



Learning Networks of Ontario



E-Channel

LBS Online Community of Practice

Making Math Fun!

November 22, 2018



Learning Networks of Ontario



E-Channel

About LBS Online Community of Practice (OCP)

- free webinar series developed by Ontario's LBS Regional Networks, Sectors, & the Provincial Support Organizations for Literacy
- supports LBS practitioners with presentations on topics important to them
- 5 English language webinars presented for LBS practitioners annually since 2015-2016
- **all** webinar presentations, recording links & transcripts here:
<https://e-channel.ca/practitioners/lbs-online-community-practice>
- webinar topic ideas welcome at: e-channel@contactnorth.ca

Today's Webinar... Making Math Fun

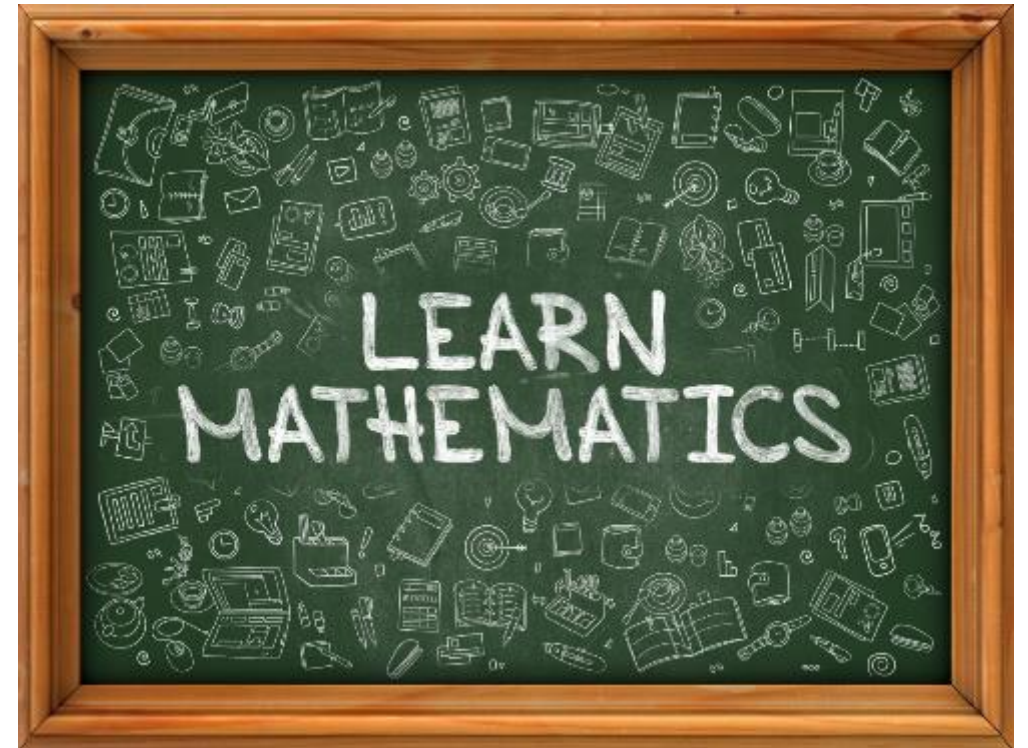


Rex Murphy on the Point of View:

<https://www.youtube.com/watch?v=V9mMh9Wn-mM&t=35s>

Today's Webinar... Making Math Fun:

- General Principles and Approaches to Making Math Fun
- Finding the “one-der” in Math
- Gamification, Gamer Psychology and Math
- Making Math Fun: Using Videos, Blogs, and Cartoons – resources
- Q and A



Meet our Panellists

Barb Glass – Executive Director – College Sector Committee for Adult Upgrading (CSC)/long-time math educator

Wayne Miedema – Instructor – Essential Skills Upgrading (ESU) – Waterloo Region District School Board

Summer Burton – Project Manager – Literacy Link South Central's Gamification Project

General
Principles
and
Approaches
to Making
Math Fun!



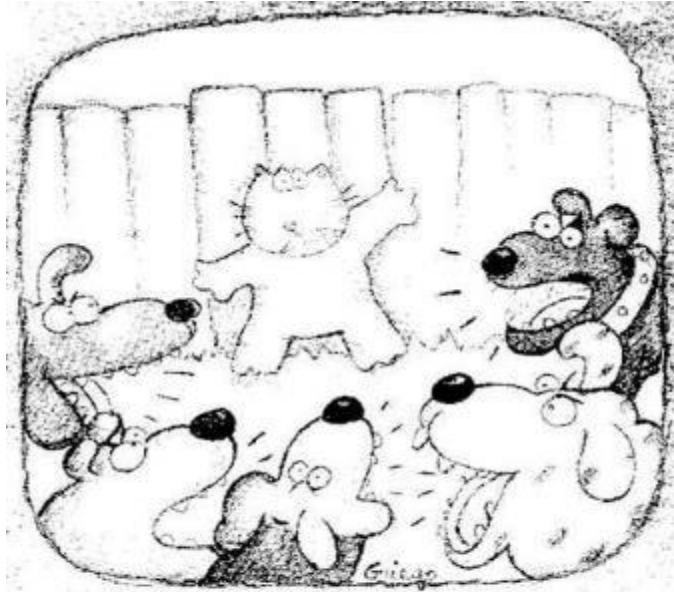
How I Finally Got Over My Fear of Math...

*The classroom smelled like feet. It had no windows and was lit by those awful overhead fluorescents that make everyone over 25 look like an extra from *The Walking Dead*.*



Not that this mattered to most of my classmates, who looked barely 18 and were probably wondering what the old lady was doing in their community college pre-algebra class. But none of this was as uncomfortable as what was facing me on the whiteboard: a long, complicated mess of an equation, full of parentheses, exponents, and negative signs. Somehow I had to come up with the answer.

How I Finally Got Over My Fear of Math...



They say you learn the most from your most difficult experiences.

I bent over my graph paper and started to calculate. All too soon, the professor called time and began walking around checking our results. I was in the second row, so he got to me quickly. I pointed to my solution.

"That is correct."

None of my friends and family understood why I'd suddenly decided, at age 38, to revisit high school math.

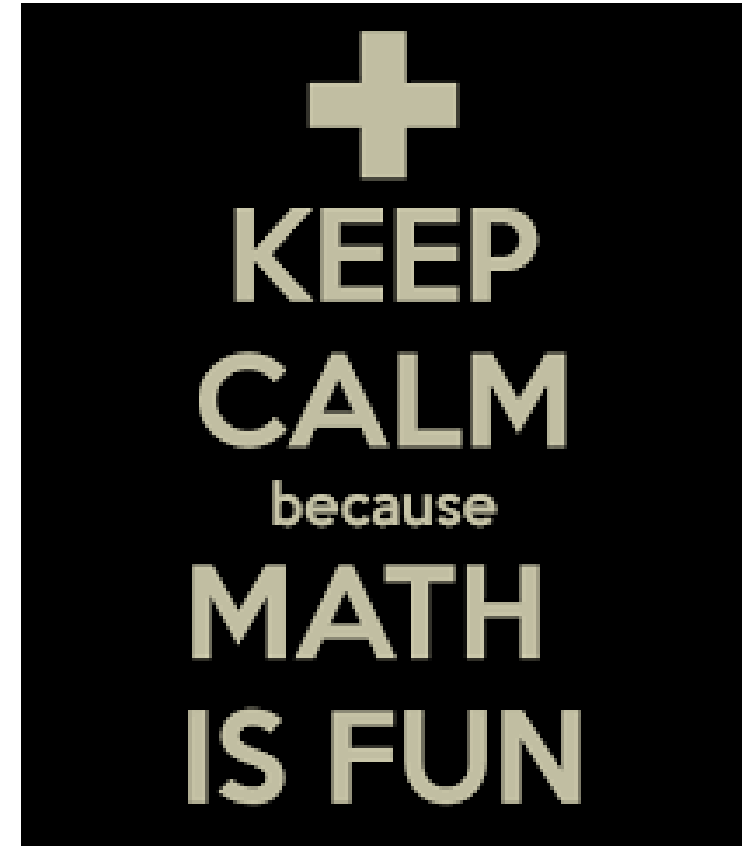
"Why would you do that to yourself?" my friend Nina, an attorney, asked over lunch, her eyes wide as she sipped her pomegranate iced tea.

