

Northpoint Horizons

Math Elevations™ (Comprehensive Intervention System) Correlated to the Grade 8 Illinois State Mathematics Content Standards

Middle / Junior High School (Grade 8)

This document provides a sampling of the extensive math directives offered throughout the *Math Elevations* program that meet the Illinois Mathematics Standards and Descriptors.

Illinois Mathematics Standards and Descriptors	<i>Math Elevations Level H (Grade 8)</i> Teacher's Guide Examples/Lessons
STATE GOAL 6, NUMBER SENSE: Demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, division), patterns, ratios and proportions	
Unit 1 – Number Sense / Integers Unit 2 – Number Theory / Fractions and Exponents Unit 3 – Algebra Unit 4 – Ratio, Proportion, and Percent Unit 5 – Advanced Algebra and Functions Unit 7 - Measurement	
6.A. Demonstrate knowledge and use of numbers and their representations in a broad range of theoretical and practical settings.	Unit 1 1.1 Integers and Absolute Value pp. 18 – 20 1.7 Exponents pp. 37 – 39 1.8 Square Roots pp. 40 – 42 Unit 4 4.4 Fractions, Decimals, and Percents pp. 114 - 116
6.A.3 Represent fractions, decimals, percentages, exponents and scientific notation in equivalent forms.	Unit 2 2.6 Rules of Exponents pp. 62 - 64 2.7 Negative and Zero Exponents pp. 65 - 67 2.8 Scientific Notation pp. 68 - 70 Unit 4 4.4 Fractions, Decimals, and Percents pp. 114 - 116
6.B. Investigate, represent and solve problems using number facts, operations (addition, subtraction, multiplication, division) and their properties, algorithms and relationships	Unit 1 1.3 Adding Integers Using a Number Line pp. 21 - 23 1.4 Subtracting Integers pp. 28 – 30 1.5 Multiplying Integers pp. 31 – 33 1.6 Dividing Integers pp. 34 – 36 Unit 2 2.6 Rules of Exponents pp. 62 – 64

Illinois Mathematics Standards and Descriptors	<i>Math Elevations Level H (Grade 8)</i> Teacher's Guide Examples/Lessons
	Unit 3 3.1 Commutative, Associative, and Distributive Properties pp. 74 - 77
6.B.3a Solve practical computation problems involving whole numbers, integers and rational numbers.	Unit 1 1.1 Integers and Absolute Value pp. 18 – 20 1.3 Adding Integers Using a Number Line pp. 21 – 23 Unit 2 2.4 Adding and Subtracting Fractions pp. 55 - 57 2.5 Multiplying and Dividing Fractions and Mixed Numbers pp. 58 - 61 Unit 3 3.3 Substituting Values for Variables in Formulas pp. 81 - 83
6.B.3b Apply primes, factors, divisors, multiples, common factors and common multiples in solving problems.	Unit 2 2.1 Factors and Prime Factorization pp. 46 – 48 2.2 Greatest Common Factor (GCF) pp. 49 – 51 2.3 Least Common Multiple (LCM) pp. 52 – 54 2.4 Adding and Subtracting Fractions p. 55 - 57
6.B.3c Identify and apply properties of real numbers including pi, squares, and square roots.	Unit 1 1.7 Exponents pp. 37 – 39 1.8 Square Roots pp. 40 – 42 Unit 2 2.6 Rules of Exponents pp. 62 – 64 2.7 Negative and Zero Exponents pp. 65 - 67 Unit 3 3.8 Pythagorean Theorem pp. 98 – 101 Unit 7 7.2 Circumference of a Circle pp. 193 – 195 7.3 Area of a Circle pp. 196 - 198
6.C. Compute and estimate using mental mathematics, paper-and-pencil methods, calculators and computers.	Unit 2 2.5 Multiplying and Dividing Fractions and Mixed Numbers pp. 58 - 61 2.6 Rules of Exponents pp. 62 – 64 2.8 Scientific Notation pp. 68 - 70
6.C.3a Select computational procedures and solve problems with whole numbers, fractions, decimals, percents and proportions.	Unit 2 2.4 Adding and Subtracting Fractions pp. 55 - 57 2.5 Multiplying and Dividing Fractions and Mixed Numbers pp. 58 - 61 Unit 3 3.3 Substituting Values for Variables in Formulas pp. 81 – 83 Unit 4 4.1 Rates and Ratios pp. 104 – 107 4.2 Writing and Solving Proportions pp. 108 – 110 4.5 Solving Percent Problems Using a Proportion pp. 117 - 119

