



symposium

series with UMathX

Ontario Symposium
Schedule on Last Pg

An Experience in Mathematics Content and Teaching Methodology
(3 to 4 hours for K to 10 - group in grades)

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Session A. The Learning Environment (1 hr)

- In this **Exploration of Mathematics Content and Teaching Methodology** we will use UMathX, a learning environment for K to 10. UMathX is the 10th version of "Understanding Math".
- **UMathX** is a journey, guided by your planning, where learners are encouraged to think through concepts, choose strategies and articulate ideas towards **constructing their understanding**.
- Information flows from **short term to long term memory** through the vehicle, "**Understanding**".
- The power of learning is invested in the student. Questioning is the key to learning. **Understanding** is achieved by association.



Grappling is
'Productive
Struggling'



The UMathX journey
can take many paths.

Frameworks give ideas for
UMathX implementation.

For information
and resources
visit our website at

www.umathx.com

Watch the video
"UMathX - What is It?"
at umathx.com/videos

Build it
Draw it
Talk it
Write it
OWN it!

Before beginning
this journey, discuss
the many possible
learning environments.

Show me another way...
Reflect and Connect
What would you do...?
Why did you... ?



UMathX is a Browser Based Learning System, which makes learning of math a **visual** and **manipulative** experience, giving students an **advantage in the acquisition of and love for mathematics**.

TOWARDS
UNDERSTANDING

how to use
UMathX
as a
tool
for learning

LET'S EXPLORE
THE CONTENT
MENU ...

ELEMENTARY
Example:

<PROCEED> IS ...

the way that UMathX
controls the pace.

It ensures attention to
tasks and separates
the pieces of the
concept being built.

Outline Today:

The Learning Environment
Content and Pedagogy
Bookmarks, Tests, Data Analysis
The Treasure Hunt

- **UMathX**—What is it? at www.umathX.com > Media > Videos
Enter the URL www.umathx.com/preview into the address box of any browser.
Enter the **Username** that you have been given for this **UMathX session**.
Enter the **Generic Password**: **umathx**

There exist 4 Login Types: student, teacher, principal, supervisor



Introduce the **CONTENT MENU** – to fill the Gaps

- Select **“CONTENT Menu”** and again follow the path below in order:
 1. **Fractions** > Equivalent Fractions > Pattern Blocks. Click on (arrow up)(arrow right)(arrow left)(double arrow up) **Content Menu** .. **Fractions** > Equivalent Fractions > **Pattern Blocks** > **Hexagon1** to work through lesson, Hexagon1
 2. Double click on **“This is one Whole Hexagon”** on the first page to have the line read and highlighted.
When **<proceed>** appears on the bottom right, click on it.
Key in “1”, then press <enter>. Key in “2” then press <enter>. Now click on <proceed>.
Enter a number ... try the number .. “2” .. three times before entering the correct answer.
NOTE- Encourage students to risk. A mistake is an opportunity to learn.
 3. Click on the 2nd icon at the top of the screen, **MENU**.
Now navigate to **Hexagon1** and complete the lesson.
A blue screen with two options – **GO BACK** .. or .. **CONTINUE**, marks the end of a lesson.
Return to the **Main Menu**.
- Select **“CONTENT Menu”** and again follow the path below in order:

Content Menu..**Fractions** > Equivalent Fractions > **Pattern Blocks** >
The green pencil beside **“Hexagon1”** indicates that a corresponding printable **framework** is available. **Click on pencil**.
Option 1: After printing it, follow the lesson outline on the framework.
Option 2: Earlier (above) you followed the lesson **“Hexagon1”** within UMathX.
Return to the **Main Menu**.
- Select **“CONTENT Menu”**. and follow the path below in order:

Fractions > The Meaning of Fractions > **Introduction... Think, Write, Say**.
The green pencil beside **“Circles”** indicates that a corresponding printable **framework** is available. **Click on the pencil**.
Option 1: After printing it, follow the lesson outline on the framework.
Option 2: Follow the lesson **“Circles”** within UMathX.
Return to the **Main Menu**.

