

SPRINGFIELD PUBLIC SCHOOLS

INTEGRATED MATH 2

Course Description

Integrated Math 2 continues the development of concepts introduced in Integrated Math 1A and Integrated Math 1B or Integrated Math 1. This course 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. This course is a prerequisite to Integrated Math 3. Prerequisite: Integrated Math 1B or Integrated Math 1.

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. Use real numbers to solve problems. (MA1; 3.4)
 - b. Use a variety of representations to demonstrate an understanding of very large and very small numbers. (MA5; 3.6)
 - c. Apply properties of exponents to simplify expressions or solve equations. (MA4; 1.6, 1.10)
 - d. Apply operations to real numbers using various methods. (MA1; MA4; MA5; 1.4, 3.4)
 - e. Judge the reasonableness of numerical computations and their results. (MA1; 3.8)
 - f. Solve problems involving proportions. (MA1; MA4; 3.3)

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, exponential, and quadratic functions. (MA4; 1.6, 3.6)
 - d. Describe the effects of parameter changes on quadratic and exponential functions. (MA4; 1.6, 4.1)

- e. Use symbolic algebra to represent and solve problems that involve quadratic 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 (piece-wise and quadratic). (MA4; 1.6, 3.4)
 - h. Use and solve systems of linear equations or inequalities 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 quadratic functions by investigating rates of change, intercepts and zeros. (MA4; 1.6, 4.1)
 - k. Use matrices to model and solve problems. (MA5; 1.8, 3.4)
3. Apply concepts of **Geometric and Spatial Relationships** including:
- a. Use inductive and deductive reasoning. (MA2; 3.5)
 - b. Apply relationships among surface areas and among volumes of similar objects. (MA2; 3.6)
 - c. Make conjectures and solve problems involving two-dimensional objects represented with Cartesian coordinates. (MA2; 3.6, 4.1)
 - d. Use and apply constructions to represent translations, reflections, rotations, and dilations of objects. (MA2; 1.10)
 - e. Translate, dilate and reflect quadratic and exponential functions. (MA4; 3.1)
 - f. Identify types of symmetries of two- and three-dimensional figures. (MA2; 1.6, 1.10)
 - g. Draw representations of three-dimensional geometric objects, using a variety of tools. (MA2; 1.4)
 - h. Draw or use visual models to represent and solve problems. (MA2; 3.1)
 - i. Use trigonometric relationships with right triangles to determine lengths and angle measures. (MA2; 1.6, 1.10)
4. Apply concepts of **Measurement** including:
- a. Solve problems of angle measure of parallel lines cut by a transversal. (MA2; 3.1, 3.4)
 - b. Determine the surface area and volume of two- and three-dimensional geometric figures. (MA2; 1.10, 3.4)
 - c. Analyze the effects of computation on precision. (MA2; 1.7, 3.8)
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 and distinguish between a statistic and a parameter. (MA3; 1.10, 3.4)
 - d. Given one-variable quantitative data, display the distribution and describe its shape. (MA3; 1.8)

- e. Display and analyze bivariate data where one variable is categorical and the other is numerical. (MA3; 1.6)
- f. Describe how sample statistics reflect the values of population parameters and use sampling distributions as the basis for informal inference. (MA3; 3.5)
- g. Describe the concepts of sample space and probability distribution. (MA3; 4.1)
- h. Use and describe the concepts of conditional probability and independent events. (MA6; 1.10, 4.1)