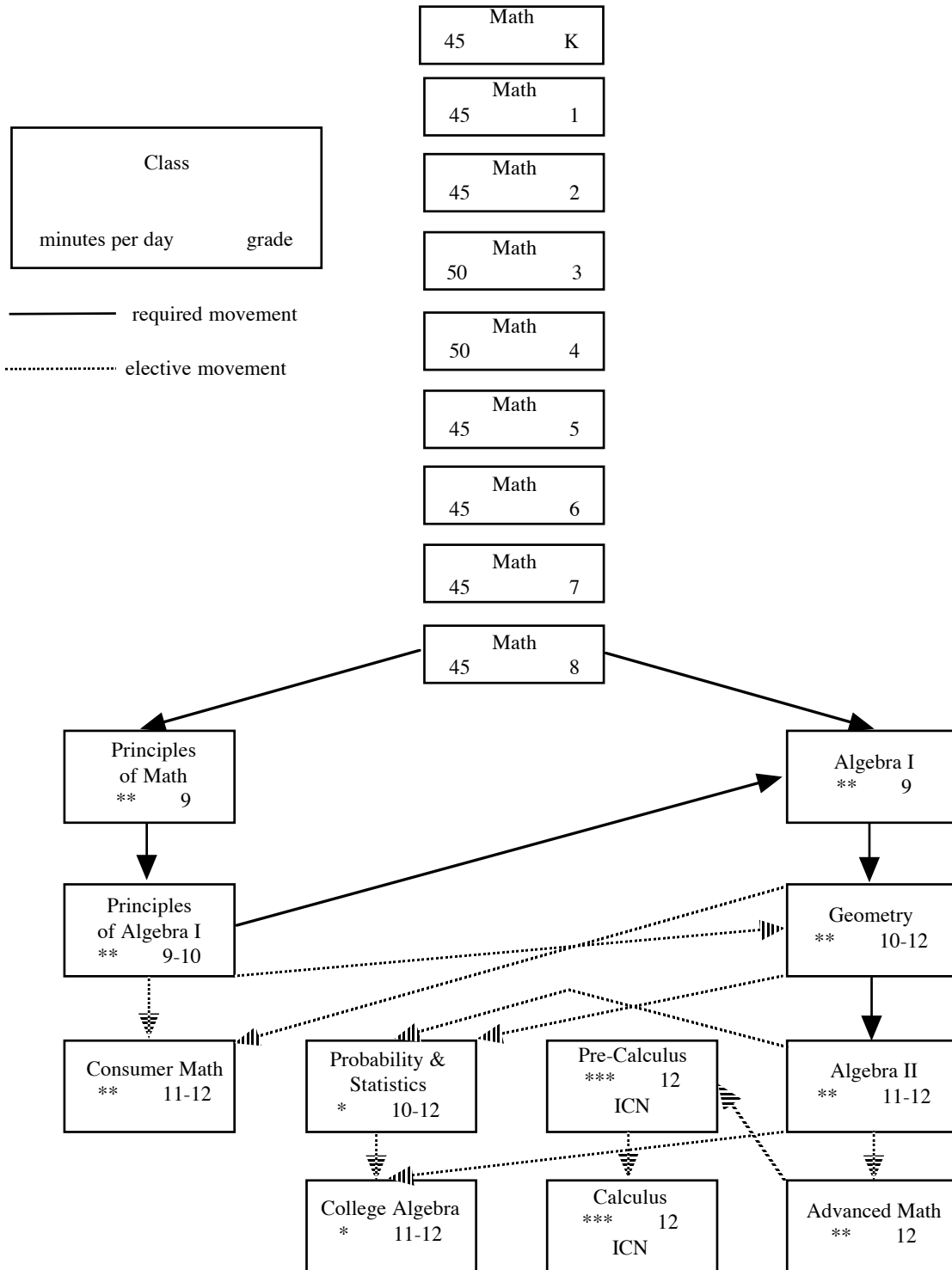


Mathematics Curriculum PROGRAM STRUCTURE



* = 80 minute block, 5 days per week for one term
 ** = 80 minute block, 5 days per week for two terms
 *** = Taught over ICN 90 minute period for one quarter

Mathematics Curriculum

Kindergarten -

STANDARD

benchmark

- 1 Effectively uses a variety of strategies in the problem-solving process
 - 4 Estimates the answer(s) to the problem
 - 5 Solves the problem
- 2 Understands and applies basic and advanced properties of the concept of numbers
 - 2 Understands characteristics of numbers.
 - 3 Understands relationships of numbers.
- 3 Uses basic and advanced procedures while performing the process of computation
 - 1 adds, subtracts, multiplies and divides real numbers.
- 4 Understands and applies basic and advanced properties of the concept of measurement
 - 1 understands the basic characteristics of measurements
 - 2 Uses appropriate tools for measurement
- 5 Understands and applies basic and advanced properties of the concepts of geometry
 - 1 Understands the basic characteristics of geometric figures
 - 2 understands the relationships among geometric figures
- 6 Understands and applies basic and advanced concepts of data analysis and distribution
 - 1 Reads and interprets data
- 7 Understands and applies basic and advanced concepts of probability and statistics
 - 1 understand the basic characteristics of probability
- 8 Understands and applies basic and advanced properties of functions and algebra
 - 1 Recognizes and extends a variety of patterns
- 9 Understands the general nature and uses of mathematics.
 - 3 Understands that mathematics often stimulate innovations in science and technology.

First Grade -

STANDARD

benchmark

- 1 Effectively uses a variety of strategies in the problem-solving process.
 - 1 Understands the problem needing to be solved
 - 2 Interprets the data given in the problem
 - 3 Identifies the strategy to be used in solving the problem
 - 4 Estimates the answer(s) to the problem
 - 5 Solves the problem
 - 7 Uses problem solving-solving real world problems.
- 2 Understands and applies basic and advanced properties of the concept of numbers
 - 1 Understands place value.
 - 2 Understands characteristics of numbers.
 - 3 Understands relationships of numbers.
- 3 Uses basic and advanced procedures while performing the process of computation
 - 1 adds, subtracts, multiplies and divides real numbers.
 - 3 Uses technology for computations
 - 4 Understand and uses correct order of operations

Mathematics Curriculum

- 4 Understands and applies basic and advanced properties of the concept of measurement
 - 1 understands the basic characteristics of measures
 - 2 Uses appropriate tools for measurement
- 5 Understands and applies basic and advanced properties of the concepts of geometry
 - 1 Understands the basic characteristics of geometric figures
 - 2 understands the relationships among geometric figures
- 6 Understands and applies basic and advanced concepts of data analysis and distribution
 - 1 Reads and interprets data
 - 2 Collects, organizes and represents data
- 8 Understands and applies basic and advanced properties of functions and algebra
 - 1 Recognizes and extends a variety of patterns
- 9 Understands the general nature and uses of mathematics.
 - 1 Understands that numbers and the operations performed on them can be used to describe things in the real world
 - 2 Understands that mathematics is used to solve practical problems

Second Grade - STANDARD benchmark

- 1 Effectively uses a variety of strategies in the problem-solving process
 - 1 Understands the problem needing to be solved
 - 2 Interprets the data given in the problem
 - 3 Identifies the strategy to be used in solving the problem
 - 4 Estimate the answer(s) to a given problem
 - 5 Solves the problem
 - 6 Checks the answer(s) for accuracy and reasonableness
- 2 Understands and applies basic and advanced properties of the concept of numbers
 - 1 Understands place value.
 - 2 Understands characteristics of numbers.
 - 3 Understands relationships of numbers.
- 3 Uses basic and advanced procedures while performing the process of computation
 - 1 adds, subtracts, multiplies and divides real numbers.
- 4 Understands and applies basic and advanced properties of the concept of measurement
 - 1 understands the basic characteristics of measurements
 - 2 Uses appropriate tools for measurement
- 5 Understands and applies basic and advanced properties of the concepts of geometry
 - 1 Understands the basic characteristics of geometric figures
 - 2 understands the relationships among geometric figures
- 6 Understands and applies basic and advanced concepts of data analysis and distribution
 - 1 Reads and interprets data
 - 2 Collects, organizes and represents data
- 8 Understands and applies basic and advanced properties of functions and algebra
 - 1 Recognizes and extends a variety of patterns
 - 3 Understands and constructs mathematical models

Mathematics Curriculum

- 9 Understands the general nature and uses of mathematics.
 - 1 Understands that mathe is a study of any pattern
 - 3 Understands that mathematics often stimulate innovations in science and technology.