"Because I got sick of believing I suck at math," I replied.

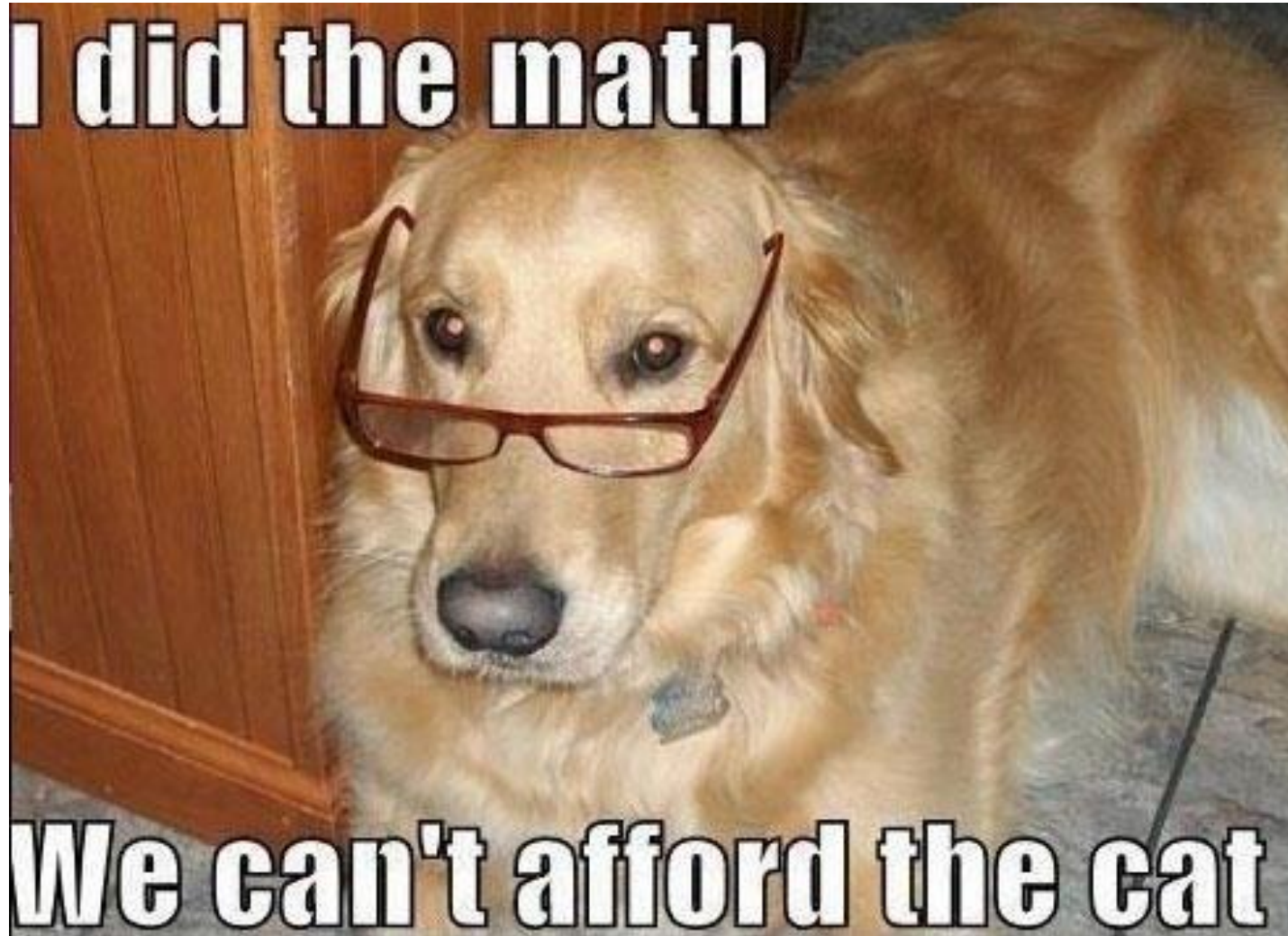
Source: <https://www.cosmopolitan.com/lifestyle/advice/a27513/fear-of-math/>

Approaches to Making Math Fun!

- ✓ Use Humour
- ✓ Be Positive About Math
- ✓ Seek Input From Learners
- ✓ Provide Positive Reinforcement
- ✓ Incorporate Technology
- ✓ And...Use Humour!



Use Humour 😊



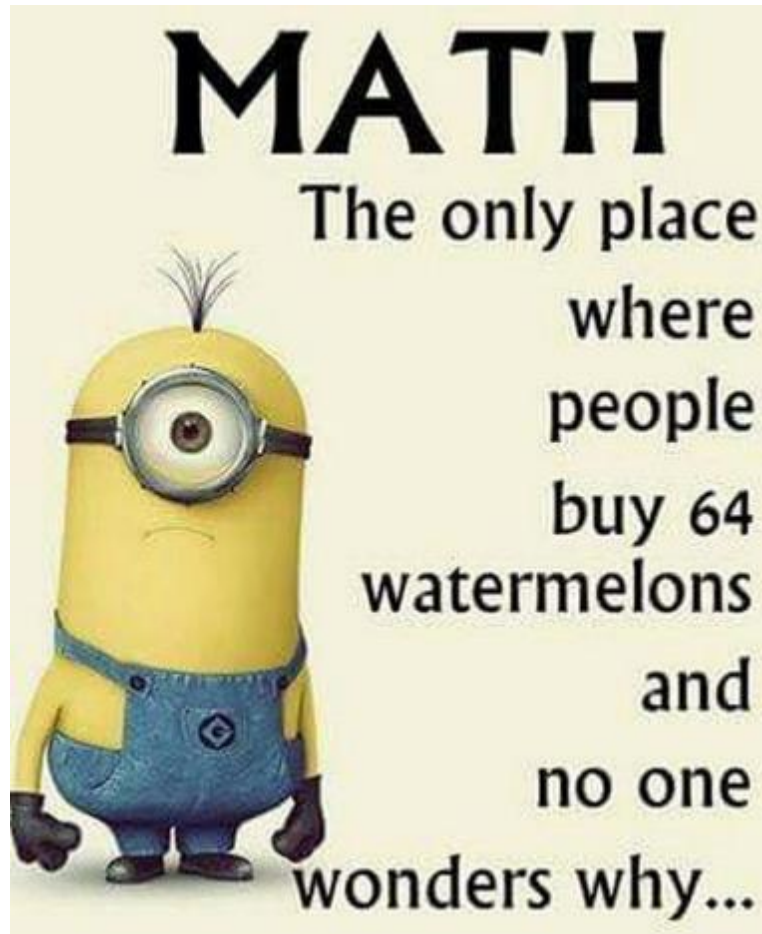
It helps to take the mystery and intimidation out of math...

Use Humour 😊

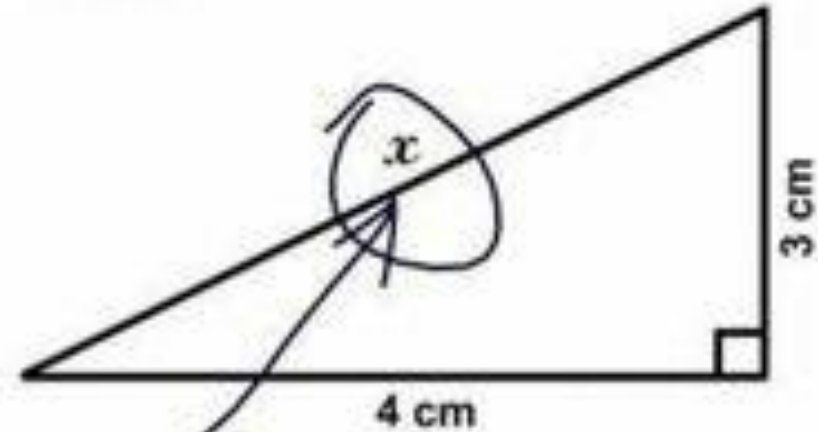
5. Sam can make 11 beaded necklaces in an hour. Sue can make 12 beaded necklaces in an hour. In one week Sam made necklaces for 6 hours and Sue made them for 3 hours. Who makes more bracelets in the week? Explain.

