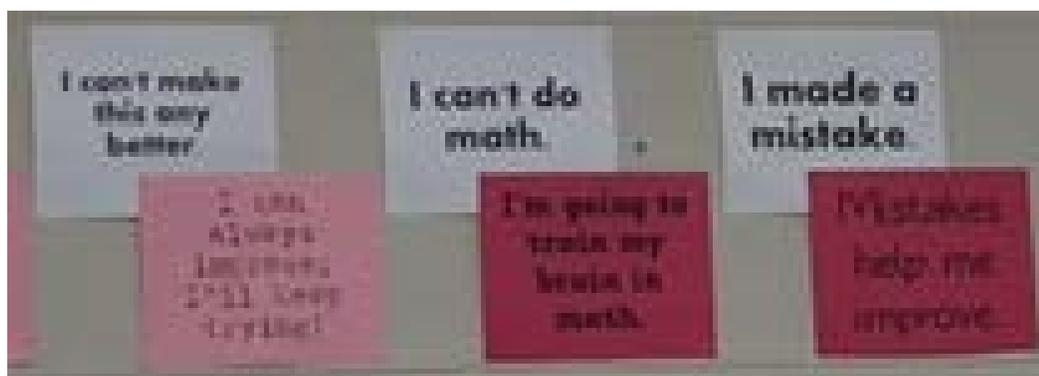
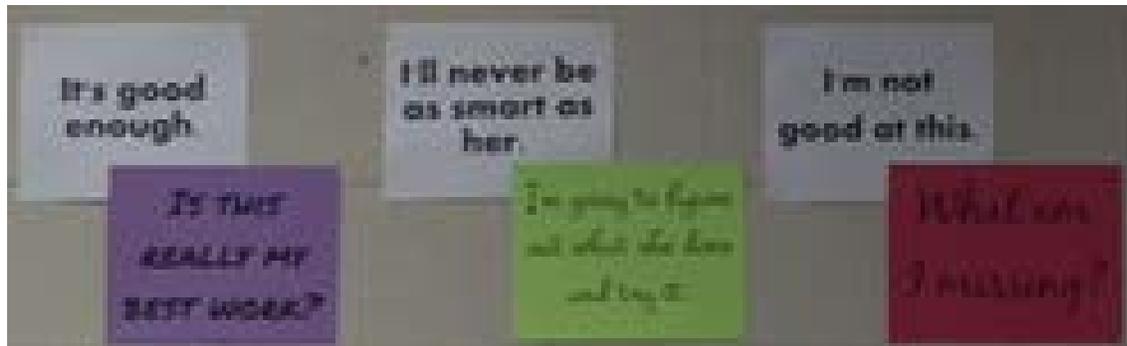


# Grenville District High School: Building Communities of Learners: Students and Staff

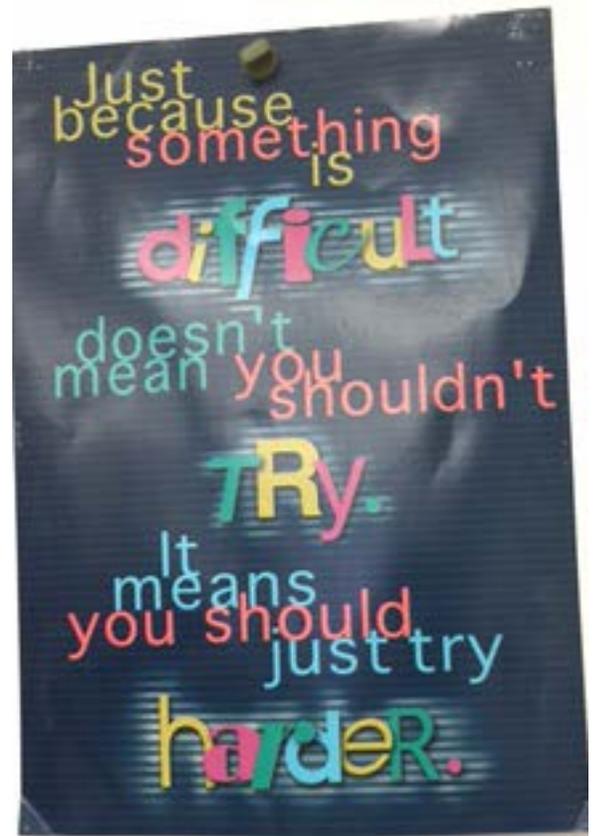
## Building a Community of Student Learners: Growth Mindset

Teachers explicitly teach Growth Mindset and give students language to use to build their own efficacy in mathematics. These message are posted in the classrooms and referred to regularly by both the teachers and the students



## Building a Community of Student Learners: Student Perseverance

Messaging exists in all of the mathematics classrooms reminding students that success comes with perseverance and effort.

