Sterling Middle School Scope and Sequence

Internal Document

MATH 7

Cycle 1: Power & Potential	
Central Concepts	**Supporting Concepts**
○ **Integers and Absolute Value** ○ **Fractions, Decimals and Percents** ○ **Roots and Exponents**	**Integers and Absolute Value** ○ Integers and Absolute Value ○ Adding Integers ○ Subtracting Integers ○ Multiplying Integers ○ Dividing Integers **Fractions, Decimals and Percents** ○ Fraction Operations ○ Decimal Operations ○ Percents and Decimals ○ Comparing and ordering Fractions/Decimals/Percents **Roots and Exponents** ○ Finding Square Roots ○ Finding Cube Roots ○ Approximating Square Roots
Essential Questions	**NC State Standards Alignment**
Integers and Absolute Value How can you use integers to represent the velocity and the speed of an object? Is the sum of two integers positive, negative, or zero? How can you tell? How are adding integers and subtracting integers related? Is the product of two integers positive, negative, or zero? How can you tell? Is the quotient of two integers positive, negative, or zero? How can you tell? **Fractions, Decimals and Percents** How can you use a number line to order rational numbers? How can you use what you know about adding integers to add rational numbers? How can you use what you know about subtracting integers to subtract rational numbers? Why is the product of two negative rational numbers positive? How does the decimal point move when you rewrite a percent as a decimal and when you rewrite a decimal as a percent? How can you order numbers that are written as fractions, decimals, and percents? **Roots and Exponents** How can you find the dimensions of a square when you are given its area? How is the cube root of a number different from the square root of a number? How can you find decimal approximations of square roots that are not rational?	**Integers and Absolute Value** **Fractions, Decimals and Percents** ○ 7.NS.1 ○ 7.NS.2 ○ 7.NS.3 **Roots and Exponents** ○ 8.NS.1 ○ 8.NS.2 ○ 8.EE.1 ○ 8.EE.2 ○ 8.EE.3 ○ 8.EE.4

Cycle 2: Forces & Validation

Central Concepts

- **Ratios and Proportions**
- **Expressions and Equations**

Supporting Concepts

Ratios and Proportions

- Ratios and Rates
- Proportions
- Scale Drawings
- Writing Proportions
- Solving Proportions
- Slope
- Direct Variation
- The Percent Proportion
- The Percent Equation
- Percents of Increase and Decrease
- Discounts and Markups
- Simple Interest

Expressions and Equations

- Algebraic Expressions
- Adding and Subtracting Linear Expressions
- Solving Equations Using Addition or Subtraction
- Solving Equations Using Multiplication or Division
- Solving Two-Step Equations
- Writing and Graphing Inequalities
- Solving Inequalities Using Addition or Subtraction
- Solving Inequalities Using Multiplication or Division
- Solving Two-Step Inequalities
- Solving Simple Equations
- Solving Multistep Equations
- Solving Equations with Variables on Both Sides
- Rewriting Equations and Formulas

Essential Questions

Ratios and Proportions

How do rates and proportions help you describe or solve real-life problems?
How can proportions help you decide when things are "fair"?
How can you use ratio tables and cross products to solve proportions?
How can you enlarge or reduce a drawing proportionally?
How can you compare two rates graphically?
How can you use a graph or equation to show the relationship between two quantities that vary directly?
How can you use models to estimate percent questions?
How can you use an equivalent form of the percent proportion to solve a percent problem?
What is a percent of decrease or percent of increase?
How can you find discounts and selling prices? How can you find the amount of simple interest earned on a savings account?
How can you find the amount of interest owed on a loan?

Expressions and Equations

How can you use inductive reasoning to discover rules in mathematics?
How can you test a rule?

NC State Standards Alignment

Ratios and Proportions

- 7.RP.1
- 7.RP.2
- 7.RP.3
- 7.G.1

Expressions and Equations

- 7.EE.1
- 7.EE.2
- 7.EE.3
- 7.EE.4
- 8.EE.7

How can you solve a multi-step equation? How can you check the reasonableness of your solution? How can you solve an equation that has variables on both sides? How can you use a formula for one measurement to write a formula for a different measurement?	

Cycle 3: Changes and Revolution

Central Concepts	Supporting Concepts
○ **Angles and Triangles** ○ **Circles** ○ **Area, Surface Area and Volume**	**Angles and Triangles** ○ Adjacent and Vertical Angles ○ Complementary and Supplementary Angles ○ Triangles ○ Parallel Lines and Transversals ○ Angles of Triangles ○ Angles of Polygons ○ Using Similar Triangles **Circles** ○ Circles and Circumference ○ Perimeters of Composite Figures ○ Area of Circles **Area, Surface Area and Volume** ○ Area of Composite Figures ○ Surface Area of Prisms ○ Surface Area of Pyramids ○ Surface Area of Cylinders ○ Volumes of Prisms ○ Volumes of Pyramids ○ Volumes of Cylinders ○ Volumes of Cones ○ Volumes of Spheres ○ Surface Areas and Volumes of Similar Solids
Essential Questions	**NC State Standards Alignment**
Angles and Triangles What can you conclude about the angles formed by two intersecting lines? How can you classify two angles as complementary or supplementary? How can you construct triangles? How can you describe angles formed by parallel lines and transversals? How can you describe the relationships among the angles of a triangle? How can you find the sum of the interior angle measures and the sum of the exterior angle measures of a polygon? How can you use angles to tell whether triangles are similar? **Circles** How can you find the circumference of a circle? How can you find the perimeter of a composite figure? How can you find the area of a circle? **Area, Surface Area and Volume** How can you find the area of a composite figure? How can you find the surface area of a prism? How can you find the surface area of a pyramid? How can you find the surface area of a cylinder? How can you find the volume of a prism?	**Angles and Triangles** ○ 7.G.2 ○ 7.G.5 ○ 8.G.5 **Circles** ○ 7.G.4 **Area, Surface Area and Volume** ○ 7.G.3 ○ 7.G.6 ○ 8.G.9

How can you find the volume of a pyramid? How can you find the volume of a cylinder? How can you find the volume of a cone? How can you find the volume of a sphere? When the dimensions of a solid increase by a factor of k, how does the surface area change? How does the volume change?	

Cycle 4: Balance and Equity	
Central Concepts	**Supporting Concepts**
○ **Statistics** ○ **Probability**	**Statistics** ○ Samples & Populations ○ Comparing Populations ○ Scatter Plot ○ Lines of Fit ○ Two-Way Tables ○ Choosing a Data Display **Probability** ○ Outcomes & Events ○ Probability ○ Experimental & Theoretical Probability ○ Compound Events ○ Independent & Dependent Events
Essential Questions	**NC State Standards Alignment**
Statistics How can you determine whether a sample accurately represents a population? How can you compare data sets that represent two populations? How can you construct and interpret a scatter plot? How can you use data to predict an event? How can you read and make a two-way table? How can you display data in a way that helps you make decisions? **Probability** In an experiment, how can you determine the number of possible results? How can you describe the likelihood of an event? How can you use relative frequencies to find probabilities? How can you find the number of possible outcomes of one or more events? What is the difference between dependent and independent events?	**Statistics** ○ 7.SP.1 ○ 7.SP.2 ○ 7.SP.3 ○ 7.SP.4 ○ 8.SP.1 ○ 8.SP.2 ○ 8.SP.3 ○ 8.SP.4 **Probability** ○ 7.SP.5 ○ 7.SP.6 ○ 7.SP.7 ○ 7.SP.8