Third Grade -

STANDARD

benchmark

- 1 Effectively uses a variety of strategies in the problem-solving process
 - 1 Understands the problem needing to be solved
 - 2 Interprets the daata given in the problem
 - 3 Identifies the strategy to be used in solving the problem.
 - 4 Estimates the answer(s) to the problem
 - 5 Solves the problem.
 - 6 Checks the answer(s) for accuracy and reasonableness
 - 7 Uses problem-solving process to solve real world problems
- 2 Understands and applies basic and advanced properties of the concept of numbers
 - 1 Understands place value.
 - 3 Understands relationships of numbers.
- 3 Uses basic and advanced procedures while performing the process of computation
 - 1 adds, subtracts, multiplies and divides real numbers.
 - 3 Uses technology for computations
 - 4 Understand and uses correct order of operations
- 4 Understands and applies basic and advanced properties of the concept of measurement
 - 1 understands the basic characteristics of measures
 - 2 Uses appropriate tools for measurement
- 5 Understands and applies basic and advanced properties of the concepts of geometry
 - 1 Understands the basic characteristics of geometric figures
 - 2 understands the relationships among geometric figures
 - 3 Uses appropriate tools for geometric measurement and construction
- 6 Understands and applies basic and advanced concepts of data analysis and distribution
 - 1 Reads and interprets data
 - 2 Collects, organizes and represents data
- 7 Understands and applies basic and advanced concepts of probability and statistics
 - 1 understand the basic characteristics of probability
- 8 Understands and applies basic and advanced properties of functions and algebra
 - 1 Recognizes and extends a variety of patterns
 - 3 Understands and constructs mathematical models
- 9 Understands the general nature and uses of mathematics
 - 1 Understands that numbers and the operations performed on them can be used to describe things in the real world
 - 2 Understands that mathematics is used to solve practical problems

Mathematics Curriculum

Fourth Grade -

STANDARD

benchmark

- 1 Effectively uses a variety of strategies in the problem-solving process
 - 2 Interprets the data given in the problem
 - 3 Identifies the strategy to be used in solving the problem
 - 4 Estimate the answer(s) to a given problem
 - 5 Solves the problem
 - 6 Checks the answer(s) for accuracy and reasonableness
 - 7 Checks the answer(s) for accuracy and reasonableness

- 2 Understands and applies basic and advanced properties of the concept of numbers
 - 1 Understands place value.
 - 3 Understands relationships of numbers.
- 3 Uses basic and advanced procedures while performing the process of computation
 - 1 adds, subtracts, multiplies and divides real numbers.
 - 3 Uses technology for computations
 - 4 Understand and uses correct order of operations

- 4 Understands and applies basic and advanced properties of the concept of measurement
 - 1 understands the basic characteristics of measurements
 - 2 Uses appropriate tools for measurement
 - 3 Understands and calculates formulas for finding measures
 - 4 Converts units of measurements

- 5 Understands and applies basic and advanced properties of the concepts of geometry
 - 1 Understands the basic characteristics of geometric figures
 - 3 Uses appropriate tools for geometric measurement and construction
 - 4 Uses properties of and relationships among figures to solve geometric problems

- 6 Understands and applies basic and advanced concepts of data analysis and distribution
 - 1 Reads and interprets data
 - 2 Collects, organizes and represents data
 - 3 Understand and applies measures of central tendency and variability

- 7 Understands and applies basic and advanced concepts of probability and statistics
 - 1 understand the basic characteristics of probability

- 8 Understands and applies basic and advanced properties of functions and algebra
 - 1 Recognizes and extends a variety of patterns

- 9 Understands the general nature and uses of mathematics
 - 1 Understands that math is a study of any pattern
 - 2 Understands that mathematics is used to solve practical problems

Fifth Grade -

STANDARD

benchmark

- 1 Effectively uses a variety of strategies in the problem-solving process
 - 1 Understands the problem needing to be solved
 - 3 Identifies the strategy to be used in solving the problem
 - 5 Solves the problem
 - 6 Checks the answer(s) for accuracy and reasonableness
 - 7 Checks the answer(s) for accuracy and reasonableness

Mathematics Curriculum

- 2 Understands and applies basic and advanced properties of the concept of numbers
 - 1 Understands place value.
 - 2 Understands characteristics of numbers.
 - 3 Understands relationships of numbers.
- 3 Uses basic and advanced procedures while performing the process of computation
 - 1 adds, subtracts, multiplies and divides real numbers.
 - 3 Uses technology for computations
 - 4 Understand and uses correct order of operations
- 4 Understands and applies basic and advanced properties of the concept of measurement
 - 1 understands the basic characteristics of measurements
 - 2 Uses appropriate tools for measurement
 - 3 Understands and calculates formulas for finding measures
 - 4 Converts units of measurements
- 5 Understands and applies basic and advanced properties of the concepts of geometry
 - 1 Understands the basic characteristics of geometric figures
 - 2 understands the relationships among geometric figures
 - 3 Uses appropriate tools for geometric measurement and construction
 - 4 Uses properties of and relationships among figures to solve geometric problems
- 6 Understands and applies basic and advanced concepts of data analysis and distribution
 - 1 Reads and interprets data
 - 2 Collects, organizes and represents data
- 7 Understands and applies basic and advanced concepts of probability and statistics
 - 1 understand the basic characteristics of probability
 - 3 Determines probability and statistics using mathematical theoretical models
- 8 Understands and applies basic and advanced properties of functions and algebra
 - 2 Understands appropriate terminology and notation used to define functions and their properties
- 9 Understands the general nature and uses of mathematics
 - 1 Understands that mathe is a study of any pattern
 - 2 Understands that mathematics is used to solve practical problems

Sixth Grade -

STANDARD

benchmark

- 1 Effectively uses a variety of strategies in the problem-solving process.
 - 1 Understands the problem needing to be solved
 - 2 Interprets the data given in the problem
 - 3 Identifies the strategy to be used in solving the problem
 - 4 Estimate the answer(s) to a given problem
 - 5 Solves the problem
 - 6 Checks the answer(s) for accuracy and reasonableness
 - 7 Checks the answer(s) for accuracy and reasonableness
- 2 Understands and applies basic and advanced properties of the concept of numbers
 - 1 Understands place value.
 - 2 Understands characteristics of numbers.
 - 3 Understands relationships of numbers.

Mathematics Curriculum

- 3 Uses basic and advanced procedures while performing the process of computation
 - 1 adds, subtracts, multiplies and divides real numbers.
 - 3 Uses technology for computations
 - 4 Understand and uses correct order of operations
 - 5 Adds, subtracts, multiplies and divides algebraic expressions
- 4 Understands and applies basic and advanced properties of the concept of measurement
 - 1 understands the basic characteristics of measurements
 - 2 Uses appropriate tools for measurement
 - 3 Understands and calculates formulas for finding measures
- 5 Understands and applies basic and advanced properties of the concepts of geometry
 - 1 Understands the basic characteristics of geometric figures
 - 3 Uses appropriate tools for geometric measurement and construction
 - 4 Uses properties of and relationships among figures to solve geometric problems
- 6 Understands and applies basic and advanced concepts of data analysis and distribution
 - 1 Reads and interprets data
 - 2 Collects, organizes and represents data
 - 3 Understand and applies measures of central tendency and variability
- 7 Understands and applies basic and advanced concepts of probability and statistics
 - 2 Understands and applies the basic characteristics of statistics
- 8 Understands and applies basic and advanced properties of functions and algebra
 - 1 Recognizes and extends a variety of patterns
- 9 Understands the general nature and uses of mathematics
 - 2 Understands that mathematics is used to solve practical problems

