CORRELATION
of
the 10 UNDERSTANDING MATH PLUS PROGRAMS & UNDERSTANDING NUMERATION PLUS PROGRAMS
with
DELAWARE MATHEMATICS CONTENT STANDARDS

K-3

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

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

STANDARD #1
Students will develop their ability to SOLVE PROBLEMS by engaging in developmentally appropriate problem-solving opportunities in which there is a need to use various approaches to investigate and understand mathematical concepts; to formulate their own problems; to find solutions to problems from everyday situations; to develop and apply strategies to solve a wide variety of problems; and to integrate mathematical reasoning, communication and connections.

PERFORMANCE INDICATORS
Through the investigation of meaningful problems, individually or in cooperative groups while using appropriate technology, all students in grades K-10 will be able to:
1.01 persist and solve problems from start to finish;
1.02 investigate and build their understanding of mathematical content;
1.03 formulate problems from everyday and mathematical situations;
1.04 develop and apply strategies to solve problems;
1.05 interpret results with respect to the original problem;
1.06 generalize strategies and solutions to new problem situations.
NUM+ Problem Solving
All Sections
MAT+ *All Programs*

STANDARD #2
Students will develop their ability to COMMUNICATE MATHEMATICALLY by solving problems in which there is a need to obtain information from the real world through reading, listening and observing; to translate this information into mathematical language and symbols; to process this information mathematically; and to present results in written, oral and visual formats.

PERFORMANCE INDICATORS
Through the investigation of meaningful problems, individually or in cooperative groups while using appropriate technology, all students in grades K-10 will be able to:
2.01 model real-world situations using oral, written, concrete, pictorial, graphical and algebraic methods;
2.02 use reading, listening, viewing, speaking and writing to explain and develop mathematical ideas;
2.03 use mathematical notation and language to describe and discuss real-world situations;
2.04 read mathematics with understanding;
2.05 develop common understandings of mathematical ideas and use generalizations discovered through investigations to formulate definitions;
2.06 ask questions to clarify the problem situation.
NUM+ Problem Solving
All Sections
MAT+ ***All Programs***

STANDARD #3
Students will develop their ability to REASON MATHEMATICALLY by solving problems in which there is a need to investigate significant mathematical ideas in all content areas; to justify their thinking; to reinforce and extend their logical reasoning abilities; to reflect on and clarify their own thinking; to ask questions to extend their thinking; and to construct their own learning.

PERFORMANCE INDICATORS
Through the investigation of meaningful problems, individually or in cooperative groups while using appropriate technology, all students in grades K-10 will be able to use inductive and deductive reasoning to:
3.01 formulate and test conjectures;
3.02 draw and then justify conclusions;

3.03 construct and follow logical arguments;
3.04 use properties, models, known facts, and relationships to explain and defend their thinking.
NUM+ Problem Solving
All Sections
MAT+ *All Programs*

STANDARD #4
Students will develop their ability to make MATHEMATICAL CONNECTIONS by solving problems in which there is a need to view mathematics as an integrated whole and to integrate mathematics with other disciplines, while allowing the flexibility to approach problems, from within and outside mathematics, in a variety of ways.

PERFORMANCE INDICATORS
Through the investigation of meaningful problems, individually or in cooperative groups while using appropriate technology, all students in grades K-10 will be able to:
4.01 make connections linking conceptual and procedural knowledge;
4.02 integrate mathematical problem-solving with other curricular areas;
4.03 use connections among mathematical topics;
4.04 use various representations of the same concept;
4.05 make connections from manipulative solutions to algorithmic solutions to technological solutions;
4.06 determine the reasonableness of a mathematical solution as it applies in a real-world situation.
STANDARDS #1-4 VIGNETTE GRADE K-3
Please see the document found at:
http://www.doe.k12.de.us/Standards/Math/standards1_4.htm#VIGNETTE%20K-3

NUM+ COUNTING
Reading and Printing Numerals
All Sections

Standard Five	
Students will develop an understanding of ESTIMATION, MEASUREMENT, and COMPUTATION by solving problems in which there is a need to measure to a required degree of accuracy by selecting appropriate tools and units; to develop computing strategies and select appropriate methods of calculation from among mental math, paper and pencil, calculators or computers; to use estimating skills to approximate an answer and to determine the reasonableness of results.	
PERFORMANCE INDICATORS: K-10	
Through the investigation of meaningful problems, individually or in cooperative groups while using appropriate technology, all students in grades K-3 will be able to:	
5.10 estimate and then measure length, perimeter, time, temperature, and weight/mass to the nearest unit using standard and nonstandard units;	**NUM+ COUNTING** **Recognize and Count Solids B, C** Counting Solids #1, #2 **COMPARING AND ORDERING** **Understand Measurement of Time B, C, D** The Clock Times to the Hour Analog and Digital Times to the Half Hour Times to Five Minutes Times to the Minute

