



**CORRELATIONS**  
**THE UNDERSTANDING MATH SERIES of PROGRAMS**  
**With**  
**ALABAMA**  
**GRADE 8**

**PROGRAMS**

The Understanding Math Series of Programs consist of 10 programs written for Kindergarten to Tenth grade. The ten programs are:

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| Understanding Numeration (K-3) English/Spanish |   |   |
| Understanding Fractions (4-10)                 | Understanding Probability (4-10)              | Understanding Exponents (4-10)                  |
| Understanding Algebra (4-10)                   | Understanding Graphing (4-10)                 | Understanding Equations (4-10)                  |
| Understanding Percent (4-10)                   | Understanding Measurement and Geometry (4-10) | Understanding Whole Numbers and Integers (4-10) |

**UNDERSTANDING NUMERATION**

The Understanding Numeration program has been developed for levels Kindergarten to Third grade. It is available in both English only and English/Spanish. Navigating through Understanding Numeration will require the user to select the following in the listed order:

1. Select a CONCEPT – There are 5 concepts to choose from e.g. Operations
2. Select a SKILL – Within each Concept there are several Skills to choose from
3. Select a LEVEL and LESSON – Within a Skill the series of Lessons have been organized by Levels A through D

Lessons are sequenced through the levels to build understanding of mathematics concepts from the concrete to the abstract. There are off-computer support sheets available for each lesson and can be selected from within the program.

A detailed Lesson Synopsis is available at [www.neufeldmath.com/synopsis](http://www.neufeldmath.com/synopsis) to assist teachers in lesson planning.

**UNDERSTANDING MATH**

Understanding Math consists of 9 highly interactive programs developed for fourth to tenth grade. All concepts are developed from the concrete to the abstract using a variety of approaches. The programs can be implemented in a variety of teaching situations; whole class lessons with one computer and data projector, small group centers, and student centered computer lab settings. The lessons can be used in remediation, intervention and enrichment. All Topics within each program end with randomly generated Practice Questions and Topic Tests. Student results from the Topic Tests can be tracked for analysis and assessment. Resources are available at [www.neufeldmath.com](http://www.neufeldmath.com) which include correlations, support sheets and word banks.



**NUMBER and OPERATIONS**

1. Use various strategies and operations to solve problems involving real numbers.

STANDARD	UNDERSTANDING MATH LESSONS
Using alternative representations of rational numbers Examples: models, drawings, grids, graphs	
Applying GCF, LCM, and prime and composite numbers, including justification for the reasonableness of results, when working with rational numbers	<p><b>Understanding Fractions</b></p> <p><b>Section 2. Products, Multiples, Factors</b></p> <p>Least Common Multiple The Concept Examples 1, 2, 3, 4 Divisibility Rule Examples 1, 2, 3, 4, 5, 6, 7, 8 Factors Introduction Factors of 8, 12, 16, 20, 5, 15, 18 Prime Numbers Prime Numbers: 2, 3, 5, 7, 11, 13, 17, 19 Composite Numbers Factor Trees Examples 1, 2, 3, 4 Greatest Common Factor Introduction 12 and 18 30 and 40 70 and 42 Problem 1: Goody Bag Problem 2: Fall Fair Venn Diagrams – Factors Examples 1, 2, 3 Practice Questions 14 questions (randomly generated) Topic Test 10 questions (randomly generated)</p>



STANDARD	UNDERSTANDING MATH LESSONS
Applying proportional reasoning	<u><b>Understanding Percent</b></u> <b>Section 4: Ratios and Proportions</b> What is Proportion? Proportions Example 1 Example 2- Lemonade Example 3 – Marbles Example 4 – Trout Example 5 – Tree Height Example 6 – Map Example 7 – Scale Drawing
Using vocabulary associated with sets, including <i>union</i> and <i>intersection</i>	
Determining whether a number is rational or irrational	
Demonstrating computational fluency with operations on rational numbers	<u><b>Understanding Fractions</b></u> <b>Section 8. Adding Fractions...ALL SECTIONS</b> <b>Section 9. Subtracting Fractions...ALL SECTIONS</b> <b>Section 10. Multiplying Fractions...ALL SECTIONS</b> <b>Section 11. Dividing Fractions...ALL SECTIONS</b>

