The PDF version of these slides are shared to support your learning from the session. Please do not use them to give your own version of my presentation.

This presentation was the result of a yearlong project and I give this presentation in districts throughout the county. If you would like me to come to your district to share this work, please contact me at <a href="mailto:mff">mff</a>ynn@mtholyoke.edu

Thank you so much for your support.

#### Master of Arts in Mathematics Teaching

Blending Online and On-Campus Students for Live Interactive Learning



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**Contact Mike Flynn with Questions** 

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### Summer Coaching Institute

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#### Professional Development for Coaching Mathematics

**July 13 - July 17** 

Attend online or on campus

Experience professional learning designed specifically for K-8 math coaches.

This course is designed to transform your practice and enhance the powerful work you do supporting teachers and students.



Polly Wagner Instructor

Powered Mount Holyoke

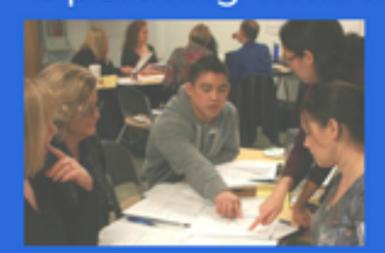
For more information, visit mathleadership.org

For questions, email mflynn@mtholyoke.edu

#### Summer Math Institutes for Teachers

Join us on campus for one of our interactive summer math institutes using the new Developing Mathematical Ideas professional learning materials for K-8 educators. Connect with teachers from around the world and deepen your own mathematical content and pedagogical knowledge.

## July 6 - July 10 Building a System of Tens (K-8) Operating with Whole Numbers and Decimals





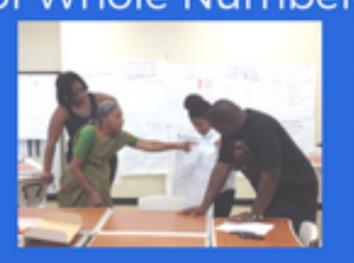


Explore how K-8 students make sense of the base-ten structure of the number system and exploit it in multi-digit computational procedures. We will then examine how basic concepts of whole numbers reappear for students when working with decimals.

mathleadership.org

## July 13 - July 17 Making Meaning for Operations (K-8) In the Domains of Whole Numbers and Fractions







Dive into a deep conceptual exploration of the four basic operations and consider how students progress in their understanding of them from kindergarten through 8th grade. We will then examine the four operations in the context of fractions.

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### Turning Adversaries Into Allies

**Building Community-Wide Support for Your Initiatives in Mathematics Education** 

June 11, 2020

7:00 p.m. EDT

#### **Description:**

Any initiative in mathematics education, whether classroom-based or state-wide, requires support from stakeholders (students, parents, administrators, school board, etc.) if it is going to be successful. However, building and sustaining that support can be challenging, especially if there are pockets of skeptics actively working against your goals. This session will address these challenges and provide educators and leaders with strategies and resources to help them build momentum in their communities to support meaningful and powerful mathematics education for each and every student.



**Speaker: Mike Flynn** 







### Turning Adversaries Into Allies

**Building Community-Wide Support for Your Initiatives in Mathematics Education** 

Presented by Mike Flynn

Text allies to 44222 to get the slides and resources from this session



@MikeFlynn55



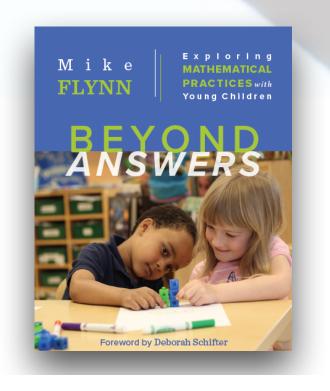
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Mount Holyoke College

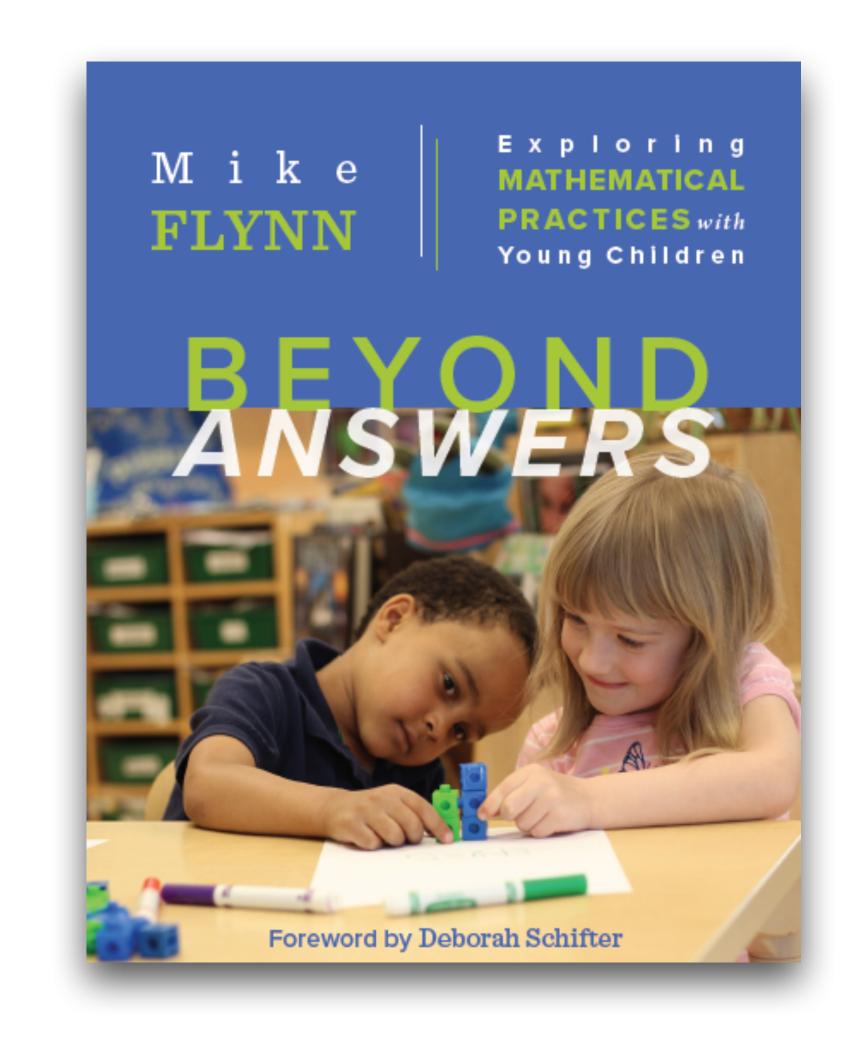




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## Name This Object



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#### U.S. NEWS

#### Failing Dentists Using New Drills

Back to the basics advocates pushing for a transition to simpler times with simpler equipment

#### By Suzanne Molar

Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment.

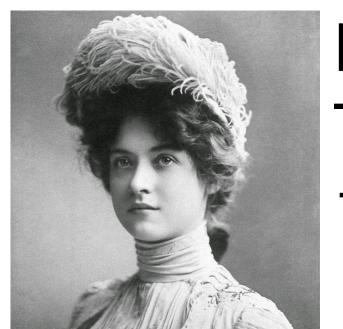
Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment. Back to the basics advocates pushing for a transition back to simpler times with simpler equipment.



New fancy drill or just a bunch of hype from overrated dentists to justify their high costs?

