SPRINGFIELD PUBLIC SCHOOLS
SIXTH GRADE

Course Description

The sixth grade mathematics program emphasizes problem solving strategies for both routine and non-routine problems. Students will expand upon their ability to use the operations of addition, subtraction, multiplication, and division of whole numbers, decimals, and fractions. Students will investigate geometric, data analysis, measurement, and algebraic concepts. Students will be introduced to the use of ratio, proportion, and percents.

Course Rationale

Sixth grade mathematics is taught to develop a complete understanding of the positive rational numbers and their relationship to geometric, data analysis, and measurement concepts. Students will be given the opportunity to apply mathematics to real world problems and future careers. Students will be involved in learning how to collect information, communicate information mathematically, solve problems from a real world context and justify the solutions to the problems.

Major Instructional Goals

The intent of Springfield R-12 Middle School 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 integers, positive rational and percents, including finding their approximate location on a number line. (MA5; 3.3)
   b. Recognize and generate equivalent forms of fractions, decimals and percents. (MA1; 3.3)
   c. Recognize equivalent representations for the same number and generate them by decomposing and composing numbers, including expanded notation. (MA1; 3.6)
   d. Use factors and multiples to describe relationships between and among numbers, including whole number factors and multiples. (MA 5; 1.10)
   e. Describe the effects of addition and subtraction on fractions and decimals. (MA1; MA5; 3.4, 4.1)
   f. Estimate and justify the results of addition and subtraction of positive rational numbers. (MA1; 3.3, 4.1)
   g. Add and subtract positive rational numbers. (MA1; 1.10, 3.3)

2. Apply the concepts of **Algebraic Relationships** including:
   b. Represent and describe patterns in different forms such as tables, graphs, pictures, symbols or words. (MA4; 1.6, 3.6)
   c. Compare and contrast various forms of representations to identify linear or nonlinear functions. (MA4; 1.6, 3.6)
   d. Use variables to represent unknown quantities in expressions. (MA4; 1.6, 3.1)

e. Recognize the properties of numbers and expressions such as associative and distributive. (MA5; 3.6)
f. Model and solve problems using graphs, tables, expressions and equations. (MA4; 1.6, 3.6)
g. Comparing situations with constant and varying rates of change. (MA2; 4 1.6, 4.1)

3. Apply the concepts of **Geometric and Spatial Relationships** including:
   a. Identify the properties of 1, 2, and 3 dimensional shapes. (MA2; 1.10, 3.3)
   b. Describe the relationship between the corresponding angles and the length of corresponding sides of similar triangles. (MA2; 1.6)
   c. Use coordinate geometry to construct geometric shapes. (MA2; 1.6, 1.8)
   d. Describe the transformation from a given pre-image to its image using the terms reflection/flips, rotation/turn and translation/slide. (MA2; 3.7)
   e. Create polygons and designs with rotational symmetry. (MA2; 1.6)
   f. Use spatial visualization to identify isometric representations of mat plans. (MA2;3.3)
   g. Draw or use visual models to represent and solve problems. (MA2; 3.1)

4. Apply the concepts of **Measurement** including:
   a. Classify and estimate angles and their measurements. (MA2; 3.1, 3.4, 4.1)
   b. Solve problems involving elapsed time. (MA5; 3.1)
   c. Estimate standard/non-standard measurement. (MA2; 1.6, 3.3)
   d. Describe how to solve problems involving the area or perimeter of polygons. (MA2; 3.4, 4.1)
   e. Convert from one unit to another within a system of measurement (mass and weight). (MA2; 1.6, 1.10)

5. Apply the concepts of **Data Analysis and Probability** including:
   a. Formulate questions, design studies and collect data about a characteristic. (MA3; 1.2)
   b. Interpret circle graphs. (MA3; 1.8)
   c. Create and interpret stem-and-leaf plots. (MA3; 1.8)
   d. Find the range and measures of central tendency, including mean, median and mode. (MA3; 3.2)
   e. Compare and evaluate different representations of data. (MA3; 3.6)
   f. Formulate conjectures. (MA3; 3.5)
   g. Use a model to illustrate the possible outcomes of an event. (MA3; MA6; 3.2)