

**CORRELATION  
of  
the UNDERSTANDING UNDERSTANDING NUMERATION PLUS PROGRAMS  
with  
Ontario MATHEMATICS CURRICULUM STANDARDS  
Kindergarten**

**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 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 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)

## SPECIFIC EXPECTATIONS

### Number Sense and Numeration (Quantity Relationships; Counting; Operational Sense)

As children progress through the Kindergarten years, they:

Expectations	Understanding Numeration PLUS lessons
<p>1. investigate the idea that quantity is greater when counting forwards and less when counting backwards (e.g., use manipulatives to create a quantity number line; move along a number line; move around on a hundreds carpet; play simple games on number-line game boards; build a structure using blocks, and describe what happens as blocks are added or removed) [A]*</p>	<p><b>NUM+ COUNTING</b>  <b>Skill – Reading and Printing Numerals</b>  <b>Level A</b>                      Introduction : Counting 1 to 10: worksheet #1, #2                      Things in a Square #1                      Join up to 10 Dots                      Building a Number Line                      Building a Vertical Number Line</p>
<p>2. investigate some concepts of quantity through identifying and comparing sets with more, fewer, or the same number of objects (e.g., find out which of two cups contains more or fewer beans, using counters; investigate the ideas of more, less, and the same, using five and ten frames; compare two sets of objects that have the same number of items, one set having the items spread out, and recognize that both sets have the same quantity [concept of conservation]; recognize that the last count represents the actual number of objects in the set [concept of cardinality]; compare five beans with five blocks, and recognize that the number 5 represents the same quantity regardless of the different materials [concept of abstraction]) [A]</p>	<p><b>NUM+ COUNTING</b>  <b>Skill – Associating Numbers in a Real World Context</b>  <b>Level A</b>                      The Street Scene: Worksheets #1, #2                      The Zoo  <b>Skill – 1 to 1 Correspondence of # to Objects</b>  <b>Level A</b>                      Keep Track by Marking: Worksheets #1, #2</p> <p><b>NUM+ COMPARING AND ORDERING</b>  <b>Skill – Locate Numbers on a Number Line</b>  <b>Level A</b>                      Find One Missing Number                      Find Two Missing Numbers  <b>Skill – Introduce “ Greater Than” &amp; “ Less Than”</b>  <b>Level A</b>                      Greater Than                      Less Than                      “Greater Than, Less Than” #1                      “Greater Than, Less Than, Equal To”</p>
<p>3. recognize some quantities without having to count, using a variety of tools (e.g., dominoes, dot plates, dice, number of fingers) or strategies (e.g., composing and decomposing numbers, subitizing) [A]</p> <p>4. begin to use information to estimate the number in a</p>	<p><b>NUM+ COUNTING</b>  <b>Skill – Estimating the Number of Objects and Reasonableness</b>  <b>Level A</b>                      Estimate the Handful                      Dot Flash Cards</p>

<p>small set (e.g., apply knowledge of quantity, use a common referent such as a five frame) [A]</p>	
<p>5. use, read, and represent whole numbers to 10 in a variety of meaningful contexts (e.g., use a hundreds chart; use magnetic and sandpaper numerals; put the house number on a house built at the block centre; find and recognize numbers in the environment; use magnetic numerals to represent the number of objects in a set; write numerals on imaginary bills at the restaurant at the dramatic play centre) [A]</p>	<p><b>NUM+ <u>COUNTING</u></b>  <b>Skill – Associating Numbers in a Real World Context</b>  <b>Level A</b>  The Street Scene: Worksheets #1, #2  The Zoo  <b>Skill – 1 to 1 Correspondence of # to Objects</b>  <b>Level A</b>  Keep Track by Marking: Worksheets #1, #2</p>
<p>6. use ordinal numbers in a variety of everyday contexts (e.g., line up toys and manipulatives, and identify the first, second, and so on; after reading a book, respond to the teacher’ s questions about who was the first or third person to come in the door; identify the first, seventh, or tenth person to arrive at school or in the group) [A]</p>	<p><b>NUM+ <u>COMPARING AND ORDERING</u></b>  <b>Skill – Use Ordinal Numbers</b>  <b>Level A</b>  Ordering Ladybugs</p>
<p>7. demonstrate an understanding of number relationships for numbers from 0 to 10, through investigation (e.g., initially: show smaller quantities using anchors of five and ten, such as their fingers or manipulatives; eventually: show quantities to 10, using such tools as five and ten frames and manipulatives) [A]</p>	<p><b>NUM+ <u>COMPARING AND ORDERING</u></b>  <b>Skill – Locate Numbers on a Number Line</b>  <b>Level A</b>  Find One Missing Number  Find Two Missing Numbers</p> <p><b>NUM+ <u>COUNTING</u></b>  <b>Skill – Reading and Printing Numerals</b>  <b>Level A</b>  Introduction : Counting 1 to 10: worksheet #1, #2  Things in a Square #1  Join up to 10 Dots</p>
<p>8. investigate and develop strategies for composing and decomposing quantities to 10 (e.g., use manipulatives or “shake and spill” activities; initially: to represent the quantity of 8, the child may first count from 1 through to 8 using his or her fingers; later, the child may put up one hand, count from 1 to 5 using each finger, pause, and then continue to count to 8 using three more fingers; eventually: the child may put up all five fingers of one hand at once and simply say “Five” , then count on, using three more fingers and saying “Six, seven, eight. There are eight.” ) [A]</p>	<p><b>NUM+ <u>COUNTING</u></b>  <b>Skill – Reading and Printing Numerals</b>  <b>Level A</b>  Introduction : Counting 1 to 10: worksheet #1, #2  Things in a Square #1  Join up to 10 Dots</p>

<p>9. explore different Canadian coins, using coin manipulatives (e.g., role-play the purchasing of items at the store at the dramatic play centre; determine which coin will purchase more – a loonie or a quarter) [A]</p>	<p><b>NUM+ <u>COUNTING</u></b>  <b>Skill – Counting Using Money</b>  <b>Level B</b>  “Pennies, Nickels, Dimes”: worksheet #1, #2</p>
<p>10. demonstrate understanding of the counting concepts of stable order (that is, the concept that the counting sequence is always the same – 1 is always followed by 2, 2 by 3, and so on) and of order irrelevance (that is, the concept that the number of objects in a set will be the same regardless of which object is used to begin the counting) [A]</p>	<p><b>NUM+ <u>COUNTING</u></b>  <b>Skill – Reading and Printing Numerals</b>  <b>Level A</b>  Introduction : Counting 1 to 10: worksheet #1, #2  Things in a Square #1  Join up to 10 Dots</p>
<p>11. begin to make use of one-to-one correspondence in counting objects and matching groups of objects (e.g., one napkin for each of the people at the table) [A]</p>	<p><b>NUM+ <u>COUNTING</u></b>  <b>Skill – 1 to 1 Correspondence of # to Objects</b>  <b>Level A</b>  Keep Track by Marking: Worksheets #1, #2</p>
<p>12. investigate addition and subtraction in everyday activities through the use of manipulatives (e.g., interlocking cubes), visual models (e.g., a number line, tally marks, a hundreds carpet), or oral exploration (e.g., dramatizing of songs) [A]</p>	<p><b>NUM+ <u>OPERATIONS</u></b>  <b>Skill – Introduce Addition...concretely... “in all” &amp; “together”</b>  <b>Level A</b>  Addition Using Gumballs #1: Worksheets #1, #2  Addition Using Beans #1: Worksheets #1, #2  Add Number of Sides of Shapes #1: Worksheets #1, #2  <b>Skill – Introduce Subtraction Concretely... “take away”</b>  <b>Level A</b>  Introduction to Subtractions #1: Worksheets #1, #2  Introduction to Subtractions #2: Worksheets #1, #2  Introduction to Subtractions #3: Worksheets #1, #2  Introduction to Subtractions #4: Worksheets #1, #2</p>

## Measurement (Attributes, Units, and Measurement Sense; Measurement Relationships)

As children progress through the Kindergarten years, they:

Expectations	Understanding Numeration PLUS lessons
13. compare and order two or more objects according to an appropriate measure (e.g., length, mass, area, temperature, capacity), and use measurement terms (e.g., hot/cold for temperature, small/ medium/large for capacity, longer/ shorter or thicker/thinner for length) [B]	<b>NUM+ <u>COMPARING AND ORDERING</u></b> <b>Skill – Understand “More” and “Less”</b> <b>Level A</b> More, More!! Worksheets #1, #2 Less, Less!! Worksheets #1, #2 More or Less...Dots Worksheets #1, #2 More or Less on a Number Line: Worksheets #1, #2
14. demonstrate, through investigation, an awareness of the use of different measurement tools for measuring different things (e.g., a balance is used for measuring mass, a tape measure for measuring length, a sandglass for measuring time) [B]	
15. demonstrate awareness of non-standard measuring devices (e.g., feet, hand spans, string, or cubes to measure length; hand claps to measure time; scoops of water or sand to measure capacity) and strategies for using them (e.g., place common objects end to end; use cubes to plan the length of a road at the sand table or the block centre; measure the distance between the classroom and the water fountain in number of footsteps) [B,A]	<b>NUM+ <u>COMPARING AND ORDERING</u></b> <b>Skill – Understand Measurement of Time</b> <b>Level B</b> The Clock: An Introduction #1, #2
16. demonstrate, through investigation, a beginning understanding of the use of non-standard units of the same size (e.g., straws, paper clips) [B,A]	