Back to the basics advocates pushing for a transition back to simpler times with simpler transition back to simpler times with simpler equipment. Back to the basics advocates equipment. Back to the basics advocates pushing for a transition back to simpler times pushing for a transition back to simpler times with simpler equipment. Back to the basics with simpler equipment. Back to the basics advocates pushing for a transition back to advocates pushing for a transition back to simpler times with simpler equipment. \

Back to the basics advocates pushing for a simpler times with simpler equipment. \



Maude Fealy @maudefealy1806 · Apr 12
The crank-operated dentist drill worked for me just fine in 1806. I want the same for my decedents. #NoNewDrills



Donald J. Trump 
● • Mar 12

@realDonaldTrump

Terrible! When I was a kid, drills made your mouth smoke. Crooked dentists are afraid of causing a little pain. SAD!









COM

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### Session Goals

Understand the psychology behind adversarial behavior

Learn why certain ideas take hold and spread while others do not

Leave with a solid toolbox of strategies to build support for your initiatives

### What is your change initiative?

Who are your allies with this initiative?

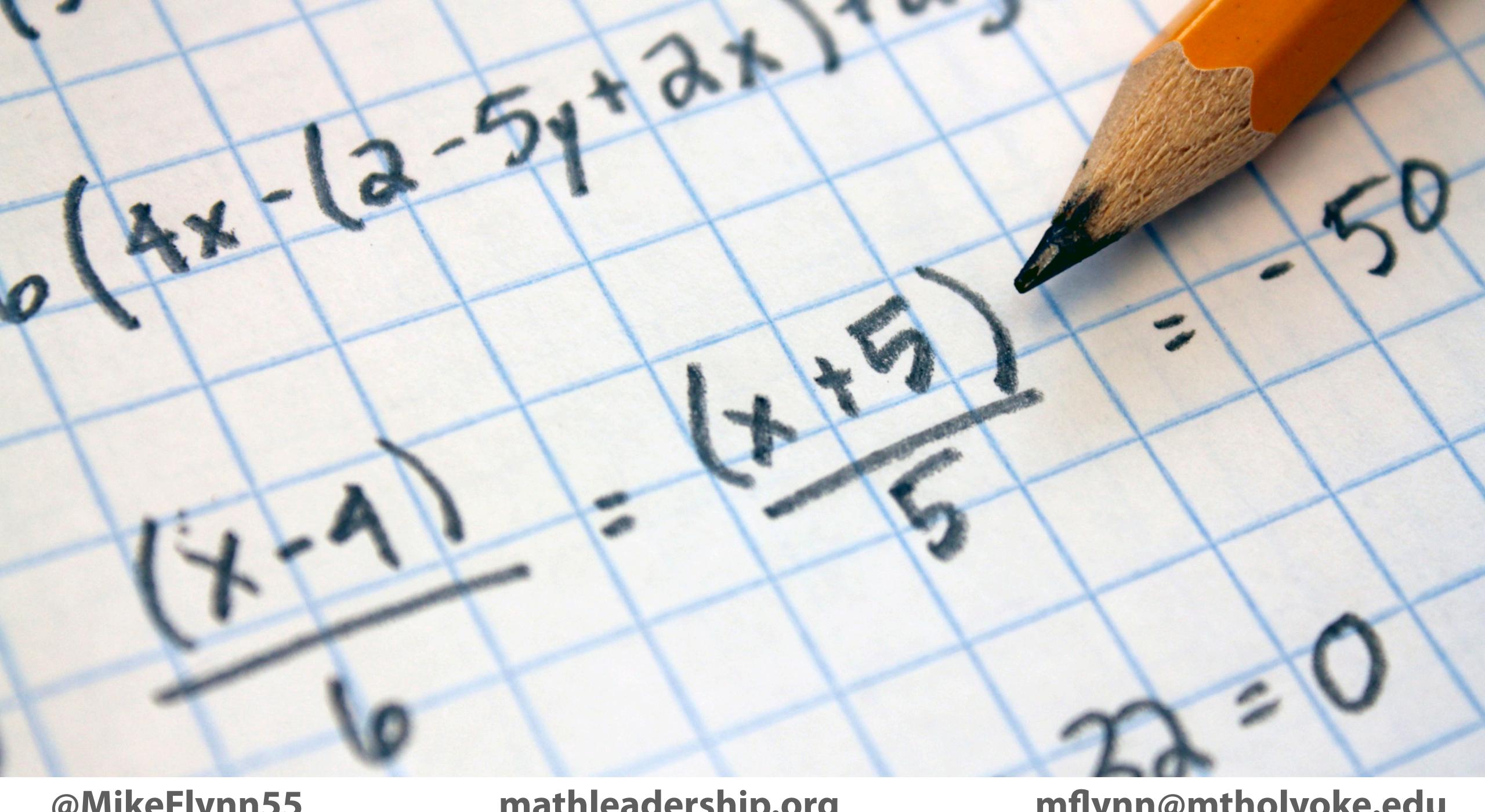
### Who are your adversaries?



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#### **Teacher-Proof Textbooks**

#### Student-Centered Learning



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## "There are two ways to change people's thoughts or have them take the action you wish for them to take." Bob Burg





Burg, B. (2013). Adversaries Into Allies: Win People Over Without Manipulation or Coercion.

Dear Dr.

I am writing to express my concern over the process you and your administration implemented with regard to the math initiative in the district. While I understand your concerns about the math scores on MCAS, at no point did you involve teachers in this decision. Leaving us out of the process prevents key stakeholders from being at the table and will likely result in poor implementation because you lack teacher buy-in from the onset.

Additionally, you have 4 nationally recognized math teacher leaders in the district who would be a valuable asset to support the administration with a new math initiative. Their knowledge and expertise is sought by school districts across the country and yet, they were not involved in any part of the process here in the district.

As a group of teachers recognized for excellence in educating children and partnering with families, we are in a unique position to contribute our knowledge of on-the-ground classroom realities to help create a shared vision for mathematics across our district. We also have the capacity to mobilize the teachers and families in our communities to support a shared vision that will improve our schools.

Please reconsider this unilateral decision to abandon our current math program in favor of a back-to-the-basics textbook approach. We ask that you start the process over and involve teachers from each grade level so we have full representation across the grades. We are a better district when we work together and you have an amazing group of teachers eager to get involved. We look forward to continuing the conversation.

Thank you for giving this matter your attention

Respectfully,

Michael Flynn

Second Grade Teacher

Michael Flynn

Norris Elementary







@MikeFlynn55

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### Northampton School Committee candidate: Michael B. Flynn

Posted Oct 28, 2009

By The Republican Newsroom





**Elective office sought:** 

Northampton School Committee-at-Large

**Age:** 34

**Web site:** http://www.facebook.com/home.php#/pages/Michael-B-Flynn/120689058218

**Occupation and Employer:** Second grade teacher, William E. Norris Elementary School, Southampton, 1998-present; self-employed education consultant, 2003-present



#### "A teacher's business is in the production of human capital."





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## Why do so many people with no teaching experience have so much influence on what happens in our classrooms?



