

Northpoint Horizons

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

Grade 6

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 F) Math Grade 6</i> Teacher's Guide Examples/Lessons
ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS	
1.1 Understand and describe patterns and functional relationships.	Unit 5 – Algebra
1. Analyze, describe in writing and extend a variety of patterns to justify predictions and identify trends.	5.2 – Patterns, pp. 92 – 93 5.3 – One-Step Algebraic Expressions, pp. 94 - 95
1.2 Represent and analyze quantitative relationships in a variety of ways.	Unit 5 – Algebra
2. Create tables of values and scatterplots from mathematical relationships and equations and vice versa to solve problems.	5.3 – One-Step Algebraic Expressions, pp. 94 – 95 5.4 – Two-Step Algebraic Expressions, pp. 96 – 97 5.6 – Word Problems, pp. 100 – 101 5.7 – Graphing Algebraic Equations, pp. 102 – 103
3. Examine tables, graphs and equations to determine patterns of change in linear relationships.	5.7 – Graphing Algebraic Equations, pp. 102 – 103

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<p>4. Write expressions, formulas, equations or inequalities using symbols or variables to denote a pattern or represent a contextual situation.</p>	<p>5.3 – One-Step Algebraic Expressions, pp. 94 – 95 5.4 – Two-Step Algebraic Expressions, pp. 96 – 97 5.7 – Graphing Algebraic Equations, pp. 102 – 103 5.8 – Inequalities, pp. 104 – 105</p>
<p>1.3 Use operations, properties and algebraic symbols to determine equivalence and solve problems.</p>	<p>Unit 5 – Algebra</p>
<p>5. Evaluate algebraic expressions and formulas using substitution.</p>	<p>5.3 – One-Step Algebraic Expressions, pp. 94 – 95 5.4 – Two-Step Algebraic Expressions, pp. 96 – 97</p>
<p>6. Write, model and solve one-step equations using mental math, tables, substitution and concrete models that demonstrate equivalence and justify the solution.</p>	<p>5.5 – Solving Equations, pp. 98 – 99 5.6 – Word Problems, pp. 100 – 101 5.7 – Graphing Algebraic Equations, pp. 102 – 103</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 – Numeration and Number Theory Unit 3 – Fractions, Decimals, and Percents Unit 6 – Geometry</p>
<p>1. Locate and label whole numbers, fractions, decimals and positive and negative integers on number lines, scales, coordinate grids (all four quadrants) and measurement tools.</p>	<p>1.1 – Decimals, pp. 18 – 19 1.4 – Introduction to Integers, pp. 24 – 25 3.2 – Comparing and Ordering Fractions, pp. 56 – 57 6.5 – The Coordinate Plane, pp. 116 - 117</p>
<p>2. Compare and order whole numbers, fractions, decimals and positive and negative integers in context using number lines and scales.</p>	<p>1.1 – Decimals, pp. 18 – 19 1.4 – Introduction to Integers, pp. 24 – 25 3.2 – Comparing and Ordering Fractions, pp. 56 – 57 6.5 – The Coordinate Plane, pp. 116 - 117</p>
<p>3. Represent and compare whole numbers (to a billion) and decimals (to thousandths) in expanded notation, e.g., $75.654 = (7 \times 10) + (5 \times 1) + (6 \times 0.1) + (5 \times 0.01) + (4 \times 0.001)$.</p>	<p>1.1 – Decimals, pp. 18 – 19 1.3 – Powers of 10, pp. 22 – 23 <i>Representing and comparing whole numbers (including expanded form) is found in Level E, Unit 1:</i> 1.1 – Whole Number Place Value, pp. 18-19</p>

