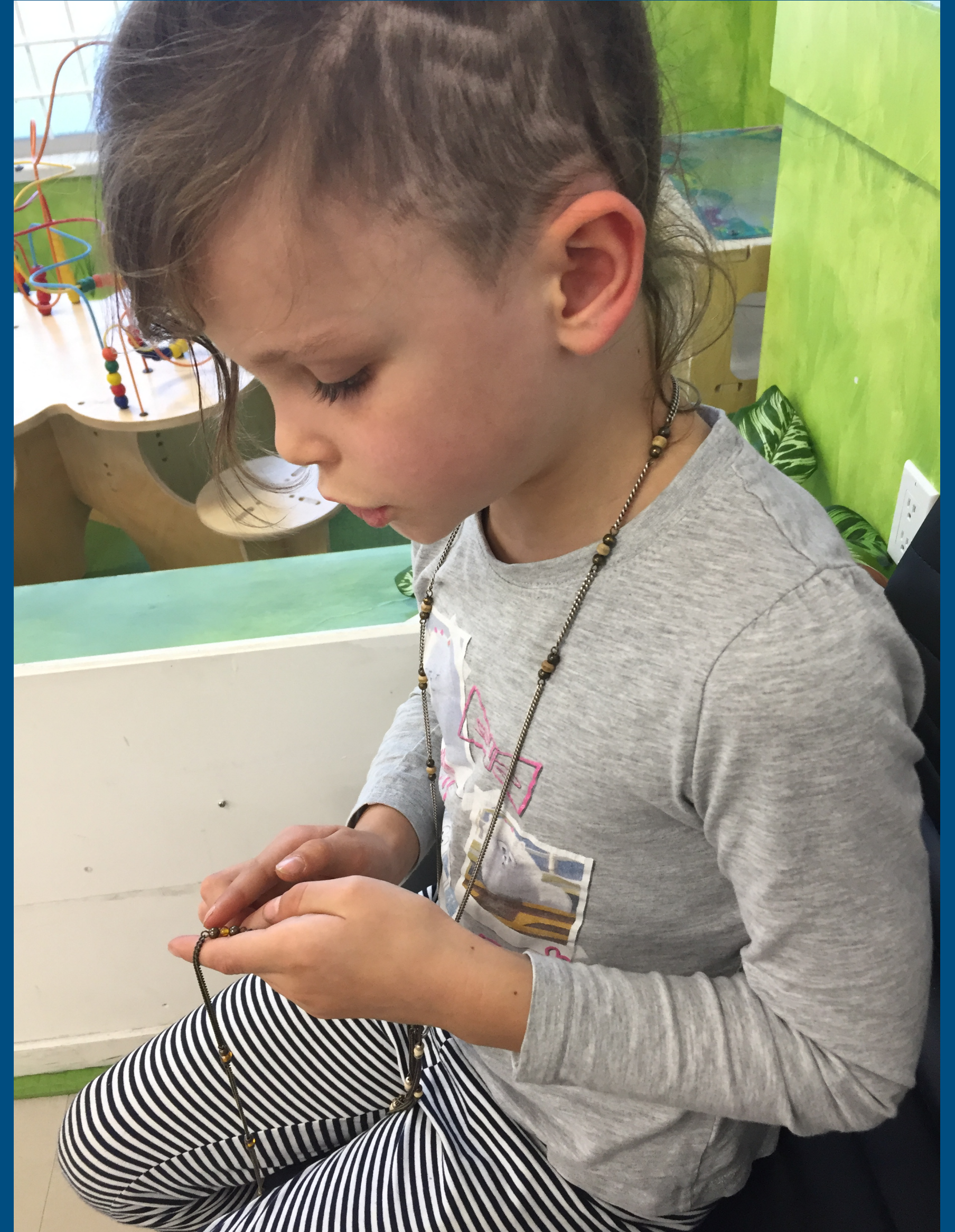


# Starting the Math Year off Right: Building a Community in Which All Learners Belong

Summer Institute 2022





**Jess Kyle**

**K-12 Numeracy Helping Teacher**

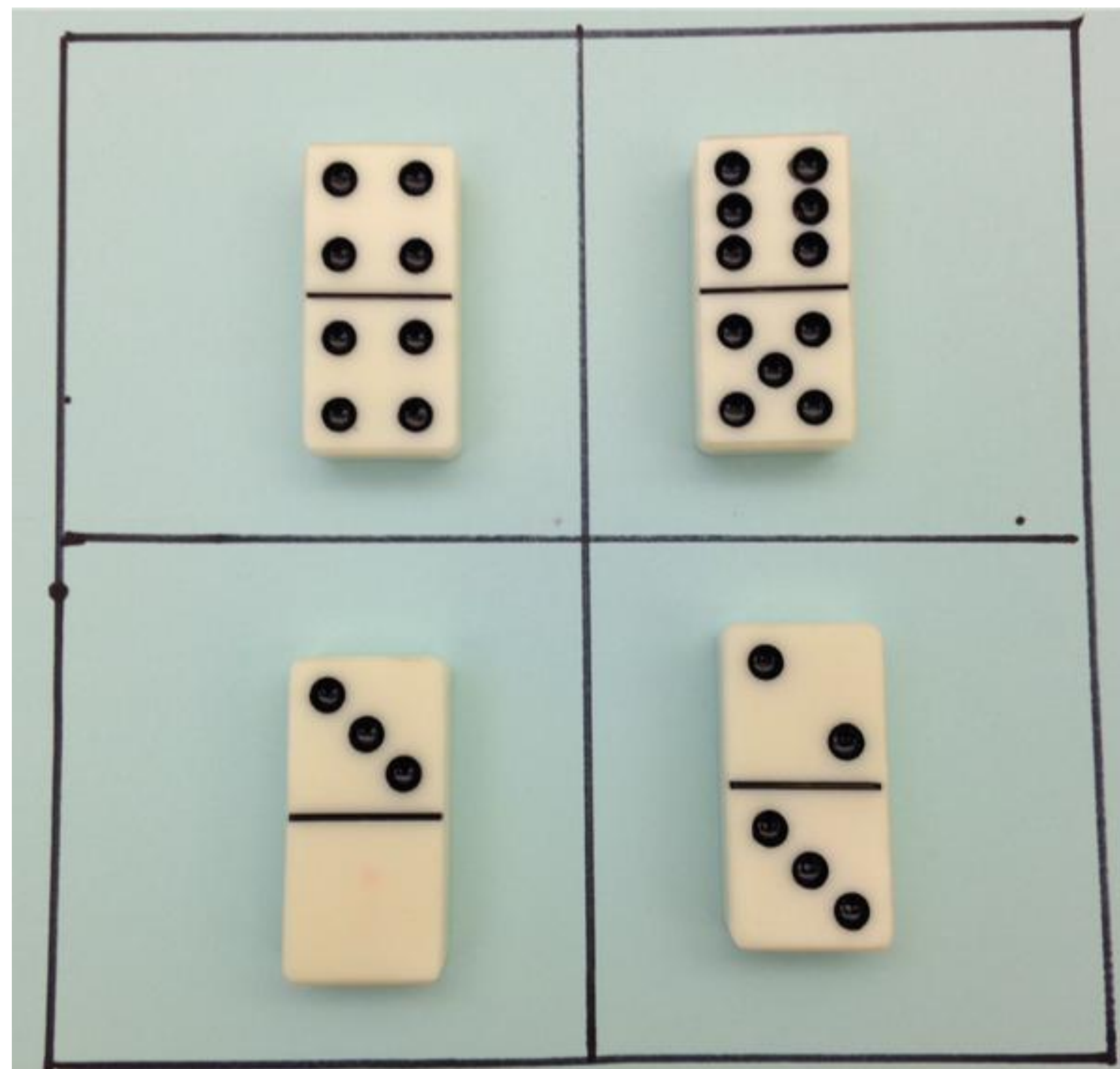
email: **kyle\_j@surreyschools.ca**

Twitter: **@Jesannwa**

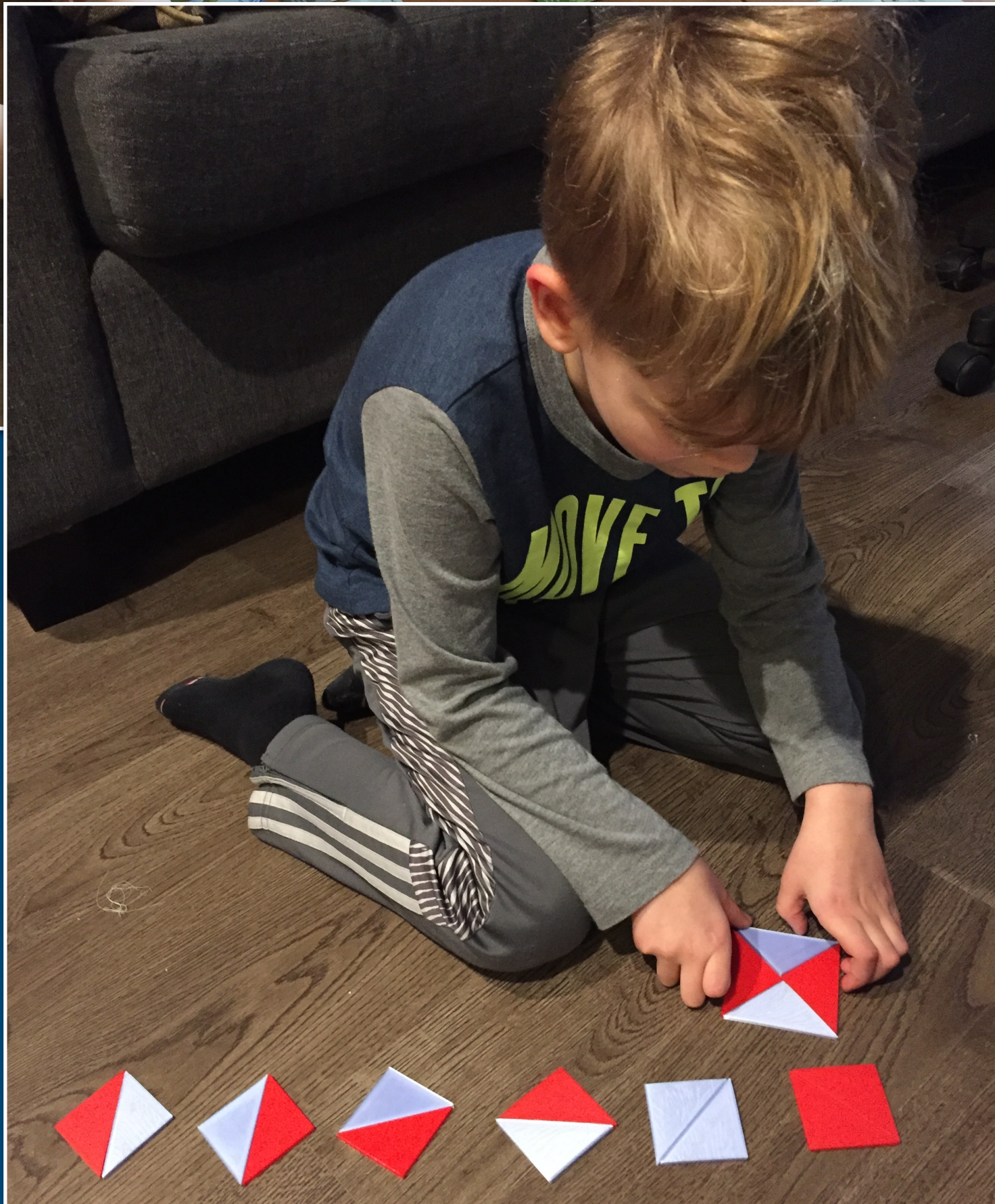
blog: **[mathingaround.com](http://mathingaround.com)**