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# The Culprits

Apprenticeship of Observation

The Dunning-Kruger Effect

Core Beliefs About Math

Parental Instincts

### The Apprenticeship of Observation

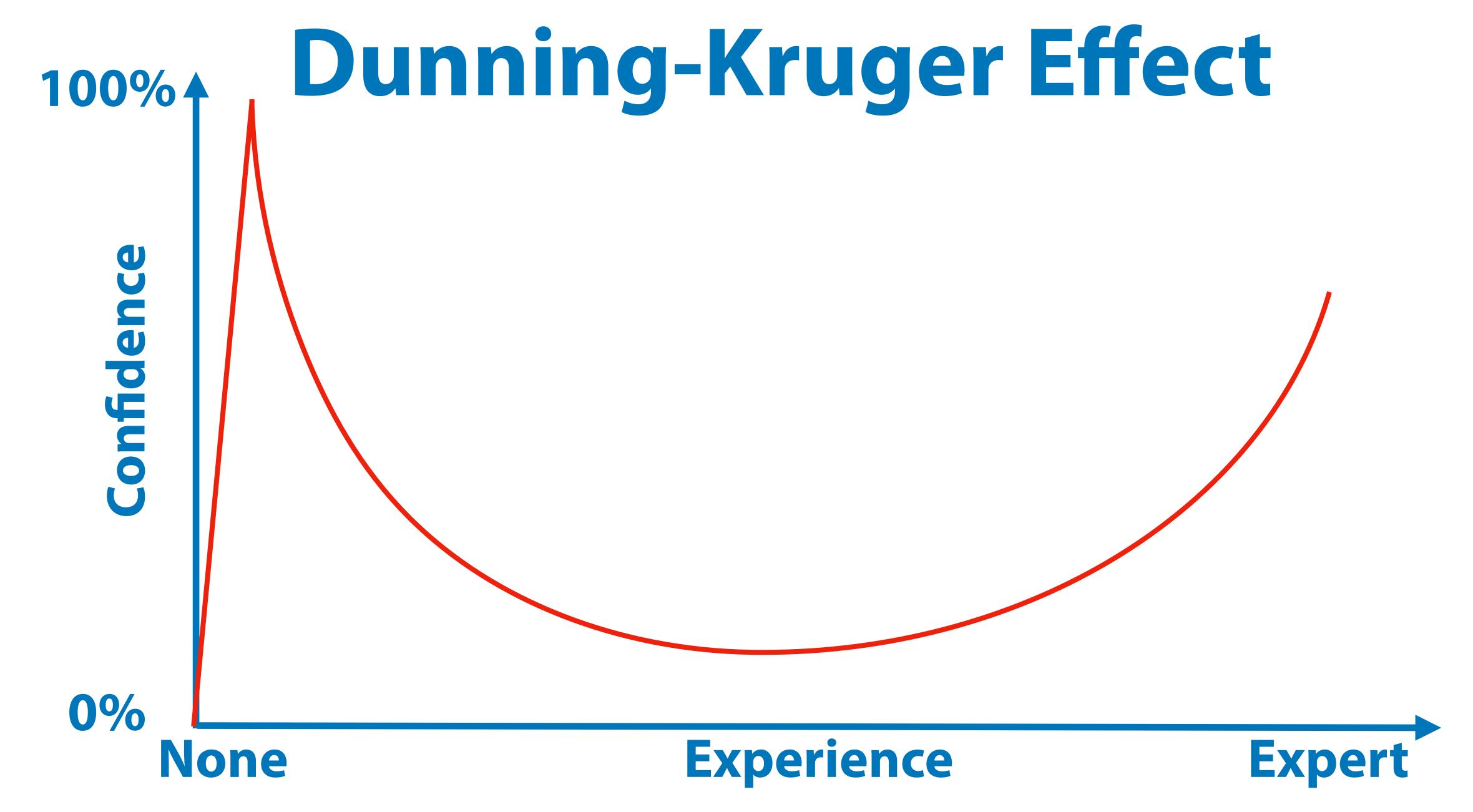
By the time a person enters college, she or he has spent approximately 13,000 hours observing teachers.



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Kruger, J. & Dunning, D. (1999). Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessments.

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"To a music lover watching a concert from the audience, it would be easy to believe that a conductor has one of the easiest jobs in the world. There he stands, waving his arms in time with the music, and the orchestra produces glorious sounds, to all appearances quite spontaneously. Hidden from the audience—especially from the musical novice—are the conductor's abilities to read and interpret all of the parts at once, and several instruments and understand the parts are coordinate and as parate parts, to motivate and communicate with all of the orchestra members."

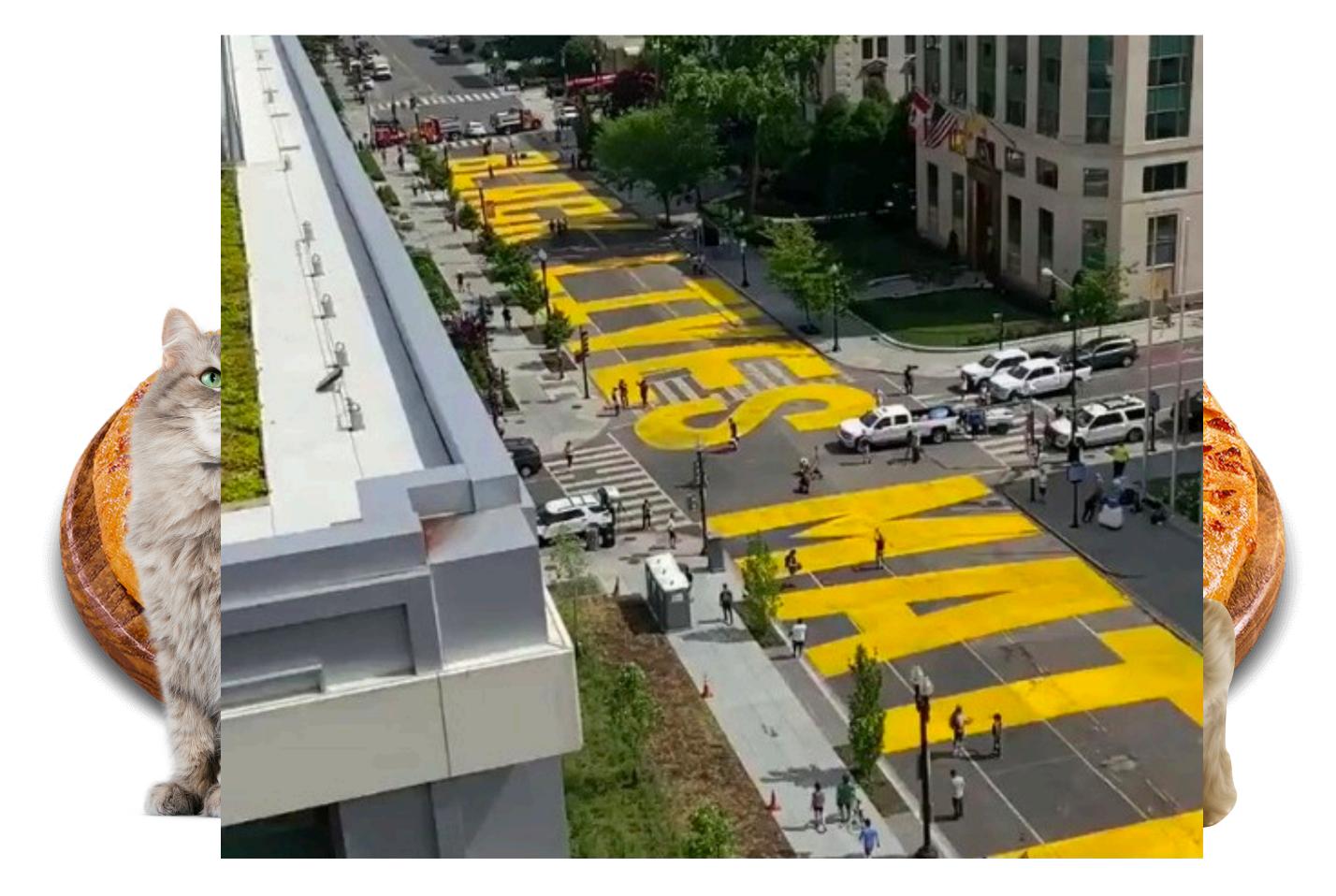


(Bransfor, Darling-Hammpond, & LePage, 2015)



# Belief Systems

The Invisible Force Behind Human Behavior.