Seventh Grade -

STANDARD

benchmark

- 1 Effectively uses a variety of strategies in the problem-solving process
 - 3 Identifies the strategy to be used in solving the problem
 - 5 Solves the problem
- 2 Understands and applies basic and advanced properties of the concept of numbers
 - 1 Understands place value.
 - 2 Understands characteristics of numbers.
- 3 Uses basic and advanced procedures while performing the process of computation
 - 1 adds, subtracts, multiplies and divides real numbers.
 - 3 Uses technology for computations
- 4 Understands and applies basic and advanced properties of the concept of measurement
 - 1 understands the basic characteristics of measurement
 - 3 Understands and calculates formulas for finding measurement
 - 4 Converts units of measurements
- 5 Understands and applies basic and advanced properties of the concepts of geometry
 - 1 Understands the basic characteristics of geometric figures
 - 4 Uses properties of and relationships among figures to solve geometric problems

Mathematics Curriculum

- 6 Understands and applies basic and advanced concepts of data analysis and distribution
 - 1 Reads and interprets data
 - 2 Collects, organizes and represents data
- 7 Understands and applies basic and advanced concepts of probability and statistics
 - 1 understand the basic characteristics of probability
 - 2 Understands and applies the basic characteristics of statistics
 - 3 Determines probability and statistics using mathematical theoretical models
- 8 Understands and applies basic and advanced properties of functions and algebra
 - 1 Recognizes and extends a variety of patterns
 - 3 Understands and constructs mathematical models

Eighth Grade - STANDARD benchmark

- 1 Effectively uses a variety of strategies in the problem-solving process
 - 1 Understands the problem to be solved
 - 3 Identifies the strategy to be used in solving the problem
 - 5 Solves the problem.
- 2 Understands and applies basic and advanced properties of the concept of numbers
 - 1 Understands place value.
 - 2 Understands characteristics of numbers.
- 3 Uses basic and advanced procedures while performing the process of computation
 - 1 adds, subtracts, multiplies and divides real numbers.
 - 3 Uses technology for computations
 - 4 Understand and uses correct order of operations
- 4 Understands and applies basic and advanced properties of the concept of measurement
 - 1 understands the basic characteristics of measures
 - 3 Understands and calculates formulas for finding measures
 - 4 Converts units of measurements
- 5 Understands and applies basic and advanced properties of the concepts of geometry
 - 1 Understands the basic characteristics of geometric figures
 - 4 Uses properties of and relationships among figures to solve geometric problems
- 6 Understands and applies basic and advanced concepts of data analysis and distribution
 - 1 Reads and interprets data
 - 2 Collects, organizes and represents data
- 7 Understands and applies basic and advanced concepts of probability and statistics
 - 1 understand the basic characteristics of probability
 - 2 Understands and applies the basic characteristics of statistics
 - 3 Determines probability and statistics using mathematical theoretical models
- 8 Understands and applies basic and advanced properties of functions and algebra
 - 1 Recognizes and extends a variety of patterns
 - 3 Understands and constructs mathematical models

Mathematics Curriculum

PRINCIPLES OF MATHEMATICS

COURSE RATIONALE

Principles of math is an elective course which provides students with hands on experience, as well as a basic foundation for higher mathematics courses. Students work with numbers and variables and learn the process of solving problems in a systematic way. They practice measuring techniques, convert answers from one unit to another, and use formulas to solve a variety of problems. Emphasis is placed on practical application of mathematical skills, higher order thinking skills, and communication skills, which are essential in today's world.

COURSE DESCRIPTION

Principles of math is a year-long, co-educational, two-credit, elective course available to freshmen, sophomores, juniors, and seniors. Through instruction in this course, the student will explore numbers and sets of numbers, estimate and round answers, practice measuring techniques, convert answers from one unit to another, analyze information, and present it in graphs, and use formulas to solve a variety of word problems. Using a hands on, practical approach, the student is actively involved in learning math concepts that will prepare him/her for higher math courses and/or for skills needed in life.

COURSE GOALS

Affective domain:

The student appreciates the importance of developing mathematical skills in order to solve problems.

Cognitive domain:

The student understands the various mathematical skills necessary to solve problems.

Psychomotor domain:

The student practices the mathematical skills necessary to solve problems.

Career goal:

The student learns about possible careers in the mathematical field.

COURSE OUTLINE/TIMELINE

I. Orientation	(1 day)
A. Course rationale and content overview	
B. Teacher expectations and student outcomes	
C. Classroom rules and grading procedure	
II. Getting to know your calculator	(2-3 days)
III. Naming numbers in different ways	(2-3 days)
IV. Finding answers with your calculator	(2-3 days)
V. Learning problem-solving techniques	(4-5 days)
A. Four steps	
B. Types of problems	
VI. Estimating answers	(3-4 days)
VII. Measuring in English and metric units	(5-6 days)
VIII. Using graphs, charts, and tables	(5-6 days)
IX. Dealing with data	(4-5 days)
X. Working with lines and angles	(4-5 days)
XI. Working with shapes in two dimensions	(4-5 days)
XII. Working with shapes in three dimensions	(5-6 days)
XIII. Using ratios and proportions	(4-5 days)
XIV. Working with scale drawings	(5-6 days)
XV. Using signed numbers and vectors	(5-6 days)
XVI. Using scientific notation	(4-5 days)
XVII. Precision, accuracy, and tolerance	(5-6 days)
XVIII. Solving problems with powers and roots	(5-6 days)

COURSE RESOURCES

CORD

Applied Mathematics

1988

Mathematics Curriculum

Principles of Mathematics

STANDARD

benchmark

- 1 Effectively uses a variety of strategies in the problem-solving process
 - 1 Understands the problem needing to be solved
 - 2 Interprets the data given in the problem
 - 3 Identifies the strategy to be used in solving the problem
 - 4 Estimates the answer(s) to the problem
 - 5 Solves the problem
 - 6 Checks the answer(s) for accuracy and reasonableness
 - 7 Uses problem-solving process to solve real world problems
- 2 Understands and applies basic and advanced properties of the concept of numbers
 - 1 Understands place value.
 - 2 Understands characteristics of numbers.
 - 3 Understands relationships of numbers.
- 3 Uses basic and advanced procedures while performing the process of computation
 - 1 adds, subtracts, multiplies and divides real numbers.
 - 3 Uses technology for computations
 - 4 Understand and uses correct order of operations
- 4 Understands and applies basic and advanced properties of the concept of measurement
 - 2 Uses appropriate tools for measurement
 - 3 Understands and calculates formulas for finding measures
 - 4 Converts units of measurements
- 5 Understands and applies basic and advanced properties of the concepts of geometry
 - 1 Understands the basic characteristics of geometric figures
 - 2 understands the relationships among geometric figures
 - 3 Uses appropriate tools for geometric measurement and construction
 - 4 Uses properties of and relationships among figures to solve geometric problems
- 6 Understands and applies basic and advanced concepts of data analysis and distribution
 - 1 Reads and interprets data
 - 2 Collects, organizes and represents data
 - 3 Understand and applies measures of central tendency and variability
- 9 Understand the general nature and uses of mathematics
 - 1 Understands that numbers and the operations performed on them can be used to describe things in the real world
 - 2 Understands that mathematics is used to solve practical problems
 - 3 Understands that mathematics often stimulate innovations in science and technology.

PRINCIPLES OF ALGEBRA

RATIONALE

Principles of Algebra is an elective course which provides students with hands on experience, as well as a basic foundation for higher mathematics courses. Students work with numbers and variables, use formats, read and draw graphs, solve problems, and work with statistics and probabilities. Emphasis is placed on practical application of algebraic skills, higher order thinking skills, and communication skills, which are essential in today's world.

Mathematics Curriculum

COURSE DESCRIPTION

Principles of Algebra is a year-long, co-educational, two-credit, elective course available to freshmen, sophomores, juniors, and seniors. Through instruction in this course, the student will solve linear and nonlinear equations, graph data, work with statistics and probabilities, use formulas and trigonometric functions, factor polynomials, identify patterns and functions, solve quadratics, systems of equations and inequalities and work with geometry in the workplace. Using hands on, practical approach, the student is actively involved in learning algebra concepts that will prepare him/her for higher math courses and/or skills needed in life.

COURSE GOALS

Affective Domain:

The student appreciates the importance of developing algebraic skills in order to solve problems.

Cognitive Domain:

The student understands various algebraic skills necessary to solve problems.

Psychomotor Domain:

The student practices the algebraic skills necessary to solve problems.

Career Goal:

The student learns about possible careers in the algebraic field.