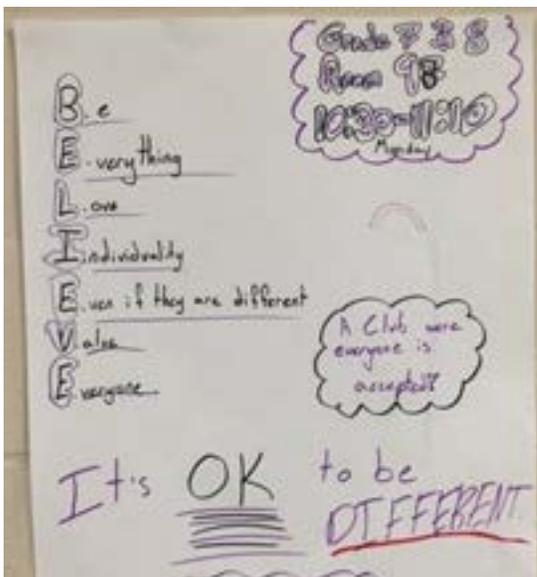


## Building a Community of Student Learners: Student Awareness of Learning Styles

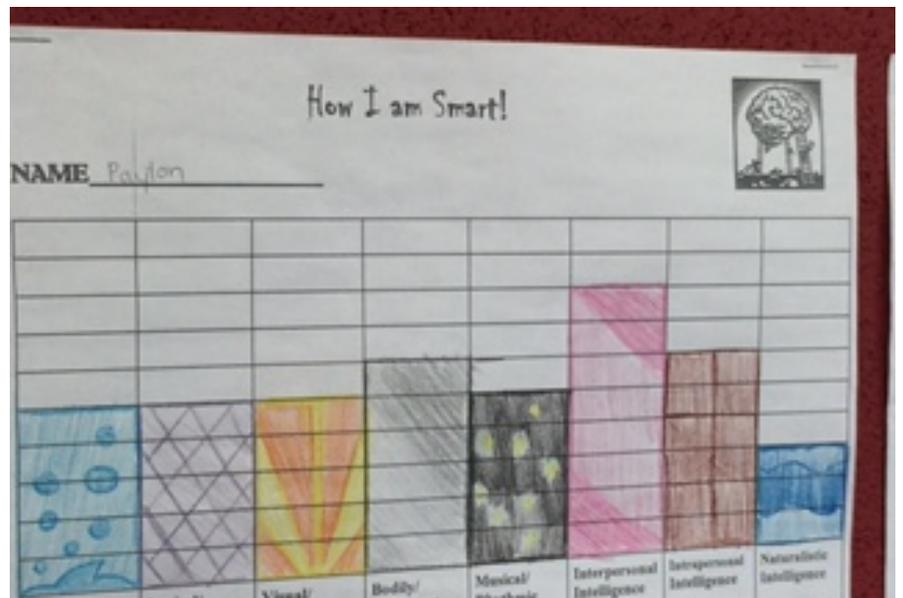
All students complete their Multiple Intelligences Survey. This informs them about their strengths in learning and areas to challenge themselves to improve. These are posted in the classroom as reminders to teachers and educational assistants about the learning styles of their students.



Who Am I Shields



Celebrating Differences



Multiple Intelligences Results

## Building a Community of Student Learners: Cross-Curricular Focus on Mathematics

Teachers in grade 7 and 8 focus on mathematics in many of their subjects: art, science, technology, health and physical education, geography, language. This cross-curricular focus on mathematics reinforces the concepts being taught in the mathematics classrooms and builds a community of staff learners.



*Technology and rates (maximizing speed)*

*Visual Arts and Geometry*



*Health and Physical Education:*

*Circles, Angles, Parabolas*



*Science: Collecting and Analyzing Data*



## Building a Community of Parent Learners: Parents are Involved in their Child's Learning

At North Grenville DHS, classroom math newsletters are sent home to parents outlining the mathematics that will be taught in the next few weeks so that parents are aware of the concepts being taught in their children's math classes. This encourages open communication with parents and helps them learn how to support their children. In addition, parents are encouraged to join workshops being taught at NGDHS or in nearby schools.



**PRESENTS...**



**Balancing a Cheque Book**

Tuesday, November 10th, 3:30-4:30

@ The Kemptville Youth centre

**Managing Credit**

Tuesday, November 24th, 3:30-4:30

@ The Kemptville Youth centre

**Families welcome.**

Kemptville Youth Centre  
5 Oxford Street, Kemptville, ON, K0C 1J0  
[www.kemptvilleyc.com](http://www.kemptvilleyc.com)  
613-258-5212

Follow us on Facebook for more events

*Building Parent Numeracy Skills*

**OPEN HOUSE**

See our program

Meet our staff

**North Grenville Intermediate**

**Grade 7**

**OPEN HOUSE**

Come Join Us

Thursday, April 7th, 2016  
6:30p.m. - 8:00p.m.

UPPER CANADA  
DISTRICT SCHOOL BOARD



NG Math @ltngdhs · 22 Oct 2015

The Third Teacher at work: Great to see Ss @NG\_Knights @UCDSB collaborating in new spaces



*Tweets Go Out to Parents Regularly*

# Parents As Partners Supporting Student Success

For parents/community members/educators

Brought to you by the Parent Involvement Committee (PIC) of the  
Upper Canada District School Board

## WHEN:

Tuesday, May 17, 2016

6:00 pm – 8:00 pm

## WHERE:

Smiths Falls District Collegiate Institute  
299 Percy Street, Smiths Falls



## Featured Presentations:

- *Fostering a "Growth Mindset" in My Child:* Ewen McIntosh,  
Principal, Rothwell Osnabruck
- *Building Your Child's Life-Long Love of Math:* Shelly Corlyon,  
Principal of Program
- *21<sup>st</sup> Century Learning/Technology and Preparing Children  
for the Future:* Sarah Stone,  
Secondary Program Learning Partner

Babysitting and light refreshments will be provided.  
Little Ray's Reptile Zoo will entertain your children.

