



8<sup>th</sup> Grade Mathematics

South Seneca Middle School

Mr. Scolaro

Brief Outline of Course

**Eighth grade lessons are organized into fourteen chapters that introduce and cover:**

1. **Number Systems** – Teaches students number theory in relation to scientific notation of numbers between zero and one. Students learn to identify rational and irrational numbers. Absolute value is taught and students are asked to explain and solve problems that apply this concept.
2. **Real Numbers** - Teaches the order of operations applied to decimals, square roots, estimation, and simplification of expressions. Students examine the use of repeating decimals and that process that is used to convert these decimals to fractions. Lessons will present the concept of roots in which students will calculate and approximate principal square roots. Students are taught to order numbers in many forms such as fractions, decimals, scientific notation, absolute value, and radicals, and to simplify numerical expressions with real numbers.
3. **Number Theory** – Students learn the various divisibility rules and how they can be applied to problem solving, how to represent numbers in base ten in other types of bases, how to identify prime and composite numbers.
4. **Ratio, Proportion, and Percent** – Teaches the student how to use the rate of change, proportional relationships, and percents greater than 100 to solve real life situations.
5. **Real World Computation** - Students learn how to solve real life problems using operations with rational numbers, ratios, percents, proportions, and applying these techniques to one, two, and multi-step problems.
6. **Expressions and Equations** - Teaches the student about simplification of expressions, properties, and translations of algebraic expressions into word expressions. Lessons also include the concept of substitution and evaluating linear equations and inequalities.

7. **Plane Geometry** - Teaches properties of parallelism, perpendicularity, and symmetry and how they can be applied to solve real world problems. Polygons are introduced as well as the concept of concave and convex polygons. Lessons also teach the Pythagorean Theorem, congruent and similar shapes, transformations, reflections, proportional relationships, dilations, and rotations.
8. **Three-Dimensional Geometry** - Teaches students how to determine the volume and surface areas of three-dimensional shapes. Lessons include instruction on angle measurement, surface area, and proportional relationships.
9. **Measurement** – Students learn how to interpret and apply different scales of measurement, select the appropriate tools for measurement, and identify the number of significant digits in a measurement.
10. **Graphing** - Teaches students how to use tables and ordered pairs to graph a linear equation. Students learn how to convert an equation to standard form and slope-intercept form. Lessons cover linear inequalities and how to graph them on a number line and a coordinate plane. Students will also explore other aspects of inequalities and linear programming.
11. **Linear Relationships** - Teaches students how to use x and y intercepts to easily graph a linear equation. Students will also determine slope from a given line graph, write equations in slope-intercept form, determine if a function is linear, and explore these concepts using the Coordinate Graphing tool.
12. **Probability** – Students learn about conditional probability, sampling techniques, the various applications of sampling, sample bias, and probability and how these relate to the processing of chance in real situations.
13. **Data and Statistics** - Teaches the student about various data representations and how these graphs can lead to different interpretations. Students will use statistics, mean, median, mode, technology use, central tendency, statistical plots, and scatterplots to interpret various types of data.