NOBODY was
making
bracelets

Use Humour 😊



3. Find x .



Here it is

Ocular Trauma – by Wade Clarke © 2005


Have a Positive Attitude Toward Math



- Emphasize that math incorporates more than just “pencil and paper” calculations.
- Talk about the fun and “beauty” of math.
- Encourage your learners to share “math successes” they have experienced, no matter how small!
- Inspire confidence in the language of math – demystify the terms through discussion, games, peer work, etc.

Have a Positive Attitude Toward Math

Use FUN FACTS!

Fun Math!! 

www.ganitgurooz.com

There are just four numbers (after 1) which are the sums of the cubes of their digits:

$$153 = 1^3 + 5^3 + 3^3$$
$$370 = 3^3 + 7^3 + 0^3$$
$$371 = 3^3 + 7^3 + 1^3$$
$$407 = 4^3 + 0^3 + 7^3$$

If you take your age and multiply it by 7, then multiply by 1443, the product repeats your age 3 times...

Have a Positive Attitude Toward Math

How I see math word problems:



**If you have 4 pencils and I have 7 apples, how many pancakes will fit on the roof?
Purple, because aliens don't wear hats.**

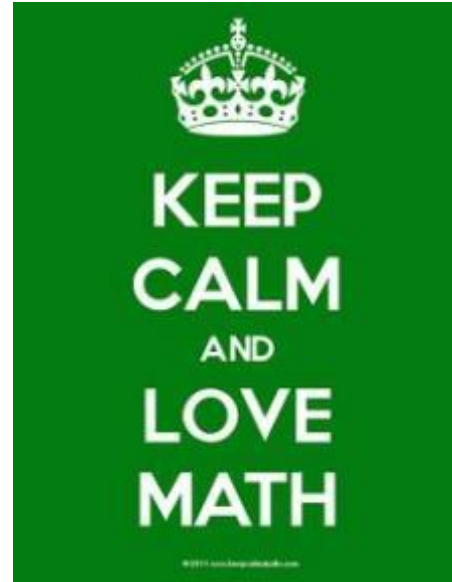
Talk about why math ISN'T fun.

Sometimes knowing that others have struggled with math resonates with our learners.

Seek Input From Learners

Ask learners what they enjoyed at school... not subjects but approaches.

Hands-on? Group work (or not!), Individual activities?



Create partner or small group math activities.

Two (or 3 or 4) brains are better than one!

Promote peer learning – they really can help each other.

Seek Input From Learners

Use a mentoring model, i.e. pair up a new learner (especially if s/he is math phobic) with a “seasoned” learner.

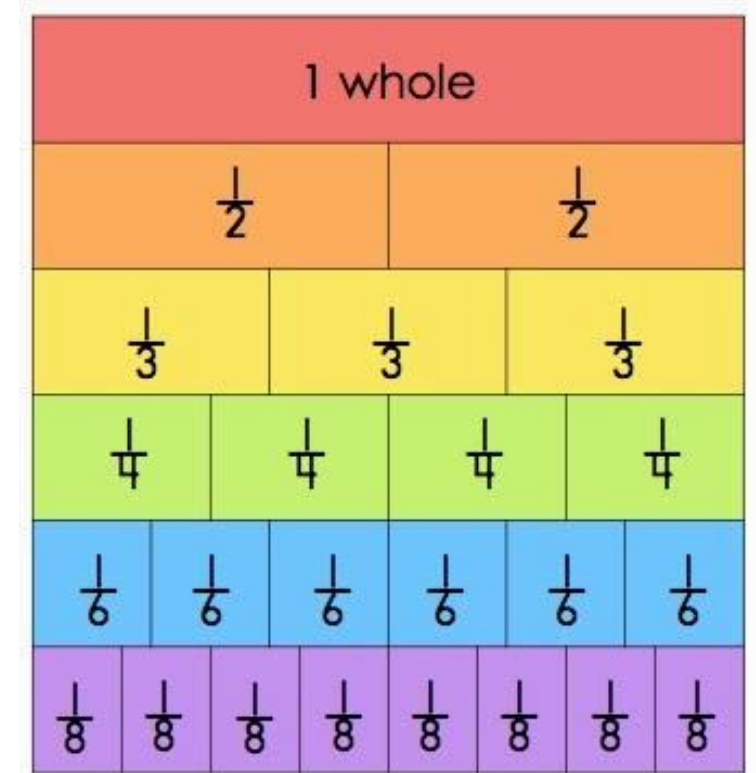


Give the “seasoned” learner credit in some way for his/her mentoring... there must be a milestone for that 😊

Seek Input From Learners

Use Real-life Materials

- Especially applicable to help learners with lower-level skill development.
- Ask learners for ideas of authentic materials to use.
- “Manipulatives” – items that learners can actually touch, count, arrange, sort, combine, etc.
- “Fraction Bars” are one example...

