

## Correlation of the Understanding Math 2008© Programs With the Ohio's Academic Content Standards for Mathematics Grade Ten

The programs are designed for use in a variety of teaching and learning environments ranging from a teacher-centered approach with one computer to a student-centered lab approach. The lessons may also be used in remediation, tutorials, intervention, resource, and fast-tracking.

### Organization of the Understanding Math 2008© Programs

The Understanding Math 2008© series of programs consists of the following nine programs written for fourth to tenth grade:

Understanding Whole Numbers and Integers  
Understanding Measurement and Geometry  
Understanding Fractions  
Understanding Graphing  
Understanding Percent

Understanding Equations  
Understanding Probability  
Understanding Algebra  
Understanding Exponents

Each program contains several sections with several topics. Every topic has the following:

- 1) an interactive concept introduction, usually with a variety of graphic approaches;
- 2) a number of particular examples;
- 3) practice questions with random questions, but specific feedback;
- 4) a topic test with random questions and tracking;
- 5) on-line worksheets selected from our website ([www.neufeldmath.com](http://www.neufeldmath.com)).

Teachers may also search for specific topics using our search engine at <http://www.corr.neufeldmath.com>.

The Academic Content Standards have been correlated to the Understanding Math 2008©. The location of each standard is listed below:

<b>Number, Number Sense and Operations Standard</b>	
Number and Number Systems	(pages 3 - 3)
Meaning of Operations	(pages 3 - 3)
Computation and Estimation	(pages 3 - 3)
<b>Measurement Standard</b>	
Use Measurement Techniques and Tools	(pages 4 - 4)
<b>Geometry and Spatial Sense Standard</b>	
Characteristics and Properties	(pages 5 - 8)
Spatial Relationships	(pages 8 - 8)
Transformation and Symmetry	(pages 8 - 9)
Visualization and Geometric Models	(pages 9 - 9)
<b>Patterns, Functions and Algebra Standard</b>	
Use Patterns, Relations and Functions	(pages 10 - 10)
Use Algebraic Representations	(pages 10 - 14)
Analyze Change	(pages 14 - 14)
<b>Data Analysis and Probability Standard</b>	
Data Collection	(pages 15 - 16)
Statistical Methods	(pages 16 - 16)
Probability	(pages 16 - 18)

Standards that are ***not included*** in the current Understanding Math 2008© programs are noted as *not yet correlated*.

For lesson planning purposes, there is space in the chart for notes, material lists, links, resources etc.



**Ohio's Academic Content Standards for Mathematics  
Correlated to Understanding Math 2008 ©  
Grade Ten**

**Grade Ten... Number, Number Sense and Operations Standard**

**Number and Number Systems**

1. Connect physical, verbal and symbolic representations of irrational numbers; e.g., construct  $\sqrt{2}$  as a hypotenuse or on a number line.

Not yet correlated

**Meaning of Operations**

2. Explain the meaning of the nth root.

Not yet correlated

**Computation and Estimation**

3. Use factorial notation and computations to represent and solve problem situations involving arrangements.

Not yet correlated

4. Approximate the nth root of a given number greater than zero between consecutive integers when n is an integer; e.g., the 4th root of 50 is between 2 and 3.

Not yet correlated



## Grade Ten... Measurement Standard

### Use Measurement Techniques and Tools

1. Explain how a small error in measurement may lead to a large error in calculated results.

Not yet correlated

2. Calculate relative error.

Not yet correlated

3. Explain the difference between absolute error and relative error in measurement.

Not yet correlated

4. Give examples of how the same absolute error can be problematic in one situation but not in another; e.g., compare “accurate to the nearest foot” when measuring the height of a person versus when measuring the height of a mountain.

Not yet correlated

5. Determine the measures of central and inscribed angles and their associated major and minor arcs.

Not yet correlated



## Grade Ten... Geometry and Spatial Sense Standard

### Characteristics and Properties

1. Formally define and explain key aspects of geometric figures, including: a. interior and exterior angles of polygons;

#### Understanding Measurement and Geometry 2008

##### Section 2: Perimeter and Area of Polygons

Polygons... What are They?

Concept

A Triangle is

A Quadrilateral is

A Pentagon is

A Hexagon is

An Octagon is

Classify Polygons

Classify Polygons with Venn Diagrams

Notes

#### Understanding Measurement and Geometry 2008

##### Section 6: Angles and Polygons

In This Topic

Parallel Lines

Examples with Parallel Lines

Example 1

Example 2

Angles in Triangles

Exploration

An Explanation

Exterior Angles

Example

Angles in Polygons

Method 1

Method 2

Exterior Angles in a Polygon

Practice Questions

5 questions (randomly generated)

Topic Test

10 questions (randomly generated)

Notes

1. Formally define and explain key aspects of geometric figures, including: b. segments related to triangles (median, altitude, midsegment);

[Not yet correlated](#)



1. Formally define and explain key aspects of geometric figures, including: c. points of concurrency related to triangles (centroid, incenter, orthocenter, circumcenter);

**Understanding Measurement and Geometry 2008**

**Notes**

**Section 7: Constructions**

Centroid of a Triangle	Construction Steps Summary
Orthocenter	Construction Steps Summary

1. Formally define and explain key aspects of geometric figures, including: d. circles (radius, diameter, chord, circumference, major arc, minor arc, sector, segment, inscribed angle).

**Understanding Measurement and Geometry 2008**

**Notes**

**Section 3: Circles**

Radius, Circumference, Diameter	
PI... A Special Number	Introduction How do we Measure Circumference? Measuring Circles Summary
Circumference of a Circle	Circumference of a Circle Ex. 1 - Ogg Ex. 2 - The Well Ex. 3 - The Rolling Coin Ex. 4 - The Semi-Circle

2. Recognize and explain the necessity for certain terms to remain undefined, such as point, line and plane.

Not yet correlated

3. Make, test and establish the validity of conjectures about geometric properties and relationships using counterexample, inductive and deductive reasoning, and paragraph or two-column proof, including: a. prove the Pythagorean Theorem;

**Understanding Exponents 2008**

**Notes**

**Section 6: Pythagorean Theorem**

Squares on the Sides of a Right Triangle	Triangle #1 Triangle #2 Triangle #3
The Pythagorean Theorem	The Pattern In General Theorem



3. Make, test and establish the validity of conjectures about geometric properties and relationships using counterexample, inductive and deductive reasoning, and paragraph or two-column proof, including: b. prove theorems involving triangle similarity and congruence;

Not yet correlated

3. Make, test and establish the validity of conjectures about geometric properties and relationships using counterexample, inductive and deductive reasoning, and paragraph or two-column proof, including: c. prove theorems involving properties of lines, angles, triangles and quadrilaterals;

**Understanding Measurement and Geometry 2008**

**Notes**

**Section 5: Angles and Their Measure**

Lines and Rays	
Angles... An Introduction	
The Degree	
Classify Angles	Classification
	Memory Game
Measuring Angles	
Estimating Angle Measure	10 questions (randomly generated)
Practice Questions	5 questions (randomly generated)
Topic Test	5 questions (randomly generated)

**Understanding Measurement and Geometry 2008**

**Notes**

**Section 6: Angles and Polygons**

Angles in Triangles	Exploration
	An Explanation
	Exterior Angles
	Example

3. Make, test and establish the validity of conjectures about geometric properties and relationships using counterexample, inductive and deductive reasoning, and paragraph or two-column proof, including: d. test a conjecture using basic constructions made with a compass and straightedge or technology.

**Understanding Measurement and Geometry 2008**

**Notes**

**Section 7: Constructions**

Before You Begin	
In This Topic	
Perpendicular Bisector	Construction Steps
	Summary
Circumcircle of a Triangle	Construction Steps
	Summary
Centroid of a Triangle	Construction Steps
	Summary
Bisector of an Angle	Construction Steps
	Summary
Incircle	Construction Steps



Perpendicular to a Point on the Line	Summary Construction Steps
Perpendicular to a Point Off the Line	Summary Construction Steps
Orthocenter	Summary Construction Steps
Draw a Line Parallel to Another Line Lesson	Summary

## Spatial Relationships

4. Construct right triangles, equilateral triangles, parallelograms, trapezoids, rectangles, rhombuses, squares and kites, using compass and straightedge or dynamic geometry software.

[Not yet correlated](#)

5. Construct congruent figures and similar figures using tools, such as compass, straightedge, and protractor or dynamic geometry software.

[Not yet correlated](#)

## Transformation and Symmetry

6. Identify the reflection and rotation symmetries of two- and three-dimensional figures.

### Understanding Graphing 2008

#### Section 4: Transformations

Reflections - An Introduction	Flip #1 Flip #2 Flip #3
Rotation - An Introduction	Turn #1 Turn #2 Turn #3 Turn #4 Turn #5

**Notes**



Reflections	Object to Image We Say, We Write Reflection Mapping Rule Examples- Example 1 Examples- Example 2
Rotations	Object to Image We Say, We Write Rotation Mapping Rule Examples- Example 1 Examples- Example 2

7. Perform reflections and rotations using compass and straightedge constructions and dynamic geometry software.

[Not yet correlated](#)

8. Derive coordinate rules for translations, reflections and rotations of geometric figures in the coordinate plane.

[Not yet correlated](#)

9. Show and describe the results of combinations of translations, reflections and rotations (compositions); e.g., perform compositions and specify the result of a composition as the outcome of a single motion, when applicable.

**Understanding Graphing 2008**

**Notes**

**Section 4: Transformations**

Transformation Machine

- Example 1
- Example 2
- Example 3
- Example 4
- Example 5
- An Introduction

Lines of Symmetry

**Visualization and Geometric Models**

10. Solve problems involving chords, radii and arcs within the same circle.

[Not yet correlated](#)



## Grade Ten... Patterns, Functions and Algebra Standard

### Use Patterns, Relations and Functions

1. Define function formally and with  $f(x)$  notation.

#### Understanding Graphing 2008

##### Section 5 : Relations, Equations and Functions

Functions

What is a Function?

Example 1

Example 2

Example 3

Function Notation

Example 1

Example 2

Notes

2. Describe and compare characteristics of the following families of functions: square root, cubic, absolute value and basic trigonometric functions; e.g., general shape, possible number of roots, domain and range.

[Not yet correlated](#)

### Use Algebraic Representations

3. Solve equations and formulas for a specified variable; e.g., express the base of a triangle in terms of the area and height.

#### Understanding Equations 2008

##### Section 4: Solving Multi-Step Equations

Literal Equations

What Are They?

How Do You Solve Them?

Why Solve the Literal Equation?

A Perimeter Example

Notes

4. Use algebraic representations and functions to describe and generalize geometric properties and relationships.

[Not yet correlated](#)



5. Solve simple linear and nonlinear equations and inequalities having square roots as coefficients and solutions.		
Not yet correlated		
6. Solve equations and inequalities having rational expressions as coefficients and solutions.		
<b>Understanding Equations 2008</b> <b>Section 4: Solving Multi-Step Equations</b> Concept - Examples without Tiles	Example 4 Example 5	Notes
<b>Understanding Equations 2008</b> <b>Section 7: Solving Inequalities</b> Solving Inequalities	Example 2 Example 6	Notes
7. Solve systems of linear inequalities.		
<b>Understanding Equations 2008</b> <b>Section 7: Solving Inequalities</b> Solving Systems of Linear Inequalities by Graphing	Example 1 Example 2	Notes
8. Graph the quadratic relationship that defines circles.		
Not yet correlated		
9. Recognize and explain that the slopes of parallel lines are equal and the slopes of perpendicular lines are negative reciprocals.		
<b>Understanding Graphing 2008</b> <b>Section 7: Slope of a Line</b> Formula		Notes
Parallel Lines	Introduction Example 1 Example 2 Example 3	
Perpendicular Lines	Introduction Example 1 Example 2	



