Grade 7
Mathematics

These are the expectations for a student by the end of Seventh Grade.

Accelerated Algebra 1
By the end of this course, students will be able to:

- Compare and/or order any real numbers.
- Simplify square roots (e.g., $\sqrt{24} = 2\sqrt{6}$).
- Find the Greatest Common Factor (GCF) and/or the Least Common Multiple (LCM) for sets of
- monomials.
- Simplify/evaluate expressions involving properties/laws of exponents, roots, and/or absolute values to solve problems.
- Use estimation to solve problems.
- Add, subtract, and/or multiply polynomial expressions (express answers in simplest form).
- Factor algebraic expressions, including difference of squares and trinomials.
- Simplify/reduce a rational algebraic expression.
- Write, solve, and/or apply a linear equation (including problem situations).
- Use and/or identify an algebraic property to justify any step in an equation-solving process.
- Interpret solutions to problems in the context of the problem situation.
- Write and/or solve a system of linear equations (including problem situations) using graphing, substitution, and/or elimination.
- Interpret solutions to problems in the context of the problem situation.
- Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.
- Determine whether a relation is a function, given a set of points or a graph.
- Identify the domain or range of a relation (maybe presented as ordered pairs, a graph, or a table).
- Create, interpret, and/or use the equation,graph, or table of a linear function.
- Translate from one representation of a linear function to another (i.e., graph, table, and equation).
- Write or identify a linear equation when given
    - the graph of the line,
    - two points on the line, or
    - the slope and a point on the line.
- Determine the slope and/or y-intercept represented by a linear equation or graph.
- Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot.
- Calculate and/or interpret the range, quartiles,and interquartile range of data.
- Estimate or calculate to make predictions based on a circle, line, bar graph, measure of central tendency, or other representation.
- Analyze data, make predictions, and/or answer questions based on displayed data (box-and-whisker plots, stem-and-leaf plots, scatter plots, measures of central tendency, or other representations).
- Make predictions using the equations or graphs of best-fit lines of scatter plots.

Additionally, students are responsible for the Pre-Algebra content located below.

Pre-Algebra
By the end of this course, students will be able to:

- Solve real-world and mathematical problems involving the four operations with rational numbers.
- Represent addition and subtraction on a horizontal or vertical number line.
- 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.
- Analyze, recognize, and represent proportional relationships and use them to solve real-world and mathematical problems.
- Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units.
- Determine whether two quantities are proportionally related.
- Identify the constant of proportionality (unit rate).
- Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation.
- Apply properties of operations to add, subtract, factor, and expand linear expressions with rational coefficients.
- Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate.
- 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.
- 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.
- Determine the reasonableness of answer(s) or interpret the solution(s) in the context of the problem.
- Solve problems involving scale drawings of geometric figures, including finding length and area.
- Identify or describe the properties of all types of triangles based on angle and side measures.
- Use and apply the triangle inequality theorem.
- Describe the two-dimensional figures that result from slicing three-dimensional figures.
- Identify and use properties of supplementary, complementary, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
- 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).
- Find the area and circumference of a circle. Solve problems involving area and circumference of a circle(s).
- 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.
- Determine whether a sample is a random sample given a real-world situation.
- Use data from a random sample to draw inferences about a population with an unknown characteristic of interest.
- Compare two numerical data distributions using measures of center and variability.
- Predict or determine whether some outcomes are certain, more likely, less likely, equally likely, or impossible
- Determine the probability of a chance event given relative frequency. Predict the approximate relative frequency given the probability.
- Find the probability of a simple event, including the probability of a simple event not occurring.
- Find probabilities of independent compound events using organized lists, tables, tree diagrams, and simulation.