Mathematics
Grade 7

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

7.1 <u>Number and Operations</u> and <u>Algebra</u>: **Develop an understanding of operations on all rational numbers and solving linear equations.**

7.1.1 Develop, analyze, and apply models (including everyday contexts), strategies, and procedures to compute with integers, with an emphasis on negative integers.

7.1.2 Extend knowledge of integers and positive rational numbers to solve problems involving negative rational numbers.

7.1.3 Develop and use strategies to estimate the result of rational number computations and justify the reasonableness of results.

7.1.4 Apply properties of rational numbers and algebra to write and solve linear equations in one variable.

7.2 <u>Number and Operations</u>, <u>Algebra</u> and <u>Geometry</u>: **Develop an understanding of and apply proportionality, including similarity.**

7.2.1 Represent proportional relationships with coordinate graphs and tables, and identify unit rate as the slope of the related line.

7.2.2 Apply ratio and proportionality to solve problems, including percent and simple probability.

7.2.3 Use coordinate graphs, tables, and equations to distinguish proportional relationships from other relationships, including inverse proportionality.

7.2.4 Develop and use scale factors and proportional relationships to solve problems, including similarity and congruence.

7.2.5 Convert among different units of measurement to solve problems, including rates.

7.2.6 Apply scale factor to analyze how the change in one measure (e.g., length, area, volume) affects another.

7.3 <u>Measurement</u> and <u>Geometry</u>: **Develop an understanding of and use formulas to determine surface area and volume.**

7.3.1 Use models to explain the reasonableness of formulas for the circumference and area of circles.

7.3.2 Know common estimates of π and use these values to estimate and calculate the circumference and area of a circle.

7.3.3 Solve problems involving areas and circumferences of circles.

7.3.4 Use models to explain the reasonableness of formulas for the surface area of pyramids and cylinders, and volume of pyramids, cylinders, and cones.

7.3.5 Find and justify relationships among the formulas for the areas of different polygons when determining surface area.

7.3.6 Solve problems involving surface areas of pyramids and cylinders and volumes of pyramids, cylinders, and cones.

7.3.7 Estimate and compute the area and volume of complex or irregular shapes by dividing them into basic shapes.