

# SPRINGFIELD PUBLIC SCHOOLS

## INTEGRATED MATH 1

### Course Description

Integrated Math 1 will emphasize skills necessary for problem-solving and continued growth in mathematics. Students will apply concepts of number and operations, algebraic relationships, geometric and spatial relationships, measurement, and data analysis and probability. Integrated Math 1 concentrates the content of Integrated Math 1A and Integrated Math 1B into one credit of study. Either this course or Integrated Math 1B can serve as a prerequisite to Integrated Math 2.

### Course Rationale

The Integrated Math program is an alternate approach to achieve mathematical understanding. The content provides the foundation for future work in mathematics and science. An understanding of integrated mathematics is essential in preparation for careers that utilize or depend upon mathematics. It provides students with tools to represent and solve problems in a variety of ways. Students will better understand the language and abstract symbols of mathematics and how to use that language in real-life applications.

### Major Instructional Goals

The intent of the Springfield R-12 Secondary Mathematics Program is to explore, investigate and understand the importance of mathematics through real-world experiences. In mathematics, students will acquire the knowledge and skills to problem solve, communicate, reason, create models and make connections. Students will:

1. Apply concepts of **Number and Operations** including:
  - a. Compare and order rational and irrational numbers. (MA5; 3.3)
  - b. Describe the effects of operations on the magnitude of quantities. (MA4; 3.4, 4.1)
  - c. Apply properties of exponents to simplify expressions or solve equations. (MA1; MA4; 1.6, 1.10, 3.4)
  - d. Apply operations to real numbers using various methods. (MA1; MA4; MA5; 1.4, 1.10, 3.3, 3.4)
  - e. Judge the reasonableness of numerical computations and their results. (MA1; 3.8)
  - f. Solve problems involving proportions. (MA1; MA4; 3.3)
  - g. Apply percent in a real-world context. (MA1; 3.8)
  
2. Apply concepts of **Algebraic Relationships** including:
  - a. Generalize patterns using explicitly or recursively defined functions. (MA4; 1.6, 3.5)
  - b. Compare and contrast various forms of representations of patterns. (MA4; 1.6)
  - c. Understand and compare the properties of linear functions. (MA4; 1.6, 3.6)
  - d. Describe the effects of parameter changes on linear functions. (MA4; 1.6, 4.1)
  - e. Use symbolic algebra to represent and solve problems that involve linear and absolute value relationships. (MA4; MA6; 1.6, 3.1)

- f. Describe and use algebraic manipulations, including factoring and rules of integer exponents. (MA4; 3.1, 4.1)
  - g. Use and solve equivalent forms of equations and inequalities. (MA4; 1.6, 3.4)
  - h. Use and solve systems of linear equations with two variables. (MA4; 1.6)
  - i. Identify quantitative relationships and determine the type(s) of functions that might model the situation to solve the problem. (MA4; 1.6, 3.6)
  - j. Analyze linear functions by investigating rates of change and intercepts. (MA 4; 1.6, 4.1)
3. Apply concepts of **Geometric and Spatial Relationships** including:
- a. Solve problems involving angle relationships and the Pythagorean Theorem. (MA2; 1.6)
  - b. Apply geometric properties and relationships to solve multi-step problems in two dimensions (including area and perimeter). (MA2; 3.6)
  - c. Solve problems involving two-dimensional objects represented with Cartesian coordinates. (MA2; 3.2, 3.6, 4.1)
  - d. Represent translations, reflections, rotations, and dilations of objects. (MA2; 1.10)
  - e. Translate and reflect linear functions. (MA4; 3.1)
  - f. Draw and use vertex-edge graphs or networks to find optimal solutions. (MA6; 3.4)
  - g. Draw and use visual models to represent and solve problems. (MA2; 3.1)
4. Apply concepts of **Measurement** including:
- a. Identify and justify appropriate units of measure for velocity. (MA1; MA2; 3.1, 4.1)
  - b. Solve problems of angle measure, including those involving triangles or other polygons. (MA2; 3.1, 3.4)
  - c. Determine the perimeter, area, surface area and volume of two- and three-dimensional geometric figures. (MA2; 1.10, 3.4)
  - d. Analyze effects of computation on precision. (MA2; 1.7, 3.8)
  - e. Use unit analysis to solve problems involving rates. (MA4; 3.1)
5. Apply concepts of **Data Analysis and Probability** including:
- a. Formulate questions, design studies and collect data about a characteristic. (MA3; 1.2)
  - b. Select, create and use appropriate graphical representation of data. (MA6; 1.8, 3.6)
  - c. Apply statistical concepts to solve problems. (MA3; 1.10, 3.4)
  - d. Given one-variable quantitative data, display the distribution and describe its shape. (MA3; 1.8)
  - e. Given a scatterplot, determine an equation for a line of best fit. (MA3; 1.6)
  - f. Make conjectures about possible relationships between two characteristics of a sample on the basis of scatterplots of the data and approximate lines of fit. (MA3; 1.2, 3.5)
  - g. Construct sample space and distributions. (MA3; 3.1, 4.1)
  - h. Use and describe the concepts of probability. (MA6; 1.10, 4.1)