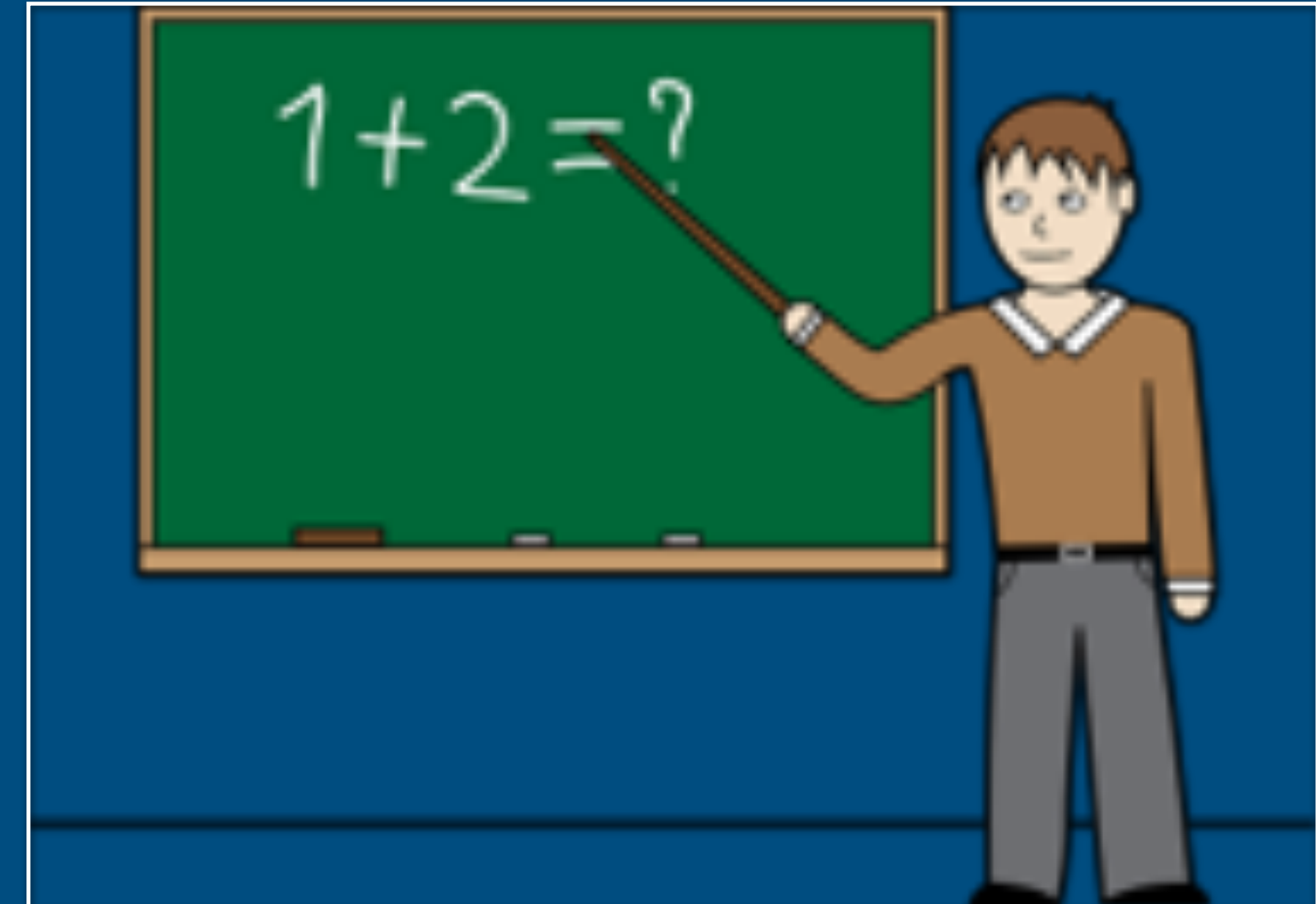
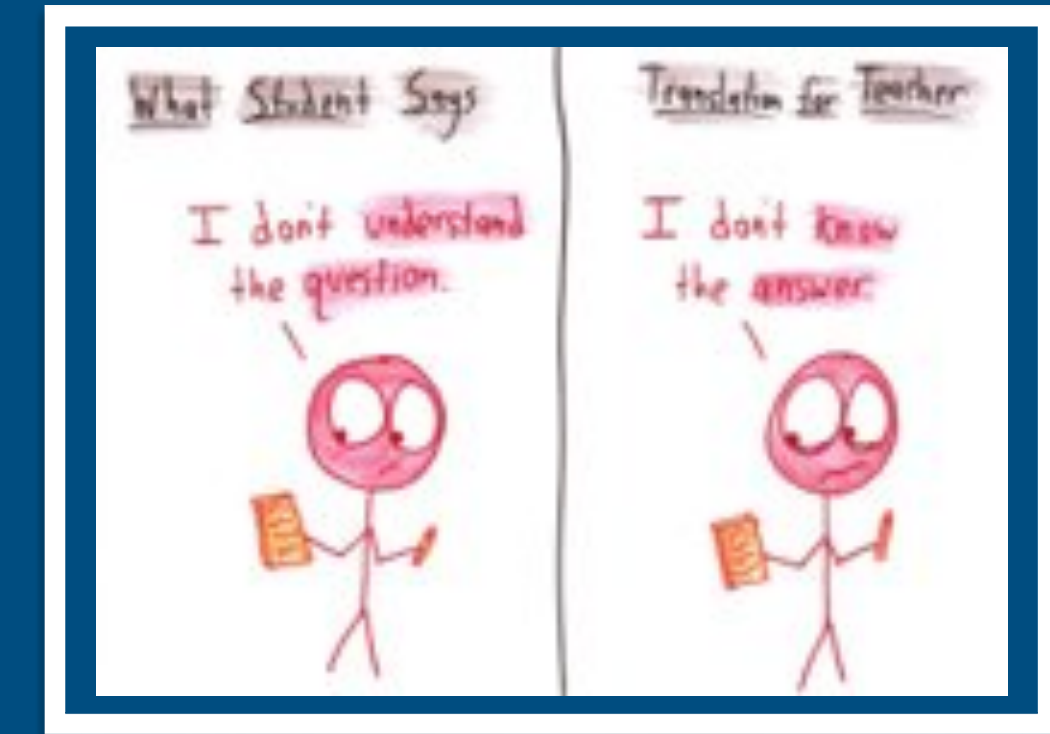
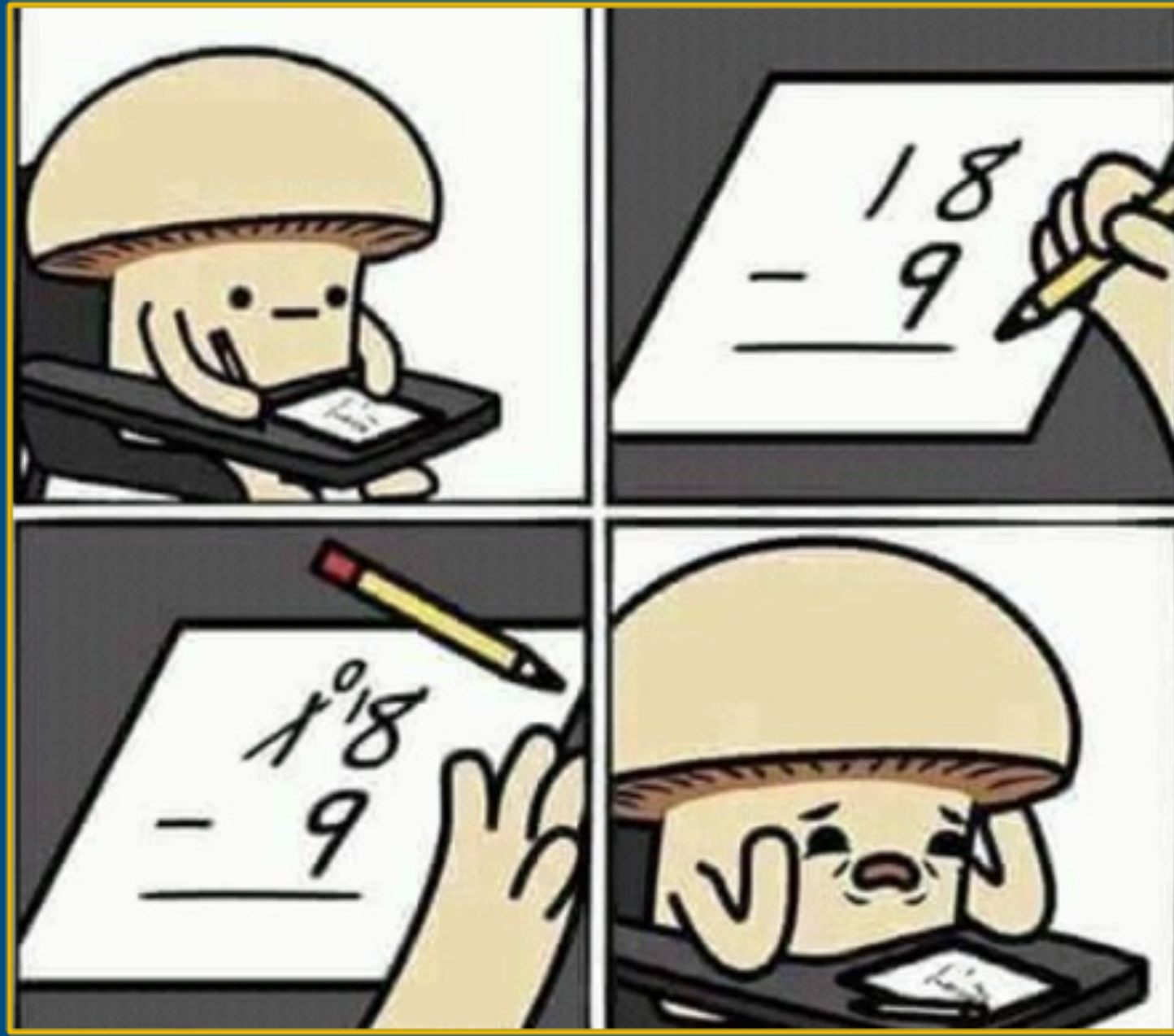
Which **One** *Doesn't* Belong?













Starting off right



Starting off **wrong**



---

LOCAL

# **Fourth-Grade Teacher Polishing Up Speech On This Not Being Third Grade Anymore**



LOCAL

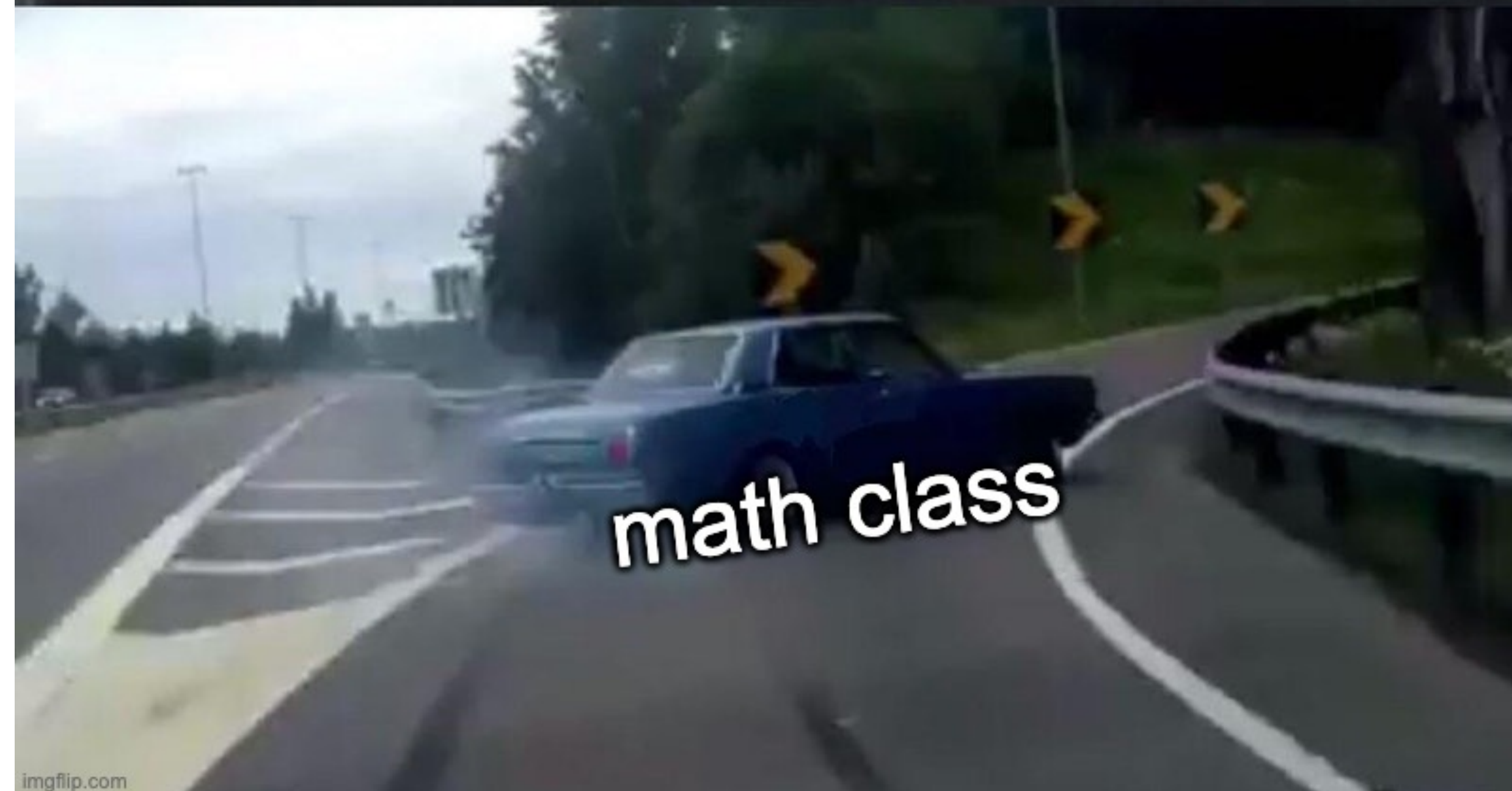
# Fourth-Grade Teacher Polishing Up Speech On This Not Being Third Grade Anymore

8/18/14 1:55PM



PALMYRA, PA—Saying it was important for her students to understand their increased expectations at the start of the new school year, Pine Street Elementary school teacher Veronica Potter reportedly spent Sunday evening putting the finishing touches on a speech that will inform her incoming class they are not in third grade anymore. “Many of you are 10 years old now, and I expect you to act like it,” said Potter, rehearsing the speech that will emphasize how the students’ responsibilities will extend not just to academic performance, but to behavior and classroom participation as well. “There’s going to be homework every night and we’re going to do several science units outdoors, which will require a lot of focus. You may have gotten away with excuses or outbursts last year, but this is fourth grade now. Okay?” Sources confirmed that Potter, worried about overwhelming her students too much on the first day, later revised her speech to put more emphasis on the spring field trip to Gettysburg.







