

Family

Friendly

Math

GEOMETRY WITH STATISTICS

Log on to the [SC Department of Education website](#), for the complete standards.

DATA, PROBABILITY, AND STATISTICAL REASONING

In Data, Probability, and Statistical Reasoning (DPSR), **Geometry w/Statistics** students will compare two data sets: categorical and quantitative. Students will continue the work from Eighth grade using two variables simultaneously. They will use scatter plots to describe relationships, find approximate line of best fit, and distinguish between correlation and causation. Geometry w/Statistics students will solve problems using the probability of compound real-world events by applying the rules of probability.

7th Grade

- Create graphs (stem-and-leaf plots and histograms) to represent real-world and mathematical situations
- Calculate and interpret the measures of center (mean, median, mode) and spread (mean absolute deviation, interquartile range, range) in mathematical and real-world situations.
- Calculate and interpret theoretical and experimental probability for simple events.
- Identify sample space for simple events

8th Grade

- Create and analyze graphs (scatter plots) that represent real-world and mathematical situations
- Draw conclusions about data sets from two populations
- Describe how adding or deleting data can affect the mean, median, mode, and distribution of the set
- Compare data displays for two data sets using double line graphs, back-to-back stem-and-leaf plots, and/or double box plots
- Calculate and interpret the probability of compound events (for example, finding the probability of it raining AND being below freezing temperature on the same day)

Geometry with Statistics

- Using the data to graph a scatter plot, describe the relation and use two points to find an approximate line of fit and compare to the line of best fit.
- Distinguish between correlation and causation.
- Describe categories of events as smaller samples of a larger sample space using comparative words such as unions, intersections, or complements.
- Apply the Addition and Multiplication Rules to find the probability of events to interpret the answer and context.

NUMERICAL REASONING

In Data, Probability, and Statistical Reasoning (DPSR), **Geometry w/Statistics** students will compare two data sets: categorical and quantitative. Students will continue the work from Eighth grade using two variables simultaneously. They will use scatter plots to describe relationships, find approximate line of best fit, and distinguish between correlation and causation. Geometry w/Statistics students will solve problems using the probability of compound real-world events by applying the rules of probability.

7th Grade

- Translate among multiple representations of rational numbers (numbers that can be written as fractions)
- Compare and order rational numbers using is equal to ($=$), is not equal to ($\neq$), is less than ($<$), is greater than ($>$), is greater than or equal to ($\geq$), and/or is less than or equal to ($\leq$)
- Represent real-world situations using rational numbers (positive and negative numbers that can be written as fractions)

8th Grade

- Recognize rational numbers (numbers that can be written as fractions) and irrational numbers (numbers that as a decimal are infinite, such as pi, 3.14159...)
- Classify and order the subsets of real numbers in the number system including natural, whole, integer, rational, and irrational numbers
- Compare and order real numbers using is equal to ($=$), is not equal to ($\neq$), is less than ($<$), is greater than ($>$), is greater than or equal to ($\geq$), and/or is less than or equal to ($\leq$)

Geometry with Statistics

- Show that all points on the number line are part of the real number system.
- Rewrite numerical expressions including radicals to simply, using addition, subtraction, multiplication and division to recognize geometric patterns.

MEASUREMENT, GEOMETRIC, AND SPATIAL REASONING

Geometry w/Statistics students will continue their learning from eighth grade by discovering and applying the relationships in similar right triangles using the Pythagorean Theorem and its properties to move into trigonometric ratios. Students will continue studying similarity by applying transformations. Students will continue to apply the volume of two-and three-dimensional figures with the addition of area to solve real-world problems. Students will apply the relationships among segments and angles in circles.

7th Grade

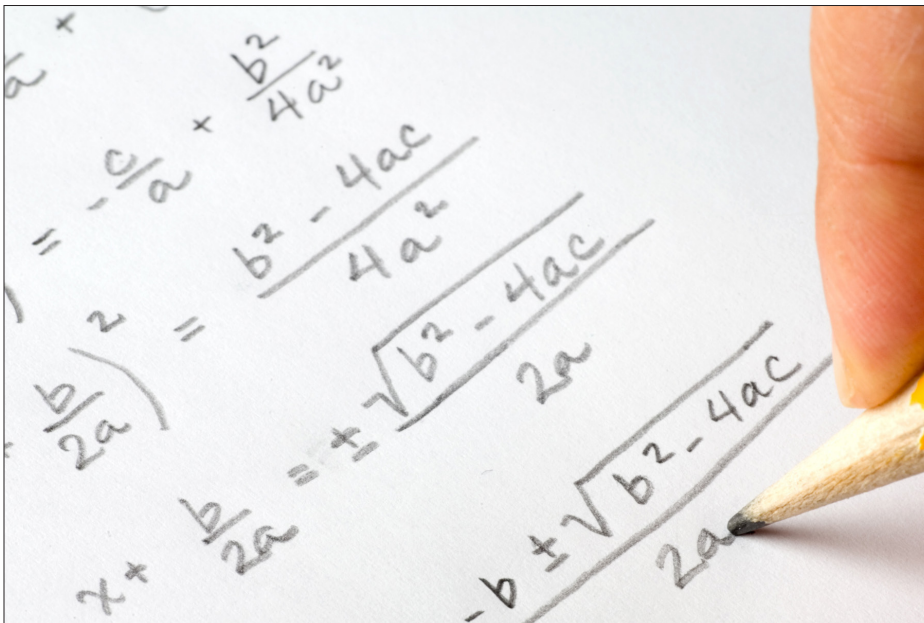
- Identify the parts of circle
- Solve mathematical and real-world problems involving circles, circumference, area, radius, and/or diameter.
- Explore the Triangle Inequality Theorem to determine what side lengths can create a triangle; use the Triangle Sum Theorem to find a missing side length in a triangle
- Solve for volume or surface area of prisms in mathematical and real-world situations.
- Explore angle relationships formed when two lines intersect.
- Use scale factor to find dimensions and areas of geometric figures and create scale drawings in mathematical and real-world situations
- Find distance between ordered pairs on the coordinate plane.