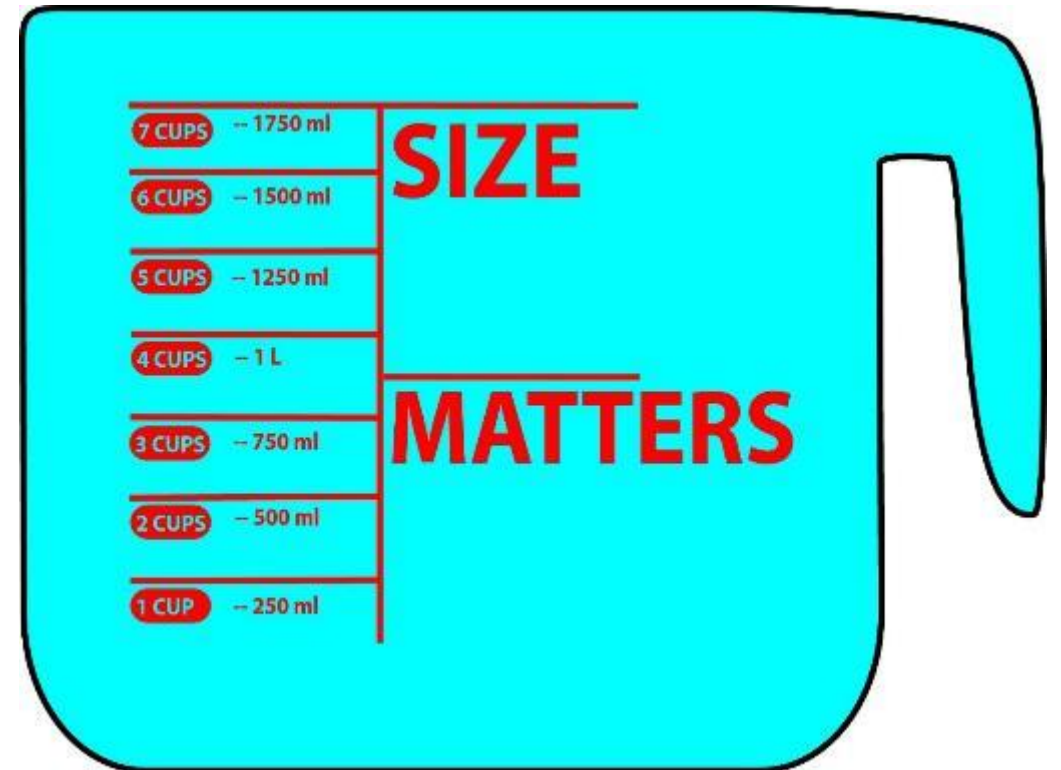


Seek Input From Learners

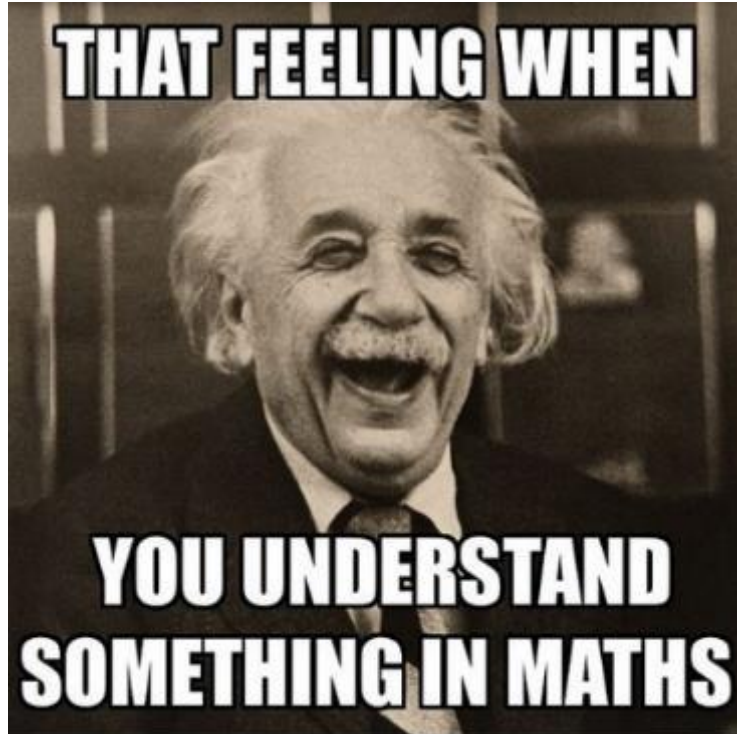
Others materials could include:

- Measuring tools
- Scales
- Store flyers/online ads
- “Fake” money
- Forms/Documents, e.g. pay stub

(It does take some time and thought to create lessons using manipulatives and authentic materials, but it's worthwhile!)



Provide LOTS of Positive Reinforcement

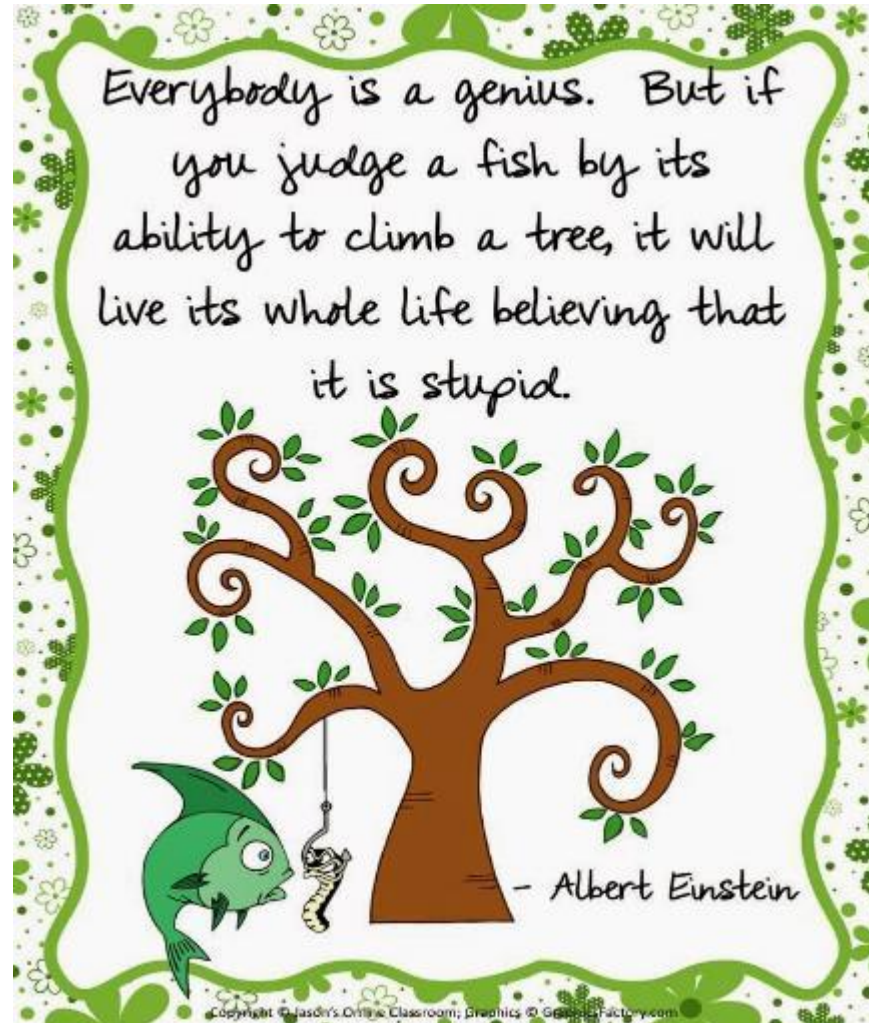


more funny stuff at FUNNYASDUCK.NET

- ✓ Acknowledge even the smallest successes!
- ✓ Inspiring confidence in math learning is a huge key to success...and greater “enjoyment”.



Provide LOTS of Positive Reinforcement



Incorporate Technology Where Possible

- Technology can be a variation on using manipulatives and authentic materials.
- It can also provide sample lessons – so many on YouTube!
 - [Simplifying Fractions](#)
- Free sites for self-study e.g. Kahn Academy
- Kahoot – free software for interactive classes (requires learners to have a device)

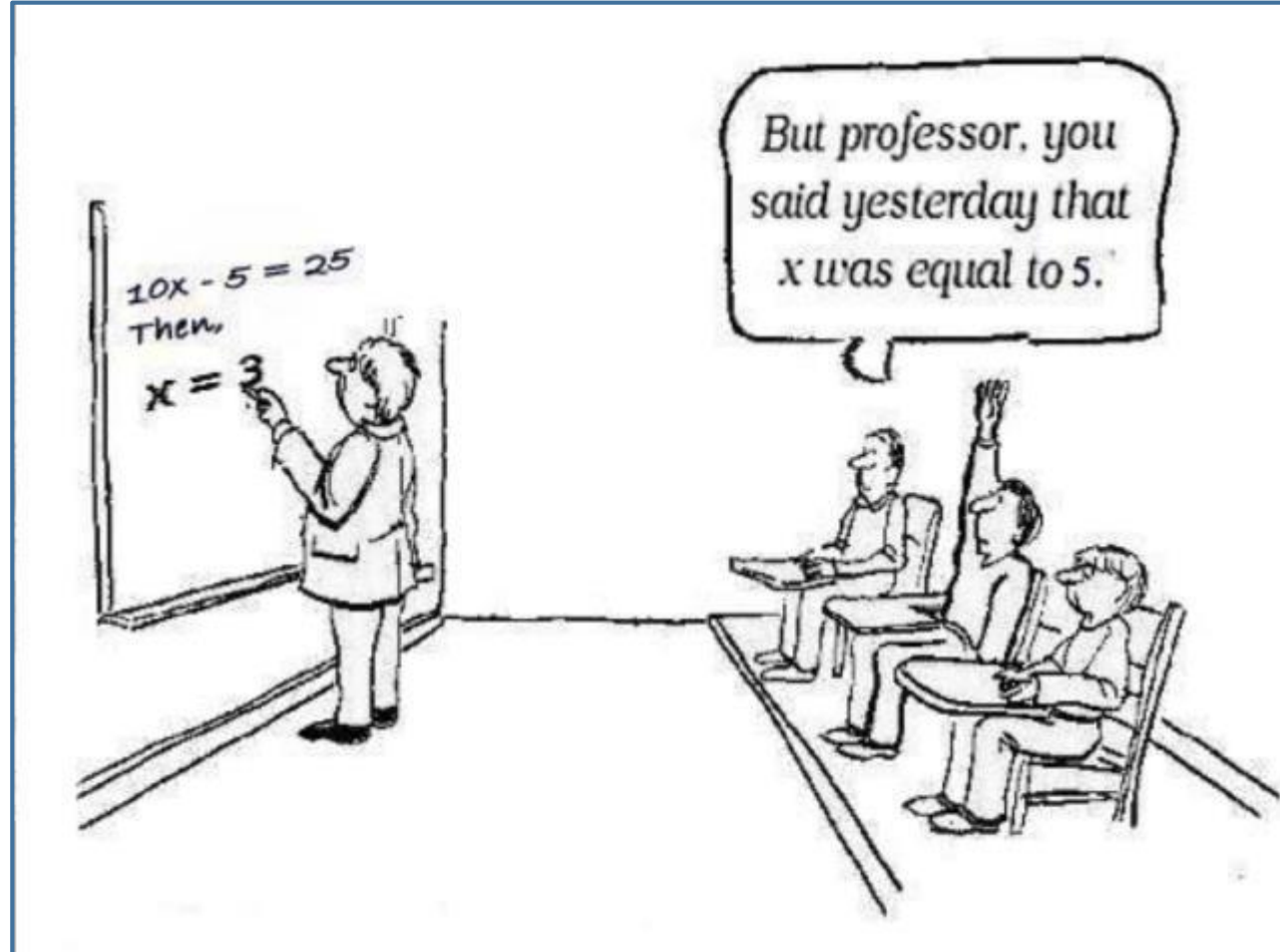


And...Use Humour!

