# SPRING GROVE AREA SCHOOL DISTRICT

## PLANNED COURSE OVERVIEW

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| **Course Title:** Mathematics-7 | **Length of Course:** 30 cycles |
| **Grade Level(s):** 7 | **Periods Per Cycle:** 6 |
| **Units of Credit:** N/A | **Length of Period:** 47 minutes |
| **Classification:** Required | **Total Instructional Time:** 141 hours |

### Course Description

The Math-7 class provides the foundation for learning basic mathematics concepts before introducing the concepts of pre-algebra. The topics covered include properties, integers, rational numbers, one-step and two-step equations, inequalities, graphing, proportions, percent, probability, statistics, and geometry.

### Instructional Strategies, Learning Practices, Activities, and Experiences

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| Anchor Charts | Graphic Organizers | Remediation |
| Anticipatory Sets | Guided Practice | Review (Games, Study Guides) |
| Assessments (Quizzes, Unit, Teacher-Created) | Higher-Level Questioning | Rocket Period |
| Bell Ringers | Homework | Simulations |
| Calculators | Interaction Sequence | Standardized Test Preparation |
| Class Discussions | Journals | Teacher Demonstrations |
| Closure (Exit Passes) | Manipulatives | Teacher Observations |
| Computer Websites and/or Software | Notes (Templates, Teacher or Student Generated) | Technology Integration (iPods, iPads, Clickers, |
| Cooperative Learning | Partners (Think-Pair-Share) | Computer Labs) |
| Critical Thinking | Posted and Numbered Objectives | Videos/DVDs |
| Cross Curricular Connections | Practice Exercises and Tests | Vocabulary (Cards, Strategies, and Lists) |
| Drill and Practice | Presentations | Wait Time and Wait Time Extended |
| Flexible Groups | Projects | |

### Assessments

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| Assessments (Quizzes, Unit, Teacher-Created) | Evaluation (Summative and Formative) | Presentations |
| Bell Ringers | Higher-Level Questioning | State Standardized Assessments |
| Closure | Homework Review | Projects |
| CDT | Interaction Sequence | Teacher Observations |

### Materials/Resources

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| Anchor Charts | Internet Resources | Resource Books |
| Calculators | Journals | Technology Integration |
| Graphic Organizers | Literature | Videos/DVDs |
| McDougal Littel 2008 | Manipulatives | Vocabulary (Cards, Strategies, and Lists) |

**Adopted:** 4/20/88
**Revised:** 9/3/91; 11/18/98; 9/17/03; 8/17/09; 5/19/14; 5/20/2019

| **2.1 Numbers and Operations** | |
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| **The Standards of Mathematical Practices** | |
| **Make sense of problems and persevere in solving them.**<br>**Construct viable arguments and critique the reasoning of others.**<br>**Use appropriate tools strategically.**<br>**Look for and make use of structure.** | **Reason abstractly and quantitatively.**<br>**Model with mathematics.**<br>**Attend to precision.**<br>**Look for and express regularity in repeated reasoning.** |
| **CONTENT/KEY CONCEPTS** | **OBJECTIVES/STANDARDS** |
| **Integers and Rational Numbers**<br>• Operations with integers and rational numbers<br>• Properties with rational numbers<br>• Number line construction (addition and subtraction using the number line)<br>• Terminating and repeating decimals<br>• Conversions of number forms (fraction to decimal)<br>• Order of operations<br>• Estimation with rational numbers | **M07.A-N.1.1.1** - Apply properties of operations to add and subtract rational numbers, including real-world contexts.<br>**M07.A-N.1.1.2** - Represent addition and subtraction on a horizontal or vertical number line.<br>**M07.A-N.1.1.3** - Apply properties of operations to multiply and divide rational numbers, including real-world contexts; demonstrate that the decimal form of a rational number terminates or eventually repeats. |
| **Ratios and Proportions**<br>• Ratios and unit rates<br>• Proportions<br>• Represent proportional relationships with graphs, tables, equations, diagrams, and verbal descriptions<br>• Explain what a point on the graph of a proportional relationship means<br>• Converting percent to fractions to decimals<br>• Use proportions to solve multi-step ratio and percent problems (tax, tip, discount, simple interest, percent of change) | **M07.A-R.1.1.1** - Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units.<br>**M07.A-R.1.1.2** - Determine whether two quantities are proportionally related (e.g., by testing for equivalent ratios in a table, graphing on a coordinate plane and observing whether the graph is a straight line through the origin).<br>**M07.A-R.1.1.3** - Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.<br>**M07.A-R.1.1.4** - Represent proportional relationships by equations.<br>**M07.A-R.1.1.5** - Explain what a point (*x, y*) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, *r*), where *r* is the unit rate.<br>**M07.A-R.1.1.6** - Use proportional relationships to solve multi-step ratio and percent problems. |