Illinois Mathematics Standards and Descriptors	<i>Math Elevations Level H (Grade 8)</i> Teacher's Guide Examples/Lessons
	4.6 Using Proportions to Solve Other Percent Problems pp. 120 - 123
6.C.3b Show evidence that computational results using whole numbers, fractions, decimals, percents and proportions are correct and/or that estimates are reasonable.	Unit 3 3.5 Solving Equations Using Multiplication or Division pp. 87 – 89 Unit 4 4.5 Solving Percent Problems Using a Proportion pp. 117 - 119 4.6 Using Proportions to Solve Other Percent Problems pp. 120 – 123 Unit 5 5.3 Translating and Solving Word Problems pp. 138 - 140
6.D. Solve problems using comparison of quantities, ratios, proportions and percents.	Unit 4 4.5 Solving Percent Problems Using a Proportion pp. 117 - 119 4.6 Using Proportions to Solve Other Percent Problems pp. 120 – 123 4.7 Percent of Change pp. 124 - 126
6.D.3 Apply ratios and proportions to solve practical problems.	Unit 4 4.8 Percent Applications pp. 127 - 129
STATE GOAL 7, Estimation and Measurement: Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.	
Unit 3 – Algebra Unit 4 – Ratio, Proportion, and Percent Unit 6 – Geometry Unit 7 – Measurement Unit 8 – Probability, Statistics, and Data Analysis	
7.A. Measure and compare quantities using appropriate units, instruments and methods.	Unit 6 6.1 Angles pp. 160 – 163 6.5 Congruent Triangles pp. 174 – 176 6.6 Similarity and Dilations pp. 177 - 179 6.7 Reflections and Translations in the Coordinate Plane pp. 180 - 183
7.A.3a Measure length, capacity, weight/mass and angles using sophisticated instruments (e.g., compass, protractor, trundle wheel).	Unit 6 6.1 Angles pp. 160 – 163 6.6 Similarity and Dilations pp. 177 - 179
7.A.3b Apply the concepts and attributes of length, capacity, weight/mass, perimeter, area, volume, time, temperature and angle measures in practical situations.	Unit 3 3.8 Pythagorean Theorem pp. 98 – 101 Unit 6 6.4 Sum of Angles in a Polygon pp. 171 - 173
7.B. Estimate measurements and determine acceptable levels of accuracy.	Unit 6 6.1 Angles pp. 160 – 163 Unit 7 7.3 Area of a Circle pp. 196 - 198

