High School Teaching and Learning

2022-2023 Scope and Sequence

NC Math 3

FIRST NINE WEEKS	OVERVIEW
	Math 3 students study piecewise, polynomial, rational, exponential, logarithmic, and sinusoidal functions. Geometric units focus on circles and their properties with modeling 2D and 3D geometric figures. Probability rules learned in previous courses are extended to the statistics of making inferences and justifying conclusions.
ASSESSMENTS	
ASSESSMENT WINDOW	**ASSESSMENT NAME**
S1: 10/14/22 to 10/28/22 S2: 3/10/23 to 3/24/23 YL: 11/21/22 to 12/9/22	NC Check-In 1

See the bottom of this document for a detailed description of the assessments as well as the parent/family resources.

UNIT	UNIT DURATION	PARENT/FAMILY RESOURCES	NORTH CAROLINA STANDARDS
Unit 1: Functions **Learning Targets:** •Understand the effects on a graph through transformations. •Compare key features of graphs •Find the inverse of a function graphically and algebraically •Solve absolute value equations and inequalities •Read and apply word problems to absolute value equations and inequalities •Solve systems of equations and systems of inequalities •Evaluate and graph piecewise functions	9 – 10 Days	• Transformations of Functions • Inverse Functions • Absolute Value Equations • Absolute Value Inequalities • System of Equations • System of Inequalities • Piecewise Functions	**Compare functions using multiple representations and understand key features to interpret, analyze, and find solutions.** ● NC.M3.A-SSE.1b: Interpret expressions that represent a quantity in terms of its context. b. Interpret expressions composed of multiple parts by viewing one or more of their parts as a single entity to give meaning in terms of a context. ● NC.M1.F-IF.4: Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: intercepts; intervals where the function is increasing, decreasing, positive, or negative; and maximums and minimums. ● NC.M3.F-IF.9: Compare key features of two functions using different representations by comparing properties of two different functions, each with a different representation (symbolically, graphically, numerically in tables, or by verbal descriptions). ● NC.M3.F-IF.2: Use function notation to evaluate piecewise defined functions for inputs in their domains, and interpret statements that use function notation in terms of a context. ● NC.M3.F-IF.7: Analyze piecewise, absolute value, polynomials, exponential, rational, and trigonometric functions (sine

			and cosine) using different representations to show key features of the graph, by hand in simple cases and using technology for more complicated cases, including: domain and range; intercepts; intervals where the function is increasing, decreasing, positive, or negative; rate of change; relative maximums and minimums; symmetries; end behavior; period; and discontinuities. ● NC.M3.F-BF.1b: Write a function that describes a relationship between two quantities. b. Build a new function, in terms of a context, by combining standard function types using arithmetic operations. ● NC.M3.F-BF.3: Extend an understanding of the effects on the graphical and tabular representations of a function when replacing $f(x)$ with $k \cdot f(x)$, $f(x) + k$, $f(x + k)$ to include $f(k \cdot x)$ for specific values of k (both positive and negative). Understand inverse relationships, describe them in various representations, and use these. **Understand inverse relationships, describe them in various representations, and use these relationships to solve, analyze and interpret.** ●NC.M3.F-BF.4a: Find an inverse function. a. Understand the inverse relationship between exponential and logarithmic, quadratic and square root, and linear to linear functions and use this relationship to solve problems using tables, graphs, and equations. ● NC.M3.F-BF.4b: Find an inverse function. b. Determine if an inverse function exists by analyzing tables, graphs, and equations. ● NC.M3.F-BF.4c: Find an inverse function. c. If an inverse function exists for a linear, quadratic and/or exponential function, f, represent the inverse function, f −1 , with a table, graph, or equation and use it to solve problems in terms of a context

