

Northpoint Horizons

Math Elevations™ (Comprehensive Intervention System)
Correlated to the
Arizona Academic Standards for Mathematics

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

<u>Grade 8 Performance Objectives</u>	<u>Process Integration</u>	<i>Math Elevations</i> Teacher’s Guide Level H (Grade 8) Lesson Examples
Strand 1: Number and Operations		
Concept 1: Number Sense		
PO 1. Compare and order real numbers including very large and small integers, and decimals and fractions close to zero. Connections: M08-S1C3-02	M08-S5C2-01. Analyze a problem situation to determine the question(s) to be answered. M08-S5C2-06. Communicate the answer(s) to the question(s) in a problem using appropriate representations, including symbols and informal and formal mathematical language.	Unit 1 – Lesson 1: <i>Integers and Absolute Value</i> pp. 18-20 Unit 2 – Lesson 8: <i>Scientific Notation</i> pp. 68-70
PO 4. Model and solve problems involving absolute value. Connections: M08-S1C2-05	M08-S5C2-04. Represent a problem situation using multiple representations, describe the process used to solve the problem, and verify the reasonableness of the solution.	Unit 1 – Lesson 1: <i>Integers and Absolute Value</i> pp. 18-20 Lesson 3: <i>Adding Integers Using Absolute Value</i> pp. 24-27
Strand 1: Number and Operations		
Concept 2: Numerical Operations		
PO 1. Solve problems with factors, multiples, divisibility or remainders, prime numbers, and composite numbers.	M08-S5C2-01. Analyze a problem situation to determine the question(s) to be answered.	Unit 2 – Lesson 1: <i>Factors and Prime Factorization</i> pp. 46-48 Unit 2 – Lesson 2: <i>Greatest Common Factor (GCF)</i> pp. 49-51 Unit 2 – Lesson 3: <i>Least Common Multiple (LCM)</i> pp. 52-54
PO 2. Describe the effect of multiplying	M08-S5C2-06. Communicate the	Unit 1 –

and dividing a rational number by a number less than zero, a number between zero and one, one, and a number greater than one.	answer(s) to the question(s) in a problem using appropriate representations, including symbols and informal and formal mathematical language.	Lesson 5: <i>Multiplying Integers</i> pp. 31-33 Unit 1 – Lesson 6: <i>Dividing Integers</i> pp. 34-36 Unit 2 – Lesson 5: <i>Multiplying and Dividing Fractions and Mixed Numbers</i> pp. 58-61
PO 3. Solve problems involving percent increase, percent decrease, and simple interest rates. Connections: M08-S1C3-01, M08-S3C2-05, M08-S3C4-02	M08-S5C2-01. Analyze a problem situation to determine the question(s) to be answered. M08-S5C2-08. Describe when to use proportional reasoning to solve a problem.	Unit 4 – Lesson 4: <i>Fractions, Decimals, and Percents</i> pp. 114-116 Unit 4 – Lesson 5: <i>Solving Percent Problems Using a Proportion</i> pp. 117-119 Unit 4 – Lesson 7: <i>Percent of Change</i> pp. 124-126 Unit 4 – Lesson 8: <i>Percent Applications</i> pp. 127-129
PO 4. Convert standard notation to scientific notation and vice versa (include positive and negative exponents).		Unit 2 – Lesson 8: <i>Scientific Notation</i> pp. 68-70
PO 5. Simplify numerical expressions using the order of operations that include grouping symbols, square roots, cube roots, absolute values, and positive exponents. Connections: M08-S1C1-04		Unit 3 – Lesson 2: <i>Order of Operations</i> pp. 78-80
Strand 2: Data Analysis, Probability, and Discrete Mathematics Concept 1: Data Analysis (Statistics)		
PO 1. Solve problems by selecting, constructing, interpreting, and calculating with displays of data, including box and whisker plots and scatterplots. Connections: M08-S2C1-04, SC08-S1C3-01, SC08-S1C3-03, SC08-S1C4-02, SS08-S1C1-01, SS08-S1C1-02, SS08-S1C1-03, SS08-S2C1-01, SS08-S2C1-02, SS08-S4C1-01, SS08-S4C1-03	M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.	Unit 8 – Lesson 4: <i>Scatter Plots</i> pp. 227-229 Unit 8 – Lesson 5: <i>Box-and-Whiskers Plots</i> pp. 230-233 Unit 8 – Lesson 6: <i>Line Graphs</i> pp. 235-237 Unit 8 – Lesson 7: <i>Circle Graphs</i> pp. 238-240 Unit 8 – Lesson 8: <i>Appropriate Graphs</i> pp. 241-243