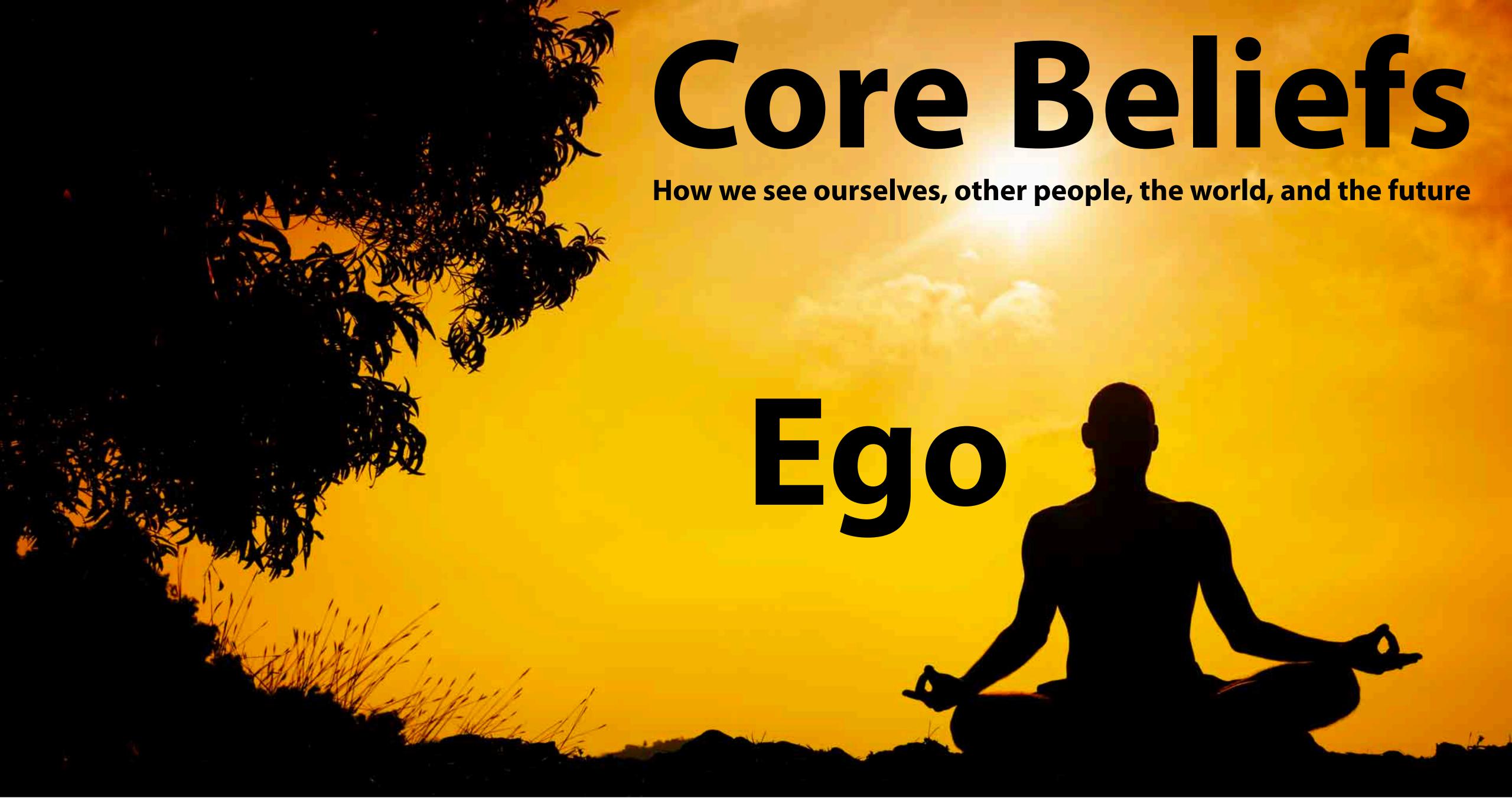


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### I'm kind of a big deal. People know me.



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### Our Belief System and Mathematics





The ultimate goal of any belief system is to ensure human survival and the passing on of your genes.



### So what does this mean for your initiative?



Apprenticeship of Observation

The Dunning-Kruger Effect

Core Beliefs About Math

**Parental Instincts** 



**Photos** 

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**₩** 

Community

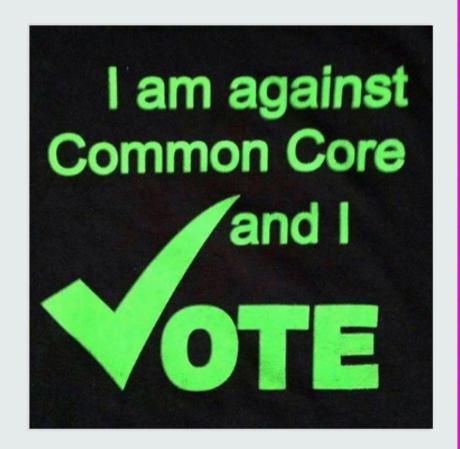








See All



Parents and
Educators Against
Common Core
Standards

@ParentsAndEducatorsAg ainstCCSS

Home

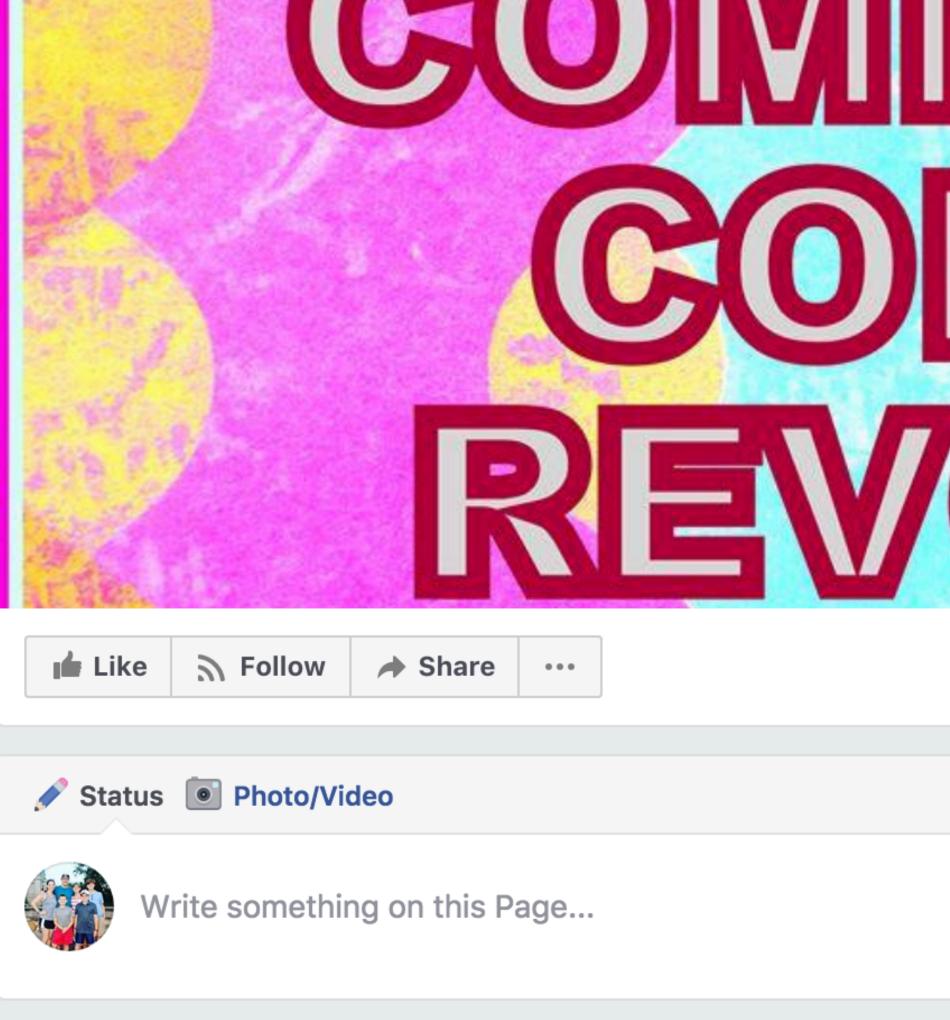
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**Photos** 

