Correlation of the Understanding Math 2008© Programs
With Mathematics Standards of Learning for Virginia Public Schools
Grade 8

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:

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).

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

The curriculum expectations for each Unit per term have been correlated to the Understanding Math 2008© programs. The location of each week is listed below:

Grade 8

Curriculum expectations 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.

Mathematics Standards of Learning for Virginia Public Schools
Correlated to Understanding Math 2008©
Grade 8

Number and Number Sense - Focus: Relationships within the Real Number System

8.1 The student will

a) simplify numerical expressions involving positive exponents, using rational numbers, order of operations, and properties of operations with real numbers; and

Understanding Exponents 2008 **Notes**

Section 3: Exponent Rules

In The Topic

Multiplication of Powers with the Same Base	Expanding the Exponents
	The Pattern
	In General
Division of Powers with the Same Base	Expanding the Exponents
	The Pattern
	In General
Raising a Power to an Exponent	Expanding the Exponents
	The Pattern
	In General
Raising a Product to an Exponent	Expand the Exponent
	In General
A Power with Exponent 0	Explanation with b
	Explanation with a
	Summary
Summary of Exponent Rules	
Powers with Rational Bases	Example 1
	Example 2
	Example 3
	In General
Example Questions	Example 1
	Example 2
	Example 6
	Example 9
	Example 10
	Example 11

b) compare and order decimals, fractions, percents, and numbers written in scientific notation.

Understanding Exponents 2008 **Notes**

Section 4: Scientific Notation

Why Use Scientific Notation?

Scientific Notation for Large Numbers	Introduction
	Chart
	The Rule
	The Steps
Scientific Notation for Small Numbers	Introduction
	Chart
	Steps
Examples	Number Question
	Park Question
	Sun Question
	Kitchen Question
Practice Questions	5 questions (randomly generated)

8.2 The student will

describe orally and in writing the relationships between the subsets of the real number system.

Understanding Whole Numbers and Integers 2008 **Notes**

Section 4: The Meaning of Integers

Integer Line

Computation and Estimation - Focus: Practical Applications of Operations with Real Numbers

8.3 The student will

a) solve practical problems involving rational numbers, percents, ratios, and proportions; and

Understanding Fractions 2008 **Notes**

Section 7: Ratios and Proportions

Proportions	Example 1
	Example 2 - Lemonade
	Example 3 - Marbles
	Example 4 - Trout
	Example 5 -Tree Height
	Example 6 - Map
	Example 7 - Scale Drawing

Understanding Fractions 2008 **Notes**

Section 8: Adding Fractions

Word Problems	Alexander's Friend
	Eating Candy
	Goal Scoring
	Taking a Walk

Understanding Fractions 2008 **Notes**

Section 9: Subtracting Fractions

Word Problems	Pedro and Alex's Race
	Washing the Cars
	Planting a Garden

Understanding Fractions 2008 **Notes**

Section 10: Multiplying Fractions

Word Problems	Boris' Money
	Maria's Trip

Understanding Percent 2008 **Notes**

Section 6: Problems Involving Percent

In This Topic	
Steps in Solving Problems	
Finding The Whole	Recall Proportionals
	School Population: Method 1... Using Proportions
	School Population: Method 2
	Grades Problem: Method 1... Using Proportions
	Grades Problem: Method 2
	Bike Sale: Method 1... Using Proportions
	Bike Sale: Method 2

Finding The Percent	Theatre Example
	Car Example
Percent of a Number	Earnings Example
	Nickel Ore Example
Percent Greater than 100%	Number Example
	Order Example
Percent Less than 1%	Number Example
	Pencil Example
Mental Calculation	Number Example
	Typing Example
Percent Change	Interest Example
	Tree Example
	Percent Markup Example
Practice Questions	10 questions (randomly generated)

b) determine the percent increase or decrease for a given situation.

Understanding Percent 2008 **Notes**

Section 6: Problems Involving Percent

Percent Change	Interest Example
	Tree Example
	Percent Markup Example

8.4 The student will

apply the order of operations to evaluate algebraic expressions for given replacement values of the variables.

Understanding Algebra 2008 **Notes**

Section 4: Patterns, Formulas, Substitution

Expressions, Terms, Variables	Summary
Substitution is... Math Scrabble 1	Scrabble 1
	Scrabble 2
	Scrabble 3
	Challenge
Substitution... Examples	Example 1: Evaluation
	Example 2: Area Formulas
	Example 3: Volume Formulas
	Example 4: Hit The Ball

8.5 The student will

a) determine whether a given number is a perfect square; and

Understanding Exponents 2008 **Notes**

Section 5 : Square Root

Squaring Numbers — Examples 1, Examples 2

Square Roots

Radical Signs

b) find the two consecutive whole numbers between which a square root lies.

