

## Outline for Kindergarten to Grade 2/3 Workshop

August 2006

**Time Allocation:** Minimum 3 hours

**Requirements for Participants:** a Windows or Macintosh computer with Understanding Numeration PLUS© and the 9 Understanding Math PLUS© programs

**Requirements for the Session Leader:** a computer loaded with Understanding Math PLUS© and Understanding Numeration PLUS© and a projector, U. Math flyer for each participant, CD preview disk information slip for each participant, handouts, support sheet, activity package for the participants if doing a hands-on activity, and the DVD: "Integrating Understanding Math Into Your Mathematics Curriculum".

### Introduction:

1. Introduce yourself and your connection with the Understanding Math© software.
2. Have the DVD playing in the background so the participants can see the 10 programs offered by Neufeld Learning Systems.
3. Key points worth noting about the software prior to using the programs:
  - 10 programs exist from K to 10
  - History of the software: writing began in the early 90's, written to address the needs of visual learners, involves all learners, learning takes place from concrete to abstract, used in many different situations (lab, one-on-one, teacher directed, remediation etc.)
  - UM PLUS is based on NCTM 4 to 10 guidelines
  - UN PLUS is based on NCTM K to 3 guidelines
  - This software is NOT the curriculum! Rather it is a TOOL to be used within the curriculum and delivery of expectations.
  - This is computer assisted software, not computer managed.
  - The teacher is the key to the software and having the students achieve success. UM is a tool within existing curriculum to enhance, expand and embrace existing curriculum.

### Preparation Checklist:

- Set up computer/projector
- Prepare the workstations
- Double check that U Math and U Numeration have been loaded on the computers
- Handout flyers and workshop packages

## Basic Guidelines for the K – 2/3 Workshop:

- The package for the participants offers choices throughout the workshop. Each work session offers K – 1 options and 2 – 3 option. Encourage the teachers to explore where they see the need. Reinforce the concept that they are the key to success within the classroom and they know where each of their students need to be. The flexibility of this software allows students to work at their own pace and complete lessons that meet their educational needs.
- Teachers will be working individually on computers and will be brought together into one large group throughout the session.
- This workshop will involve both on and off computer sections.
- We will be having many discussions throughout the workshop about how to integrate technology into a variety of classroom settings.
- Encourage participants to keep notes in their package as we complete the different lessons. Keeping notes will be helpful when teachers return to their classroom to use the software.

## Computer Configurations

### ALL

\* Have a brief discussion with the teachers to see how they have computers configured in their school. If time permits, or if the audience is particularly eager, you could discuss what positives and negatives they have experienced with the different settings. Throughout the presentation it is important to make comments about how specific lessons could be used for specific computer configurations. Some of the possible configurations for schools could be:

- **Lab** – Students work all together on the same content, usually independently.
- **Centre** - A few computers in a classroom used as a centre which students will rotate through.
- **Teacher Led** - One computer for teacher-centered lessons used in conjunction with a TV or a video projector.
- **Remediation** – One student working on the computer independently or in a partnership.

**Introduce Understanding Numeration Plus©  
ALL**

Let's start by looking at how the program is set up. At the main menu there are six options: Counting, Place Value, Comparing and Ordering, Operations, Problem Solving and Preferences. Explain that the first five are for selecting lessons. Demonstrate the option of using the drop down menus as well. Explain that you need to select 4 things: concept, skill, level and lesson. The levels are rated A, B, C and D which indicate difficulty and over the range of Kindergarten to 3<sup>rd</sup> grade. Level A is the basic introduction including numbers to 10. Level D generally includes numbers to about 1000. Note that the ear is an option and that students can turn off the ear if they do not need to have additional sound support. Whenever an ear is on the screen a prompt can be read. When the back button appears on the screen a child can review a concept.

Note that the speed of the program is meant to enhance the understanding of a child and not the impatient adult. A mistake is an opportunity to learn. While exploring the software encourage the participants to make mistakes.

