

Northpoint Horizons

Math Elevations™ (Comprehensive Intervention System) Correlated to the Grade 4 New Jersey Core Curriculum Content Standards

This document provides a sampling of the extensive math directives offered throughout the *Math Elevations* program that meet the New Jersey Core Curriculum Content Standards.

Math Content Standard	Math Elevations Level D (Grade 4) Teacher's Guide Examples/Lessons
STANDARD 4.1 (NUMBER AND NUMERICAL OPERATIONS)	
4.1.4 A. Number Sense	
1. Use real-life experiences, physical materials, and technology to construct meanings for numbers (unless otherwise noted, all indicators for grade 4 pertain to these sets of numbers as well).	
• Whole numbers through millions	Unit 1 – Lesson 1: <i>Large Numbers</i> pp. 18-19
• Commonly used fractions (denominators of 2, 3, 4, 5, 6, 8, 10, 12, and 16) as part of a whole, as a subset of a set, and as a location on a number line	Unit 1 – Lesson 4: <i>Fractions as Part of a Whole</i> pp. 24-25 Lesson 5: <i>Fractions of a Set</i> pp. 26-27
• Decimals through hundredths	Unit 1 – Lesson 6: <i>Fractions as Decimals</i> pp. 28-29 Lesson 7: <i>Comparing and Rounding Decimals</i> pp. 30-31
2. Demonstrate an understanding of place value concepts.	Unit 1 – Lesson 8: <i>Problem Solving</i> pp. 32-33
3. Demonstrate a sense of the relative magnitudes of numbers.	Unit 1 – Lesson 2: <i>Comparing Numbers</i> pp. 20-21 Lesson 3: <i>Rounding</i> pp. 22-23
4. Understand the various uses of numbers.	
• Counting, measuring, labeling (e.g., numbers on baseball uniforms), locating (e.g., Room 235 is on the second floor)	Unit 1 – Lesson 1: <i>Large Numbers</i> pp. 18-19
5. Use concrete and pictorial models to relate whole numbers, commonly used fractions,	Unit 1 –

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and decimals to each other, and to represent equivalent forms of the same number.	Lesson 2: <i>Comparing Numbers</i> pp. 20-21 Lesson 4: <i>Fractions as Part of a Whole</i> pp. 24-25 Lesson 5: <i>Fractions as Part of a Set</i> pp. 26-27 Lesson 6: <i>Fractions as Decimals</i> pp. 28-29
6. Compare and order numbers.	Unit 1 – Lesson 2: <i>Comparing Numbers</i> pp. 20-21
4.1.4 B. Numerical Operations	
1. Develop the meanings of the four basic arithmetic operations by modeling and discussing a large variety of problems.	
• Addition and subtraction: joining, separating, comparing	Unit 2 – Lesson 1: <i>Mental Addition and Subtraction</i> pp. 36-37
• Multiplication: repeated addition, area/array	Unit 3 – Lesson 1: <i>Mental Multiplication</i> pp. 54-55
2. Develop proficiency with basic multiplication and division number facts using a variety of fact strategies (such as “skip counting” and “repeated subtraction”) and then commit them to memory.	Unit 3 – Lesson 1: <i>Mental Multiplication</i> pp. 54-55 Lesson 2: <i>Patterns of Calculations</i> pp. 56-57 Lesson 3: <i>Multiplication by One-Digit Numbers</i> pp. 58-59 Lesson 4: <i>Multiplication by Two-Digit Numbers</i> pp. 60-61 Lesson 8: <i>Word Problems</i> pp. 68-69
3. Construct, use, and explain procedures for performing whole number calculations and with:	
• Pencil-and-paper	Unit 2 – Lesson 2: <i>Column Addition (I)</i> pp. 38-39 Lesson 5: <i>Word Problems (Three- and Four-Digit Numbers)</i> pp. 44-45
• Mental math	Unit 2 – Lesson 1: <i>Mental Addition and Subtraction</i> pp. 36-37 Unit 3 – Lesson 1: <i>Mental Multiplication</i> pp. 54-55
4. Use efficient and accurate pencil-and-paper procedures for computation with whole numbers.	
• Addition of 3-digit numbers	Unit 2 –

