North Carolina Essential Standards
High School Math A

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Occupational Course of Study—High School Math A

Note on Numbering: example – OMA.N.1.1 indicates Occupational Course of Study Algebra (Math A). Number and Operations. Essential Standard 1. and Clarifying Objective 1.

Note: **N** = Number and Operations, **A** = Algebra, **G** = Geometry, **S** = Statistics and Probability , and **D** = Discrete

Number and Operations

	Essential Standard	Clarifying Objectives	
OMA.N.1	**Use ratios and rates to solve problems.**	OMA.N.1.1	Use proportions to solve problems.
		OMA.N.1.2	Select appropriate units and explain the result based on the problem being solved.
OMA.N.2	**Use properties of exponents to simplify expressions.**	OMA.N.2.1	Represent numerical expressions with exponents in their simplest forms.
		OMA.N.2.2	Represent algebraic expressions with exponents in their simplest forms.
		OMA.N.2.3	Use strategies to compute square roots and cube roots of numbers that are not perfect squares or perfect cubes.

Algebra

	Essential Standard	Clarifying Objectives	
OMA.A.1	**Use appropriate properties and strategies to combine and factor algebraic expressions.**	OMA.A.1.1	Execute all operations with algebraic expressions (division by monomials only).
		OMA.A.1.2	Use associative, commutative and distributive properties to combine algebraic expressions.
		OMA.A.1.3	Analyze quadratic expressions to determine their factors.

	Essential Standard	Clarifying Objectives	
OMA.A.2	**Use direct and indirect variation to solve problems.**	OMA.A.2.1	Use substitution strategies to solve equations involving direct and inverse variation.
		OMA.A.2.2	Use literal equations to represent direct and indirect variation.
		OMA.A.2.3	Explain the effect that an increase or decrease in one variable will have on the other variables.
OMA.A.3	**Analyze patterns of change in functional relationships.**	OMA.A.3.1	Differentiate between linear, quadratic and exponential patterns of change.
		OMA.A.3.2	Identify intervals of increase or decrease.
		OMA.A.3.3	Explain the rate of increase or decrease on an interval.
OMA.A.4	**Understand functions based on mathematical and real-world phenomena.**	OMA.A.4.1	Categorize relations as functions or “not functions”.
		OMA.A.4.2	Use appropriate terminology and notation (function, domain, range and intercepts) associated with functions.
		OMA.A.4.3	Interpret the relationship of constants and coefficients for data presented in graphs, tables and equations.
		OMA.A.4.4	Represent linear functions in a variety of equivalent forms (including point-slope).
		OMA.A.4.5	Use graphs, tables and symbols to solve linear equations.
		OMA.A.4.6	Use tables and graphs to solve exponential equations.
		OMA.A.4.7	Use graphs, tables, and properties to solve quadratic equations.
OMA.A.5	**Use strategies to find solutions for linear and exponential relationships.**	OMA.A.5.1	Represent linear and exponential relationships in the form of models.
		OMA.A.5.2	Use strategies to solve systems of linear equations in two variables, graphically and symbolically.
		OMA.A.5.3	Use tables and graphs to solve pairs of linear inequalities in two variables.
		OMA.A.5.4	Use tables and graphs to solve systems with linear and exponential inequalities.

Geometry

	Essential Standard	Clarifying Objectives	
OMA.G.1	**Analyze properties of geometric shapes in the Cartesian coordinate system.**	OMA.G.1.1	Use strategies to calculate the slope, distance between points, coordinates of the midpoints and the distance from a point to a line.
		OMA.G.1.2	Use geometric properties to identify geometric shapes.
OMA.G.2	**Use formulas to solve problems involving area and volume.**	OMA.G.2.1	Recognize examples of chord, tangent and secant in visual displays.
		OMA.G.2.2	Use formulas to solve problems involving the areas of polygons.
		OMA.G.2.3	Understand the 3:1 relationship between volumes of right circular cylinders and cones with the same height and circular base and between the volume of a prism and pyramid with the same base area and height.
		OMA.G.2.4	Use formulas to solve problems involving volume of right prisms, pyramids, circular cylinders and right circular cones.
		OMA.G.2.5	Represent the relationship between the surface area of prisms, cylinders and pyramids to the sum of the area(s) of their base(s) and lateral surfaces using planar nets to illustrate and sum the relevant measures.

Statistics and Probability

	Essential Standard	Clarifying Objectives	
OMA.S.1	**Analyze statistical distributions in terms of the relationships among shape, center, spread and outliers.**	OMA.S.1.1	Explain the effect of an outlier on the mean, median and range of various graphical displays.
		OMA.S.1.2	Compare shape, center, and spread of univariate data using graphical displays, quartiles, percentiles, outliers, means and standard deviations.

	Essential Standard	Clarifying Objectives	
OMA.S.2	**Infer trends in bivariate data.**	OMA.S.2.1	Use formal strategies for placement of lines of best fit to model bivariate data.
		OMA.S.2.2	Infer trends in bivariate data displayed in scatter plots to determine informally if the data is best fit with a linear, exponential or quadratic model.

Discrete

	Essential Standard	Clarifying Objectives	
OMA.D.1	**Use vertex-edge graphs to route and optimize critical paths.**	OMA.D.1.1	Apply the properties of vertex-edge graphs.
		OMA.D.1.2	Use vertex-edge graphs and algorithmic thinking (a step-by-step plan) to model and solve problems involving efficient route, Euler Circuits, and Hamiltonian Circuits.