**LET'S EXPLORE
THE
CURRICULUM
MENU ...**

**ELEMENTARY
Example:**

**THREE PART
MODEL LESSONS
(FRAMEWORKS)**

are meant to:

1. Tie on-screen knowledge to it's concrete expression off-computer

Provide support for RTI & STEAM models

**LET'S EXPLORE
CONTENT MENU
&**

**CURRICULUM
MENU ...**

**SECONDARY
Example:**

Introduce the CURRICULUM MENU

- **Select "Ontario Expectations CURRICULUM Menu".**
Follow this path in order:
 1. **Grade 4**, then **4.NSN > 01**.
Click (arrow right)(arrow left)(arrow up)(double arrow up).
 2. Select **Ontario Expectations**.
 3. Click .. **Grade 4 > 4.NSN > 01 > 09**
You have now reached suggested lessons to fit **4.NSN.01.09**
 4. You now have **2 choices** – **Tab 1** – “**Lessons**” and **Tab 2** – “**Frameworks**”
 5. Select **Lessons**.
You are at lessons selected from the **Content Menu** for **4.NSN.01.09**.
Lessons are in order that we recommend that they be taught.
 6. Double Click the 3rd lesson- **Fractions > Equivalent Fractions > Pattern Blocks > Hexagon1 (Remember this?)**
Do a few <proceeds> into the lesson.
 7. **Exit the lesson** by clicking on the 2nd icon at the top of the screen, **MENU**.
You are returned to the **Selection Menu** within the **Curriculum Selection, 4.NSN.01.09**, ready for another choice.
 8. Click on tab “**Frameworks**”.
You see **tiered 3 part model printable lessons** which give ideas on implementing **UMathX**.
 9. Double-Click on ... **Equivalent Fractions -1.pdf**.
Note the 3 part lesson. It can be printed in colour or in black and white double sided to save on paper.
This can be given to a student or a pair of students as a plan for implementation of **UMathX**.
Note that the instructions to the student(s) direct them within the **Content Menu**.
 10. Return to **UMathX**, by moving the mouse to the top of the screen and click on the **X** for **Equivalent Fractions-1.pdf**.
- **Select "Help Me Get Started" on the Main Menu.**
- “**UMathX Videos**” will appear. **Select and play the video, "Frameworks for Learning"**
Select "CONTENT Menu".
Follow this path in order:
 - **Select "CONTENT Menu".**
Follow this path in order:
Graphing > Linear Relations > The Elastic Example.
Note the green pencil icon beside the lesson, “**Setup Equations**”. Click on it to display the **framework**.
Option 1: After printing it, follow the lesson outline on the **framework**.
Option 2: Follow the lesson “**Setup Equations**” within **UMathX**.
Return to the **Main Menu**.
- **Select the ONTARIO CURRICULUM Menu.**
Follow the path to 8.PA.01.02
Click on tab “**Lessons**”.
Double Click the lesson- **Graphing > Linear Relations > The Elastic Example > Setup Equations**
Click on the tab “**Frameworks**”.

Note tiered 3 part lessons, **Linear Relations – Elastic -1, -2, -3** for a suggestion to implement **UMathX**.

Introduce FRAMEWORKS – THE MODEL LESSONS

**MODEL LESSONS
(FRAMEWORKS)**

Framework Role:

Model Lessons

Implement:

RTI

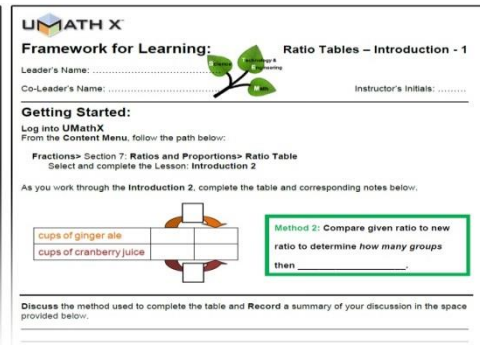
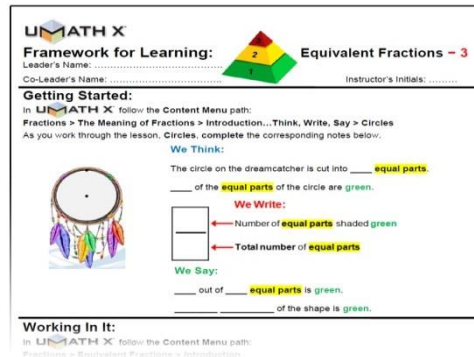
STEM

The **FRAMEWORK** offers another way to use UMathX

It saves the teacher time and effort.