This is a **FREE** event

# 8 Practical Ways to Conquer Your Child's Math Anxiety

## 1 Be involved

Student success in school has been shown to increase if their parents are positively involved in their education.



Math is everywhere: Have your child show thinking using and connecting many representations (concrete materials, pictures, graphs, charts, words, etc.)

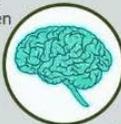
## 8 Make math relevant to real life

Highlight ways in which you and your family use math in everyday life and discuss how good math skills will open the doors to a larger choice of career options.



## 2 Encourage a growth mindset

Studies have shown that effort trumps ability when it comes to learning math, so set high expectations when encouraging your child.



## 7 Take baby steps

Support new topics by slowly building from the topics your child already understands. Use gradual, repeated success to build math confidence in your child.



## 3 Be positive about math

A parent's perception of mathematics influences not only their child's feelings about math but also their child's achievement in mathematics.



## 6 Allow mistakes

Focus on the concepts rather than the right answer, since making (and correcting) mistakes is an essential part of math learning.



## 4 Overcome gender stereotypes

Foster math confidence regardless of the gender of your child by highlighting achievements made by both male and female scientists.

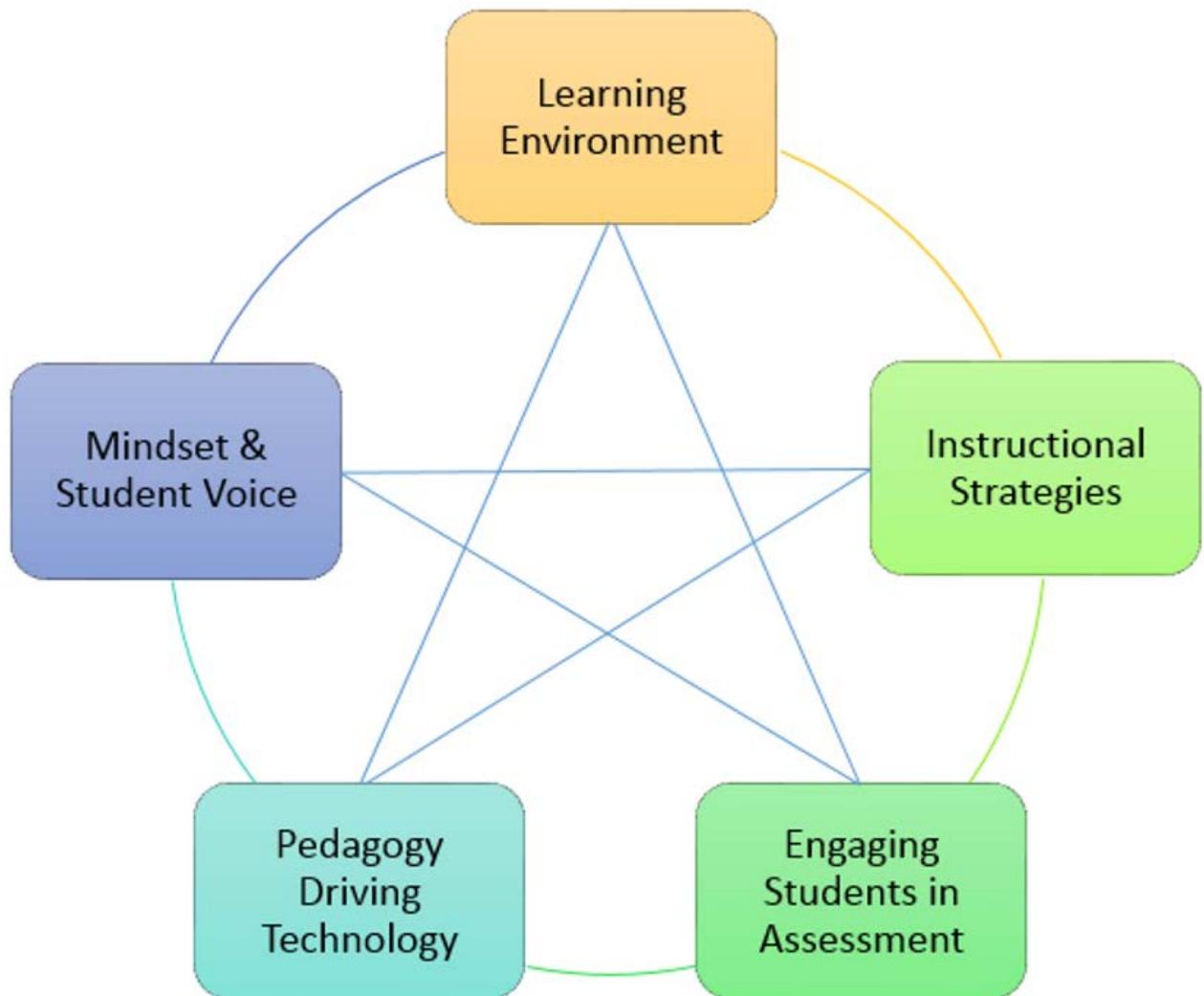


## 5 Learn the basics

Children need to have strategies to learn the basics. Let your child tell you how he/she figured out an answer – encourage him/her to practice many ways until he/she has number fluency.  
(THIS DESCRIBE OR MODIFIED FROM SOURCE BELOW)

## Building a Community of Staff Learners: Administrators and Teachers are Co-Learners

The teachers, principals and vice principals meet monthly in math learning teams to learn together about building math conceptual understanding, procedural fluency, processes and curriculum expectations, fluency with numbers, number talks, making student thinking visible, rich tasks, assessment as, of, and for, and the third teacher, to name but a few of the research-based areas they explore. The grade 7 and 8 teachers have common preps as well so collaboration occurs twice a week during prep time.



