

Northpoint Horizons

Math Elevations™ (Comprehensive Intervention System) Correlated to Grade 8 Ohio Academic Content Standards for Mathematics

This document provides a sampling of the extensive math directives offered throughout the *Math Elevations* program that meet **Ohio Academic Content Standards for Mathematics**.

Ohio Academic Content Standards Grade 8	Math Elevations Level H Teacher's Guide Examples/Lessons
Number, Number Sense and Operations Standard	
1. Use scientific notation to express large numbers and small numbers between 0 and 1.	Unit 2 – Lesson 8: <i>Scientific Notation</i> pp. 68-70
2. Recognize that natural numbers, whole numbers, integers, rational numbers and irrational numbers are subsets of the real number system.	Unit 1 – Lesson 1: <i>Integers and Absolute Value</i> pp. 18-20
3. Apply order of operations to simplify expressions and perform computations involving integer exponents and radicals.	Unit 2 – Lesson 6: <i>Rules of Exponents</i> pp. 62-64 Unit 2 – Lesson 7: <i>Negative and Zero Exponents</i> pp. 65-67 Unit 3 – Lesson 2: <i>Order of Operations</i> pp. 78-80
4. Explain and use the inverse and identity properties and use inverse relationships (addition/subtraction, multiplication/division, squaring/square roots) in problem solving situations.	Unit 3 – Lesson 1: <i>Commutative, Associative, and Distributive Properties</i> pp. 74-77
5. Determine when an estimate is sufficient and when an exact answer is needed in problem situations, and evaluate estimates in relation to actual answers; e.g., very close, less than, greater than.	Unit 1 – Lesson 8: <i>Square Roots</i> pp. 40-42
6. Estimate, compute and solve problems involving rational numbers, including ratio, proportion and percent, and judge the reasonableness of solutions.	Unit 4 – Lesson 1: <i>Ratios and Rates</i> pp. 104-107 Unit 4 – Lesson 2: <i>Writing and Solving Proportions</i> pp. 108-110
7. Find the square root of perfect squares, and approximate the square root of non-perfect squares as consecutive integers between which the root lies.	Unit 1 – Lesson 8: <i>Square Roots</i> pp. 40-42
8. Add, subtract, multiply, divide and compare numbers written in scientific notation.	Unit 2 – Lesson 8: <i>Scientific Notation</i> pp. 68-70

Measurement Standard	
1. Compare and order the relative size of common U.S. customary units and metric units; e.g., mile and kilometer, gallon and liter, pound and kilogram.	
2. Use proportional relationships and formulas to convert units from one measurement system to another; e.g., degrees Fahrenheit to degrees Celsius.	
3. Use appropriate levels of precision when calculating with measurements.	Unit 7 – Lesson 4: <i>Surface Area of a Prism</i> pp. 199-201 Unit 7 – Lesson 5: <i>Surface Area of a Cylinder</i> pp. 202-204 Unit 7 – Lesson 6: <i>Surface Area of a Pyramid and a Cone</i> pp. 205-207 Unit 7 – Lesson 7: <i>Volume of a Prism and a Cylinder</i> pp. 208-210 Unit 7 – Lesson 8: <i>Volume of a Pyramid and a Cone</i> pp. 211-213
4. Derive formulas for surface area and volume and justify them using geometric models and common materials.	Unit 7 – Lesson 4: <i>Surface Area of a Prism</i> pp. 199-201 Unit 7 – Lesson 5: <i>Surface Area of a Cylinder</i> pp. 202-204 Unit 7 – Lesson 6: <i>Surface Area of a Pyramid and a Cone</i> pp. 205-207 Unit 7 – Lesson 7: <i>Volume of a Prism and a Cylinder</i> pp. 208-210 Unit 7 – Lesson 8: <i>Volume of a Pyramid and a Cone</i> pp. 211-213
5. Determine surface area for pyramids by analyzing their parts.	Unit 7 – Lesson 6: <i>Surface Area of a Pyramid and a Cone</i> pp. 205-207
6. Solve and determine the reasonableness of the results for problems involving rates and derived measurements, such as velocity and density, using formulas, models and graphs.	Unit 4 – Lesson 1: <i>Ratios and Rates</i> pp. 104-107 Unit 4 – Lesson 2: <i>Writing and Solving Proportions</i> pp. 108-110
7. Apply proportional reasoning to solve problems involving indirect measurements or rates.	Unit 4 – Lesson 2: <i>Writing and Solving Proportions</i> pp. 108-110 Unit 4 – Lesson 5: <i>Solving Percent Problems Using a Proportion</i> pp. 117-