			Understand absolute value and piecewise defined relationships, describe them in various representations, and use these relationships to solve, analyze and interpret. ● NC.M3.A-CED.1: Create equations and inequalities in one variable that represent absolute value, polynomial, exponential, and rational relationships and use them to solve problems algebraically and graphically. ● NC.M3.A-CED.2: Create and graph equations in two variables to represent absolute value, polynomial, exponential and rational relationships between quantities. ● NC.M3.A-CED.3: Create systems of equations and/or inequalities to model situations in context. ● NC.M3.A-SSE.1a: Interpret expressions that represent a quantity in terms of its context. a. Identify and interpret parts of a piecewise, absolute value, polynomial, exponential and rational expressions including terms, factors, coefficients, and exponents. ● NC.M3.A-SSE.1b: Interpret expressions that represent a quantity in terms of its context. b. Interpret expressions composed of multiple parts by viewing one or more of their parts as a single entity to give meaning in terms of a context. ● NC.M3.A-REI.1: Justify a solution method for equations and explain each step of the solving process using mathematical reasoning. ● NC.M3.A-REI.11: Extend an understanding that the x-coordinates of the points where the graphs of two equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$ and approximate solutions using a graphing technology or successive approximations with a table of values.
Unit 2: Polynomial Functions **Learning Targets:** Students will be able to:	9 – 10 Days	• Key Features of Polynomials • Operations • Factoring and solving • Division of Polynomials	**Understand and apply the Fundamental Theorem of Algebra, the Remainder Theorem, the Factor Theorem, and the Division Algorithm. Create polynomial equations in one or two variables and**

• Find and interpret key features of polynomials • Compare key features graphically, numerically, and algebraically • Identify number of solutions (zeros and roots) of polynomial functions • Create and solve one or two variable polynomial equations • Create a polynomial function using zeros • Identify the number of real and imaginary solutions real by viewing the graph and the degree of the polynomial • Divide polynomials using synthetic and long division • Apply the factor and remainder theorem Apply optimization using real-world applications		• Remainder and Factor Theorems • Modeling (Box Problem)	**use them to solve problems algebraically and graphically.** ● NC.M3.N-CN.9: Use the Fundamental Theorem of Algebra to determine the number and potential types of solutions for polynomial functions. ● NC.M3.A-SSE.1a: Interpret expressions that represent a quantity in terms of its context. a. Identify and interpret parts of a piecewise, absolute value, polynomial, exponential and rational expressions including terms, factors, coefficients, and exponents. ● NC.M3.A-SSE.1b: Interpret expressions that represent a quantity in terms of its context. b. Interpret expressions composed of multiple parts by viewing one or more of their parts as a single entity to give meaning in terms of a context. ● NC.M3.A-SSE.2: Use the structure of an expression to identify ways to write equivalent expressions. ● NC.M3.A-APR.2: Understand and apply the Remainder Theorem ● NC.M3.A-APR.3: Understand the relationship among factors of a polynomial expression, the solutions of a polynomial equation and the zeros of a polynomial function. ● NC.M3.A-CED.1: Create equations and inequalities in one variable that represent absolute value, polynomial, exponential, and rational relationships and use them to solve problems algebraically and graphically. ● NC.M3.A-CED.2: Create and graph equations in two variables to represent absolute value, polynomial, exponential and rational relationships between quantities. ● NC.M3.A-REI.1: Justify a solution method for equations and explain each step of the solving process using mathematical reasoning. ● NC.M3.F-BF.1a: Write a function that describes a relationship between two quantities. a. Build polynomial and exponential functions with real solution(s) given a graph, a description of a

			relationship, or ordered pairs (include reading these from a table). ● NC.M3.F-BF.1b: Write a function that describes a relationship between two quantities. b. Build a new function, in terms of a context, by combining standard function types using arithmetic operations. **Recognize key features, zeros, and transformations of polynomial functions. Analyze a polynomial function and compare two or more functions by using their key features. Analyze and compare the relative rates of growth of exponential and polynomial functions.** ● NC.M1.F-IF.4: Interpret functions that arise in applications in terms of the context. Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: intercepts; intervals where the function is increasing, decreasing, positive, or negative; and maximums and minimums. ● NC.M3.F-IF.7: Analyze functions using different representations. Analyze piecewise, absolute value, polynomials, exponential, rational, and trigonometric functions (sine and cosine) using different representations to show key features of the graph, by hand in simple cases and using technology for more complicated cases, including: domain and range; intercepts; intervals where the function is increasing, decreasing, positive, or negative; rate of change; relative maximums and minimums; symmetries; end behavior; period; and discontinuities. ● NC.M3.F-IF.9: Analyze functions using different representations. Compare key features of two functions using different representations by comparing properties of two different functions, each with a different representation (symbolically, graphically, numerically in tables, or by verbal descriptions). ● NC.M3.F-BF.1a: Build a function that models a relationship between two