<p>PO 2. Make inferences by comparing the same summary statistic for two or more data sets.</p> <p>Connections: M08-S1C3-01, M08-S2C1-03</p>	<p>M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.</p> <p>M08-S5C2-09. Make and test conjectures based on information collected from explorations and experiments.</p>	<p>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</p>
<p>PO 3. Describe how summary statistics relate to the shape of the distribution.</p> <p>Connections: M08-S2C1-02</p>	<p>M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.</p>	<p>Unit 8 – Lesson 8: <i>Appropriate Graphs</i> pp. 241-243</p>
<p>PO 4. Determine whether information is represented effectively and appropriately given a graph or a set of data by identifying sources of bias and compare and contrast the effectiveness of different representations of data.</p> <p>Connections: M08-S2C1-01, SC08-S1C3-04, SC08-S1C3-05, SC08-S2C2-04, SS08-S1C1-02, SS08-S1C1-06, SS08-S2C1-02, SS08-S2C1-06, SS08-S4C1-03</p>	<p>M08-S5C2-06. Communicate the answer(s) to the question(s) in a problem using appropriate representations, including symbols and informal and formal mathematical language.</p>	<p>Unit 8 – Lesson 8: <i>Appropriate Graphs</i> pp. 241-243</p>
<p>PO 5. Evaluate the design of an experiment.</p> <p>Connections: SC08-S1C2-02</p>	<p>M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.</p>	<p>Unit 8 – Lesson 2: <i>Making Predictions</i> pp. 219-221</p>
<p>Strand 2: Data Analysis, Probability, and Discrete Mathematics Concept 2: Probability</p>		
<p>PO 1. Determine theoretical and experimental conditional probabilities in</p>		<p>Unit 8 – Lesson 1: <i>Counting Methods</i> pp. 216-219 Lesson 2: <i>Making Predictions</i> pp. 220-223</p>

compound probability experiments.		
PO 2. Interpret probabilities within a given context and compare the outcome of an experiment to predictions made prior to performing the experiment.	M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.	Unit 8 – Lesson 2: <i>Making Predictions</i> pp. 219-221
PO 3. Use all possible outcomes (sample space) to determine the probability of dependent and independent events.		Unit 8 – Lesson 1: <i>Counting Methods</i> pp. 216-218
Connections: M08-S2C3-01		
Strand 2: Data Analysis, Probability, and Discrete Mathematics		
Concept 3: Systematic Listing and Counting		
PO 1. Represent, analyze, and solve counting problems with or without ordering and repetitions.	M08-S5C2-04. Represent a problem situation using multiple representations, describe the process used to solve the problem, and verify the reasonableness of the solution.	Unit 8 – Lesson 1: <i>Counting Methods</i> pp. 216-218
Connections: M08-S2C2-03		
PO 2. Solve counting problems and represent counting principles algebraically including factorial notation.	M08-S5C2-04. Represent a problem situation using multiple representations, describe the process used to solve the problem, and verify the reasonableness of the solution	Unit 8 – Lesson 1: <i>Counting Methods</i> pp. 216-218
Connections: M08-S1C3-01		
Strand 3: Patterns, Algebra, and Functions		
Concept 1: Patterns		
PO 1. Recognize, describe, create, and analyze numerical and geometric sequences using tables, graphs, words, or symbols; make conjectures about these sequences.	M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.	Unit 5 – Lesson 6: <i>Graphing Linear Functions</i> pp. 147-150
Connections: M08-S3C2-02, M08-S3C2-03, M08-S3C2-05		
Strand 3: Patterns, Algebra, and Functions		
Concept 2: Functions and Relationships		