*A Framework for Learning in Learning Teams*



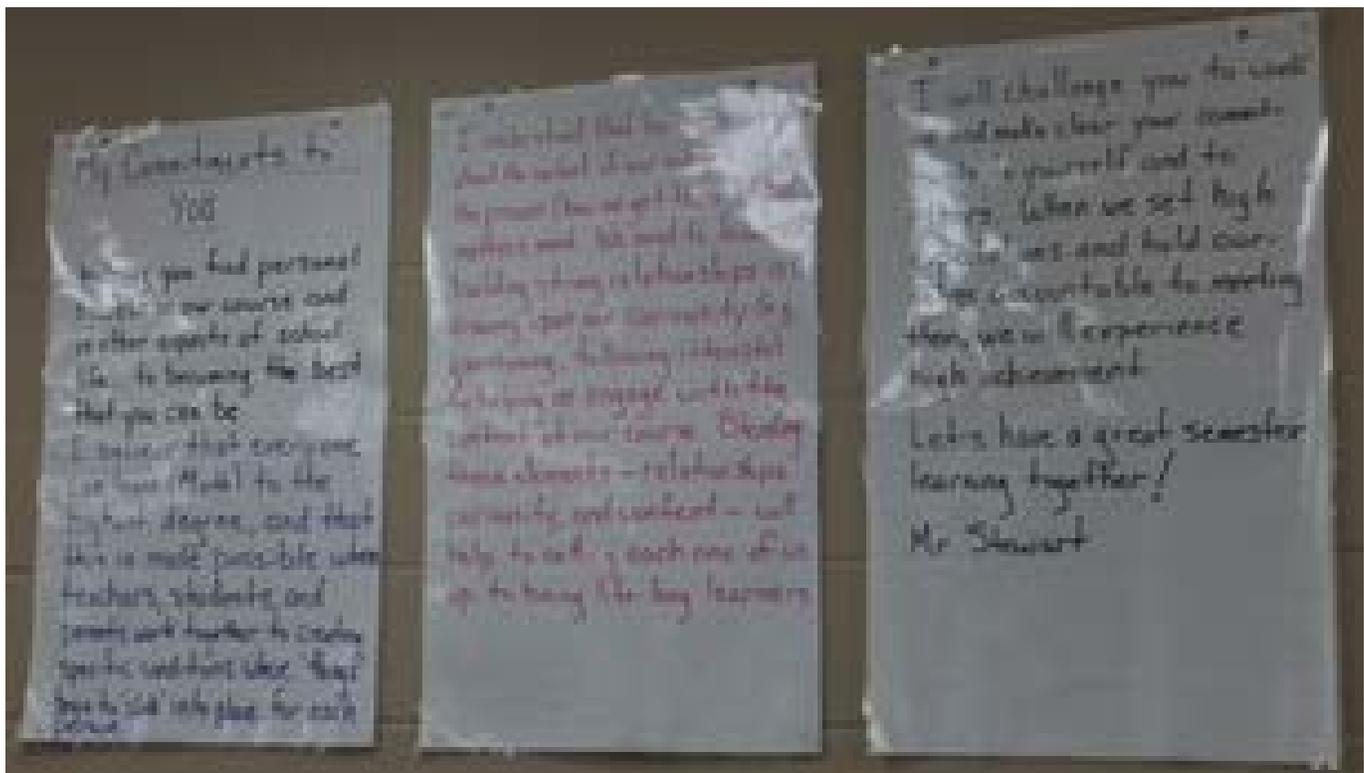
## Teacher Self- Reflection: Chris Stewart

### Professional Practice

- ▶ If my students and I work collaboratively to learn mathematics, then student engagement will increase
  - ▶ Realizing collaboration...
    - ▶ ...through the physical learning environment
      - ▶ to occasion thinking
    - ▶ ...through assessment practices that focus on process and invite student input