**“THIS YEAR IS GOING TO BE TOUGHER THAN LAST  
YEAR!!**

**If you want centre time you must behave!**

**No new learning until you’ve settled in and are ready.**

**...No running...**

**...Hands to yourself...**

**....Raise your hand to speak...**

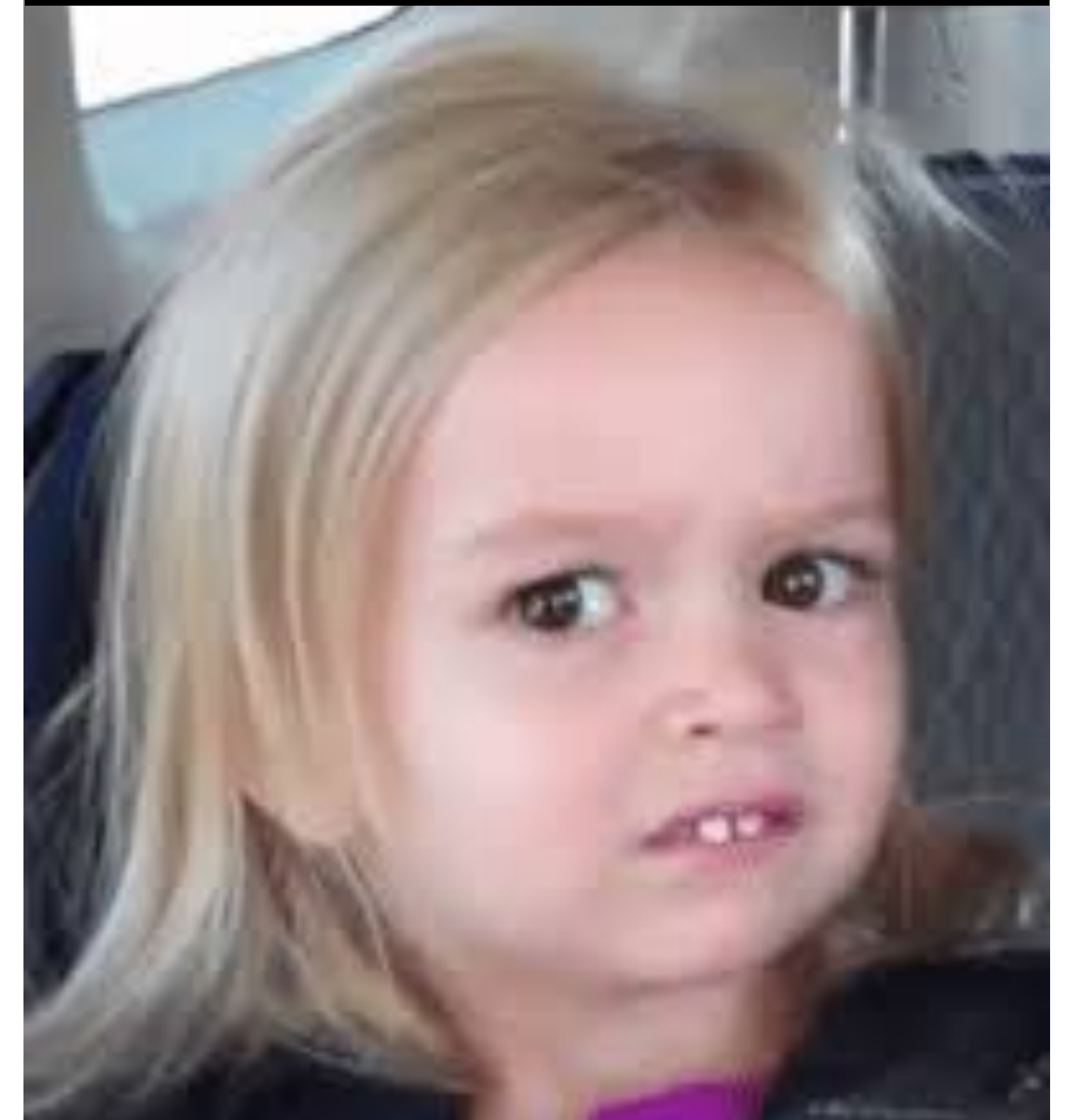
**...Garbage-free lunch...**

**...Indoor shoes required for gym...**

**...Planners must be signed ...**

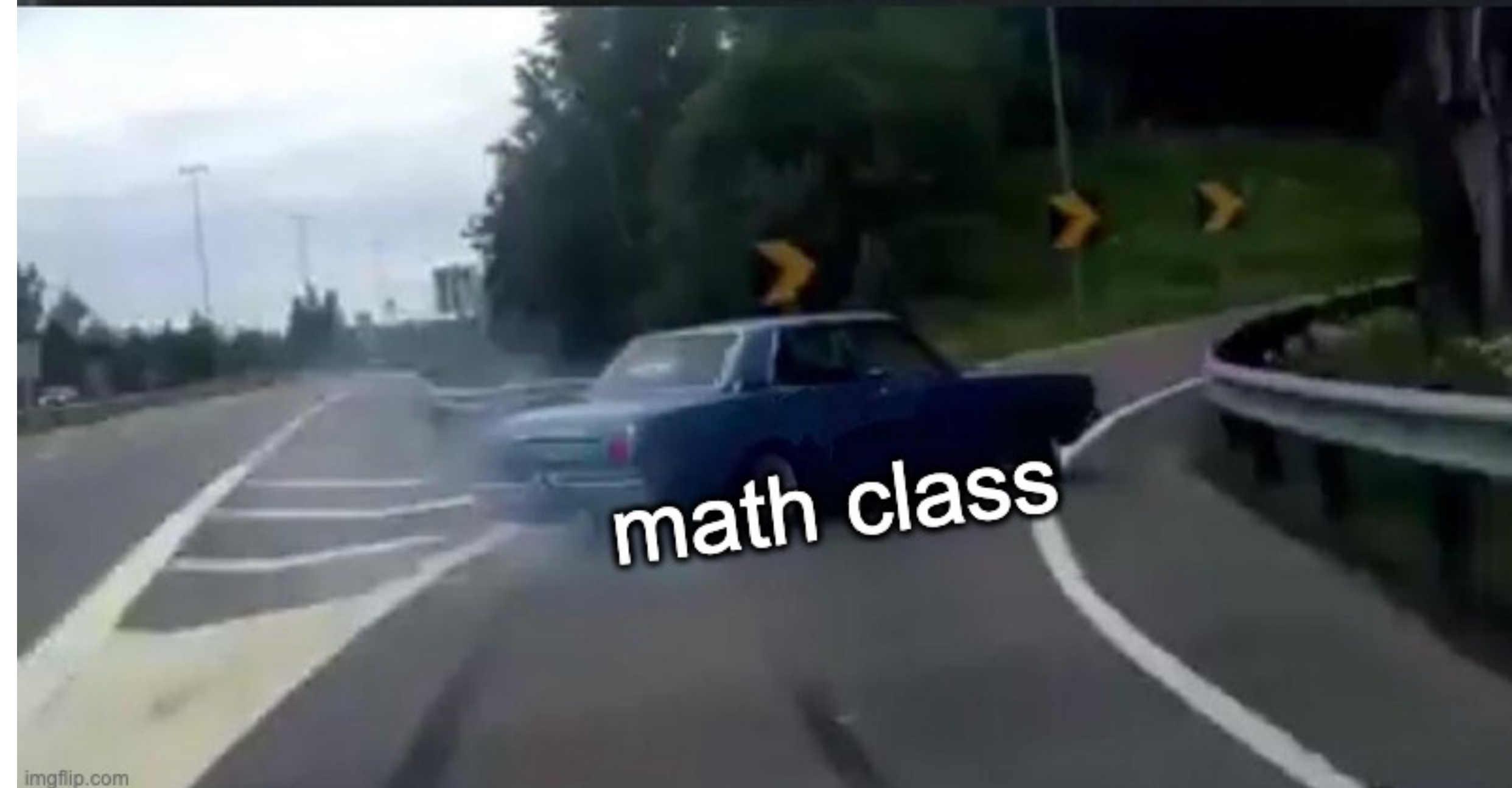
**Responsibility...Kindness...Expectations...Rules**

**ALL I HEAR IS...**



**WAH WAH WAH WAH WAH**





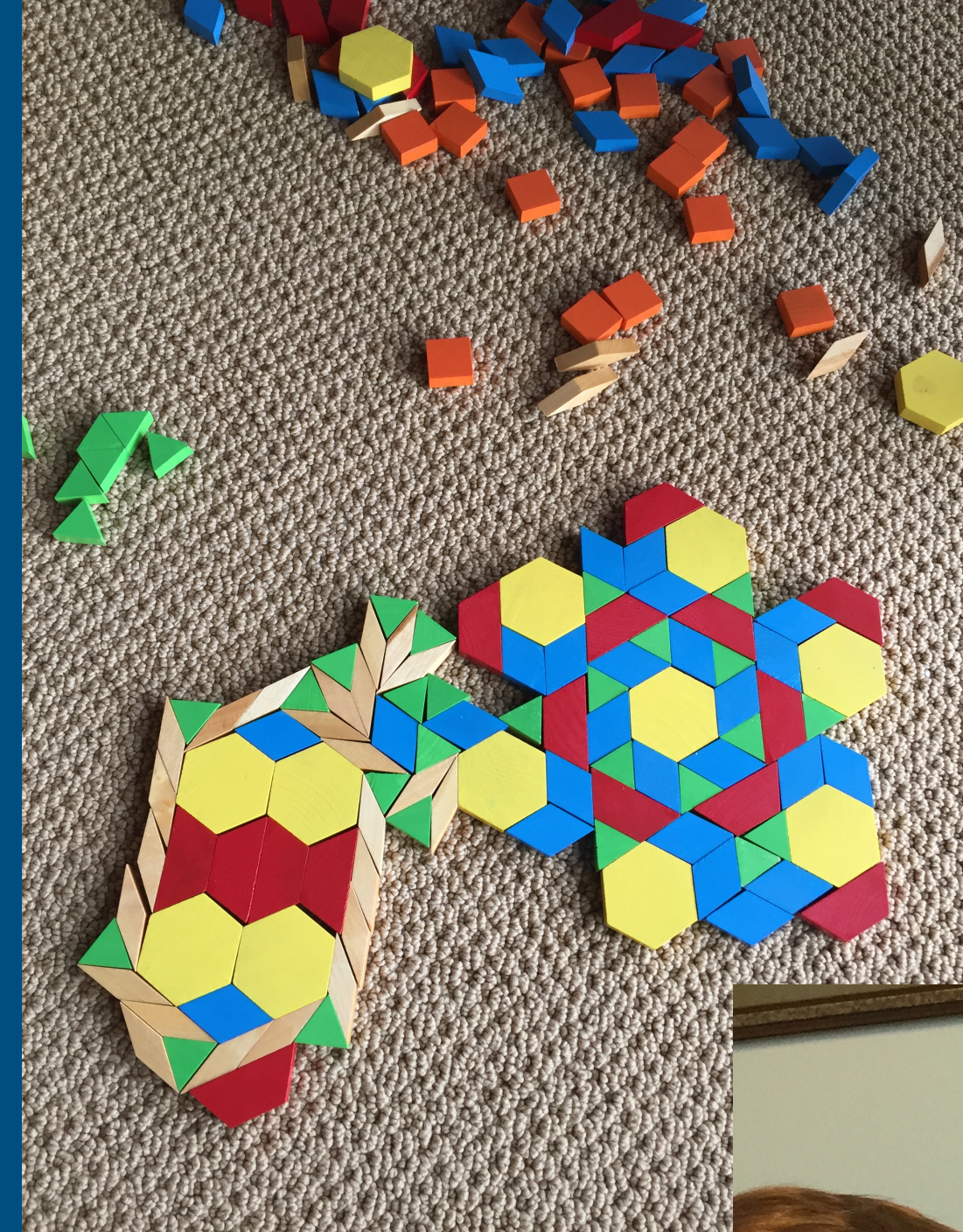


Not this but that

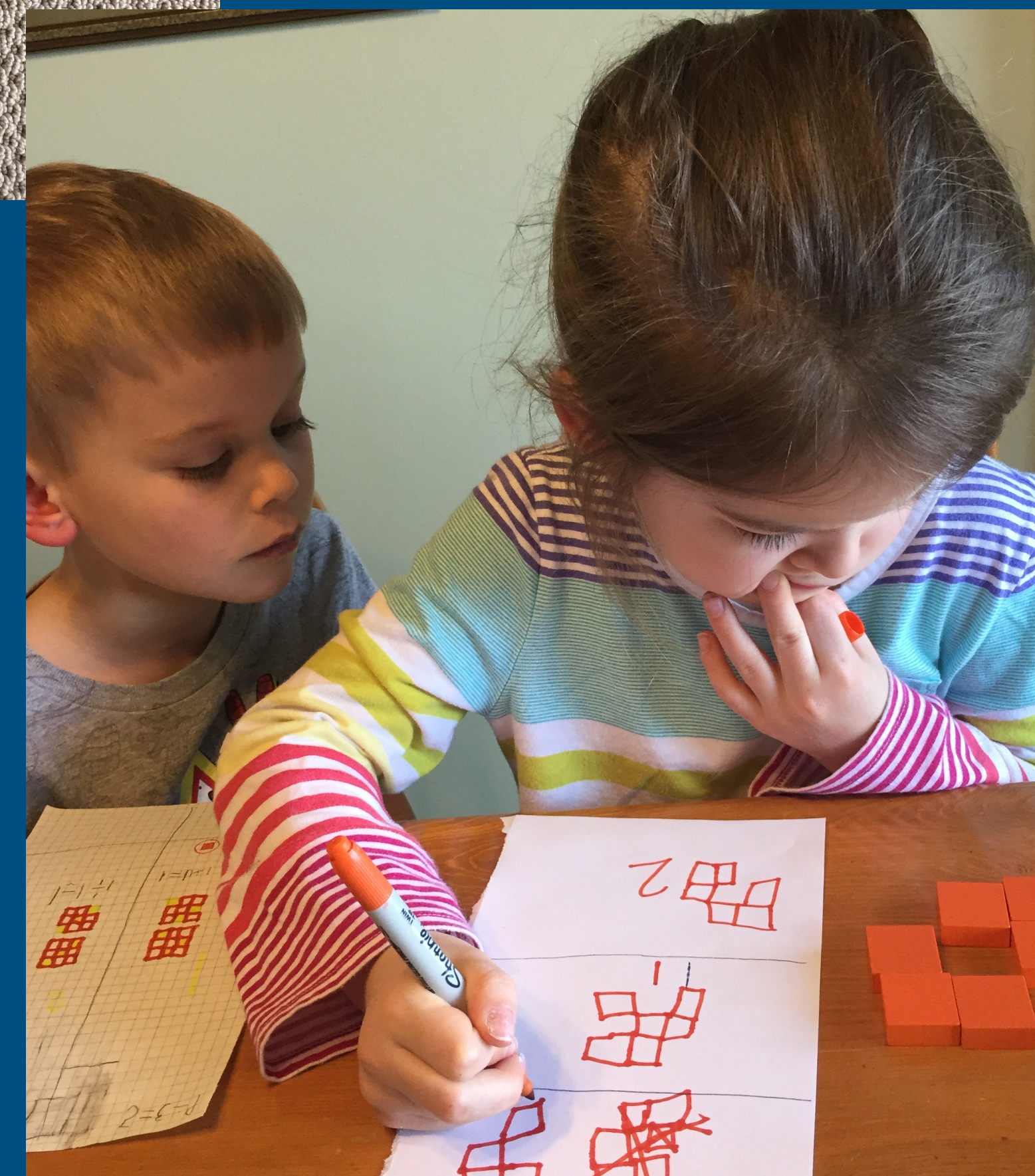


Talk about all the **rules** and **abstract concepts** you'll be re-enforcing this year and then give **“review”** or **busy-work** while **screening students** for “grade readiness” and “learning gaps.”

OR



Pattern Block  
Challenges





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## Week of Inspirational Math(s)

The Week of Inspirational Maths (WIM) resources are free lessons and videos about math and mindset designed to inspire students. They are ideal for the first week of school, to get students excited for the year ahead, but can be used any time. On this page, you can build your own WIM week by selecting one video, one resource for creating a positive maths community, and one task per day and adding them to your playlist. Then click "See Summary" to play videos, download materials and save/share your WIM week! Check out these pre-made playlists curated by the youcubed team for [first grade](#), [middle school](#) and [high school](#) and share your playlist on social media with #myWIM!

[Looking for the old WIM? Click here](#)

Displaying 11 of 11 results for **K, Number Sense**

[Search](#)

[Clear](#)

Grade
 

☒ K
 ☐ 7th
 ☐ 1st
 ☐ 8th
 ☐ 2nd
 ☐ 9th
 ☐ 3rd
 ☐ 10th
 ☐ 4th
 ☐ 11th
 ☐ 5th
 ☐ 12th
 ☐ 6th
 ☐ College

Videos

Jo Boaler

What is Number Sense? (English version)

Jo Boaler

What is Number Sense? (Spanish version)

Tasks

Which is More? (K-1)

Count on Me (K)

Estimating Dots (K)

Finger Activities (K-2)

Finger Trails (K)

Flexible Number Trains (K)

Foot Parade (K)

Game of Totals (K)

Number Visuals (K)

Topics

☒ Number Sense
 

☐ Patterns and Generalization
 ☐ Shape, Space and Measures
 ☐ Data Science, Probability and Statistics

# Math For Love



# belonging

part of something  
greater

the feeling of being an accepted member of a group.

need

respected

math class

desire

included

“math people”

supported



“... another key part of **belonging** is being given  
**the opportunity to add value.**”