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	Lesson 1: <i>Mental Addition and Subtraction</i> pp. 36-37 Lesson 2: <i>Column Addition (I)</i> pp. 38-39 Lesson 5: <i>Word Problems (Three- and Four-Digit Numbers)</i> pp. 44-45 Lesson 6: <i>Column Addition (II)</i> pp. 46-47 Lesson 8: <i>Word Problems (Five-Digit Numbers)</i> pp. 50-51
<ul style="list-style-type: none"> • Subtraction of 3-digit numbers 	Unit 2 – Lesson 1: <i>Mental Addition and Subtraction</i> pp. 36-37 Lesson 3: <i>Making Change</i> pp. 40-41 Lesson 4: <i>Column Subtraction (I)</i> pp. 42-43 Lesson 7: <i>Column Subtraction (II)</i> pp. 48-49 Lesson 8: <i>Word Problems (Five-Digit Numbers)</i> pp. 50-51
<ul style="list-style-type: none"> • Multiplication of 2-digit numbers 	Unit 3 – Lesson 1: <i>Mental Multiplication</i> pp. 54-55 Lesson 2: <i>Patterns of Calculations</i> pp. 56-57 Lesson 3: <i>Multiplication by One-Digit Numbers</i> pp. 58-59 Lesson 4: <i>Multiplication by Two-Digit Numbers</i> pp. 60-61 Lesson 8: <i>Word Problems</i> pp. 68-69
<ul style="list-style-type: none"> • Division of 3-digit numbers by 1-digit numbers 	Unit 3 – Lesson 7: <i>Long Division (Three-Digit ÷ One-Digit Numbers)</i> pp. 66-67
5. Construct and use procedures for performing decimal addition and subtraction.	Unit 2 – Lesson 3: <i>Making Change</i> pp. 40-41
6. Count and perform simple computations with money.	Unit 2 – Lesson 3: <i>Making Change</i> pp. 40-41
<ul style="list-style-type: none"> • Standard dollars and cents notation 	Unit 2 – Lesson 3: <i>Making Change</i> pp. 40-41
7. Select pencil-and-paper, mental math, or a calculator as the appropriate computational method in a given situation depending on the context and numbers.	Unit 2 – Lesson 1: <i>Mental Addition and Subtraction</i> pp. 36-37
8. Check the reasonableness of results of computations.	Unit 2 –

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	Lesson 1: <i>Mental Addition and Subtraction</i> pp. 36-37
9. Use concrete models to explore addition and subtraction with fractions.	Unit 4 – Lesson 5: <i>Addition of Fractions with Like Denominators</i> pp. 80-81 Lesson 6: <i>Subtraction of Fractions with Like Denominators</i> pp. 82-83 Lesson 7: <i>Addition and Subtraction of Mixed Numbers</i> pp. 84-85 Lesson 8: <i>Addition and Subtraction of Fractions with Unlike Denominators</i> pp. 86-87
4.1.4 C. Estimation	
2. Construct and use a variety of estimation strategies (e.g., rounding and mental math) for estimating both quantities and the results of computations.	Unit 3 – Lesson 4: <i>Multiplication by Two-Digit Numbers</i> pp. 60-61 Unit 5 – Lesson 4: <i>Functional Relationships</i> pp. 96-97
4. Use estimation to determine whether the result of a computation (either by calculator or by hand) is reasonable.	Unit 2 – Lesson 5: <i>Word Problems (Three- and Four-Digit Numbers)</i> pp. 44-45 Unit 3 – Lesson 4: <i>Multiplication by Two-Digit Numbers</i> pp. 60-61 Unit 4 – Lesson 4: <i>Fractions and Mixed Numbers as Decimals</i> pp. 78-79 Lesson 6: <i>Subtraction of Fractions with Like Denominators</i> pp. 82-83 Lesson 7: <i>Addition and Subtraction of Mixed Numbers</i> pp. 84-85
STANDARD 4.2 (GEOMETRY AND MEASUREMENT)	
4.2.4 A. Geometric Properties	
1. Identify and describe spatial relationships of two or more objects in space.	
• Direction, orientation, and perspectives (e.g., which object is on your left when you are standing here?) •	Unit 5 – Lesson 8: <i>Directions</i> pp. 104-105
2. Use properties of standard three-dimensional and two-dimensional shapes to identify,	