**K - 3**

**Concept** - Counting

**Skill** – 6) Recognize and Count Solids

**Level** - B

**Lesson** – Counting Solids #1

**(note the help .. in 3 levels of error)**

**After modeling the introduction, have the participants follow the handouts. Model a segment or question from K-3 and then give them a few minutes to explore the software.**

**K-1**

**Concept** - Counting

**Skill** – 1) Reading and Printing Numerals

**Level** – A

**Lesson** – 1) Counting 1 to 10

2) Joining up to 10 Dots

3) Things in a Square #1

**Off Computer** – Making Music with Digits

**Things Worth Noting** – These lessons would be ideal in a classroom and the students would rotate through this station in pairs. These lessons could be used to introduce counting with manipulatives.

**K – 3**

**Concept** – Operations

**Skill** – 10) Making 10

**Level** – A

**Lesson** – 1) Ways to Make 10

2) Ways to Make 10 Reverse Order

**Things Worth Noting:** Demonstrate Skill 5) Making 5, Level A, Lesson 4 Horizontal and Vertical. When you show this, note how the equal sign is created for a vertical question. Note that the manipulatives and number sentences change from horizontal to vertical. Having a sample of the manipulatives in a session is powerful as you can walk around and stress the fact that the quantity is not changing as you rotate the blocks. Having students do this reinforces the concept.

## **ALL TOGETHER**

**Concept** – Operations

**Skill** – 12) Add 3 or 4 Numbers

**Level** – B and C

**Lesson** – 1) Add 3 Numbers Vertically #1 (B)

2) Add 3 Numbers Vertically #2 (B)

3) Add 3 Numbers – Chain Addition #2(B)

4) Magic Square (C)

**Things Worth Noting** – Note the variety of approaches. When here show the Tutorial Mode, Worksheet Mode, Hidden Button and Skill Test

**Tutorial Mode** – When a lesson is launched in tutorial mode, it will first guide the student through the operation of the software. This allows the student/teacher to start with any lesson, even if they have never used the software before. At the end of the tutorial, the student is taken into the lesson automatically.

**Worksheet Mode** – When a lesson is used in this mode, the software skips over the instructional part of the lesson and goes directly to the worksheet section. This allows the teacher to quickly view the worksheets for a lesson and also lets the student hear and see how the worksheets are completed.

**Hidden Button** – Demonstrate the difference between using the BACK option and the hidden button. This is where the role of the teacher is key and they get to select which option works best for them.

## **ALL TOGETHER**

Go over the **Support Document** that is the second page in their handout. Briefly discuss each of the numbered items. Participants may choose to include this worksheet in the box the software comes in so all teachers can access the support information.

### **Lesson Synopsis**

(If the Internet is available, show the lesson synopsis. If the Internet is not available, make reference to the hand out included in their package.)

A lesson synopsis is available at the following link on the Neufeld Learning Systems website:

<http://www.neufeldmath.com/numeration/index.html>

These are a few samples from the lesson synopsis. Each synopsis include outcomes, written from a teacher's perspective, descriptions, written from the programmers and some include additional suggestions.

These two synopsis show the differences between Addition Using Beans #1 and Addition Using Beans #2 (the use of the word "and" is included in the second lesson).

Many of the lesson synopses also include a list of corresponding manipulatives that can be used in conjunction with the software or after to reinforce the student's learning. Some lessons include follow up activities as well.

**2 – 3**

**Concept** – Place Value

**Skill** – 4) Identify Place Value Patterns to 100

**Level** – C

**Lesson** – 4) 2 Digit Numbers – Different Ways

**Things Worth Noting** – Show the lessons selected and note the composition and decomposition of numbers. Explain the importance of children having a firm understanding of place value as all operations are built upon this prior knowledge.