- **“Find a Framework” in 4 Possible Ways:**
 1. In the **Content Menu**, a **green pencil** beside a lesson name indicates that a corresponding printable framework is available.
 2. In the **Selection Menu**, within a **Curriculum Menu**, the appropriate framework is available.
 3. In the **Main Menu**, select **“View a Framework”**
 4. **Navigate to .. www.umathx.com/frameworks**

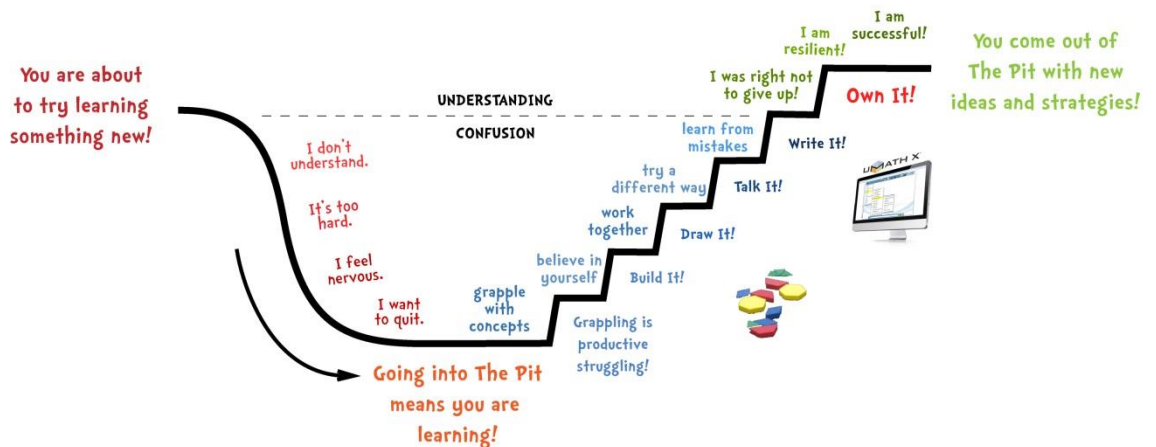
Each Framework: .. is on 1 double sided printable page in color or in black and white
.. has 3 parts: **Get Started**
Working At It
Reflect and Connect



View and Discuss – The LEARNING PIT

- UMathX transforms a “Valley of Despair” into productive struggling in a “learning pit”.
- UMathX is a full service K to Algebra1 learning environment, supporting a **growth mindset** within a **learning pit** encouraging students and teachers to **grapple** with concepts.

The Learning Pit
A Model for a Growth Mindset



- Play the video <http://www.jamesnottingham.co.uk/learning-pit> followed by a discussion.

PLAN A LESSON:

OPTION 1

1ST **CONTENT MENU**

2ND **FRAMEWORK**

OPTION 2

1ST **CURRICULUM menu**

2ND **LESSON PATHS**

3RD **FRAMEWORKS**

CURRICULUM

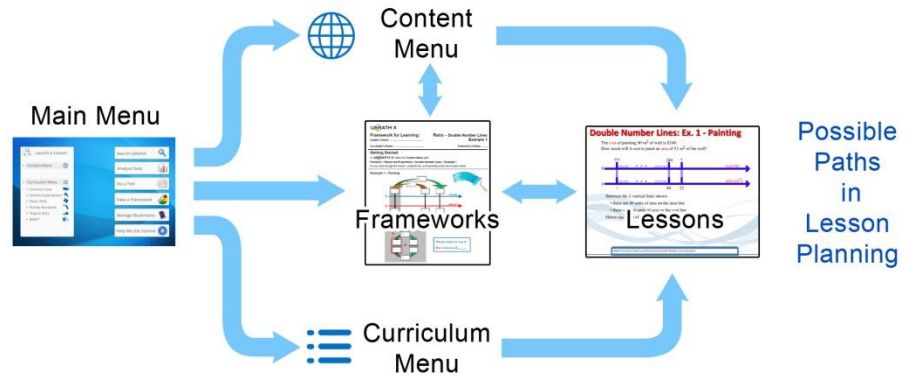
K TO 2

CURRICULUM

3 TO 5

Session B. Content & Pedagogy(1 hr)

- **PLANNING a LESSON – OPTION 1** – Choose from lessons scaffolded within the **Content Menu**.
First .. Select the **Content Menu**. Choose the path to a particular lesson or set of lessons.
Example: Place Value>Identify Place Value Patterns(to 1000)>D>Expanded Notation
Second .. Note a green pencil icon beside .. 1) Expanded Notation
This indicates that a corresponding framework is available.
 Click on the framework and print it, possibly 1 for every 2 or 3 students in the group.
- **PLANNING a LESSON–OPTION 2-This is likely the option if you work in Ontario Curriculum.**
First .. Follow the steps in the **ONTARIO CURRICULUM** menu for your choice.
Second .. Click on the **LESSON** button to make appropriate lessons available.
Third .. Click on the **FRAMEWORKS** button for appropriate frameworks if they exist. Print.