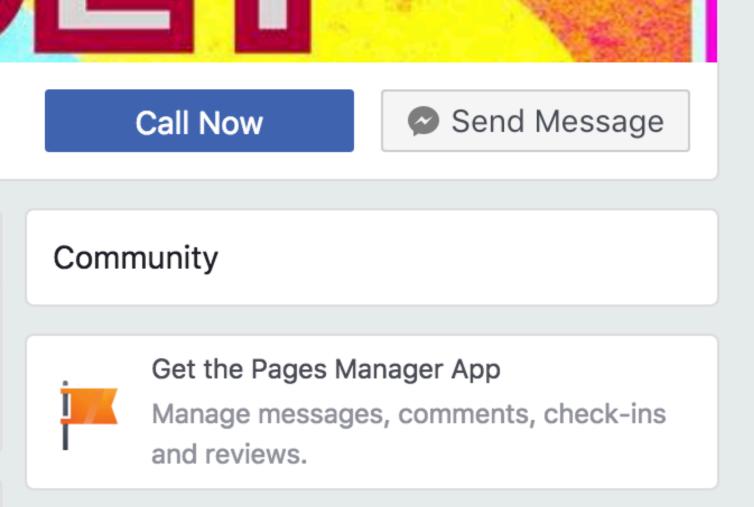
**Events** 

**Videos** 

Notes



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#### Session Goals

Understand the psychology behind adversarial behavior

## Learn why certain ideas take hold and spread while others do not

Leave with a solid toolbox of strategies to build support for your initiatives



#### common core math







All

Videos

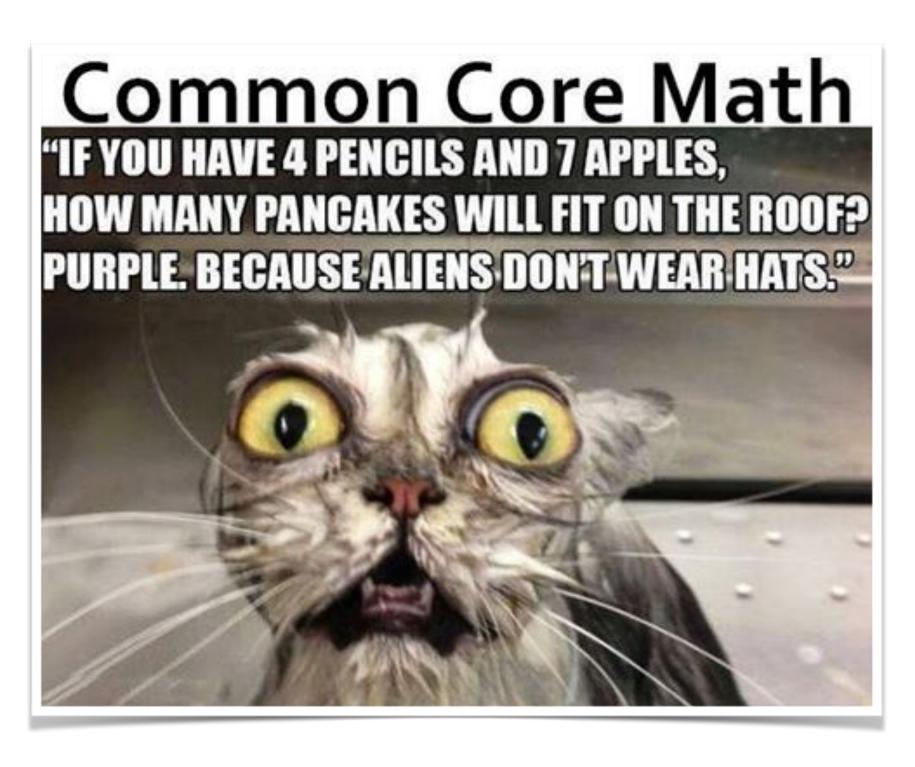
**Images** 

News

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Tools



#### Fuzzy Math

The Common Core math standards serve to make simple mathematics more complicated. Here's one example of the types of "new math" many parents and teachers have been criticizing:

Books

Add 26 + 17 by breaking apart numbers to make a ten.

Use a number that adds with the 6 in 26 to make a 10.

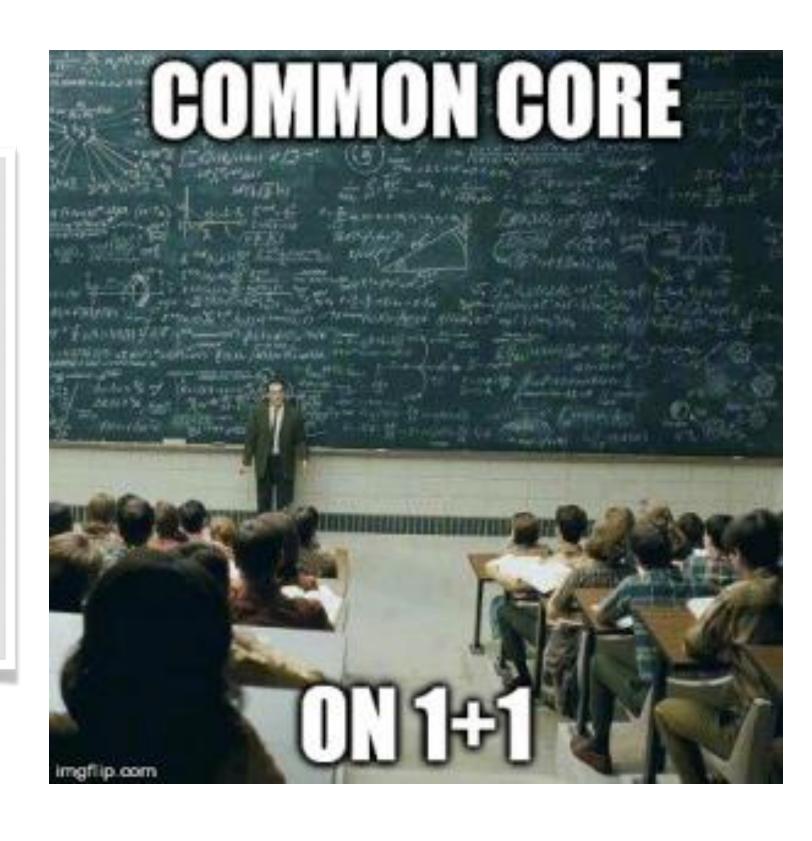
Since 6 + 4 = 10, use 4.

Think: 17 = 4 + 13

Add 26 + 4 = 30

Add 30 + 13 = 43.

So, 26 + 17 = 43.



#### Look how math coscues solves a simple problem



## Fuzzy Math

The Common Core math standards serve to make simple mathematics more complicated. Here's one example of the types of "new math" many parents and teachers have been criticizing:

Add 26 + 17 by breaking apart numbers to make a ten.

