CMS
Course-at-a-Glance 2017-2018
<u>MATH 3</u>

Unit 1 Title: Functions and Their Inverses   **Suggested Pacing: 4 Days**

Standards: NC.M3.F-IF.9, NC.M3.F-BF.4, NC.M3.F-BF.4a, NC.M3.F-BF.4b, NC.M3.F-BF.4c

In this unit, students will understand the inverse relationship between exponential and logarithmic, quadratic and square root, and linear to linear functions graphically, numerically in tables, algebraically and in the context of real-world situations. Students will determine when a function is one-to-one and whether an inverse function exists by analyzing tables, graphs and equations.

Unit 2 Title: Modeling with Functions   **Suggested Pacing: 5 Days**

Standards: NC.M3.A-SSE.1a, NC.M3.A-CED.1, NC.M3.A-CED.2, NC.M3.A-CED.3, NC.M3.A-REI.11, NC.M3.F-IF.2, NC.M3.F-IF.7, NC.M3.F-BF.1b, NC.M3.F-BF.3

In this unit, students will create, graph and solve absolute value equations and inequalities in one and two variables. Students will evaluate and graph piecewise functions and analyze parts of a piecewise function in context. Students will build new functions by combining standard function types and identify the new function's domain.

Unit 3 Title: Polynomial Functions   **Suggested Pacing: 8 Days**

Standards: NC.M3.N-CN.9, NC.M3.A-SSE.1a, NC.M3.A-APR.2, NC.M3.A-APR.3, NC.M3.A-CED.1, NC.M3.A-CED.2, NC.M3.F-IF.7, NC.M3.F-IF.9, NC.M3.F-BF.1a, NC.M3.F-BF.1b, NC.M3.F-LE.3, NC.M3.G-MG.1, NC.M3.G-GMD.3, NC.M3.A-REI.11

In this unit, students will identify and interpret parts of a polynomial expression, interpret the Fundamental Theorem of Algebra and use it to solve polynomial functions for all zeros (both real and complex). Students will graph and analyze the key features of polynomial functions, divide polynomials and use both the Remainder and Factor Theorems to prove factors and solutions. Students will build polynomial functions from real solutions and use polynomials in the context of modeling problems. Students will solve systems of equations involving polynomials.

Unit 4 Title: Rational Functions   **Suggested Pacing: 7 Days**

Standards: NC.M3.A-SSE.1a, NC.M3.A-APR.6, NC.M3.A-APR.7, NC.M3.A-CED.1, NC.M3.A-CED.2, NC.M3.A-REI.1, NC.M3.A-REI.2, NC.M3.F-IF.4, NC.M3.F-IF.7, NC.M3.F-IF.9

In this unit, students will perform operations with rational expressions, create and solve rational equations, graph rational functions and identify and interpret the meaning of key features of rational function graphs.

Unit 5 Title: Exponential and Logarithmic Functions   **Suggested Pacing: 6 Days**

Standards: NC.M3.A-CED.1, NC.M3.A-CED.2, NC.M3.A-SSE.1a, NC.M3.A-SSE.3c, NC.M3.F-IF.7, NC.M3.F-IF.9, NC.M3.F-BF.1a, NC.M3.F-BF.3, NC.M3.F-BF.4a, NC.M3.F-LE.4

In this unit, students will create and graph equations that represent exponential relationships and identify and give meaning to parts of an exponential equation including terms, coefficients and exponents. Students will identify and describe graphical changes to an exponential function when transformed vertically and horizontally and analyze key features including, but not limited to, domain and range, increasing/decreasing intervals, symmetry and end behavior. Students will solve exponential equations algebraically and graphically, and evaluate a logarithm using technology. Students will create linear, quadratic and exponential models to compare relationships between quantities.

Unit 6 Title: Modeling & Reasoning with Geometry　　　　**Suggested Pacing: 6 Days**

Standards: NC.M3.G-GMD.3, NC.M3.G-GMD.4, NC.M3.G-MG.1, NC.M3.G-CO.10, NC.M3.G-CO.11 , NC.M3.G-CO.14

In this unit, students will experiment with and verify the properties of the centers of triangles, prove theorems about parallelogram and use volume formulas for three-dimensional figures to solve problems. Students will identify the shapes of two-dimensional cross sections and the three-dimensional figure created by a rotation of a two-dimensional object. Students will also use geometric concepts to model and solve real-world situations involving density, design, and optimization.

Unit 7 Title: Circles　　　　　　　　　　**Suggested Pacing: 7 Days**

Standards: NC.M3.G-GPE.1, NC.M3.G-C.2, NC.M3.G-C.5, NC.M3.G-MG.1, NC.M3.G-CO.14

In this unit, students will derive the equation of a circle using the Pythagorean Theorem, relate it to the distance formula, and complete the square to find the center and radius of a circle. Students will understand and apply theorems about angles (central, inscribed, and circumscribed) and segments (radii, diameters, secants, tangents, and chords) of circles. Students will compute areas of sectors of circles and arc lengths, using both radian and degree measure.

Unit 8 Title: Trigonometric Functions　　　　**Suggested Pacing: 5 Days**

Standards - NC.M3.F-IF.1, NC.M3.F-IF.4, NC.M3.F-IF.7, NC.M3.F-IF.9, NC.M3.F-BF.3, NC.M3.F-TF.1, NC.M3.F-TF.2, NC.M3.F-TF.5

In this unit, students will understand that trigonometric ratios are functions of angle measures and be able to relate the unit circle to the periodicity, domain, range, and shape of sine and cosine values and graphs. Students will define a radian measure of an angle and convert between degrees and radians. Students will use technology to investigate transformations of sine graphs and interpret key features.

Unit 9 Title: Statistics　　　　　　　　**Suggested Pacing: 5 Days**

Standards - NC.M3.S-IC.1, NC.M3.S-IC.3, NC.M3.S-IC.4, NC.M3.S-IC.5, NC.MC.S-IC.6

In this unit, students will understand how sample values apply to a larger population of study and be able to identify inaccurate results and possible lurking variables. Students will distinguish between types of studies and types of sampling methods and be able to calculate margin of error and estimate population mean or proportion based on a sample. Students will evaluate real-world reports based on survey data.