



CORRELATIONS
THE UNDERSTANDING MATH SERIES of PROGRAMS
With
MISSISSIPPI MATHEMATICS FRAMEWORK
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 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 which include correlations, support sheets and word banks.



Content Strands

Patterns/Algebraic Thinking (P) Data Analysis/Prediction (D) Measurement (M) Geometric Concepts (G) Number Sense (N)

1. Apply concepts and perform basic operations using real numbers. (P, D, G, N)

STANDARD	UNDERSTANDING MATH LESSONS
<p>a. Classify and give examples of real numbers such as natural, whole, integers, rational, and irrational.</p>	<p><u>Understanding Whole Numbers and Integers</u> Section 4. The Meaning of Integers Comparing Integers Example 1, 2 Explanation Example 3, 4 Example Questions Example 1, 2, 3, 4, 5, 6 Practice Questions 11 questions (randomly generated) Topic Test 10 questions (randomly generated)</p>
<p>b. Identify, compare, and order fractions and decimals.</p> <p>c. Round and estimate fractions and decimals.</p>	<p><u>Understanding Fractions</u> Section 15. Multiplication and Division of Decimals Repeating Decimals An Example How to Write Them Rounding Decimals Examples 1, 2, 3, 4, 5 Special Case #1, #2 Summary Examples 6, 7 Fraction to Decimal</p>
<p>d. Solve real-life problems involving addition, subtraction, multiplication, and division of fractions, decimals, and mixed numbers.</p>	<p><u>Understanding Fractions</u> Section 8. Adding Fractions Word Problems Alexander's Friend Eating Candy Goal Scoring Taking a Walk Shapes in a Square Examples 1, 2 Fraction Card Game Instructions Levels 1, 2 Magic Square (randomly generated) Practice Questions 10 questions (randomly generated)</p>



STANDARD	UNDERSTANDING MATH LESSONS
<p>d. Solve real-life problems involving addition, subtraction, multiplication, and division of fractions, decimals, and mixed numbers.</p> <p>CONTINUED</p>	<p><u>Understanding Fractions</u></p> <p>Section 9. Subtracting Fractions Word Problems Pedro and Alex's Race Washing the Cars Planting a Garden Practice Questions 10 questions (randomly generated)</p> <p>Section 10. Multiplying Fractions Multiplying Many Fractions Examples 1, 2 Practice Questions 10 questions (randomly generated)</p> <p>Section 11. Division of Fractions Examples Without Diagrams Numerical Example 1 Numerical Example 2 Central High School Practice Questions 10 questions (randomly generated)</p> <p>Section 13. Improper Fractions and Mixed Numbers Adding Mixed Numbers On a Ruler 5 questions (randomly generated) Methods 1,2 Subtracting Mixed Numbers On a Ruler 5 questions (randomly generated) Methods 1,2 Multiplying Mixed Numbers Area Method 2 Dividing Mixed Numbers Fraction Card Game Instructions Levels 1, 2 Number Sentence Factory Control Room – Length of Timer Training Room Factory Floor 5 questions (randomly generated) Practice Questions 18 questions (randomly generated)</p>



STANDARD	UNDERSTANDING MATH LESSONS
<p>d. Solve real-life problems involving addition, subtraction, multiplication, and division of fractions, decimals, and mixed numbers.</p> <p>CONTINUED</p>	<p><u>Understanding Fractions</u></p> <p>Section 14. Addition and Subtraction of Decimals</p> <p>Decimals Around Us Length in Metric Units Tools Examples 1, 2, 3, 4, 5 Pencils Examples 1, 2, 3, 4, 5 Money Examples 1, 2, 3, 4, 5 Track Meet Example 1, 2, 3, 4, 5 School Supplies Practice Questions 10 questions (randomly generated)</p> <p>Section 15. Multiplication and Division of Decimals</p> <p>Decimals Around Us – Word Problems Example 1 - Oranges Example 2 - Bananas Example 3 - Cycling Example 4 – Baseball Cards Example 5 - Cookies Example 6 - Running Example 7 - Apples Example 8 - Saving Example 9 - Skipping Fractions to Decimals Method 1 – Long Division Examples 1, 2, 3</p>