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<p>4. Represent chain multiplication, including powers of 10 in exponential and standard form, e.g., $5 \times 5 \times 5 = 5^3 = 125$.</p>	<p>1.2 – Understanding Exponents, pp. 20 – 21</p>
<p>5. Factor composite numbers and express them as a product of primes using exponents.</p>	<p>1.2 – Understanding Exponents, pp. 20 – 21 1.5 – Primes and Composites, pp. 26 - 27</p>
<p>6. Determine equivalent fraction, decimal, and percentage representations and choose among these forms to solve problems.</p>	<p>3.1 – Simplest Form, pp. 54 – 55 3.2 – Comparing and Ordering Fractions, pp. 56 – 57 3.5 – Converting Between Percents, Fractions, and Decimals, pp. 62 – 63 3.6 – More Converting Fractions, pp. 64 - 65</p>
<p>7. Use ratios and rates (involving different units) to compare quantities.</p>	<p>3.7 – Ratios and Proportions, pp. 66 – 67 3.8 – Solving Proportions, pp. 68 – 69 <i>Rates (and additional work with ratios) are more thoroughly explored in Level G (grade 7) Unit 5:</i> 5.1 – Ratios, pp. 128 – 131 5.2 – Rates, pp. 132 – 134</p>
<p>2.2 Use numbers and their properties to compute flexibly and fluently and to reasonably estimate measures and quantities.</p>	<p>Unit 1 – Numeration and Number Theory Unit 2 – Computation with Integers and Decimals Unit 3 – Fractions, Decimals, and Percents Unit 4 – Computation with Fractions Unit 5 – Algebra</p>
<p>8. Understand place value and patterns in place value when multiplying and dividing decimals by powers of 10.</p>	<p>1.3 – Powers of 10, pp. 22 – 23 2.4 – Multiplying and Dividing by Powers of 10, pp. 42 - 43</p>
<p>9. Develop, describe and use strategies for solving, simplifying and estimating multiplication and division problems involving large numbers, decimals and powers of 10, e.g., $4.25 \times 100 = 425$ and $365,000 \div 6,000 = 365 \div 6$; $365 \div 6 \cong 360 \div 6$ or 60.</p>	<p>2.4 – Multiplying and Dividing by Powers of 10, pp. 42 - 43</p>

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<p>10. Estimate and find percentages of a number in context using benchmarks and number patterns and ratios to 100.</p>	<p>3.4 – Understanding Percents, pp. 60 – 61 3.5 – Converting Between Percents, Fractions, and Decimals, pp. 62 – 63 3.6 – More Converting Fractions, pp. 64 - 65</p>
<p>11. Solve practical problems involving rates, ratios, percentages and proportionality.</p>	<p>3.7 – Ratios and Proportions, pp. 66 – 67 3.8 – Solving Proportions, pp. 68 – 69</p>
<p>12. Add, subtract, multiply and divide by fractions and decimals in context.</p>	<p>2.3 – Addition and Subtraction, pp. 40 – 41 2.6 – Multiplying by Decimals, pp. 46 – 47 2.7 – Division, pp, 48 – 49 4.1 – Addition and Subtraction of Fractions, pp. 72 - 73 4.4 – Multiplying Fractions, pp. 78 - 79 4.5 – Multiplying Mixed Numbers, pp. 80 - 81 4.6 – Dividing Fractions by a Whole Number, pp. 82 - 83 4.7 – Dividing Fractions by Fractions, pp. 84 – 85 4.8 – Dividing Mixed Numbers, pp. 86 – 87</p>
<p>13. Describe situations in writing that connect multiplying fractions to determining the fractional part of a set.</p>	<p>4.4 – Multiplying Fractions, pp. 78 - 79 4.5 – Multiplying Mixed Numbers, pp. 80 - 81</p>
<p>14. Examine the relationships between multiplication by a unit fraction and dividing by the fraction’s denominator, e.g., $\frac{1}{2}$ of \$6 is the same as $\\$6 \div 2$, and use this to solve problems.</p>	<p>4.7 – Dividing Fractions by Fractions, pp. 84 – 85 4.8 – Dividing Mixed Numbers, pp. 86 – 87</p>
<p>15. Use the inverse relationship between multiplication and division to make sense of procedures for multiplying and dividing fractions.</p>	<p>4.6 – Dividing Fractions by Whole Numbers, pp. 82 - 83 4.7 – Dividing Fractions by Fractions, pp. 84 – 85 4.8 – Dividing Mixed Numbers, pp. 86 – 87</p>
<p>16. Understand and defend in writing the magnitude of the result of multiplication or division problems involving fractions or decimals.</p>	<p>2.6 – Multiplying by Decimals, pp. 46 – 47 4.4 – Multiplying Fractions, pp. 78 - 79 4.5 – Multiplying Mixed Numbers, pp. 80 - 81</p>
<p>17. Determine when an estimate is sufficient or when an exact answer is needed.</p>	<p>2.2 – Rounding Numbers, pp. 38 - 39 2.8 – Word Problems, pp. 50 - 51</p>

