

Northpoint Horizons

Math Elevations Correlated to the **CONNECTICUT MATHEMATICS CURRICULUM STANDARDS**

Grade 5

This document provides a sampling of the extensive math directives offered throughout the *Math Elevations* program that meet the Connecticut Mathematics Curriculum Standards. N/A denotes Not Applicable.

State Framework Grade-Level Expectations	<i>Math Elevations (Level E) Math Grade 5</i> Teacher's Guide Examples/Lessons
ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS	
1.1 Understand and describe patterns and functional relationships.	Unit 5 – Algebra
1. Represent, extend and compare geometric and numeric patterns using words, tables, graphs and equations.	5.2 – Investigating Patterns, pp. 92 – 93
2. Analyze patterns and data to make generalizations, make predictions and to identify trends.	5.2 – Investigating Patterns, pp. 92 – 93 5.3 – Algebraic Expressions, pp. 94 – 95
1.2 Represent and analyze quantitative relationships in a variety of ways.	Unit 3 – Numeration and Fractions Unit 5 – Algebra
3. Represent and describe mathematical relationships using variables or symbols in expressions, equations and inequalities.	5.3 – Algebraic Expressions, pp. 94 – 95 5.4 – Evaluating Expressions, pp. 96 – 97 5.5 – Solving One-Step Equations, pp. 98 – 99 5.6 – Problem Solving, pp. 100 – 101 5.7 – Inequalities, pp. 102 – 103

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<p>4. Describe how a change in one variable relates to a change in a second variable in context. For example: If a recipe requires two cups of flour for eight servings, the flour must be doubled for 16 servings or increased by one-half for 12 servings.</p>	<p>3.1 – Understanding Fractions, pp. 54 – 55 3.2 – Equivalent Fractions and Simplest Form, pp. 56 – 57</p>
<p>1.3 Use operations, properties and algebraic symbols to determine equivalence and solve problems.</p>	<p>Unit 5 – Algebra</p>
<p>5. Replace variables or symbols in algebraic expressions with given values and evaluate or simplify the expression, e.g., If $\frac{1}{3} = 5$, find the value of $4 \times \frac{1}{3} + 7$.</p>	<p>5.3 – Algebraic Expressions, pp. 94 – 95 5.4 – Evaluating Expressions, pp. 96 – 97</p>
<p>6. Model, write and solve one-step equations by using appropriate concrete materials that model equivalence, e.g., If $4 \times \Delta = 36$, then Δ equals 9.</p>	<p>5.5 – Solving One-Step Equations, pp. 98 – 99 5.6 – Problem Solving, pp. 100 – 101</p>
<p align="center">NUMERICAL AND PROPORTIONAL REASONING</p>	
<p>2.1 Understand that a variety of numerical representations can be used to describe quantitative relationships.</p>	<p>Unit 1 – Numbers and Operations Unit 2 – Computation with Whole and Decimal Numbers Unit 3 – Numeration and Fractions Unit 4 – Computation with Fractions, Decimals, and Percents Unit 5 – Algebra</p>
<p>1. Compare, order and round whole numbers to 1,000,000 using number patterns, number lines and diagrams.</p>	<p>1.1 – Whole Number Place Value, pp. 18 – 19 1.3 – Working with Whole Numbers, pp. 22 – 23</p>
<p>2. Represent whole numbers up to 1,000,000 in expanded and regrouped forms and use the forms to support computation.</p>	<p>1.1 – Whole Number Place Value, pp. 18 – 19</p>