			quantities. Write a function that describes a relationship between two quantities. a. Build polynomial and exponential functions with real solution(s) given a graph, a description of a relationship, or ordered pairs (include reading these from a table). ● NC.M3.F-BF.1b: Build a function that models a relationship between two quantities. Write a function that describes a relationship between two quantities. b. Build a new function, in terms of a context, by combining standard function types using arithmetic operations. ● NC.M3.F-BF.3: Build new functions from existing functions. Extend an understanding of the effects on the graphical and tabular representations of a function when replacing $f(x)$ with $k \cdot f(x)$, $f(x) + k$, $f(x + k)$ to include $f(k \cdot x)$ for specific values of k (both positive and negative). ● NC.M3.F-LE.3: Construct and compare linear and exponential models and solve problems. Compare the end behavior of functions using their rates of change over intervals of the same length to show that a quantity increasing exponentially eventually exceeds a quantity increasing as a polynomial function.
Unit 3: Exponential and Logarithmic Functions **Learning Targets:** • Graph exponential and logarithmic functions • Identify key features of exponential and logarithmic functions • Solve exponential and logarithmic equations • Identify and compare equivalent equations using growth and decay Solve real-world problems using growth and decay	9 – 10 Days	• Exponential Graphs • Logarithmic Graphs • Solving Exponential Equations • Solving Logarithmic Equations • Exponential Growth and Decay	**Understand how to create exponential equations and graphs with one or two variables, and be able to identify the different parts of an exponential equation and relate them to the real world.** ● NC.M3.A-CED.1: Create equations and inequalities in one variable that represent absolute value, polynomial, exponential, and rational relationships and use them to solve problems algebraically and graphically. ● NC.M3.A-CED.2: Create and graph equations in two variables to represent absolute value, polynomial, exponential and rational relationships between quantities. ● NC.M3.A-SSE.1a: Interpret expressions that represent a quantity in terms of its

			context. a. Identify and interpret parts of a piecewise, absolute value, polynomial, exponential and rational expressions including terms, factors, coefficients, and exponents. ● NC.M3.A-SSE.1b: Interpret expressions that represent a quantity in terms of its context. b. Interpret expressions composed of multiple parts by viewing one or more of their parts as a single entity to give meaning in terms of a context. ● NC.M3.A-SSE.2: Use the structure of an expression to identify ways to write equivalent expressions. ● NC.M3.A-SSE.3: Write an equivalent form of an exponential expression by using the properties of exponents to transform expressions to reveal rates based on different intervals of the domain. ● NC.M3.A-REI.1: Justify a solution method for equations and explain each step of the solving process using mathematical reasoning. **Recognize the relationship between exponential and logarithmic equations as inverses using multiple representations, interpret the key features of the graph, and use them to solve equations and model real world phenomena.** ● NC.M3.F-BF.3: Extend an understanding of the effects on the graphical and tabular representations of a function when replacing $f(x)$ with $k \cdot f(x)$, $f(x) + k$, $f(x + k)$ to include $f(k \cdot x)$ for specific values of k (both positive and negative). ● NC.M1.F-IF.4: Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: intercepts; intervals where the function is increasing, decreasing, positive, or negative; and maximums and minimums. ● NC.M3.F-IF.7: Analyze piecewise, absolute value, polynomials, exponential, rational, and trigonometric functions (sine and cosine) using different

