

MATH CURRICULUM

(Boy's Version)

MATH COURSE OUTLINE

<u>Grade</u>	<u>Regular</u>	<u>Upper</u>
7	General Math 7 or Pre-Algebra	Algebra I, Part I
8	Pre-Algebra or Intro. to Algebra	Algebra I, Part II
9	Fundamentals of Algebra	Formal Geometry
10	Geometry or Informal Geometry	Algebra II/Trigonometry
11	Algebra II	Pre-calculus
12	Probability (AP Option)	Calculus (AP Option)

Flow Chart

MATH CURRICULUM

Grade 7, Regular Level

Course:

General Math 7/ Pre-Algebra

Course Goals:

The goal of the regular track is to prepare Middle School students for 9th grade Algebra. This year provides the groundwork of arithmetic concepts and skills for successful completion of Pre-Algebra in 8th grade.

Text:

Pre-Algebra by Charles, et. al. (One of several approved by Montgomery County Public Schools)

Additional Materials:

Pencil, **No Calculator**

Major Topics and/or Skills Taught:

- Algebraic Concepts
- Common Fractions
- Statistics
- Decimal Operations
- Geometry and Measurement

MATH CURRICULUM

Grade 7, Upper Level

Course:

Algebra 1, Part 1

Course Goals:

The upper level track prepares students for the Advanced Placement Calculus Exam at the end of High School. The Middle School years are used to provide a strong and rigorous grounding in Algebra to be used as the building blocks of higher level Algebra in High School. Pre-requisite arithmetic skills and teacher recommendation are required for entrance into this level. A grade of A/B average or better must be maintained in order to continue in the Honors Track.

Text:

Algebra Structure and Method Book 1, by Brown et al

Additional Materials:

Pencil, **No Calculator**

Major Topics and/or Skills Taught:

- Introduction to Algebra
- Working with Real Numbers
- Solving Equations and Problems
- Polynomials
- Factoring Polynomials
- Fractions

MATH CURRICULUM

Grade 8, Regular Level

Course:

Pre-Algebra

Course Goals:

The focus of the 8th grade curriculum is to learn the necessary Pre-Algebra skills in order to complete Algebra in the 9th grade.

Text:

Pre-Algebra by Charles, et. al. or Pre-Algebra by Glencoe Publisher

Additional Materials:

Pencil, **No Calculator**

Major Topics and/or Skills Taught:

- Algebraic Expressions and Integers
- Solving one-step equations and Inequalities
- Decimals and Equations
- Factors, Fractions, and Exponents
- Operations With Fractions
- Ratios, Proportions, and Percents
- Solving Equations and Inequalities
- Linear Functions and Graphing
- Spatial Thinking
- Area and Volume
- Right Triangles in Algebra
- Data Analysis and Probability
- Nonlinear Functions and Polynomials

MATH CURRICULUM

Grade 8, Upper Level

Course:

Algebra 1, Part 2

Course Goals:

Algebraic terminology and techniques are continued in the 8th grade year. Students complete a solid Algebra base for higher level math in High School. Entrance in this section is selective and based on a combination of teacher recommendation, prior math success, and intellectual maturity. A grade of A/B average or better must be maintained in order to continue in the Honors Track.

Text:

Algebra Structure and Method Book 2, by Brown et al

Additional Materials:

Pencil, **No Calculator**

Major Topics and/or Skills Taught:

- Applying Fractions
- Introduction to Functions
- Systems of Linear Equations
- Inequalities
- Rational and Irrational Numbers
- Quadratic Functions
- Introduction to Probability and Statistics

MATH CURRICULUM

Grade 9, Regular Level

Course:

Fundamentals of Algebra

Course Goals:

The goal of this course is to provide a solid Algebra experience for future courses in math including Geometry and Algebra II or Algebra II - SAT/Trigonometry.

Text:

Algebra 1 by Glencoe Publisher

Additional Materials:

Pencil, TI-83 Graphing Calculator Required

Major Topics and/or Skills Taught:

- Solving Linear Equations
- Graphing Relations and Functions
- Analyzing Linear Equations
- Solving Linear Inequalities
- Solving Systems of Linear Equations and Inequalities
- Polynomials
- Factoring
- Quadratic and Exponential Functions
- Radical Expressions and Triangles
- Rational Expressions and Equations
- Statistics
- Probability

MATH CURRICULUM

Grade 9, Upper Level

Course:

Formal Geometry**

Course Goals:

The goal of this course is to learn Geometry with a high level of abstraction and logic. Proofs are done throughout the course and are an integral portion of the course. Teacher recommendation is necessary for entrance into this section.

