



## Critical Areas for COHERENCE in Mathematics in 7<sup>th</sup> Grade

In Grade 7, instructional time should focus on **five** critical areas:

**1. Developing understanding of and applying proportional relationships;**

Students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems. Students use their understanding of ratios and proportionality to solve a wide variety of percent problems, including those involving discounts, interest, taxes, tips, and percent increase or decrease. Students solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line. They distinguish proportional relationships from other relationships.

**2. Developing understanding of operations with rational numbers.**

Students develop a unified understanding of number, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percent as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division.

**3. Working with expressions and linear equations.**

Students refine their work by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. They use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems.

**4. Solving problems involving scale drawings and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume.**

Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle. Students will explore and generalize formulas for volume and surface area of right prisms and cylinders. In preparation for work on congruence and similarity in Grade 8 they reason about relationships among two-dimensional figures using scale drawings. Students work with the relationships between three-dimensional figures and two-dimensional figures by examining cross-sections of three-dimensional figures and shapes created by rotating a two-dimensional shape around an edge. They solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, right prisms, and cylinders. This sets the stage for studying cones and pyramids in Grade 8.

5. **Drawing inferences about populations based on samples.**

Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences.