

CORRELATION
of
the 10 UNDERSTANDING MATH PLUS PROGRAMS
with
Louisiana Mathematics Framework
Benchmarks 5-8

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

Framework Standards:

NUMBER and NUMBER RELATIONS

Benchmarks 5-8

Students in Grades 5-8 use estimation, mental arithmetic, number lines, graphs, appropriate models, manipulatives, calculators, and computers as they extend their investigations of problems involving rational numbers. As a result, what they know and are able to do includes:

Standard	Understanding Math PLUS Program and Lesson
N-1-M demonstrating that a rational number can be expressed in many forms, and selecting an appropriate form for a given situation (e.g., fractions, decimals, and percents);	MAT+ <u>Understanding Fractions</u> Topic 6: Percents...Fractions...Decimals 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

	<p>Examples 1,2 Method 2 Examples 1,2 Lightning Examples Number Line #2 Chart Practice Questions; Topic Test</p>
<p>N-2-M demonstrating number sense and estimation skills to describe, order, and compare rational numbers (e.g., magnitude, integers, fractions, decimals, and percents);</p>	<p>MAT+ <u>Understanding Whole Numbers and Integers</u> Topic 4: The Meaning of Integers Integers Around Us Temperature Helicopter Submarine Elevator The Integer Line Opposite Integers Examples 1,2 Absolute Value Examples 1,2 Comparing Integers Examples 1,2,3,4 Examples Questions: Examples 1,2,3,4,5,6 Practice Questions; Topic Test</p>
<p>N-3-M reading, writing, representing, and using rational numbers in a variety of forms (e.g., integers, mixed numbers, and improper fractions);</p>	<p>MAT+ <u>Understanding Fractions</u> Topic 13: Improper Fractions and Mixed Numbers The Concept Packages Clock Improper Fractions and Mixed Numbers...What are They? Introductory Problem Mixed to Improper Method 1 – Examples 1, 2 Method 2 – Examples 1,2 Improper to Mixed Examples 1,2 Practice Questions</p>
<p>N-4-M demonstrating a conceptual understanding of the meaning of the basic arithmetic operations (add, subtract, multiply, and divide) and their relationships to each other;</p>	<p>MAT+ <u>Understanding Whole Numbers and Integers</u> Topic 2: Adding and Subtracting Whole Numbers Add...Partial Sums Examples 1 & 2 – with blocks Examples 3 through 6 – without blocks</p>

Add...Trade first
 Examples 1 & 2 – with blocks
 Examples 3 through 6 – without blocks

Add...Right to Left
 Examples 1 & 2 – with blocks
 Examples 3 through 6 – without blocks

Subtract...Right to Left
 Examples 1 & 2 – with blocks
 Examples 3 through 6 – without blocks

Subtract...Trade First
 Examples 1 & 2 – with blocks
 Examples 3 through 6 – without blocks

Subtract...Add Up
 Examples 1 through 4 – with blocks
 Examples 5 & 6 – without blocks

Subtract...Add Up to Zero
 Examples 1,2,3,4

Whole Numbers Around Us
 Example 1 – kilometers
 Example 2 – quarters
 Example 3 – baseball cards
 Example 4 –dollars
 Example 5 – pennies
 Example 6 – water in a jug
 Example 7 – coins
 Example 8 – jelly beans
 Example 9 – photographs
 Example 10 – minutes walking
 Example 11 – cost of a car
 Practice Questions; Topic Test

Topic 3: Multiplying and Dividing Whole Numbers

Multiplication of Facts
 Groups of 6, 7, 8, 9

Commutative Property
 $5 \times 1 = 1 \times 5$
 $5 \times 2 = 2 \times 5$
 $5 \times 3 = 3 \times 5$
 $4 \times 3 = 3 \times 4$