	119
8. Find the sum of the interior and exterior angles of regular convex polygons with and without measuring the angles with a protractor.	Unit 6 – Lesson 4: <i>Sum of Angles in Polygons</i> pp. 171-173
9. Demonstrate understanding of the concepts of perimeter, circumference and area by using established formulas for triangles, quadrilaterals, and circles to determine the surface area and volume of prisms, pyramids, cylinders, spheres and cones. (Note: Only volume should be calculated for spheres and cones.)	Unit 7 – Lesson 1: <i>Area of a Trapezoid</i> pp. 190-192 Unit 7 – Lesson 2: <i>Circumference of a Circle</i> pp. 193-195 Unit 7 – Lesson 3: <i>Area of a Circle</i> pp. 196-198 Unit 7 – Lesson 4: <i>Surface Area of a Prism</i> pp. 199-201 Unit 7 – Lesson 5: <i>Surface Area of a Cylinder</i> pp. 202-204 Unit 7 – Lesson 6: <i>Surface Area of a Pyramid and a Cone</i> pp. 205-207 Unit 7 – Lesson 7: <i>Volume of a Prism and a Cylinder</i> pp. 208-210 Unit 7 – Lesson 8: <i>Volume of a Pyramid and a Cone</i> pp. 211-213
10. Use conventional formulas to find the surface area and volume of prisms, pyramids and cylinders and the volume of spheres and cones to a specified level of precision.	Unit 7 – Lesson 4: <i>Surface Area of a Prism</i> pp. 199-201 Unit 7 – Lesson 5: <i>Surface Area of a Cylinder</i> pp. 202-204 Unit 7 – Lesson 6: <i>Surface Area of a Pyramid and a Cone</i> pp. 205-207 Unit 7 – Lesson 7: <i>Volume of a Prism and a Cylinder</i> pp. 208-210 Unit 7 – Lesson 8: <i>Volume of a Pyramid and a Cone</i> pp. 211-213
Geometry and Spatial Sense Standard	
1. Make and test conjectures about characteristics and properties (e.g., sides, angles, symmetry) of two-dimensional figures and three-dimensional objects.	Unit 6 – Lesson 1: <i>Angles</i> pp. 160-163 Unit 6 – Lesson 2: <i>Angles in Parallel Lines Cut by a Transversal</i> pp. 164-166 Unit 6 – Lesson 3: <i>Polygons</i> pp. 167-170

	Unit 6 – Lesson 4: <i>Sum of Angles in Polygons</i> pp. 171-173 Unit 6 – Lesson 5: <i>Congruent Triangles</i> pp. 174-176 Unit 6 – Lesson 6: <i>Similarity and Dilations</i> pp. 177-179 Unit 6 – Lesson 7: <i>Reflections and Translations in the Coordinate Plane</i> pp. 180-183 Unit 6 – Lesson 8: <i>Rotations in the Coordinate Plane</i> pp. 184-187
2. Recognize the angles formed and the relationship between the angles when two lines intersect and when parallel lines are cut by a transversal.	Unit 6 – Lesson 1: <i>Angles</i> pp. 160-163 Unit 6 – Lesson 2: <i>Angles in Parallel Lines Cut by a Transversal</i> pp. 164-166
3. Use proportions in several forms to solve problems involving similar figures (part-to-part, part-to-whole, corresponding sides between figures).	Unit 4 – Lesson 2: <i>Writing and Solving Proportions</i> pp. 108-110
4. Represent and analyze shapes using coordinate geometry; e.g., given three vertices and the type of quadrilateral, find the coordinates of the fourth vertex.	Unit 6 – Lesson 7: <i>Reflections and Translations in the Coordinate Plane</i> pp. 180-183 Unit 6 – Lesson 8: <i>Rotations in the Coordinate Plane</i> pp. 184-186
5. Draw the results of translations, reflections, rotations and dilations of objects in the coordinate plane, and determine properties that remain fixed; e.g., lengths of sides remain the same under translations.	Unit 6 – Lesson 7: <i>Reflections and Translations in the Coordinate Plane</i> pp. 180-183 Unit 6 – Lesson 8: <i>Rotations in the Coordinate Plane</i> pp. 184-186
6. Draw nets for a variety of prisms, pyramids, cylinders and cones.	Level C – Unit 6 – Lesson 7: <i>Solid Figures and Their Nets</i> pp. 120-121
Patterns, Functions and Algebra Standard	
1. Relate the various representations of a relationship; i.e., relate a table to graph, description and symbolic form.	Unit 5 – Lesson 6: <i>Graphing Linear Functions</i> pp. 147-150
2. Generalize patterns and sequences by describing how to find the nth term.	Unit 5 – Lesson 6: <i>Graphing Linear Functions</i> pp. 147-150