STANDARD	UNDERSTANDING MATH LESSONS
e. Determine the absolute value and additive inverse of real numbers.	
f. Classify, compare, and order integers and rational numbers.	<p><u>Understanding Whole Numbers and Integers</u> Section 4. The Meaning of Integers Absolute Values Example 1, 2 Comparing Integers Example 1, 2 Explanation Example 3, 4 Example Questions Example 1, 2, 3, 4, 5, 6 Practice Questions 11 questions (randomly generated) Topic Test 10 questions (randomly generated)</p>
g. Add, subtract, multiply, and divide integers and rational numbers with and without calculators.	<p><u>Understanding Whole Numbers and Integers</u> Section 5. Adding Integers Number Lines... An Introduction to Addition Example 1, 2, 3 Summary... Using a Number Line Writing Positive Integers Example 1, 2, 3 Word Problems Temperature Money Car Practice Questions 10 questions (randomly generated)</p> <p>Section 6. Subtracting Integers Going for a Walk Preliminary The Walk David's Trip Part 1, 2 Summary Word Problems The Sailboat The Bank Practice Questions 10 questions (randomly generated)</p>



STANDARD	UNDERSTANDING MATH LESSONS
<p>f. Classify, compare, and order integers and rational numbers. CONTINUED</p>	<p><u>Understanding Whole Numbers and Integers</u> Section 7. Multiplying Integers Positive Integers x Positive Integers Example 1, 2 Positive Integers x Negative Integers Example 1, 2 Negative Integers x Positive Integers Method 1, 2 Negative Integers x Negative Integers Example 1, 2 Pattern #1, #2 Summary #1, #2 ... Sign Example Questions Examples 1, 2, 3, 4, 5 Word Problems Washing Cars The Helicopter Construction Practice Questions 17 questions (randomly generated)</p> <p>Section 8. Dividing Integers Practice (10 questions randomly generated) The Inverse of Multiplication Example 1, 2 Summary #1, #2 ... Sign Examples Examples 1, 2, 3, 4 Fact Triangles Word Problems Casino Plant Graham's Walk Practice Questions 8 questions (randomly generated)</p>
<p>g. Add, subtract, multiply, and divide integers and rational numbers with and without calculators.</p>	



2. Use basic concepts of numbers sense and perform operations involving order of operations, exponents, scientific notation. (P, M, N)

STANDARD	UNDERSTANDING MATH LESSONS
<p>a. Simplify expressions using order of operations.</p>	<p><u>Understanding Whole Numbers and Integers</u> Section 9. Order of Operations BEDMAS Example 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 Please Excuse My Dear Aunt Sally Examples 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 Example Questions – Integers BEDMAS Examples 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 Please Excuse My Dear Aunt Sally Examples 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 Word Problems Shipping Babysitting Garbage Practice Questions BEDMAS 10 questions (randomly generated) Please Excuse My Dear Aunt Sally 10 questions (randomly generated)</p>
<p>b. Use the rules of exponents when multiplying or dividing like bases, and when raising a power to a power.</p>	<p><u>Understanding Exponents</u> 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</p>
<p>c. Multiply and divide numbers by powers of ten.</p>	

STANDARD	UNDERSTANDING MATH LESSONS
<p>d. Convert between standard form and scientific notation.</p>	<p><u>Understanding Exponents</u> Section 4. Scientific Notation 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 Examples Number Question Park Question Sun Question Kitchen Question</p>
<p>e. Multiply and divide numbers written in scientific notation.</p>	
<p>f. Evaluate and estimate powers, squares, and square roots with and without calculators.</p>	<p><u>Understanding Exponents</u> Section 5. Square Root Squaring Numbers Examples 1, 2 Square Roots Radical Signs Square Roots of Negative Numbers Example Questions 1. Radicals First 2. The Four Equations 3. Lawn Question 4. Make a Square Estimating Square Roots Examples 1, 2 Estimating Square Roots on the Number Line Practice Questions 10 questions (randomly generated)</p>

