Bath Middle/High School
Math Curriculum Overview
Algebra I

Curriculum/Textbook: McGraw Hill Algebra I Common Core Edition
Student Website: http://connectED.mcgraw-hill.com
Standards: Math Common Core State Standards

Topics Covered

Semester 1	Semester 2
Relationships between Quantities Linear Relationships	Exponential and Quadratic Relationships Advanced Functions and Equations Data Analysis

Focus Skills and Concepts

- Solve equations with one and two variables.
- Solve equations involving more than one operation.
- Write equations for proportional and non-proportional relationships.
- Write linear equations in different forms.
- Solve linear inequalities involving more than one operation.
- Solve systems of equations by using elimination and substitution.
- Solve problems involving exponential growth and decay.
- Solve quadratic expressions and equations using different methods.
- Solve problems by using the Pythagorean Theorem.
- Solve radical equations.
- Multiply and divide rational expressions.
- Divide a polynomial by a monomial or binomial.
- Find probabilities by using random variables.

Essential questions students can answer at the end of the course:

- What are the steps to solve equations with two variables?
- How can you solve a system of equations?
- What are the different methods used to solve quadratic equations?
- How do you solve radical equations?
- What are the different uses of the Pythagorean Theorem in everyday life?

Prerequisite skills critical for success:

- Understanding of how to add, subtract, multiply, and divide rational numbers
- Know how to find percentages using proportions
- Understanding of basic geometric formulas of area and perimeter for rectangles, triangles, and circles
- Ability to find surface area and volume of three dimensional figures
- Know how to find simple probability and odds
- Basic organizational skills

Assessments & Examinations

Semester 1 Pre-Assessment
Semester 1 Exam
Semester 2 Pre-Assessment
Semester 2 Exam
Mid-Chapter Assessments
End of Chapter Assessments

Bath High School
Math Curriculum Overview
Geometry

Curriculum/Textbook: Glencoe Geometry by McGraw-Hill
Student Website: http://connected.mcgraw-hill.com/connected/login.do
Standards: Math Common Core State Standards

Topics Covered

Semester 1	Semester 2
Geometric Structure Congruence	Similarity Measurement

Focus Skills and Concepts

- Explain answers using proofs.
- Mathematically transform geometric figures.
- Identify and explain the properties of different polygons.
- Apply properties of similarity and congruence to geometric figures.
- Use measurement with various geometric figures.
- Calculate the area and perimeter of polygons and circles.
- Calculate the surface area and volume of three dimensional figures.
- Apply geometric probability as well as measurement to real-world situations.

Essential questions students can answer at the end of the course:

- How can mathematical relationships be used to find missing dimensions of geometric figures?
- What does it mean for objects to be similar or congruent?
- How can calculations related to two- and three-dimensional figures be applied to real-world situations in order to solve a problem?

Prerequisite skills critical for success:

- Know how to solve single and multi-step equations
- Understand how to plot points and lines on a graph
- Write the equation of a line
- Perform operations that include decimals, percentages and fractions quickly
- Explain how to arrive at a solution verbally

Major Projects

- Chapter 6 - Design fabric to be used to create clothing
- Chapter 12 - Build and design a cereal box that is unique and use properties of similarity and congruence to build a jumbo box of the same design

Assessments & Examinations

Chapter Tests 1-5, 7-11, 13
Semester 1 Exam
Semester 2 Exam

Bath High School
Math Curriculum Overview
Algebra II

Curriculum/Textbook: Glencoe Algebra 2 2014
Student Website: McGraw Hill Student Login Page
Standard Overview: Math Common Core State Standards

Topics Covered

Semester 1	Semester 2
Linear Relations and Functions Quadratic, Polynomial and Radical Function and Relations	Advanced Function and Relations Discrete Mathematics