2. Simplify expressions containing natural number exponents by applying one or more of the laws of exponents.

STANDARD	UNDERSTANDING MATH LESSONS
Writing numbers using scientific notation	<p><b><u>Understanding Exponents</u></b>  <b>Section 4. Scientific Notation</b>            Why Use Scientific Notation?            Scientific Notation for Large Numbers            Introduction            Chart            The Rule            The Rule            The Steps            Scientific Notation for Small Numbers            Introduction            Chart            The Steps</p>

3. Use order of operations to evaluate and simplify algebraic expressions.

STANDARD	UNDERSTANDING MATH LESSONS
<p>Applying the substitution principle</p> <p>Applying the properties of operations on rational numbers to evaluate and simplify algebraic expressions</p>	<p><b><u>Understanding Algebra</u></b>  <b>Section 4. Patterns, Formulas, Substitution</b>            Substitution... Examples            Example 1: Evaluation            Example 2: Area Formulas            Example 3: Volume Formulas            Example 4: Hit The Ball            Patterns... Magic Billiard Table            Investigation #1, #2, #3            The Formula            Patterns... Tower of Hanoi            Introduction            Exploration            To Formula            Summary            Practice Questions 10 questions (randomly generated)            Topic Test 10 questions (randomly generated)</p>

4. Graph linear relations by plotting points or by using the slope and y-intercept.

STANDARD	UNDERSTANDING MATH LESSONS
<p>Determining slopes and y-intercepts of lines</p>	<p><b><u>Understanding Graphing</u></b>  <b>Section 7. Slope of a Line</b>            In This Topic            Introductions to Slope            Slope When Driving            A Ski Slope            Slope of a Roof            Slope Order            Steepness Factor            Definition            Introductory            Examples            Examples 1, 2, 3, 4            Formula</p> <p><b>Section 8. Equation of a Straight Line</b>            Slope y-intercept Equation            Concept            Examples 1,2,3,4</p>
<p>Calculating the slope of a linear relation given as a table or graph</p>	<p><b><u>Understanding Graphing</u></b>  <b>Section 7. Slope of a Line</b>            Parallel Lines            Introduction            Examples 1, 2, 3            Perpendicular Lines            Introduction            Examples 1, 2, 3            Positive and Negative Slope            Examples 1, 2, 3, 4            Pattern            Special Slopes            Examples 1, 2, 3, 4            Pattern            Sketch Line, Given Point and Slope            Examples 1, 2, 3, 4            Slopes of Parallel Lines            Examples 1, 2, 3            Slopes of Perpendicular Lines            Examples 1, 2, 3; Pattern</p>



STANDARD	UNDERSTANDING MATH LESSONS
Exhibiting conceptual understanding of various uses of variables	<p><b><u>Understanding Algebra</u></b>  <b>Section 4. Patterns, Formulas, Substitution</b>  Expressions, Terms, Variables  Definitions  Summary  Substitution is... Math Scrabble 1  Scrabble 1, 2, 3  Challenge  Patterns... Hockey Standings  Patterns... Squares – Perimeter and Area  Patterns... Toothpicks Introduction  Exploration  To Formula  Patterns 1, 2, 3, 4  Summary  Patterns... Counting Money  The Pattern... Methods 1, 2  The Pattern... In General  Summary  Patterns... Angles in a Polygon  Interior Angles  The Pattern  Summary  Patterns... The Bridge  Introduction  Exploration  To Formula  Patterns 1, 2, 3  Summary</p>

