



Mathematics – Grade 7

In seventh grade, students will acquire skills and abilities in six mathematics domains:

Mathematical Practices

- make sense of problems and persevere in solving them
- reason abstractly and quantitatively
- construct viable arguments and critique the reasoning of others
- model with mathematics
- use appropriate tools strategically
- attend to precision
- look for and make use of structure
- look for and express regularity in repeated reasoning.

Ratios and Proportional Relationships

- compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units
- recognize and represent proportional relationships between quantities
- use proportional relationships to solve multi-step ratio and percent problems.

The Number System

- apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram
- apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers
- solve real-world and mathematical problems involving the four operations with rational numbers
- compare, order, estimate, and translate among integers, fractions and mixed numbers (i.e., rational numbers), decimals, and percents.

Expressions and Equations

- apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients
- solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically
- use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

Geometry

- solve problems involving scale drawings of geometric figures, such as computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale
- describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids
- know the formulas for the area and circumference of a circle and solve problems; give an informal derivation of the relationship between the circumference and area of a circle
- use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and use them to solve simple equations for an unknown angle in a figure
- solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Statistics and Probability

- understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population; understand that random sampling tends to produce representative samples and support valid inferences
- use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations
- understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring
- find probabilities of compound events using organized lists, tables, tree diagrams, and simulation