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<p>18. Estimate solutions to problems and justify the reasonableness of estimates in writing.</p>	<p><i>The Math Elevations program has a three-step Instructional Approach to Learning Success; Instruction, Practice and Reinforcement, and Assessment. In all three steps, students are encouraged to determine the reasonableness of their findings through estimation. This tool is used throughout the entire program and is evident in the Wrap Up part of the lessons.</i></p>
<p>19. Write and solve multistep problems in context involving addition, subtraction, multiplication and division with whole numbers, fractions, decimals, money and simple percentages.</p>	<p>5.5 – Solving Equations, pp. 98 – 99 5.6 – Word Problems, pp. 100 – 101</p>
<p>20. Understand and use divisibility rules, factors of composite numbers and powers of 10 to find products and quotients.</p>	<p>1.3 – Powers of 10, pp. 24 - 25 1.5 – Primes and Composites, pp. 26- 27 1.6 – Divisibility, pp. 28 - 29</p>
<p>21. Apply the order of operations and algebraic properties; i.e., commutative, associative, distributive, inverse operations, and the additive and multiplicative identities; to compute and solve multistep problems and explain solutions in writing.</p>	<p>5.1 – Order of Operations, pp. 90 – 91 5.5 – Solving Equations, pp. 98 – 99 5.6 – Word Problems, pp. 100 – 101 <i>The Commutative, Associative, and Distributive Properties are introduced and explored in Level G , Unit 3:</i> 3.7 – Commutative and Associative Properties, pp. 92 - 94 3.8 – Distributive Property, pp. 95 - 97</p>
<p>22. Use concrete models to develop strategies to add and subtract integers.</p>	<p>2.1 – Adding Integers, pp. 36 – 37 <i>Subtracting Integers is introduced and explored in Level G (grade 7) Unit 3:</i> 3.3 – Subtracting Integers, pp. 80 - 82</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 – Geometry Unit 7 – Measurement</p>
<p>1. Classify sets and subsets of polygons using the relationship of the sides (length, parallel and perpendicular) and angles (types and measure).</p>	<p>6.1 – Properties of Polygons, pp. 108 – 109 6.2 – Classifying Quadrilaterals, pp. 110 – 111</p>

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<p>2. Make and test conjectures about polygons and congruence using side and angle relationships and describe the results in writing.</p>	<p>6.1 – Properties of Polygons, pp. 108 – 109 6.2 – Classifying Quadrilaterals, pp. 110 – 111 7.3 – Angles, pp. 130 – 131 7.4 – Angles in a Triangle, pp. 132 – 133 <i>More formal exploration with side-angle relationships can be found in Level H, Unit 6:</i> 6.5 – Congruent Triangles, pp. 174 - 176</p>
<p>3. Identify lines of symmetry and reflections, rotations and translations of geometric figures.</p>	<p>6.1 – Properties of Polygons, pp. 108 – 109 6.2 – Classifying Quadrilaterals, pp. 110 – 111 6.6 – Translation, pp. 118 – 119 6.7 – Reflection, pp. 120 – 121 6.8 – Rotation, pp. 122 - 123</p>
<p>4. Use rectangles as basic shapes to model and develop formulas for finding the area of triangles, parallelograms and trapezoids.</p>	<p>7.5 – Area of Rectangles and Parallelograms, pp. 134-135 7.6 – Area of Triangles, pp. 136 - 137 7.7 – Area of Irregular Figures pp. 138 – 139 <i>Area of trapezoids can be found in Level H, Unit 7:</i> 7.1 – Area of a Trapezoid, pp. 190 - 192</p>
<p>5. Recognize the relationships among radius, diameter, circumference and area of circles and develop formulas for finding circumference and area based on these relationships.</p>	<p>6.4 – Circles, pp. 114 - 115</p>
<p>3.2 Use spatial reasoning, location and geometric relationships to solve problems.</p>	<p>Unit 7 - Measurement</p>
<p>6. Use and describe concrete strategies for finding the volume of rectangular solids and cylinders.</p>	<p>7.8 – Volume, pp. 140 – 141 <i>Volume of cylinders can be found in Level H, Unit 7:</i> 7.7 – Volume of a Prism and a Cylinder, pp. 208 - 210</p>
<p>7. Use measurements to examine the ratios between corresponding side lengths of scale models and similar figures.</p>	<p><i>This expectation can be found in Level G, Unit 6:</i> 6.5 – Similar Polygons, pp. 169 – 171 <i>And again in Level H, Unit 4:</i> 4.3 – Scale Drawings and Models, pp. 111 - 113</p>