- 1.NSN.01.08-Place Value> Model Numbers Grouped in Packages > C > Ones and Groups of Ten
- 1.NSN..01.08-Place Value >Identify Place Value Patterns (to 20) >C>Tens & Ones to Pictures #1
- 1.NSN..01.08-Place Value >Identify Place Value Patterns (to 20) >C>Numbers to Pictures #1
- 2.NSN.01.03-Place Value >Identify Place Value Patterns (to 100) >C>Tens & Ones to Pictures #2
- 2.NSN.01.03-Place Value >Identify Place Value Patterns (to 100) >C>Numbers to Pictures #2
- 2.NSN.01.03-Place Value >Identify Place Value Patterns (to 100) >C>2 Digit Numbers – Different Ways
 (Place Value Patterns to 20 – Pictures to Numbers #1)
 (Place Value – 2 Digit Numbers –Different Ways)
- 2.NSN.03.05 – Operations>14) Add 2 Digit...Concretely> C (Add 2 Digit Numbers-Concretely-With Regrouping)
- 3.NSN.01.04 – Place Value>Identify Place Value Patterns (to 1000) >D>Expanded Notation
 (Place Value to 1000 – Expanded Notation)
 (Expanded Notation – to 999)
 (Represent Numbers in Many Ways – Place Value -1)
 (Represent Numbers in Many Ways – Place Value -2)
 (Represent Numbers in Many Ways – Place Value -3)
- 3.NSN.03.02 – Operations> 23) Subt 3 Digit Numbers.. Concretely> D (Subtraction With Regrouping #3)
- 4.NSN.01.02 – Fractions> Introduction to Decimals> Place Value >Tens, Ones, and Tenths
- 4.NSN.01.04 – Whole Numbers & Integers>The MeaningofWholeNumbers>Rounding LargeNumbers>Concepts
- 4.NSN.01.04- Whole Numbers & Integers>The MeaningofWholeNumbers>Rounding LargeNumbers>Examples
 (Rounding Large Numbers – To the Nearest Ten)
 (Rounding Large Numbers – To the Nearest Hundred)
 (Rounding Large Numbers – To the Nearest 10, 100 and 1,000)
- 4.NSN.01.06 – Fractions> TheMeaningofFract> Intro...Think,Write,Say> Circles(Fraction Intro- Pattern Blocks-1)
- 5.NSN.01.02- Fractions>Introduction to Decimals>Understanding Place Value> Example 1
 (Expanded Notation – To 9999)

Ontario Symposium Schedule on Last Pg	<h2 style="margin: 0;">An Experience in Mathematics Content and Teaching Methodology</h2> <h3 style="margin: 0; color: #FFA500;">(3 to 4 hours for K to 10 - group in grades)</h3>
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CURRICULUM
6 TO 7

CURRICULUM
8 TO ALG1

ANOTHER SOURCE OF LESSONS..
Within CONTENT MENU

5.NSN.01.02 – Whole Numbers & Integers> The Meaning of Whole Numbers>Place Value to 999,999>Neighbors (Place Value to 999,999 – Neighbors)

5.NSN.03.03 -Whole#&Int>Mult&DivofWhole Nu>Multby2DigitMult>Part Prod-Area>Ex 1(Mult 2 digit.PP24x37) - Whole # & Int> Mult & Div of Whole Num> Multby 2 Digit Mult> Partial Prod-Area> Ex 4–Without Blocks

5.M.01.04 - Meas& Geom> Per & Area of Polyg> Areas of Polyg>Polyg to SimpleShapes>Ex 1(Polygons Broken -1)

6.NSN.02.04 - Fractions>Mult & Division of Dec> Mult by PartialProducts Area(Mult Dec by PartialProd 2.4 x 3.7)

6.NSN.03.01 –Fractions >Ratios & Proportions>Ratio,Tape Diagram>Introduction (Ratios & Proportions - Tape) And ... Fractions>Ratios & Proportions > Ratio Table> Introduction 1 (Ratio – Ratio Tables_Intro-1 STEM)