“I HATE THE IDEA THAT, WHEN IT COMES TO BOOKS AND LEARNING, HARD IS OFTEN SEEN AS THE OPPOSITE OF FUN. IT’S STRANGE TO ME THAT WE SHOULD BE SO QUICK TO GIVE UP ON A BOOK OR A MATH PROBLEM WHEN WE ARE SO WILLING TO GRAPPLE, FOR CENTURIES IF NECESSARY, WITH A SINGLE LEVEL OF ANGRY BIRDS.”

—John Green

And...Use Humour!



Finding the “one-der” in math







Discovering the human stories: Leonardo Fibonacci and the Fibonacci series

Wrote *Liber Abaci* (The Book of Calculation) in 1202 which introduced Europe to a new system of numbers (including decimals) that had been developed by Hindu and then Arabic mathematicians. This Hindu-Arabic system of numbers then took over from the Roman numeral system.

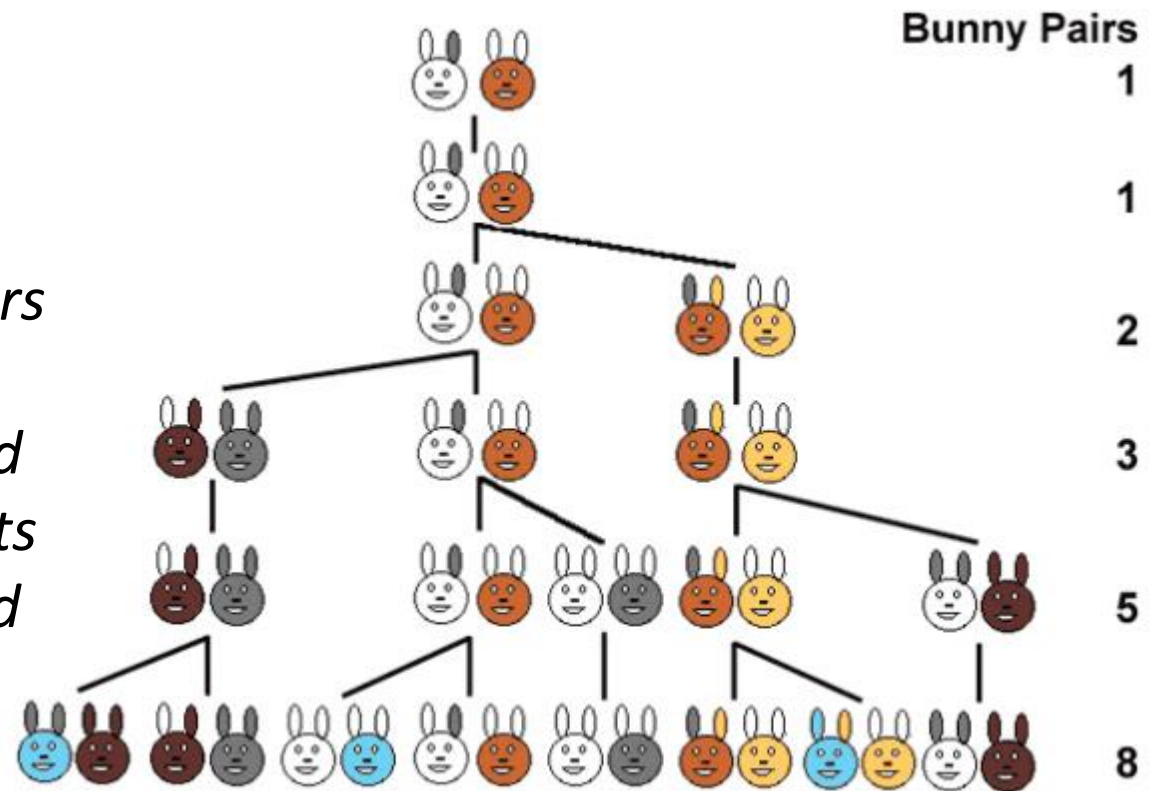
<i>Roman</i>	<i>Hindu- Arabic</i>
I	1
V	5
X	10
L	50
C	100
D	500
M	1000



Leonardo Fibonacci
1175 – 1250

Discovering the human stories: Leonardo Fibonacci and the Fibonacci series

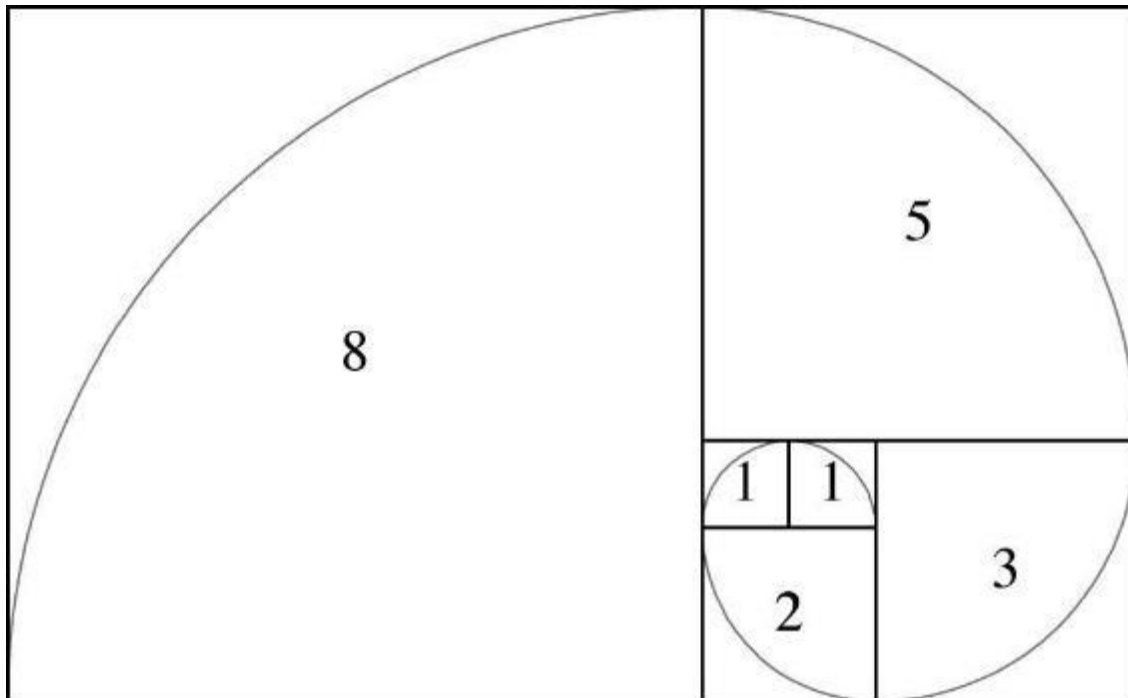
“A certain man put a pair of rabbits in a place surrounded on all sides by a wall. How many pairs of rabbits can be produced from that pair in a year if it is supposed that every month each pair begets a new pair which from the second month on becomes productive?”



The answer is the **Fibonacci number sequence**: 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89...

Discovering the human stories: Leonardo Fibonacci and the Fibonacci series

The Fibonacci number sequence 1, 1, 2, 3, 5, 8, ... gives us the Fibonacci Spiral which appears in so many places in nature.