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<p>3. Construct and use models, number patterns and pictorial representations to extend place value concepts and patterns to decimals, e.g., 0.1 is one-tenth of one and 0.01 is one one-hundredth of one and one-tenth of 0.1.</p>	<p>1.2 – Place Value through Thousandths, pp. 20 – 21 1.4 – Working with Decimal Numbers, pp. 24 – 25</p>
<p>4. Investigate negative integers (values less than zero) using place value models, diagrams and number lines and represent negative integers in practical applications, e.g. temperatures, money and locations below sea level.</p>	<p><i>The concept of integers is introduced in Level F, Grade 6, Unit 1:</i> 1.4 – Introduction to Integers, pp. 24 – 25</p>
<p>5. Classify numbers as prime, composite or perfect squares and identify factor pairs using rectangular arrays.</p>	<p>1.5 – Primes and Composites, pp. 26 – 27 1.6 – Divisibility, pp. 28 – 29</p>
<p>6. Represent equivalent fractions, decimals, ratios and percents using models, pictures, number patterns and common factors.</p>	<p>3.1 – Understanding Fractions, pp. 54 – 55 3.2 – Equivalent Fractions and Simplest Form, pp. 56 – 57 3.4 – Relating Decimals and Fractions, pp. 60 – 61 4.7 – Converting Between Percents, Decimals, and Fractions, pp. 84 – 85</p>
<p>7. Choose and use benchmarks to approximate locations, of fractions, mixed numbers and decimals, on number lines and coordinate grids.</p>	<p>1.2 – Place Value through Thousandths, pp. 20 – 21 1.4 – Working with Decimal Numbers, pp. 24 – 25 3.1 – Understanding Fractions, pp. 54 – 55 3.5 – Comparing and Ordering Fractions, pp. 62 – 63 3.8 – Comparing and Ordering Fractions and Decimals, pp. 68 – 69 5.8 – The Coordinate Plane, pp. 104 – 105</p>
<p>8. Write division problems in fraction form and round the fraction form to estimate an answer to a division problem.</p>	<p>2.6 – Estimating Quotients, pp. 46 – 47 3.4 – Relating Decimals and Fractions, pp. 60 – 61</p>
<p>9. Use models and pictures to identify and compare ratios and represent ratios in equivalent fraction and decimal forms.</p>	<p>3.1 – Understanding Fractions, pp. 54 – 55 3.2 – Equivalent Fractions and Simplest Form, pp. 56 – 57 3.4 – Relating Decimals and Fractions, pp. 60 – 61</p>

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<p>2.2 Use numbers and their properties to compute flexibly and fluently and to reasonably estimate measures and quantities.</p>	<p>Unit 1 – Numbers and Operations Unit 2 – Computation with Whole and Decimal Numbers Unit 3 – Numeration and Fractions Unit 4 – Computation with Fractions, Decimals, and Percents Unit 8 – Probability and Data Analysis</p>
<p>10. Solve practical problems involving 10, 100, 1,000 and 10,000 more or less than a number.</p>	<p>1.1 – Whole Number Place Value, pp. 18 – 19 2.3 – Multiplying by Multiples of 10, 100, and 1,000, pp. 40 – 41</p>
<p>11. Estimate products and missing factors using multiples of 10, 100 and 1,000.</p>	<p>2.3 – Multiplying by Multiples of 10, 100, and 1,000, pp. 40 – 41</p>
<p>12. Develop and use strategies involving place value relationships, inverse operations and algebraic properties (commutative, associative and distributive) to simplify addition, subtraction and multiplication problems with three-, four- and five-digit numbers and money amounts and division by one-digit factors.</p>	<p>1.1 – Whole Number Place Value, pp. 18 – 19 1.2 – Place Value through Thousandths, pp. 20 – 21 2.1 – Addition and Subtraction of Whole Numbers, pp. 36 – 37 2.2 – Addition and Subtraction of Decimal Numbers, pp. 38 – 39 2.3 – Multiplying by Multiples of 10, 100, and 1,000, pp. 40 – 41 2.4 – Multiplying by a Two-Digit factor, pp. 42 – 43 2.5 – Multiplying Decimals, 44 – 45 2.7 – Long Division, pp. 48 – 49</p>
<p>13. Multiply and divide decimals and money amounts by whole numbers.</p>	<p>2.5 – Multiplying Decimals, 44 – 45 2.6 – Estimating Quotients, pp. 46 – 47 2.7 – Long Division, pp. 48 – 49</p>