Understanding Exponents 2008 **Notes**

Section 5 : Square Root

Estimating Square Roots — Example 1, Example 2

Estimating Square Roots on the Number Line

Measurement - Focus: Problem Solving

8.6 The student will

a) verify by measuring and describe the relationships among vertical angles, adjacent angles, supplementary angles, and complementary angles; and

Understanding Measurement and Geometry 2008		**Notes**
Section 5: Angles and Their Measure		
In This Topic		
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)	

b) measure angles of less than 360°.

Understanding Measurement and Geometry 2008		**Notes**
Section 5: Angles and Their Measure		
Measuring Angles		
Estimating Angle Measure	10 questions (randomly generated)	

8.7 The student will

a) investigate and solve practical problems involving volume and surface area of prisms, cylinders, cones, and pyramids; and

Understanding Measurement and Geometry 2008		**Notes**
Section 4: Solids.. Volume and Surface Area		
Classifying Solids	A Prism is…	
	Some Special Prisms	
	A Pyramid is…	
	Some Special Pyramids	
	A Cylinder is…	
	A Cone is…	
	Platonic Solids	
Surface Area of a Solid	Concept	
	Surface Area of a Pyramid	
	Surface Area of a Cylinder	

Volume of a Solid	Concept Volume of a Prism: Example 1 Volume of a Prism: Example 2 Volume of a Cylinder Volume of a Pyramid Volume of a Cone

b) describe how changing one measured attribute of a figure affects the volume and surface area.

Understanding Measurement and Geometry 2008 **Notes**

Section 4: Solids.. Volume and Surface Area

Summary

Geometry - Focus: Problem Solving with 2- and 3-Dimensional Figures

8.8 The student will

a) apply transformations to plane figures; and

Understanding Graphing 2008 **Notes**

Section 4: Transformations

In This Topic

What is a Transformation?

Introduction to Common Transformations

Translations - An Introduction	Slide #1
	Slide #2
	Slide #3
	Slide #4
Reflections - An Introduction	Flip #1
	Flip #2
	Flip #3
Rotation - An Introduction	Turn #1
	Turn #2
	Turn #3
	Turn #4
	Turn #5
Transformation Machine	Example 1
	Example 2
	Example 3
	Example 4
	Example 5
Tessellations	Introductions
	Examples- Example 1
	Examples- Example 2
	Examples- Example 3
	Examples- Example 4
	Examples- Example 5
	Examples- Example 6

b) identify applications of transformations.

Understanding Graphing 2008 **Notes**

Section 4: Transformations

Tangrams	Tangram Introduction
	Tangram Construction
	Example 1
	Example 2
	Example 3

	Example 4	
	Example 5	
	Example 6	
Understanding Percent 2008		**Notes**
Section 4: Ratios and Proportions		
Proportions	Example 5 - Tree Height	
	Example 6 - Map	
	Example 7 - Scale Drawing	

8.9 The student will

construct a three-dimensional model, given the top or bottom, side, and front views.

Understanding Measurement and Geometry 2008		**Notes**
Section 4: Solids.. Volume and Surface Area		
Surface Area of a Solid	Concept	
	Surface Area of a Pyramid	
	Surface Area of a Cylinder	

8.10 The student will

a) verify the Pythagorean Theorem; and

Understanding Exponents 2008		**Notes**
Section 6: Pythagorean Theorem		
In This Topic		
The Right Triangle		
Math or Magic?	Introduction	
	Omar's Rope Trick #1	
	Omar's Rope Trick #2	
	Our Rope Trick	
Squares on a Grid	Example 1	
	Example 2	
	Example 3	
	Example 4	
Squares on the Sides of a Right Triangle	Triangle #1	
	Triangle #2	
	Triangle #3	
The Pythagorean Theorem	The Pattern	
	In General	
	Theorem	

b) apply the Pythagorean Theorem.

Understanding Exponents 2008 **Notes**

Section 6: Pythagorean Theorem

Example Questions	Example 1… Pole Example
	Example 2… Tower Example
	Example 3… Walking Example
	Example 4… Lake Example
	Example 5… Geometric Example
Practice Questions	5 questions (randomly generated)

8.11 The student will

solve practical area and perimeter problems involving composite plane figures.