5. Solve problems involving linear functions.

STANDARD	UNDERSTANDING MATH LESSONS
Identifying functions from information in tables, sets of ordered pairs, equations, graphs, and mappings Determining the rule that defines a function	<u><b>Understanding Graphing</b></u> <b>Section 5. Relations, Equations, and Functions</b> Functions What is a Function – Examples 1,2,3 Vertical Line Test Examples 1, 2, 3 Function Notation Examples 1,2 Patterns to Words to Equations Examples 1,2,3,4
Classifying variables in a function as independent or dependent	
Classifying relations as linear or nonlinear by examining tables, graphs, or simple equations	<u><b>Understanding Graphing</b></u> <b>Section 6. Linear Relations</b> In This Topic What is a Linear Relation? Graphs of Linear Relations Concept Examples Examples 1, 2, 3, 4, 5, 6 The Taxi Example Setup Equations Graph Equations The Elastic Example Setup Equations Graph Lightning Example Setup Equations Graph Basketball Example Setup Equations Graph

STANDARD	UNDERSTANDING MATH LESSONS
6. Solve multistep linear equations, including equations requiring the use of the distributive property.	<p><b><u>Understanding Equations</u></b>  <b>Section 4. Solving Multi-Step Equations</b>  Our Problem  Concepts – Examples with/without Tiles  Examples 1,2,3,4,5  Summary  Literal Equations  What are They?  How do you solve them?  Why Solve Literal Equations?  A Perimeter Example  A Temperature Example  Practice Questions 6 questions (randomly generated)</p>

## GEOMETRY

7. Solve problems using the Pythagorean Theorem.

STANDARD	UNDERSTANDING MATH LESSONS
Applying the Triangle Inequality Theorem Verifying the Pythagorean Theorem Applying the Pythagorean Theorem to determine if a triangle is a right triangle Applying the Pythagorean Theorem to find the missing length of a side of a right triangle	<p><b><u>Understanding Exponents</u></b>  <b>Section 6. Pythagorean Theorem</b>  In This Topic  The Right Triangle  Math or Magic?  Introduction  Omar's Rope Trick #1, #2  Our Rope Trick  Squares on a Grid  Examples 1-4  Squares on the Sides of a Right Triangle  Triangles 1,2,3  The Pythagorean Theorem  The Pattern  In General  Theorem  Example Questions  Example 1 – Pole Example  Example 2 – Tower Example  Example 3 – Walking Example  Example 4 – Lake Example  Example 5 – Geometric Example</p>



Calculating distances on the coordinate plane using the Pythagorean Theorem	
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8. Compare quadrilaterals, triangles, and solids, using their properties and characteristics.

STANDARD	UNDERSTANDING MATH LESSONS
Developing mathematical arguments about the relationships among types of quadrilaterals and triangles	
Identifying angle bisectors, perpendicular bisectors, congruent angles, and congruent figures Constructing congruent and similar polygons, congruent angles, congruent segments, and parallel and perpendicular lines	<p><b><u>Understanding Measurement and Geometry</u></b>  <b>Section 7. Constructions</b>            Before You Begin            In This Topic            Perpendicular Bisector            Circumcircle            Centroid            Angle Bisector            Incircle            Perpendicular from Point on Line            Perpendicular from Point off Line</p>

## MEASUREMENT

STANDARD	UNDERSTANDING MATH LESSONS
<p>Determine the measures of special angle pairs, including adjacent, vertical, supplementary, and complementary angles, and angles formed by parallel lines cut by a transversal.</p>	<p><b><u>Understanding Measurement and Geometry</u></b>  <b>Section 6. Angles and Polygons</b>            In This Topic            Parallel Lines            Example with Parallel Lines            Examples 1,2            Angles in Triangles            Exploration            An Explanation            Exterior Angles – Example            Angles in Polygons            Methods 1,2            Exterior Angles in a Polygon            Practice Questions 5 questions (randomly generated)            Topic Test 10 questions (randomly generated)</p>
<p>10. Find the perimeter and area of regular and irregular plane figures.</p>	<p><b><u>Understanding Measurement and Geometry</u></b>  <b>Section 2. Perimeter and Area of Polygons</b>            Relationship – Area and Perimeter            The Information            The Graph: Length and Perimeter, Length and Area            Given Area and Perimeter –            Create Shape            Examples 1, 2, 3, 4            Problem Section Length of Fence            Area of Wall            The Tablecloth</p>

