



Integrated Math 1

Course Description:

This Integrated Math course will give students an understanding of the foundations of Algebra and Geometry. Students will build on an understanding of variables, expressions and working with equations. They will learn to write and solve simple and complex linear equations, then apply this to angles, triangles, and polygons in Geometry. Students will learn to work with equations of lines and segments on the coordinate plane, as well as solve systems of equations using various methods. Extending their understanding of measures of central tendency, students will create visuals and tables in order to determine probabilities and make predictions. Using the concepts of congruence, students will recognize and construct transformations as well as prove triangles congruent.

Part 1: 5 credit hours | Part 2: 5 credit hours

Course Outline

Unit 1 – Solving Linear Equations

- 1.1 Simple (one step) Equations
- 1.2 Multi-Step Equations
- 1.3 Equations with Variables on both sides
- 1.4 Solving Ratios and Proportions
- 1.5 Absolute Value Equations
- 1.6 Solving Literal Equations

Unit 2 – Solving Linear Inequalities

- 2.1 Writing Inequalities
- 2.2 Graphing Inequalities (on a number line)
- 2.3 Solving Simple Inequalities
- 2.4 Solving Multi-Step Inequalities
- 2.5 Solving Compound Inequalities
- 2.6 Absolute Value Inequalities

Unit 3 – Graphing Linear Functions

- 3.1 Functions
- 3.2 Linear Functions
- 3.3 Function Notation
- 3.4 Graphing Linear Equations
- 3.5 Transformations and Shifts in Linear Graphs
- 3.6 Graphing Absolute Value Functions

Common Core Standards

Integrated Math 1, Part 1

In this unit:

Students will learn how to solve a variety of equations. Students will first learn how to solve a simple one step equation, then learn to solve equations that are progressively more challenging. They will learn how to add like terms, work with variables on both sides of the equation, and write two equations from an absolute value equation. The unit culminates with learning to solve for any variable given a literal equation.

[N-Q, A-CED, A-REI]

In this unit

Students will explore the difference between an equation and an inequality on a number line. They will use number lines to express an inequality and then solve progressively more challenging inequalities. Students will learn the similarities and differences between a compound inequality and an absolute value inequality and how to represent both on a number line.

[A-REI, A-SSE, A-CED]

In this unit:

Students will learn how to recognize, evaluate and analyze functions. They will learn function notation and how to recognize a linear function in graphic form or as a set of ordered pairs. They will learn to graph functions using slope and y-intercept as well as use the parent function to transform functions in the coordinate plane. Students will use algebraic and visual techniques for graphing absolute value functions.

[A-CED, F-IF, F-BF, F-LE]

Unit 4 – Writing Linear Functions

- 4.1 Slopes and Graphs
- 4.2 Writing Linear Equations - Slope-Intercept Form
- 4.3 Writing Linear Equations - Point-Slope Form
- 4.4 Writing Linear Equations - Standard Form
- 4.5 Scatter Plots and Lines of Best Fit

Unit 5 – Systems of Linear Equations

- 5.1 Solving Systems of Equations - Graphing Methods
- 5.2 Solving Systems of Equations - The Substitution Method
- 5.3 Solving Systems of Equations - The Elimination (aka Addition) Method
- 5.4 Special Systems of Linear Equations
- 5.5 Graphing Linear Inequalities (2 Variables)
- 5.6 Systems of Linear Inequalities

Unit 6 – Exponential and Radical Functions

- 6.1 Zero and Negative Exponents
- 6.2 Exponential Functions
- 6.3 Exponential Growth vs. Decay
- 6.4 Solving Exponential Equations
- 6.5 Simplifying Radicals

Unit 7 – Arithmetic and Geometric Sequences

- 7.1 Arithmetic Sequences
- 7.2 Geometric Sequences
- 7.3 Infinite Geometric Series

In this unit:

Students will explore linear functions in depth. They will move from recognizing functions to writing and manipulating functions given an intercept and slope, a point and slope, or two points. Applying what they have learned about linear functions students will interpret data and recognize correlations given a set of data points and determine a line of best of fit.

[N-Q, A-SSE, F-IF, A-CED, S-ID]

In this unit:

Students will explore systems of equations, including consistent and inconsistent equations, and their relationships on a coordinate plane. They will develop strategies for determining the number of solutions of two equations, and use substitution, addition, and graphing to solve systems of equalities and inequalities. Students will learn techniques for determining the most appropriate method. They will learn to determine ranges of solutions of inequalities and express solutions on the coordinate plane as well as using interval notation.

[A-CED, A-REI]

In this unit:

Students will explore rational expressions to develop an understanding of the properties of exponents, including the relationship between dividing and negative exponents. Applying this understanding, students will recognize and solve growth and decay functions. Students will extend this understanding of exponents to rational exponents, learning how to convert them to radical expressions.