The 10x10 Multiplication Table
 User Picks
 Computer Picks

The 12x12 Multiplication Table
 Associative Property

	<p>Examples 1,2</p> <p>Multiples of 10, 100, 1000</p> <p>Patterns in Multiplication by 10</p> <p>Patterns in Multiplication by 100</p> <p>Patters in Multiplication by 1000</p> <p>Examples 1,2,3</p> <p>Multiply by a Single Digit Multiplier</p> <p>Repeated Addition</p> <p> Repeated Addition – Examples 1 & 2 – with blocks</p> <p> Repeated Addition – Examples 3 & 4 – without blocks</p> <p>Partial Products</p> <p> Partial Products - Examples 1,2,3 – with blocks</p> <p> Partial Products – Examples 4,5,6 – without blocks</p> <p> Partial Products – Questions 1,2,3</p> <p>Distributive Method</p> <p> Distributive Method – Examples 1,2,3</p> <p> Distributive Method – Questions 1,2,3</p> <p>Lattice Method</p> <p> Lattice Method – Examples 1,2,3</p> <p> Lattice Method – Questions 1,2,3</p> <p>The Standard Method</p> <p> The Standard Method– Examples 1,2,3</p> <p> The Standard Method– Questions 1,2,3</p> <p>Multiply by a Two Digit Multiplier</p> <p> Partial Products (Area)</p> <p> Partial Products – Examples 1,2,3 – with blocks</p> <p> Partial Products – Examples 4,5,6 – without blocks</p> <p> Partial Products – Questions 1,2,3</p> <p>The Distributive Method</p> <p> Distributive Method – Examples 1,2,3</p> <p> Distributive Method – Questions 1,2,3</p> <p>The Lattice Method</p> <p> Lattice Method – Examples 1,2,3</p> <p> Lattice Method – Questions 1,2,3</p> <p>The Standard Method</p> <p> The Standard Method– Examples 1,2,3</p> <p> The Standard Method– Questions 1,2,3</p> <p>Divide by a Single Digit Divisor</p> <p> Fair Sharing</p> <p> Fair Sharing – Example 1 – with blocks</p>
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	<p>Fair Sharing – Example 2 – without blocks</p> <p>Fair Sharing – Questions 1 through 6</p>
<p>N-5-M applying an understanding of rational numbers and arithmetic operations to real-life situations;</p> <p>N-6-M constructing, using, and explaining procedures to compute and estimate with rational numbers employing mental math strategies;</p> <p>N-7-M selecting and using appropriate computational methods and tolls for given situations involving rational numbers;</p>	<p>MAT+ <u>Understanding Fractions</u></p> <p>Topic 8: Adding Fractions</p> <p>Word Problems</p> <ul style="list-style-type: none"> Alexander’s Friends Eating Candy Goal Scoring Taking a Walk <p>Fraction Card Game</p> <p>Magic Square</p> <p>Practice Questions; Topic Test</p> <p>Topic 9: Subtracting Fractions</p> <p>Word Problems</p> <ul style="list-style-type: none"> Pedro and Alex Race Washing the Cars Planting a Garden <p>Practice Questions; Topic Test</p> <p>Topic 10: Multiplying Fractions</p> <p>Word Problems</p> <ul style="list-style-type: none"> Boris’ Money Maria’s Trip <p>A Summary</p> <p>The Meaning of “OF”</p> <p>Order in Multiplying</p> <ul style="list-style-type: none"> Examples 1,2 <p>Multiplying Fractions with Large Numbers</p> <ul style="list-style-type: none"> Examples 1,2 <p>Practice Questions; Topic Test</p> <p>Topic 14: Dividing Fractions</p> <p>Another Explanation</p> <ul style="list-style-type: none"> Examples 1 & 2 <p>Examples without Diagrams</p> <ul style="list-style-type: none"> Numerical Examples 1,2 Central High School <p>Practice Questions; Topic Test</p>
<p>N-8-M demonstrating a conceptual understanding and applications of proportional reasoning.</p>	<p>MAT+ <u>Understanding Percent</u></p> <p>Topic 4: Ratios and Proportions</p>

	<p>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</p>
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ALGEBRA

Benchmarks 5-8

Students in Grades 5-8 use manipulatives, models, graphs, tables, technology, number sense, and estimation as they extend their investigations of problems involving the concepts and application of algebra. As a result, what they know and are able to do includes:

<p>A-1-M demonstrating a conceptual understanding of variables, expressions, equations, and inequalities (e.g. symbolically represent real-world problems as linear terms, equations, or inequalities);</p>	<p>MAT+ <u>Understanding Algebra</u> Topic 4: Patterns, Formulas, Substitution Introduction...Math is Patterns Expressions, Terms, Variables Definitions Summary</p> <p>MAT+ <u>Understanding Equations</u> Topic 1: Tiles, Balances, and Equations Definitions Introduction Summary Parts 1 & 2 The Meaning of “Solving Equations” Solve by Systematic Trials Recall Tile Concepts Balances...An Introduction Practice Questions; Topic Test</p> <p>Topic 7: Solving Inequalities Comparing Integers The Integer Line Example 1 ...Great Than; Example 2...Less Than Explanation Example 3...Greater Than; Example 4...Less Than</p>
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	<p>Inequalities What are They? Inequality vs. Equation Summary of Relationships Inequality on the Number Line Examples 1-4 Solving Inequalities Examples 1-6</p>
<p>A-2-M modeling and developing methods for solving equations and inequalities (e.g., using charts, graphs, manipulatives, and/or algebraic procedures);</p>	<p>MAT+ <u>Understanding Equations</u> Topic 2: Solving One-Step Equations Our Problem Concepts – Examples with Tiles Examples 1,2,3,4 Concepts – Examples without Tiles Practice Questions; Topic Test</p> <p>Topic 3: Solving Two-step Equations Our Problem Concepts – Examples with Tiles Examples 1 through 4 Concepts – Examples without Tiles Practice Questions; Topic Test</p> <p>Topic 7: Solving Inequalities Solving Inequalities</p>
<p>A-3-M representing situations and number patterns with tables, graphs, and verbal and written statements, while exploring the relationships among these representations (e.g. multiple representations for the same situation);</p>	<p>MAT+ <u>Understanding Algebra</u> Topic 3: Patterns, Patterns, Patterns 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>A-4-M analyzing tables and graphs to identify relationships exhibited by the data and making generalizations based upon these relationships;</p>	<p>MAT+ <u>Understanding Graphing</u> Topic 2: Statistics In This Topic An Introduction</p>

