# Sterling Middle School Scope and Sequence
*Internal Document*

**MATH 7**

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

# Cycle 2: Forces & Validation

| Central Concepts | Supporting Concepts |
|---|---|
| <ul><li>**Ratios and Proportions**</li><li>**Expressions and Equations**</li></ul> | **Ratios and Proportions**<ul><li>Ratios and Rates</li><li>Proportions</li><li>Scale Drawings</li><li>Writing Proportions</li><li>Solving Proportions</li><li>Slope</li><li>Direct Variation</li><li>The Percent Proportion</li><li>The Percent Equation</li><li>Percents of Increase and Decrease</li><li>Discounts and Markups</li><li>Simple Interest</li></ul>**Expressions and Equations**<ul><li>Algebraic Expressions</li><li>Adding and Subtracting Linear Expressions</li><li>Solving Equations Using Addition or Subtraction</li><li>Solving Equations Using Multiplication or Division</li><li>Solving Two-Step Equations</li><li>Writing and Graphing Inequalities</li><li>Solving Inequalities Using Addition or Subtraction</li><li>Solving Inequalities Using Multiplication or Division</li><li>Solving Two-Step Inequalities</li><li>Solving Simple Equations</li><li>Solving Multistep Equations</li><li>Solving Equations with Variables on Both Sides</li><li>Rewriting Equations and Formulas</li></ul> |

| Essential Questions | NC State Standards Alignment |
|---|---|
| **Ratios and Proportions**<br>How do rates and proportions help you describe or solve real-life problems?<br>How can proportions help you decide when things are "fair"?<br>How can you use ratio tables and cross products to solve proportions?<br>How can you enlarge or reduce a drawing proportionally?<br>How can you compare two rates graphically?<br>How can you use a graph or equation to show the relationship between two quantities that vary directly?<br>How can you use models to estimate percent questions?<br>How can you use an equivalent form of the percent proportion to solve a percent problem?<br>What is a percent of decrease or percent of increase?<br>How can you find discounts and selling prices? How can you find the amount of simple interest earned on a savings account?<br>How can you find the amount of interest owed on a loan?<br><br>**Expressions and Equations**<br>How can you use inductive reasoning to discover rules in mathematics?<br>How can you test a rule? | **Ratios and Proportions**<ul><li>7.RP.1</li><li>7.RP.2</li><li>7.RP.3</li><li>7.G.1</li></ul>**Expressions and Equations**<ul><li>7.EE.1</li><li>7.EE.2</li><li>7.EE.3</li><li>7.EE.4</li><li>8.EE.7</li></ul> |

| How can you solve a multi-step equation?<br>How can you check the reasonableness of your solution?<br>How can you solve an equation that has variables on both sides?<br>How can you use a formula for one measurement to write a formula for a different measurement? | |
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## Cycle 3: Changes and Revolution

| Central Concepts | Supporting Concepts |
|---|---|
| o **Angles and Triangles**<br>o **Circles**<br>o **Area, Surface Area and Volume** | **Angles and Triangles**<br>o Adjacent and Vertical Angles<br>o Complementary and Supplementary Angles<br>o Triangles<br>o Parallel Lines and Transversals<br>o Angles of Triangles<br>o Angles of Polygons<br>o Using Similar Triangles<br><br>**Circles**<br>o Circles and Circumference<br>o Perimeters of Composite Figures<br>o Area of Circles<br><br>**Area, Surface Area and Volume**<br>o Area of Composite Figures<br>o Surface Area of Prisms<br>o Surface Area of Pyramids<br>o Surface Area of Cylinders<br>o Volumes of Prisms<br>o Volumes of Pyramids<br>o Volumes of Cylinders<br>o Volumes of Cones<br>o Volumes of Spheres<br>o Surface Areas and Volumes of Similar Solids |
| **Essential Questions** | **NC State Standards Alignment** |
| **Angles and Triangles**<br>What can you conclude about the angles formed by two intersecting lines?<br>How can you classify two angles as complementary or supplementary?<br>How can you construct triangles?<br>How can you describe angles formed by parallel lines and transversals?<br>How can you describe the relationships among the angles of a triangle?<br>How can you find the sum of the interior angle measures and the sum of the exterior angle measures of a polygon?<br>How can you use angles to tell whether triangles are similar?<br><br>**Circles**<br>How can you find the circumference of a circle?<br>How can you find the perimeter of a composite figure?<br>How can you find the area of a circle?<br><br>**Area, Surface Area and Volume**<br>How can you find the area of a composite figure?<br>How can you find the surface area of a prism?<br>How can you find the surface area of a pyramid?<br>How can you find the surface area of a cylinder?<br>How can you find the volume of a prism? | **Angles and Triangles**<br>o 7.G.2<br>o 7.G.5<br>o 8.G.5<br><br>**Circles**<br>o 7.G.4<br><br>**Area, Surface Area and Volume**<br>o 7.G.3<br>o 7.G.6<br>o 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 | |
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| **Central Concepts** | **Supporting Concepts** |
| <ul><li>**Statistics**</li><li>**Probability**</li></ul> | **Statistics**<ul><li>Samples & Populations</li><li>Comparing Populations</li><li>Scatter Plot</li><li>Lines of Fit</li><li>Two-Way Tables</li><li>Choosing a Data Display</li></ul>**Probability**<ul><li>Outcomes & Events</li><li>Probability</li><li>Experimental & Theoretical Probability</li><li>Compound Events</li><li>Independent & Dependent Events</li></ul> |
| **Essential Questions** | **NC State Standards Alignment** |
| **Statistics**<br>How can you determine whether a sample accurately represents a population?<br>How can you compare data sets that represent two populations?<br>How can you construct and interpret a scatter plot?<br>How can you use data to predict an event?<br>How can you read and make a two-way table?<br>How can you display data in a way that helps you make decisions?<br><br>**Probability**<br>In an experiment, how can you determine the number of possible results?<br>How can you describe the likelihood of an event?<br>How can you use relative frequencies to find probabilities?<br>How can you find the number of possible outcomes of one or more events?<br>What is the difference between dependent and independent events? | **Statistics**<ul><li>7.SP.1</li><li>7.SP.2</li><li>7.SP.3</li><li>7.SP.4</li><li>8.SP.1</li><li>8.SP.2</li><li>8.SP.3</li><li>8.SP.4</li></ul>**Probability**<ul><li>7.SP.5</li><li>7.SP.6</li><li>7.SP.7</li><li>7.SP.8</li></ul> |