- Community
- Culture
- Curriculum







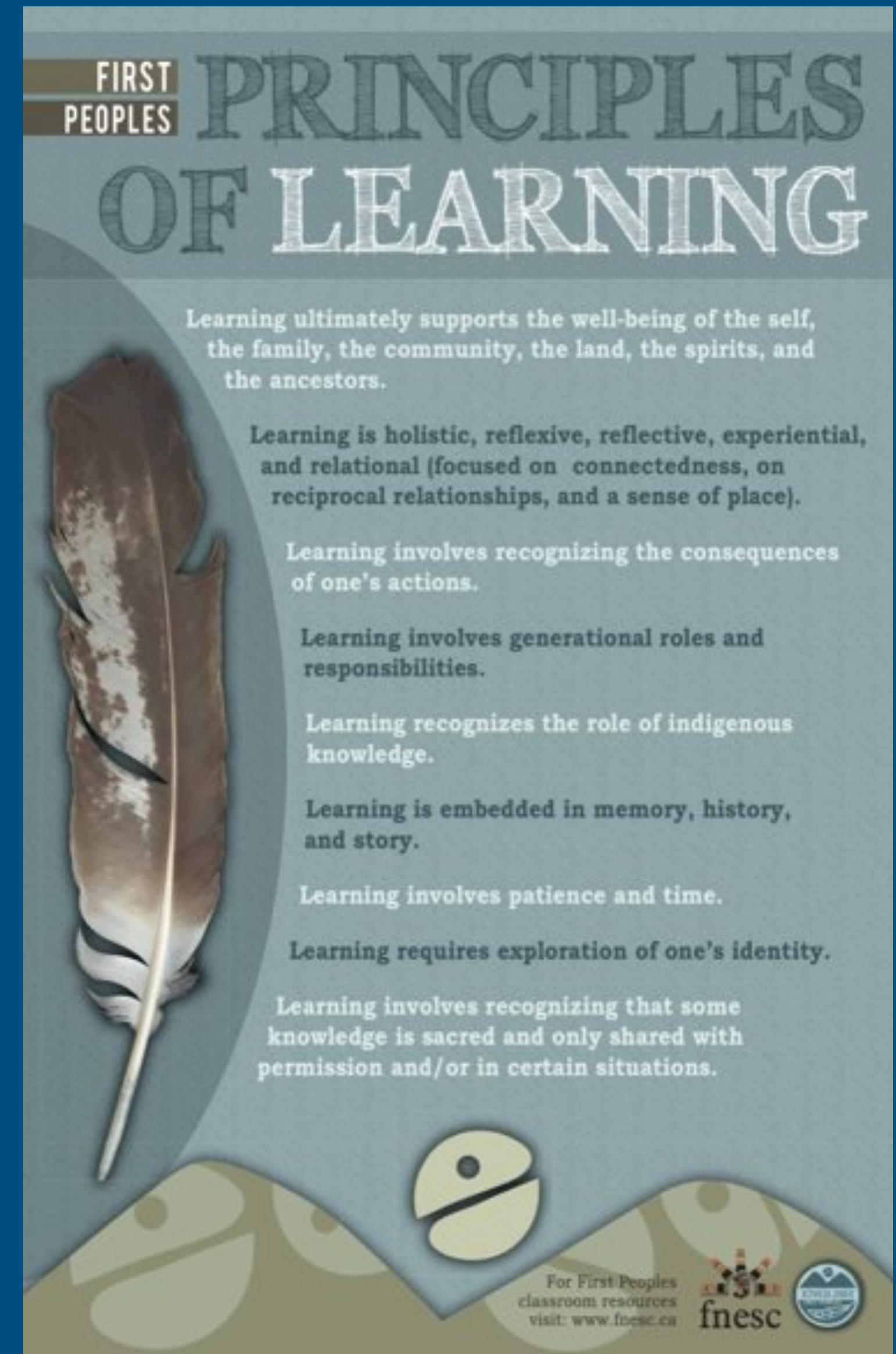
- **Interpersonal**
- **Instructional**



# The *instructional* domain of Belonging-Centered Instruction:

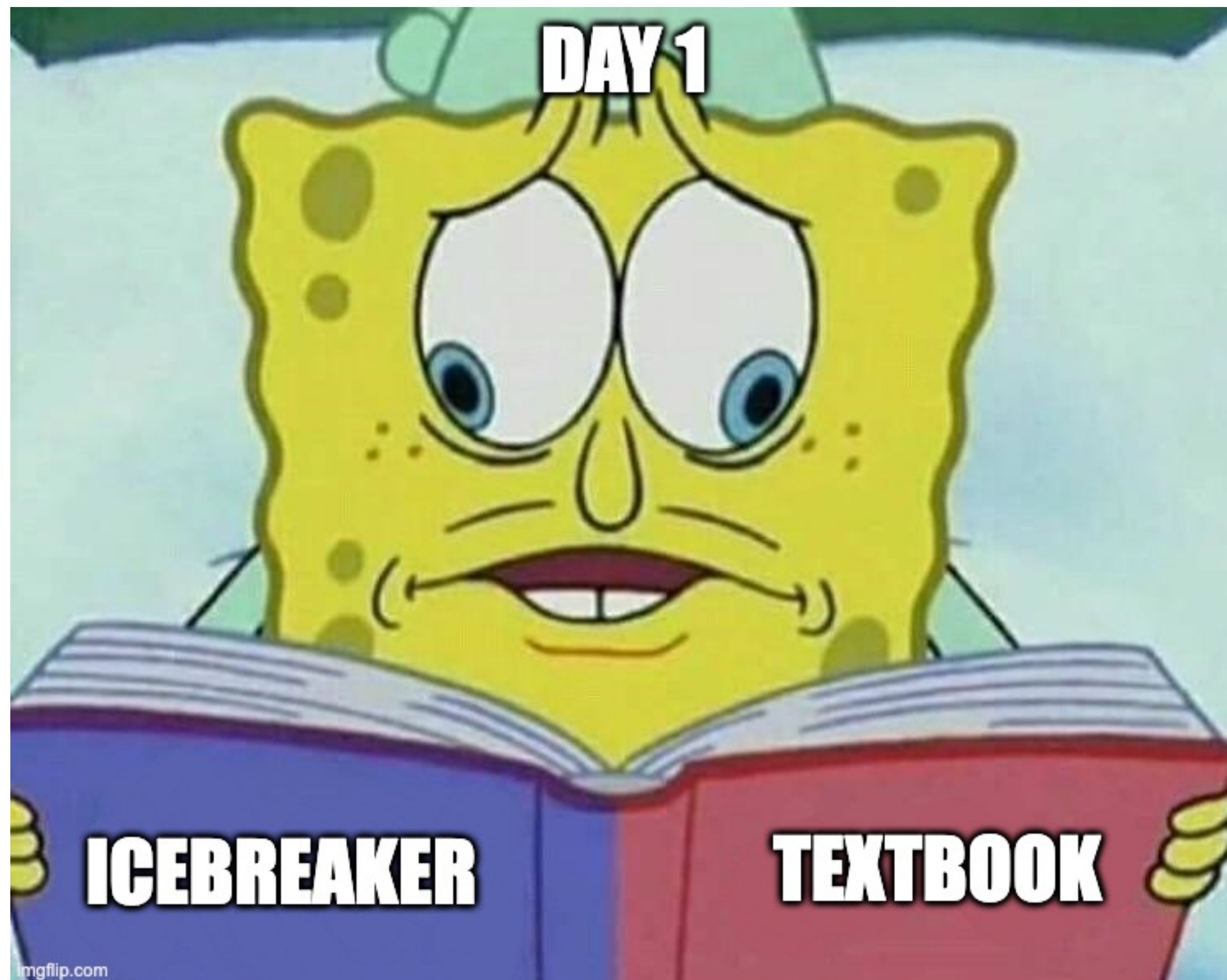
1. Safety to Be Wrong
2. De-centering Teacher Authority
3. Mathematics to Know Myself & My World
4. High Standards & Rigorous Support

Matthews, J. (2021, October 15). Belonging-centered instruction: An observational approach toward establishing inclusive mathematics classrooms. <https://doi.org/10.31219/osf.io/n7bv2>



<http://www.fnesc.ca/first-peoples-principles-of-learning/>





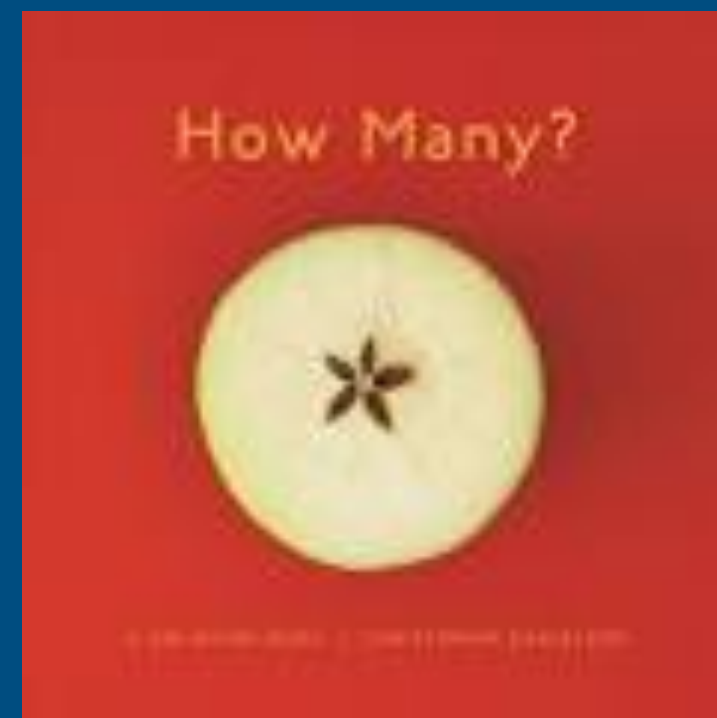
**DAY 1**

**ICEBREAKER**

**TEXTBOOK**



How Many?  
Number Talks  
Splat!



What do you notice?  
What do you wonder?

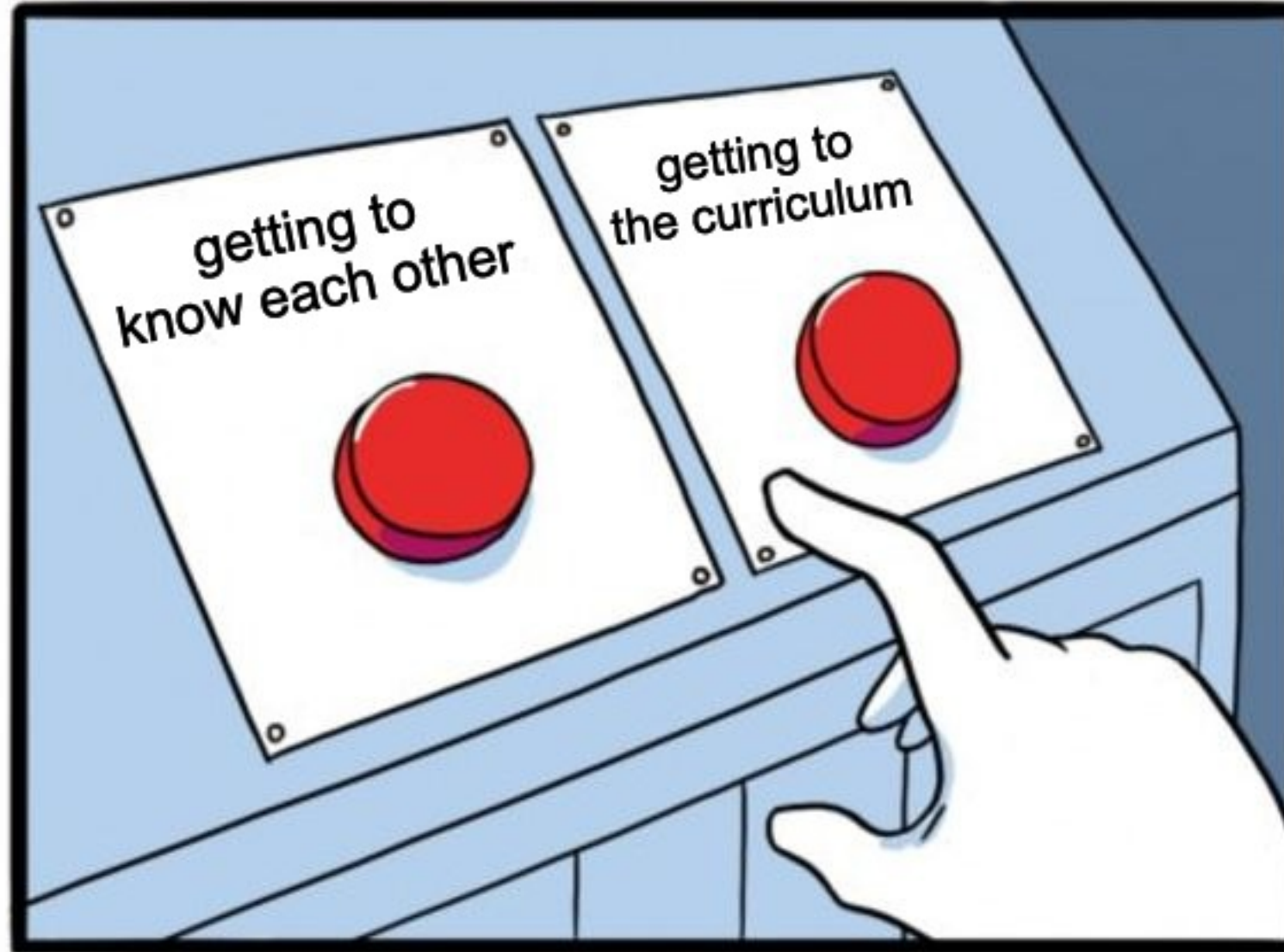


Place-Based Math and Provocations  
General link      K/1 Specific Link



- What is Math?
- What Math lives here?
- What Math could we use to help us do this task/solve this problem?
- What story is this Math telling?
- What Math lives in this story?
- What stories can you create about this Math?



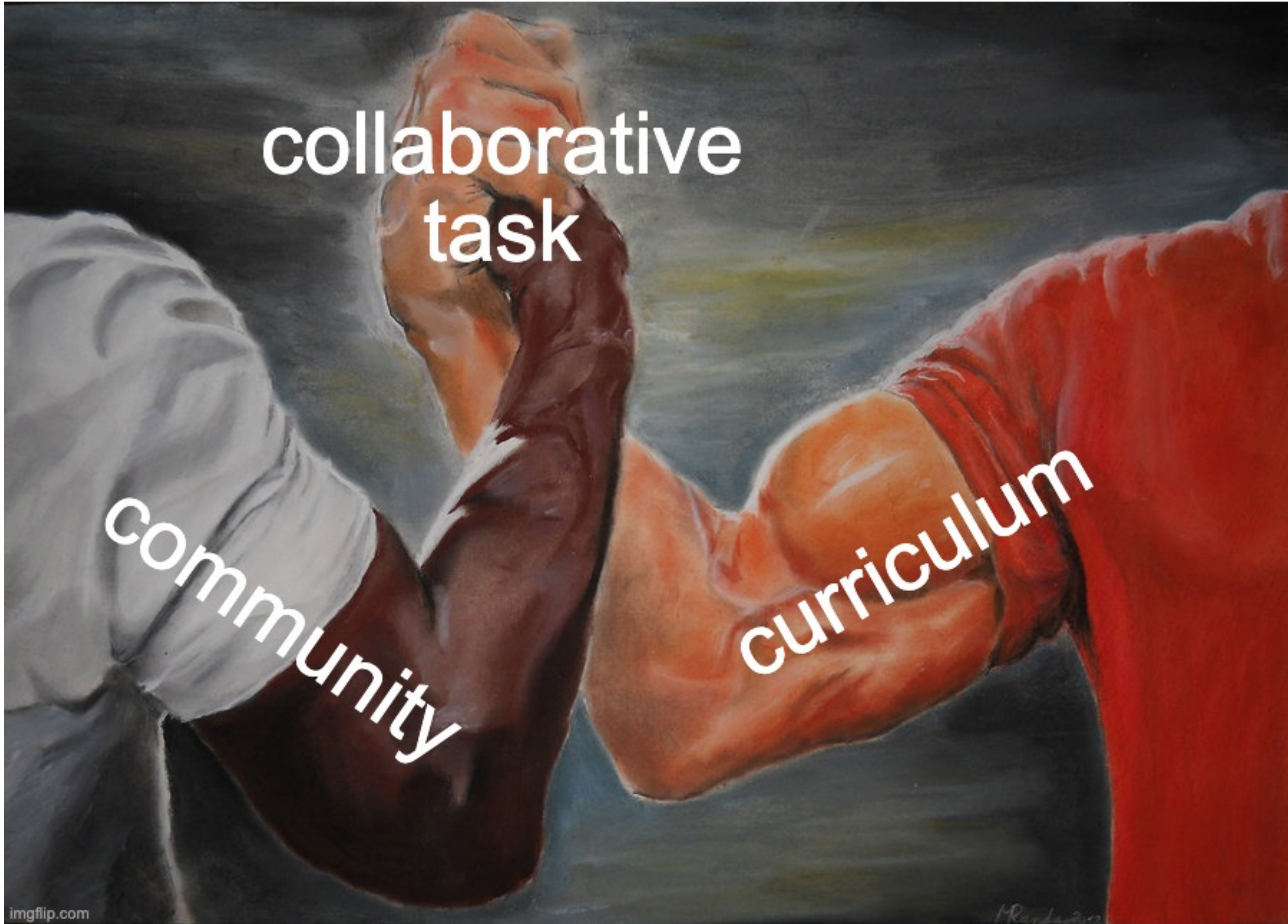




“... interpersonal supports for belonging are necessary but insufficient for creating inclusive mathematical environments; teachers must also create opportunities for **mathematical belonging** through their **instructional techniques** and **pedagogical choices**.”