			representations to show key features of the graph, by hand in simple cases and using technology for more complicated cases, including: domain and range; intercepts; intervals where the function is increasing, decreasing, positive, or negative; rate of change; relative maximums and minimums; symmetries; end behavior; period; and discontinuities. ● NC.M3.F-IF.9: Compare key features of two functions using different representations by comparing properties of two different functions, each with a different representation (symbolically, graphically, numerically in tables, or by verbal descriptions). ● NC.M3.F-BF.1a: Write a function that describes a relationship between two quantities. a. Build polynomial and exponential functions with real solution(s) given a graph, a description of a relationship, or ordered pairs (include reading these from a table). ● NC.M3.F-BF.1b: Write a function that describes a relationship between two quantities. b. Build a new function, in terms of a context, by combining standard function types using arithmetic operations. ● NC.M3.F-BF.4a: Find an inverse function. a. Understand the inverse relationship between exponential and logarithmic, quadratic and square root, and linear to linear functions and use this relationship to solve problems using tables, graphs, and equations. ● NC.M3.F-BF.4b: Find an inverse function. b. Determine if an inverse function exists by analyzing tables, graphs, and equations. ● NC.M3.F-BF.4c: Find an inverse function. c. If an inverse function exists for a linear, quadratic and/or exponential function, f, represent the inverse function, f −1 , with a table, graph, or equation and use it to solve problems in terms of a context ● NC.M3.F-LE.4: Use logarithms to express the solution to $abct = d$ where a, b, c, and d are numbers and evaluate the logarithm using technology.

High School Teaching and Learning

2022-2023 Scope and Sequence

NC Math 3

Unit 4: Modeling with Geometry **Learning Targets:** • Complete the square to find the radius and center of a circle • Write and graph the equation of a circle with center (h,k) and radius r • Explain the variables and how the volume formula was built • Use volume formulas to solve problems • Identify 2D shapes formed by the cross section of a 3D figure • Identify 3D figures formed by the rotation of a 2D shape Use geometric concepts to model and solve real-world problems	7 Days	• Circles • Volume • Density • Cross Sections • Rotating 2D Figures	**Derive the equation of a circle as well as distinguishing the center and radius of a circle from an equation.** ● NC.M3.G-GPE.1: Translate between the geometric description and the equation for a conic section. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation. **Implement surface area and volume of geometric figures and model using polynomial functions. Furthermore, relating cross sections with two-dimensional and three-dimensional figures.** ● NC.M3.G-GMD.3: Explain volume formulas and use them to solve problems. Use the volume formulas for prisms, cylinders, pyramids, cones, and spheres to solve problems. ● NC.M3.G-GMD.4: Visualize relationships between two-dimensional and three-dimensional objects. Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects. ● NC.M3.G-MG.1: Apply geometric concepts in modeling situations. Apply geometric concepts in modeling situations Use geometric and algebraic concepts to solve problems in modeling situations: ○ Use geometric shapes, their measures, and their properties, to model real-life objects. ○ Use geometric formulas and algebraic functions to model relationships. ○ Apply concepts of density based on area and volume. ○ Apply geometric concepts to solve design and optimization problems. ● NC.M3.G-CO.14: Prove geometric theorems. Apply properties, definitions, and theorems of two-dimensional figures to prove geometric theorems and solve problems. ● NC.M3.A-SSE.1b: Interpret the structure of expressions. Interpret expressions that

			represent a quantity in terms of its context. b. Interpret expressions composed of multiple parts by viewing one or more of their parts as a single entity to give meaning in terms of a context. ● NC.M3.A-SSE.2: Use the structure of an expression to identify ways to write equivalent expressions. ● NC.M3.A-REI.1: Justify a solution method for equations and explain each step of the solving process using mathematical reasoning. ● NC.M3.F-BF.1b: Write a function that describes a relationship between two quantities. b. Build a new function, in terms of a context, by combining standard function types using arithmetic operations.

High School Teaching and Learning

2022-2023 Scope and Sequence

NC Math 3

SECOND NINE WEEKS	OVERVIEW
	Math 3 students study piecewise, polynomial, rational, exponential, logarithmic, and sinusoidal functions. Geometric units focus on circles and their properties with modeling 2D and 3D geometric figures. Probability rules learned in previous courses are extended to the statistics of making inferences and justifying conclusions.