<p>PO 1. Sketch and interpret a graph that models a given context; describe a context that is modeled by a given graph.</p> <p>Connections: M08-S3C2-04, M08-S3C2-05, M08-S3C3-01, M08-S3C3-04</p>	<p>M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.</p> <p>M08-S5C2-05. Apply a previously used problem-solving strategy in a new context.</p>	<p>Unit 5 – Lesson 4: <i>Relations and Functions</i> pp. 141-143 Lesson 6: <i>Graphing Linear Functions</i> pp. 147-150</p>
<p>PO 2. Determine if a relationship represented by a graph or table is a function.</p> <p>Connections: M08-S3C1-01, M08-S3C2 -05</p>	<p>M08-S5C2-02. Analyze and compare mathematical strategies for efficient problem solving; select and use one or more strategies to solve a problem.</p> <p>M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.</p>	<p>Unit 5 – Lesson 4: <i>Relations and Functions</i> pp. 141-143</p>
<p>PO 3. Write the rule for a simple function using algebraic notation.</p> <p>Connections: M08-S3C1-01, M08-S3C2 -05</p>		<p>Unit 5 – Lesson 4: <i>Relations and Functions</i> pp. 141-143</p>
<p>PO 4. Identify functions as linear or nonlinear and contrast distinguishing properties of functions using equations, graphs, or tables.</p> <p>Connections: M08-S3C2-01</p>	<p>M08-S5C2-03. Identify relevant, missing, and extraneous information related to the solution to a problem.</p> <p>M08-S5C2-12. Make, validate, and justify conclusions and generalizations about linear relationships.</p>	<p>Unit 5 – Lesson 4: <i>Relations and Functions</i> pp. 141-143</p>
<p>PO 5. Demonstrate that proportional relationships are linear using equations, graphs, or tables.</p> <p>Connections: M08-S1C2-03, M08-S3C1-01, M08-S3C2-01, M08-S3C2-02, M08-S3C2-03, M08-S3C3-03, M08-S3C3-04,</p>	<p>M08-S5C2-08. Describe when to use proportional reasoning to solve a problem.</p> <p>M08-S5C2-12. Make, validate, and justify conclusions and generalizations about linear relationships.</p>	<p>Unit 4 – Lesson 2: <i>Writing and Solving Proportions</i> pp. 108-110</p>

M08-S3C4-01, M08-S3C4-02, M08-S5C1-01		
Strand 3: Patterns, Algebra, and Functions Concept 3: Algebraic Representations		
<p>PO 1. Write or identify algebraic expressions, equations, or inequalities that represent a situation.</p> <p>Connections: M08-S3C2-01</p>	<p>M08-S5C2-04. Represent a problem situation using multiple representations, describe the process used to solve the problem, and verify the reasonableness of the solution.</p>	<p>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 Unit 5 – Lesson 3: <i>Translating and Solving Word Problems</i> pp. 138-140 Unit 5 – Lesson 5: <i>Two-Variable Equations</i> pp. 144-146</p>
<p>PO 2. Evaluate an expression containing variables by substituting rational numbers for the variables.</p> <p>Connections: M08-S1C3-01</p>		<p>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. 87-89</p>