**K – 3**

**Concept** – Place Value

**Skill** – 3) Identify Place Value Patterns to 20

**Level** – C

**Lesson** – 1) Pictures to Numbers #1

2) Tens and Ones to Pictures #1

3) Numbers to Pictures #1

**Off Computer Extension** – Place Value Mat Activities

## ALL TOGETHER

### DVD – Integrating Technology Into Your Mathematics Classroom

- Explain the six main options in the main menu on the DVD
- Demonstrate how to select a model lesson and show the 4 parts of a particular lesson
  - Select Model Lesson
  - Select Understanding Numeration Plus©
  - Select Beans (**you may want to show this lesson before showing the DVD**)
  - Select Play All so all 4 segments will run in sequence
- Explain that Part 1 shows how to navigate to a particular lesson within the Understanding Numeration Plus© software for which the model lesson will relate.
- Part 2 outlines materials needed and expectations that will be covered in the off computer activity.
- Part 3 is the lesson being modeled.
- Part 4 is either possible follow up within the software, extension activities or a method of assessment.

Show another video clip if time permits. Demonstrate the lesson entitled Count Up within Understanding Numeration Plus©.

**Lead them though this with discussion of pedagogy**

**Gr 2 – 3**

**Concept** – Operations

**Skill** – 23) Subtract Three Digit Numbers Concretely

**Level** – D

**Lesson** – 4) Subtract with Regrouping #3

**Things Worth Noting:** The visual prompts on the screen for understanding what regrouping looks like and means are very powerful. Clicking and dragging the actual base ten blocks help students to visualize what each number/part represents within the entire number. Make sure you use the Go Back button on this example to show how the chart reflects the regrouping.

## **INDIVIDUAL WORK**

**Gr 2 – 3**

**Concept** – Comparing and Ordering

**Skill** – 15) Reading and Comparing Temperatures

**Level** – C

**Lesson** – 2) Compare Temperatures in a Day

AND/OR

**Concept** – Operations

**Skill** – 39) Given Graph – Perform Operations

**Level** – C

**Lesson** – 1) Operations with Tally Charts

2) Operations with Pictographs

3) Operations with Bar Graphs

AND/OR

**Concept** – Operations

**Skill** – 41) Find the Area of a Shape

**Level** – D

**Lesson** – 2) Area of Shaded Region #2

**Off Computer Extension** – Wacky Areas (also see DVD)

**K – 3****Concept** – Counting**Skill** – 9) Introduce Fractions – Equal Parts**Level** – B**Lesson** – 3) Three Equal Parts

AND/OR

**Concept** – Counting**Skill** – 10) Introduce Fractions – Parts of a Whole**Level** – B**Lesson** – 2) One Third

**Things Worth Noting:** The visual prompts on the screen for understanding what the components of a fraction mean are very powerful. Clicking and dragging the actual shapes help students to visualize what each number/part represents within a fraction.

**2 – 3****Concept** – Operations**Skill** – 25) Introduce Multiplication Concretely**Level** – C**Lesson** – 3) Eggs in Bowls – Introduce X**Concept** – Operations**Skill** – 33) Note Patterns in Multiplication Table**Level** – D**Lesson** – 5) X Table – Computer Picks**Off Computer Extension:** Head Bangers**K – 3 Discussion**

Discuss Possible Classroom Layouts

Pose questions such as:

1. How do you see the software being used?
2. What students do you see using the software with?
3. What computer configurations can you see using the software with?
4. What is one quality that draws you to this software?
5. Do you have any questions or concerns?

Make notes of teacher responses for future reference and ideas:

### **K – 3**

**Concept** – Comparing and Ordering

**Skill** – 9) Understand Measurement of Time

**Level** – B

**Lesson** – 1) The Clock – An Introduction

2) Times to the Hour

3) Analog and Digital

**Worth Noting:** Demonstrate the power of technology with the first lesson in creating a number line that turns into a clock. This is a WOW moment!