[A-SSE, A-APR, A-REI]

In this unit:

Students will explore mathematic patterns, applying these patterns to arithmetic and geometric sequences. Students will identify common differences or common ratios in order to distinguish between arithmetic and geometric sequences. They will learn techniques to find the specific term in a sequence and the sum of a series, both finite or infinite. Students will recognize the growth patterns for each sequence.

[A-SSE, A-APR]

Course Outline

Common Core Standards

Integrated Math 1, Part 2

Unit 1- Statistics and Data Analysis

- 1.1 Mean, Median, Mode, Range, and Standard Deviation
- 1.2 Box and Whisker Plot
- 1.3 Distributions – Right, left, and Zero Skewed
- 1.4 Two Way Tables
- 1.5 Quantitative vs. Qualitative Data

In this unit:

Students will calculate measures of central tendency to describe a set of data. Students will represent statistical data visually in box plots, and bar graphs, and use these representations to analyze data. Applying their knowledge of data and distribution, students will determine probabilities and make predictions. Students will evaluate scenarios in which data is collected to determine if data is qualitative or quantitative.

[S-CP, S-MD]

Unit 2 – An Intro to Geometry

- 2.1 Points, Lines, Rays, Segments, and Planes
- 2.2 Line Segments – Distance and the Segment Addition Postulate
- 2.3 The Distance Formula
- 2.4 The Midpoint Formula
- 2.5 The Coordinate Plane - Area and Perimeter
- 2.6 Types of Angles
- 2.7 Pairs of Angles

In this unit:

Students will learn the basic concepts of Geometry, particularly, points, lines segments and planes. Students will extend their understanding of segments to include finding the length of a segment, the midpoint, and apply the segment addition postulate. Students will use the coordinate plane to graph figures and use the distance formula to calculate area and perimeter. Students will learn to name, classify, and measure angles.

[G-CO, G-GPE, G-MG]

Unit 3 – Perimeter and Area

- 3.1 Perimeters of Polygons
- 3.2 Areas of Triangles
- 3.3 Areas of Parallelograms
- 3.4 Areas of Trapezoids
- 3.5 Areas of Rhombus and Kites
- 3.6 Areas of Regular Polygons

In this unit:

Students will learn to classify polygons by the number of sides and angle measures. Applying their knowledge of area formulas, students will find area, perimeter, angle measure and side length of triangles, parallelograms, trapezoids, a rhombus and kites.

[G-GPE]

Unit 4 – Proofs and Reason

- 4.1 Conditional Statements, Converse, Inverse, and Contrapositives
- 4.2 Inductive vs. Deductive Reasoning
- 4.3 Point, line, and Plane Postulates
- 4.4 Reflexive, Symmetric and Transitive Properties
- 4.5 Types of Proofs - Two Column, Flowchart, & Paragraph

In this unit:

Students will learn the basic principles of logic, including deductive and inductive reasoning. Students will learn to write conditional statements, including contrapositive, converse and inverse statements. Students will learn postulates and properties, then apply these to prove various geometric theorems.

[G-GPE, G-CO, S-CP, S-MD]

Unit 5 – Parallel vs. Perpendicular Lines

- 5.1 Parallel, Perpendicular and Skew Lines Defined
- 5.2 Parallel Lines and Transversals - The Angles They Form
- 5.3 Identifying Parallel and Perpendicular Lines
- 5.4 Writing Linear Equations – Parallel Lines
- 5.5 Writing Linear Equations – Perpendicular Lines

In this unit:

Students will learn the characteristics of parallel, perpendicular and skew lines. Students will learn to classify and determine the measure of angles created by a transversal and parallel lines. Students will use information such as slope and points to write the equations of a line.

[A-CED, A-REI, G-CO, G-GPE]

Unit 6 – Transformations and Graphs

- 6.1 Translations
- 6.2 Rotations
- 6.3 Dilations
- 6.4 Reflections
- 6.5 Compositions of Transformations

In this unit:

Students will learn to identify rigid and non-rigid transformations, including translations, reflections, rotations and dilations. Using composition of transformations, students will construct congruent and similar figures.

[G-CO]

Unit 7 – Triangles

- 7.1 Types of Triangles
- 7.2 Congruent Polygons
- 7.3 Equilateral and Isosceles Triangles
- 7.4 Proving Triangles Congruent by SSS and ASA
- 7.5 Proving Triangles Congruent by SAS, HL and AAS
- 7.6 CPCTC

In this unit:

Students will learn to classify triangles by side length and angle measure. Students will learn to prove triangles are congruent using SSS, SAS, ASA, AAS, and HL. Applying their understanding of congruent triangles, students will determine the lengths of sides of polygons and triangles.

[G-CO]