	<p>Tally Chart Pictograph #1, #2 Bar Graph #1, #2 Line Graph #1, #2 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>A-5-M demonstrating the construction of algebra to the other strands and to real-life situations.</p>	

MEASUREMENT

Benchmarks 5-8

Students in grades 5-8 use number sense, estimation, appropriate manipulatives, tools, and technology as they extend their investigations of problems involving measurement. As a result, what they know and area able to do includes:

<p>M-1-M applying the concepts of length, area, surface area, volume, capacity, weight, mass, money, time, temperature, and rate to real-world experiences;</p>	<p>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</p>
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	<p>Area of a triangle Relationship – Area and Perimeter Squares Rectangles Given Area and Perimeter – Create Shapes Examples 1, 2, 3, 4 Problems Section Length of Fence Area of a Wall The Tablecloth</p> <p>Topic 4: Solids: Volume and Surface Area 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>M-2-M demonstrating an intuitive sense of measurement (e.g., estimating and determining reasonableness of measures);</p> <p>M-3-M selecting appropriate units and tools for tasks by considering the purpose for the measurement and the precision required for the task (e.g., length of a room in feet rather than inches);</p>	<p>MAT+ <u>Understanding Measurement and Geometry</u> 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 Measurements with a Ruler Introduction to the Ruler Centimeters #1 Centimeters #2 Inches #1 Inches #2 Calculating Distances Using Centimeters Examples 1, 2, 3, 4, 5, 6</p>

	Using Inches Examples 1, 2, 3, 4, 5, 6
M-4-M using intuition and estimation skills to describe, order, and compare formal and informal measures (e.g., ordering cup, pint, quart, gallon; comparing a meter to a yard);	MAT+ <u>Understanding Measurement and Geometry</u> Topic 1: An Introduction to Measurement Benchmarks Establishing Benchmarks Meter Benchmarks Foot Benchmarks Centimeter Benchmarks Inch Benchmarks Yard Benchmarks Our Benchmarks Using Benchmarks
M-5-M converting from one unit of measurement to another within the same system;	MAT+ <u>Understanding Measurement and Geometry</u> Topic 1: An Introduction to Measurement Converting Between Metric Units
M-6-M demonstrating the connection of measurement to the other strands and to real-life situations.	

GEOMETRY

Benchmarks 5-8

Students in grades 5-8 use number sense, estimation, models, drawings, manipulatives, and technology as they extend their investigations of problems involving geometric concepts. As a result, what they know and are able to do includes:

G-1-M using estimation skills to describe, order, and compare geometric measures;	
G-2-M identifying, describing, comparing, constructing, and classifying geometric figures and concepts;	MAT+ <u>Understanding Measurement and Geometry</u> Topic 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
G-3-M making predictions regarding transformations of geometric figures (e.g., make predictions regarding translations, reflections, and rotations of common figures);	MAT+ <u>Understanding Graphing</u> Topic 4: Transformations

	<p>What is a Transformation? Introduction to Common Transformations Translations – An Introduction Slides #1, #2, #3, #4 Reflections – An Introduction Flips #1, #2, #3, #4 Rotations – An Introduction Turns #1, #2, #3, #4 The Transformation Machine Examples 1,2,3,4,5 Translations Object to Image We Say, We Write Translation Mapping Rule Examples Reflections Object to Image We Say, We Write Translation Mapping Rule Examples Rotations Object to Image We Say, We Write Translation Mapping Rule Examples</p>
<p>G-4-M constructing two- and three- dimensional models;</p>	<p>MAT+ <u>Understanding Measurement and Geometry</u> Topic 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>
<p>G-5-M making and testing conjectures about geometric shapes and their properties;</p>	
<p>G-6-M demonstrating an understanding of the coordinate system (e.g., locate points, identify coordinates, and graph points in a coordinate plane to represent real-world situations);</p>	<p>MAT+ <u>Understanding Graphing</u> Topic 3: Points on a Grid Josh’s Neighbourhood Concept Number Houses</p>