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classify, and describe them.	
<ul style="list-style-type: none"> • Vertex, edge, face, side, angle 	Unit 7 – Lesson 1: <i>Types of Angles</i> pp. 126-127 Lesson 7: <i>Solid Figures</i> pp. 138-139
<ul style="list-style-type: none"> • 3D figures – cube, rectangular prism, sphere, cone, cylinder, and pyramid 	Unit 7 – Lesson 7: <i>Solid Figures</i> pp. 138-139
<ul style="list-style-type: none"> • 2D figures – square, rectangle, circle, triangle, quadrilateral, pentagon, hexagon, octagon 	Unit 7 – Lesson 3: <i>Classifying Polygons</i> pp. 130-131
<ul style="list-style-type: none"> • Inclusive relationships – squares are rectangles, cubes are rectangular prisms 	Unit 7 – Lesson 3: <i>Classifying Polygons</i> pp. 130-131
3. Identify and describe relationships among two-dimensional shapes.	
<ul style="list-style-type: none"> • Congruence 	Unit 7 – Lesson 5: <i>Flips and Slides</i> pp. 134-135
<ul style="list-style-type: none"> • Lines of symmetry 	Unit 7 – Lesson 4: <i>Symmetry</i> pp. 132-133
4. Understand and apply concepts involving lines, angles, and circles.	
<ul style="list-style-type: none"> • Parallel, perpendicular 	Unit 7 – Lesson 2: <i>Parallel and Perpendicular Lines</i> pp. 128-129
<ul style="list-style-type: none"> • Angles – acute, right, obtuse 	Unit 7 – Lesson 1: <i>Types of Angles</i> pp. 126-127
4.2.4 B. Transforming Shapes	
2. Describe and use geometric transformations (slide, flip, turn).	Unit 7 – Lesson 5: <i>Flips and Slides</i> pp. 134-135
4.2.4 C. Coordinate Geometry	
1. Locate and name points in the first quadrant on a coordinate grid.	Unit 5 – Lesson 7: <i>Ordered Pairs</i> pp. 102-103
2. Use coordinates to give or follow directions from one point to another on a map or grid.	Unit 5 – Lesson 7: <i>Ordered Pairs</i> pp. 102-103 Lesson 8: <i>Directions</i> pp. 104-105
4.2.4 D. Units of Measurement	
1. Understand that everyday objects have a variety of attributes, each of which can be measured in many ways.	Unit 6 – Lesson 1: <i>Perimeter of Squares and Rectangles</i> pp. 108-109 Lesson 2: <i>Area of Squares and Rectangles</i> pp. 110-111