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<p>14. Write and solve multistep problems for all four operations involving multidigit whole numbers and money amounts and explain how answers were determined, orally and in writing.</p>	<p>2.1 – Addition and Subtraction of Whole Numbers, pp. 36 – 37 2.2 – Addition and Subtraction of Decimal Numbers, pp. 38 – 39 2.3 – Multiplying by Multiples of 10, 100, and 1,000, pp. 40 – 41 2.4 – Multiplying by a Two-Digit factor, pp. 42 – 43 2.6 – Estimating Quotients, pp. 46 – 47 2.7 – Long Division, pp. 48 – 49</p>
<p>15. Find fractional parts of a set by using estimation, counting, grouping of objects, number patterns, equivalent ratios and division.</p>	<p>2.8 – Interpreting Remainders, pp. 50 – 51</p>
<p>16. Add and subtract fractions, decimals and mixed numbers using a variety of strategies, e.g., models, mental math, equivalence and substitution: $\frac{1}{2} + \frac{3}{4}$ can also be solved using $0.5 + 0.75$.</p>	<p>2.2 – Addition and Subtraction of Decimal Numbers, pp. 38 – 39 4.1 – Addition and Subtraction of Fractions, (Like Denominators), pp. 72 – 73 4.2 – Addition and Subtraction of Mixed Numbers, (Like Denominators), pp. 74 – 75 4.3 - Addition and Subtraction of Fractions (Unlike Denominators), pp. 76 – 77 4.4 – Addition of Mixed Numbers (Unlike Denominators) pp. 78 – 79 4.5 – Subtraction of Mixed Number (Unlike Denominators) pp. 80 – 81</p>
<p>17. Construct and use models and pictorial representations to multiply common fractions and mixed numbers by whole numbers.</p>	<p>4.8 – Percent of a Quantity, pp. 86 – 87</p>
<p>18. Use ratios and proportions to solve practical problems, e.g., interpreting scale drawings and maps and determining the probability of an event.</p>	<p>3.2 – Equivalent Fractions and Simplest Form, pp. 56 – 57 8.2 – Evaluating Probability</p>

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<p>19. Use estimation to predict results and to recognize when an answer is or is not reasonable, or will result in an overestimate or underestimate and explain the reasoning used orally and in writing.</p>	<p>2.6 – Estimating Quotients, pp. 46 – 47 2.7 – Long Division, pp. 48 – 49 2.8 – Interpreting Remainders, pp. 50 – 51</p>
<p align="center">GEOMETRY AND MEASUREMENT</p>	
<p>3.1 Use properties and characteristics of two- and three- dimensional shapes and geometric theorems to describe relationships, communicate ideas and solve problems.</p>	<p>Unit 6 – Measurement Unit 7 – Geometry</p>
<p>1. Represent the surface of three-dimensional solids using two-dimensional nets.</p>	<p>7.8 – Solid Figures, pp. 140 – 141</p>
<p>2. Develop formulas for finding the perimeter and area of squares, rectangles and triangles and use them to solve problems.</p>	<p>6.1 – Area and Perimeter, pp. 108 – 109 6.2 – Investigating Area and Perimeter, pp. 110 – 111 6.3 – Perimeter of Irregular Shapes, pp. 112 – 113 6.4 – Area of Parallelograms, pp. 114 – 115 6.5 – Area of Triangles, pp. 116 – 117</p>
<p>3. Use the attributes of parallel sides, perpendicular sides, congruent sides/angles, number and length of sides or faces and number and kinds of angles (right, acute or obtuse) to describe, classify and sort polygons and solids (cube, prism, pyramid and sphere).</p>	<p>7.1 – Geometric Concepts, pp. 126 - 127 7.2 – Lines, pp. 128 – 129 7.3 – Measuring and Classifying Angles, pp. 130 - 131 7.4 – Classifying Triangles, pp. 132 – 133 7.8 – Solid Figures, pp. 140 – 141</p>
<p>4. Make and test conjectures about polygons using geometric relationships.</p>	<p>6.2 – Investigating Area and Perimeter, pp. 110 – 111 6.3 – Perimeter of Irregular Shapes, pp. 112 – 113 7.3 – Measuring and Classifying Angles, pp. 130 - 131 7.4 – Classifying Triangles, pp. 132 – 133</p>
<p>3.2 Use spatial reasoning, location and geometric relationships to solve problems.</p>	<p>Unit 5 – Algebra Unit 6 – Measurement</p>

