high school students are required to earn four mathematics credits. A student must be enrolled in a mathematics course each year in high school. Students begin their credit-bearing courses with Math I, Math II, and Math III or Algebra I, Geometry, and Algebra II. Generally, students take these credit-bearing courses in Grades 9-12, though some students begin taking them in middle school.

In addition, options for a fourth mathematic course available to students in either pathway include: Advanced Mathematical Modeling, Calculus, High School Mathematics IV, Trigonometry/Pre-Calculus, STEM Readiness, Transition Mathematics for Seniors, AP Calculus, AP Computer Science, and AP Statistics. Additional course options include dual credit mathematics courses and advanced mathematics courses offered through West Virginia Virtual School. The student's family, teachers, and counselors should discuss with the student which fourth year math course aligns with the plans of the student after high school.

Family Engagement

How to help your student succeed in mathematics:

- Make mathematics a part of your student's daily routine by:
  » Computing gas mileage
  » Calculating discounts and sales tax on purchases
  » Calculating interest paid on a credit card bill
  » Comparing the cost of cell phone plans
  » Examining how mathematics is used in careers

- Talk with the teacher about the problem-solving strategies and content your student is learning and practice those strategies at home.

- Visit the *math4life* website at: *https://wvde.us/math4life/* for information about:
  » Resources for families
  » Fostering success in mathematics
  » Information about what your student should master in each grade level
  » Activities to help with mathematics fluency and understanding
  » Links to the best apps and sites for practice and assistance in mathematics

West Virginia
math4life
What Students will Learn

9TH GRADE - 12TH GRADE
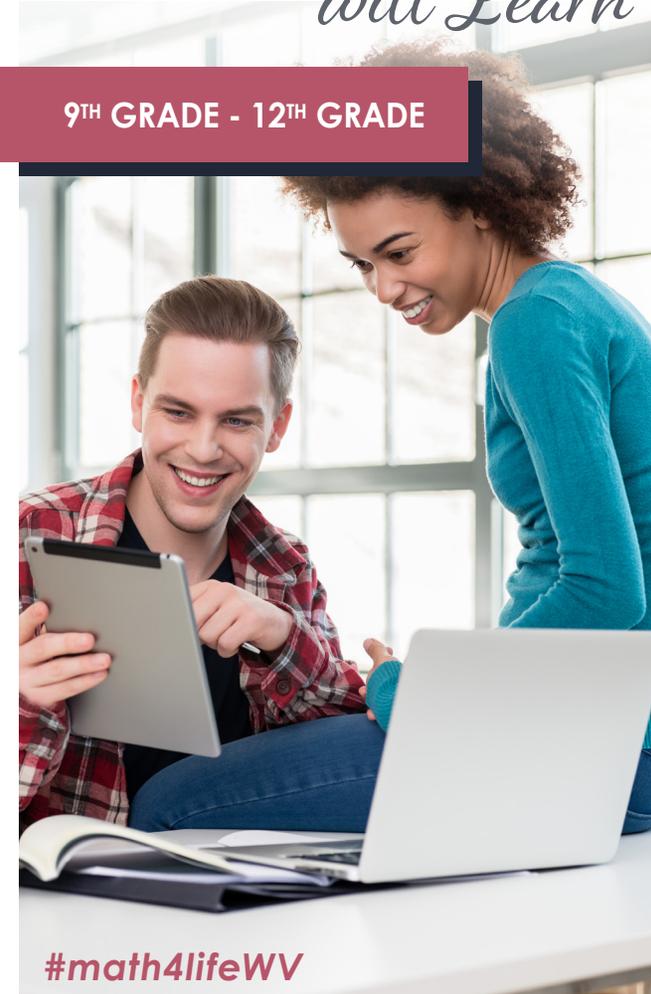
Mathematical Habits of Mind Thinking Skills for Life

MHM1: Make sense of problems and persevere to solve them.
Identify what the problem is asking and work until a solution is found.

MHM2: Reason abstractly and quantitatively.
Use reasoning to examine numbers and ideas.

MHM3: Construct viable arguments and critique the reasoning of others.
Use clear and precise language in discussions with others and to explain one's own reasoning.

MHM4: Model with Mathematics.
Represent problems in multiple ways using drawings, objects, charts, and equations.

MHM5: Use appropriate tools strategically.
Use math tools that will help solve a problem such as rulers, protractors, and drawings.

MHM6: Attend to precision.
Make sure the answer makes sense in the context of the problem.

MHM7: Look for and make use of structure.
Look for patterns and structure to gain understanding and speed in problem solving. Ex. 4 + 7 and 7 + 4 both equal 11.

MHM8: Look for and express regularity in repeated reasoning.
Look for repeated patterns in calculations.

For additional information about Mathematical Habits of Mind go to
https://wvde.us/math4life

College- and Career-Readiness*

Students in 11th grade will take the SAT as the high school summative assessment. The SAT Math Test is intended to collect evidence in support of the following claim about student performance.

"Students have fluency with, understanding of, and the ability to apply the mathematical concepts, skills, and practices that are central to their ability to progress through a range of college courses, career training, and career opportunities."

The SAT Math Test assesses students in four content areas.

Heart of Algebra

- Analyzing and fluently solving linear equations and systems of linear equations
- Creating linear equations and inequalities to represent relationships between quantities and to solve problems
- Understanding and using the relationship between linear equations and inequalities and their graphs to solve problems

Problem Solving and Data Analysis

- Creating and analyzing relationships using ratios, proportional relationships, percentages, and units
- Representing and analyzing quantitative data
- Finding and applying probabilities in context

Passport to Advanced Math

- Identifying and creating equivalent algebraic expressions
- Creating, analyzing, and fluently solving quadratic and other nonlinear equations
- Creating, using, and graphing exponential, quadratic, and nonlinear functions

Additional Topics in Math

- Solving problems related to area and volume
- Applying definitions and theorems related to lines, angles, triangles, and circles
- Working with right triangles, the unit circle, and trigonometric functions

Sample Problems for High School*

Sample problem 1

Anthony is staying at a hotel charging $99.95 per night plus tax for a room. A tax of 8% is applied to the room rate, and an additional one-time untaxed fee of $5 is charged by the hotel. Which of the following represents Anthony's total charge, in dollars, for staying x nights?

a) $(99.95 + 0.08x) + 5$
b) $1.08(99.95x) + 5$
c) $1.08(99.95x + 5)$
d) $1.08(99.95x + 5)x$

Choice b is correct. The total charge Anthony will pay is the room rate, the tax on the room rate, and the one-time untaxed fee.

Sample problem 2

A survey was conducted among a randomly chosen sample of US citizens about US voter participation in the most recent presidential election. The table below displays a summary of the survey results.

Reported Voting by Age (in thousands)

Age Group	Number who Voted	Number Surveyed
18- to 34-year-olds	30,329	63,008
35- to 54-year-olds	47,085	74,282
55- to 74-year-olds	43,075	59,998
More than 74-year-olds	12,459	17,794

According to the table, for which age group did the greatest percentage of people report they had voted?

a) 18- to 34-year-olds
b) 35- to 54-year-olds
c) 55- to 74-year-olds
d) More than 74-year-olds

Choice c is correct. This age group had the highest percentage of voters (approximately 72%).