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2. Select and use appropriate standard units of measure and measurement tools to solve real-life problems	Lesson 4: <i>Metric Measurement</i> pp. 114-115
• Length – fractions of an inch (1/8, 1/4, 1/2), mile, decimeter, kilometer	Unit 6 – Lesson 4: <i>Metric Measurement</i> pp. 114-115
• Area – square inch, square centimeter	Unit 6 – Lesson 2: <i>Area of Squares and Rectangles</i> pp. 110-111 Lesson 3: <i>Area and Perimeter of Irregular Polygons</i> pp. 112-113
• Volume – cubic inch, cubic centimeter	Unit 7 – Lesson 8: <i>Volume</i> pp. 140-141
• Weight – ounce	Unit 6 – Lesson 7: <i>Weight</i> pp. 120-121
• Capacity – fluid ounce, cup, gallon, milliliter	Unit 6 – Lesson 5: <i>Measuring Capacity</i> pp. 116-117 Lesson 6: <i>Capacity Conversions</i> pp. 118-119
3. Develop and use personal referents to approximate standard units of measure (e.g., a common paper clip is about an inch long).	
4. Incorporate estimation in measurement activities (e.g., estimate before measuring).	Unit 6 – Lesson 3: <i>Area and Perimeter of Irregular Polygons</i> pp. 112-113 Lesson 5: <i>Measuring Capacity</i> pp. 116-117 Lesson 7: <i>Weight</i> pp. 120-121
4.2.4 E. Measuring Geometric Objects	
1. Determine the area of simple two-dimensional shapes on a square grid.	Unit 6 – Lesson 2: <i>Area of Squares and Rectangles</i> pp. 110-111 Lesson 3: <i>Area and Perimeter of Irregular Polygons</i> pp. 112-113
2. Distinguish between perimeter and area and use each appropriately in problem-solving situations.	Unit 6 – Lesson 1: <i>Perimeter of Squares and Rectangles</i> pp. 108-109 Lesson 2: <i>Area of Squares and Rectangles</i> pp. 110-111 Lesson 3: <i>Area and Perimeter of Irregular Polygons</i> pp. 112-113
3. Measure and compare the volume of three-dimensional objects using materials such	Unit 7 –

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as rice or cubes.	Lesson 8: <i>Volume</i> pp. 140-141
STANDARD 4.3 (PATTERNS AND ALGEBRA)	
4.3.4 A. Patterns	
1. Recognize, describe, extend, and create patterns.	
<ul style="list-style-type: none"> • Descriptions using words, number sentences/expressions, graphs, tables, variables (e.g., shape, blank, or letter) 	Unit 5 – Lesson 4: <i>Functional Relationships</i> pp. 96-97
<ul style="list-style-type: none"> • Sequences that stop or that continue infinitely 	Unit 5 – Lesson 4: <i>Functional Relationships</i> pp. 96-97 Lesson 5: <i>Linear Functions</i> pp. 98-99
<ul style="list-style-type: none"> • Whole number patterns that grow or shrink as a result of repeatedly adding, subtracting, multiplying by, or dividing by a fixed number (e.g., 5, 8, 11, . . . or 800, 400, 200, . . .) 	Unit 5 – Lesson 4: <i>Functional Relationships</i> pp. 96-97 Lesson 5: <i>Linear Functions</i> pp. 98-99
4.3.4 B. Functions and Relationships	
1. Use concrete and pictorial models to explore the basic concept of a function.	
<ul style="list-style-type: none"> • Input/output tables, T-charts 	Unit 5 – Lesson 4: <i>Functional Relationships</i> pp. 96-97
4.3.4 C. Modeling	
1. Recognize and describe change in quantities.	
<ul style="list-style-type: none"> • How change in one physical quantity can produce a corresponding change in another (e.g., pitch of a sound depends on the rate of vibration) 	Unit 5 – Lesson 4: <i>Functional Relationships</i> pp. 96-97
2. Construct and solve simple open sentences involving any one operation (e.g., $3 \times 6 = \underline{\quad}$, $n = 15 \div 3$, $3 \times \underline{\quad} = 0$, $16 - c = 7$).	Unit 5 – Lesson 2: <i>Solving Open Sentences (Addition and Subtraction)</i> pp. 92-93 Lesson 3: <i>Solving Open Sentences (Multiplication and Division)</i> pp. 94-95
STANDARD 4.4 (DATA ANALYSIS, PROBABILITY, AND DISCRETE MATHEMATICS)	
4.4.4 A. Data Analysis	
1. Collect, generate, organize, and display data in response to questions, claims, or curiosity.	
<ul style="list-style-type: none"> • Data collected from the school environment 	Unit 8 – Lesson 1: <i>Data Handling</i> pp. 144-145
2. Read, interpret, construct, analyze, generate questions about, and draw inferences from displays of data.	
<ul style="list-style-type: none"> • Pictograph, bar graph, line plot, line graph, table 	Unit 8 –

