The mathematics standards in middle school build on students' understanding of number and quantity. Students apply more formal statistics, probability, and algebra to model phenomena in the world around them. Students gain a deeper understanding of geometry and its application. Students also persevere in solving problems as they use strategies to apply their new tools and techniques.

Expectations for 8th Grade Students:

- **Number and Quantity**: Calculate using radicals (√2, $\sqrt[3]{27}$) and exponents (7^2, 5^6); explain the difference between rational and irrational numbers and locate each on a number line.
- **Algebra and Functions**: Use scientific notation to write very large or small numbers (6.02 x 10^23); fluently solve linear equations and systems of linear equations; explain the meaning of a function in mathematics; distinguish between functions whose graphs are linear (make a straight line) and those which are not linear; use tables, graphs, and equations to show linear relationships; describe the meaning of the slope (steepness) and y-intercept of a linear relationship; identify if two variables have a relationship by informally examining graphs and tables.
- **Data, Statistics, and Probability**: Apply statistical techniques to compare how the change in one set of numbers relates to changes in a second set of numbers.
- **Geometry**: Calculate distances and areas using the Pythagorean Theorem; calculate the volume of cones, cylinders, and spheres; describe how rotating, stretching, shrinking, reflecting or sliding a shape impacts its shape and size; understand the difference between congruence and similarity; explain the concept of similarity and make connections between slope and similar triangles.

Throughout 8th Grade You May Find Students:

- Measuring classmates' height and arm-span, and making a graph to show how height and arm-span are related.
- Solving a variety of algebra equations for "x" such as 3x + 28 = 8x – 34.
- Using graphs and tables of data to determine if the relationship between the height of a plant and the amount it is watered each day is a function.
- Renting a truck with a flat rate of $20 and a $0.70 per mile and identifying the y-intercept as the flat fee and slope as the per-mile charge.
- Proving why the sum of the angles in a triangle is always 180 degrees.
- Comparing the steepness of stairs and ramps for a variety of buildings (rise to run).
- Calculating the height of a kite using 150 feet of string that is directly above a pool 60 feet away from where you are standing.
- Computing the shortest distance between two points.
- Finding the height of a flag pole using shadows and similar triangles.
- Comparing when the cost of a cell phone data plan is greater than, equal to, or less than the cost of another cell phone data plan.
- Explaining why 1/7 is rational but √2 is irrational.