**Concept** – Comparing and Ordering

**Skill** – 9) Understand Measurement of Time

**Level** – C

**Lesson** – 1) Time to Five Minutes

**Concept** – Comparing and Ordering

**Skill** – 10) Describe Elapsed Time...Hours, 5 Minutes

**Level** – C

**Lesson** – 1) Elapsed Time in Hours #1

**Worth Noting:** Demonstrate the power of technology with using the digital clock and analog clock simultaneously.

**Make mistakes and note the feedback on counting by 5's etc etc..**

### **ALL TOGETHER**

**Concept** – Problem Solving

**Strategy** – Draw a Picture

**Problem** – Eating Apples

**Strategy** – Problems

**Problem** – Brick Path

**Things Worth Noting:**

- This template for problem solving is unique to mathematics software in that the program teaches six strategies to go about solving a problem using very specific problems to demonstrate these skills. There are six questions with fully worked solutions using all six strategies to solve one question. Included with each of these problems are problem solving templates. Despite the fact that the content of the questions are at a young learner level, the strategies can be easily taught at any level using the same content. Working with math buddies is a great way to have older students learn these concepts.
- Note the four steps in problem solving.
- Note that if one clicks on 'step 1' then it is read to you.
- If one clicks on the underlined words, then an alternate meaning is read.
- Note the six strategies that can be available to select in step 2.
- Explain that the steps and format are the same for each problem. If a child gets an answer that is reasonable but not correct, the student is taken back to their work to check their answer. If a child's response is unreasonable, the student tackles the problem again from the beginning.

## **ALL TOGETHER**

### **Understanding Math PLUS©**

#### **Understanding Fractions**

##### **Topic – 3) Equivalent Fractions**

\* Switch from UN+ to UM+ and explain that there are differences in navigation as well as the lesson format. Sound is currently not an option.

#### **While navigating through this piece of software, note the following:**

- How to navigate UM+
- Main Menu Items
- Cumulative Check
- Topic Menus
- Practice Questions – random with interaction
- Topic Tests – random with tracking
- Selecting the lesson

Specifically demonstrate the following with these series of lessons on Equivalent Fractions:

- Concepts taught with a variety of approaches
- Mistakes offer learning opportunities, not just the correct answer
- Students have to input the correct answer
- Students have to input words with correct spelling. If this is an issue we as teachers can decide to provide either a word wall for the entire class, or word sheets for specific students to help students overcome this possible difficulty.
- Graphics relate to content on screen.

## **K – 3**

### **Understanding Math PLUS©**

#### **Understanding Fractions**

##### **Topic – 1) The Meaning of Fractions**

- Think, Say, Write
- Parts of a Fraction
- Fraction Strips

#### **Things Worth Noting:**

This content reviews the introduction students may have been exposed to using the Understanding Numeration PLUS© fraction material. The visual aids and support are within this software and clearly demonstrate the difference between numerator and denominator. Again, multiple approaches are used to teach the concept of fractions. Show the drop down menu to the participants to demonstrate this.

## **3**

### **Understanding Math PLUS©**

#### **Understanding Fractions**

##### **Topic – 3) Equivalent Fractions**

- Introduction
- Number Line
- Multiplication Table
- Memory Game

#### **Things Worth Noting:**

Within Equivalent Fractions it is important to show the multiple approaches to teaching one concept. The first example using the pattern blocks is an excellent model to show the scaffolding that is provided when errors occur.

**ALL TOGETHER**  
**Video Clip**

**Things Worth Noting:**

This video is just meant as a nice 'break' with the group. It's a very humorous approach to investigating multiple approaches to addition and multiplication of numbers. This is a nice lead in to the addition and multiplication strategies within the Understanding Whole Numbers and Integers© section.