Focus Skills and Concepts

- Classify real numbers.
- Solve expression and inequalities.
- Analyze linear relations and functions.
- Graph a linear equations and inequality.
- Solve systems of two equations by graphing, substitution, elimination, matrices and using a calculator.
- Solve quadratic equations by graphing, factoring, square root property, quadratic formula and using a calculator.
- Define an imaginary number and why we have them.
- Solve polynomials by graphing, long division, synthetic division and using a calculator.
- Determine the general shape of a polynomial function by highest degree.
- Find the inverse of a function.
- Simplify, graph and solve radical expressions.
- Graph and solve logarithmic and exponential equations.
- Use logarithmic and exponential function to model real-life problems.
- Solve radical equations by using the Least Common Multiple.
- Graph radical equations by finding vertical and horizontal asymptotes.
- Translate and dilate conic sections.
- Understand the equations for each conic section.
- Use arithmetic and geometric sequences and series to find sums and area under the curve.

- Classify statistical studies.
- Construct and compare data.
- Test hypotheses and check to see if the data is reliable.

Essential questions students can answer at the end of the course:

- What are all the most common polynomial functions and what does their general shape look like?
- How do we find zeros of polynomial functions, and how can we use the zeros?
- What are conic sections and how are they made?
- What type of function best describes a data set?
- How can you use data to answer questions or explain situations?

Prerequisite skills critical for success:

- Mastery of basic algebra skills:
  - Graphing a line
  - Solving a one variable equation
- Self-driven independent working skills
- Basic fluency with a graphing calculator

Assessments & Examinations

Chapter Tests
Semester 1 Exam (Chapters 1-6)
Semester 2 Exam (Chapters 6-11)

Bath High School
Math Curriculum Overview
Pre-Calculus

Curriculum/Textbook: PreCalculus by Mcgraw-Hill
Student Website: McGraw Hill Student Login Page
Standard Overview: Equivalent to first year college level program

Topics Covered

Semester 1	Semester 2
Functions from a Calculus Perspective Trigonometry Matrices	Conic Sections and Parametric Equations Polar Coordinates and Complex Numbers Sequences and Series Inferential Statistics

Focus Skills and Concepts

- Analyze functions continuity and end behavior with limits.
- Find extremas and average rate of change.
- Evaluate function composition and operations with functions.
- Use an equation to graph the transformations of parent functions.
- Identify and find inverse relationships algebraically and graphically.
- Solve power, radical, and polynomial functions.
- Use synthetic and long division of functions to solve polynomials.
- Use properties of logs and exponential functions to solve equations.
- Use the six trigonometric functions and their properties to solve and simplify equations.
- Use Radian mode and the unit circle to find trigonometric values.
- Use trigonometric identities to solve problems.
- Solve systems of equations using matrices.
- Use conic sections to write parametric equations.
- Find components and resultants of vectors and use them to solve real world problems.
- Gain a basic understanding of polar coordinates and how to graph complex numbers.
- Solve geometric, arithmetic, and infinite series and sequences.
- Use mathematical induction to prove mathematical relationships.
- Gain a basic understanding for analyzing statistics and distributions.

Essential questions students can answer at the end of the course:

- How can graphs tell me about the function?
- How does changing a function affect the graph?
- How do trigonometric functions behave?
- What is a polar coordinate and how does it relate to complex numbers?
- How do sequences or series behave and how can I write an equation for it?

Prerequisite skills critical for success:

- Mastery of basic algebra skills
- High success in Algebra II
- Self-driven independent working skills
- Basic fluency with a graphics calculator

Assessments & Examinations

Chapter Tests
Semester 1 Exam (Chapters 1-5)
Semester 2 Exam (Chapters 6-11)

Bath High School
Math Curriculum Overview
Advanced Placement Calculus

Curriculum/Textbook: Rogawski's Calculus for AP
Student Website: AP Calculus Planbook
Standard Overview: AP Calculus College Board

Topics Covered

Semester 1	Semester 2
Pre-Calc Review Limits Derivatives Application of Derivatives	Integrals Differential Equations Application of Integrals