## Geometry and Spatial Sense (Geometric Properties; Geometric Relationships; Location and Movement)

As children progress through the Kindergarten years, they:

Expectations	Understanding Numeration PLUS lessons
17. explore, sort, and compare traditional and non-traditional two-dimensional shapes and three-dimensional figures (e.g., compare equilateral triangles with triangles that are not equilateral; sort different sizes of boxes, attribute blocks, 5 pattern blocks, a variety of triangles, shapes with three curved sides, objects that create an open shape with three lines) [C]	<b>NUM+ <u>COUNTING</u></b> <b>Skill – Recognize and Count Two-Dimensional Figures</b> <b>Level B</b> Counting 2-D Figures #1
18. identify and describe, using common geometric terms, two-dimensional shapes (e.g., triangle) and three-	

dimensional figures (e.g., cone) through investigations with concrete materials [C,A]	
19. compose pictures and build designs, shapes, and patterns in two-dimensional shapes, and decompose two-dimensional shapes into smaller shapes, using various tools or strategies (e.g., sand at the sand table, stickers, geoboards, pattern blocks, a computer program) [C,A]	
20. build three-dimensional structures using a variety of materials, and begin to recognize the three-dimensional figures that the structure contains [C]	<b>NUM+ <u>COUNTING</u></b> <b>Skill – Recognize and Count Solids</b> <b>Level B</b> Counting Solids #1 <b>NUM+ <u>COUNTING</u></b> <b>Skill – Recognize and Count Two-Dimensional Figures</b> <b>Level B</b> Counting 2-D Figures #1 <b>Skill – Recognize and Count Solids</b> <b>Level B</b> Counting Solids #1
21. investigate the relationship between two-dimensional shapes and three-dimensional figures in objects that they have made [C,A]	
22. demonstrate an understanding of basic spatial relationships and movements (e.g., use above/below, near/far, in/out; use these words while retelling a story) [C]	

<b>Expectations</b>	<b>Understanding Numeration PLUS lessons</b>
23. identify, extend, reproduce, and create repeating patterns through investigation, using a variety of materials (e.g., attribute materials, pattern blocks, a hundreds chart, toys, bottle tops, buttons, toothpicks) and actions (e.g., physical actions such as clapping, jumping, tapping) [D]	
24. identify and describe informally the repeating nature of patterns in everyday contexts (e.g., patterns in nature, clothing, floor tiles, literature, schedules), using oral expressions (e.g., “goes before” , “goes after” , “morning, noon, and night” , “the four seasons” ) and gestures (e.g., pointing, nodding) [D]	

### **Data Management and Probability (Collection and Organization of Data;Data Relationships; Probability)**

As children progress through the Kindergarten years, they:

<b>Expectations</b>	<b>Understanding Numeration PLUS lessons</b>
25. sort, classify, and compare objects and describe the attributes used (e.g., initially: sort them into piles or collections on the basis of a common attribute; eventually: state the rule they used to sort, classify, or compare) [E]	
26. collect objects or data and make representations of their observations, using concrete graphs (e.g., conduct simple surveys and use graphs to represent the data collected from questions posed; use a variety of graphs, such as graphs using people to represent things, bar graphs, pictographs; use tally charts) [E,A]	<b>NUM+ OPERATIONS</b> <b>Skill – Given Graphs...Perform Operations</b> <b>Level D</b> Operations with Tally Charts: Worksheets #1, #2 Operations with Pictographs: Worksheets #1, #2
27. respond to and pose questions about data collection and graphs [E]	
28. use mathematical language in informal discussions to describe probability (e.g., chance, never, sometimes, always) [E]	
* The letters in boldface type that follow each specific expectation indicate the overall expectation(s) to which the specific expectation is linked.	