Matthews, J. (2021, October 15). Belonging-centered instruction: An observational approach toward establishing inclusive mathematics classrooms.  
<https://doi.org/10.31219/osf.io/n7bv2>









[Hide Menu](#)

**Problem**

[Student Solutions](#)

[Teachers' Resources](#)

[Primary Curriculum Linked](#)

**You may also like**

**Consecutive Numbers**

An investigation involving adding and subtracting sets of consecutive numbers. Lots to find out, lots to explore.

**Roll These Dice**

Roll two red dice and a green dice. Add the two numbers on the red dice and take away the number on the green. What are all the different possible answers?

**Domino Square**

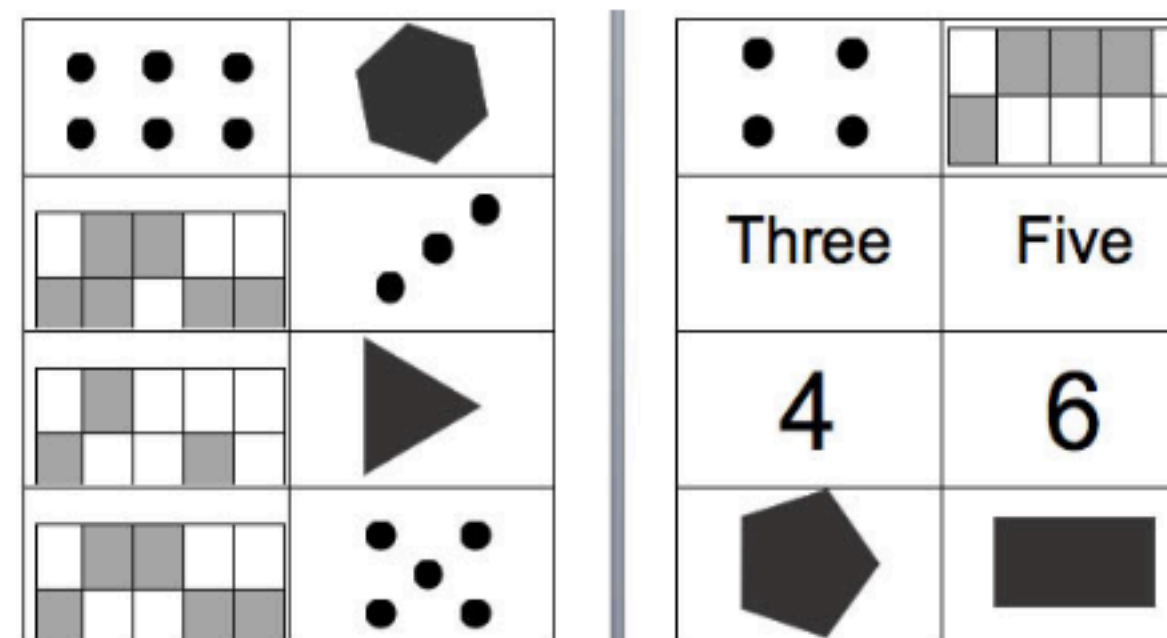
Use the 'double-3 down' dominoes to make a square so that each side has eight dots.

## Number Match

**Age 5 to 11**

**Challenge Level** ★

This is one of a series of problems designed to develop learners' team working skills. Other tasks in the series can be found by going to [this article](#).



**What are you aiming to do?**

**For the task:**

Every member of the team has to end up with a set of four cards in front of them that are related to each other in a similar way. The task is only successfully completed when everyone on the team has completed their set.

**As a team:**

- Responding to the needs of others
- Helping others to do things for themselves.



# non-curricular

highly engaging thinking tasks used  
without concern for curriculum.



Liljedahl, P. (2021). *Building thinking classrooms in mathematics, grades K-12: 14 teaching practices for enhancing learning*. Corwin.



“... these results show that to get students thinking *about* curriculum tasks, they need to first be **primed** to do so using **non-curricular tasks**. Nothing in my research has shown a way to avoid this. **You have to go slow to go fast.**”

Liljedahl, P. (2021). *Building thinking classrooms in mathematics, grades K-12: 14 teaching practices for enhancing learning*. Corwin.



**“Rich tasks** (or good problems) **encourage**  
collaboration and discussion”

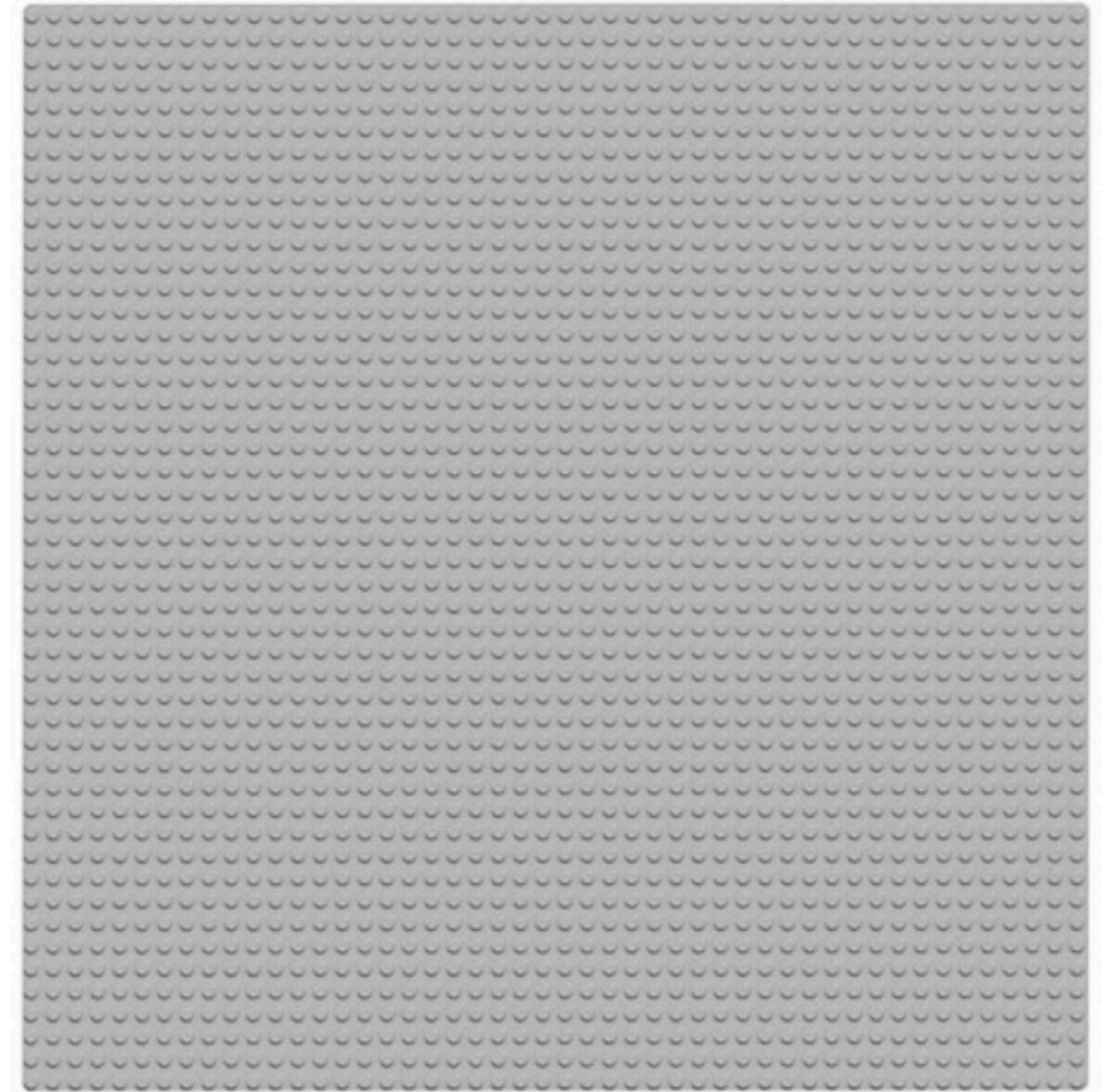


## GOING SWIMMING

Your three LEGO friends are ready to go swimming but they need a pool. Your task is to build one for them.



1. Decide how many pieces of LEGO you will need for your pool and what it will look like. Plan a pool that is a reasonable size. Draw some pictures. You can use the lego plate picture to help with this.
2. Get some LEGO and build the pool!
3. How many pieces of LEGO did you use?
4. More LEGO friends are coming over and they want to swim too. How many LEGO people can swim in your pool at the same time?







“And sometimes the bulk of the challenge is **figuring out what is being asked.**”

- James Tanton



“Imagine this problem is a room, and all students need to enter it through a doorway. If we want all our students to be able to succeed, we can ***lower the threshold*** in the doorway and the floor in the room so students have fewer barriers to get inside and get started.

Zager, T. (2017). *Becoming the math teacher you wish you'd had: Ideas and strategies from vibrant classrooms*. Stenhouse.



We also want to make sure the students in the room are not constrained, banging their heads, unable to stretch. We want to ***raise the ceiling*** so there are fewer limits on students' thinking. We want to create problems that will flow right into deeper investigations for students who are ready.”

Zager, T. (2017). *Becoming the math teacher you wish you'd had: Ideas and strategies from vibrant classrooms*. Stenhouse.



Everyone can get **started**.



Everyone can get **stuck**.



[Meyer, D. \(2014\). Video games and making math more like things students like. \[Video\]](#)

