CORRELATION
of
the 10 UNDERSTANDING MATH PLUS PROGRAMS
with
California State Board of Education ACADEMIC CONTENT STANDARDS

For Grade 6

Note: a. The Understanding Math PLUS series of programs consist of 10 programs written for Kindergarten to 10th 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 3rd 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 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 4th to 10th 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

Grade Six

Mathematics Content Standards.

NUMBER SENSE

1.0 Students compare and order positive and negative fractions, decimals, and mixed numbers. Students solve problems involving fractions, ratios, proportions, and percentages:

Content Standard	Understanding Math PLUS computer assisted lessons
1.1 Compare and order positive and negative fractions, decimals, and mixed numbers and place them on a number line.	**MAT+ Understanding Fractions** **Topic 1: The Meaning of Fractions** Fraction on a Number Line Halves Thirds Quarters Summary **Topic 5: Introduction to Decimals** Comparing Decimals Examples 1,2,3,4 Ordering Decimals Introduction Examples 1,2,3,4
1.2 Interpret and use ratios in different contexts (e.g., batting averages, miles per hour) to show the relative sizes of two quantities, using appropriate notations (*a/b, a* to *b, a:b*).	**MAT+ Understanding Percent** **Topic 4: Ratios and Proportions** 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
1.3 Use proportions to solve problems (e.g., determine the value of *N* if 4/7 = *N*/ 21, find the length of a side of a polygon similar to a known polygon). Use cross-multiplication as a method for solving such problems, understanding it as the multiplication of both sides of an equation by a multiplicative inverse.	**MAT+ Understanding Percent** **Topic 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
1.4 Calculate given percentages of quantities and solve problems involving discounts at sales, interest earned, and tips.	**MAT+ Understanding Percent** **Topic 7: Percent in Business** In This Topic Sales Tax Bicycle Question Coat Question Restaurant Tipping Discount Football Sale

	What Can I Afford? Which is Cheaper? Competitor's Discount Simple Interest What is it? Complete the Table Bank Interest Credit Card Bill

2.0 Students calculate and solve problems involving addition, subtraction, multiplication, and division:

Content Standard	Understanding Math PLUS computer assisted lessons
2.1 Solve problems involving addition, subtraction, multiplication, and division of positive fractions and explain why a particular operation was used for a given situation.	**MAT+ Understanding Fractions** **Topic 8: Adding Fractions** Word Problems Alexander's Friends Eating Candy Goal Scoring Taking a Walk **Topic 9: Subtracting Fractions** Word Problems Pedro and Alex Race Washing the Cars Planting a Garden **Topic 10: Multiplying Fractions** Word Problems Boris' Money Maria's Trip A Summary The Meaning of "OF" Order in Multiplying Examples 1,2 Multiplying Fractions with Large Numbers Examples 1,2 **Topic 14: Dividing Fractions** Examples without Diagrams Numerical Examples 1,2 Central High School
2.2 Explain the meaning of multiplication and division of positive fractions and perform the calculations (e.g., 5/8 ÷ 15/16 = 5/8 x 16/15 = 2/3).	**Topic 10: Multiplying Fractions** Pattern Blocks Hexagons 1,2,3 Fractions Strips Concepts 1,2 Word Problems Boris' Money Maria's Trip A Summary The Meaning of "OF" Order in Multiplying Examples 1,2 **Topic 14: Dividing Fractions** Understanding Division Examples with Diagrams Soda Pop

	Ice Cream Shapes 1 & 2 Patterns from Examples Another Explanation Examples 1 & 2
2.3 Solve addition, subtraction, multiplication, and division problems, including those arising in concrete situations, that use positive and negative integers and combinations of these operations.	**MAT+ Understanding Whole Numbers and Integers** **Topic 5: Adding Integers** Word Problems Temperature Money Car Practice Questions; Topic Test **Topic 6: Subtracting Integers** Example Questions Example 1 – With Brackets Example 2 – With Brackets Example 3 – Meaning of …2-5 Example 4 – Meaning of -7-3 Example 5 – Meaning of -7+9-18 Example 6 – Meaning of -4-9+2-8 Summary from Examples 3 to 6 Word Problems The Sailboat The Bank Practice Questions; Topic Test **Topic 7: Multiplying Integers** Word Problems Washing Cars The Helicopter Construction Practice Questions; Topic Test **Topic 8: Dividing Integers** Word Problems Casino Plant Graham's Walk Practice Questions; Topic Test
2.4 Determine the least common multiple and the greatest common divisor of whole numbers; use them to solve problems with fractions (e.g., to find a common denominator to add two fractions or to find the reduced form for a fraction).	**MAT+ Understanding Fractions** **Topic 3: Equivalent Fractions** Greatest Common Factor 12 and 18 30 and 40 70 and 42 Simplifying Fractions to Simplest Form Methods 1,2

ALGEBRA AND FUNCTIONS

1.0 Students write verbal expressions and sentences as algebraic expressions and equations; they evaluate algebraic expressions, solve simple linear equations, and graph and interpret their results:

Content Standard	Understanding Math PLUS computer assisted lessons
1.1 Write and solve one-step linear equations in one variable.	**MAT+ Understanding Equations** **Topic 2: Solving One-step Equations** Our Problem Concepts – Examples with Tiles

	Examples 1 through 4 Concepts – Examples without Tiles Practice Questions; Topic Test **MAT+ Understanding Graphing** In This Topic What is a Linear Relation? Graphs of Linear Relations Concept Examples 1 through 6
1.2 Write and evaluate an algebraic expression for a given situation, using up to three variables. **1.3** Apply algebraic order of operations and the commutative, associative, and distributive properties to evaluate expressions; and justify each step in the process.	**MAT+ Understanding Algebra** **Topic 4: Patterns, Formulas, Substitution** Introduction…Math is Patterns Expressions, Terms, Variables Definitions Summary Patterns to Formulas Example…Hockey Standings Example…Counting Money Example…Angles in a Polygon Substitution is…Math Scrabble Scrabble 1,2,3 Challenge Substitution Examples Examples 1,2,3,4
1.4 Solve problems manually by using the correct order of operations or by using a scientific calculator.	**MAT+ Understanding Whole Numbers and Integers** **Topic 9: Order of Operations** Why use Order of Operations? BEDMAS Example Questions Examples 1 through 10 Word Problems Shipping Babysitting Garbage

2.0 Students analyze and use tables, graphs, and rules to solve problems involving rates and proportions:

Content Standard	Understanding Math PLUS computer assisted lessons
2.1 Convert one unit of measurement to another (e.g., from feet to miles, from centimeters to inches).	**MAT+ Understanding Measurement and Geometry** **Topic 1: An Introduction to Measurement** Measurement in the News A Glimpse into the Past Metric and US Standard Measurement Searching for Standardized Measurements Related Units from Metric Prefixes Metric Prefixes at Work Converting Between Metric Units
2.2 Demonstrate an understanding that *rate* is a measure of one quantity per unit value of another quantity.	
2.3 Solve problems involving rates, average speed, distance, and time.	

3.0 Students investigate geometric patterns and describe them algebraically:

Content Standard	Understanding Math PLUS computer assisted

	lessons
3.1 Use variables in expressions describing geometric quantities (e.g., $P = 2w + 2l$, $A = 1/2bh$, $C = pd$ - the formulas for the perimeter of a rectangle, the area of a triangle, and the circumference of a circle, respectively).	**MAT+ <u>Understanding Measurement and Geometry</u>** **Topic 2: Perimeter and Area of Polygons** Walk Around a Polygon Joan Walks Perimeter of Various Shapes Perimeter of the Ranch Length of the Metal Strip Find the Perimeter Amount of Surface The Driveway – An Introduction to Area Area – Estimation Area of a Rectangle Area of a Parallelogram Area of a triangle Relationship – Area and Perimeter Squares Rectangles Given Area and Perimeter – Create Shapes Examples 1, 2, 3, 4 **Topic 3: The Circle** Radius, Circumference, Diameter PI…A Special Number Introduction How do we Measure Circumference? Measuring Circles Summary
3.2 Express in symbolic form simple relationships arising from geometry.	**MAT+ <u>Understanding Measurement and Geometry</u>** **Topic 2: Perimeter and Area of Polygons** Given Area and Perimeter – Create Shapes Examples 1, 2, 3, 4 Problems Section Length of Fence Area of a Wall The Tablecloth

MEASUREMENT AND GEOMETRY

1.0 Students deepen their understanding of the measurement of plane and solid shapes and use this understanding to solve problems:

Content Standard	Understanding Math PLUS computer assisted lessons
1.1 Understand the concept of a constant such as p; know the formulas for the circumference and area of a circle. **1.2** Know common estimates of p (3.14; 22/7) and use these values to estimate and calculate the circumference and the area of circles; compare with actual measurements.	**MAT+ <u>Understanding Measurement and Geometry</u>** **Topic 3: The Circle** Circumference of a Circle Circumference Example 1 – Egg Example 2 – The Well Example 3 – The Rolling Coin Example 4 – The Semi-Circle Area of a Circle Recall Area Area Exploration #1, #2 Example 1 – Wheel Example 2 – Pizza Example 3 – The Semi-circle Example 4 – The Dog's Run Example 5 – The Hockey Rink

1.3 Know and use the formulas for the volume of triangular prisms and cylinders (area of base x height); compare these formulas and explain the similarity between them and the formula for the volume of a rectangular solid.	**MAT+ Understanding Measurement and Geometry** **Topic 4: Solids: Volume and Surface Area** Volume of a Solid The Concept Volume of a Prism: Examples 1, 2 Volume of a Cylinder

2.0 Students identify and describe the properties of two-dimensional figures:

Content Standard	Understanding Math PLUS computer assisted lessons
2.1 Identify angles as vertical, adjacent, complementary, or supplementary and provide descriptions of these terms. **2.2** Use the properties of complementary and supplementary angles and the sum of the angles of a triangle to solve problems involving an unknown angle.	**MAT+ Understanding Measurement and Geometry** **Topic 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 Practice Questions; Topic Test
2.3 Draw quadrilaterals and triangles from given information about them (e.g., a quadrilateral having equal sides but no right angles, a right isosceles triangle).	

