

Grade 7 Mathematics Overview

Understanding 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, called the slope. They distinguish proportional relationships from other relationships.

Operations with Rational Numbers, Working with Expressions and Linear Equations

Students develop a unified understanding of number, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents 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. By applying these properties, and 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.

Geometry: Scale Drawing, Area/Surface Area/Volume of Two and Three Dimensional Shapes

Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three-dimensional objects. In preparation for work on congruence and similarity in Grade 8 they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. 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 and right prisms.

Statistics: 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.

Grade 7 Units

Proportional Relationships	Percents
<ul style="list-style-type: none"> • Finding constant of proportionality using an equation, table, graph <ul style="list-style-type: none"> ○ Vocabulary: “Constant Rate of Change” • Graphing Proportional Relationships 	<ul style="list-style-type: none"> • Review of strategies from 6th grade • Estimation • Commission • Simple Interest

<ul style="list-style-type: none"> • Scale Factor 	<ul style="list-style-type: none"> • Percent of Decrease (Discount, sale price, etc.) • Percent of Increase (Tax, tip, etc.) • Multistep problems with percents
<p>Number Sense</p> <ul style="list-style-type: none"> • Real Number System • Rational Numbers • Add/Subtract/Multiply/Divide Integers • Perfect Squares and Cubes • Estimating Squares • Exponents and Integers • Order of Operations • Word Problems 	<p>Algebra</p> <ul style="list-style-type: none"> • Combining Like Terms and Simplifying Expressions • Factoring • Solving 1 and 2 step equations • Solving equations with variables on both sides • Solving and Translating Inequalities
<p>Statistics</p> <ul style="list-style-type: none"> • Population/Sample • Sampling Methods • Bias • Inferences and Predictions from random samples • Measures of variability 	<p>Probability</p> <ul style="list-style-type: none"> • Experimental/Theoretical Probability • Simulation • Sample Space • Compound Events
<p>Geometry</p> <ul style="list-style-type: none"> • Circles – radius, circumference, area • 3D Shapes • Angles: Supplementary/Complementary • Angle Relationships Formed by Intersecting Lines • Triangles: Angle and Side Relationships • Pythagorean Theorem 	<p>Linear Functions</p> <ul style="list-style-type: none"> • Table/Graph view of line • Equations of a line