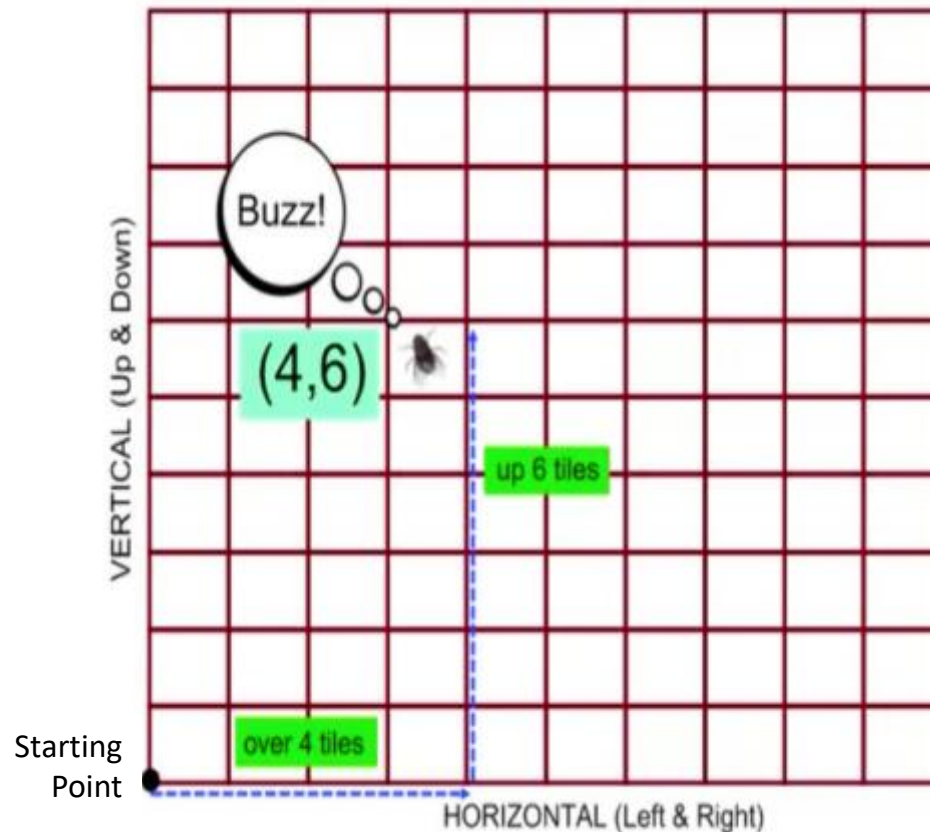
Discovering the human stories: Leonardo Fibonacci and the Fibonacci series



The Fibonacci Spiral has been discovered in many patterns in nature. It is known as Nature's Code.

Discovering the human stories: The Coordinate Plane (Cartesian Plane)

Legend has it
Rene Decartes
thought up the
coordinate
plane by
watching a fly
on tiles.



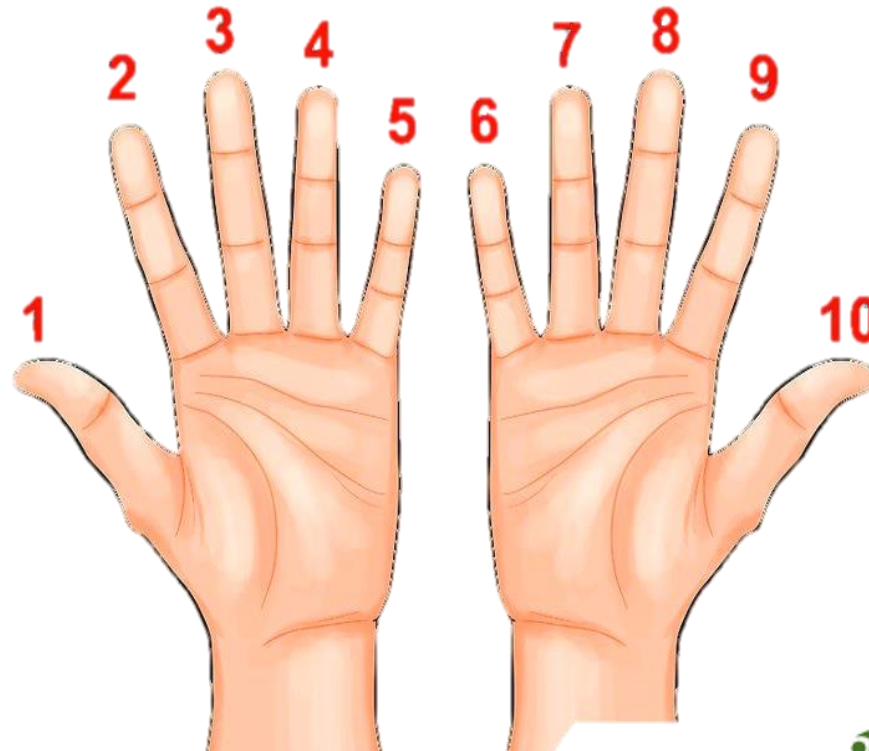
Rene Descartes
1596 - 1650

Discovering patterns and relationships: Nine times tables

9x tables patterns

$$\begin{array}{l} 1 \times 9 = 09 \\ 2 \times 9 = 18 \\ 3 \times 9 = 27 \\ 4 \times 9 = 36 \\ 5 \times 9 = 45 \\ 6 \times 9 = 54 \\ 7 \times 9 = 63 \\ 8 \times 9 = 72 \\ 9 \times 9 = 81 \\ 10 \times 9 = 90 \\ \vdots \\ 243 \times 9 = 2187 \end{array}$$

9x tables on fingers



Discovering patterns and relationships: Relationships between operations

$$\begin{array}{r} 4 \\ 4 \\ 4 \\ 4 \\ 4 \\ + 4 \\ \hline 24 \end{array}$$

Short cut \rightarrow $\frac{4 \times 6}{24}$

😊 ∞ (repetitive)

multiplication is a short cut for adding the same number over and over

$$5 \times 5 \times 5 \times 5 = 625$$

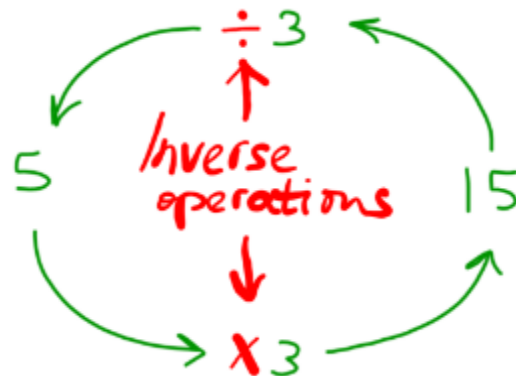
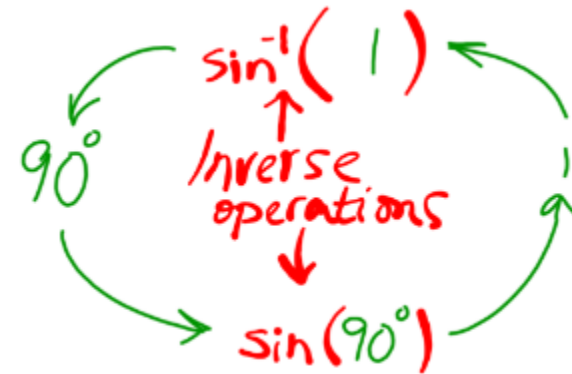
short cut \downarrow