Illinois Mathematics Standards and Descriptors	<i>Math Elevations Level H (Grade 8)</i> Teacher's Guide Examples/Lessons
7.B.3 Select and apply instruments including rulers and protractors and units of measure to the degree of accuracy required.	Unit 6 6.1 Angles pp. 160 – 163 6.2 Angles in Parallel Lines Cut by a Transversal pp. 164 – 166 Unit 8 8.7 Circle Graphs pp. 238 – 240
7.C. Select and use appropriate technology, instruments and formulas to solve problems, interpret results and communicate findings.	Unit 3 3.3 Substituting Values for Variables in Formulas pp. 81 – 83 3.8 Pythagorean Theorem pp. 98 – 101 Unit 6 6.4 Sum of Angles in a Polygon pp. 171 – 173 6.6 Similarity and Dilations pp. 177 – 179 6.7 Reflections and Translations in the Coordinate Plane pp. 180 – 183 Unit 7 7.1 Area of a Trapezoid pp. 190 – 192 7.2 Circumference of a Circle pp. 193 - 195 7.3 Area of a Circle pp. 196 - 198
7.C.3a Construct a simple scale drawing for a given situation.	Unit 4 4.3 Scale Drawing and Models pp. 111 – 113 Unit 6 6.6 Similarity and Dilations pp. 177 – 179
7.C.3b Use concrete and graphic models and appropriate formulas to find perimeters, areas, surface areas and volumes of two- and three-dimensional regions.	Unit 7 7.1 Area of a Trapezoid pp. 190 – 192 7.2 Circumference of a Circle pp. 193 – 195 7.3 Area of a Circle pp. 196 – 198 7.4 Surface Area of a Prism pp. 199 – 201 7.5 Surface Area of a Cylinder pp. 202 – 204 7.6 Surface Area of Pyramids and Cones pp. 205 – 207 7.7 Volume of a Prism and a Cylinder pp. 208 - 210 7.8 Volume of a Pyramid and a Cone pp. 211 – 213
STATE GOAL 8, Algebra and Analytical Methods: Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems and predict results.	
Unit 1 – Number Sense / Integers Unit 3 – Algebra Unit 4 – Ratio, Proportion, and Percent Unit 5 – Advanced Algebra and Functions	
8.A. Describe numerical relationships using variables and patterns.	Unit 5 5.3 Translating and Solving Word Problems pp. 138 – 140 5.5 Two-Variable Equations pp. 144 – 146

Illinois Mathematics Standards and Descriptors	<i>Math Elevations Level H (Grade 8)</i> Teacher's Guide Examples/Lessons
8.A.3a Apply the basic properties of commutative, associative, distributive, transitive, inverse, identity, zero, equality and order of operations to solve problems.	Unit 3 3.1 Commutative, Associative, and Distributive Properties pp. 74 – 77 3.2 Order of Operations pp. 78 – 80 3.4 Solving Equations Using Addition or Subtraction pp. 84 – 86 3.5 Solving Equations Using Multiplication or Division pp. 87 – 89
8.A.3b Solve problems using linear expressions, equations and inequalities.	Unit 3 3.3 Substituting Values for Variables in Formulas pp. 81 – 83 3.6 Solving Inequalities Using Addition or Subtraction pp. 90 – 93 3.7 Solving Inequalities Using Multiplication or Division pp. 94 – 97 Unit 5 5.2 Solving Multi-Step Equations pp. 135 – 137 5.3 Translating and Solving Word Problems pp. 138 – 140
8.B. Interpret and describe numerical relationships using tables, graphs and symbols.	Unit 5 5.4 Relations and Functions pp. 141 – 143 5.7 Interpreting Linear Functions pp. 151 – 153
8.B.3 Use graphing technology and algebraic methods to analyze and predict linear relationships and make generalizations from linear patterns.	Unit 5 5.6 Graphing Linear Functions pp. 147 – 150 5.7 Interpreting Linear Functions pp. 151 – 153 5.8 Slope pp. 154 - 157
8.C. Solve problems using systems of numbers and their properties	Unit 5 5.3 Translating and Solving Word Problems pp. 138 – 140 5.4 Relations and Functions pp. 141 – 143 5.5 Two-Variable Equations pp. 144 - 146
8.C.3 Apply the properties of numbers and operations including inverses in algebraic settings derived from economics, business and the sciences.	Unit 5 5.3 Translating and Solving Word Problems pp. 138 – 140 5.4 Relations and Functions pp. 141 – 143 5.5 Two-Variable Equations pp. 144 - 146
8.D. Use algebraic concepts and procedures to represent and solve problems.	Unit 3 3.3 Substituting Values for Variables in Formulas pp. 81 – 83 Unit 5 5.2 Solving Multi-Step Equations pp. 135 – 137 5.3 Translating and Solving Word Problems pp. 138 – 140
8.D.3a Solve problems using numeric, graphic or symbolic representations of variables, expressions, equations and inequalities.	Unit 3 3.3 Substituting Values for Variables in Formulas pp. 81 – 83 Unit 5 5.3 Translating and Solving Word Problems pp. 138 – 140 5.4 Relations and Functions pp. 141 – 143 5.6 Graphing Linear Functions pp. 147 – 150 5.7 Interpreting Linear Functions pp. 151 – 153