8th Grade

- Solve for volume of cones, cylinders, and spheres in mathematical and real-world situations.
- Apply the Pythagorean Theorem ($a^2 + b^2 = c^2$) to find distances and missing side lengths on right triangles.
- Understand congruence and similarity using physical models, transparencies, or Geometry software (for example, given two congruent figures, show how to obtain one from the other by a sequence of rotations, translations, and/or reflections).
- Determine angle relationships with parallel lines that are cut by a transversal.
- Create a dilation using a given scale factor and describe the effect of a dilation.

Geometry with Statistics

- Apply area and volume formulas of two-and three-dimensional figures to solve real-world situations.
- Identify and describe the shape formed when a three-dimensional figure is sliced, vertically, horizontally or diagonally.
- Using geometric vocabulary (rotation, reflection, and translation), students will be able to describe and apply a sequence of transformations of one figure to another figure.
- Determine that two figures are congruent by a series of rigid motions and justify the congruence of triangles using congruence conditions.
- Demonstrate and justify experimentally the properties of dilation of a figure given the scale factor and the center.
- Justify and apply the characteristics angles, triangles and quadrilaterals to solve real-world situations.
- Discover and apply the converse of the Pythagorean Theorem and constant ratios to right triangles in real-life situations.
- Students will apply the relationships among segments and angles in circles to solve real-world situations.



PATTERNS, ALGEBRA, AND FUNCTIONAL REASONING

Geometry w/Statistics students will analyze and interpret the structure of expressions, equations and inequalities. Students will determine an efficient strategy to find solutions and justify those solutions to make predictions in different contexts. Using graphs on a coordinate plane, students will determine exact or approximate solutions of equations and inequalities.

7th Grade

- Write and solve multi-step equations and inequalities for real-world and mathematical problems (such as calculating the total cost of a shopping trip where you need to factor in the price of items, sales tax, and a delivery fee, "item price + (item price * tax rate) + delivery fee = total cost.")
- Use ratios and rates, and proportional relationships to solve real-world problems (for example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?)
- Solve real-world percent problems (for example, tax, tips, markups, and markdowns)
- Explore positive and negative exponents and the laws of exponents ($7^{-3} = 1/7^3$)
- Use the greatest common factor (GCF) to create an equivalent expression ($6a + 15b = 3(2a + 5b)$)
- Apply all operations with rational numbers (positive and negative) to solve real-world and mathematical problems

8th Grade

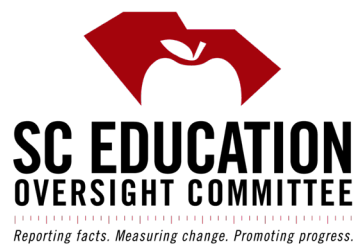
- Explain and identify slope in equations, tables, or graphs
- Determine what makes a function
- Describe key features of functions, including domain, range, intervals of increasing or decreasing, constant, discrete, continuous, and intercepts.
- Use multiple representations including mappings, tables, graphs, verbal description, and equations (only when linear) of two functions to compare the functions and draw conclusions.
- Write and solve multi-step equations and inequalities with variables on both sides for real-world and mathematical problems (for example, when wanting to know how long it will take two cars to reach the same location when starting at different points)
- Explore positive and negative exponents attached to variables, square roots, and cube roots (for example, evaluating $c^3(c^5)$ or $\sqrt{36}$ or $\sqrt[3]{27}$)

Geometry with Statistics

- Discover, analyze and apply the derivations of the formulas for circumference, area of a circle, volume and surface area of a prism, cylinder, pyramid, cone, sphere, length of an arc and area of a sector in a circle, to model and solve real-world situations.
- Analyze and determine the slopes of lines to determine if they are parallel, perpendicular or neither.
- Use coordinates to determine distance and midpoint of segments to find areas of triangles and quadrilaterals and to prove simple geometric theorems algebraically.



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The South Carolina Education Oversight Committee (EOC) is an independent, nonpartisan group of 18 educators, business people, and elected officials appointed by the legislature and governor. The EOC enacts the South Carolina Education Accountability Act of 1998, which sets standards for improving the state's K-12 educational system. The EOC reviews the state's education improvement process, assesses how schools are doing, and evaluates the standards schools must meet to build the education system needed to compete in this century.