| **2.2 Algebraic Concepts** | |
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| **CONTENT/KEY CONCEPTS** | **OBJECTIVES/STANDARDS** |
| **Expressions and Equations**<br><br>• Write expressions<br>• Simplify linear expressions<br>• Generate equivalent expressions<br>• Solve multi-step equations and inequalities with integers, decimals, and rational numbers<br>• Use variables with equations and inequalities<br>• Determine reasonableness of an answer | **M07.B-E.1.1.1** - Apply properties of operations to add, subtract, factor, and expand linear expressions with rational coefficients.<br>**M07.B-E.2.1.1** - Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate.<br>**M07.B-E.2.3.1** - Determine the reasonableness of answer(s) or interpret the solution(s) in the context of the problem.<br>**M07.B-E.2.2.1** - Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where $p$, $q$, and $r$ are specific rational numbers.<br>**M07.B-E.2.2.2** - Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where $p$, $q$, and $r$ are specific rational numbers, and graph the solution set of the inequality. |

| **2.3 Geometry** | |
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| **CONTENT/KEY CONCEPTS** | **OBJECTIVES/STANDARDS** |
| **Geometry**<br><br>• Angle relationships<br>• Triangle relationships<br>• Proportions/Scale Drawings<br>• 3D figures<br>• Area and volume<br>• Pythagorean theorem<br>• Transformation | **M07.C-G.2.1.1** - Identify and use properties of supplementary, complementary, and adjacent angles in a multistep problem to write and solve simple equations for an unknown angle in a figure.<br>**M07.C-G.2.1.2** - Identify and use properties of angles formed when two parallel lines are cut by a transversal (e.g., angles may include alternate interior, alternate exterior, vertical, corresponding).<br>**M07.C-G.1.1.2** - Identify or describe the properties of all types of triangles based on angle and side measures.<br>**M07.C-G.1.1.3** - Use and apply the triangle inequality theorem.<br>**M07.C-G.1.1.1** - Solve problems involving scale drawings of geometric figures, including finding length and area.<br>**M07.C-G.1.1.4** - Describe the two-dimensional figures that result from slicing three-dimensional figures.<br>**M07.C-G.2.2.1** - Find the area and circumference of a circle. Solve problems involving area and circumference of a circle(s). **Formulas will be provided.**<br>**M07.C-G.2.2.2** - Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. **Formulas will be provided.**<br><br>**M08.C-G.3.1.1** - Apply formulas for the volumes of cones, cylinders, and spheres to solve real-world and mathematical problems. **Formulas will be provided.**<br>**M08.C-G.2.1.1** - Apply the converse of the Pythagorean theorem to show a triangle is a right triangle.<br>**M08.C-G.2.1.2** - Apply the Pythagorean theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two- and three-dimensions. (Figures provided for problems in three dimensions will be consistent with Eligible Content in grade 8 and below.)<br>**M08.C-G.2.1.3** - Apply the Pythagorean theorem to find the distance between two points in a coordinate system.<br>**M08.C-G.1.1.1** - Identify and apply properties of rotations, reflections, and translations.<br>**M08.C-G.1.1.2** - Given two congruent figures, describe a sequence of transformations that exhibits the congruence between them.<br>**M08.C-G.1.1.3** - Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.<br>**M08.C-G.1.1.4** - Given two similar two-dimensional figures, describe a sequence of transformations that exhibits the similarity between them. |

| **2.4 Measurement, Data, and Probability** | |
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| **CONTENT/KEY CONCEPTS** | **OBJECTIVES/STANDARDS** |
| **Statistics and Probability**<br><br>• Recognize random samples (misleading data)<br>• Draw inferences about a population from a random sample (data predictions)<br>• Use statistical measures to compare two numerical data distributions (scatter plots and trend lines)<br>• Predict the likelihood of outcomes<br>• Determine probability of an event given relative frequency (theoretical vs. experimental)<br>• Find probability of a simple event occurring and not occurring<br>• Find the probabilities of independent compound events using lists, tables, tree diagrams, and simulations. (independent vs. dependent) | **M07.D-S.1.1.1** - Determine whether a sample is a random sample given a real-world situation.<br>**M07.D-S.1.1.2** - Use data from a random sample to draw inferences about a population with an unknown characteristic of interest.<br>**M07.D-S.2.1.1** - Compare two numerical data distributions using measures of center and variability.<br>**M07.D-S.3.1.1** - Predict or determine whether some outcomes are certain, more likely, less likely, equally likely, or impossible (i.e., a probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event).<br>**M07.D-S.3.2.1** - Determine the probability of a chance event given relative frequency. Predict the approximate relative frequency given the probability.<br>**M07.D-S.3.2.2** - Find the probability of a simple event, including the probability of a simple event **not** occurring.<br>**M07.D-S.3.2.3** - Find probabilities of independent compound events using organized lists, tables, tree diagrams, and simulation. |