7.PA.01.04 – Algebra> Patterns, Patterns, Patterns>Patterns to Formulas> Ex. 4 (Patterns with Toothpicks) (challenge) –Algebra>Patterns, Patterns, Patterns> Sum of Seq –Geom – Real Life(Sum of Geom Seq)

8.NSN.02.04 – Fractions> Multiplying Fractions> Developing the Rule> Ex. 3 (Multiply Proper Fractions -1)

8.DMP.02.05-Graphing>Read & Sketch Graphs>Graphs Without Scale> Ex 7, 9, 11 (Graphs Without – Creating -1)

MFM2P.MLR.02.01 – Graphing > Slope of a Line > Slope > Steepness Factor(Slope In the Real World)

MFM2P.MLR.02.06 – Graphing> Eq Str Line > Word Prob-Applic>Walker>(Slope & Line –Walk in Real World-1)

MFM2P.QR.03.01 – Graphing> Quadratic Functions> Max Cage Area>Trial & Error toSummary(Quad-MaxCage-1)

MFM1P.NSA.01.03 – Fractions> Ratios and Proportions> Proportions> Ex 3 Marbles(Estimation U Proportions)

MFM1P.NSA.01.05 – Fractions> Ratios & Proportions> Ratio Table> Introduction 1 & 2(Ratio Tables-Intro 2)

see www.umathx Check the webinar topics and lessons.

Video .. Understanding vs Memorization .. Pa & Ma Kettle.



TEST ACCESS:
Main Menu (first page)
Activity Window


TEST TYPES:
ONTARIO
CONTENT
CUSTOM

DATA ANALYSIS
Lessons & Tests
Growth
Usage

For more information on Data Analysis, we welcome you to contact us.

Session C. Bookmarks, Tests, Data Analysis

- **ACCESS:** Main Menu .. Click on “Do a Test”  or Activity Window .. Click on the  icon



For a Class

- **TYPES:**
 - Ontario Tests** – coverage within curriculum for a specific grade (example 5.NF)
 - Content Tests** cover items within a certain content area across grade levels
 - Custom Tests** are generated by the teacher by choosing any specific content.
- **Analyze Data”** in the Main Menu. The “Data Module” requires data by students.

The **full version** allows students to do lessons and tests with results recorded into perpetuity. A teacher or student can then check student data .. **tests, lessons, usage, growth and more.**

After a student has created data, the teacher of that student could do the following:
 Select “Analyze Data”. Select “Test Data”. Select a class or a student, a test category and a test. Click on a specific vertical, then horizontal bar. Click on a question that was answered incorrectly.
2 choices. 1 - see results. 2 - launch an appropriate lesson.

Session D. The Treasure Hunt – K to 5 – Ontario - 1 hr

This Treasure Hunt contains directions to guide navigation through the **Content Menu**, the **Ontario Curriculum8/J Menu** and the **Frameworks for Learning** of UMathX. An observation question is connected with each set of directions to assist you in experiencing a variety of learning environments in UMathX.

UMathX is created to address the following **Principles of Learning**:

- Interactive with audio;
- Encourage “grappling” to support a “growth mindset” - learning from mistakes;
- Multiple representations of concepts;
- Moving from concrete to pictorial to abstract;
- Pacing controlled by the learner;
- Using a wide variety of teaching strategies – options/suggestions within “Frameworks For Learning”

Record your observations in the “Your Answers” column and note the “Principle of Learning” featured in each lesson. Please appreciate that you may be navigating into the middle of a math topic and may be missing the background information. You may want to navigate to preceding lessons to find the needed information.

The session leader may consider setting up a jigsaw activity using this Treasure Hunt activity.

Log into UMathX and work your way through the Treasure Hunt in a non-linear, random order.

An Answer Key is available at www.UMathX.com under Training.