COURSE OUTLINE

- | | |
|---|-------------|
| I. Orientation (1 day) | |
| II. Solving problems that involve linear equations | (7-8 days) |
| III. Graphing data | (7-8 days) |
| IV. Solving problems that involve nonlinear equations | (8-10 days) |
| V. Working with statistics | (7-8 days) |
| VI. Working with probabilities | (7-8 days) |
| VII. Using right-triangle relationships | (7-8 days) |
| VIII. Using trigonometric functions | (7-8 days) |
| IX. Factoring | (8-10 days) |
| X. Patterns and functions | (7-8 days) |
| XI. Quadratics | (8-10 days) |

COURSE RESOURCES

CORD

Applied Mathematics

1988

Principles of Algebra

STANDARD

benchmark

- Effectively uses a variety of strategies in the problem-solving process.
 - Understands the problem needing to be solved
 - Interprets the data given in the problem
 - Identifies the strategy to be used in solving the problem
 - Estimates the answer(s) to the problem
 - Solves the problem
 - Checks the answer(s) for accuracy and reasonableness
 - Uses problem-solving process to solve real world problems
- Understands and applies basic and advanced properties of the concept of numbers
 - Understands relationships of numbers.
- Uses basic and advanced procedures while performing the process of computation
 - adds, subtracts, multiplies and divides real numbers.
 - Uses technology for computations
 - Understand and uses correct order of operations
 - Adds, subtracts, multiplies and divides algebraic expressions

Mathematics Curriculum

- 4 Understands and applies basic and advanced properties of the concept of measurement
 - 1 understands the basic characteristics of measures
 - 2 Uses appropriate tools for measurement
 - 3 Understands and calculates formulas for finding measures
- 5 Understands and applies basic and advanced properties of the concepts of geometry
 - 1 Understands the basic characteristics of geometric figures
 - 3 Uses appropriate tools for geometric measurement and construction
 - 4 Uses properties of and relationships among figures to solve geometric problems
- 6 Understands and applies basic and advanced concepts of data analysis and distribution
 - 1 Reads and interprets data
 - 2 Collects, organizes and represents data
 - 3 Understand and applies measures of central tendency and variability
- 7 Understands and applies basic and advanced concepts of probability and statistics
 - 1 understand the basic characteristics of probability
 - 2 Understands and applies the basic characteristics of statistics
 - 3 Determines probability and statistics using mathematical theoretical models
- 8 Understands and applies basic and advanced properties of functions and algebra
 - 1 Recognizes and extends a variety of patterns
 - 2 Understands appropriate terminology and notation used to define functions and their properties
 - 3 Understands and constructs mathematical models
 - 4 Determine the algebraic equation of a function
- 9 Understands the general nature and uses of mathematics
 - 1 Understands that numbers and the operations performed on them can be used to describe things in the real world
 - 2 Understands that mathematics is used to solve practical problems
 - 3 Understands that mathematics often stimulate innovations in science and technology.

ALGEBRA I COURSE RATIONALE

Algebra I is an elective course which provides students with the foundation for higher mathematics courses. Students work with variables, as well as numbers. They translate words into algebraic symbols and sentences into equations and inequalities. They then solve problems of various types. In addition, students graph linear and quadratic equations and inequalities. Emphasis is placed on higher order thinking skills, as well as communication skills, which are essential in today's world.

COURSE DESCRIPTION

Algebra I is a year-long, co-educational, two-credit, elective course available to freshmen, sophomores, juniors and seniors. Through instruction in this course, the student will review sets and the number systems. Considerable time is spent solving and graphing linear and quadratic equations and also inequalities. There is a detailed study of exponents and radicals. Algebraic concepts are further studied by applying the principles of practical story problems. Algebra I provides many beneficial skills which can be used in many of the other high school courses. Algebra I is a prerequisite for Geometry, Algebra II, and College Preparatory Mathematics.

COURSE GOALS

AFFECTIVE DOMAIN:

The student appreciates the importance of developing algebraic skills in order to solve problems.

COGNITIVE DOMAIN:

The student understands the various algebraic skills necessary to solve problems.

PSYCHOMOTOR DOMAIN:

The Student practices the algebraic skills necessary to solve problems.

CAREER GOAL:

The student learns about possible careers in the mathematics area.

Mathematics Curriculum

COURSE OUTLINE/TIMELINE

I. ORIENTATION		(1 DAY)
A. Course Rationale & Content Overview		
B. Teacher Expectations & Student Outcomes		
C. Classroom Rules & Grading Procedure		
II. INTRODUCTION TO ALGEBRA		(14 DAYS)
A. Variables & Equations		
B. Applications & Problem Solving		
C. Numbers on a Line		
III. WORKING WITH REAL NUMBERS		(13 DAYS)
A. Addition & Subtraction		
B. Multiplication		
C. Division		
IV. SOLVING EQUATIONS & PROBLEMS		(15 DAYS)
A. Transforming Equations		
B. Solving Problems		
C. Extending Problem Solving Skills		
V. POLYNOMIALS		(16 DAYS)
A. Addition & Subtraction		
B. Multiplication		
C. Problem Solving		
VI. FACTORING POLYNOMIALS		(20 DAYS)
A. Quotients & Factoring		
B. Products & Factors		
C. Factoring Patterns		
D. General Factoring & Its Application		
VII. FRACTIONS		(14 DAYS)
A. Algebraic Fractions		
B. Adding & Subtracting Fractions		
C. Polynomial Division		
VIII. APPLYING FRACTIONS		(15 DAYS)
A. Ratio & Proportion		
B. Fractional Equations		
C. Percent Problems		
D. Mixture & Work Problems		
E. Problems Involving Exponents		
IX. INTRODUCTION TO FUNCTIONS		(16 DAYS)
A. Using Two Variables		
B. Linear Equations		
C. Functions		
D. Variation		
X. SYSTEMS OF LINEAR EQUATIONS		(15 DAYS)
A. Solving Systems		
B. Application		
XI. INEQUALITIES		(14 DAYS)
A. Inequalities in One Variable		
B. Combining Open Sentences		
C. Inequalities in Two Variables		
XII. RATIONAL & IRRATIONAL NUMBERS		(15 DAYS)
A. Rational Numbers		
B. Irrational Numbers		
C. Radical Expressions		
XIII. QUADRATIC FUNCTIONS		(12 DAYS)
A. Quadratic Equations		
B. Using Quadratic Equations		
C. Variation		

Mathematics Curriculum

COURSE RESOURCES

Algebra: Structure & Method

by Brown & Others, (Houghton-Mifflin)

Algebra I

STANDARD

benchmark

- 1 Effectively uses a variety of strategies in the problem-solving process
 - 2 Interprets the data given in the problem
 - 3 Identifies the strategy to be used in solving the problem
 - 7 Uses problem-solving process to solve real world problems
 - 2 Understands and applies basic and advanced properties of the concept of numbers
 - 1 Understands place value.
 - 2 Understands characteristics of numbers.
 - 3 Understands relationships of numbers.
 - 3 Uses basic and advanced procedures while performing the process of computation
 - 5 Adds, subtracts, multiplies and divides algebraic expressions
 - 4 Understands and applies basic and advanced properties of the concept of measurement
 - 1 understands the basic characteristics of measures
 - 3 Understands and calculates formulas for finding measures
 - 5 Understands and applies basic and advanced properties of the concepts of geometry
 - 4 Uses properties of and relationships among figures to solve geometric problems
 - 6 Understands and applies basic and advanced concepts of data analysis and distribution
 - 2 Collects, organizes and represents data
 - 8 Understands and applies basic and advanced properties of functions and algebra
 - 2 Understands appropriate terminology and notation used to define functions and their properties
 - 3 Understands and constructs mathematical models
-

GEOMETRY

COURSE RATIONALE

Geometry is studied since it provides understanding of meaning of proof; develop & uses deductive reasoning skills; extends and strengthens math vocabulary and problem solving abilities in situations using points, lines, planes, angles, polygons and circles. The geometric skills studied are necessary for success in higher Math and Science classes as well as real world applications.