Illinois Mathematics Standards and Descriptors	<i>Math Elevations Level H (Grade 8)</i> Teacher's Guide Examples/Lessons
8.D.3b Propose and solve problems using proportions, formulas and linear functions.	Unit 3 3.3 Substituting Values for Variables in Formulas pp. 81 – 83 Unit 4 4.2 Writing and Solving Proportions pp. 108 – 110 4.5 Solving Percent Problems Using a Proportion pp. 117 - 119 4.6 Using Proportions to Solve Other Percent Problems pp. 120 – 123 Unit 5 5.6 Graphing Linear Functions pp. 147 – 150 5.7 Interpreting Linear Functions pp. 151 – 153
8.D.3c Apply properties of powers, perfect squares and square roots.	Unit 1 1.7 Exponents pp. 37 – 39 1.8 Square Roots pp. 40 – 42
STATE GOAL 9, GEOMETRY: Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes and space.	
Unit 3 – Algebra Unit 4 – Ratio, Proportion, and Percent Unit 6 – Geometry Unit 7 – Measurement	
9.A. Demonstrate and apply geometric concepts involving points, lines, planes and space.	Unit 6 6.1 Angles pp. 160 – 163 6.2 Angles in Parallel Lines Cut by a Transversal pp. 164 – 166 6.3 Polygons pp. 167 – 170
9.A.4a Construct a model of a three-dimensional figure from a two-dimensional pattern.	Unit 7 7.4 Surface Area of a Prism pp. 199 – 201 7.5 Surface Area of a Cylinder pp. 202 – 204 7.6 Surface Area of Pyramids and Cones pp. 205 – 207
9.A.4b Make perspective drawings, tessellations and scale drawings, with and without the use of technology.	Unit 4 4.3 Scale Drawing and Models pp. 111 – 113 Unit 6 6.6 Similarity and Dilations pp. 177 – 179 6.7 Reflections and Translations in the Coordinate Plane pp. 180 – 183 6.8 Rotations in the Coordinate Plane pp. 184 - 186
9.B. Identify, describe, classify and compare relationships using points, lines, planes and solids.	Unit 6 6.1 Angles pp. 160 – 163 6.3 Polygons pp. 167 – 170 6.4 Sum of Angles in a Polygon pp. 171 – 173
9.B.3 Identify, describe, classify and compare two- and three-dimensional geometric figures and models according to their properties.	Unit 6 6.3 Polygons pp. 167 – 170 6.4 Sum of Angles in a Polygon pp. 171 – 173