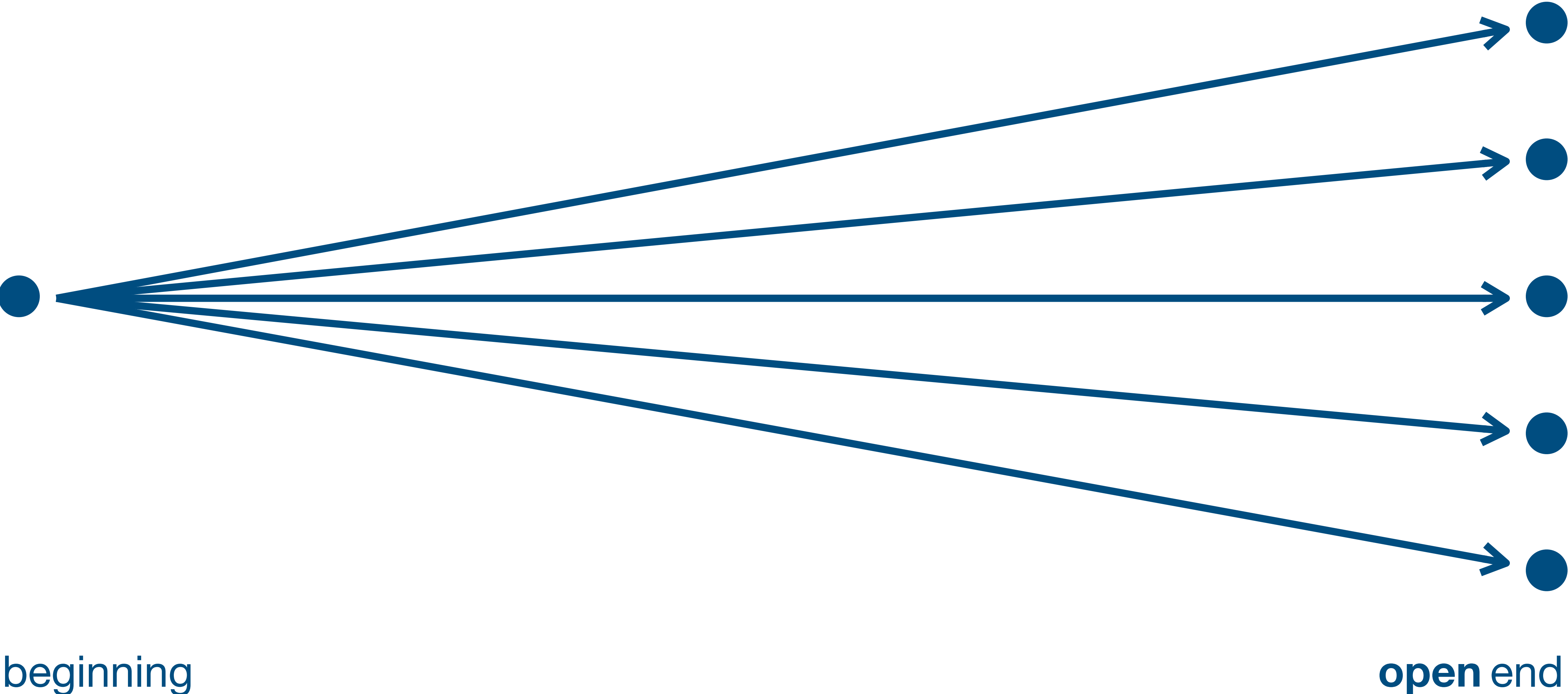


beginning

**closed end**

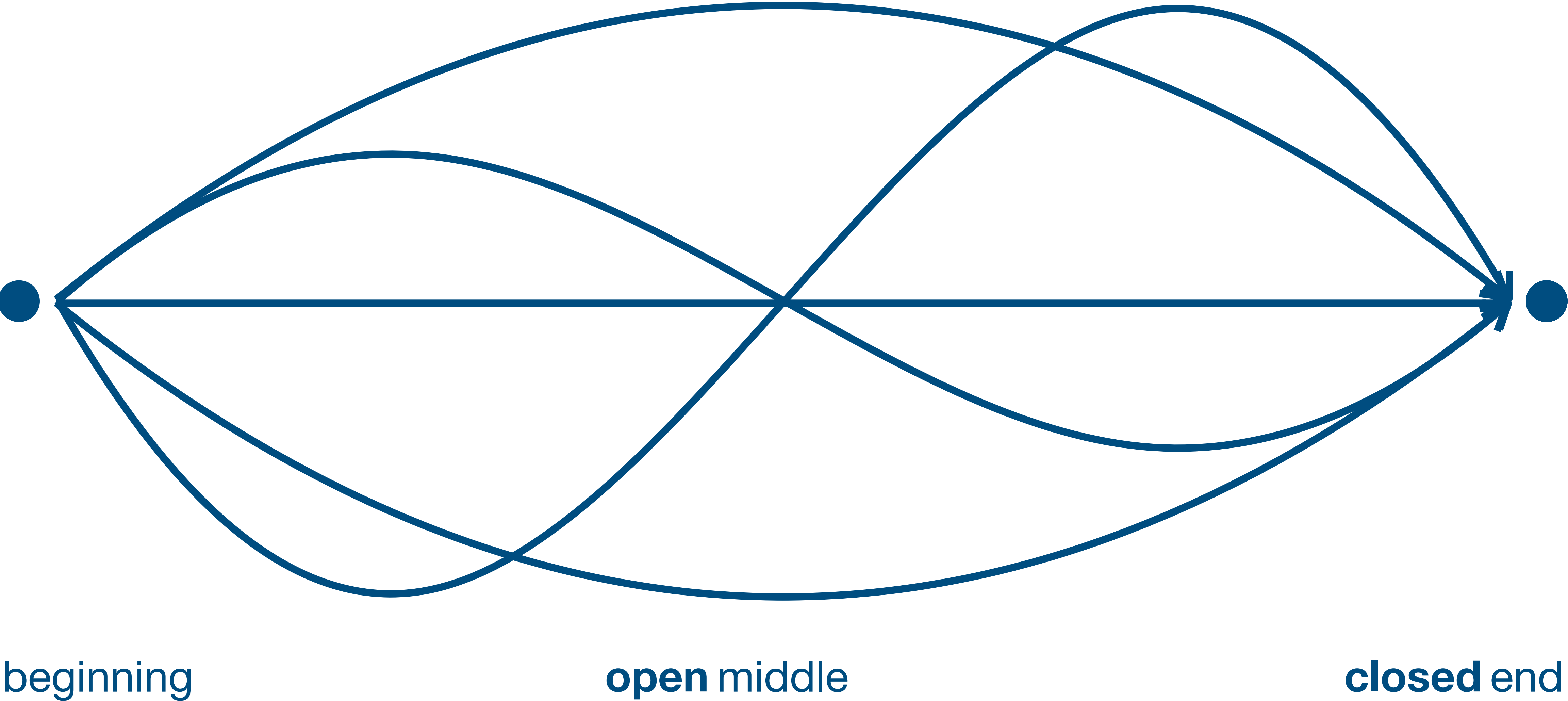


[Meyer, D. \(2014\). Video games and making math more like things students like. \[Video\]](#)





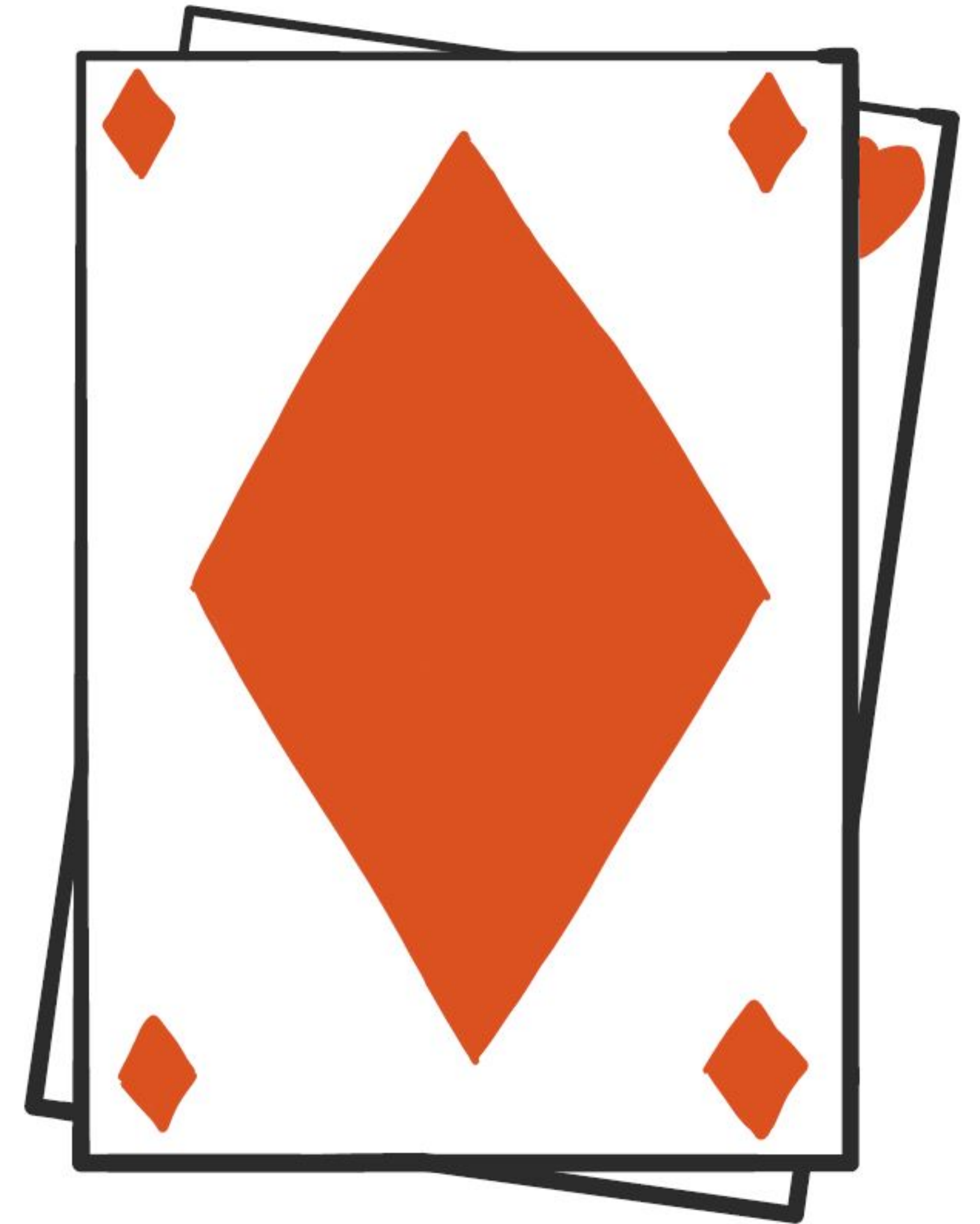
[Meyer, D. \(2014\). Video games and making math more like things students like. \[Video\]](#)





“... another key part of **belonging** is being given  
**the opportunity to add value.**”

*visibly  
random*  
groupings





“Although many students rail against the groups they find themselves in on Day 1, at the three-week point this resistance is usually completely gone, and they are **open to working with anyone** they are placed with.”

Liljedahl, P. (2021). *Building thinking classrooms in mathematics, grades K-12: 14 teaching practices for enhancing learning*. Corwin.

“When teachers allow students to self-select, what we see is often a reflection of the social structures easily observable in the hallways. Students choose their friends, their affinity groups, or their social groups. These social structures can create barriers to collaboration in the classroom.

Liljedahl, P. (2021). *Building thinking classrooms in mathematics, grades K-12: 14 teaching practices for enhancing learning*. Corwin.



With visibly random grouping, these **barriers** begin to **fall away**. When students worked with new random partners every hour, they began to **cross social boundaries** and **form an awareness about each other** in ways that were not happening before.”

Liljedahl, P. (2021). *Building thinking classrooms in mathematics, grades K-12: 14 teaching practices for enhancing learning*. Corwin.

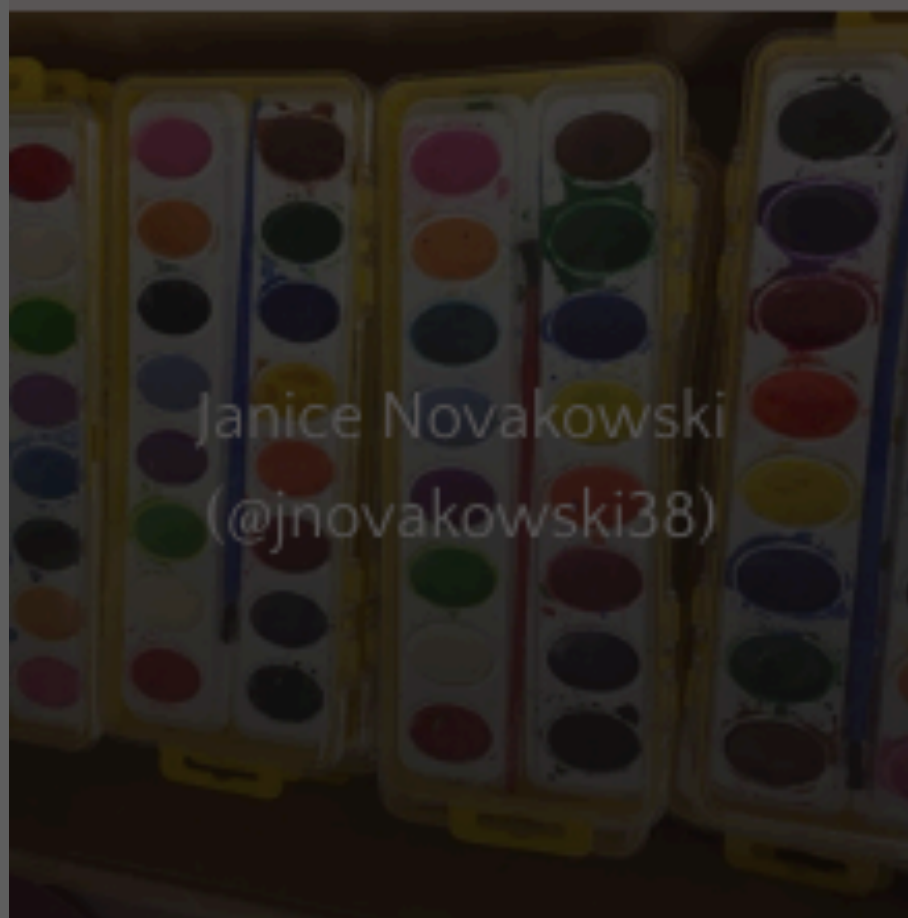




Britanny Wright  
(wrightkitchen.com /  
@wrightkitchen)



Kristen M. Acosta  
(@aprilf4175)



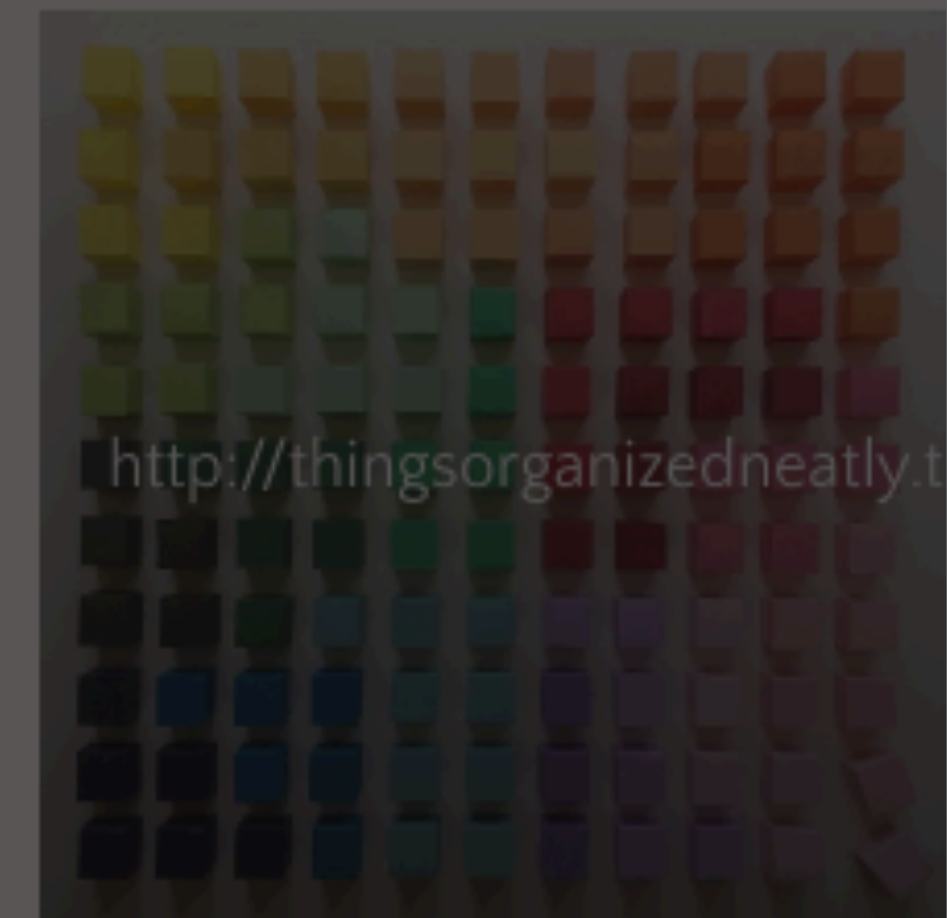
Janice Novakowski  
(@jnovakowski38)



<http://thingsorganizedneatly.tumblr.com/>



@celinerc

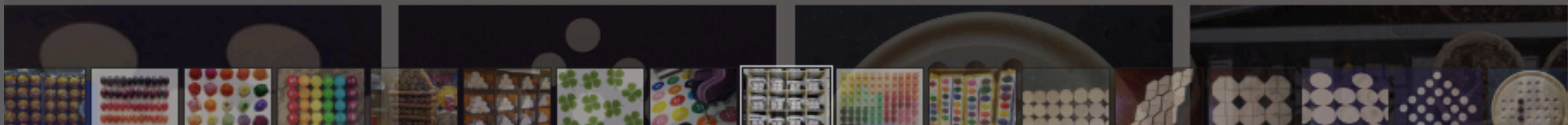


<http://thingsorganizedneatly.t>



Christopher  
(@Trianglemancsd)

<http://ntimages.weebly.com/photos.html>







instructional  
routine

predictable  
structure

focus  
on learning



“The **predictable** structure lets **students** pay less attention to [‘What is it that I’m supposed to be doing?,’ ‘What question will I be asked next?,’ or ‘How will things work today in the lesson?'] and **more attention to the way in which they and their classmates are thinking about a particular math task.**

Kelemanik, G., Lucenta, A., & Creighton, S.J. (2016). *Routines for reasoning: Fostering the mathematical practices in all students*. Heinemann.



For you as the **teacher**, the routines keep the flow of the mathematics instruction deliberately **predictable** so that, as you gain familiarity with them, you can **better attend to** the most unpredictable elements of your mathematics instruction: **how your students are making sense of the mathematics.**”

Kelemanik, G., Lucenta, A., & Creighton, S.J. (2016). *Routines for reasoning: Fostering the mathematical practices in all students*. Heinemann.