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<ul style="list-style-type: none"> Average (mean), most frequent (mode), middle term (median) 	Lesson 3: <i>Pictographs</i> pp. 148-149 Unit 8 – Lesson 2: <i>Mode and Mean</i> pp. 146-147
4.4.4 B. Probability	
1. Use everyday events and chance devices, such as dice, coins, and unevenly divided spinners, to explore concepts of probability.	
<ul style="list-style-type: none"> Probability of tossing “heads” does not depend on outcomes of previous tosses 	Unit 8 – Lesson 8: <i>Probability</i> pp. 158-159
2. Determine probabilities of simple events based on equally likely outcomes and express them as fractions.	
<ul style="list-style-type: none"> Predict probabilities in a variety of situations (e.g., given the number of items of each color in a bag, what is the probability that an item picked will have a particular color). 	Unit 8 – Lesson 8: <i>Probability</i> pp. 158-159
<ul style="list-style-type: none"> Collect data and use that data to predict the probability (experimental) 	Unit 8 – Lesson 7: <i>Predicting Possible Outcomes</i> pp. 156-157
<ul style="list-style-type: none"> Analyze all possible outcomes to find the probability (theoretical) 	Unit 8 – Lesson 8: <i>Probability</i> pp. 158-159
4.4.4 C. Discrete Mathematics—Systematic Listing and Counting	
1. Represent and classify data according to attributes, such as shape or color, and relationships.	
<ul style="list-style-type: none"> Venn diagrams 	Unit 8 – Lesson 6: <i>Venn Diagrams</i> pp. 154-155
2. Represent all possibilities for a simple counting situation in an organized way and draw conclusions from this representation.	
<ul style="list-style-type: none"> Organized lists, charts, tree diagrams 	Unit 8 – Lesson 7: <i>Predicting Possible Outcomes</i> pp. 156-157
<ul style="list-style-type: none"> Dividing into categories (e.g., to find the total number of rectangles in a grid, find the number of rectangles of each size and add the results) 	Unit 8 – Lesson 7: <i>Predicting Possible Outcomes</i> pp. 156-157
4.4.4 D. Discrete Mathematics—Vertex-Edge Graphs and Algorithms	
1. Follow, devise, and describe practical sets of directions (e.g., to add two 2-digit numbers).	Unit 5 – Lesson 4: <i>Functional Relationships</i> pp. 96-97 Lesson 5: <i>Linear Functions</i> pp. 98-99
2. Play two-person games and devise strategies for winning the games (e.g., “make 5” where players alternately add 1 or 2 and the person who reaches 5, or another designated number, is the winner).	Unit 8 – Lesson 8: <i>Probability</i> pp. 158-159

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STANDARD 4.5 (MATHEMATICAL PROCESSES)	
4.5 A. Problem Solving	
1. Learn mathematics through problem solving, inquiry, and discovery.	Unit 2 – Lesson 5: <i>Word Problems (Three- and Four-Digit Numbers)</i> pp. 44-45
2. Solve problems that arise in mathematics and in other contexts.	
• Open-ended problems	Unit 8 – Lesson 8: <i>Probability</i> pp. 158-159
• Problems with multiple solutions	Unit 6 – Lesson 8: <i>Appropriate Units</i> pp. 122-123
3. Select and apply a variety of appropriate problem-solving strategies (e.g., “try a simpler problem” or “make a diagram”) to solve problems.	Unit 6 – Lesson 8: <i>Appropriate Units</i> pp. 122-123
4. Pose problems of various types and levels of difficulty.	Unit 5 – Lesson 2: <i>Solving Open Sentences (Addition and Subtraction)</i> pp. 92-93 Lesson 3: <i>Solving Open Sentences (Multiplication and Division)</i> pp. 94-95
5. Monitor their progress and reflect on the process of their problem solving activity.	Unit 1 – Lesson 1: <i>Large Numbers</i> pp. 18-19
6. Distinguish relevant from irrelevant information, and identify missing information.	Unit 2 – Lesson 5: <i>Word Problems (Three- and Four-Digit Numbers)</i> pp. 44-45
4.5 B. Communication	
1. Use communication to organize and clarify their mathematical thinking.	
• Reading and writing	Unit 6 – Lesson 8: <i>Appropriate Units</i> pp. 122-123
• Discussion, listening, and questioning	Unit 4 – Lesson 2: <i>Equivalent Fractions</i> pp. 74-75
2. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others, both orally and in writing.	Unit 8 – Lesson 5: <i>Line Graphs</i> pp. 152-153
3. Analyze and evaluate the mathematical thinking and strategies of others.	Unit 5 – Lesson 4: <i>Functional Relationships</i> pp. 96-97
4. Use the language of mathematics to express mathematical ideas precisely.	Unit 5 – Lesson 7: <i>Ordered Pairs</i> pp. 102-103