Use a number that adds with the 6 in 26 to make a 10.

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$$6 + 4 = 10$$
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Think: 
$$17 = 4 + 13$$

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$$Add 30 + 13 = 43.$$

So, 
$$26 + 17 = 43$$
.

## Checking homework: Ohio dad's ridicule of Common Core goes viral

Published September 23, 2015 FoxNews.com **DOUGLAS A. HERRMANN** 1170 06/97 **MARLO K. HERRMANN** 6-12/410 PAINESVILLE, OH 44077-3689 Dollars NCBANK PNC Bank, N.A. For\_



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Why Some Ideas Survive and Others Die

## 

## 

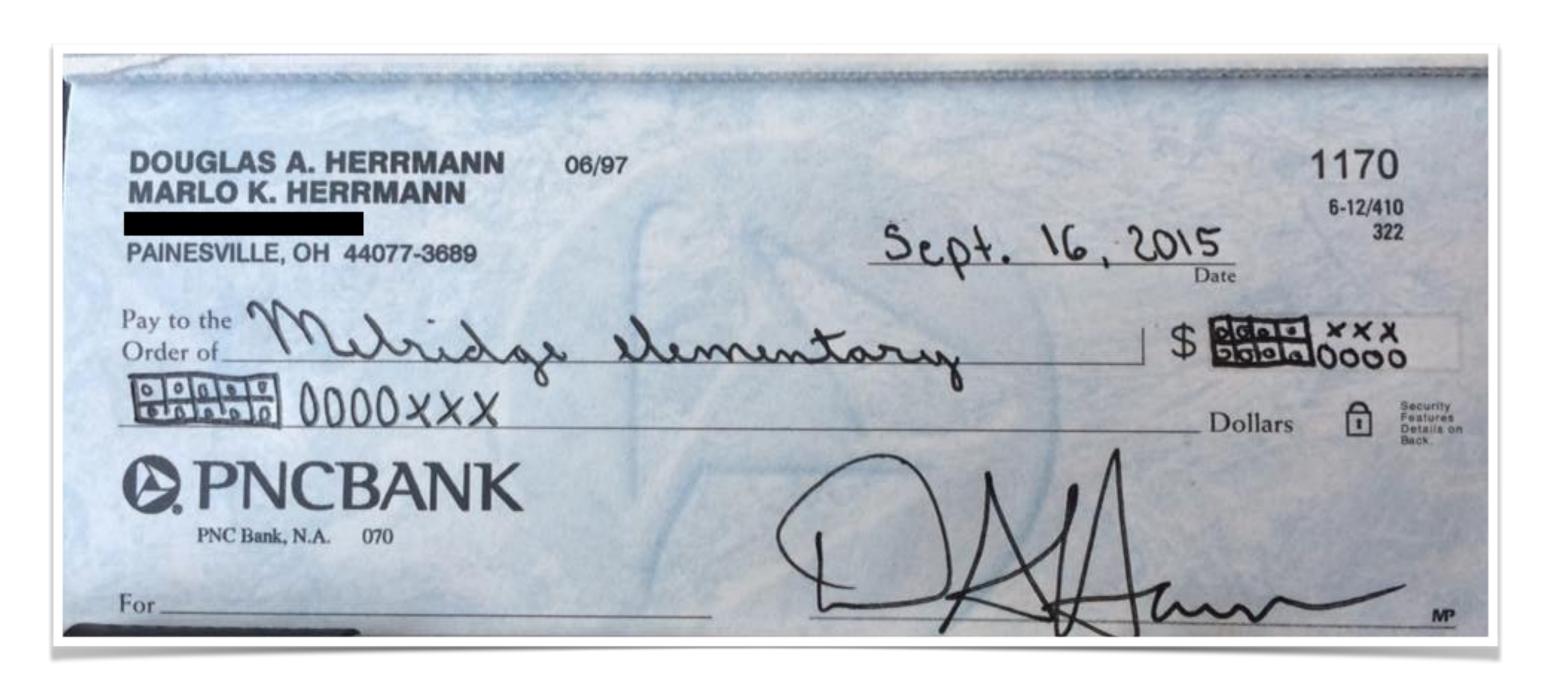
Chip Heath & Dan Heath

With ADDED MATERIAL (now extra sticky!)

## Simple Unexpected Concrete Credible Emotional Stories



## Simple Unexpected Concrete Credible Emotional



How does this example fit the SUCCESS framework?

#### Session Goals

Understand the psychology behind adversarial behavior

Learn why certain ideas take hold and spread while others do not

## Leave with a solid toolbox of strategies to build support for your initiatives

# So now what?



Fuzzy Math

The Common Core math standards serve to make simple mathematics more complicated. Here's one example of the types of "new math" many parents and teachers have been criticizing:

Add 26 + 17 by breaking apart numbers to make a ten.

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#### Setting a Positive Frame

#### Teaching Versus Telling

Intellectual Empathy and Rehearsals

Addressing the Curse of Knowledge

#### Messaging Using the SUCCESS Framework

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### Set the Frame



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## Consider Your Frame



Burg, B. (2013). Adversaries Into Allies: Win People Over Without Manipulation or Coercion.

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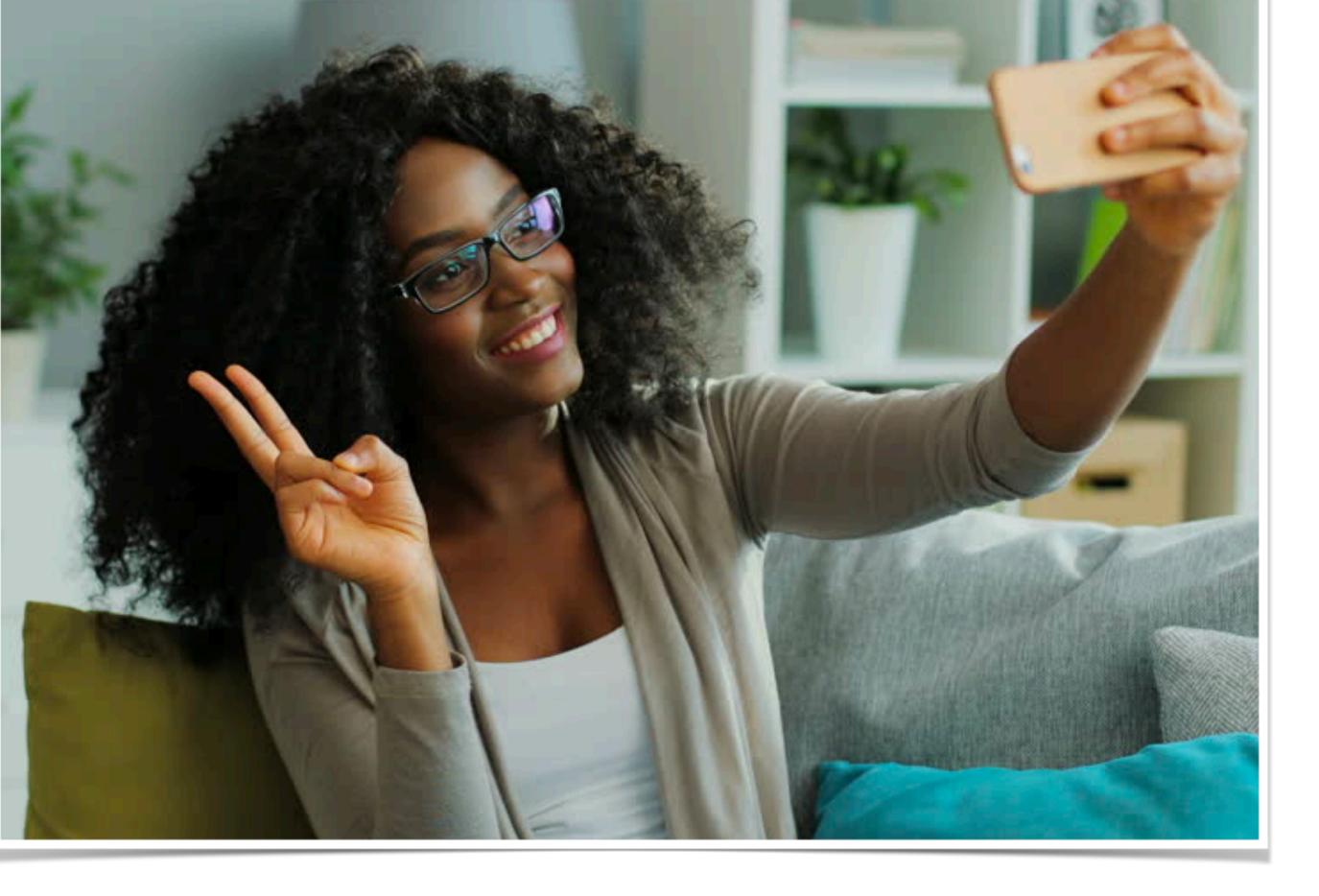
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"The single biggest mistake people make is focusing on themselves and their own agenda rather than on the other person and his or her agenda." **Bob Burg** 