### Learning Cafes

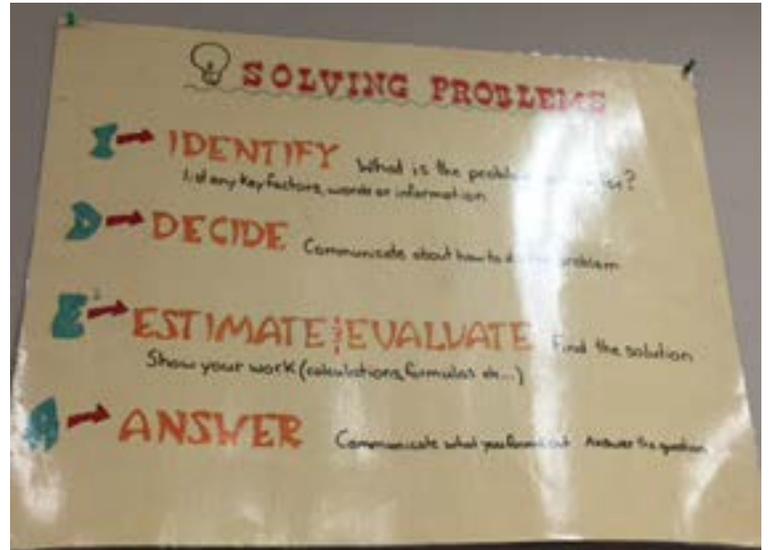
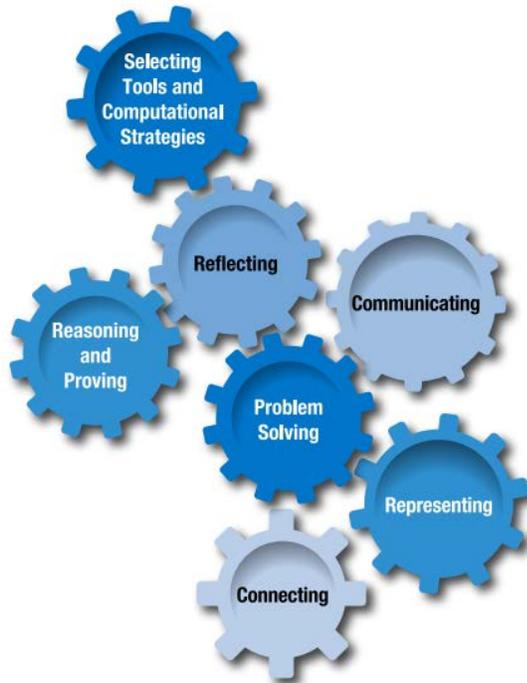
- ▶ If I share my practice with others, then I will build relational trust and will set directions for future inquiries with my colleagues
  - ▶ Cafes became a place for staff to think about their own practice and what I was trying to do in my own classroom
    - ▶ The future? Exploring possibilities



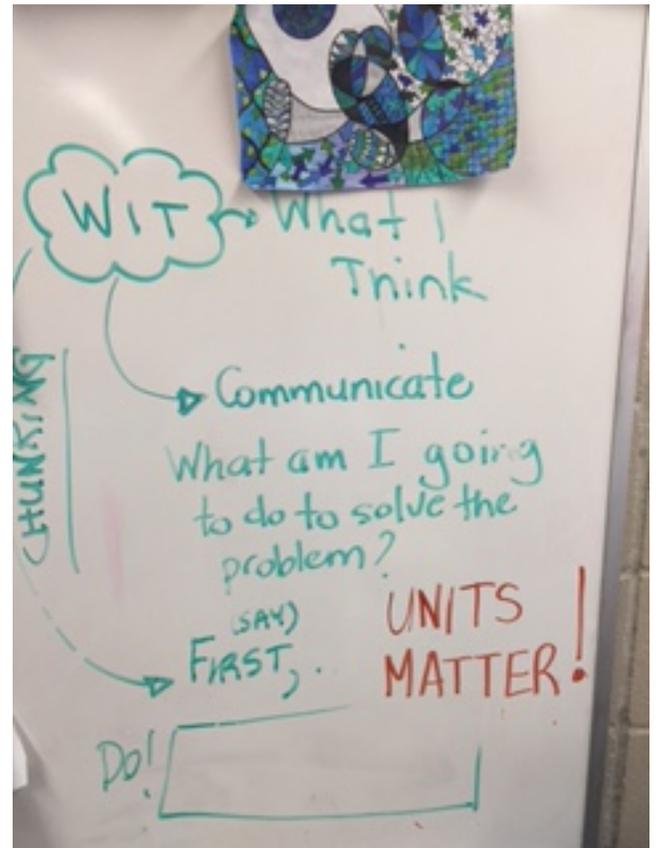
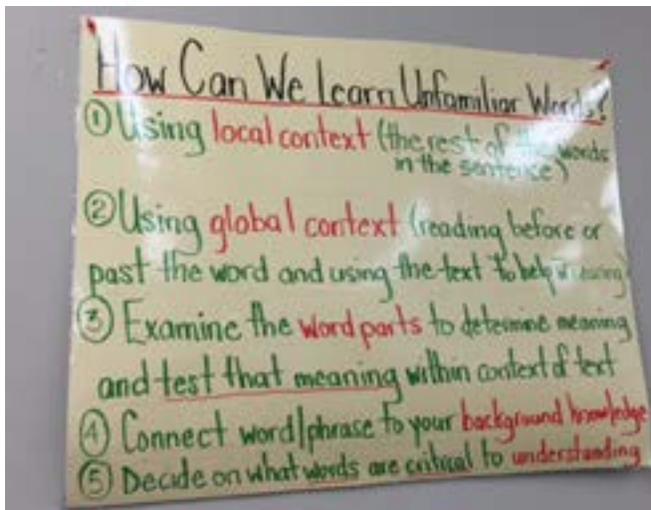
Mr. Stewart's Commitment to his Students: Posted in the Classroom

## Building a Community of Staff Learners: The Mathematical Processes

The teachers know the importance of pairing the processes in mathematics with curriculum content areas. They co-construct success criteria with the students so they know specifically the steps to problem solving, for example.



The seven mathematical processes describe the actions of doing mathematics. They support the acquisition and use of mathematical knowledge and skills.



