

**CORRELATION**  
of  
**the 10 UNDERSTANDING MATH PLUS PROGRAMS**  
with  
**NEVADA MATH CONTENT STANDARDS**  
EIGHTH Grade

**Note: a.** The Understanding Math PLUS series of programs consist of 10 programs written for Kindergarten to 10<sup>th</sup> Grade.

**The 10 programs are:**

- Understanding Fractions
- Understanding Probability
- Understanding Exponents
- Understanding Algebra
- Understanding Numeration
- Understanding Measurement and Geometry
- Understanding Whole Numbers and Integers
- Understanding Percent
- Understanding Equations
- Understanding Graphing

**Note: b.** The Understanding Numeration software for K to 3 is set up so that the teacher selects items in the following order:  
**Concept** .. from 5 concepts .. Counting, Comparing & Ordering, Place Value, Operations and Problem Solving.  
**Skill** .. chosen from the list of specific learning expectations  
**Level** .. indicates the levels of development for Kindergarten to 3<sup>rd</sup> grade.

Level	Upper Range of Number
A	10
B	20
C	100
D	1000

**Lesson** .. 250 lessons are sequenced to build understanding of concepts.  
**A detailed Lesson Synopsis** on the website [www.neufeldmath.com](http://www.neufeldmath.com) to assist the teacher by stating the lesson contents but also by giving lesson suggestions.  
**Worksheet** .. off computer worksheets are selected from the CD by a code.

**Note: c.** The remaining 9 Understanding Math programs for 4<sup>th</sup> to 10<sup>th</sup> grade are set up so that they can be used in a variety of teaching and learning environments ranging from a teacher centered approach with 1 computer to a student centered lab approach. The lessons can also be used in remediation, tutorial, intervention, resource, fast-tracking.  
 Each topic has:  
 ..an interactive concept introduction, usually with a variety of graphic approaches.  
 ..a number of particular examples  
 ..practice questions with random questions but particular feedback  
 ..a topic test with random questions and tracking  
 ..off computer worksheets selected from the website .. [www.neufeldmath.com](http://www.neufeldmath.com)

**Numbers, Number Sense, and Computation**

**Content Standard 1.0:** *To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will accurately calculate, use estimation techniques, number relationships, operation rules, and algorithms; they will determine the reasonableness of answers and the accuracy of solutions.*

By the end of <b>Grade 8</b> , students know and are able to do everything required in the previous grades and:	Understanding Math PLUS Programs
<p>I/S</p> <p>1.8.1 Read, write, add, subtract, multiply, and divide <b>real numbers</b> in various forms including <b>radicals</b>, exponential, and <b>scientific notation</b>. Ec 2.8.2; Ec 9.8.4; H 3.8.4</p>	<p><b>MAT+ Understanding Exponents</b>  <b>Topic 2: Exponents in Formulas</b>            The Power Key            An Introduction            Power with a Positive Base            Power with a Negative Base            Adding Two Powers: Long Way            Adding Two Powers: Short Way            An Introduction to Formulas            Area Formulas Involving Exponents            Volume Formulas Involving Exponents</p> <p><b>Topic 3: The Exponent Rules</b>            In This 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            Expanding the Exponents            In General            A Power with Exponent 0            Explanation with <math>b</math>; Explanation with <math>a</math>            Summary            A Power with a <b>NEGATIVE</b> Exponent            Method 1: Explanation with <math>b</math>            Method 2: Explanation with <math>k</math></p>

