IRVINE UNIFIED SCHOOL DISTRICT

Year at a Glance - Math 8

What Students Learn
Eighth grade is the culmination of middle school math, when students fuse all of their arithmetic skills with their growing knowledge of number relationships, equations, the coordinate plane, and spatial reasoning to become high school-ready problem-solvers. Grade 8 is when arithmetic matures into algebra. In addition, by the end of middle school, foundations have been laid for further exploration of statistics and geometry in high school. Students should attain conceptual and procedural fluency with regard to single-variable linear equations, and become familiar with how to use them to model and solve problems. They also begin to solve pairs of two-variable equations and commence the foundational work on defining, evaluating and comparing functions. The concept of a function is a critical area of instruction in grade eight. Students are introduced to functions and learn that proportional relationships are part of a broader group of linear functions. Students are introduced to irrational numbers and radicals and learn to place them on the number line, as well as beginning a study of operations with exponents. Geometric transformations (translations, rotations, reflections and dilations), a major emphasis in 8th grade, are explored and used to build toward an understanding of the concepts of congruence and similarity. Another topic of Grade 8 is the Pythagorean Theorem, and applying it to solve problems involving right triangles. Finally, eighth graders augment their knowledge of three-dimensional figures by studying cylinders, cones and spheres.

Unit Numbers and Titles	Overview of Depth of Mastery
1. Congruence and Similarity Through Transformations (4 weeks)	Math 8 students should **master**: ● Understanding congruence and similarity through rotations, reflections, translations, and dilations. ● Defining and comparing linear functions in multiple representations ● Evaluating and using linear functions as they model relationships between quantities ● Calculating and comparing rates of change of linear functions ● Simplifying expressions with integer exponents ● Understanding and applying the Pythagorean Theorem to solve real world problems including the use and knowledge of radicals Math 8 students **work towards fluency** in: ● Solving single variable and systems of linear equations ● Understanding if data represents a function and if it is linear or non-linear ● Comparing rational and irrational numbers which includes estimating irrational numbers ● Recognizing patterns of association in bivariate data with scatter plots and informally fit a straight line Math 8 students are **introduced** to: ● Calculating volumes of cylinders, cones, and spheres ● Operations with scientific notation ● Using rational approximations of irrational numbers
2. Linear Functions (and Non-Linear Functions) (7 weeks)	
3. Bivariate Data (3 weeks)	
4. Solving Single Variable Linear Equations (4 weeks)	
5. Solving Systems of Linear Equations (4 weeks)	
6. Rational & Irrational Numbers (4 weeks)	
7. Rules of Exponents & Scientific Notation (4 weeks)	
8. Triangles and the Pythagorean Theorem (4 weeks)	
9. Volume of Cylinders, Cones & Spheres (2 weeks)	