STATISTICS, DATA ANALYSIS, AND PROBABILITY

1.0 Students compute and analyze statistical measurements for data sets:

Content Standard	Understanding Math PLUS computer assisted lessons
1.1 Compute the range, mean, median, and mode of data sets. **1.2** Understand how additional data added to data sets may affect these computations of measures of central tendency. **1.3** Understand how the inclusion or exclusion of outliers affects measures of central tendency. **1.4** Know why a specific measure of central tendency (mean, median, mode) provides the most useful information in a given context.	**MAT+ Understanding Graphing** **Topic 2: Statistics** Measures of Central Tendency Introduction The Mean Average The Median Average The Mode Summary Another Example Adding Data Points

2.0 Students use data samples of a population and describe the characteristics and limitations of the samples:

Content Standard	Understanding Math PLUS computer assisted lessons
2.1 Compare different samples of a population with the data from the entire population and identify a situation in which it makes sense to use a sample.	
2.2 Identify different ways of selecting a sample (e.g., convenience sampling, responses to a survey, random sampling) and which method makes a sample more representative for a population.	
2.3 Analyze data displays and explain why the way in which the question was asked might have influenced the results obtained and why the way in which the results were displayed might have influenced the conclusions reached.	
2.4 Identify data that represent sampling errors and explain why the sample (and the display) might be biased.	
2.5 Identify claims based on statistical data and, in simple cases, evaluate the validity of the claims.	

3.0 Students determine theoretical and experimental probabilities and use these to make predictions about events:

Content Standard	Understanding Math PLUS computer assisted lessons
3.1 Represent all possible outcomes for compound events in an organized way (e.g., tables, grids, tree diagrams) and express the theoretical probability of each outcome.	**MAT+ <u>Understanding Probability</u>** **Topic 1 .. An Introduction to Probability** The Language of Chance Impossible to Certain Activity 1 Activity 2 Probability Lines Line 1 Line 2 Experiments with Spinners Experiment 1, Experiment 2 …. Experiment 6 The Spinner Game Board 1 Board 2 IT's in the Bag Tree Diagrams Meals Socks
3.2 Use data to estimate the probability of future events (e.g., batting averages or number of accidents per mile driven).	
3.3 Represent probabilities as ratios, proportions, decimals between 0 and 1, and percentages between 0 and 100 and verify that the probabilities	

computed are reasonable; know that if *P* is the probability of an event, 1- *P* is the probability of an event not occurring.	
3.4 Understand that the probability of either of two disjoint events occurring is the sum of the two individual probabilities and that the probability of one event following another, in independent trials, is the product of the two probabilities.	**MAT+ Understanding Probability** **Topic 7: Independent Events** In This Topic What are They? Examples 1,2
3.5 Understand the difference between independent and dependent events.	**MAT+ Understanding Probability** **Topic 7: Independent Events** In This Topic What are They? Examples 1,2 **Topic 8: Dependent Events** In This Topic What Are They? Independent Events Dependent Events Examples 1,2 Probability – Examples 1,2,3

MATHEMATICAL REASONING

1.0 Students make decisions about how to approach problems:

Content Standard	Understanding Math PLUS computer assisted lessons
1.1 Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.	**Understanding Math PLUS…all programs**
1.2 Formulate and justify mathematical conjectures based on a general description of the mathematical question or problem posed.	**Understanding Math PLUS…all programs**
1.3 Determine when and how to break a problem into simpler parts.	**Understanding Math PLUS…all programs**

2.0 Students use strategies, skills, and concepts in finding solutions:

Content Standard	Understanding Math PLUS computer assisted lessons
2.1 Use estimation to verify the reasonableness of calculated results.	
2.2 Apply strategies and results from simpler problems to more complex problems.	**Understanding Math PLUS…all programs**
2.3 Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.	
2.4 Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and	**MAT+ Understanding Equations** **Topic 5: Word Problems**

models, to explain mathematical reasoning. **2.5** Express the solution clearly and logically by using the appropriate mathematical notation and terms and clear language; support solutions with evidence in both verbal and symbolic work.	Words and Symbols The Translation Machine Examples 1,2,3,4 The Trick Machine Instructions The Machine Explanation with Picture; with Symbols Area of Walls Chemistry Pools Puzzler – The First Problem Perimeter Problem with Diagram Money Problem with Chart Age Problem with Chart Buying CDs Meat Mixture Coffee Mixture Rate of Work Summary: Problem Solving Using Equations Practice Questions; Topic Test
2.6 Indicate the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.	
2.7 Make precise calculations and check the validity of the results from the context of the problem.	

3.0 Students move beyond a particular problem by generalizing to other situations:

Content Standard	Understanding Math PLUS computer assisted lessons
3.1 Evaluate the reasonableness of the solution in the context of the original situation.	
3.2 Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems.	
3.3 Develop generalizations of the results obtained and the strategies used and apply them in new problem situations.	