COURSE DESCRIPTION

Grade Level--10, 11, 12

Prerequisite--Algebra I

Geometry is a year-long, co-educational, two-credit, elective course available to sophomores, juniors, and seniors. Through instruction in this course, the student will attain an extensive study of the following; geometric symbols and abbreviation, basic assumptions and definitions, meaning of the proof, parallel lines, basic constructions, and loci, triangles, congruence, quadrilaterals, circles, inequalities, ratio and proportion, similar polygons, area, regular polygons, perpendicular lines, volumes, the Pythagorean Theorem, numerical trigonometry, coordinate geometry, vectors, and transformations. Students will be expected to use definitions, postulates, axioms, and proven theorems to develop an understanding of the meaning and nature of the mathematical proof. Students will be expected to improve and develop the quality of thinking and reasoning in both mathematical and non-mathematical situations. Students will be expected to attain the best possible preparation for more advanced mathematics and other related subjects.

Mathematics Curriculum

COURSE GOALS

The student appreciates the role of geometry in today's world by its being useful in solving many practical problems in the physical and life sciences, the social sciences, and the humanities.

The student understands how to reason deductively as well as the geometric concepts and algebraic skills used in computation.

The student practices reasoning skills and geometric and algebraic skills in mathematical and non-mathematical situations.

COURSE OUTLINE/TIMELINE

- I. POINTS, LINES, PLANES, AND ANGLES (2 WEEKS)
 - A. Points
 - B. Lines
 - C. Planes
 - D. Segments
 - E. Rays
 - F. Distance
 - G. Angles
 - H. Postulates and Theorems Relating
 - I. Constructions Points, Lines, and Planes
- II. DEDUCTIVE REASONING (3 WEEKS)
 - A. If-Then statements; Converses
 - B. Properties from Algebra I
 - C. Two Column Proofs
 - D. Planning a Proof
 - E. Special Pairs of Angles
 - F. Perpendicular Lines
 - G. Constructions
- III. PARALLEL LINES AND PLANES (2 WEEKS)
 - A. Definitions
 - B. Properties of Parallel Lines
 - C. Proving Lines Parallel
 - D. Angles of a Triangle
 - E. Angles of a Polygon
 - F. Inductive Reasoning
 - G. Constructions
- IV. CONGRUENT TRIANGLES (3 WEEKS)
 - A. Ways to Prove Triangles Congruent
 - B. Using Congruent Triangles
 - C. Isosceles Triangle Theorems
 - D. Using More Than One Pair of Congruent Triangles
 - E. Proving Overlapping Triangles Congruent
 - F. Medians, Altitudes, and Perpendicular Bisectors
 - G. Constructions
- V. QUADRILATERALS (3 WEEKS)
 - A. Properties of Parallelograms
 - B. Ways to Prove Quadrilaterals are Parallelograms
 - C. Theorems Involving Parallel Lines
 - D. Properties of the Rhombus
 - E. Properties of the Rectangle
 - F. Properties of the Square
 - G. Properties of the Trapezoid and Isosceles Trapezoid
 - H. Constructions

Mathematics Curriculum

- VI. INEQUALITIES IN GEOMETRY (2 WEEKS)
- A. Inequalities
 - B. Inverses and Contrapositives
 - C. Indirect Proof
 - D. Inequalities for one Triangle
 - E. Inequalities for two Triangles
- VII. SIMILAR POLYGONS (3 WEEKS)
- A. Ratio
 - B. Proportion
 - C. Similar Polygons
 - D. Similar Triangles
 - E. Proportional Lengths
 - F. Constructions
- VIII. RIGHT TRIANGLES (3 WEEKS)
- A. Similarity in Right Triangles
 - B. Pythagorean Theorem
 - C. Converse of Pythagorean Theorem
 - D. Special right Triangles
 - E. Tangent Ratio
 - F. Sine Ratio
 - G. Cosine Ratio
 - H. Applications of Right Triangle Trigonometry
 - I. Constructions
- IX. CIRCLES (3 WEEKS)
- A. Tangents
 - B. Arcs
 - C. Chords
 - D. Inscribed Angles
 - E. Central Angles
 - F. Other Angles
 - G. Circles and Lengths of Segments
 - H. Constructions
- X. AREAS OF PLANE FIGURES (4 WEEKS)
- A. Areas of Squares
 - B. Areas of Rectangles
 - C. Areas of Parallelograms
 - D. Areas of Triangles
 - E. Areas of Rhombuses
 - F. Areas of Trapezoids
 - G. Areas of Regular Polygons
 - H. Circumferences and Areas of Circles
 - I. Arc Lengths and Areas of Sectors
 - J. Areas of Segments
 - K. Ratios of Areas
 - L. Geometric Probability
- XI. AREAS AND VOLUMES OF SOLIDS (3 WEEKS)
- A. Prisms
 - B. Pyramids
 - C. Cylinders
 - D. Cones
 - E. Spheres
 - F. Areas and Volumes of Similar Solids

Mathematics Curriculum

XII. COORDINATE GEOMETRY

(3 WEEKS)

- A. Distance Formula
- B. Slopes of Lines
- C. Parallel and Perpendicular Lines
- D. Vectors
- E. Midpoint Formula
- F. Graphing Linear Equations
- G. Writing Linear Equations
- H. Organizing Coordinate Proofs
- I. Coordinate Geometry Proofs

XIII. TRANSFORMATIONS

(2 WEEKS)

- A. Mappings and Functions
- B. Reflections
- C. Translations
- D. Glide Reflections
- E. Rotations
- F. Dilations
- G. Symmetry

COURSE RESOURCES

TEXTBOOKS:

Geometry,

Houghton-Mifflin,

1990

Geometry

STANDARD

benchmark

- 1 Effectively uses a variety of strategies in the problem-solving process
 - 7 Uses problem-solving process to solve real world problems
 - 8 Understands and solves mathematical proofs
 - 2 Understands and applies basic and advanced properties of the concept of numbers
 - 3 Understands relationships of numbers.
 - 3 Uses basic and advanced procedures while performing the process of computation
 - 5 Adds, subtracts, multiplies and divides algebraic expressions
 - 4 Understands and applies basic and advanced properties of the concept of measurement
 - 3 Understands and calculates formulas for finding measures
 - 5 Understands and applies basic and advanced properties of the concepts of geometry
 - 1 Understands the basic characteristics of geometric figures
 - 2 understands the relationships among geometric figures
 - 3 Uses appropriate tools for geometric measurement and construction
 - 4 Uses properties of and relationships among figures to solve geometric problems
 - 7 Understands and applies basic and advanced concepts of probability and statistics
 - 1 understand the basic characteristics of probability
 - 8 Understands and applies basic and advanced properties of functions and algebra
 - 2 Understands appropriate terminology and notation used to define functions and their properties
 - 3 Understands and constructs mathematical models
 - 4 Determine the algebraic equation of a function
 - 9 Understands the general nature and uses of mathematics
 - 1 Understands that numbers and the operations performed on them can be used to describe things in the real world
-

Mathematics Curriculum

ALGEBRA II

COURSE RATIONALE

Algebra II provides needed review of first year Algebra. Algebra II is studied so its mathematical ideas can be used in everyday applications as well as in the Sciences. The Algebra II skills studied are necessary for success in higher math and science classes. Integration of technology prepares students for participation in a technological society.

COURSE DESCRIPTION

Grade Level--11, 12

Prerequisite--Algebra I and Geometry

Algebra II is a year-long, co-educational, two-credit, elective course available to juniors and seniors. Through instruction in this course, the student will receive a thorough review of the basic concepts underlying mathematics and algebra. These ideas are then developed and extended to more general applications. The review and extend approach are included in the first eight chapters. Complex numbers are introduced and given extensive coverage throughout the text. The concept of function is given broad coverage, including quadratic, exponential, and logarithmic functions. Other topics include coordinate geometry, real exponents, and conic sections. Elementary probability, sequences and series, determinants, and trigonometric topics are covered as time permits. Students will be expected to achieve competency in these areas.

COURSE GOALS

The student appreciates the basic concepts of algebra needed for further study in mathematics.

The student understands the basic algebraic skills and algebraic concepts.

The student uses these algebraic skills in mathematical and non-mathematical situations.