Oh! I can see why what might exthine. as inefficient and be frustrated.





What a brilliant way to approach this problem.



# "People will only willingly do what you want if it's in their self-interest to do so."









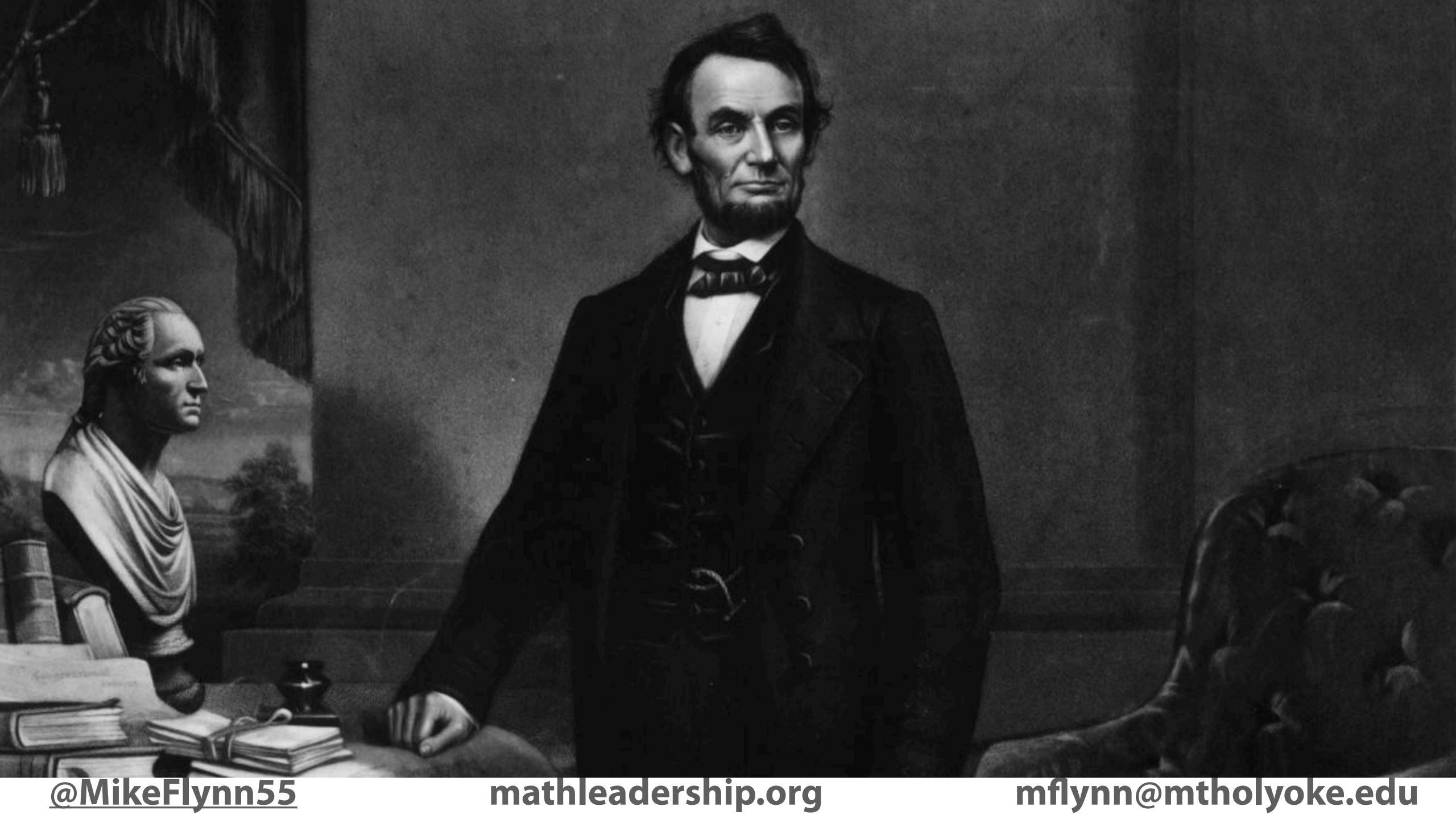
#### Perspective Taking

(Intellectual Empathy)

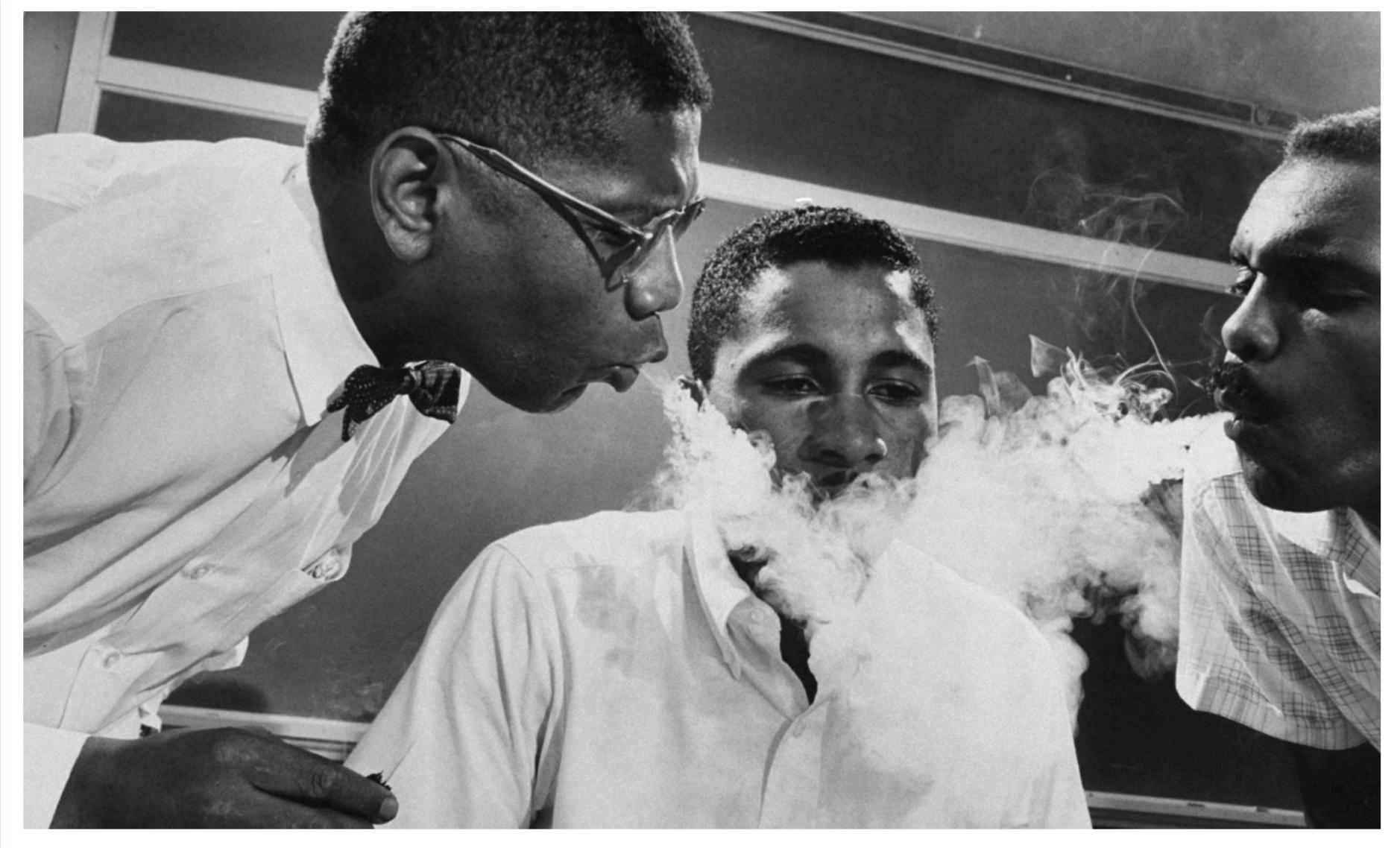
"Having the consciousness and ability to reconstruct accurately the viewpoints and reasoning of others and to reason from premises, assumptions, and ideas other than our own."