11. Determine the surface area and volume of rectangular prisms, cylinders, and pyramids.

STANDARD	UNDERSTANDING MATH LESSONS
Estimating surface area and volume of solid figures Determining the appropriate units of measure to describe surface area and volume Developing formulas for determining surface area and volume of rectangular prisms, cylinders, and pyramids	<u><b>Understanding Measurement and Geometry</b></u> <b>Section 4. Solids... Volume and Surface Area</b> 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: Examples 1, 2 Volume of a Cylinder Volume of a Pyramid Summary Slicing: From a Solid to a Flat Surface Practice Questions 5 questions (randomly generated)

12. Determine the lengths of missing sides and measures of angles in similar and congruent figures.

STANDARD	UNDERSTANDING MATH LESSONS
Applying proportional reasoning	<u><b>Understanding Percent</b></u> <b>Section 4. Ratios and Proportions</b> Examples 1, 2, 3 Proportions Example 1 Example 2 - Lemonade Example 3 - Marbles Example 4 - Trout Example 5 - Tree Height Example 6 - Map Example 7 - Scale Drawing
Using dilations on the coordinate plane to determine measures of similar figures	<u><b>Understanding Graphing</b></u> <b>Section 4. Transformations</b> Dilatations Object to Image We Say, We Write Dilatation Mapping Rule Examples

STANDARD	UNDERSTANDING MATH LESSONS
Finding the ratios of the perimeters and areas of similar triangles, trapezoids, and parallelograms	<p><b><u>Understanding Measurement and Geometry</u></b>  <b>Section 9. Ratios for Areas and Volumes</b>            In This Topic            Ratios            Introduction            Area            Volume            Practice Questions 10 questions (randomly generated)</p>

**DATA ANALYSIS and PROBABILITY**

13. Interpret data from populations, using given and collected data.

STANDARD	UNDERSTANDING MATH LESSONS
Representing the data with the most appropriate graph, including box-and-whisker plot, circle graph, and scatterplot Making predictions by estimating the line of best fit from a scatterplot	<p><b><u>Understanding Graphing</u></b>  <b>Section 2. Statistics</b>            Presenting Data            Stem-and-Leaf Diagram            Examples 1 &amp; 2            Bar Graph            Examples 1 &amp; 2            Histogram            Examples 1 &amp; 2            Line Graph            Examples 1 &amp; 2            Circle or Pie Graph            Examples 1 &amp; 2            Scatter Plot            Examples 1 &amp; 2            Box and Whisker Plots            Concepts            Examples 1, 2</p>
Comparing data sets involving two populations	
Determining the measure of center that is the most appropriate for a given situation	



14. Determine the theoretical probability of an event.

STANDARD	UNDERSTANDING MATH LESSONS
Calculating the probability of complementary events and mutually exclusive events	
Comparing experimental and theoretical probability	<p><b><u>Understanding Probability</u></b>  <b>Section 2. What's the Chance?</b>            Experimental Probability Introduction            Example 1, 2  <b>Section 3. Dice Probabilities</b>            Roll One Die            Your Experiment            Computer's Experiment            Theoretical Experiment            Patterns            Summary            Roll Two Dice            Your Experiment            Computer's Experiment            Theoretical Experiment            Patterns            Summary</p>
Computing the probability of two independent events and two dependent events	<p><b><u>Understanding Probability</u></b>  <b>Section 7: Independent Events</b>            In This Topic            What are They?            Examples 1,2            Probability – Examples 1,2,3            Patterns and Summary – Examples 1,2,3            Practice Questions 5 questions (randomly generated)            Topic Test 5 questions (randomly generated)</p> <p><b>Section 8: Dependent Events</b>            In This Topic            What Are They?            Independent Events            Dependent Events            Examples 1,2            Probability – Examples 1,2,3            Patterns and Summary – Examples 1,2,3,4            Practice Questions 5 questions (randomly generated)            Topic Test 5 questions (randomly generated)</p>
Determining the probability of an event through simulation	