Illinois Mathematics Standards and Descriptors	<i>Math Elevations Level H (Grade 8)</i> Teacher's Guide Examples/Lessons
	6.7 Reflections and Translations in the Coordinate Plane pp. 180 – 183
9.C. Construct convincing arguments and proofs to solve problems.	Unit 6 6.4 Sum of Angles in a Polygon pp. 171 – 173 6.5 Congruent Triangles pp. 174 – 176
9.C.3a Construct, develop and communicate logical arguments (informal proofs) about geometric figures and patterns.	Unit 6 6.5 Congruent Triangles pp. 174 – 176
9.C.3b Develop and solve problems using geometric relationships and models, with and without the use of technology.	Unit 3 3.8 Pythagorean Theorem pp. 98 – 101 Unit 7 7.2 Circumference of a Circle pp. 193 – 195 7.3 Area of a Circle pp. 196 – 198 7.4 Surface Area of a Prism pp. 199 – 201 7.5 Surface Area of a Cylinder pp. 202 – 204 7.6 Surface Area of Pyramids and Cones pp. 205 – 207 7.7 Volume of a Prism and a Cylinder pp. 208 - 210 7.8 Volume of a Pyramid and a Cone pp. 211 – 213
9.D. Use trigonometric ratios and circular functions to solve problems.	Right Triangle vocabulary relevant to trigonometric ratios is introduced in Lesson 3.8.
9.D.3 Compute distances, lengths and measures of angles using proportions, the Pythagorean theorem and its converse.	Unit 3 3.8 Pythagorean Theorem pp. 98 – 101
STATE GOAL 10, Data Analysis and Probability: Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.	
Unit 8 – Probability, Statistics, and Data Analysis	
10.A. Organize, describe and make predictions from existing data.	Unit 8 8.2 Making Predictions pp. 220 - 223
10.A.3a Construct, read and interpret tables, graphs (including circle graphs) and charts to organize and represent data.	Unit 8 8.4 Scatter Plots pp. 227 – 229 8.5 Box-and-Whiskers Plots pp. 230 – 233 8.6 Line Graphs pp. 234 – 237 8.7 Circle Graphs pp. 238 – 240 8.8 Appropriate Graphs pp. 241 – 243
10.A.3b Compare the mean, median, mode and range, with and without the use of technology.	Unit 8 8.3 Mean, Median, and Mode pp. 224 - 226
10.A.3c Test the reasonableness of an argument based on data and communicate their findings.	8.3 Mean, Median, and Mode pp. 224 – 226 8.4 Scatter Plots pp. 227 – 229 8.5 Box-and-Whiskers Plots pp. 230 – 233 8.6 Line Graphs pp. 234 – 237

Illinois Mathematics Standards and Descriptors	<i>Math Elevations Level H (Grade 8)</i> Teacher's Guide Examples/Lessons
	8.7 Circle Graphs pp. 238 – 240 8.8 Appropriate Graphs pp. 241 – 243
10.B. Formulate questions, design data collection methods, gather and analyze data and communicate findings.	Unit 8 8.2 Making Predictions pp. 220 – 223 8.3 Mean, Median, and Mode pp. 224 – 226 8.4 Scatter Plots pp. 227 – 229 8.5 Box-and-Whiskers Plots pp. 230 – 233 8.6 Line Graphs pp. 234 – 237 8.7 Circle Graphs pp. 238 – 240 8.8 Appropriate Graphs pp. 241 – 243
10.B.3 Formulate questions (e.g., relationships between car age and mileage, average incomes and years of schooling), devise and conduct experiments or simulations, gather data, draw conclusions and communicate results to an audience using traditional methods and contemporary technologies.	Unit 8 8.2 Making Predictions pp. 220 – 223 8.3 Mean, Median, and Mode pp. 224 – 226 8.4 Scatter Plots pp. 227 – 229 8.5 Box-and-Whiskers Plots pp. 230 – 233 8.6 Line Graphs pp. 234 – 237 8.7 Circle Graphs pp. 238 – 240
10.C. Determine, describe and apply the probabilities of events.	Unit 8 8.2 Making Predictions pp. 220 – 223
10.C.3a Determine the probability and odds of events using fundamental counting principles.	Unit 8 8.1 Counting Methods pp. 216 – 219
10.C.3b Analyze problem situations (e.g., board games, grading scales) and make predictions about results.	Unit 8 8.2 Making Predictions pp. 220 – 223 8.6 Line Graphs pp. 234 – 237 8.7 Circle Graphs pp. 238 – 240 8.8 Appropriate Graphs pp. 241 – 243