

Mathematical Modeling to Make Thinking Visible

**PROFESSIONAL
LEARNING
K TO 10

ONTARIO**



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Model to Make Thinking Visible in Linear Relations and Slope in "STEAM"

Gr 6 to 10 We will model blended learning in diverse learning environments and offer 3 part lessons to "grapple", "see" solutions and construct understanding in Slope and Linear Relationships. Access will be given to a computer program and 3 part lessons.

Model to Make Thinking Visible in Addition with Regrouping, Fraction Multiplication and Partial Products

Gr 2 to 6 We will model blended learning in diverse learning (computer/manipulative/paper) and offer 3 part lessons to "grapple", "see" solutions and construct understanding in Addition with Regrouping, Fractions and Partial Products. Access will be given to a program and lessons.

**THE
LEARNING
ENVIRONMENT**

**CORE &
INTERVENTION**

Grappling is .. more than "persevering"
.. more than "engaging"
.. "productive struggling"



**A MISTAKE IS AN
OPPORTUNITY TO LEARN**

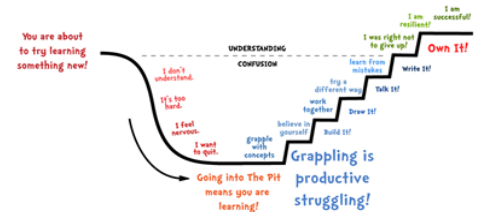
Multiple Representations

Concrete to Pictorial to Abstract

Build it -
Draw it -
Talk it -
Write it -
OWN IT!!

The Learning Pit

A Model for a Growth Mindset



<http://www.jamesnottingham.co.uk/learning-pit>

LOGIN

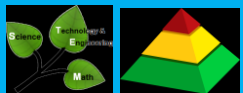
For 1 month: www.umathx.com/preview Login: **count** Generic Password: **umathx**
After 1 month: www.umathx.com and select **Preview** to set up your own access.

**3 PART MODEL
LESSONS
(FRAMEWORKS)
WWW.UMATHX.COM
RESOURCES**

Students articulate ideas, consider peer perspectives as a way to construct understanding.

- | | |
|--|---|
| 1. Creating & Interpreting Line Graphs (STEAM) | 1. Add 2 Digit Numbers With Regrouping |
| 2. Slope in the Real World | 2. Fraction Introduction – Pattern Blocks -1 (RTI) |
| 3. Linear Relations – Elastic (STEAM) | 3. Multiply Two 2-Digit Numbers – Partial Products |
| 4. Slope and the Line – Walk in Real World -1 (RTI) | 4. Multiply Proper Fractions |

**MENUS:
CURRICULUM
CONTENT**



- 2.NSN.03.05 – Operations>14) Add 2 Digit ... Concretely-> C -> **Addition With Regrouping**
- 3.NSN.03.02 – Operations> 23) Subtract 3 Digit Numbers.. Concretely> D >**Subtraction With Regrouping #3**
- 4.NSN.01.06 – Fractions> The Meaning of Fractions> Introduction...Think, Write, Say> Circles – **Pattern Blocks**
- 4.NBT.02.05-Whole#&Int>Mult&DivofWhole Num>Multby2DigitMult>Partial Prod-Area>Ex 1–With Blocks(24x37)
- Whole # & Int> Mult & Div of Whole Num> Mult by 2 Digit Mult> Partial Prod-Area> Ex 4–Without Blocks(24x37)
- 6.NSN.02.04- Fractions> Mult & Division of Decimals> Multiply by Partial Products Area> **Ex 1-With Blocks(2.4 x 3.7)**
- 6.NSN.03.01 – Fractions>Ratios & Proportions>Ratio,Tape Diagram>**Introduction & > Ratio Table> Introduction 1**
- 8.NSN.02.04 – Fractions> Multiplying Fractions> Developing the Rule> **Ex. 3 – Proper FractionXProper Fraction**
- MFM2P.MLR.02.01 - Graphing>Slope of a Line> Introduction to Slope & Slope>**Steepness Factor**
- MPM1D.LR.02.02 – Graphing> Linear Relations> The Elastic Example> **Setup Equations AND THEN Graph -STEAM**
- MFM2P.MLR.02.06 – Graphing> Eq of a Str Line > Word Problems-Applications> **The Walker> Same Speed-RTI**
- MPM2D.AG.01.02-Graphing>Read & Sketch Graphs>Graphs Without Scale> Ex 7, 9, 11>**Glasses of Water+ STEAM**