Understanding Measurement and Geometry 2008 **Notes**

Section 2: Perimeter and Area of Polygons

Walk Around a Polygon	Joan Walks
	Perimeter of Various Shapes- Example - 1
	Perimeter of Various Shapes- Example - 2
	Perimeter of Various Shapes- Example - 3
	Perimeter of The Ranch
	Length of the Metal Strip
	Find the Perimeter - 3 Examples
Areas of Polygons	Polygons Broken into Simpler Shapes- Example 1
	Polygons Broken into Simpler Shapes- Example 2
	Polygons Broken into Simpler Shapes- Example 3
Tangrams and Area	Tangram Introduction
	Tangram Construction
	Square Inches
	Square Centimeters

Probability and Statistics - Focus: Statistical Analysis of Graphs and Problem Situations

8.12 The student will

determine the probability of independent and dependent events with and without replacement.

Understanding Probability 2008 **Notes**

Section 1: Introduction to Probability

Possible Outcomes	What Are They?
	1. Coins
	2. Pick 1 Ball
	3. Pick 2 Balls
	4. Eye Test
	5. Travel
Experiment with Spinners	Experiment 1
	Experiment 2
	Experiment 3
	Experiment 4
	Experiment 5
	Experiment 6
The Spinner Game	Board 1- Single Player
	Board 1- 2 player
	Board 2- Single Player
	Board 2- 2 player
IT's in the Bag	Board 2
Tree Diagrams	Coin and Die
	Meals
	Socks
	Rabbits
	Forest
Problem Solving - Logic and Probability	Introduction
	Demonstration
	Level 1
	Level 2
Practice Questions	10 questions (randomly generated)

Understanding Probability 2008 **Notes**

Section 2: What's the Chance

Probability	What is it
	Introduction 1
	Introduction 2
Probability Examples	1. Coin Toss
	2. Picking 1 Ball
	3. Picking 2 Balls

	4. Spinner #1	
	5. Spinner #2	
	6. The Bag	
	7. Travel Example	
	8. Number Example	
	9. Rabbit Example	
	10. Mailing Letters	
	11. Forest	
	12. Ahmed's Maze	

Understanding Probability 2008 **Notes**

Section 7: Independent Events

In This Topic		
What Are They		
Examples	1. Toss 2 Coins	
	2. Replacing Marbles	
Probability	1. Coin and Die	
	2. Balls	
	3. Letter Tiles	
Patterns and Summary	1. Summary	
	2. Spinner	
	3. Cards	
Practice Questions	5 questions (randomly generated)	

Understanding Probability 2008 **Notes**

Section 8: Dependent Events

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)	

8.13 The student will

a) make comparisons, predictions, and inferences, using information displayed in graphs; and

Understanding Graphing 2008 **Notes**

Section 1: Reading And Sketching Graphs

In This Topic

Graphs Without a Scale	Concept... Age and Weight
	Example 1... Height and Weight
	Example 2... Errors and Years
	Example 3... Pushups and Situps
	Example 4... Nelia's Bike Ride
	Example 5... Temperature and Time
	Example 6... Melissa Eating Popcorn (situations are randomly generated)
	Example 7... Glasses of Water
	Example 8... Bottles of Water
	Example 9... Bottles of Water... Matching
	Example 10... Age and Height
	Example 11... The Bathtub #1
	Example 12... The Bathtub #2
	Example 13... The Hot Tub
Graphs With a Scale	Concept... Distance and Time
	Example 1... Wins in Soccer
	Example 2... Books and Days
	Example 3... The Travel Log
	Example 4... Winning in Baseball
	Example 5... Cost and Distance
	Example 6... Ivan's Ride to the Party
	Example 7... The Cyclists
	Example 8... Baseball (situations are randomly generated)
	Example 9... The Beach
	Example 10... Rate
	Example 11... Villeneuve
	Example 12... Volume and Time
	Example 13... The River Problem
	Example 14... Angelo's Walk
Discrete Data	
Continuous Data	
Extrapolation	
Practice Questions	5 questions (randomly generated)

Understanding Graphing 2008 **Notes**

Section 2: Statistics

In This Topic

An Introduction

- Tally Chart
- Pictograph #1
- Pictograph #2
- Bar Graph #1
- Bar Graph #2
- Line Graph #1
- Line Graph #2

b) construct and analyze scatterplots.

Understanding Graphing 2008 **Notes**

Section 2: Statistics

Presenting Data

- Scatter Plot- Example 1… The T-Shirt Tailor
- Scatter Plot- Example 2… Matching

Patterns, Functions, and Algebra - Focus: Linear Relationships

8.14 The student will

make connections between any two representations (tables, graphs, words, and rules) of a given relationship.

Understanding Graphing 2008		**Notes**
Section 5 : Relations, Equations and Functions		
Relations	Example 1: Triangle- Display the Relation	
	Example 1: Triangle- Describe the Relation	
	Example 1: Triangle- Predict New Information	
	Example 2: Tiles, Part 1	
	Example 3: Tiles, Part 2- Introduction - The Garden	
	Example 3: Tiles, Part 2- The Problem	
	Example 3: Tiles, Part 2- Patterns from Pictures #2	
	Example 3: Tiles, Part 2- Patterns from Pictures #3	
	Example 3: Tiles, Part 2- Patterns from Pictures #4	
	Example 3: Tiles, Part 2- Summary	
	Example 4 Running- Display the Relation	
	Example 4 Running- Describe the Relation	
	Example 4 Running- Predict New Information	
Patterns to Words to Equations	Example 1	
	Example 2	
	Example 3	
	Example 4	

Understanding Graphing 2008		**Notes**
Section 6: Linear Relations		
The Taxi Example	Setup Equations	
	Graph Equations	
The Elastic Example	Setup Equations	
	Graph	
Lightning Example	Setup Equations	
	Graph	

Understanding Equations 2008		**Notes**
Section 5: Problem Solving		
The Translation Machine	Example 1	
	Example 2	
	Example 3	
	Example 4	
Expressions - The Language of Algebra	Example 1	
	Example 2	

	Example 3	
Area of Walls		
Chemistry		
Fish Problem with Diagram		
Understanding Algebra 2008		**Notes**
Section 3: Patterns, Patterns, Patterns		
Patterns to Formulas	Example 1	

8.15 The student will

a) solve multistep linear equations in one variable with the variable on one and two sides of the equation;

Understanding Equations 2008		**Notes**
Section 2: Solving One-Step Equations		
Our Problem		
Concept - Examples with Tiles	Example 1	
	Example 2	
	Example 3	
	Example 4	
	Example 5	
Concept - Examples without Tiles	Example 1	
	Example 2	
	Example 3	
	Example 4	
	Example 5	
Practice Questions	10 questions (randomly generated)	
Understanding Equations 2008		**Notes**
Section 3: Solving Two-Step Equations		
Our Problem		
Concept - Examples with Tiles	Example 1	
	Example 2	
	Example 3	
	Example 4	
Concept - Examples without Tiles	Example 1	
	Example 2	
	Example 3	
	Example 4	
	Example 5	
	Example 6	
Practice Questions	10 questions (randomly generated)	

Understanding Equations 2008 **Notes**

Section 4: Solving Multi-Step Equations

- Our Problem
- Concept - Examples with Tiles
- Concept - Examples without Tiles
  - Example 1
  - Example 2
  - Example 3
  - Example 4
  - Example 5
- Summary

b) solve two-step linear inequalities and graph the results on a number line; and

Understanding Equations 2008 **Notes**

Section 7: Solving Inequalities

- Solving Inequalities
  - Example 1
  - Example 2
  - Example 3
  - Example 4
  - Example 5
  - Example 6

c) identify properties of operations used to solve an equation.

Understanding Equations 2008 **Notes**

Section 4: Solving Multi-Step Equations

- Our Problem
- Concept - Examples with Tiles
- Concept - Examples without Tiles
  - Example 1
  - Example 2
  - Example 3
  - Example 4
  - Example 5
- Summary

8.16 The student will

graph a linear equation in two variables.

Understanding Graphing 2008 **Notes**

Section 6: Linear Relations

In This Topic	
What is a Linear Relation?	
Graphs of Linear Relations	Concept
	Examples- Example 1
	Examples- Example 2
	Examples- Example 3
	Examples- Example 4
	Examples- Example 5
	Examples- Example 6
The Taxi Example	Setup Equations
	Graph Equations
The Elastic Example	Setup Equations
	Graph
Lightning Example	Setup Equations
	Graph

Understanding Graphing 2008 **Notes**

Section 8: Equation of a Straight Line

Graph y = mx+ b	Example 1
	Example 2
	Example 3
	Example 4
	Patterns to Summary
	Example 5
	Example 6
	Example 7
	Example 8

8.17 The student will

identify the domain, range, independent variable, or dependent variable in a given situation.

Understanding Graphing 2008 **Notes**

Section 5 : Relations, Equations and Functions

Relations	Domain and Range
	Example 1: Triangle- Display the Relation
	Example 4 Running- Display the Relation
Functions	What is a Function?