3. Use properties to create and simplify algebraic expressions and solve linear equations and inequalities. (P, G, N)

STANDARD	UNDERSTANDING MATH LESSONS
<p>a. Identify and apply the commutative, associative, and distributive properties.</p>	<p><u>Understanding Whole Numbers and Integers</u> Section 3. Multiplying and Dividing Whole Numbers Commutative Property $5 \times 1 = 1 \times 5$ $5 \times 2 = 2 \times 5$ $5 \times 3 = 3 \times 5$ $4 \times 3 = 3 \times 4$ Associative Property Examples 1,2 Distributive Method Distributive Method – Examples 1,2,3 Distributive Method – Questions 1,2,3</p>
<p>b. Distinguish between numerical and algebraic expressions, equations, and inequalities.</p>	<p><u>Understanding Algebra</u> Section 4. Patterns, Formulas, Substitution Introduction... Math is Patterns Expressions, Terms, Variables Definitions Summary Substitution is... Math Scrabble 1 Scrabble 1, 2, 3 Challenge</p> <p><u>Understanding Equations</u> Section 1. Tiles, Balances, and Equations Definitions Introduction Summary 1, 2 The Meaning of “Solving an Equation” Solve by Systematic Trials Recall Tile Concepts Balances... An Introduction Tiles, Balances, Equations Practice Questions 5 questions (randomly generated) Topic Test 10 questions (randomly generated)</p>

STANDARD	UNDERSTANDING MATH LESSONS
<p>c. Convert between word phrases or sentences and algebraic expressions, equations, or inequalities.</p> <p>d. Simplify and evaluate numerical and algebraic expressions.</p>	<p><u>Understanding Algebra</u> Section 4. Patterns, Formulas, Substitution 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 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)</p>

STANDARD	UNDERSTANDING MATH LESSONS
<p>c. Convert between word phrases or sentences and algebraic expressions, equations, or inequalities.</p> <p>d. Simplify and evaluate numerical and algebraic expressions.</p> <p>CONTINUED</p>	<p><u>Understanding Equations</u></p> <p>Section 1. Tiles, Balances, and Equations</p> <p>Definitions Introduction Summary Parts 1 & 2 The Meaning of "Solving Equations" Solve by Systematic Trials Recall Tile Concepts Balances...An Introduction</p> <p>Section 2. Solving One-step Equations</p> <p>Our Problem Concepts – Examples with Tiles Examples 1 through 4 Concepts – Examples without Tiles Practice Questions; Topic Test</p>



STANDARD	UNDERSTANDING MATH LESSONS
<p>e. Solve and check one and two-step linear equations and inequalities.</p> <p>f. Solve and check multi-step linear equations using the distributive property.</p> <p>g. Graph solutions to inequalities on a number line.</p>	<p><u>Understanding Equations</u> Section 7. Solving Inequalities Comparing Integers The Integer Line Example 1... Greater Than Example 2... Less Than Explanation Example 3... Greater Than Example 4... Less Than Greater Than or Less Than Inequalities What Are They? Inequalities vs. Equations Summary of Relationships Inequalities on a Number Line Examples 1, 2, 3, 4 Solving Inequalities Examples 1, 2, 3, 4, 5, 6 Solving Compound Inequalities Examples 1, 2</p>
<p>h. Write a corresponding real-life situation from an algebraic expression.</p>	

4. Apply the concepts of ratio, proportion, and percent to solve real-life problems. (P, D, M, G, N)

STANDARD	UNDERSTANDING MATH LESSONS
<p>a. Write ratios comparing given data.</p>	<p>Understanding Percent Section 4. Ratios and Proportions Ratios in the News What is a Ratio? Example 1 - Fraction Strip Example 2 - Balls Example 3 - Students Example 4 - Gears Writing Ratios Concept Examples 1, 2, 3, 4, 5, 6 What is a Proportion? Proportions with Pattern Blocks Examples 1, 2, 3 Ratios and Your Body Golden Ratio Introduction Part 1, 2 Measuring Your Body</p>
<p>b. Convert among ratios, decimals, and percents.</p>	<p>Understanding Percent Section 2. Percent to Fraction/Decimal Expressing a Percent as a Fraction Introduction Without Graphics Introduction With Graphics Fraction in Simplest Form Greatest Common Factor - GCF Examples 1, 2 Simplifying Fractions Methods 1, 2 Examples Examples 1, 2, 3, 4 The Watering Can Expressing a Percent as a Decimal Introduction Examples 1, 2, 3 Number Line Practice Questions 10 questions (randomly generated)</p>