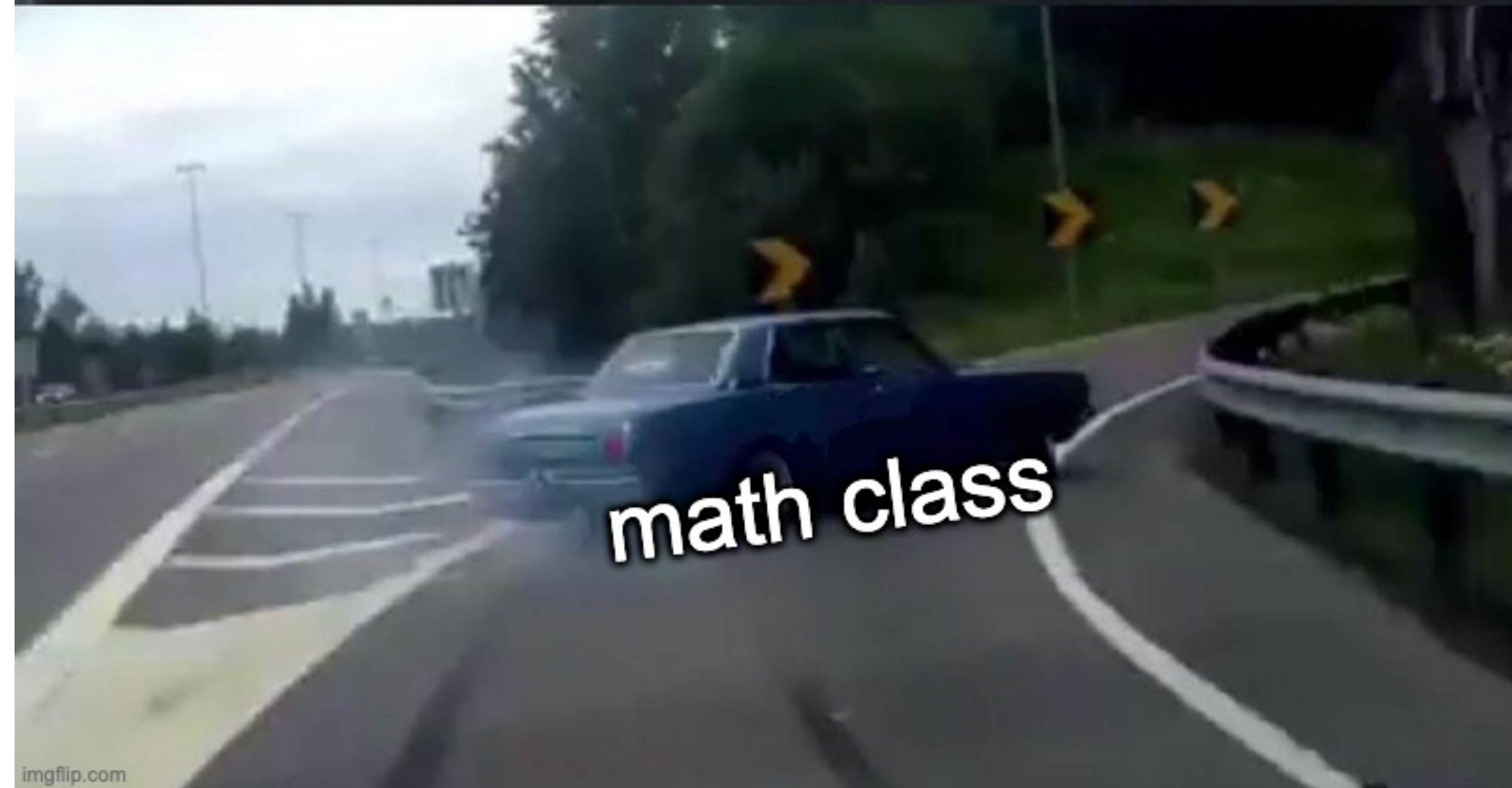
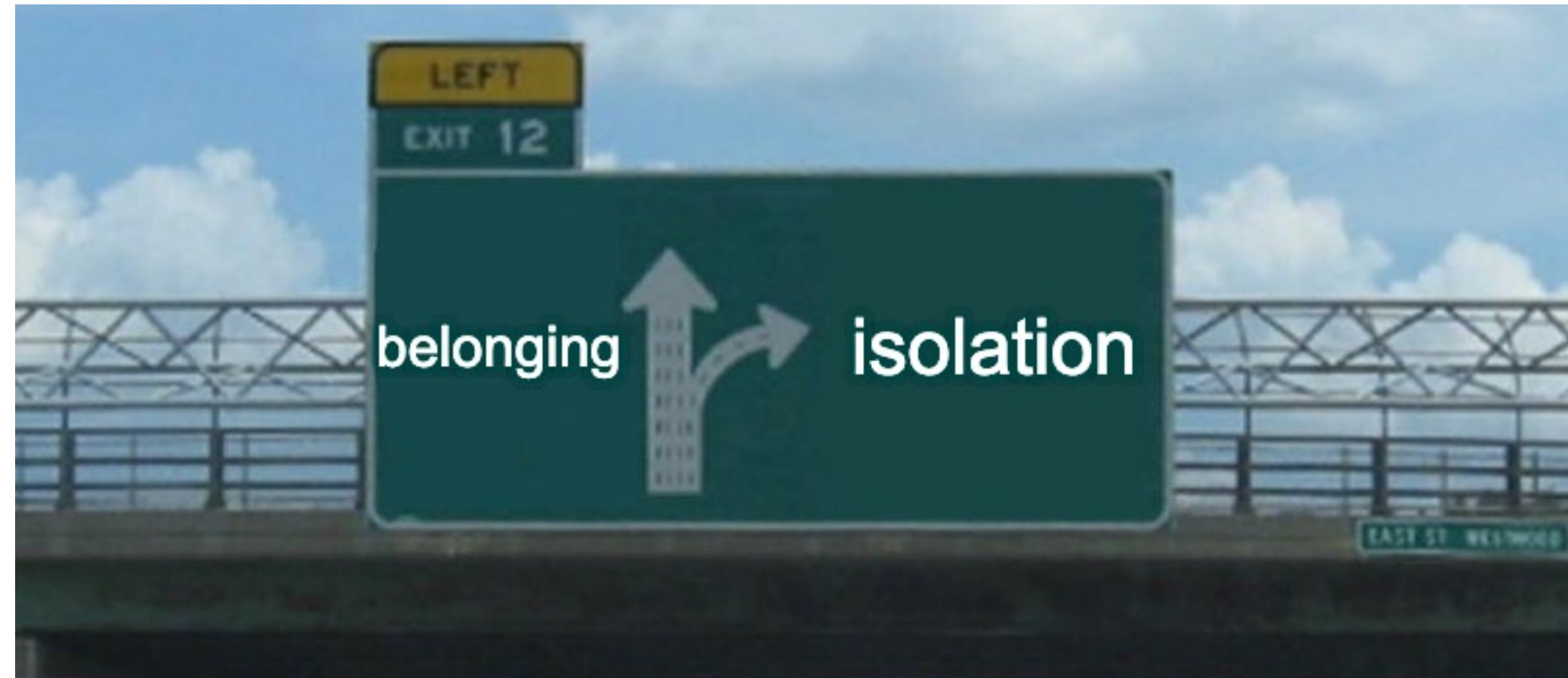
**"SCREENS"**

**"SCREENS" EVERYWHERE**



# belonging

the feeling of being an accepted member of a group.





“An assessment **functions formatively** to the extent that evidence about student achievement is elicited, interpreted, and used by teachers, learners, or their peers **to make decisions about the next steps in instruction** that are likely to be better than the decisions that they would have made in the absence of that evidence.”

William, D. (2011). *Embedded formative assessment*. Solution Tree.

**SO, TELL ME ABOUT**

**HOW YOUR COMPREHENSIVE BEGINNING  
OF THE YEAR ASSESSMENT IS "DIAGNOSTIC"**



# 10 Keys to Effective Assessment

- 
- The background of the slide features a blurred image of a checklist. It shows several checkboxes, some of which are marked with a green checkmark or a red 'X'. A dark-colored pen is also visible, lying diagonally across the checklist. The text of the 10 keys is overlaid on this background.
1. Use Multiple Measures
  2. Measure What Matters
  3. Align to Goals
  4. Fair & Equitable
  5. Engaging
  6. Ongoing Evidence
  7. Understood Goal
  8. Worthwhile Feedback
  9. Adapt & Modify
  10. Student Independence





beginning  
of the year  
assessment of  
content knowledge  
from prior grades



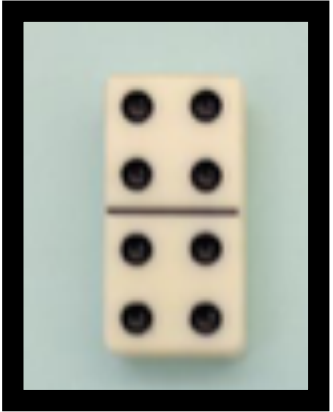



ongoing  
pre-assessments  
of readiness  
for upcoming  
grade-level concepts



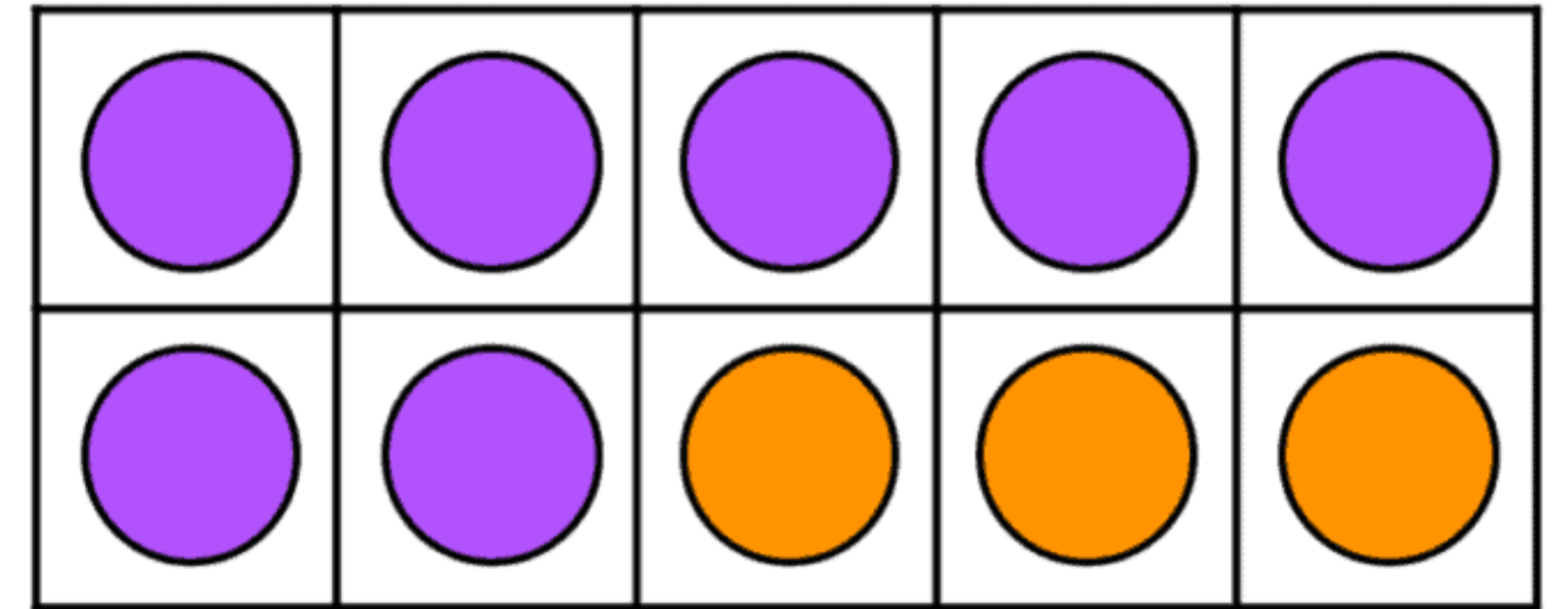
# Which One Doesn't Belong?



| Count  | Parts/<br>Whole  | Number<br>Sense to<br>10  | Number<br>Sense<br>beyond 10  |
|--|--|---|---|
|  |  |   |   |
|  |  |   |   |
|  |  |  |   |
|  |  |   |  |



I line them up and count  
1,2,3.....10



How do you know  
when you have 10  
(5, 20, 100)?