Text:

Geometry by Jurgensen et al

Additional Materials:

Pencil, Protractor/Compass at teacher's discretion
PSAT/SAT preparatory material

Major Topics and/or Skills Taught:

- Points, Lines, Planes, and Angles
- Parallel Lines and Planes
- Congruent Triangles
- Using Congruent Triangles
- Similar Polygons
- Right Triangles
- Circles
- Areas of Plane Figures
- Areas and Volumes of Solids
- Coordinate Geometry

** Proof-Oriented Geometry. Level of difficulty is higher than 10th grade Informal Geometry/Geometry.

MATH CURRICULUM

Grade 10, Regular Level

Course:

Informal Geometry or Geometry

Course Goals:

The goal of this course is to learn the foundations of Informal Geometry, with limited work with proofs, necessary to succeed on the math component of the SAT. A variety of extra-curricular materials are employed to prepare the students for the PSAT/SAT exams.

Text:

Geometry by Jurgensen, et. al. or Informal Geometry by Cox

Additional Materials:

Pencil, Protractor/Compass at teacher's discretion
PSAT/SAT preparatory material – Provided by teacher.

Major Topics and/or Skills Taught:

- Points, Lines, Planes, and Angles
- Parallel Lines and Planes
- Congruent Triangles
- Using Congruent Triangles
- Similar Polygons
- Right Triangles
- Circles
- Areas of Plane Figures
- Areas and Volumes of Solids
- Coordinate Geometry

MATH CURRICULUM

Grade 10, Upper Level

Course:

Algebra 2/Trigonometry

Course Goals:

The goal of this course is to review and extend Algebra skills and knowledge needed for successful completion of Calculus in the senior year. A graphing calculator is used in this course. Depending on the level of the students, Trigonometry will either be started or completed this year. A variety of extra-curricular materials are employed to prepare the students for the PSAT/SAT exams.

Text:

Advanced Mathematics by Brown

Additional Materials:

Pencil, Calculator (TI83 or better)

PSAT/SAT preparatory material provided by teacher.

Major Topics and/or Skills Taught:

- Linear and Quadratic Functions
- Polynomial Functions
- Inequalities
- Functions
- Exponents and Logarithms
- Analytic Geometry
- Trigonometric Functions
- Applications in Trigonometry

MATH CURRICULUM

Grade 11, Regular Level

Course:

Algebra 2/ Algebra 2 with Trigonometry/ Algebra SAT

Course Goals:

The goal of this course is to review Algebra I and continue amassing knowledge of additional algebraic topics. A graphing calculator will be introduced in this course. A variety of extra-curricular materials are employed to prepare the students for the PSAT/SAT exams.

Text:

Algebra 2 by Bellman, et.al.

Additional Materials:

Pencil, Graphing Calculator
SAT preparatory material

Major Topics and/or Skills Taught:

- Basic Concepts of Algebra
- Inequalities and Proof
- Linear Equations and Functions and Graphs
- Products and Factors of Polynomials
- Rational Expressions
- Irrational and Complex Numbers
- Quadratic Equations and Functions
- Variations and Polynomial Equations
 - TIME PERMITTING:
 - Analytic Geometry
 - Exponential and Logarithmic Functions
 - Topics in Trigonometry

MATH CURRICULUM

Grade 11, Upper Level

Course:

Pre-Calculus

Course Goals:

The goal of this course is to prepare students for Calculus the following year. A graphing calculator is required. Though called Pre-Calculus, this course introduces Calculus in the last quarter of the school year. A variety of extra-curricular materials are employed to prepare the students for the PSAT/SAT exams.

Text:

Advanced Mathematics by Brown
Calculus by Finney et al

Additional Materials:

Pencil, Calculator (TI83 or better)
SAT preparatory material

Major Topics and/or Skills Taught:

- Trigonometric Functions
- Trigonometric Equations and Applications
- Triangle Trigonometry
- Trigonometric Addition Formulas
- Polar Coordinates and Complex Numbers
- Sequences and Series
- Combinatorics
- Limits, Series, and Iterated Functions
- An Introduction to Calculus
- Prerequisites for Calculus
- Limits and Continuity
- Derivatives

MATH CURRICULUM

Grade 12, Regular Level

Course:

Business Math and Personal Finance

Course Goals:

The class will develop and reinforce practical financial skills for life, in order to enable the student to be effective at whatever he/she chooses in life (living on your own as a single person, marriage and family, work outside the home, work inside the home, volunteering, etc.). This course is designed to prepare students for the various personal financial decisions that will be made throughout their lives

CUC Credit earned for students receiving "B" or better for full year attendance.

Text(s):

Succeeding in the World of Work, Sixth Edition. By Kimbrell and Vineyard

National Endowment for Financial Education- High School Financial Planning Program

The Job Hunting Handbook, by Dahlstrom & Company

Financial Fitness for Life, by the National Council on Economic Education

Additional Materials:

Simple hand-held calculator- required by each student for each day's class discussion and for homework.

A 1 ½" three-ring binder is required for this class for the many handouts. A section in a larger binder is fine, but not recommended, as this notebook will probably be saved for future reference after graduation. This is needed by the beginning of the second week.