<p>1.8.2 Compute with rational and irrational numbers to solve a variety of problems including rates, recipes, unit costs, and percents (e.g., discounts, interest, sale, prices, commissions, taxes). Ec 9.8.4</p>	<p>Method 3: Bacteria Doubling Summary of Exponent Rules Powers with Rational Bases Examples 1,2,3 In General Examples Questions : Examples 1 through 11</p>
<p>E/S</p>	<p><b>MAT+ Understanding Percent</b> <b>Topic 7: Percent in Business</b> In This Topic Sales Tax Bicycle Question Coat Question Restaurant Tipping Discount Football Sale What Can I Afford? Which is Cheaper? Competitor's Discount Commission Car Salesman Real Estate Car Dealership Simple Interest What is it? Complete the Table Bank Interest Credit Card Bill Compound Interest What is it? Complete the Table Formula Spreadsheet Interest Calculator Bank Interest</p>
<p>1.8.3 Explain and apply number theory and the properties of real numbers to solve problems.</p>	
<p>H 3.8.4 E/S 1.8.6 Compare and order rational numbers.</p>	

<p>1.8.7 Estimate in problem-solving situations and in practical applications; determine the reasonableness of the answer and verify the results.</p>	<p>E/S</p>
<p>1.8.9 Explain the relationship among fractions, decimals, and percents; translate among various representations of equal numbers (e.g., from fractions to decimals to percents, various forms of “1” such as <math>\frac{3}{3}</math> or <math>\frac{16}{16}</math>) to solve problems efficiently.</p>	<p><b>MAT+ Understanding Fractions</b>  <b>Topic 6: Percents...Fractions...Decimals</b>  Expressing a percent as a Fraction  Introduction with/without Graphics  Expressing a Fraction in Simplest Form  Greatest Common Factor  Examples 1,2  Simplifying Fractions  Method 1,2  Examples  Examples 1,2,3,4  The Watering Can  Expressing a Percent as a Decimal  Introduction  Examples 1,2,3  Number Line #1  Decimal Strips  Concepts 1,2,3  Expressing a Decimal as a Percent  Examples 1,2,3  Summary and Pattern  % Nitrogen in the Air  Batting Averages  Expressing a Fraction as a Percent  An Example  Method 1  Examples 1,2  Method 2  Examples 1,2  Lightning Examples  Number Line #2  Chart</p>

## Patterns, Functions, and Algebra

**Content Standard 2.0:** *To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use various algebraic methods to analyze, illustrate, extend, and create numerous representations (words, numbers, tables, and graphs) of patterns, functions, and algebraic relations as modeled in practical situations.*

By the end of <b>Grade 8</b> , students know and are able to do everything required in the previous grades and:	Understanding Math PLUS Programs
<p>E/S</p> <p>2.8.1 Use <b>inductive reasoning</b> to find the missing term in number and geometric patterns and to generalize basic patterns to the <math>n</math>th term, with and without calculators; use written, oral, and <b>symbolic language</b> to identify and describe patterns, <b>sequences</b>, and <b>functions</b>.</p>	<p><b>MAT+ Understanding Algebra</b>  <b>Topic 3: Patterns, Patterns, Patterns</b>            Geometric Patterns            Examples 1, 2, 3, 4, 5, 6, 7, 8            Number Patterns            Examples 1, 2, 3, 4, 5, 6            Number and Geometric Patterns            Examples 1, 2            Patterns to Formulas            Examples 1, 2, 3</p>
<p>E/S</p> <p>2.8.2 Translate among verbal descriptions, graphic, tabular, and algebraic representations of mathematical situations.            Ec 3.8.2; S 1.8.1; S 1.8.4;            S 14.8.6; S 20.8.2</p>	<p><b>MAT+ Understanding Algebra</b>  <b>Topic 4: Patterns, Formulas, Substitution</b>            Introduction...Math is Patterns            Expressions, Terms, Variables            Definitions            Summary            Patterns to Formulas            Example...Hockey Standings            Example...Counting Money            Example...Angles in a Polygon</p>
<p>I/S</p> <p>2.8.3 Identify, model, describe, and evaluate relationships, including functions, using a variety of methods with and without technology.</p>	<p><b>MAT+ Understanding Graphing</b>  <b>Topic 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</p>
<p>I/S</p> <p>2.8.4 Add and subtract binomials; describe the connection between the algebraic process and the arithmetic process.</p>	<p><b>MAT+ Understanding Algebra</b>  <b>Topic 5: Adding Expressions</b>            Adding Expressions with X-Squared Tiles            Examples 1,2,3</p>