	Describe Elapsed Time…Hours, 5 Minutes C, D Elapsed Time in Hours #1, #2 Elapsed Time – 5 Minutes #1, #2 Time Goes By – Analog, Digital **Describe Elapsed Time …Minutes, D** Elapsed Time – Minutes 1, 2 **Describe Back in Time…Minutes D** Back in Time **Reading and Comparing Temperatures C** Fahrenheit and Celsius Temperatures Compare Temperatures in a Day
5.11 determine the value of a given set of coins;	**NUM+ COUNTING** **Counting Using Money B, C, D** Pennies, Nickels, Dimes Coins – Count by 10s, 5s, and 1s Quarters Dollars
5.12 measure and compute the perimeter of rectangles;	**MAT+ UNDERSTANDING MEASUREMENT AND GEOMETRY** **Topic 2. Perimeter and Area of Polygons** Walk Around a Polygon
5.13 use multiple computational procedures with whole numbers;	**NUM+ OPERATIONS** ***ALL SECTIONS***
5.14 add and subtract single-digit and multi-digit whole numbers;	**NUM+ OPERATIONS** **Add 2-, 3- Digit Numbers** **Subtract 2 -, 3 – Digit Numbers**

5.15 multiply whole numbers using at least one single-digit factor ;	**NUM+ OPERATIONS** **Introduce Multiplication Facts…1 through 9 C** *All Sections* **Demonstrate Commutative Properties C** *All Sections* **Note Patterns in 10X10 Multiplication Table D** *All Sections*
5.16 divide whole numbers using single-digit divisors;	**NUM+ OPERATIONS** **Introduction to Division C** *All Sections* **Introduce Division Facts 2 through 9 C, D** *All Sections*
5.17 make estimates before measuring, counting and computing;	
5.18 round whole numbers and values of money as an estimation strategy;	
5.19 select appropriate measures to compare objects;	
5.20 compare objects through measurable attributes;	
5.21 read and write decimal notation when representing money.	**NUM+ COUNTING** **Counting Using Money B, C, D** Pennies, Nickels, Dimes Coins – Count by 10s, 5s, and 1s Quarters Dollars

STANDARD #6	
Students will develop NUMBER SENSE by solving problems in which there is a need to represent and model real numbers verbally, physically and symbolically; to use operations with understanding; to explain the relationships between numbers; to apply the concept of a unit; and to determine the relative magnitude of real numbers.	
PERFORMANCE INDICATORS: K-10	
Through the investigation of meaningful problems, individually or in cooperative groups while using appropriate technology,	
all students in grades K-3 will be able to:	
6.10 connect physical, verbal and symbolic representations of whole numbers;	
6.11 show whole/part relationships;	
6.12 use fractions to represent part of a whole and part of a set;	**NUM+ COUNTING** **<u>Introduce Common Fractions as Parts of a Whole B, C</u>** One Half of a Shape Two Thirds of a Shape Three Quarters of a Shape Cut in Half Fifths to Tenths Write the Fraction **<u>Introduce Fraction of a Set C</u>** Fraction of a Set
6.13 decompose and recompose whole numbers	**NUM+ OPERATIONS**

using addition and subtraction;	*Addition & Subtraction…All Sections*
6.14 build whole numbers using the concept of place value using base ten;	**NUM+ PLACE VALUE** **Break Numbers into Groups B, C** Making Groups Break 12 into Groups Break 15 into Groups Break 27 into Groups Breaking into Groups of 10 Groups of Items **Model Numbers Grouped in Packages** Ones and Groups of Tens **Identify Place Value Patterns (to 20) C** Pictures to Numbers Tens and Ones to Picture Numbers to Pictures
6.15 demonstrate an understanding of order relations for whole numbers;	
6.16 examine the relative effect of operations on whole numbers;	**NUM+ OPERATIONS** *All Sections*
6.17 recognize the arbitrary size of a unit;	
6.18 connect repeated addition with multiplication and repeated subtraction with division;	**NUM+ OPERATIONS** **Topic 3. Multiplying and Dividing Whole Numbers: Multiply by a Single Digit Multiplier** Repeated Addition: Examples 1 through 4
6.19 recognize inverse operations:	**MAT+ Understanding Whole Numbers and Integers**

subtraction/addition and division/multiplication;	**Topic 3. Multiplying and Dividing Whole Numbers: Multiply by a Single Digit Multiplier** *All Sections*
6.20 count sets of objects and units of measure;	
6.21 count on, count back, and count by multiples.	**NUM+ COUNTING** **Counting Backwards A, B** Counting Backwards Counting Up and Down