How to Show Your Work (in Math)

- 1) Write formula/problem  
 $C = 2\pi r$  Find the circumference
- 2) Substitute variables  
 $C = 2\pi r$   
 $= 2(3.14) \times 6$  Use Up Exponents opposite side
- 3) Solve using BEDMAS  
 $C = 2\pi r$   
 $= 2(3.14) \times 6$   
 $= 37.68 \text{ cm}$  unit of measure

Table with columns: Term #, Term Value, Equation

1	10	$T = 10 + 2n$
2	12	
3	14	
4	16	

General Term or Equation of Formula

Communicating your Learning

Mathematical Processes

# Representing

I could show this idea a different way by...

The various forms helps me to see different aspects of the problem such as...

I know I am representing when I:

- mathematize a situation using concrete materials, pictures, diagrams, graphs, tables, numbers, words or symbols

## Mathematical Processes

Problem Solving and Communicating are central to doing and learning mathematics.

Mathematics of thinking is communicated orally, visually, kinesthetically, and in writing.

Interrelated aspects of Problem Solving include: Representing, Reflecting, Connecting, Reasoning and Proving, Selecting Tools and Computational Strategies.

Life-long learners of mathematics build new knowledge and skills in prior knowledge using the mathematical processes.

Confidence and flexibility results from conceptual understanding.

Accuracy and efficiency results from knowing facts and procedures.

**BEDMAS**

**EXONENTS**  
power  $6^3 = 6 \cdot 6 \cdot 6$   
base

**LINEAR ALGEBRA**

**PATTERN**

**TERM #**

**TERM VALUE**

**EQUATION**

$n^{\text{th}}$  TERM

**ISOLATE VARIABLE**

**INVERSE OPERATIONS**

**BALANCE EQUATION**

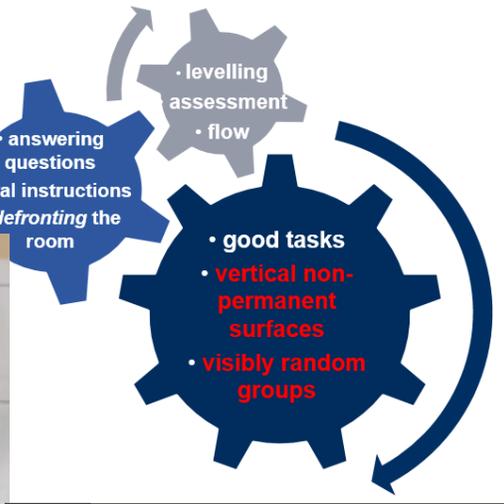
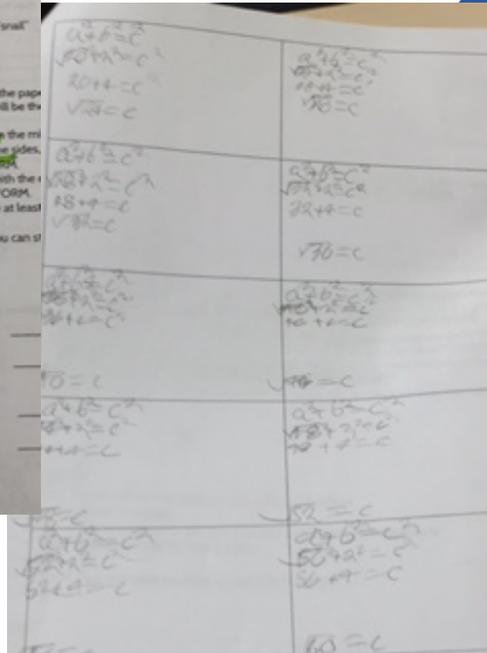
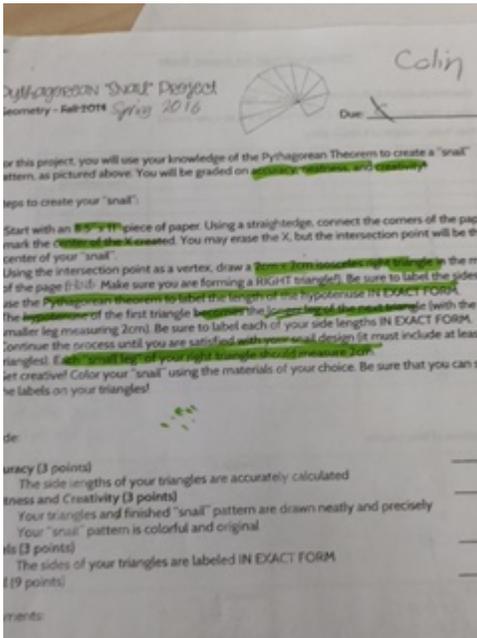
**EXPRESSION/GENERAL TERM**

Language of Mathematics: Improved Communication

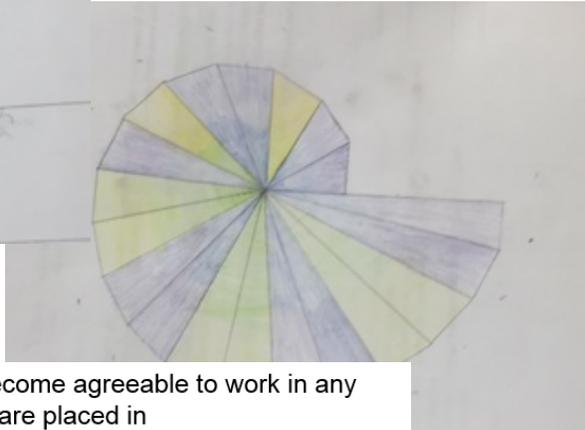
# Building a Community of Staff Learners: Rich Tasks, Non-Permanent Vertical Surface and Visible Random Groupings