STANDARD	UNDERSTANDING MATH LESSONS
c. Solve proportions.	<p><u>Understanding Percent</u> Section 4. Ratios and Proportions 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 Ratios and Your Body Golden Ratios Measuring Your Body</p>
d. Solve for part, rate, or base.	<p><u>Understanding Percent</u> Section 4. Ratios and Proportions Rate and Unit Rate Concept Examples The Best? Examples 1, 2, 3</p>

STANDARD	UNDERSTANDING MATH LESSONS
<p>f. Find percent of increase and decrease.</p> <p>g. Write and solve real-life word problems using percents with and without calculators.</p>	<p><u>Understanding Percent</u> Section 6. Problems Involving Percent In This Topic Steps in Solving Problems Finding the Whole Recall Proportion School Population Grades Problem Bike Sale: Method 1 Finding the Percent Theatre problem Car problem Percent of a Number Earnings Problem Nickel Ore Mental Calculation Number Problem Tipping Percent Change Interest Tree Problem Percent Markup</p>



5. Convert and use standard units (English and metric) of measurement. (P, D, M, G, N)

STANDARD	UNDERSTANDING MATH LESSONS
<p>a. Convert, perform basic operations, and solve word problems using standard measurements.</p> <p>d. Select appropriate units of measurement for real-life problems.</p>	<p><u>Understanding Measurement and Geometry</u> Section 1. An Introduction to Measurement Benchmarks - Metric Introduction Examples 4 questions (randomly generated) Benchmarks – US Standard Introduction Practice 4 questions (randomly generated) Measurement and Your Body - Metric Golden Ratio Introduction Parts 1, 2 Your Ratio Measurement and Your Body – US Standard Golden Ratio Introduction Parts 1, 2 Your Ratio My Body – Metric and US Standard Rudy’s Run Metric and US Standard Practice Questions Metric 10 questions (randomly generated) US Standard 10 questions (randomly generated) Topic Test Metric 10 questions (randomly generated) US Standard 10 questions (randomly generated)</p>
<p>b. Measure line segments and find dimensions of given figures using standard measurements.</p>	
<p>c. Write and solve real-life problems involving standard measurements.</p>	

6. Apply geometric principles to polygons, angles, and two and three-dimensional figures. (P, M, G, N)

STANDARD	UNDERSTANDING MATH LESSONS
<p>a. Identify parallel, perpendicular, intersecting, and skew lines.</p>	<p><u>Understanding Measurement and Geometry</u> Section 6. Angles and Polygons In This Topic Parallel Lines</p>
<p>b. Identify and describe characteristics of polygons.</p>	<p><u>Understanding Measurement and Geometry</u> 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</p>
<p>c. Find the perimeter and area of polygons and circumference and area of circles.</p>	<p><u>Understanding Measurement and Geometry</u> Section 2. Perimeter and Area of Polygons Perimeter of Various Shapes Examples 1, 2, 3 Perimeter of The Ranch Length of the Metal Strip Find the Perimeter (3 Examples) Introduction to Area Units Estimate Examples 1, 2, 3 Areas of Polygons Area of a Rectangle Concept Examples 1, 2, 3, 4 Area of a Parallelogram Concept Examples 1, 2</p>

STANDARD	UNDERSTANDING MATH LESSONS
<p>c. Find the perimeter and area of polygons and circumference and area of circles.</p> <p>CONTINUED</p>	<p><u>Understanding Measurement and Geometry</u></p> <p>Section 3. Circles</p> <p>Circumference of a Circle</p> <p>Ex. 1 – Ogg</p> <p>Ex. 2 – The Well</p> <p>Ex. 3 – The Rolling Coin</p> <p>Ex. 4 – The Semi-Circle</p> <p>AREA of a Circle</p> <p>Recall Area</p> <p>Area Exploration #1, #2</p> <p>Ex. 1 – Wheel</p> <p>Ex. 2 – Pizza</p> <p>Ex. 3 – The Semi-Circle</p> <p>Ex. 4 – The Dog’s Run</p> <p>Ex. 5 – The Hockey Rink</p> <p>Ex. 6 – Circle and Square</p> <p>Practice Questions 5 questions (randomly generated)</p>