Directions	Questions	Your Answers
<p>In the Content Menu, follow the path – Fractions> Equivalent Fractions</p> <p>Now select and work through the menu items within Equivalent Fractions listed below:</p> <p>Introduction - Square Pattern Blocks – Hexagon 1 The Clock – Introduction 1 Slicing – Example 1 An Explanation With Sets – Case1 Then select- Memory Game</p>	<p>Make a series of mistakes to see how UMathX responds. List a hint that you felt was particularly helpful.</p> <p>Please double click on a line for audio.</p> <p>Would you use lessons within Equivalent Fractions to: a) Introduce a new concept, b) Reinforce a concept, or c) Intervention?</p> <p>Note the various approaches to understanding Equivalent Fractions. Note the variety of possible learning environments. Would you use a whole group, small group or individual learning? How would you use the Memory Game?</p>	
<p>In the Ontario Curriculum Menu, navigate to 4.NSN.01.09 Click on a button labelled, Lessons. Find lesson:Square. Double Click on it. Then click on the Menu Icon on menu bar at the top of the screen. Click on 09 again. Click on the Frameworks button. Double Click on each of three Frameworks.</p> <p>Select 4.NSN.03.05 in 8/0 the Ont Menu. Click on Lessons. Select Multiplication: Groups of 4. Work through few of 9 questions. Click on the Menu Icon at the top. Navigate to 3.OA.01.01 again. Select the framework - Introduce Multiplication Facts .. Groups of 4 Follow instructions in framework.</p>	<p>The Content menu contains scaffolded lessons ... great for filling learning gaps. The Ont Menu contacts those items from from Ontario menu that fit Ont Curriculum.Compare tiered frameworks ... Equivalent Fractions -1, Equivalent Fractions -2 and Equivalent Fractions -3</p> <p>Note the SET approach in understanding multiplication. Note the relationship between the addition sentences and the multiplication sentences . Note value in following instructions on computer, recording on paper to lead to a pattern .. the multiplication table</p> <p>What is the path to this lesson within the Content Menu?</p>	

Directions	Questions	Your Answers
<p>Note the 3 tiered frameworks – Multiplication Introduction – 1 Multiplication – Repeated Addition Multiplication Introduction - 2 Eggs in Bowls...Introduce x Multiplication Introduction – 3 Grouping Eggs in Bowls Glance over the 3 frameworks.</p>	<p>Compare the repeated addition sentences and the multiplication sentences in Getting Started</p> <p>This method is one approach to help in understand multiplication.</p> <p>Note the scaffolding within the 3 frameworks as well as within the 3 corresponding lessons within UMATHX.</p>	
<p>Go to www.umathx.com .. Resources to Frameworks. Find the framework, Multiply Two 2-Digit Numbers by Partial Products – 1 at ...</p> <p>Grapple through “Getting Started”.</p> <p>Work through part of the instructions in “Working In It” on the framework with the help of your computer and partner.</p> <p>The framework above, leads to the Content Menu: (login and go there) Whole Numbers and Integers .. to Multiplication and Division of .. to Multiply by a 2 Digit Multiplier.. to Partial Product – Area .. to Ex 1 – With Blocks</p> <p>Now go to Ex 4 – Without Blocks</p> <p>Note .. refer back to picture to understand.</p>	<p>The “Getting Started” section, directs to work away from the computer first.</p> <p>It is suggested that they work with <u>paper</u> and <u>base 10 blocks</u> to model numbers - ____ and ____ and ____</p> <p>Note that in “Getting Started” one needs to grapple to find an answer.</p> <p>Then in “Working In It”, UMATHX on computer helps toward solutions.</p> <p>Check that the code for this lesson within the Ontario menu is 5.NSN.03.03</p> <p>This lesson should not be missed.</p> <p>Note when ones goes to Ex 1 and then to Ex. 4 . Comment on how .. Ex 1 to Ex 4 help in understanding.</p> <p>Then check framework .. Multiplying Decimals – Partial Products</p>	
<p>From the Ontario Menu, select 4.NSN.01.06</p> <p>First select the 3 Tiered Frameworks- Fraction Introduction – Pattern Blocks -1</p> <p>Fraction Introduction - Pattern Blocks -2</p> <p>Fraction Introduction – Pattern Blocks -3</p>	<p>The frameworks are located in 2 places. What are they?</p> <p>If possible print out the 3 frameworks.</p> <p>How are the frameworks the same?</p> <p>How are the frameworks different?</p> <p>Note the scaffolding .. in tiered lessons</p>	
<p>In the Content Menu, hover over: Whole Numbers and Integers to Multiplication and Division of Whole Numbers to Divide by Single Digit Divisor to Fair Sharing</p>	<p>Work through both :Fair Sharing Ex. 1 .. with blocks and Fair Sharing Ex 2 .. without blocks Find fair sharing in Ont Menu.. 5.NSN.03.04. Find both the lesson and the framework. Comment on scaffolding from Ex 1 to Ex 2</p>	
<p>Find & work through the framework ... Subtract 3 Digit Numbers Concretely Subtraction with Regrouping #3 at www.umathx.com .</p> <p>See Frameworks under Resources.</p>	<p>In the Ontario Menu, go to 3.NSN.03.02 Find the Lesson & the Framework. In “Working At It”, we suggest using paper, real base 10 blocks and UMATHX in the computer. Would you suggest using all at the same time?</p> <p>Comment on the critical regrouping step where we see concrete and abstract simultaneously.</p> <p>How many different methods of subtraction are listed in this section?</p>	

Session D. The Treasure Hunt – 6 to 10 – Ontario - 1 hr

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Record your observations in the “Your Answers” column and note the “Principle of Learning” featured in each lesson. Please appreciate that you may be navigating into the middle of a math topic and may be missing the background information. You may want to navigate to preceding lessons to find the needed information.