Focus Skills and Concepts

- Work with functions represented in a variety of ways including graphical, numerical, analytical and verbal representations and understand the connections among these representations.
- Understand the meaning of the derivative in terms of the rate of change and local and linear approximation.
- Use the derivative and definite integral as tools to solve problems.
- Understand the relationship between the derivative and the definite integral.
- Understand the meaning of the definite integral both as a limit of Riemann sums and as the net accumulation of change.
- Articulate solutions to problems through clear, concise, and accurate verbal and written explanations.
- Model a written description of a physical situation with a function, a differential equation, or an integral.
- Use technology to help solve problems, experiment, interpret results and support conclusions.
- Determine the reasonableness of solutions, including sign, size, relative accuracy, and units of measurement.
- Develop an appreciation of calculus as a coherent body of knowledge and as human accomplishment.

Prerequisite skills critical for success in this class:

Before studying calculus, all students should complete four years of secondary mathematics designed for college-bound students: courses in which they study algebra, geometry, trigonometry, analytic geometry, and elementary functions.

Assessments & Examinations

Unit Tests

Semester 1 Exam

Semester 2 Exam

Bath High School
Math Curriculum Overview
College Statistics

Curriculum/Textbook: Pearson - Elementary Statistics
Student Website: College Statistics Fusion Page
Standards: Math Common Core Standards: Statistics & Probability

Topics Covered

One Semester Course
Interpreting Categorical & Quantitative Data Making Inferences & Justifying Conclusions Conditional Probability & the Rules of Probability Using Probability to Make Decisions

Focus Skills and Concepts

- Analyze data sets and explain the meaning of basic, descriptive statistics.
- Draft, develop, and finalize professional survey and data collection techniques to effectively gather information about student designed questions.
- Utilize probability models to develop and test hypotheses with sound, scientific methods in order to come to a conclusion about a sample or population.

Essential questions students can answer at the end of the course:

- What is the most effective way to gather and display data to support a hypothesis or projection?
- How are normal distributions and confidence intervals used and applied in the real world?
- How can I use descriptive statistics, proper data collection methods, and multi-tier analysis to come to a conclusion about a research question?

Prerequisite skills critical for success:

- Understanding of basic facts involving decimals, percentages, and introductory probability concepts.
- Addition, subtraction, multiplication, and division of fractions
- Proficient use of algebraic concepts
- Ability to apply basic counting principles and graph data and information

Major Projects

- Housing Project
- Da Vinci's Ratios Lab
- Paper Airplane Lab
- Experimental Design Project
- Normal Distribution Project
- Statistical Analysis Project

Assessments & Examinations

Unit 1 Test – Proper use of Statistics and Basic Descriptive Statistics
Normal Distribution Test
Confidence Intervals and Hypothesis Testing Test
College Statistics Final Exam

Bath High School
Math Curriculum Overview
Personal Finance

Course Overview: A project based class that teaches students how to manage their own finances.

Topics Covered

One Semester Course
Budgeting
Credit Card Use
Loans
Taxes
Insurance
Stock, Bonds, and Savings

<u>Focus Skills and Concepts</u>

- Create financial goals.
- Create a budget to meet financial goals.
- Know the basics of how to use and pay with a credit card.
- Use a Shumer box to find credit card information.
- Analyze how loans accumulate money and how they are paid.
- Identify the different types of loans.
- Understand how much we pay in taxes.
- Understand hidden taxes and where they are present.
- Understand the different types of insurance and when you need them.
- Identify ways to invest money.
- Know the difference between high risk and low risk investments.
- Understand how the stock market works.

<u>Essential questions students can answer at the end of the course:</u>

- How do I avoid overspending?
- How do I make smart purchases based on my financial state?
- What can I do to help my future self be financially secure?

Prerequisite skills critical for success:

- Knowledge of using percentages
- Basic computer skills

Projects

Future Budget Project
Credit Card “Paying the Minimum” Project
My First Mortgage Project
Taxes by State Project
Insurance That Is Right for Me Project
Making Money in the Market Project
Final: Budget for a Vacation