	<p>Grid Maps Ordered Pairs Axis Quadrants and Cartesian Plane Order in Important Examples Shapes Battleship</p>
<p>G-7-M demonstrating the connection of geometry to the other strands and to real-life situations (e.g., applications of the Pythagorean Theorem).</p>	<p>MAT+ <u>Understanding Exponents</u> Topic 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 1-4 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 Practice Questions; Topic Test</p>

DATA ANALYSIS, PROBABILITY, and DISCRETE MATH

Benchmarks 5-8

Students in grades 5-8 use collection and organizational techniques, number sense, estimation, manipulatives, and technology as they extend their investigation of problems involving data. As a result, what they know and are able to do includes:

<p>D-1-M systematically collecting, organizing, describing, and displaying data in charts, tables, plots, graphs, and/or spreadsheets;</p>	<p>MAT+ <u>Understanding Graphing</u> Topic 2: Statistics Collecting Data Throw a Die Throw 2 Dice Voting Primary Data – Gathering Methods Secondary Data – Gathering Methods 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</p>
<p>D-2-M analyzing, interpreting, evaluating, drawing inferences, and making estimations, predictions, decisions, and convincing arguments based on organized data (e.g., analyze data using concepts of mean, median, mode, range, random samples, sample size, bias, and data extremes);</p>	<p>MAT+ <u>Understanding Graphing</u> Topic 2: Statistics Measures of Central Tendency Introduction The Mean Average The Median Average The Mode Summary Another Example Adding Data Points</p>
<p>D-3-M describing informal thinking procedures (e.g., solving elementary logic problems using Venn diagrams, tables, charts, and/or logic operatives to solve logic problems in real-life situations; reach valid conclusions in elementary logic problems involving “ and, or, not, if/then”);</p>	
<p>D-4-M analyzing various counting and enumeration procedures with and without replacement (e.g., find the total number of possible outcomes or possible choices in a given situation);</p> <p>D-5-M comparing experimental probability results with theoretical probability (e.g, representing probabilities of concrete situations as common fractions, investigating single-event and multiple-event probability, using sample spaces, geometric figures, tables, and/or graphs);</p>	<p>MAT+ <u>Understanding Probability</u> Topic 2: What’s the Chance Probability What is it? Introductions 1 & 2 Spinner 1</p>

<p>D-6-M demonstrating the connection of data analysis, probability, and discrete math to other strands and to real-life situations.</p>	<p>Spinner 2 The Bag Probability Examples 1. Coin Toss 2. Picking One Ball 3. Picking Two Balls 4. Travel Example 5. Number Example 6. Rabbit Example 7. Mailing Letters 8. Forest Ahmed's Maze The Probability Scale Examples Summary Follow Up Soccer Example Experimental Probability Introduction Examples 1,2 Practice Questions; Topic Test</p>
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PATTERNS, RELATIONS, and FUCTIONS

Benchmarks 5-8

Students in grades 5-8 use numbers sense, estimation, manipulatives, drawings, tables, graphs, formulas, and technology as they extend their investigations of problems involving patterns, relations, and functions. As a result, what they know and are able to do includes:

<p>P-1-M describing, extending, analyzing, and creating a wide variety of numerical, geometrical, and statistical patterns (e.g., skip counting of rational numbers and simple exponential number patterns);</p>	<p>MAT+ <u>Understanding Algebra</u> Topic 3: Patterns, Patterns, Patterns 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 MAT+ <u>Understanding Exponents</u> Topic 1: The Meaning of Exponents Introduction...The Money Game</p>
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	<p>Money Grab Game Show Graphs – Game Show Results Graphs – Comparing the Two Results Introduction ... Bacteria Doubling Introduction ... Paper Folding Experiment Pattern Exponents, Powers, Bases Powerful Explosions Introductory Examples Examples 1,2,3,4,5 Examples – Substitution Examples 1,2,3,4 Examples – Order of Operation Examples 1,2,3,4 Practice Questions; Topic Test</p>
P-2-M describing and representing relationships using tables, rules, simple equations, and graphs;	
P-3-M analyzing relationships to explain how a change in one quantity results in a change in another (e.g., change in the dimensions of a rectangular solid affects the volume);	
P-4-M demonstrating the pervasive use of patterns, relations, and function in other strands and in real-life situations.	<p>MAT+ <u>Understanding Graphing</u> Topic 5: Relations, Equations, and Functions 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>