The session leader may consider setting up a jigsaw activity using this Treasure Hunt activity.

Log into UMathX and work your way through the Treasure Hunt in a non-linear, random order.

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Directions	Questions or Suggestions	Your Notes or Answers
<p>In the Content Menu, follow the path Fractions>Multiplying Fractions> Pattern Blocks> Hexagon1</p> <p>Return to the Content Menu and follow path Fractions>Multiplying Fractions> Real World Problems with Pictures> Boris’ Money</p> <p>Work through the lesson.</p>	<p>Do the short lessons. Make mistakes. Comment on learning from concrete to abstract.</p> <p>Go to www.umathx.com . Select “framework” under “resources”, Mult Fractions – Word Problems -1</p> <p>Write a note on how the diagram helps in understanding the word problem here. What is the role of “Reflect/Connect” in the framework?</p>	
<p>In Ontario Menu, navigate to 8.NSN.02.04 Click on the button marked, Lessons - Ex. 3 – Proper Fraction X Proper Fraction Work through the lesson.</p> <p>Now navigate to 8.NSN.02.04 again. Click on the button marked frameworks. Multiplying Fractions & Whole Numbers. Select the framework – Multiply Proper Fractions - 1 Follow instructions in the framework..</p> <p>Note the 3 tiered frameworks. This is a difficult topic. One must not “tell the rule” . The 3 tiered frameworks help lead towards understanding. Students reflect/connect with Benoit’s Problem. Note that one can also reach the same frameworks through www.umathx.com and select “frameworks” under “resources”</p>	<p>Comment on scaffolding in the UMathX menu. Fractions – Multiplying – Pattern Blocks – Fraction Strips - Developing the Rule</p> <p>This is a rich sequence .. List the variety of methods and steps to scaffold to understanding “why” we multiply as we do.</p> <p>In this case, the Getting Started section of the framework refers to another graphic – a simpler example with pattern blocks. This however does not prove the algorithm.</p> <p>Reflect and Connect with a partner. In doing so, one may at some point say ... “I GOT IT!!” ... not I “believe you” or “you told me”</p>	<p>The methods of multiplying here are: ... pattern blocks(particular/concrete) ... number line (fraction strips) ... rectangular (area model)</p> <p>Note the 3 methods direct from concrete to abstract. .. note the scaffolding. First we use specific numbers and then we use red and blue arrows to lead to the algorithm for mult of fractions. We suggest a teacher led, whole class lesson here .. difficult concept . Class</p> <p>needs to grapple/reflect &connect to move toward understanding here.</p>