STANDARD #7	
Students will develop an understanding of ALGEBRA by solving problems in which there is a need to progress from the concrete to the abstract using physical models, equations and graphs; to generalize number patterns; and to describe, represent and analyze relationships among variable quantities.	
PERFORMANCE INDICATORS: K-10	
Through the investigation of meaningful problems, individually or in cooperative groups while using appropriate technology,	
all students in grades K-3 will be able to:	
7.10 represent operations with symbols;	**NUM+ OPERATIONS** **Introduce the words… "plus" and "equals" A** Addition Using Gumballs Addition Using Beans Add Number of Sides of Shapes

7.11 use symbols as representations of variables such as missing addends or factors;	
7.12 generate and write number sentences vertically and horizontally;	**NUM+ OPERATIONS** *All Sections*
7.13 solve open sentences using informal methods.	

STANDARD #8	
Students will develop SPATIAL SENSE and an understanding of GEOMETRY by solving problems in which there is a need to recognize, construct, transform, analyze properties of, and discover relationships between, geometric figures.	
PERFORMANCE INDICATORS: K-10	
Through the investigation of meaningful problems, individually or in cooperative groups while using appropriate technology, all students in grades K-3 will be able to:	
8.10 sort solid and plane figures by common attributes;	**NUM+ COUNTING** **Recognize and Count Solids B, C** Counting Solids #1, #2
8.11 recognize congruence of geometric figures in the real world;	
8.12 identify and create symmetrical shapes (line symmetry);	**MAT+ UNDERSTANDING GRAPHING** **Topic 4. Transformations** Line of Symmetry – An Introduction

	Introduction, Examples Symmetry Match Puzzles 1,2
8.13 draw an example of a flip, slide, or turn given a model;	**MAT+ UNDERSTANDING GRAPHING** **Topic 4. Transformations** What is a Transformation? Introduction to Common Transformations
8.14 draw a square, rectangle, and triangle on grid paper;	
8.15 describe the effect of combining two or more shapes.	

STANDARD #9	
Students will develop an understanding of STATISTICS AND PROBABILITY by solving problems in which there is a need to collect, appropriately represent, and interpret data; to make inferences or predictions; to present convincing arguments; and to model mathematical situations to determine the probability.	
PERFORMANCE INDICATORS: K-10	
Through the investigation of meaningful problems, individually or in cooperative groups while using appropriate technology, all students in grades K-3 will be able to:	
9.10 collect data by observing, measuring, surveying and counting;	**MAT+ UNDERSTANDING PROBABILITY** **Topic 1. What's Possible?**

	All Sections
9.11 demonstrate a variety of techniques for representing and organizing data such as using physical objects, tallies, pictographs, and bar graphs;	**MAT+ UNDERSTANDING GRAPHING** **Topic 2. Statistics** An Introduction Tally Chart Pictograph Bar Graph Line Graph
9.12 interpret data by: looking for patterns and relationships, considering cause and effect, drawing conclusions, answering the stated question or related questions;	
9.13 determine the likelihood of a simple chance event.	**MAT+ UNDERSTANDING PROBABILITY** **Topic 1. What's Possible?** *All Sections*

STANDARD #10	
Students will develop an understanding of PATTERNS, RELATIONSHIPS AND FUNCTIONS by solving problems in which there is a need to recognize and extend a variety of patterns; and to analyze, represent, model and describe real-world functional relationships.	
PERFORMANCE INDICATORS: K-10	
Through the investigation of meaningful problems, individually or in cooperative groups	

while using appropriate technology, all students in grades K-3 will be able to:	
10.10 sort and classify objects by common attributes;	**MAT+ UNDERSTANDING MEASUREMENT AND GEOMETRY** **Topic 2. Perimeter and Area of Polygons** Polygons…What are They?
10.11 recognize, analyze, create and extend visual, symbolic, oral and physical patterns;	
10.12 sort numbers into different classes such as evens, odds, multiples and factors.	