Supplemental handouts and worksheets from many sources will be provided for class exercises, including: Appreciating People (Including Yourself!), by Miriam Adahan, sections reprinted with permission; Please Understand Me, by David Keirse and Marilyn Bates

Personal Finance, By Karl Biedenweg, Understanding Maryland Taxes, published by the Maryland Internal Revenue Service, and Your Work Benefits, by William C. Schultheis.

Various Internet sites will be used during the class: for example:

SchoolsintheUSA.com (to research colleges and careers), *BLS.gov* (Occupational Outlook Handbook), *SBA.gov* (research entrepreneurship, and writing a business plan), *Stocksquest.com* (semester-long stock market simulation game), *IRS.gov*, *Carmax.com* (research purchasing a car), *moneyopolis.org*, etc....

Major Topics:

Unit 1: How much do I need to earn?- Introductory discussion of cost of living and budgeting

MATH CURRICULUM

Unit 2 Self-Assessment (includes the Myers-Briggs Type Indicator)/ Setting Goals / Making Financial decisions now and for the future

Unit 2: Exploring Careers: on-line research with the Occupational Outlook Handbook (and SchoolsintheUSA.com)

Unit 3: Finding a Job- includes writing a Resume and Cover letter, Job applications, and interview skills

Unit 4: Entrepreneurship – End of the semester team project: Develop a Business Plan and Presentation.

Unit 5: Personal Finance (Second Semester)–

Lesson 1: Types of Financial Institutions- mini-US Economics lesson, Checking Account use and reconciliation

Lesson 2: The Stock Market (StocksQuest game- introduced here and “play”/invest/manage portfolio for most of the semester)

Lesson 3: Savings and Investments;

Lesson 4: Credit – sources of credit, credit reports, debt (or how to avoid it), scams, rights

Lesson 5: Payroll Deductions

Lesson 6: Taxes (studied in April – using Federal and Maryland forms and on-line)

Lesson 7: Insurance

Lesson 8: Household Expenses - Renting or Buying a home/apartment;

Buying a car and “consumer durable goods”; Comparison Shopping;

Budgeting.

Skills Taught:

- Skills and Abilities self-assessment
- Analytical, Thinking and other business communication skills
- Resume writing and other job applications and interview skills
- Understand employee pay and deductions, including Federal and State taxes; keeping a budget and financial records including check writing guidelines and a variety of banking services.
- Personal Tax preparation
- Budget preparation
- Understand and track performance of stocks and other personal investments
- Basic discount calculations as needed for daily shopping and purchases
- Planning, research and comparison shopping for major household purchases including a car
- Understand credit ratings, types of credit, how to establish credit and ways to manage money in order to stay out of debt
- Understand the basic types of insurance and why and when they are necessary

MATH CURRICULUM

Grade 12, Regular Level

Course:

Probability and Statistics

Course Goals:

The goal of this course is to provide a solid introduction to Probability and Statistics topics that can later be taken in a college setting.

Text:

Elementary Statistics by Triola

Major Topics and/or Skills Taught:

Selected Material from:

- Introduction to Statistics
- Descriptive Statistics
- Probability
- Probability Distributions
- Normal Probability Distributions
- Estimates and Sample Sizes
- Testing Hypotheses
- Inferences from Two Samples
- Correlation and Regression

MATH CURRICULUM

Grade 12, Upper Level

Course:

Calculus (AP and Regular)

Course Goals:

The goal of this course is to master fundamental Calculus concepts in order to prepare students to perform well on the AP exam or in college level Calculus.

Text:

Calculus by Finney et al

Additional Materials:

Pencil, Calculator (TI83 or better)
School-provided AP Review Book

Major Topics and/or Skills Taught:

For Advanced Placement AB and BC:

- Applications of Derivatives
- The Definite Integral
- Differential Equations and Mathematical Modeling
- Applications of Definite Integrals
- L'Hôpital's Rule

For Advanced Placement BC only:

- Improper Integrals, and Partial Fractions
- Infinite Series
- Parametric, Vector, and Polar Functions]

MATH CURRICULUM

Grade 12

Course:

Accounting

Course Goals:

This course is designed to give the basics of accounting. It is an introduction to real world business recording and reporting standards and methods. Additionally, financial organization skills are learned for individual use. College credit may be earned for this course.

Text:

Glencoe, Accounting: Concepts, Procedures and Applications

Additional Materials:

QuickBooks Accounting Software

Major Topics and/or Skills Taught:

- The Basic Accounting Cycle
- Analyzing, Recording and Posting Business Transactions
- Preparing Worksheets and Financial Statements for a Sole Proprietorship
- Cash Control and Banking
- Accounting for a Merchandising Business
- Accounting for a Payroll System
- Accounting for Depreciation of Property and Equipment
- Accounting for Notes Payable and Receivable
- Analyzing and Interpreting Financial Statements

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