3. Identify functions as linear or nonlinear based on information given in a table, graph or equation.	Unit 5 – Lesson 6: <i>Graphing Linear Functions</i> pp. 147-150
4. Extend the uses of variables to include covariants where y depends on x.	Unit 5 – Lesson 6: <i>Graphing Linear Functions</i> pp. 147-150 Unit 5 – Lesson 7: <i>Interpreting Linear Functions</i> pp. 151-153 Unit 5 – Lesson 8: <i>Slope</i> pp. 154-157
5. Use physical models to add and subtract monomials and polynomials, and to multiply a polynomial by a monomial.	Unit 5 – Lesson 5: <i>Two-Variable Equations</i> pp. 144-146
6. Describe the relationship between the graph of a line and its equation, including being able to explain the meaning of slope as a constant rate of change and y-intercept in real-world problems.	Unit 5 – Lesson 8: <i>Slope</i> pp. 154-157
7. Use symbolic algebra (equations and inequalities), graphs and tables to represent situations and solve problems.	Unit 5 – Lesson 1: <i>Solving Two-Step Equations</i> pp. 132-134 Unit 5 – Lesson 2: <i>Solving Multi-Step Equations</i> pp. 135-137 Unit 5 – Lesson 3: <i>Translating and Solving Word Problems</i> pp. 138-140 Unit 5 – Lesson 4: <i>Relations and Functions</i> pp. 141-143 Unit 5 – Lesson 5: <i>Two-Variable Equations</i> pp. 144-146 Unit 5 – Lesson 6: <i>Graphing Linear Functions</i> pp. 147-150 Unit 5 – Lesson 7: <i>Interpreting Linear Functions</i> pp. 151-153
8. Write, simplify and evaluate algebraic expressions (including formulas) to generalize situations and solve problems.	Unit 5 – Lesson 1: <i>Solving Two-Step Equations</i> pp. 132-134 Unit 5 – Lesson 2: <i>Solving Multi-Step Equations</i> pp. 135-137 Unit 5 – Lesson 3: <i>Translating and Solving Word Problems</i> pp. 138-140 Unit 5 – Lesson 4: <i>Relations and Functions</i> pp. 141-143 Unit 5 – Lesson 5: <i>Two-Variable Equations</i> pp. 144-146