COURSE OUTLINE

- | | |
|--|-----------|
| I. REAL NUMBERS | (2 WEEKS) |
| A. Variables | |
| B. Subsets and Relationships of these | |
| 1. Whole numbers | |
| 2. Natural numbers | |
| 3. Integers | |
| 4. Rational numbers | |
| 5. Irrational numbers | |
| C. Operations with Real Numbers | |
| D. Postulates for Real Numbers | |
| E. Equation Solving | |
| F. Story Problems | |
| 1. Age | |
| 2. Integer | |
| G. Theorems and Proofs | |
| II. EQUATIONS AND INEQUALITIES | (2 WEEKS) |
| A. Solving Equations for Variables | |
| B. Solving Absolute Value Equations | |
| C. Solving Inequalities | |
| D. Properties of Order/Proof | |
| III. GRAPHING | (2 WEEKS) |
| A. Coordinate Plane | |
| B. Graphing Equations with Two Variables | |
| C. Slopes | |
| D. Parallel and Perpendicular Lines | |
| E. Equations of a Line | |
| F. Direct Variation and Proportion | |
| G. Graphing Inequalities | |

Mathematics Curriculum

- IV. SYSTEMS OF SENTENCES (3 WEEKS)
- A. Solving Linear Systems by Graphing
 - B. Solving Linear Systems by Addition
 - C. Solving Linear Systems by Substitution
 - D. Consistent and Inconsistent Systems
 - E. Determinants
 - F. Third Order Determinants
 - G. Solving Systems of Linear Inequalities
 - H. Story Problems
- V. RELATIONS AND FUNCTIONS (3 WEEKS)
- A. Constant Functions
 - B. Identity Function
 - C. Absolute Value Functions
 - D. Greatest Integer Function
 - E. Signum Function
 - F. Linear Functions
 - G. Composite Functions
 - H. Inverse Relations
- VI. POLYNOMIALS (3 WEEKS)
- A. Addition
 - B. Subtraction
 - C. Multiplication
 - D. Division
 - E. Factoring
 - F. Remainder and Factor Theorem
 - G. Problem Solving and Applications: Area
- VII. RATIONAL EXPRESSIONS (3 WEEKS)
- A. Simplification
 - B. Multiplication
 - C. Division
 - D. Addition and Subtraction
 - E. Solving Equations with Rational Expressions
 - F. Story Problems
 - 1. Distance/Rate/Time
 - 2. Work/Rate/Problems
- VIII. RADICALS/QUADRATIC FUNCTIONS (3 WEEKS)
- A. Simplifying Radicals
 - B. Adding and Subtracting Radicals
 - C. Solving Radical Equations
 - D. Distance Formula
 - E. Midpoint Formula
 - F. Coordinate Proofs
 - G. Quadratic Functions
 - H. Maximum and Minimum
 - I. Role of a in $y=ax^2$
 - J. Role of b in $y=ax^2+bx+c$
 - K. Role of c in $y=ax^2+bx+c$
- IX. COMPLEX NUMBERS (3 WEEKS)
- A. Pure Imaginary Numbers
 - B. Addition and Subtraction of Complex Numbers
 - C. Multiplication and Division of Complex Numbers
 - D. Completing the Square
 - E. Factoring
 - F. Quadratic Formula
 - G. Sum and Product of Roots
 - H. Locating Real Zeros

Mathematics Curriculum

- X. CONIC SECTIONS (3 WEEKS)
- A. Circle
 - B. Ellipse
 - C. Parabola
 - D. Hyperbola
 - E. Rectangula Hyperbola
 - F. Inverse/Joint Variation
 - G. Second Degree Inequalities
 - H. Systems of First and Second Degree Equations
 - I. Systems of Two Second Degree Equations
- XI. EXPONENTIAL AND LOGARITHMIC FUNCTIONS (3 WEEKS)
- A. Negative Exponents
 - B. Scientific Notation
 - C. Rational Exponents
 - D. Radicals and Exponents
 - E. Exponential Equations
 - F. Properties of Logarithms
 - G. Computing with Logarithms
 - H. Interpolation
- XII. SEQUENCES AND SERIES (2 WEEKS)
- A. Sequences
 - B. Arithmetic Sequences
 - C. Geometric Sequences
 - D. Arithmetic Series
 - E. Geometric Series
 - F. Sum of Infinite Geometric Series
- XIII. SYSTEMS OF SENTENCES: THREE VARIABLES (2 WEEKS)
- A. Graphing in Three Space
 - B. Solving Three Variable Three Equation Systems
 - C. Augmented Matrix Method
 - D. Addition and Subtraction of Matrices
 - E. Multiplication of Matrices
 - F. Inverse of Matrix
- XIV. PROBABILITY (1 WEEK)
- A. Permutations
 - B. Permutations of Elements Not All Different
 - C. Combinations
 - D. Probability
 - E. Mutually Exclusive Events
 - F. Conditional Probability
- XV. TRIGONOMETRIC FUNCTIONS (1 WEEK)
- A. Sine Function
 - B. Cosine Function
 - C. Tangent Function
 - D. Cotangent Function
 - E. Cosecant Function
 - F. Secant Function

COURSE RESOURCES

TEXTBOOK

Algebra II, An Integrated Approach.

D.C. Heath.

1995

Mathematics Curriculum

Algebra II

STANDARD benchmark

- 1 Effectively uses a variety of strategies in the problem-solving process
 - 7 Uses problem-solving process to solve real world problems
 - 8 Understands and solves mathematical proofs
 - 2 Understands and applies basic and advanced properties of the concept of numbers
 - 3 Understands relationships of numbers.
 - 3 Uses basic and advanced procedures while performing the process of computation
 - 5 Adds, subtracts, multiplies and divides algebraic expressions
 - 4 Understands and applies basic and advanced properties of the concept of measurement
 - 3 Understands and calculates formulas for finding measures
 - 5 Understands and applies basic and advanced properties of the concepts of geometry
 - 1 Understands the basic characteristics of geometric figures
 - 2 understands the relationships among geometric figures
 - 3 Uses appropriate tools for geometric measurement and construction
 - 4 Uses properties of and relationships among figures to solve geometric problems
 - 7 Understands and applies basic and advanced concepts of probability and statistics
 - 1 understand the basic characteristics of probability
 - 8 Understands and applies basic and advanced properties of functions and algebra
 - 2 Understands appropriate terminology and notation used to define functions and their properties
 - 3 Understands and constructs mathematical models
 - 4 Determine the algebraic equation of a function
 - 9 Understands the general nature and uses of mathematics
 - 1 Understands that numbers and the operations performed on them can be used to describe things in the real world
-

CONSUMER MATH

COURSE RATIONALE

Consumer Math is studied since it provides students with consumer solving skills and critical thinking skills. It provides opportunities to improve mathematical skills. The consumer math topics covered are real world applications. Education in these areas will increase student's ability to make wise and economical consumer choices.

COURSE DESCRIPTION

Grade Level--12

Prerequisite--Two years of math

Consumer Math is a year-long, co-educational, two-credit, elective course available to juniors and seniors. Through instruction in this course the student will review addition, subtraction, multiplication, division, percentages, and fraction skills. The course covers in detail such topics as income tax, social security, property taxes and consumer purchasing. Emphasis is also place in areas of banking and interest, insurance, employability skills, stocks and bonds, loans, automobile ownership and cost of housing. A review of the metric system is also included. This class is designed for students who have had, at most, two years of math study. Students will be expected to improve necessary math skills to make good consumer choices.

COURSE GOALS

The student appreciates the critical thinking skills and problem-solving skills necessary to survive in a consumer world.

The student understands the critical thinking skills and problem-solving skills that justify good consumer choices.

The student uses the necessary applied math skills to make wise consumer choices.