ASSESSMENTS	
ASSESSMENT WINDOW	**ASSESSMENT NAME**
S1: 11/18/22 to 12/2/22 S2: 4/28/23 to 5/12/23 YL: 3/6/23 to 3/24/23	NC Check-In 2
S1: 1/13/23 to 1/20/23 S2: 6/2/23 to 6/8/23 YL: 6/2/23 to 6/8/23	NC Math 3 End of Course Test

UNIT	UNIT DURATION	PARENT/FAMILY RESOURCES	NORTH CAROLINA STANDARDS
Unit 5: Rational Functions **Learning Targets:** • Rewrite and simplify a rational expression by factoring, long division, or synthetic division • Multiply and divide rational expressions • Add and subtract rational expressions • Solve rational equations • Determine the domain, range, asymptotes, and discontinuities of a rational function	10 Days	• Simplifying Rational Expressions • Multiplying and Dividing Rational Expressions • Adding and Subtracting Rational Expressions • Solving Rational Equations • Graphing Rational Functions • Discontinuities of Rational Functions • Applications of Rational Functions	**Recognize rational expressions as the division of two polynomials and use properties of simple fractions to analyze, perform arithmetic operations, create and solve equations that model real world phenomena.** ● NC.M3.A-SSE.1a: Interpret expressions that represent a quantity in terms of its context. a. Identify and interpret parts of a piecewise, absolute value, polynomial, exponential and rational expressions including terms, factors, coefficients, and exponents. ● NC.M3.A-SSE.1b: Interpret expressions that represent a quantity in terms of its context. b. Interpret expressions composed of multiple parts by viewing one or more of their parts as a single entity to give meaning in terms of a context. ● NC.M3.A-SSE.2: Use the structure of an expression to identify ways to write equivalent expressions. ● NC.M3.A-APR.6: Rewrite simple rational expressions in different forms; write polynomials with the degree of r (x) less than the degree of b (x) . a(x) b(x) in the form q +r(x) (x) , b(x) where a (x), b(x), q(x) ● NC.M3.A-APR.7a: Understand the similarities between arithmetic with rational expressions and arithmetic with rational numbers. a. Add and subtract two rational expressions, a (x) and b (x), where the denominators of both a (x) and b (x)), and are linear expressions. ● NC.M3.A-APR.7b: Understand the similarities between arithmetic with rational expressions and

• Graph rational functions using key features Create and solve a rational equation to solve an application			arithmetic with rational numbers. b. Multiply and divide two rational expressions. ● NC.M3.A-CED.1: Create equations that describe numbers or relationships. Create equations and inequalities in one variable that represent absolute value, polynomial, exponential, and rational relationships and use them to solve problems algebraically and graphically. ● NC.M3.A-CED.2: Create equations that describe numbers or relationships. Create and graph equations in two variables to represent absolute value, polynomial, exponential and rational relationships between quantities. ● NC.M3.A-REI.1: Justify a solution method for equations and explain each step of the solving process using mathematical reasoning. ● NC.M3.A-REI.2: Solve and interpret one variable rational equations arising from a context, and explain how extraneous solutions may be produced. **Understand and interpret the key features, uses and limitations of multiple representations of a rational function.** ● NC.M3.F-BF.1b: Write a function that describes a relationship between two quantities. b. Build a new function, in terms of a context, by combining standard function types using arithmetic operations. ● NC.M1.F-IF.4: Interpret functions that arise in applications in terms of the context. Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: intercepts; intervals where the function is increasing, decreasing, positive, or negative; and maximums and minimums. ● NC.M3.F-IF.7: Analyze functions using different representations. Analyze piecewise, absolute value, polynomials, exponential, rational, and trigonometric functions (sine and cosine) using different representations to show key features of the graph, by hand in simple cases and using technology for more complicated cases, including: domain and range; intercepts; intervals where the function is increasing, decreasing, positive, or negative; rate of change; relative maximums and minimums; symmetries; end behavior; period; and discontinuities. ● NC.M3.F-IF.9: Analyze functions using different representations. Compare key features of two functions using different representations by comparing properties of two different functions, each with a different representation (symbolically,