STANDARD	UNDERSTANDING MATH LESSONS
<p>d. Classify, draw, and measure acute, obtuse, right, and straight angles.</p>	<p><u>Understanding Measurement and Geometry</u> Section 5. Angles and Their Measure 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)</p>
<p>e Identify and find the missing angle measure for adjacent, vertical, complementary, and supplementary angles.</p> <p>f. Locate and identify angles formed by parallel lines cut by a transversal (e.g., corresponding, alternate interior, and alternate exterior).</p> <p>g. Classify triangles by sides and angles and find the missing angle measure.</p>	<p><u>Understanding Measurement and Geometry</u> Section 6. Angles and Polygons 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</p>
<p>h. Identify three-dimensional figures and describe their faces, vertices, and edges.</p>	<p><u>Understanding Measurement and Geometry</u> Section 4. Solids... Volume and Surface Area Classifying Solids A Solid is... Recall Polygons A Polyhedron is... A Prism is... Some Special Pyramids A Cylinder is... A Cone is... Platonic Solids</p>

STANDARD	UNDERSTANDING MATH LESSONS
<p>i. Use the Pythagorean Theorem to solve problems, with and without a calculator.</p>	<p><u>Understanding Exponents</u> Section 6. Pythagorean Theorem 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, 2, 3, 4 Squares on the Sides of a Right Triangle Triangles #1, #2, #3 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>



7. Interpret, organize, and make predictions about a variety of data using concepts of probability and statistics. (P, D, M, G, N)

STANDARD	UNDERSTANDING MATH LESSONS
a. Interpret and construct frequency tables and charts.	
b. Find mean, median, mode, and range of a given set of data.	<p><u>Understanding Graphing</u> Section 2. Statistics Measures of Central Tendency Introduction The Mean Average The Median Average The Mode Summary Another Example Adding Data Points</p>
<p>c. Interpret and construct bar, line, circle graphs, and pictographs from given data.</p> <p>d. Interpret and construct stem-and-leaf, box-and-whisker, and scatterplots from given data.</p>	<p><u>Understanding Graphing</u> Section 2. Statistics Presenting Data Stem-and-Leaf Diagram Examples 1 & 2 Bar Graph Examples 1 & 2 Histogram Examples 1 & 2 Line Graph Examples 1 & 2 Circle or Pie Graph Examples 1 & 2 Scatter Plot Examples 1 & 2 Box and Whisker Plots Concepts Examples 1, 2</p>
e. Predict patterns or trends based on given data.	
f. Use combinations and permutations in application problems.	

STANDARD	UNDERSTANDING MATH LESSONS
<p>g. Calculate and apply basic probability.</p>	<p><u>Understanding Probability</u> Section 2. What's the Chance? Probability What is it ? Introductions 1, 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 Probability Scale Examples Summary Follow up Soccer Example Experimental Probability Introduction Example 1, 2 Practice Questions 10 questions (randomly generated)</p>

8. Apply the principles of graphing in the coordinate system. (P, D, M, G, N)

STANDARD	UNDERSTANDING MATH LESSONS
<p>a. Identify the x- and y-axis, the origin, and the quadrants of a coordinate plane.</p> <p>b. Plot ordered pairs.</p> <p>c. Label the x and y coordinates for a given point.</p>	<p><u>Understanding Graphing</u> Section 3. Points on a Grid Ordered pairs Axis Quadrants and Cartesian Plane Finding a Point Order is Important Examples Examples 1, 2, 3 Shapes Randomly Generated Battleship Randomly Generated Topic Test 5 questions (randomly generated)</p>
<p>d. Using tables, graph simple linear equations.</p>	<p><u>Understanding Graphing</u> Section 8. Equation of a Straight Line Graph $y = mx + b$ Examples 1, 2, 3, 4 Patterns to Summary Examples 5, 6, 7, 8 Slope, Y-intercept Equations Concept Examples 1, 2, 3, 4 Exercise: Slope, Y-intercept Concept Examples 1, 2, 3, 4</p>