The research of Peter Lyljedahl has helped shaped the work in the classrooms:

Rich Tasks:



**BIGGEST IMPACT**



Visibly Random Groupings:



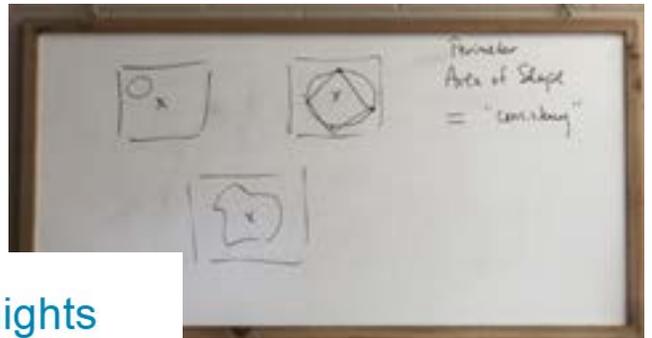
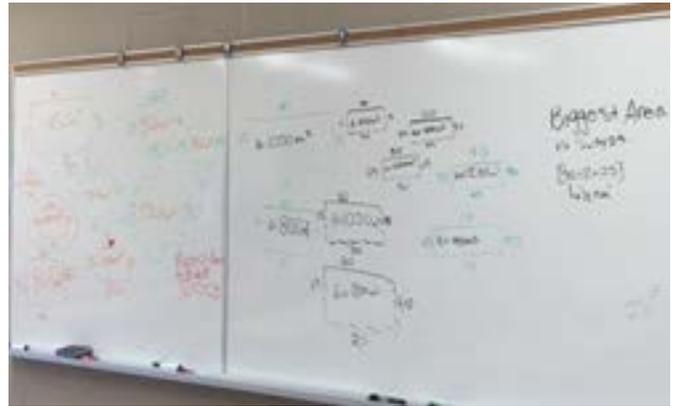
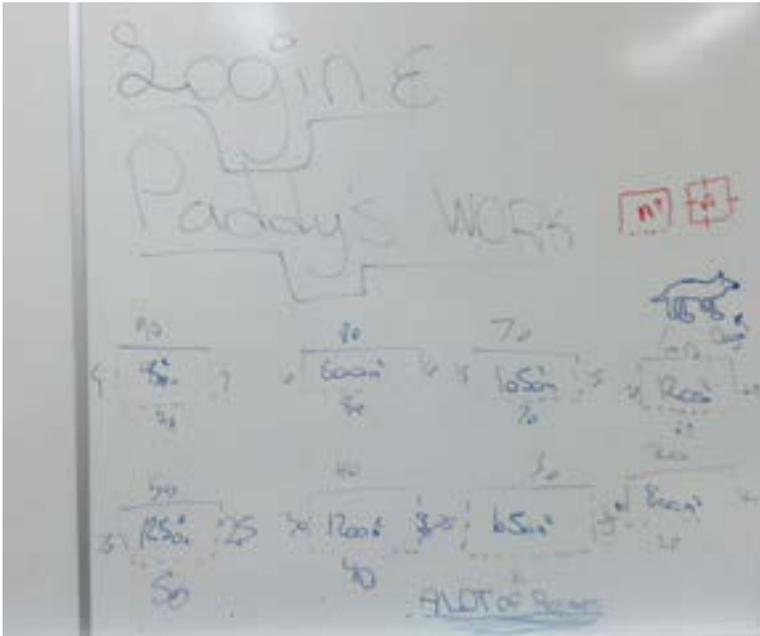
Flipping the Focus @flip4change · Feb 10  
Class starts @NG\_Knights @UCDSB, single prompt: "Make your thinking visible." Ss automatically choose #VNPS Awesome!



- students become agreeable to work in any group they are placed in
- there is an elimination of social barriers within the classroom
- mobility of knowledge between students increases
- reliance on the teacher for answers decreases
- reliance on co-constructed intra- and inter-group answers increases
- engagement in classroom tasks increase
- students become more enthusiastic about mathematics class

Liljedahl, P. (in press). The affordances of using visually random groups in a mathematics classroom. In Y. Li, E. Silver, & S. Li (eds.) *Transforming Mathematics Instruction: Multiple Approaches and Practices*. New York, NY: Springer.

Vertical Non Permanent Surfaces:



NG Math @ltngdhs · 9 Sep 2015

Great day with Gr 10 Ss @NG\_Knights collaborating and sharing their understanding using WBs and random groupings



## Building a Community of Staff Learners: Learning Goals and Co-Constructed Success Criteria – Making Student Thinking Visible

The teachers understand the importance of setting learning goals in the classroom and co-constructing success criteria with the students. Student talk, they realize, is key to making student thinking visible so they have co-constructed success criteria for student talk moves.