Slope of Parallel Lines	Example 3 Example 1 Example 2	<b>Notes</b>
Slope of Perpendicular Lines	Example 3 Example 1 Example 2 Example 3 Pattern	
<b>Understanding Graphing 2008</b> <b>Section 8: Equation of a Straight Line</b> Parallel and Perpendicular Lines		<b>Notes</b>
	Concept 1 Concept 2 Example 1 Example 2 Example 3 Example 4	
10. Solve real-world problems that can be modeled using linear, quadratic, exponential or square root functions.		
<b>Understanding Graphing 2008</b> <b>Section 6: Linear Relations</b>		<b>Notes</b>
The Taxi Example	Setup Equations Graph Equations	
The Elastic Example	Setup Equations Graph	
Lightning Example	Setup Equations Graph	
Baseball Example	Setup Equations Graph	
<b>Understanding Graphing 2008</b> <b>Section 8: Equation of a Straight Line</b> Word Problems-Applications		<b>Notes</b>
	The Taxi - Case 1- Task 1: Find the Equation The Taxi - Case 1- Task 2: Graph the Equation The Taxi - Case 1- Task 3: Interpret the Equation The Taxi - Case 2- Task 1: Find the Equation The Taxi - Case 2- Task 2: Graph the Equation The Taxi - Case 2- Task 3: Interpret the Equation The Taxi - Summary The Walker The Basketball Food	



<p><b>Understanding Graphing 2008</b>  <b>Section 9: Quadratic Function</b>  Maximize Cage Area   Maximize Potato Income   Bob's Beach ball   Hit the Brakes</p>	<p>By Trial and Error  Use Quadratic Function  Graph  Conclusions  Summary  By Trial and Error  By Quadratic Function  By Quadratic Function: Graph  By Quadratic Function: Summary  Find Maximum Height  Graph Equation  Summary  Derive Equation  Graph Equation  Summary</p>	<p><b>Notes</b></p>
<p><b>Understanding Percent 2008</b>  <b>Section 7: Percent in Business</b>  Compound Interest</p>	<p>Formula  Car Depreciation  Mortgage</p>	<p><b>Notes</b></p>
<p><b>Understanding Exponents 2008</b>  <b>Section 3: Exponent Rules</b>  A Power with a NEGATIVE Exponent</p>	<p>Method - Bacteria Doubling</p>	<p><b>Notes</b></p>
<p><b>Understanding Exponents 2008</b>  <b>Section 5 : Square Root</b>  Example Questions</p>	<p>3. Lawn Questions</p>	<p><b>Notes</b></p>
<p>11. Solve real-world problems that can be modeled, using systems of linear equations and inequalities.</p>		
<p><b>Understanding Equations 2008</b>  <b>Section 6: Solving Linear Systems</b>  About This Topic  The Meaning of a Linear System  The Meaning of Solving a Linear System  Solving a Linear System by Graphing</p>	<p>Example 1: Intersecting Lines  Example 2: Intersecting Lines  Example 3: Intersecting Lines Involving Fractions  Example 4: Intersecting Lines Involving Fractions</p>	<p><b>Notes</b></p>



Solving a Linear System by Substitution	<p>Example 5: Parallel Lines            Example 6: Coincidental Lines            Example 1: Intersecting Lines            Example 2: Intersecting Lines            Example 3: Intersecting Lines Involving Fractions            Example 4: Intersecting Lines Involving Fractions</p>
Solving a Linear System by Elimination	<p>Example 5: Parallel Lines            Example 6: Coincidental Lines            Example 1: Intersecting Lines            Example 2: Intersecting Lines            Example 3: Intersecting Lines Involving Fractions            Example 4: Intersecting Lines Involving Fractions</p>
Solving a Linear System by Comparison	<p>Example 5: Parallel Lines            Example 6: Coincidental Lines            Example 1: Intersecting Lines            Example 2: Intersecting Lines            Example 3: Intersecting Lines Involving Fractions            Example 4: Intersecting Lines Involving Fractions</p>
Solving Problems Using Linear Systems	<p>Example 5: Parallel Lines            Example 6: Coincidental Lines            Example 1- Beginning of Question            Example 1- Draw Graph            Example 2- Beginning of Question            Example 2- Draw Graph</p>
Practice Questions	10 questions (randomly generated)
Topic Test	10 questions (randomly generated)
<b>Understanding Equations 2008</b>	
<b>Section 7: Solving Inequalities</b>	
Solving Systems of Linear Inequalities by Graphing	
	Example 1
	Example 2
<b>Analyze Change</b>	
12. Describe the relationship between slope of a line through the origin and the tangent function of the angle created by the line and the positive x-axis.	
<a href="#">Not yet correlated</a>	

