



North Carolina Essential Standards Mathematics Grade 8

Note on Numbering: **N**–Number and Operations, **A**–Algebra, **G**–Geometry, **M**–Measurement, **S**–Statistics and Probability and **D**–Discrete Mathematics

Number and Operations

	Essential Standard	Clarifying Objectives	
8.N.1	Apply combinations of addition, subtraction, multiplication, and division to solve multi-step problems with all rational numbers.	8.N.1.1	Use all four operations for all rational numbers, including formal algorithms.
8.N.2	Understand the structure of the Real number system.	8.N.2.1	Classify Real numbers as natural, whole, integer, rational or irrational providing a justification.
		8.N.2.2	Represent Real numbers on a number line using opposites and absolute value.
		8.N.2.3	Compare Real numbers.

Algebra

	Essential Standard	Clarifying Objectives	
8.A.1	Use the combining of like terms and the distributive property to write equivalent expressions.	8.A.1.1	Use area models to illustrate the distributive property.
		8.A.1.2	Use Greatest Common Factor and area models to determine possible dimensions of a rectangle when given the area.
		8.A.1.3	Use like terms to write equivalent expressions.
		8.A.1.4	Use a given value of the variable to identify equivalent expressions.
8.A.2	Apply mathematical operations and properties to solve inequalities and equations, including variables on both sides.	8.A.2.1	Use mathematical operations and properties to solve equations.
		8.A.2.2	Use mathematical operations and properties to solve inequalities.

	Essential Standard	Clarifying Objectives	
8.A.3	Understand the use of linear relationships in slope-intercept form to solve relevant problems.	8.A.3.1	Translate a linear relationship between its verbal, tabular, graphic and algebraic forms.
		8.A.3.2	Interpret the meaning of x-intercepts and y-intercepts.
		8.A.3.3	Represent a linear equation in slope-intercept form, given the slope and y-intercept, slope and a point or two points.
		8.A.3.4	Classify ordered pairs as correct or incorrect solutions to a linear equation.
8.A.4	Interpret the meaning and value of slope of linear relationships.	8.A.4.1	Represent slope given a table, graph, linear equation or two points.
		8.A.4.2	Compare the slopes of two linear relationships to determine whether the lines are parallel or intersect at a point.
		8.A.4.3	Interpret the rate of change in tables to identify linear and non-linear relationships between variables.
8.A.5	Use the Cartesian coordinate system to solve problems involving a linear inequality.	8.A.5.1	Represent a linear inequality on the Cartesian coordinate system.
		8.A.5.2	Use graphs to find solutions to a linear inequality.

Geometry

	Essential Standard	Clarifying Objectives	
8.G.1	Understand square roots and cube roots.	8.G.1.1	Understand the relationship between geometric squares, perfect squares and their square roots.
		8.G.1.2	Understand the relationship between geometric cubes, cube numbers and their cube roots.
		8.G.1.3	Infer an approximate square root of non-perfect squares between two consecutive integers.
8.G.2	Apply the Pythagorean Theorem and its converse to solve relevant problems.	8.G.2.1	Apply the concepts of squares and square roots with the Pythagorean Theorem to find the side lengths of right triangles.
		8.G.2.2	Use the converse of the Pythagorean theorem to identify right triangles.
8.G.3	Apply properties of angle relationships to solve problems.	8.G.3.1	Use properties of adjacent, vertical, supplementary and complementary angles to solve problems.
		8.G.3.2	Use properties of parallel lines cut by a transversal to determine angle measures.
		8.G.3.3	Use proportional reasoning to determine arc lengths and central angles.

	Essential Standard	Clarifying Objectives	
8.G.4	Understand rotations of points and two-dimensional geometric shapes about the origin in the Cartesian coordinate system.	8.G.4.1	Illustrate symbolic representation for rotations of points for 90° , 180° , 270° , both clockwise and counterclockwise about the origin.
		8.G.4.2	Illustrate symbolic representation for rotations of two-dimensional geometric shapes for 90° , 180° , 270° , both clockwise and counterclockwise about the origin.

Measurement

	Essential Standard	Clarifying Objectives	
8.M.1	Explain the effect of one or more changes in dimensions on perimeter, area, volume and surface area of two-dimensional and three-dimensional figures (prisms and cylinders).	8.M.1.1	Understand the effect that dimension changes have on perimeter and area of two-dimensional figures.
		8.M.1.2	Understand the effect that dimension changes have on volume and surface area of prisms and cylinders.

Statistics and Probability

	Essential Standard	Clarifying Objectives	
8.S.1	Calculate the probabilities of dependent and independent events.	8.S.1.1	Use probabilities of simple events to calculate the probabilities of independent and dependent events.
8.S.2	Use scatterplots to summarize bivariate data.	8.S.2.1	Classify type (positive, negative, no relation) of bivariate data correlation in scatterplots.
		8.S.2.2	Represent trends in bivariate data, when appropriate, with a linear model.
		8.S.2.3	Represent the linear model with a linear equation in slope-intercept form.
		8.S.2.4	Predict the value of one variable based on the other using the linear model to fit the data.

	Essential Standard	Clarifying Objectives	
8.S.3	Understand misuse and distortion of data, statistical measures and graphical displays.	8.S.3.1	Understand how to determine outliers using the formula.
		8.S.3.2	Understand the effect of an outlier on the mean, median, inter-quartile range and range of a set of data.
		8.S.3.3	Understand misuses of surveys, sampling, graphs and statistics.