<p>2.8.5 Describe how a change in one variable of a mathematical relationship affects the remaining variables using various tools and methods.</p> <p>I/S</p>	<p>Adding Expressions without Tiles Examples 1,2 Practice Questions with Tiles Practice Questions without Tiles</p> <p><b>Topic 6: Subtracting Expressions</b> Our Problem Subtracting Expressions with X and Y Tiles Concept Examples 1,2 Subtracting Expressions with X-squared Tiles Examples 1,2 Subtracting Expressions without Tiles</p>
<p>2.8.6 Model, identify, and solve linear equations and inequalities; relate this process to the order of operations.</p> <p>H 3.8.4 I/S 2.8.7 Solve simple linear equations and connect that process to the order of operations.</p> <p>E/S</p>	<p><b>MAT+ Understanding Graphing</b> <b>Topic 8: Equation of a Straight Line</b> Slope – Point Form of the Equation Example 1 : Solutions 1,2 Example 2 : Solution 1,2,3,4 Special Cases Example 1 – Zero Slope Example 2 – Undefined Example to Summarize</p> <p><b>MAT+ Understanding Equations</b> <b>Topic 7: Solving Inequalities</b> Inequality on the Number Line Examples 1-4 Solving Inequalities Examples 1-6</p>

**Measurement**

**Content Standard 3.0:** *To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use appropriate tools and techniques of measurement to determine, estimate, record, and verify direct and indirect measurements.*

	Understanding Math PLUS Programs
<p>By the end of <b>Grade 8</b>, students know and are able to do everything required in the previous grades and:</p> <p>3.8.2 Demonstrate an understanding of precision, error, and <b>tolerance</b> in measurement using the appropriate measurement tool to the required degree of accuracy. S.23.8.5</p>	
<p>3.8.3 Select and apply appropriate formulas to solve problems; identify the relationship between changes in area and volume and changes in linear measures of figures.</p>	<p><b>MAT+ Understanding Measurement and Geometry</b>  <b>Topic 4: Solids: Volume and Surface Area</b>            Surface Area of a Solid            The Concept            Surface Area of a Pyramid            Surface Area of a Cylinder            Surface Area of a Sphere              Volume of a Solid            The Concept            Volume of a Prism: Examples 1, 2            Volume of a Cylinder            Volume of a Pyramid            Volume of a Cone            Volume of a Sphere            Summary</p>
<p>3.8.5 Apply ratios and proportions to calculate rates and as a method of indirect measure (e.g., miles per hour, cost per unit).             Ec 2.8.2; S 23.8.1</p>	<p><b>MAT+ Understanding Percent</b>  <b>Topic 4: Ratios and Proportions</b>            Ratios in the News            What is a Ratio            Examples            1. Fraction Strip            2. Balls            3. Students            4. Gears              Writing Ratios            Concept            Examples 1,2,3,4              What is Proportion?            Proportions            Example 1            Example 2- Lemonade            Example 3 – Marbles</p>

	<p>Example 4 – Trout          Example 5 – Tree Height          Example 6 – Map          Example 7 – Scale Drawing          Ratios and Your Body          Golden Ratios          Measuring Your Body</p>
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**Spatial Relationships and Geometry**

**Content Standard 4.0:** *To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will identify, represent, explain, verify, and apply spatial relationships and geometric properties.*

<p>By the end of <b>Grade 8</b>, students know and are able to do everything required in the previous grades and:</p> <p>4.8.2          Apply the properties of equality and proportionality to solve problems involving congruent or similar shapes.</p> <p>H.3.8.4          I/S</p> <p>4.8.3          Use coordinate geometry and models to change scale (enlarge and reduce).</p>	<p>Understanding Math PLUS Programs</p>
<p><b>MAT+ Understanding Measurement and Geometry</b>  <b>Topic 8 : Projective Geometry</b>          An Introduction          Toothpicks on Isometric Dot Paper          Toothpicks to Cube          The Views          Using Isometric Grid Paper          Orthographic Projections: Introduction          The Cube Tool          Introduction          Tutorial          Play with Tool          Given Solid – Build it          Examples 1 through 6          Given Views – Build it          Examples 1 through 6</p>	