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<p>3.3 Develop and apply units, systems, formulas and appropriate tools to estimate and measure.</p>	<p>Unit 7 - Measurement</p>
<p>8. Select and use appropriate strategies, tools and units to estimate and solve measurement problems involving length, perimeter, area, volume, capacity, mass and weight.</p>	<p>7.2 – Perimeter, pp. 128 – 129 7.5 – Area of Rectangles and Parallelograms, pp. 134-135 7.6 – Area of Triangles, pp. 136 - 137 7.7 – Area of Irregular Figures pp. 138 – 139 7.8 – Volume, pp. 140 – 141</p>
<p>9. Use ratios to convert between customary units of length, mass, capacity and time.</p>	<p><i>This expectation can be found in Level E, Unit 6:</i> 6.8 – Converting within the Customary System, pp. 122 – 123</p>
<p>10. Use ratios and powers of 10 to convert between metric units.</p>	<p><i>This expectation can be found in Level E, Unit 6:</i> 6.7 – Converting within the Metric System, pp. 120 – 121</p>
<p align="center">WORKING WITH DATA: PROBABILITY AND STATISTICS</p>	
<p>4.1 Collect, organize and display data using appropriate statistical and graphical methods.</p>	<p>Unit 8 – Probability, Statistics, and Data Analysis</p>
<p>1. Compare sets of data between two populations, e.g., heights of two classes of students, or within a population, e.g., height vs. arm length of sixth-grade students, using a variety of graphical representations.</p>	<p>8.5 – Displaying Data, pp. 152 - 153</p>
<p>2. Select, create and use appropriate graphical representations of data including, circle graphs, scatter plots, histograms, and stem and leaf plots.</p>	<p>8.2 – Line Plots, and Stem-and-Leaf Plots, pp. 146 – 147 8.3 – Scales and Bar Graphs, pp. 148 – 149 8.5 – Displaying Data, pp. 152 – 153 8.6 – Line Graphs, pp. 154 – 155 <i>Circle graphs are explored in Level E, Grade 6, Unit 8:</i> 8.8 – Circle Graphs, pp. 158 – 159</p>

<p style="text-align: center;">State Framework Grade-Level Expectations</p>	<p style="text-align: center;">Math Elevations (Level F) Math Grade 6 Teacher’s Guide Examples/Lessons</p>
<p>4.2 Analyze data sets to form hypotheses and make predictions.</p>	<p>Unit 8 – Probability, Statistics, and Data Analysis</p>
<p>3. Describe the shape of numerical data sets using measures of spread (range) and central tendency (mean, median, mode) and outliers.</p>	<p>8.1 – Mean, Mode, and Median, pp. 144 - 145</p>
<p>4. Determine how the mean, median, mode and range change as a result of changes in the data set and describe in writing.</p>	<p>8.1 – Mean, Mode, and Median, pp. 144 - 145</p>
<p>4.3 Understand and apply basic concepts of probability.</p>	<p>Unit 8 – Probability, Statistics, and Data Analysis</p>
<p>5. Investigate and describe the relationship between the number of trials in an experiment and the predicted outcomes.</p>	<p>8.7 – Probability, pp. 156 – 157 8.8 – Probability Experiments, pp. 158 – 159</p>
<p>6. Design and conduct probability experiments to test predictions about outcomes and fairness.</p>	<p>8.4 – Conducting Surveys, p. 150 – 151 8.7 – Probability, pp. 156 – 157 8.8 – Probability Experiments, pp. 158 – 159</p>
<p>7. Express probabilities as fractions, ratios, decimals and percentages.</p>	<p>8.7 – Probability, pp. 156 – 157 8.8 – Probability Experiments, pp. 158 – 159</p>
<p>8. Find all possible outcomes by systematic listing and counting strategies to solve problems.</p>	<p>8.8 – Probability Experiments, pp. 158 – 159 <i>Additional counting strategies can be found in Level H, Unit 8:</i> 8.1 – Counting Methods, pp. 216 - 219</p>