### Student Talk Moves

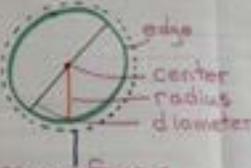
- Do most of the talking
- Explain their thinking
- Show that they are listening
- Openly admit if there's confusion or something that's not yet known
- Expect, respect and

- inspect their own mistakes and the mistakes of others
- Challenge other's thinking non-judgmentally
- Ask questions when they do not understand

### HOW TO DRAW A GRAPH (A GOOD ONE)

- Use a ruler for ALL straight lines
- Use graph paper!
- Label axes (x,y) properly
- Give relevant title, centered + underlined
- Date + Name in top right corner
- Colour or patterns to show data
- Proper scale on axes!
- Legend with colour off to the side
- Border around Page
- Not too BIG or too small
- Do a rough copy
- Use a squiggle line to show jump in scale break

### CIRCLES



- $r = d \div 2$
- $d = r \times 2$
- $C = \pi d$
- $C = 2\pi r$
- $A = \pi r^2$

Group Goals

### Participation Group Goals

- Leaning in and working in the middle of the table
- Equal 'air time'
- Sticking together
- Listening to each other
- Asking each other lots of questions
- Following your team roles

### FACTORS = MULTIPLES

24

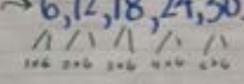
The factors of 24 are 1, 2, 3, 4, 6, 8, 12, 24



We can represent as factor pairs.

$1 \times 24 = 24$	$3 \times 8 = 24$
$2 \times 12 = 24$	$4 \times 6 = 24$

The MULTIPLES of 6  $\rightarrow$  6, 12, 18, 24, 30



so that 24 is the 4<sup>th</sup> multiple

## Building a Community of Staff Learners: Descriptive Feedback – Assessment For and As Learning

The teachers understand the importance of excellence and high expectations. They provide descriptive feedback to their students and expect them to go back to their solutions and improve upon them.



NG Math @ltngdhs · 26 Nov 2015

Collaboration from Ss re: descriptive feedback on linear systems @NG\_Knights  
Well done moving us forward!



KU:      APP:      T/PS:      COMM:

**Bloom's/Achievement, to inform assessment of learning**

Expectations

Through this assessment of learning, you will have the opportunity to showcase your ability to...

- ... Use the distribution from a probability experiment to determine the experimental probability of an event
- ... Determine the theoretical probability of an event (using different strategies—e.g., reasoning, tree diagrams, complement)

**prompt to use success criteria during assignment completion, assessment as learning**

Instructions

Answer each of the problems that follow on lined paper. Check the success criteria to make sure that your solutions are completely showing your thinking. The communication aspect will be assessed using the attached rubric (p4).

Some **success criteria**: 'Must-haves' when designing and completing your solution to #1

Did I...

**Recording solutions and feedback  
in MS Onenote (Classroom Notebook)**

KU	#1: Incorporate the term "outlier", if appropriate, and discuss its potential impact on the value of the mean?	Approaching	On Target	Working to Exceed
	You also compared the mean to the median. ← summarize			
KU	#1: Choose an appropriate bin width? Recall: min of 5 and no more than 20 bins. Bin width = Range / # of bins	Approaching	On Target	Working to Exceed
	For this data set, it makes sense to only show a calculation for 5 bins. For other data sets, you'd want to consider calculating the bin width for the maximum 20 intervals. In this case, a simple statement of why one would not bother calculating for a bin width greater than 2 would do. ← explain			
			redirect	
KU	#1: Show all steps in the calculation of the standard deviation—organizing your work in the form of a table? If I used technology (e.g., Excel), have I shared this with my teacher? Or have I included a screenshot of the table in my assignment?	Approaching	On Target	Working to Exceed

Onenote Classroom Notebook has become an effective means for students to chronicle the learning process, engaging in a 'continuous' conversation with their teacher on how to improve their work/deepen understanding.

**Explain and re-direct (SE2R)**

To gamble <sup>in</sup> this situation, this is the way to go.

ii) ∴ from this spinner, they will have a better chance of selling the house for 10,000 more as they have a 50% chance of this happening. Highlight the aspect of "gambling" in this situation. That is, describe how the spinner would be used to experiment. (continued, below)

∴ the probability of flipping a black face king queen or jack is 11.5% chance

3. a) 52 cards  
 black face/ King 2  
 queen 2  
 jack 2  
 $\frac{6}{52} = .1153 / 11.5\%$

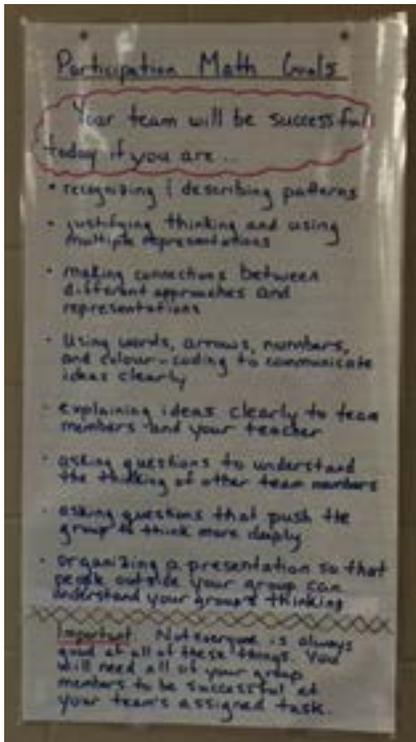
b) 4 aces, 4 twos, 4 threes.

3b) Give this one a 2<sup>nd</sup> try.

\*26) Give this a try.

#2 contd.: How many times would you spin; what to do with the results; and how would you interpret the results?

# Building a Community of Staff Learners: Student and Staff Work Collaboratively



NG Math @ltngdhs · 22 Oct 2015

The Third Teacher at work: Great to see Ss @NG\_Knights @UCDSB collaborating in new spaces