	Unit 5 – Lesson 6: <i>Graphing Linear Functions</i> pp. 147-150 Unit 5 – Lesson 7: <i>Interpreting Linear Functions</i> pp. 151-153
9. Solve linear equations and inequalities graphically, symbolically and using technology.	Unit 3 – Lesson 3: <i>Substituting Values for Variables in Equations</i> pp. 81-83 Unit 3 – Lesson 4: <i>Solving Equations Using Addition or Subtraction</i> pp. 84-86 Unit 3 – Lesson 5: <i>Solving Equations Using Multiplication or Division</i> pp. 87-88 Unit 3 – Lesson 6: <i>Solving Inequalities by Addition and Subtraction</i> pp. 90-93 Unit 3 – Lesson 7: <i>Solving Inequalities Using Multiplication and Division</i> pp. 94-97 Unit 5 – Lesson 1: <i>Solving Two-Step Equations</i> pp. 132-134 Unit 5 – Lesson 2: <i>Solving Multi-Step Equations</i> pp. 135-137
10. Solve 2 by 2 systems of linear equations graphically and by simple substitution.	Unit 5 – Lesson 5: <i>Two-Variable Equations</i> pp. 144-146
11. Interpret the meaning of the solution of a 2 by 2 system of equations; i.e., point, line, no solution.	Unit 5 – Lesson 5: <i>Two-Variable Equations</i> pp. 144-146
12. Solve simple quadratic equations graphically; e.g., $y = x^2 - 16$.	Unit 5 – Lesson 5: <i>Two-Variable Equations</i> pp. 144-146
13. Compute and interpret slope, midpoint and distance given a set of ordered pairs.	Unit 5 – Lesson 8: <i>Slope</i> pp. 154-157
14. Differentiate and explain types of changes in mathematical relationships, such as linear vs. nonlinear, continuous vs. noncontinuous, direct variation vs. inverse variation.	Unit 5 – Lesson 4: <i>Relations and Functions</i> pp. 141-143
15. Describe and compare how changes in an equation affects the related graphs; e.g., for a linear equation changing the coefficient of x affects the slope and changing the constant affects the intercepts.	Unit 5 – Lesson 7: <i>Interpreting Linear Functions</i> pp. 151-153 Unit 5 –

	Lesson 8: <i>Slope</i> pp. 154-157
16. Use graphing calculators or computers to analyze change; e.g., interest compounded over time as a nonlinear growth pattern.	Unit 5 – Lesson 7: <i>Interpreting Linear Functions</i> pp. 151-153 Unit 5 – Lesson 8: <i>Slope</i> pp. 154-157
Data Analysis and Probability Standard	
1. Use, create and interpret scatterplots and other types of graphs as appropriate.	Unit 8 – Lesson 4: <i>Scatter Plots</i> pp. 225-228 Unit 8 – Lesson 5: <i>Box-and-Whiskers Plots</i> pp. 229-232 Unit 8 – Lesson 6: <i>Line Graphs</i> pp. 233-236 Unit 8 – Lesson 7: <i>Circle Graphs</i> pp. 237-240 Unit 8 – Lesson 8: <i>Appropriate Graphs</i> pp. 241-243
2. Evaluate different graphical representations of the same data to determine which is the most appropriate representation for an identified purpose; e.g., line graph for change over time, circle graph for part-to-whole comparison, scatterplot for relationship between two variants.	Unit 8 – Lesson 8: <i>Appropriate Graphs</i> pp. 241-243
3. Differentiate between discrete and continuous data and appropriate ways to represent each.	Unit 8 – Lesson 6: <i>Line Graphs</i> pp. 233-236
4. Compare two sets of data using measures of center (mean, mode, median) and measures of spread (range, quartiles, interquartile range, percentiles).	Unit 8 – Lesson 3: <i>Mean, Median, and Mode</i> pp. 222-224
5. Explain the mean's sensitivity to extremes and its use in comparison with the median and mode.	Unit 8 – Lesson 3: <i>Mean, Median, and Mode</i> pp. 222-224
6. Make conjectures about possible relationship in a scatterplot and approximate line of best fit.	Unit 8 – Lesson 4: <i>Scatter Plots</i> pp. 225-228
7. Identify different ways of selecting samples, such as survey response, random sample, representative sample and convenience sample.	Level D – Unit 8 – Lesson 1: <i>Data Handling</i> pp. 144-145
8. Describe how the relative size of a sample compared to the target population affects the validity of predictions.	Unit 8 – Lesson 2: <i>Making Predictions</i> pp. 220-223
9. Construct convincing arguments based on analysis of data and interpretation of graphs.	Unit 8 – Lesson 2: <i>Making Predictions</i> pp. 220-223 Unit 8 –

	Lesson 3: <i>Mean, Median, and Mode</i> pp. 222-224
10. Calculate the number of possible outcomes for a situation, recognizing and accounting for when items may occur more than once or when order is important.	Unit 8 – Lesson 1: <i>Counting Methods</i> pp. 216-218
11. Demonstrate an understanding that the probability of either of two disjoint events occurring can be found by adding the probabilities for each and that the probability of one independent event following another can be found by multiplying the probabilities.	Unit 8 – Lesson 2: <i>Making Predictions</i> pp. 220-223