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4.5 C. Connections	
1. Recognize recurring themes across mathematical domains (e.g., patterns in number, algebra, and geometry).	Unit 5 – Lesson 7: <i>Ordered Pairs</i> pp. 102-103
2. Use connections among mathematical ideas to explain concepts (e.g., two linear equations have a unique solution because the lines they represent intersect at a single point).	Unit 5 – Lesson 1: <i>Order of Operations</i> pp. 90-91
3. Recognize that mathematics is used in a variety of contexts outside of mathematics.	Unit 8 – Lesson 2: <i>Mode and Mean</i> pp. 146-147
4. Apply mathematics in practical situations and in other disciplines.	Unit 8 – Lesson 2: <i>Mode and Mean</i> pp. 146-147
6. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.	Unit 5 – Lesson 7: <i>Ordered Pairs</i> pp. 102-103
4.5 D. Reasoning	
1. Recognize that mathematical facts, procedures, and claims must be justified.	Unit 5 – Lesson 6: <i>Writing Simple Algebraic Equations</i> pp. 100-101
2. Use reasoning to support their mathematical conclusions and problem solutions.	Unit 6 – Lesson 8: <i>Appropriate Units</i> pp. 122-123
3. Select and use various types of reasoning and methods of proof.	Unit 5 – Lesson 2: <i>Solving Open Sentences (Addition and Subtraction)</i> pp. 92-93 Lesson 3: <i>Solving Open Sentences (Multiplication and Division)</i> pp. 94-95
5. Make and investigate mathematical conjectures.	Unit 8 – Lesson 8: <i>Probability</i> pp. 158-159
6. Evaluate examples of mathematical reasoning and determine whether they are valid.	Unit 8 – Lesson 8: <i>Probability</i> pp. 158-159
4.5 E. Representations	
1. Create and use representations to organize, record, and communicate mathematical ideas.	
• Concrete representations (e.g., base-ten blocks or algebra tiles)	Unit 1 – Lesson 3: <i>Rounding</i> pp. 22-23 Lesson 6: <i>Fractions as Decimals</i> pp. 28-29
• Pictorial representations (e.g., diagrams, charts, or tables)	Unit 5 –

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	Lesson 4: <i>Functional Relationships</i> pp. 96-97
• Symbolic representations (e.g., a formula)	Unit 6 – Lesson 2: <i>Area of Squares and Rectangles</i> pp. 110-111
• Graphical representations (e.g., a line graph)	Unit 8 – Lesson 5: <i>Line Graphs</i> pp. 152-153
2. Select, apply, and translate among mathematical representations to solve problems.	Unit 4 – Lesson 2: <i>Equivalent Fractions</i> pp. 74-75 Unit 4 – Lesson 3: <i>Converting Between Improper Fractions and Mixed Numbers</i> pp. 76-77
3. Use representations to model and interpret physical, social, and mathematical phenomena.	Unit 5 – Lesson 8: <i>Directions</i> pp. 104-105
4.5 F. Technology	Technology is used throughout the <i>Math Elevations</i> program. Students use software in conjunction with their written materials to reinforce concepts presented in the program.
1. Use technology to gather, analyze, and communicate mathematical information.	
2. Use computer spreadsheets, software, and graphing utilities to organize and display quantitative information.	
5. Use computer software to make and verify conjectures about geometric objects.	
6. Use computer-based laboratory technology for mathematical applications in the sciences (cf. science standards).	