			graphically, numerically in tables, or by verbal descriptions).
Unit 6: Reasoning with Geometry **Learning Targets:** • Apply theorems about parallelograms to prove other theorems or solve problems • Explore and prove properties of centers of triangles • Apply the properties of the centroid, incenter, and circumcenter of triangles to solve problems • Use circle vocabulary such as radii, diameter, central angle, inscribed angle, and circumscribed angle • Find the length of an arc • Find a central angle of a circle • Find an inscribed angle of a circle • Find angles created by tangents and chords	15 Days	• Properties of Parallelograms • Centers of Triangles • Angles and Circles • Tangents, Secants, and Chords • Arc Lengths and Sectors • Modeling	**Construct logical arguments and explain reasoning with two-dimensional figures to prove geometric theorems about parallelograms and solve problems. Demonstrate an understanding of the properties of three of a triangle's points of concurrency.** ● NC.M3.G-CO.11: Prove theorems about parallelograms. ○ Opposite sides of a parallelogram are congruent. ○ Opposite angles of a parallelogram are congruent. ○ Diagonals of a parallelogram bisect each other. ○ If the diagonals of a parallelogram are congruent, then the parallelogram is a rectangle. ● NC.M3.G-CO.14: Prove geometric theorems. Apply properties, definitions, and theorems of two-dimensional figures to prove geometric theorems and solve problems. ● NC.M3.G-CO.10: Verify experimentally properties of the centers of triangles (centroid, incenter, and circumcenter). **Understand properties of circles and how to apply them algebraically and geometrically. Demonstrate understanding that within circles, segments, lines, and angles create special relationships and use these to solve geometric problems.** ● NC.M3.G-C.2: Understand and apply theorems about circles. ○ Understand and apply theorems about relationships with angles and circles, including central, inscribed and circumscribed angles. ○ Understand and apply theorems about relationships with line segments and circles including, radii, diameter, secants, tangents and chords. ● NC.M3.G-C.5: Using similarity, demonstrate that the length of an arc, s, for a given central angle is proportional to the radius, r, of the circle. Define radian measure of the central angle as the ratio of the length of the arc to the radius of the circle, s/r. Find arc lengths and areas of sectors of circles. ● NC.M3.G-CO.14: Prove geometric theorems. Apply properties, definitions, and theorems of two-dimensional figures to prove geometric theorems and solve problems. ● NC.M3.G-MG.1: Apply geometric concepts in modeling situations. Apply geometric concepts in modeling situations Use geometric and algebraic concepts to solve problems in modeling situations:

• Find the different lengths of sides using chords, secants, and tangents • Find the area of a sector of a circle Choose an appropriate geometric figure for modeling a particular real-world object			● Use geometric shapes, their measures, and their properties, to model real-life objects. ● Use geometric formulas and algebraic functions to model relationships. ● Apply concepts of density based on area and volume. ● Apply geometric concepts to solve design and optimization problems.
Unit 7: Trigonometric Functions **Learning Targets:** • Understand the ratios between sides of special right triangles • Use the Unit Circle to find the trig function of different angles • Use angle measures in radians and degrees • Graph sine and cosine functions • Understand the relationship between the Unit Circle and graphs of sine and cosine • Use technology, graphs, and tables to compare sine	10 Days	• Trigonometric Ratios • Radian Measure and Unit Circle • Graphing Sine and Cosine Functions • Transformations of Sine and Cosine Functions • Modeling Sine and Cosine Functions	**Understand that trigonometric functions can be represented on the coordinate plane in different ways based on the quantities used for the axises. Understand the relationships between different representations of trigonometric functions on the coordinate plane. Identify and interpret key features of trigonometric functions.** ● NC.M3.F-IF.1: Extend the concept of a function by recognizing that trigonometric ratios are functions of angle measure. ● NC.M1.F-IF.4: Interpret functions that arise in applications in terms of the context. Interpret key features of graphs, tables, and verbal descriptions in context to describe functions that arise in applications relating two quantities, including: intercepts; intervals where the function is increasing, decreasing, positive, or negative; and maximums and minimums. ● NC.M3.F-IF.7: Analyze functions using different representations. Analyze piecewise, absolute value, polynomials, exponential, rational, and trigonometric functions (sine and cosine) using different representations to show key features of the graph, by hand in simple cases and using technology for more complicated cases, including: domain and range; intercepts; intervals where the function is increasing, decreasing, positive, or negative; rate of change; relative maximums and minimums; symmetries; end behavior; period; and discontinuities. ● NC.M3.F-IF.9: Analyze functions using different representations. Compare key features of two functions using different representations by comparing properties of two different functions, each with a different representation (symbolically,