<p>I/S</p> <p>4.8.5 Use coordinate geometry to represent and interpret relationships defined by equations and formulas (including distance, midpoint, and slope), with and without technology.</p>	<p><b>MAT+ Understanding Graphing</b> <b>Topic 7: Slope of a Line</b> Positive and Negative Slopes Examples 1,2,3,4 Pattern</p> <p>Sketch Line Given Point and Slope Examples 1,2,3,4</p> <p>Slopes of Parallel Lines Examples 1,2,3</p> <p>Slopes of Perpendicular Lines Examples 1,2,3 Pattern</p>
<p>I/S</p> <p>4.8.6 Form generalizations and validate conclusions about properties of geometric shapes including parallel lines, perpendicular lines, bisectors, triangles, and quadrilaterals.</p> <p>H 3.8.4</p>	<p><b>MAT+ Understanding Measurement and Geometry</b> <b>Topic 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>
<p>I/S</p> <p>4.8.7 Verify and explain the Pythagorean Theorem using various methods (e.g., using grid paper, applying it to a missing side of a right triangle); determine missing sides and angles of triangles based on properties of their sides and angles.</p> <p>H 3.8.4</p>	<p><b>MAT+ Understanding Exponents</b> <b>Topic 6: Pythagorean Theorem</b> 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>
<p>W/L</p> <p>4.8.8 Use hand tools, technology, and models to construct figures and bisect angles and line segments; distinguish among constructions, sketches and drawings.</p>	<p><b>MAT+ Understanding Measurement and Geometry</b> <b>MAT+ Understanding Measurement and Geometry</b> <b>Topic 7: Constructions</b> Before You Begin In This Topic Perpendicular Bisector Circumcircle</p>

	Centroid Angle Bisector
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**Data Analysis**

**Content Standard 5.0:** *To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will collect, organize, display, interpret, and analyze data to determine statistical relationships and probability projections.*

Understanding Math PLUS Programs	
By the end of <b>Grade 8</b> , students know and are able to do everything required in the previous grades and:	
<p>E/S</p> <p>5.8.1 Organize, display, read, and analyze data, with and without technology, using a variety of displays including box and whisker plots.</p>	<p><b>MAT+ <u>Understanding Graphing</u></b>            Data...What is it?            Examples of Data            Example 1 – Fast Food Earnings            Example 2 – Infant’s Walk            Example 3- Canada and U.S. Forecast            Example 4 – King of the Strike Out            Example 5 – U.S. Stake in India            Example 6 – Allergy Troubles            A Summary: Examples            Statistics... What is it?            Collecting Data            Throw a Die            Throw 2 Dice            Voting            Primary Data – Gathering Methods            Secondary Data – Gathering Methods</p>
<p>I/S</p> <p>5.8.2 Find the theoretical probability of an event using different counting methods ( e.g., tree diagrams, sample spaces, and organized lists) and compare those results with actual (experimental) results, differentiating between the probability of an event and the odds of an event.            S 22.8.3</p>	<p><b>MAT+ <u>Understanding Probability</u></b>  <b>Topic 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>

<p>I/S</p> <p>5.8.3 Find the number of combinations possible in given situations using a variety of counting methods.</p>	<p><b>MAT+ Understanding Graphing</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</p>
<p>E/S</p> <p>5.8.5 Evaluate arguments that are based on data analysis for accuracy and validity; analyze the effect a change of scale or a change of format will have on statistical charts and graphs.</p>	<p>S 19.8.1</p> <p>I/S</p> <p>5.8.6 Formulate reasonable inferences and projections based on interpolations and extrapolations of data to solve problems.</p> <p>S 20.8.2; S 23.8.6</p>