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<p>5. Use an x, y coordinate system to plot points, to estimate the distance between points and to determine the horizontal or vertical distance between two points.</p>	<p>5.8 – The Coordinate Plane, pp. 104 – 105</p>
<p>6. Analyze and describe the effect that changing the dimensions (perimeter) of a polygon has on its area and vice versa.</p>	<p>6.2 – Investigating Area and Perimeter, pp. 110 – 111 6.3 – Perimeter of Irregular Shapes, pp. 112 – 113</p>
<p>3.3 Develop and apply units, systems, formulas and appropriate tools to estimate and measure.</p>	<p>Unit 6 – Measurement</p>
<p>7. Use calendars and clocks to plan and sequence events and to solve problems involving the conversion of measures of time and elapsed time using days, hours, minutes and seconds.</p>	<p><i>The concept of time as related to calendars and clocks, can be found in Level C, Unit 7 – Measurement;</i> 7.1 – Time, pp. 126 – 127</p>
<p>8. Estimate and measure to solve a variety of problems that involve angles, length, area, weight, mass, temperature, capacity and volume in either metric or customary units explain the reasoning used orally and in writing.</p>	<p>6.1 – Area and Perimeter, pp. 108 – 109 6.2 – Investigating Area and Perimeter, pp. 110 – 111 6.3 – Perimeter of Irregular Shapes, pp. 112 – 113 6.4 – Area of parallelograms, pp. 114 – 115 6.5 – Area of Triangles, pp. 116 – 117 6.6 – Volume of Rectangular Solids, pp. 118 – 119</p>
<p>9. Use cubic inch or cubic centimeter models to find the volume of rectangular solids.</p>	<p>6.6 – Volume of Rectangular Solids, pp. 118 – 119</p>
<p>10. Solve length problems involving conversions of measure within the customary (inches, feet, yards and miles) or metric systems (millimeters, centimeters, meters and kilometers).</p>	<p>6.7 – Converting within the Metric System, pp. 120 – 121 6.8 – Converting within the Customary System, pp. 122 – 123</p>
<p align="center">WORKING WITH DATA: PROBABILITY AND STATISTICS</p>	

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<p>4.1 Collect, organize and display data using appropriate statistical and graphical methods.</p>	<p>Unit 8 – Probability and Data Analysis</p>
<p>1. Represent sets of data using line plots, bar graphs, double bar graphs, pictographs, simple circle graphs, stem and leaf plots and <i>scatter plots</i>.</p>	<p>8.6 – Bar Graphs, pp. 154 – 155 8.7 – Line Graphs, pp. 156 – 157 8.8 – Circle Graphs, pp. 158 – 159 <i>Line plots and Stem-and-Leaf Plots are explored in Level F, Unit 8: Probability, Statistics, and Data Analysis.</i> 8.2 – Line Plots and Stem-and-Leaf Plots, pp. 146 – 147 <i>Scatter Plots can be found in Level H, Unit 8:</i> 8.4 – Scatter Plots, pp. 227 - 229</p>
<p>2. Compare different representations of the same data set and evaluate how well each kind of display represents the features of the data.</p>	<p>8.6 – Bar Graphs, pp. 154 – 155 8.7 – Line Graphs, pp. 156 – 157 8.8 – Circle Graphs, pp. 158 – 159 <i>Additional exploration with displaying and evaluating data is found in Level F, Grade 6, Unit 8:</i> 8.5 – Displaying Data, pp. 152 – 153</p>
<p>4.2 Analyze data sets to form hypotheses and make predictions.</p>	<p>Unit 8 – Probability and Data Analysis</p>
<p>3. Design and conduct surveys of a representative sample of a population and use the data collected to begin to make inferences about the general population.</p>	<p><i>This expectation can be found in Level F, Unit 8:</i> 8.4 – Conducting Surveys, pp. 150 – 151</p>
<p>4. Determine the mean, mode and median of a data set and explain in writing, how they are affected by a change in the data set.</p>	<p>8.4 – Mode, Median, and Range, pp. 150 – 151 8.5 – The Mean, pp. 152 – 153</p>
<p>4.3 Understand and apply basic concepts of probability.</p>	<p>Unit 8 – Probability and Data Analysis</p>

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<p>5. Design and conduct probability experiments and simple games of chance to test predictions about outcomes and fairness.</p>	<p>8.1 – Possible Outcomes, pp. 144 – 145 8.2 – Evaluating Probability, pp. 146 – 147 8.3 – Probability Experiments, pp. 148 – 149 <i>Additional work with fairness can be found in Level C, Unit 8:</i> 8.8 – Fair and Unfair Games, pp. 158 – 159</p>
<p>6. Determine and describe possible outcomes and express the likelihood of events as a fraction.</p>	<p>8.1 – Possible Outcomes, pp. 144 – 145 8.2 – Evaluating Probability, pp. 146 – 147 8.3 – Probability Experiments, pp. 148 – 149</p>
<p>7. Determine and describe possible outcomes using permutations, where order does matter, e.g., when there is a choice of vanilla (V), chocolate (C) or strawberry (S) ice cream for a three-scoop cone, there are two possible ways to have the chocolate scoop on top CVS or CSV.</p>	<p><i>This expectation can be found in Level G, Unit 8:</i> 8.1 – Possible Outcomes, pp. 212 – 214 8.2 – Permutations, pp. 215 – 217 8.3 – Combinations, pp. 218 – 220</p>