$$5^4 = 625$$

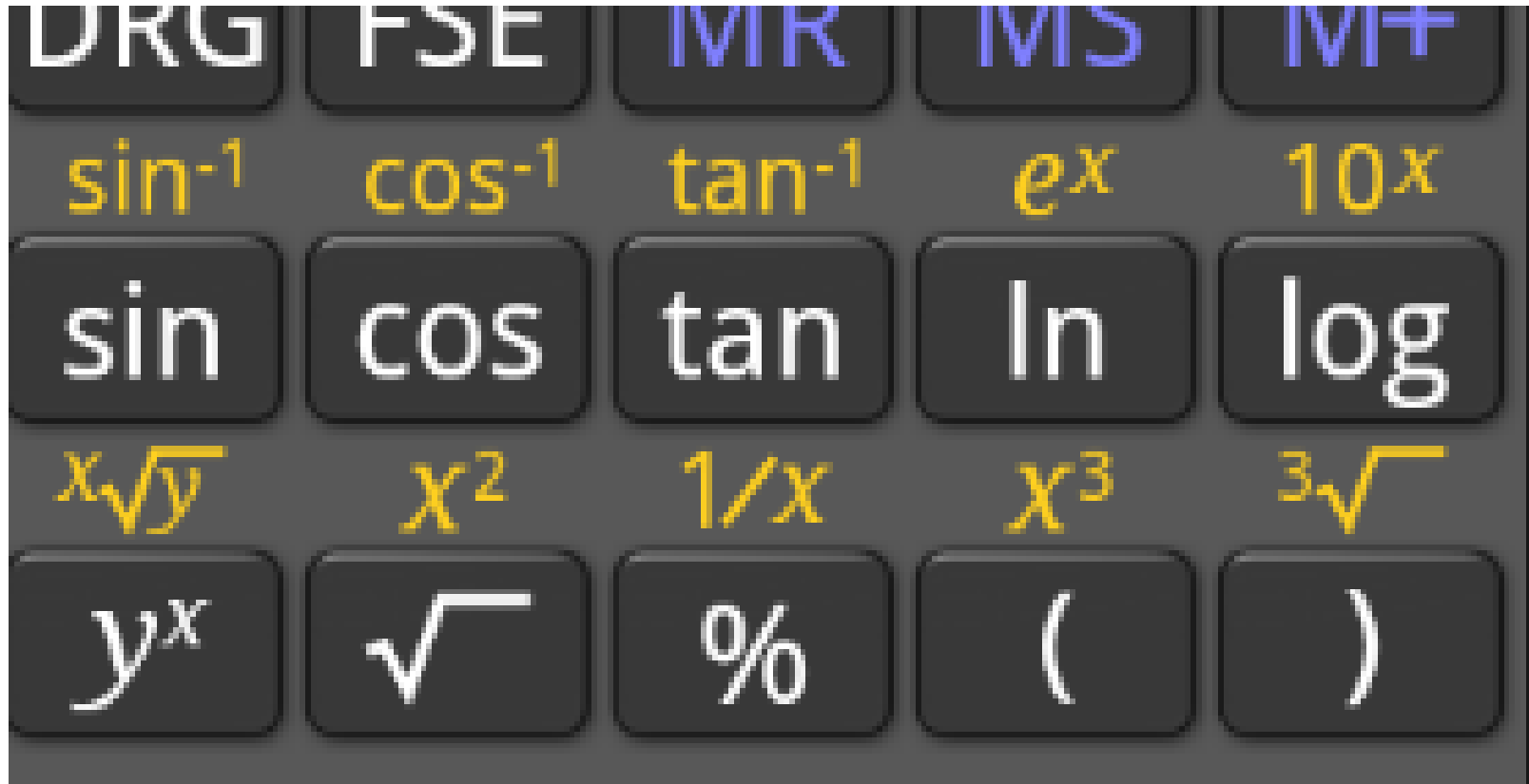
exponents are a short cut for multiplying the same number over and over.

Discovering patterns and relationships: Inverse operations

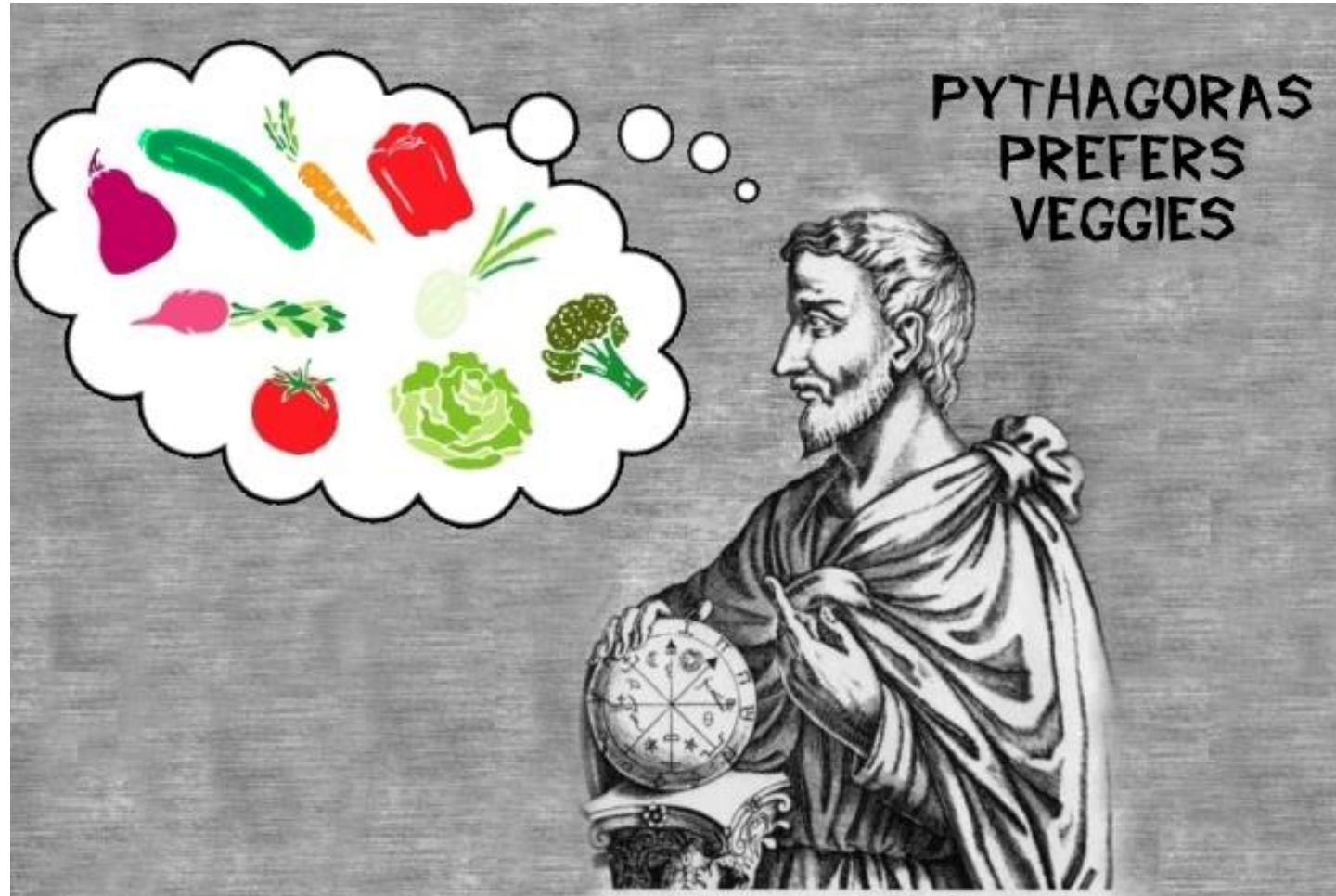
Every operation has another operation that will undo it



Discovering patterns and relationships: Inverse operations



Discovering the connection to world view:



Use the word “yet”

IF YOU ARE TEMPTED TO SAY
"I CAN'T"
HAVE THE COURAGE TO ADD
"YET"



Gamification, Gamer Psychology and Math

What is Gamification?

What is it?

How do I do it?

Do I even WANT to do it?

- The act of applying game-design elements and motivations to a non-game setting to increase engagement, change behaviour, or achieve a specific, desired result
- “Learning is not made into a game; the features of games which entice players to engage are used to draw in learners”

Core Drives of Gaming

1. Epic meaning & Calling
2. Development & Accomplishment
3. Empowerment & Creativity
4. Ownership & Possession
5. Social Influence & Relatedness
6. Scarcity & Impatience
7. Unpredictability & Curiosity
8. Loss & Avoidance



Gamer Psychology



Explorers, Achievers, Socializers and Killers

Helpful Gaming Traits

- Problem solving
- Collaboration skills
- Intense focus
- Continual skill development
- The ability to fail, learn from that failure, and try again

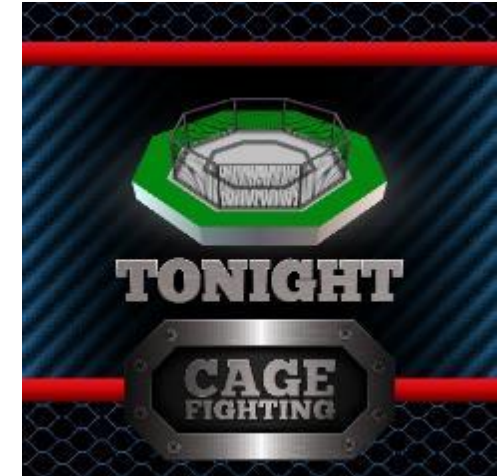


When Gamification Goes Wrong



“If you liked it then you should have put a badge on it”

It's a **RUMBLE** in the classroom jungle!