$$5+5=10$$

$$4+6=10$$

$$3+7=10$$

$$2+8=10$$

$$10=1+9$$

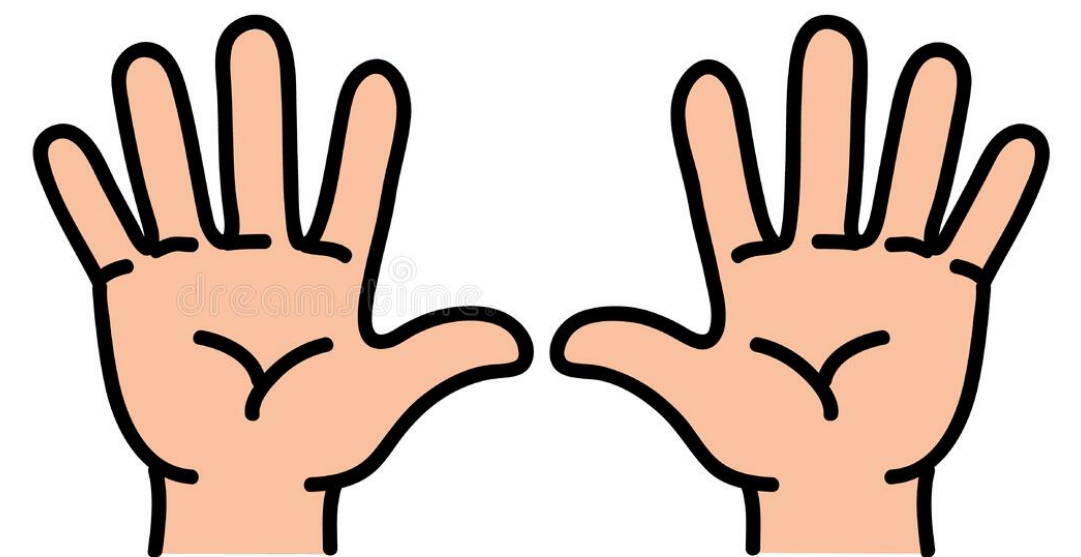
$$10=10+0$$

$$11-1=10$$

$$20-10=10$$

10

ten







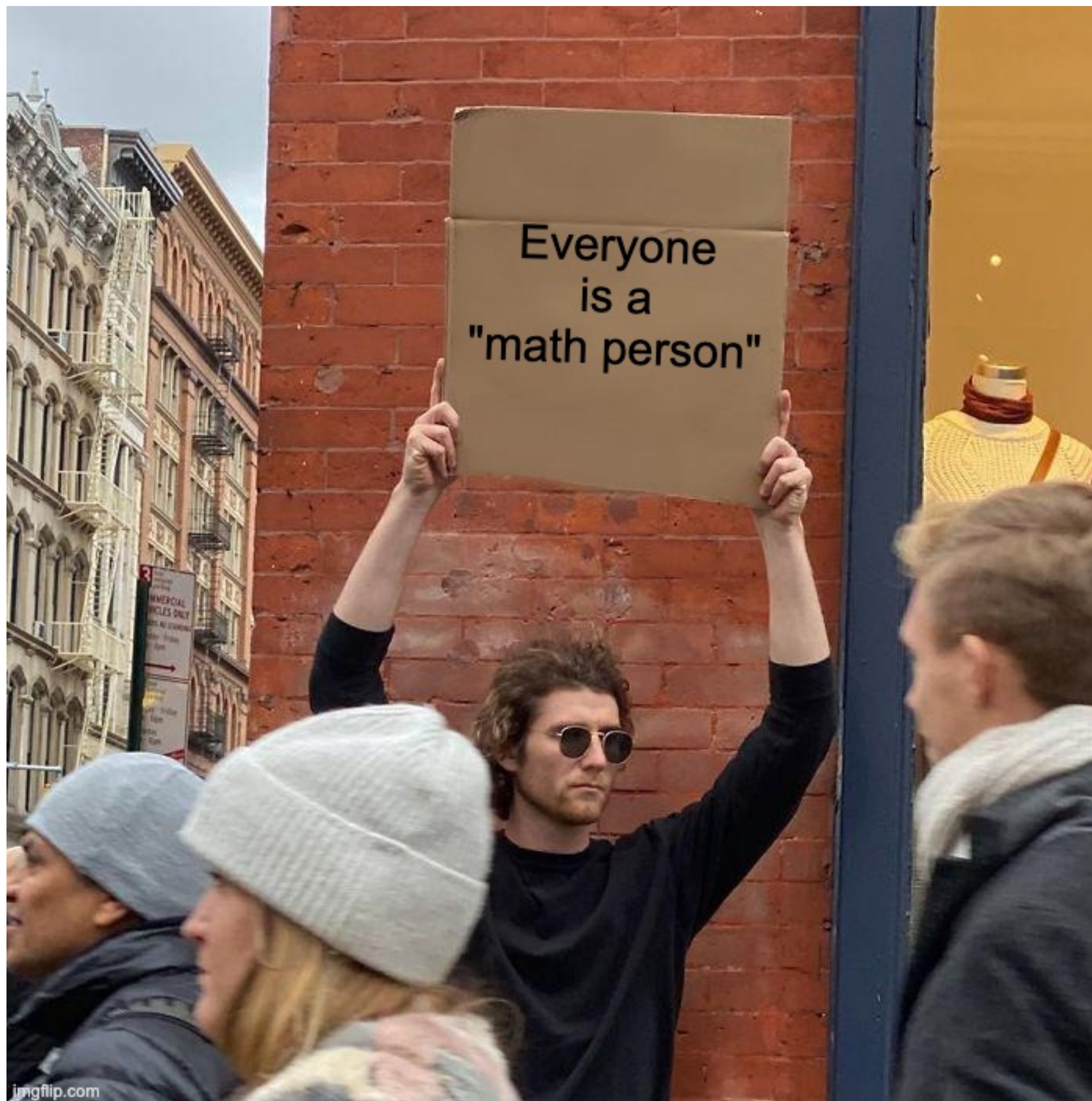


# hidden curriculum

a set of unintended lessons included in any learning experience.  
the norms, values, and beliefs conveyed in the classroom.

**FASTER IS SMARTER**

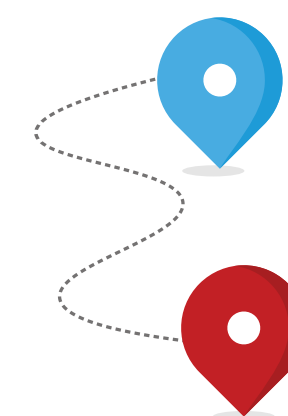




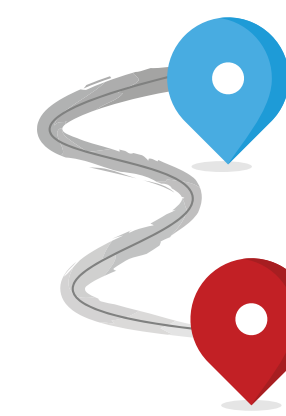
## Everyone Can Learn Maths To High Levels!

There is no such thing as a maths person! This is how we grow maths brains. When we learn, one of three things happen:

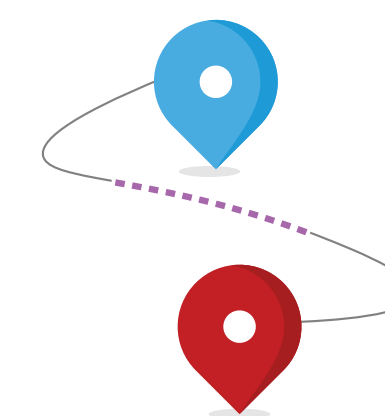
(1) We grow a new brain pathway:



(2) A brain pathway becomes stronger:

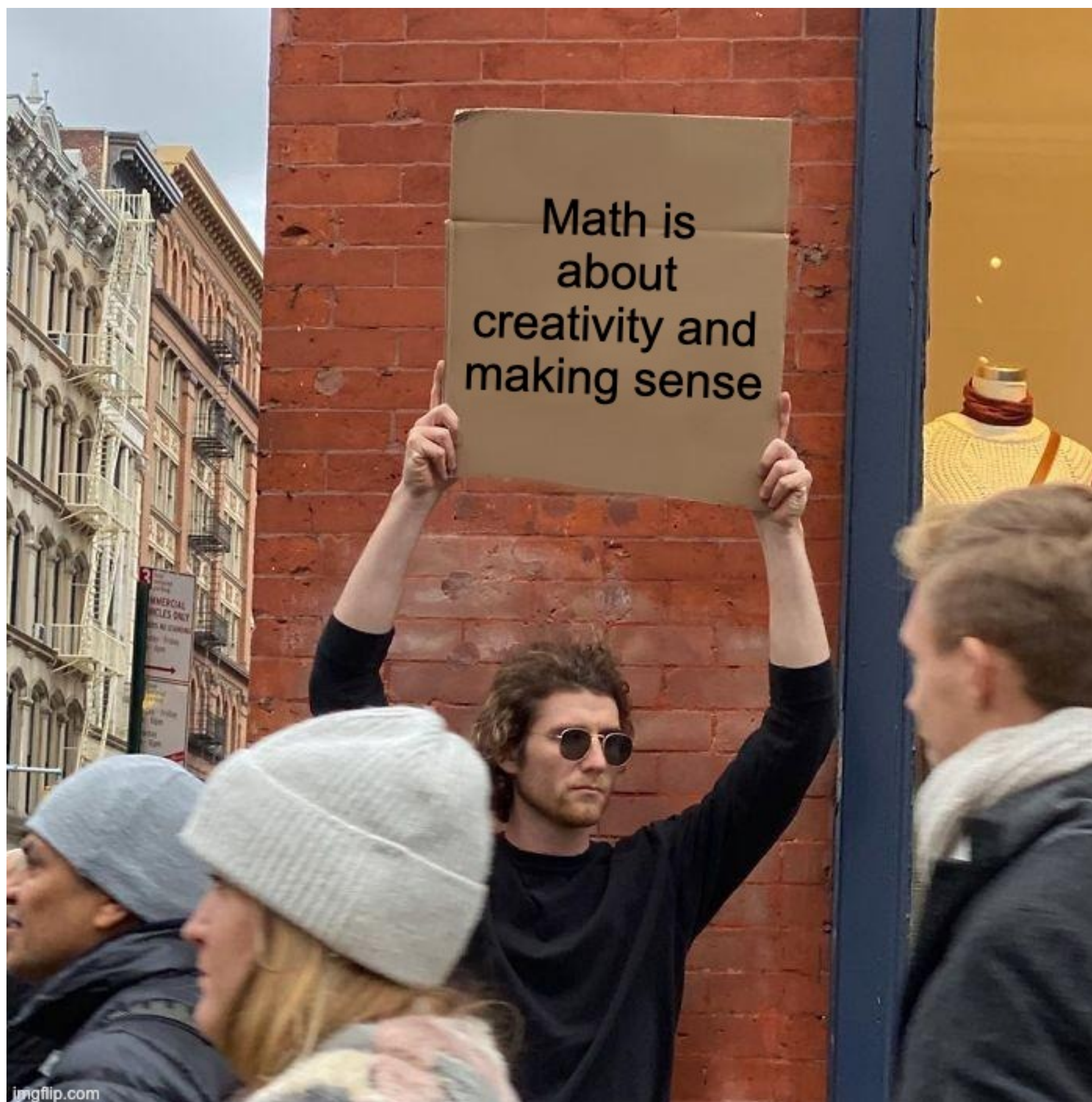


(3) Different brain pathways connect:



 **youcubed**<sup>®</sup>





# Maths Is About Creativity And Making Sense!



Maths is a sense-making subject, you yourself can know if an answer is right by reasoning about it.

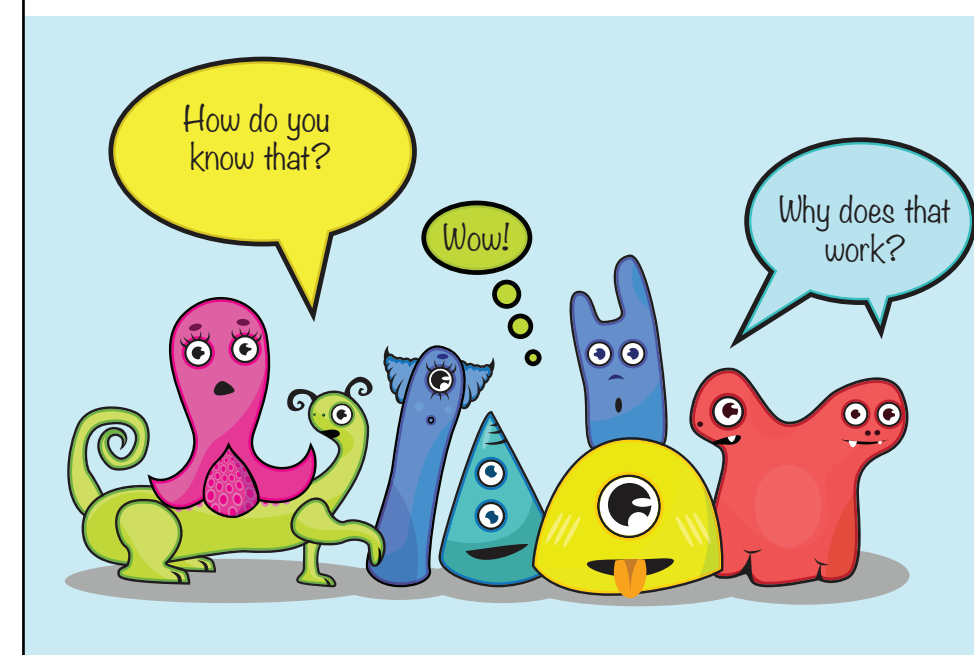
If you finish a question think of a different way to solve it or pose another question!







## Questions and Discussion Deepen Your Mathematical Understanding!



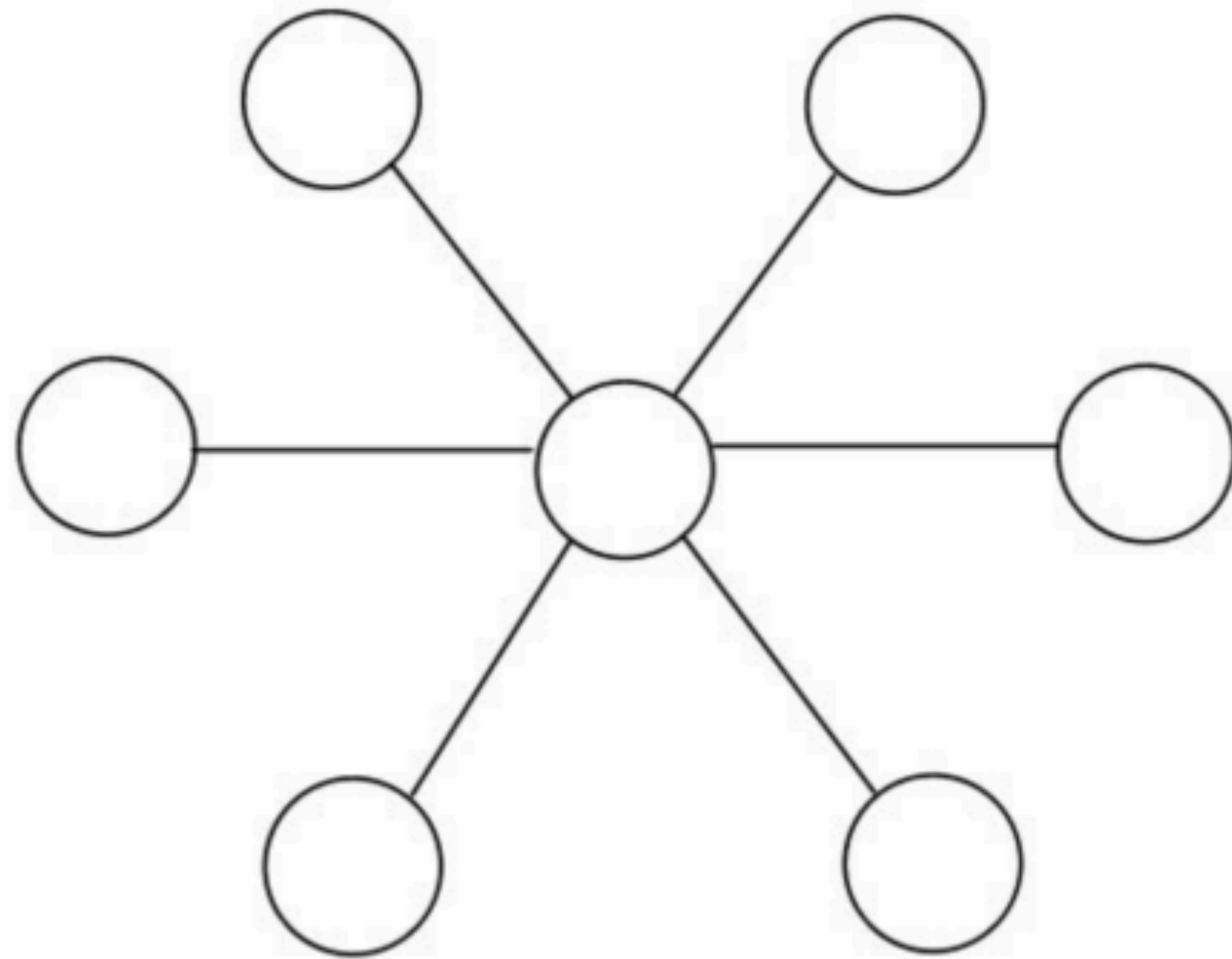
Studies show that doing maths with others helps you. Get together with your friends to do maths and discuss it, it will really help you!





# Flower Petal Puzzles

Write in the numbers 1 through 7 so that every group of three numbers in a line adds up to \_\_\_\_\_.



1    2    3    4    5    6    7





How does representing numbers in many ways help us to make connections and understand numbers in new ways?





How Close to 25?  
Gameboard

|   |   |   |   |   |
|---|---|---|---|---|
| ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● |
| ● | ● | ● | ● | ● |

<https://www.youcubed.org/week-inspirational-math/>







**STARTED THE MATH YEAR**



**OFF RIGHT**



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**K-12 Numeracy Helping Teacher**

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Twitter: **@Jesannwa**

blog: **[mathingaround.com](http://mathingaround.com)**