Directions	Questions or Suggestions	Your Notes or Answers
<p>From the Ontario Curriculum Menu, find and work through lessons.. Introduction 1 & Introduction 2 under 6.NSN.03.01.</p> <p>Now from 6.NSN.03.01 in the Ontario Curriculum Menu select the framework, “Ratio – Ratio Tables _ Introduction-2”</p>	<p>How do the two introductions differ? Please fill in the tables on page 1 of the framework.</p> <p>In the “Working In It” section on pg 2, complete the “Lawn Fertilizer” question.</p>	
<p>From the Content menu bar select Graphing >Quadratic Functions >Maximize Cage Area</p> <p>Work through the beginning of each of the sub lessons to the graph in Summary.</p> <p>In ONT menu, select MFM2P.QR.03.01 Then select the framework, Quadratic Functions – Maximize Cage Area -1</p>	<p>Note the “scaffolding” as each concept leads to the next concept.</p> <p>Describe how the real life concept is linked to the visual graph to the abstract equation in ...Summary</p> <p>Draw and label the final graph in Summary to the right.</p>	
<p>In the Content Menu follow the path .. Fractions> Ratios and Proportions> What is a Ratio?> Ex 2 - Marbles</p> <p>Then work through the lesson on the computer.</p>	<p>How does this lesson help understanding?</p> <p>Write a related question involving ratios to determine the number of pike fish in a lake</p>	
<p>From the Content Menu select the path .. Algebra> Adding Expressions>Adding Expressions with X & YTile >Example 1</p>	<p>Go back and recall blue representing positive and red representing negative. With the information above, record how dragging coloured tiles helps understanding.</p>	
<p>From the Ontario Menu select MPM2D.QR.03.02</p> <p>Then select the button, Frameworks.</p> <p>Then select the framework and do ... >Factoring Trinomials</p>	<p>List the 3 parts of every framework. What is the relationship in scaffolding from blue and red algebra tiles to multiplying and factoring. In the framework, Getting Started begins work on paper. Work through parts of this framework.</p>	
<p>Navigate to the Ontario Curriculum Menu .. MFM1D.LR.02.02</p> <p>First find 2 lessons in The Elastic Setup Equations ... Graph Equations. Just do the beginning of each. Navigate to the Ontario Menu .. MFM2P.MLR.02.06. Find the first lesson “The Walker”. It is labelled .. “Same Speed”. Work through the first few questions. Now find the 3 tiered frameworks within the curriculum</p>	<p>How could you utilize the variety of examples to incorporate different teaching strategies in your classroom?</p> <p>These lessons address STEM. How? How do frameworks and lesson on the computer complement each other? Check each of the 3 frameworks and comment on how a teacher might organize a class to accommodate a variety of levels in a class.</p>	
<p>From the Content menu bar select Equations. Then select the sections: Problem Solving Solving Linear Systems Solving Linear Inequalities</p>	<p>In Problem Solving , scan 5 problems. In Solving Linear Systems List the number of methods. Do Ex 2 in Solve Problems Using Linear Systems In Solving Inequalities, check Graphing</p>	
<p>Navigate within the Content Menu along path .. Exponents> Pythagorean Theorem Skim through the list of concepts from ... In This Topic To ... The Pythagorean Theorem</p>	<p>Find the corresponding lessons on Pythagorean Theorem within the CCSS Curriculum Menu for 8th grade. Find and list the corresponding Frameworks.</p>	

Sample – 4 Hour Summer Math Symposium for K to 10

AN EXPERIENCE IN MATHEMATICS CONTENT AND TEACHING METHODOLOGY

Location requirements:

Good internet access. Manipulatives as needed.

1 main room to meet all participants with tables to seat up to 4 participants per table.

Up to 3 additional smaller rooms to be able to meet with up to 4 grade level groups.

Each participant will bring a personal laptop or share a laptop with a partner.

Each room has a computer attached to a projector to display onto a screen for the group.

Session 1: 8:00am to 9:00am - Setting the Learning Environment

1 group - 1 hour

Pages 1 to 4 above. Outlines will be provided

Session 2: 9:00am to 10:00pm - Content and Pedagogy

Up to 4 Groups depending on the grade levels and # of participants. Groups meet for 1 hour at the same time.

Possibly 4 Groups of K to 2, 3 to 5, 6 to 7, 8 to 10

Or .. possibly 2 groups of K to 5 and 6 to 10 .. or .. other possibilities.

Pages 5 and 6 above. Outlines and Model Lessons will be provided.

Session 3: 10:30pm to 11:15pm - Testing, Data Analysis, Bookmarking

1 group – 45 minutes

Page 6 above

Session 4: 11:15pm to 12:00pm - Treasure Hunt

1 group .. 45 minutes

Activities for K to 5 and Activities for 6 to 10

Pages 7 to 10 above. The Treasure Hunt materials will be provided.

Costs: Pre Register by connecting with bmathies@umathx.com or 866 429 6284 (toll free)

Option 1: Focus on Mathematics for Participants from 1 to many schools with additional focus on their students.

\$200 per participant includes 4 hour symposium and personal access for 1 year to:

- all content within UMathX to fill gaps online from K to Alg1 and all curriculum from K to Alg1 online.
- access to all lessons, tests, resources in UMathX
- access to regular webinars to introduce new concepts at no additional charge.

Additional/Optional **\$11 per student** for student personal access for 1 year for all students of a participant.

(Option1 cost is regular cost of UMathX software and resources for a teacher and his/her students)

... so training here is free

Option 2: Focus on a Mathematics Resource for students and teachers in a larger school .. \$6,000 per year

Additional/Optional 4 hour symposium for all teachers ... unlimited ... \$2,500.00

- access to regular webinars to introduce new concepts at no additional charge

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