and cosine graphs • State the amplitude, period, and vertical shift of sine and cosine functions • Use technology to interpret key features of sine and cosine graphs in a real-world situation • Use key features to construct the graph of sine and cosine function			graphically, numerically in tables, or by verbal descriptions). ● NC.M3.F-BF.3: Build new functions from existing functions. Extend an understanding of the effects on the graphical and tabular representations of a function when replacing $f(x)$ with $k \cdot f(x)$, $f(x) + k$, $f(x + k)$ to include $f(k \cdot x)$ for specific values of k (both positive and negative). ● NC.M3.F-TF.1: Understand radian measure of an angle as: ○ The ratio of the length of an arc on a circle subtended by the angle to its radius. ○ A dimensionless measure of length defined by the quotient of arc length and radius that is a real number. ○ The domain for trigonometric functions. ● NC.M3.F-TF.2a: Build an understanding of trigonometric functions by using tables, graphs and technology to represent the cosine and sine functions. a. Interpret the sine function as the relationship between the radian measure of an angle formed by the horizontal axis and a terminal ray on the unit circle and its y coordinate. ● NC.M3.F-TF.2b: Build an understanding of trigonometric functions by using tables, graphs and technology to represent the cosine and sine functions. b. Interpret the cosine function as the relationship between the radian measure of an angle formed by the horizontal axis and a terminal ray on the unit circle and its x coordinate. ● NC.M3.F-TF.5: Use technology to investigate the parameters, , , and of a sine function, a b h and interpret key features in terms of a context.
Unit 8: Statistics **Learning Targets:** • Distinguish between a sample and a population • Describe different sampling techniques • Explain the purpose of sample surveys, observational studies, and experiments	5 Days	• Sampling Techniques • Surveys, Observational Studies, and Experiments • Margin of Error	**Understand statistics as a process of making inferences about a population (parameter) based on results from a random sample (statistic).** ● NC.M3.S-IC.1: Understand the process of making inferences about a population based on a random sample from that population. ● NC.M3.S-IC.3: Recognize the purposes of and differences between sample surveys, experiments, and observational studies and understand how randomization should be used in each. **Understand simulation is useful for using data to make decisions. Understand that samples can differ by chance.** ● NC.M3.S-IC.4: Use simulation to understand how samples can be used to estimate a population mean

• Determine how results of a statistical study can be generalized to make conclusions about a population based on a sample • Determine and justify if results from an experiment are statistically significant • State a conclusion of the effectiveness or accuracy of a claim based on a sample • Use the data from a sample survey to estimate a population mean or proportion with a margin of error			or proportion and how to determine a margin of error for the estimate. ● NC.M3.S-IC.5: Use simulation to determine whether observed differences between samples from two distinct populations indicate that the two populations are actually different in terms of a parameter of interest. **Understand not all data that is reported is valid. Reports should be evaluated based on source, design of the study, and data displays.** ● NC.M3.S-IC.6: Evaluate articles and websites that report data by identifying the source of the data, the design of the study, and the way the data are graphically displayed.

NC Check-Ins Mathematics

NC Check-Ins are interim assessments aligned to North Carolina grade-level content standards in mathematics for grades 3–8 developed by the North Carolina Department of Public Instruction (NCDPI).

High School Teaching and Learning

2022-2023 Scope and Sequence

NC Math 3

The main purpose of NC Check-Ins is to provide students, teachers, parents, and stakeholders with immediate in-depth action-data and a reliable estimate of students' current performance on the selected sub-set of content standards. A secondary purpose is derived from NC Check-Ins strong relationship with grade level end-of-grade (EOG) summative assessments.

NC Math 3 NC Check-Ins Assessed Standards	
1	2
A-APR.6	A-APR.7
A-CED.1	A-REI.2
A-SSE.2	F-IF.7
F-BF.1	F-IF.9
F-BF.4	G-GPE.1
F-LE.4	G-MG.1

Parent/Family Materials

These materials are designed to give parents support for each lesson in our NC Math 3 units. There are video tutorials as well as additional problems and answers for the topics that can be used for extra practice.