**Notes**



## Grade Ten... Data Analysis and Probability Standard

### Data Collection

1. Describe measures of center and the range verbally, graphically and algebraically.

#### Understanding Graphing 2008

##### Section 2: Statistics

Measures of Central Tendency

Introduction  
The Mean Average  
The Median Average  
The Mode  
Summary  
Another Example  
Adding Data Points

Notes

2. Represent and analyze bivariate data using appropriate graphical displays (scatterplots, parallel box-and-whisker plots, histograms with more than one set of data, tables, charts, spreadsheets) with and without technology.

#### Understanding Graphing 2008

##### Section 2: Statistics

Presenting Data

Stem and Leaf Diagram- Example 1... Age of Fans  
Stem and Leaf Diagram- Example 2... Height of Students  
Bar Graph- Example 1... Energy  
Bar Graph- Example 2... Lengths of Rivers  
Histogram- Example 1... Height of Students  
Histogram- Example 2... Roll of Die  
Line Graph- Example 1... Life Expectancy  
Line Graph- Example 2... Software Profits  
Circle or Pie Graphs- Example 1... The Radio Station  
Circle or Pie Graphs- Example 2... Heath Survey  
Scatter Plot- Example 1... The T-Shirt Tailor  
Scatter Plot- Example 2... Matching

Notes

3. Display bivariate data where at least one variable is categorical.

Not yet correlated



4. Identify outliers on a data display; e.g., use interquartile range to identify outliers on a box-and-whisker plot.		<b>Notes</b>
<b>Understanding Graphing 2008</b> <b>Section 2: Statistics</b> Box and Whisker Plot	Concepts Example 1: Math Marks Example 2: Income in 1998	
<b>Statistical Methods</b>		
5. Provide examples and explain how a statistic may or may not be an attribute of the entire population; e.g., intentional or unintentional bias may be present.		
Not yet correlated		
6. Interpret the relationship between two variables using multiple graphical displays and statistical measures; e.g., scatterplots, parallel box-and-whisker plots, and measures of center and spread.		
<b>Understanding Graphing 2008</b> <b>Section 2: Statistics</b> Presenting Data	Stem and Leaf Diagram- Example 2... Height of Students Histogram- Example 1... Height of Students	<b>Notes</b>
<b>Probability</b>		
7. Model problems dealing with uncertainty with area models (geometric probability).		
<b>Understanding Probability 2008</b> <b>Section 5: Geometric Probabilities</b> In This Topic Introduction The Parachutist Dartboard	Instructions Your Experiment	<b>Notes</b>





Patterns and Summary	3. Letter Tiles 1. Summary 2. Spinner 3. Cards	
Practice Questions	5 questions (randomly generated)	
Topic Test	5 questions (randomly generated)	
<b>Understanding Probability 2008</b>		<b>Notes</b>
<b>Section 8: Dependent Events</b>		
In This Topic		
What Are They?	Independent Events Dependent Events	
Examples	1. Keep the First Marble 2. Choose the Flowers	
Probability	1. Keep the First Ball 2. Keep the First Tile 3. Keep the First Flower	
Patterns and Summary	1. Summary 2. Money 3. Socks 4. Names	
Practice Questions	5 questions (randomly generated)	
Topic Test	5 questions (randomly generated)	