Mathematics Curriculum

COURSE OUTLINE/TIMELINE

- I. CONSUMER CALCULATIONS (2 WEEKS)
 - A. Calculation Methods
 - B. Estimation
 - C. Calculating Sums
 - D. Calculating Differences
 - E. Calculating Products
 - F. Calculating Quotients
- II. SOLVING CONSUMER PROBLEMS (2 WEEKS)
 - A. Problem Solving Guidelines
 - B. Tables and Graphs
 - C. Finding Data and Advice
 - D. Solving Multi-Step Problems
 - E. Using Formulas
 - F. Reasonable Answers
 - G. Choosing and Applying Problem-Solving Strategies
- III. USING FRACTIONS (2 WEEKS)
 - A. Addition
 - B. Subtraction
 - C. Multiplication
 - D. Division
- IV. USING PERCENTS (2 WEEKS)
 - A. Percent Comparisons
 - B. Finding Percent of a Number
 - C. Finding What Percent One Number is of Another
 - D. Find Percent of Increase or Decrease
 - E. Percent Equivalents
- V. EARNING MONEY (2 WEEKS)
 - A. Computing Wages
 - B. Computing Overtime Pay
 - C. Comparing Benefits
 - D. Tips
 - E. Commission
 - F. Piecework
 - G. Finding a Job
- VI. PERSONAL FINANCE (2 WEEKS)
 - A. Checking Accounts
 - B. Borrowing Money and Interest
 - C. Savings Accounts
 - D. Budgeting
- VII. SPENDING MONEY (2 WEEKS)
 - A. Grocery Shopping
 - B. Buying on Sale
 - C. Installment Buying
 - D. Credit Cards
 - E. Buying from a Catalog
 - F. Renting Instead of Buying
 - G. Local Telephone Service
 - H. Cost of Long Distance Calls
 - I. Add-Ons and Discounts

Mathematics Curriculum

VIII. USING CONSUMER INFORMATION	(2 WEEKS)
A. Organizing Data	
B. Mean	
C. Mode	
D. Median	
E. Sports Statistics	
F. Line Graphs	
G. Bar Graphs	
H. Misleading Graphs	
I. Trimmed Mean	
IX. PROBABILITY	(2 WEEKS)
A. Problems of Chance	
B. Probability and Odds	
C. Compound Probability	
D. Expectation	
E. Counting Problems	
F. Arrangements	
X. NUTRITION	(2 WEEKS)
A. Calorie Intake	
B. Reading Labels	
C. Diet Planning	
D. Food Catering	
E. Comparing Costs	
F. Food Production	
XI. HEALTH AND FITNESS	(2 WEEKS)
A. Health Insurance	
B. Fitness Programs	
C. Life Insurance	
XII. TAXES	(2 WEEKS)
A. Sales Tax	
B. Withholding Tax	
C. Social Security Tax	
D. Federal Income Tax	
E. State and Local Income Tax	
F. Property Tax	
G. Gift, Estate, and Excise Tax	
XIII. USING A CAR	(2 WEEKS)
A. Car Expenses	
B. Automobile Liability Insurance	
C. Collision Insurance	
D. Comprehensive Insurance	
E. Renting a Car	
F. Maintenance and Repairs	
XIV. TRANSPORTATION	(2 WEEKS)
A. Riding a Bus	
B. Traveling by Taxi	
C. Mileage Charts	
D. Riding a Train	
E. Air Travel	
XV. HOUSING	(2 WEEKS)
A. Financing a House	
B. Closing Costs	
C. Utility Costs	
D. Homeowners and Renters Insurance	
E. Energy Conservation	
F. Renting a House	

Mathematics Curriculum

- XVI. HOME IMPROVEMENTS (2 WEEKS)
 - A. Painting
 - B. Decorating
 - C. Adding on to the House
 - D. Landscaping
 - E. Tiling
 - F. Roofing
- XVII. TRAVEL AND LEISURE (2 WEEKS)
 - A. Planning a Trip
 - B. Hotels and Motels
 - C. Exchanging Currency
 - D. Boating
 - E. Golf
 - F. Scuba Diving
 - G. Photography
- XVIII. INVESTMENTS AND RETIREMENT (2 WEEKS)
 - A. Buying Stocks and Bonds
 - B. Investing in Mutual Funds
 - C. Investing in Collectibles
 - D. Compound Interest
 - E. Social Security
 - F. Retirement Plans

COURSE RESOURCES

TEXTBOOKS:

<u>Consumer Mathematics.</u>	Houghton-Mifflin,	1982
<u>Consumer Mathematics.</u>	Addison-Wesley,	1989
<u>Business Mathematics.</u>	Gregg/McGraw-Hill,	1971

Consumers Math

STANDARD benchmark

- 1 Effectively uses a variety of strategies in the problem-solving process
 - 5 Solves the problem
 - 7 Checks the answer(s) for accuracy and reasonableness
- 2 Understands and applies basic and advanced properties of the concept of numbers
 - 1 Understands place value.
- 3 Uses basic and advanced procedures while performing the process of computation
 - 1 adds, subtracts, multiplies and divides real numbers.
 - 3 Uses technology for computations
- 4 Understands and applies basic and advanced properties of the concept of measurement
 - 2 Uses appropriate tools for measurement
 - 4 Converts units of measurements
- 6 Understands and applies basic and advanced concepts of data analysis and distribution
 - 1 Reads and interprets data
 - 3 Understand and applies measures of central tendency and variability

Mathematics Curriculum

COLLEGE ALGEBRA

COURSE RATIONALE

College Algebra provides an extension of Algebra II topics. College Algebra is studied so success in higher math and science classes can be achieved. Incorporating technology prepares students for participation in a technological society. College credit can be earned by successful completion of this class.

COURSE DESCRIPTION

College Algebra is a one-term elective course available to juniors and seniors. Topics covered include the Real Numbers and their properties, linear equations, and inequalities, systems of equations, exponents, powers, and roots, quadratic equations, equations of second degree and their graphs, and exponential and logarithmic functions, and sequences and series. This class can be taken for high school and/or college credit as arranged with the instructor. It is taught over the fiber optics system.

COURSE GOALS

The student appreciates the detailed concepts of algebra needed for further study in mathematics.

The student understands the basic algebraic skills and algebraic concepts.

The student uses these algebraic skills in mathematical and non-mathematical situations.

COURSE OUTLINE/TIMELINE

- | | |
|--|----------|
| I. Fundamental Algebra | (6 days) |
| A. Real Number System | |
| B. Exponents | |
| C. Binomial Theorem | |
| D. Factoring | |
| E. Rational Expressions | |
| F. Radicals | |
| G. Complex Numbers | |
| II. Equations and Inequalities | (5 days) |
| A. Linear Equations | |
| B. Quadratic Equations | |
| C. Inequalities | |
| D. Absolute Value Equations and Inequalities | |
| E. Story Problem Applications | |
| III. Functions and Graphs | (5 days) |
| A. Linear Equations | |
| B. Equations of a Line | |
| C. Symmetry Rules | |
| D. Inverse Functions | |
| IV. Polynomial and Rational Functions | (6 days) |
| A. Quadratic Functions | |
| B. Synthetic Division | |
| C. Rational Zeroes of Polynomial Functions | |
| D. Rational Functions | |
| V. Exponential and Logarithmic Functions | (5 days) |
| A. Exponential Equations | |
| B. Logarithmic Equations | |
| VI. Systems of Equations and Inequalities | (6 days) |
| A. Properties of Matrices | |
| B. Determinants | |
| C. Partial Fractions | |
| VII. Analytic Geometry | (6 days) |
| A. Parabolas | |
| B. Ellipses | |
| C. Hyperbolas | |
| D. Circles | |

Mathematics Curriculum

- VIII. Further Topics (6 days)
- A. Arithmetic Series and Sequences
 - B. Geometric Series and Sequences
 - C. Binomial Theorem
 - D. Mathematical Induction

COURSE RESOURCES

- Algebra: Structure & Method by Brown & Others, (Houghton-Mifflin)
Fundamentals of College Algebra by Miller, (Harper Collins) 1994

College Algebra

STANDARD

benchmark

- 1 Effectively uses a variety of strategies in the problem-solving process
 - 1 Uses problem solving process to solve real world problems involving roots and exponents
 - 4 Represent real-world problems using algebraic functions and graphs of those functions
 - 7 Uses problem solving process to solve real world problems involving roots and exponents
 - 16 Uses mathematical induction to solve problems
 - 2 Understands and applies basic and advanced properties of the concepts of numbers
 - 3 Understands basic characteristics of exponents
 - 9 Has a basic understanding of the concept of inequalities
 - 3 Uses basic and advanced procedures while performing the process of computation
 - 1 Adds, subtracts, Multiplies and divides algebraic
 - 4 Understands and applies basic and advanced properties of the concept of measurement
 - 12 Understands basic generalization about the nature of graphs
 - 5 Understands and applies basic and advanced properties of the concepts of geometry
 - 7 Describes a spatial relationship in geometric terms ...symmetrical
 - 6 Understands and applies basic and advanced concepts of data analysis and distribution
 - 1 Understands the basic features of data sets (matrices)
 - 8 Understands and applies basic and advanced properties of functions and algebra
 - 7 Fits alone to a set of points
 - 9 Understands the general nature and uses of mathematics
 - 1 Understands that math is a study of any pattern
-

Mathematics Curriculum

ADVANCED MATH

COURSE RATIONALE

Advanced Mathematics is studied to provide the ground work for further study of mathematics at the college level since all standard precalculus topics are taught. Numerous application are worked to establish the importance of math to everyday life and a variety of scientific and technical fields. Integration of technology prepares student for participation in technological society.