		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 Unit 5 – Lesson 3: <i>Translating and Solving Word Problems</i> pp. 138-140 Unit 5 – Lesson 5: <i>Two-Variable Equations</i> pp. 144-146
PO 3. Analyze situations, simplify, and solve problems involving linear equations and inequalities using the properties of the real number system. Connections: M08-S3C2-05	M08-S5C2-02. Analyze and compare mathematical strategies for efficient problem solving; select and use one or more strategies to solve a problem.	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 5: <i>Two-Variable Equations</i> pp. 144-146
PO 4. Translate between different representations of linear equations using symbols, graphs, tables, or written descriptions. Connections: M08-S3C2-01, M08-S3C2-05	M08-S5C2-04. Represent a problem situation using multiple representations, describe the process used to solve the problem, and verify the reasonableness of the solution.	Unit 5 – Lesson 6: <i>Graphing Linear Functions</i> pp. 147-150
PO 5. Graph an inequality on a number		Unit 3 –

line.		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
Strand 3: Patterns, Algebra, and Functions Concept 4: Analysis of Change		
PO 1. Interpret the relationship between a linear equation and its graph, identifying and computing slope and intercepts. Connections: M08-S3C2-05	M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning. M08-S5C2-12. Make, validate, and justify conclusions and generalizations about linear relationships.	Unit 5 – Lesson 8: <i>Slope</i> pp. 154-157
PO 2. Solve problems involving simple rates. Connections: M08-S1C2-03, M08-S1C3-01, M08-S3C2-05	M08-S5C2-08. Describe when to use proportional reasoning to solve a problem.	Unit 4 – Lesson 1: <i>Rates</i> pp. 104-107
Strand 4: Geometry and Measurement Concept 1: Geometric Properties		
PO 1. Identify the attributes of circles: radius, diameter, chords, tangents, secants, inscribed angles, central angles, intercepted arcs, circumference, and area.	M08-S5C2-11. Identify simple valid arguments using <i>if... then</i> statements.	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
PO 3. Use proportional reasoning to determine congruence and similarity of triangles. Connections: M08-S4C4-02	M08-S5C2-08. Describe when to use proportional reasoning to solve a problem. M08-S5C2-13. Verify the Pythagorean Theorem using a valid argument.	Unit 6 – Lesson 5: <i>Congruent Triangles</i> pp. 174-176 Unit 6 – Lesson 6: <i>Similarity and Dilations</i> pp. 177-179
PO 4. Use the Pythagorean Theorem to	M08-S5C2-02. Analyze and compare	Unit 3 –

<p>solve problems.</p> <p>Connections: M08-S4C3-02, M08-S5C2-13</p>	<p>mathematical strategies for efficient problem solving; select and use one or more strategies to solve a problem.</p> <p>M08-S5C2-06. Communicate the answer(s) to the question(s) in a problem using appropriate representations, including symbols and informal and formal mathematical language.</p>	<p>Lesson 8: <i>Pythagorean Theorem</i> pp. 98-101</p>
<p>Strand 4: Geometry and Measurement Concept 2: Transformation of Shapes</p>		
<p>PO 1. Model the result of rotations in multiples of 45 degrees of a 2-dimensional figure about the origin.</p>	<p>M08-S5C2-02. Analyze and compare mathematical strategies for efficient problem solving; select and use one or more strategies to solve a problem.</p> <p>M08-S5C2-05. Apply a previously used problem-solving strategy in a new context.</p>	<p>Unit 6 – Lesson 8: <i>Rotations in the Coordinate Plane</i> pp. 184-186</p>
<p>Strand 4: Geometry and Measurement Concept 4: Measurement</p>		
<p>PO 2. Solve geometric problems using ratios and proportions.</p> <p>Connections: M08-S4C1-03, M08-S5C2-13</p>	<p>M08-S5C2-08. Describe when to use proportional reasoning to solve a problem.</p>	<p>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</p>
<p>PO 3. Calculate the surface area and volume of rectangular prisms, right triangular prisms, and cylinders.</p>		<p>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 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</p>
<p>Strand 5: Structure and Logic Concept 1: Algorithms and Algorithmic Thinking</p>		