Let's play! Okay, I know we're really getting an insurance quote, but isn't it more fun this way?



Getting It Right

Examples of gamification can be found in:

- Marketing
- Health care
- Education



Using Gamification with Learners: Gateway's ArduCopter Course



- Think-outside-the-box course with a specific focus on appealing to disengaged adults under 30
- Piece by piece: both the course work and the ArduCopter build
- Learning style identification, tool safety, literacy skills and of course... mathematics (including area & perimeter)

Using Gamification with Learners:

LLSC's Project



- Bringing literacy to the basketball court
- The cool factor: the 94Fifty Smart Sensor Basketball, App, and Smart Net
- Embedded calculation of angles, percentages, ratios and more
- Using a driving force already in play for the intended audience



What Could the Next Level Look Like?

- SMART Soccer Balls?
- Escape Rooms?
- Augmented Reality?
 - Pokémon Go
 - Google Cardboard
- What do you think???



Making Math Fun: Using Videos, Blogs, and Cartoons

Here are several of the videos, blogs, and cartoons (on the topic of Making Math Fun) available on YouTube and searchable by keywords (although linked in this document). Steve Ballard did a fantastic job putting together the videos listed below as well as the blog RUGS (Really Useful GED Stuff).

Math Doctor: Multiplication New Version

Write out a multiplication grid in under 1.5 minutes. Handy if you have to do a test and you aren't allowed a calculator and are not sure of all your multiplication/division facts. You can multiply, divide, and find the square root of any number on the grid:

https://www.youtube.com/watch?v=a_O5YAJUxoU

Making Math Fun: Using Videos, Blogs, and Cartoons

YouTube is a great visual aid for creating fun and easy-to-follow math instruction, including the ones shown below.



Dividing fractions:

<https://www.youtube.com/watch?v=sNhg7HHM1kY>

Multiplying fractions:

<https://www.youtube.com/watch?v=Z28J4jJeUOM>

Additional videos about fractions:

https://www.youtube.com/results?search_query=steve+ballard+%2B+fractions

Making Math Fun: Using Videos, Blogs, and Cartoons

There are several great videos about percents on YouTube as well:

Type 2:

<https://www.youtube.com/watch?v=0Bx6eki3OxU&t=5s>

Type 3:

<https://www.youtube.com/watch?v=ZCclGod1Jvk>

Type 4:

<https://www.youtube.com/watch?v=oHF3gQL2wrc>



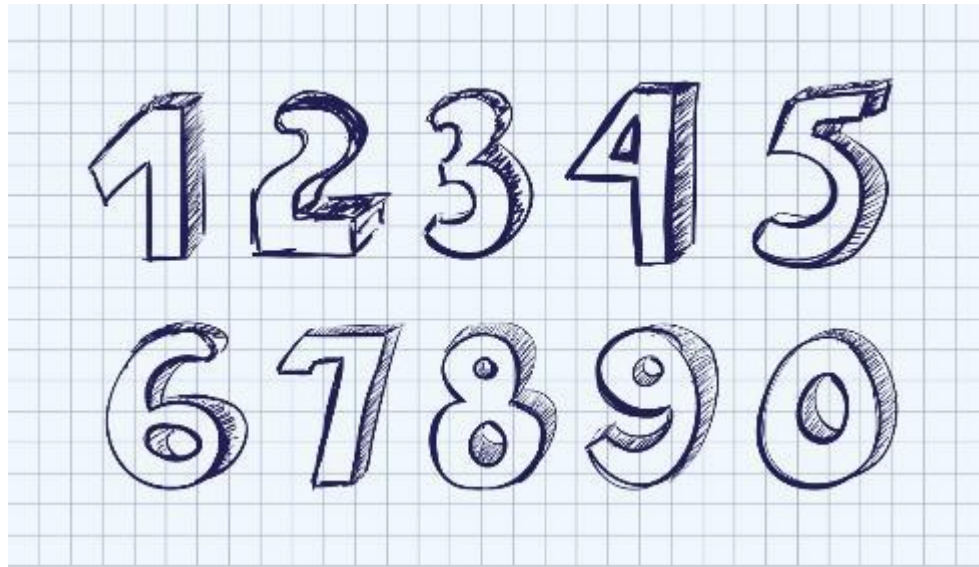
Making Math Fun: Using Videos, Blogs, and Cartoons

Really Useful GED Stuff (RUGS)

A blog with really useful and fun tips for math and other subjects covered in the GED. Using examples from this blog has been helpful in working with individuals with different learning styles and how they approach math – there are so many wonderful and easy to follow ways of learning different subjects in math:

<http://reallyusefulgedstuff.blogspot.com/search/label/how%20do%20I%20pass%20the%20GED%20math>

Making Math Fun: Using Videos, Blogs, and Cartoons



Basic-Mathematics.com

A website/webpage that is used for tips on making adding, subtracting, multiplying, and dividing easier to do, mentally, using compensation:

<https://www.basic-mathematics.com/compensation.html>

Making Math Fun: Using Videos, Blogs, and Cartoons

Khan Academy.org

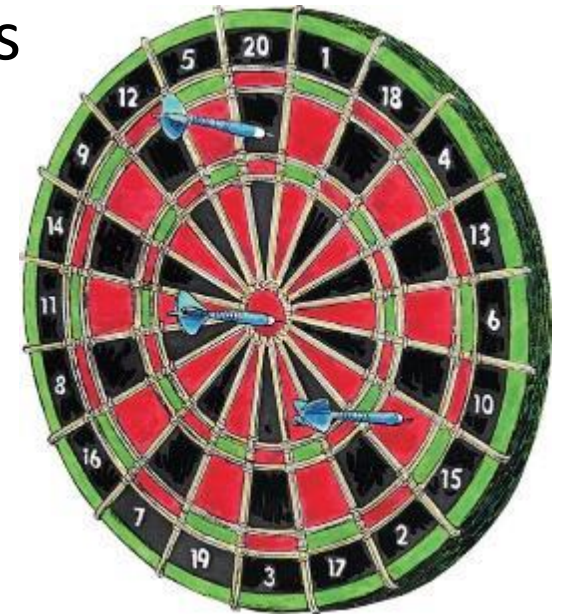
A fantastic (and free) website that covers many topics, including math starting at Early Math and going to Calculus, Differential Equations, Linear Algebra, and more! YouTube videos that are narrated with great visuals for different types of learners with practice tests and quizzes so that an individual can review and test their skills as they go:

<https://www.khanacademy.org/math>

Additional Gamification Resources

- “Gamification and Adult Literacy: Investigating the history, impact and execution of gamification principals in adult education”
- “Using Gamification Techniques to Increase Learner Comfort with Typing”,
- “Gamification Tips for Educators”

<https://www.llsc.on.ca/resources1#InnovationinLiteracy>



The background of the slide is a white surface with several dice scattered across it. The dice are light-colored with black pips. They are positioned at various angles, some showing multiple faces. The lighting is soft, creating subtle shadows on the white background.

15 Best Gamification Resources for Trainers and Educators:

<https://blog.capterra.com/15-best-gamification-resources-trainers-educators/>

The Gamification Research Network's Bibliography, containing dozens of academic papers, case studies, blogs and websites discussing the use of gamification in education:

<http://gamification-research.org/bibliography/>

Thank you to the
presenters and
contributors to this
webinar!

THANK
YOU



Thank you!



Coming soon:

❖ webinar resources:

<https://e-channel.ca/practitioners/lbs-online-community-practice>

❖ webinar evaluation

❖ registration link for our next webinar

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