COURSE DESCRIPTION

Grade Level--12

Prerequisite--Geometry and Algebra II

Advanced Math is a year-long, co-educational, two-credit, elective course available to seniors. Through instruction in this course the student will obtain an in-depth study of trigonometry the first semester. Varied topics such as vectors, matrices, conic sections, sequences, series, limits, exponential, and logarithmic functions and the derivative are studied second semester. This math class is intended for the college bound student and is an absolute necessity for students interested in taking engineering, physics, chemistry, or mathematics in college. Students will be expected to work several college placement tests. The student also should obtain necessary skills to meet or exceed pre calculus requirements of virtually all colleges and universities.

COURSE GOALS

The student appreciates precalculus through a thorough study of all the necessary mathematical skills used to satisfy precalculus requirements of any college.

The student understands math skills expected of university freshman.

The student uses these precalculus math skills and critical thinking skills to achieve competence in mathematics.

COURSE OUTLINE/TIMELINE

- I. NUMBERS, RELATIONS, FUNCTIONS (3 WEEKS)
 - A. Real Numbers
 - B. Postulates, Definitions, and Proof
 - C. Solving and Graphing Inequalities
 - D. Mathematical Induction
 - E. Binomial Theorem
 - F. Absolute Value
 - G. Mappings, Composition, and Inverses of functions
 - H. Complex Numbers
- II. CIRCULAR FUNCTIONS (4 WEEKS)
 - A. Distance
 - B. Wrapping Function
 - C. Sine Function
 - D. Cosine Function
 - E. Graphs of Sine and Cosine Function
 - 1. Amplitude
 - 2. Period
 - 3. Phase Shift
 - F. Tangent Function
 - G. Identities
 - H. Cotangent Function
 - I. Secant Function
 - J. Cosecant Function
 - K. Graphs of Tangent, Cotangent, Secant, and Cosecant functions
- III. TRIGONOMETRY (5 WEEKS)
 - A. Radian Measure
 - B. Trig Functions and Triangles
 - C. Trig and Circular Functions
 - D. Reduction Formulas
 - E. Sum and Difference Identities for Cosine

Mathematics Curriculum

- F. Sum and Difference Identities for Sine
- G. Sum and Difference Identities for Tangent
- H. Double and Half Angle Identities
- I. Sum and Product Identities
- IV. APPLYING TRIG (4 WEEKS)
 - A. Law of Sines
 - B. Law of Cosines
 - C. Area
 - D. Finding Angles
 - E. Inverse Circular Functions
 - F. Trig Equations
 - G. Trig Inequalities
 - H. Complex Numbers in Polar Forms
 - I. De Moivre's Theorem, Roots, and Power
 - J. Polar Coordinates
 - K. Graphs of Polar Equations
- V. EXPONENTIAL AND LOGARITHMIC FUNCTIONS (2 WEEKS)
 - A. Rational and Real Exponents
 - B. Number e
 - C. The Function $f(x) = e^x$
 - D. Inverses
 - E. Logarithmic Functions
 - F. Logarithms with Special Bases
- VI. CONIC SECTIONS (2 WEEKS)
 - A. Ellipse
 - B. Hyperbola
 - C. Parabola
 - D. Translating Conics
 - E. Rotations of Conics
- VII. VECTORS, LINES, AND PLANES (4 WEEKS)
 - A. Addition, Subtraction, and Multiplication of Vectors
 - B. Basis Vectors
 - C. Perpendicular Basis
 - D. Dividing a Segment into any Ratio
 - E. Lines in Two Space
 - F. Angle Between Two Vectors in Three Space
 - G. Parallel and Perpendicular Lines: Distance
 - H. Cross Product of Two Vectors
 - I. Equation of a Plane
 - J. Intersecting Planes and Distance
- VIII. MATRICES, VECTORS, AND LINEAR TRANSFORMATIONS (4 WEEKS)
 - A. Addition and Subtraction of Matrices
 - B. Multiplication of Matrices
 - C. Inverses of Matrices
 - D. Determinants of Matrices
 - E. Homogeneous Systems of Equations
 - F. Nonhomogeneous Systems of Equations
 - G. Special Linear Transformations
 - H. Rotations about Origin
 - I. Compositions of Linear Transformations
 - J. Translations

Mathematics Curriculum

- IX. FUNCTIONS AND LIMITS (3 WEEKS)
- A. Sequences and their Limit
 - B. Series and their Limits
 - C. Graphing Sequences and Open Intervals
 - D. Neighborhoods and Sequence
 - E. Convergent Sequences
 - F. Divergent Sequence
- X. FUNCTIONS AND LIMITS (3 WEEKS)
- A. Sequences and Functions
 - B. Limit of a Function at a Point $x=a$
 - C. Limit Theorems and Polynomials
 - D. Rational Functions and Discontinuities
 - E. Derived Function's Definition
 - F. Geometric Interpretation of the Derived Function
 - G. Rules for finding $f'(x)$

COURSE RESOURCES

TEXTBOOK: Advanced Math, Houghton/Mifflin; 1992
PreCalculus, D.C. Heath, 1993

Advanced Math

STANDARD benchmark

- 1 Effectively uses a variety of strategies in the problem-solving process
 - 7 Uses problem-solving process to solve real world problems
 - 8 Understands and solves mathematical proofs
- 2 Understands and applies basic and advanced properties of the concept of numbers
 - 3 Understands relationships of numbers.
- 3 Uses basic and advanced procedures while performing the process of computation
 - 2 Adds, subtracts, multiplies, and divides imaginary numbers
 - 5 Adds, subtracts, multiplies and divides algebraic expressions
- 4 Understands and applies basic and advanced properties of the concept of measurement
 - 3 Understands and calculates formulas for finding measures
- 5 Understands and applies basic and advanced properties of the concepts of geometry
 - 1 Understands the basic characteristics of geometric figures
 - 4 Uses properties of and relationships among figures to solve geometric problems
6. Understands and applies basic and advanced concepts of data analysis and distribution
 - 2 Collects, organizes and represents data
 - 3 Understand and applies measures of central tendency and variability
- 7 Understands and applies basic and advanced concepts of probability and statistics
 - 1 understand the basic characteristics of probability
 - 2 Understands and applies the basic characteristics of statistics
- 8 Understands and applies basic and advanced properties of functions and algebra
 - 1 Recognizes and extends a variety of patterns
 - 3 Understands and constructs mathematical models
 - 4 Determine the algebraic equation of a function

Mathematics Curriculum

PROBABILITY AND STATISTICS

PROGRAM RATIONALE

Probability and Statistics is studied since today, more than ever, data plays a very important role in our lives. Research studies in sociology, business, ecology, economics, education, medicine, psychology and mathematics fields provide data that is constantly being analyzed to improve the quality of life. Data applications will be worked to demonstrate the importance of statistics and probability to everyday life decisions.

COURSE DESCRIPTION

Grade Level 10, 11, 12

Prerequisite - Geometry

Probability and Statistics is a one team, co-educational, one credit, elective course available to juniors and seniors. Through instruction in this course, the student will obtain an in-depth study of data and chance. Frequency distributions, histograms, Ogives, stem and leaf diagrams, and pictographs will be used to picture a mass of data. Various topics such as the normal curve, z-scores, measures of central tendency, and regression curves will be studied. The students will also obtain necessary skills in probability, permutations, combinations, odds, and mathematical expectation. The student should obtain the necessary skills to take college level Probability and Statistics.

PROGRAM GOALS

1. The student appreciates the basic concepts of probability and statistics needed for a college level class in this area.
2. The student understands the basic probability and statistics concepts.
3. The student uses these probability and statistics skills in mathematical and non-mathematical situations.