

# Mathematics

## Grade 8

It is essential that these standards be addressed in contexts that promote problem solving, reasoning, communication, making connections, and designing and analyzing representations.

### 8.1 Algebra: **Analyze and represent linear functions, and solve linear equations and systems of linear equations.**

- 8.1.1 Translate among contextual, verbal, tabular, graphical, and algebraic representations of linear functions.
- 8.1.2 Determine the slope of a line and understand that it is a constant rate of change.
- 8.1.3 Identify and interpret the properties (i.e. slope, intercepts, continuity, and discreteness) of linear relationships as they are shown in the different representations and recognize proportional relationships ( $y/x = k$  or  $y = kx$ ) as a special case.
- 8.1.4 Use linear functions and equations to represent, analyze and solve problems, and to make predictions and inferences.
- 8.1.5 Relate systems of two linear equations in two variables and their solutions to pairs of lines that are intersecting, parallel, or the same line.
- 8.1.6 Use informal strategies (e.g., graphs or tables) to solve problems involving systems of linear equations in two variables.

### 8.2 Data Analysis and Algebra: **Analyze and summarize data sets.**

- 8.2.1 Organize and display data (e.g., histograms, box-and-whisker plots, scatter plots) to pose and answer questions; and justify the reasonableness of the choice of display.
- 8.2.2 Use measures of center and spread to summarize and compare data sets.
- 8.2.3 Interpret and analyze displays of data and descriptive statistics.
- 8.2.4 Compare descriptive statistics and evaluate how changes in data affect those statistics.
- 8.2.5 Describe the strengths and limitations of a particular statistical measure, and justify or critique its use in a given situation.
- 8.2.6 Use sample data to make predictions regarding a population.
- 8.2.7 Identify claims based on statistical data and evaluate the reasonableness of those claims.
- 8.2.8 Use data to estimate the likelihood of future events and evaluate the reasonableness of predictions.

### 8.3 Geometry and Measurement: **Analyze two- and three-dimensional spaces and figures by using distance and angle.**

- 8.3.1 Use properties of parallel lines, transversals, and angles to find missing sides and angles, and to solve problems including determining similarity or congruence of triangles.
- 8.3.2 Use models to show that the sum of the angles of any triangle is 180 degrees and apply this fact to find unknown angles.
- 8.3.3 Use models and logical arguments to show that the sum of the angles of any quadrilateral is 360 degrees, and apply this fact to find unknown angles.
- 8.3.4 Use models to explore the validity of the Pythagorean Theorem, and use it to find missing lengths.
- 8.3.5 Apply the Pythagorean Theorem to find distances in a variety of 2- and 3-dimensional contexts, including distances on coordinate graphs.
- 8.3.6 Use models and referents to explore and estimate square roots.