<p>PO 1. Create an algorithm to solve problems involving indirect measurements, using proportional reasoning, dimensional analysis, and the concepts of density and rate.</p> <p>Connections: M08-S1C3-01, M08-S3C2-05, M08-S4C4-01</p>	<p>M08-S5C2-05. Apply a previously used problem-solving strategy in a new context.</p> <p>M08-S5C2-08. Describe when to use proportional reasoning to solve a problem.</p>	<p>Unit 4 – Lesson 2: <i>Writing and Solving Proportions</i> pp. 108-110</p>
<p>Strand 5: Structure and Logic Concept 2: Logic, Reasoning, Problem Solving, and Proof</p>		
<p>PO 1. Analyze a problem situation to determine the question(s) to be answered.</p>		<p>Unit 5 – Lesson 3: <i>Translating and Solving Word Problems</i> pp. 138-140</p>
<p>PO 2. Analyze and compare mathematical strategies for efficient problem solving; select and use one or more strategies to solve a problem.</p>		<p>Unit 5 – Lesson 3: <i>Translating and Solving Word Problems</i> pp. 138-140</p>
<p>PO 3. Identify relevant, missing, and extraneous information related to the solution to a problem.</p>		<p>Unit 5 – Lesson 3: <i>Translating and Solving Word Problems</i> pp. 138-140</p>
<p>PO 4. Represent a problem situation using multiple representations, describe the process used to solve the problem, and verify the reasonableness of the solution.</p>		<p>Unit 8 – Lesson 8: <i>Appropriate Graphs</i> pp. 241-243</p>
<p>PO 5. Apply a previously used problem-solving strategy in a new context.</p>		<p>Unit 5 – Lesson 3: <i>Translating and Solving Word Problems</i> pp. 138-140</p>
<p>PO 6. Communicate the answer(s) to the question(s) in a problem using appropriate representations, including symbols and informal and formal mathematical language.</p>		<p>Unit 8 – Lesson 8: <i>Appropriate Graphs</i> pp. 241-243</p>
<p>PO 7. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences,</p>		<p>Unit 8 – Lesson 4: <i>Scatter Plots</i> pp. 227-229 Unit 8 –</p>

draw conclusions, and justify reasoning.		Lesson 5: <i>Box-and-Whiskers Plots</i> pp. 230-233 Unit 8 – Lesson 6: <i>Line Graphs</i> pp. 234-237 Unit 8 – Lesson 7: <i>Circle Graphs</i> pp. 238-240 Unit 8 – Lesson 8: <i>Appropriate Graphs</i> pp. 241-243
PO 8. Describe when to use proportional reasoning to solve a problem.		Unit 4 – Lesson 2: <i>Writing and Solving Proportions</i> pp. 108-110
PO 9. Make and test conjectures based on information collected from explorations and experiments.		Unit 8 – Lesson 2: <i>Making Predictions</i> pp. 220-223
PO 10. Solve logic problems involving multiple variables, conditional statements, conjectures, and negation using words, charts, and pictures.	M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning. M08-S5C2-09. Make and test conjectures based on information collected from explorations and experiments.	Unit 3 – Lesson 3: <i>Substituting Values for Variables in Equations</i> pp. 81-83
PO 11. Identify simple valid arguments using <i>if... then</i> statements.	M08-S5C2-03. Identify relevant, missing, and extraneous information related to the solution to a problem.	Unit 8 – Lesson 2: <i>Making Predictions</i> pp. 220-223
PO 12. Make, validate, and justify conclusions and generalizations about linear relationships.	M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.	Unit 5 – Lesson 6: <i>Graphing Linear Functions</i> pp. 147-150 Unit 5 – Lesson 7: <i>Interpreting Linear Functions</i> pp. 151-153
PO 13. Verify the Pythagorean Theorem using a valid argument. Connections: M08-S4C1-04, M08-S4C3-02	M08-S5C2-07. Isolate and organize mathematical information taken from symbols, diagrams, and graphs to make inferences, draw conclusions, and justify reasoning.	Unit 3 – Lesson 8: <i>Pythagorean Theorem</i> pp. 98-101

	M08-S5C2-09. Make and test conjectures based on information collected from explorations and experiments.	
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