**K – 3**

**Understanding Math PLUS©**

**Understanding Whole Numbers and Integers©**

**Topic – 1) The Meaning of Whole Numbers**

- Seeing the Number to Thousands Ex. 1
- Representing Numbers in Different Ways Ex. 5
- Place Value to 999,999
- Comparing Large Numbers Ex. 3
- Ordering Large Numbers Ex. 1

**2) Adding and Subtracting Whole Numbers**

- Add – Trade First Ex. 1
- Whole Numbers Around Us Ex. 5 and 8

**Things Worth Noting:**

Note that the color of the blocks when broken apart stay the same. Also note the consistency in color throughout the various lessons.

## ALL TOGETHER

**Review the Handout Sheet** with the samples of Understanding Math handouts available at [www.neufeldmath.com](http://www.neufeldmath.com)

**Discussion:** Gather the group together for a discussion. Pose the question, what advantages do you see with this computer technology in your mathematics classroom? If this is a stumbling block some possible lead-ins could be: remediation, multiple approaches etc. Have the participants be as specific as possible.

Then pose the question, how do you see using this with your students? Specific examples of lessons would be ideal here.

### **DVD – Integrating Technology Into Your Mathematics Classroom**

Show:  
Understanding Whole Numbers and Integers:  
Broken Calculator

The Freyer Model for word definitions included in their package is a very nice activity to complete with the group for an off computer activity for many of the concepts in this workshop. Assign each teacher a word they have to define (multiple people get the same word), have them work together to define their word and record this then share some examples.

**K – 3**

### **Understanding Math PLUS©**

#### **Understanding Algebra**

**Topic – 3) Patterns, Patterns, Patterns**

- Geometric Patterns

#### **Things Worth Noting:**

This is a great activity to provide students with corresponding manipulatives. Students can create the patterns like on the screen and continue it using these tools. If students are given the opportunity to use these tools through modeling, they will become more comfortable when they need to apply their learning or create their own problems.

Note that the initial patterns are very visual and later develop into the concrete and abstract working together.

**2 – 3**

### **Understanding Math PLUS©**

#### **Understanding Probability**

**Topic – 1) Introduction to Probability**

- Probability Line
- Experiments with Spinners
- Spinner Game

AND/OR

### **Understanding Math PLUS©**

#### **Understanding Graphing**

**Topic – 4) Transformations**

- Introduction to Common Transformations
- Translations – Introduction
- Reflections – Introduction
- Rotations – Introduction

**ALL TOGETHER**  
**Understanding Math Plus®**  
**Understanding Fractions**

**Cumulative Check**

**Topic 1 – The Meaning of Fractions**  
Topic Test

State that the tracking in Understanding Numeration is completed in the same format.

- Take the cumulative check. Take the topic test for topic 1. (Try and get at least one answer question correct.) Show how to log in. Stress the importance of giving students their login which can be as simple as their first and last name. Encourage your teachers to record students' password as you cannot track their passwords or check if forgotten. For my students, if they take a test in the future and change their login, I do not check for their results, I simply let them know it is a zero. This makes students more accountable for their studies. Students can enter their own names and then a class can be created.
- After taking the test show the student summary sheet. These can be printed and submitted. Demonstrate how students can self correct.
- Exit the software and now play the role of the teacher. Create your own class then show the multiple levels of tracking that can be done.
- Let the participants know that the DVD has video clips and more information on the tracking system when needed.

**ALL TOGETHER**

Have the participants complete the Summary Sheet at the end of the workshop. This is the final page in their handouts. This is an excellent way to keep in touch with your participants.

**Understanding Math Plus®**  
**Understanding Numeration Plus®**  
Neufeld Learning Systems  
**K – 2/3 Session**  
**Summary Sheet**

**Name:**  
**School:**  
**Assignment:**

List three things that you learned today during the session.

- 1.
- 2.
- 3.

Outline one lesson that you are excited to go back and use with your class (could be small groups, one-on-one, teacher led lesson, lab etc.) Please be specific and possibly include an off computer link you would do with your students.

Do you have any further questions or concerns you would like to have addressed?

Check this box if you would like us to contact you.