**Maureen Linker** 

https://www.press.umich.edu/5914478

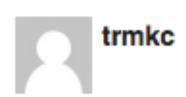


# Intellectual Empathy and Rehearsals



Caption from LIFE. "Smoke Test, one of the harassments sit-ins have met 'on the firing line,' as students call demonstrations, is administered to Virginius Thornton. His tormentors are David Gunter, an N.A.A.C.P.-student adviser (left), Leroy Hill, high school teacher." In other words: Thornton is having smoke blown in his face by his friends in order to practice keeping his cool and not reacting to provocation during his upcoming lunch-counter protest.

Howard Sochurek—Time & Life Pictures/Getty Images



WTF! Our school ran a Pilot Program for Common Core. The honor math kids hated it. They said it was really a Language Arts Class. The parents pulled their kids from the class, revolted and demanded "Real" math. It was a frustrating nightmare for the students and parents alike. We had a parent who is a a Math Professor (PHD) who could not figure out what they were trying to teach with Common Core math. Parents Run ..do not walk away fast from this program.



I guess none of these kids are going to be pursuing higher physics, or sending any satellites to planets or even figuring out how to make medicines or other chemistry any time soon. Competitive in the marketplace? I think not.



Delving this deep into simple addition, subtraction, multiplication and division might be going a bit too far, especially for us oldtimers who memorized our times tables, etc., but I have to admit that I somewhat like the idea of teachers actually teaching various ways to thing about and solve problems and then requiring students to demonstrate proficiency in those methods. If executed properly, with sufficient time, money, and parental support, this could actually turn out to be a good thing. Yeah, I know, there are a lot of "if's" in there... that's on purpose.

#### Anticipate Your Audience's Needs







## Intellectual Empathy Rehearsals

- Always saw herself as good at math
- Works as a software engineer for an investment firm
- Frustrated with new math program
- Feels like kids are learning inefficient strategies
- Worried her daughters now hate math
- Hired a private tutor to "fix" the problem



- 15 years of teaching experience
- Master of Arts in Teaching Mathematics
- Wants each student to develop a conceptual understanding of math
- Frustrated when parents teach procedures
- Loves how the new math program balances between work on skills and concepts



#### Perspective-Taking Worksheet

Target Audience: Mother of a student

What might some of their core values?	What are some of their points of contention?
What are their learning needs with regard to your change initiative?	What areas of expertise might they bring to the table?

## Intellectual Empathy Rehearsals Have a mock meeting with one person playing

- Have a mock meeting with one person playing the parent and one person playing the teacher.
- Observers take notes on the interactions.
  - What frame did the tea

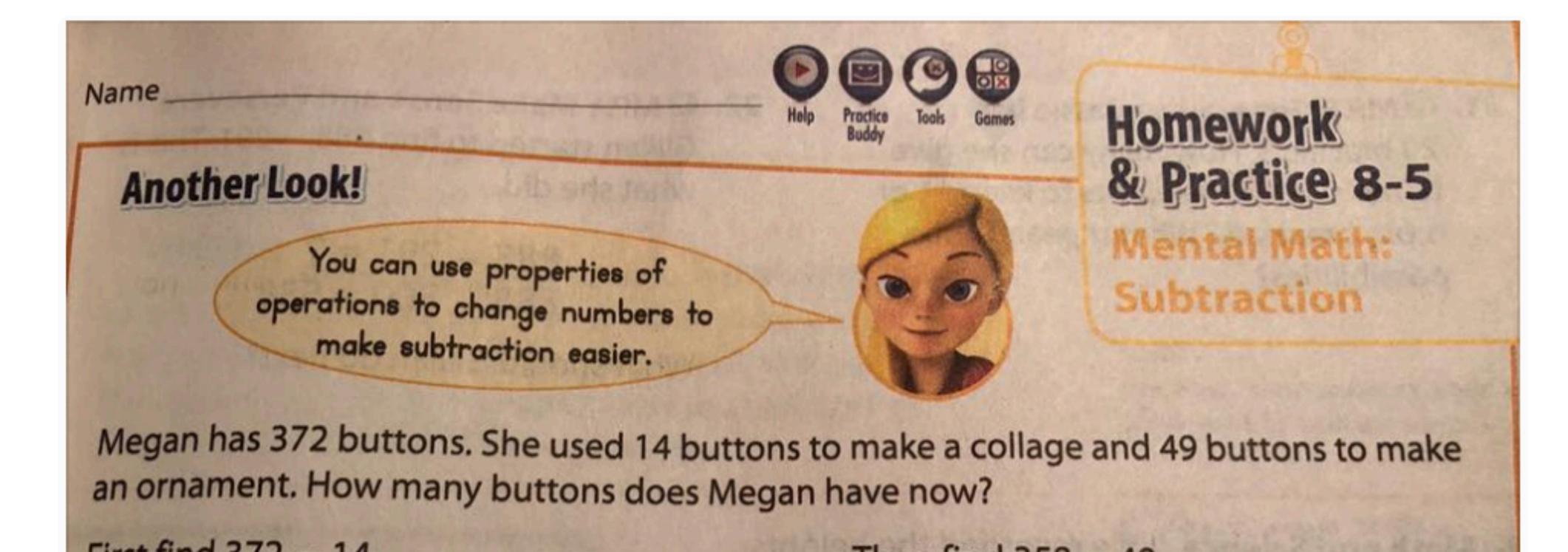






10 hrs · 🎎

Is there anyone who can explain to me why on earth it makes sense to ask third graders to add before subtracting? I mean, is this really efficient or are math people just getting fancy and creative for no reason except to drive children and parents crazy. Because I literally could pull my hair out.



#### Hit them in the head and the heart.



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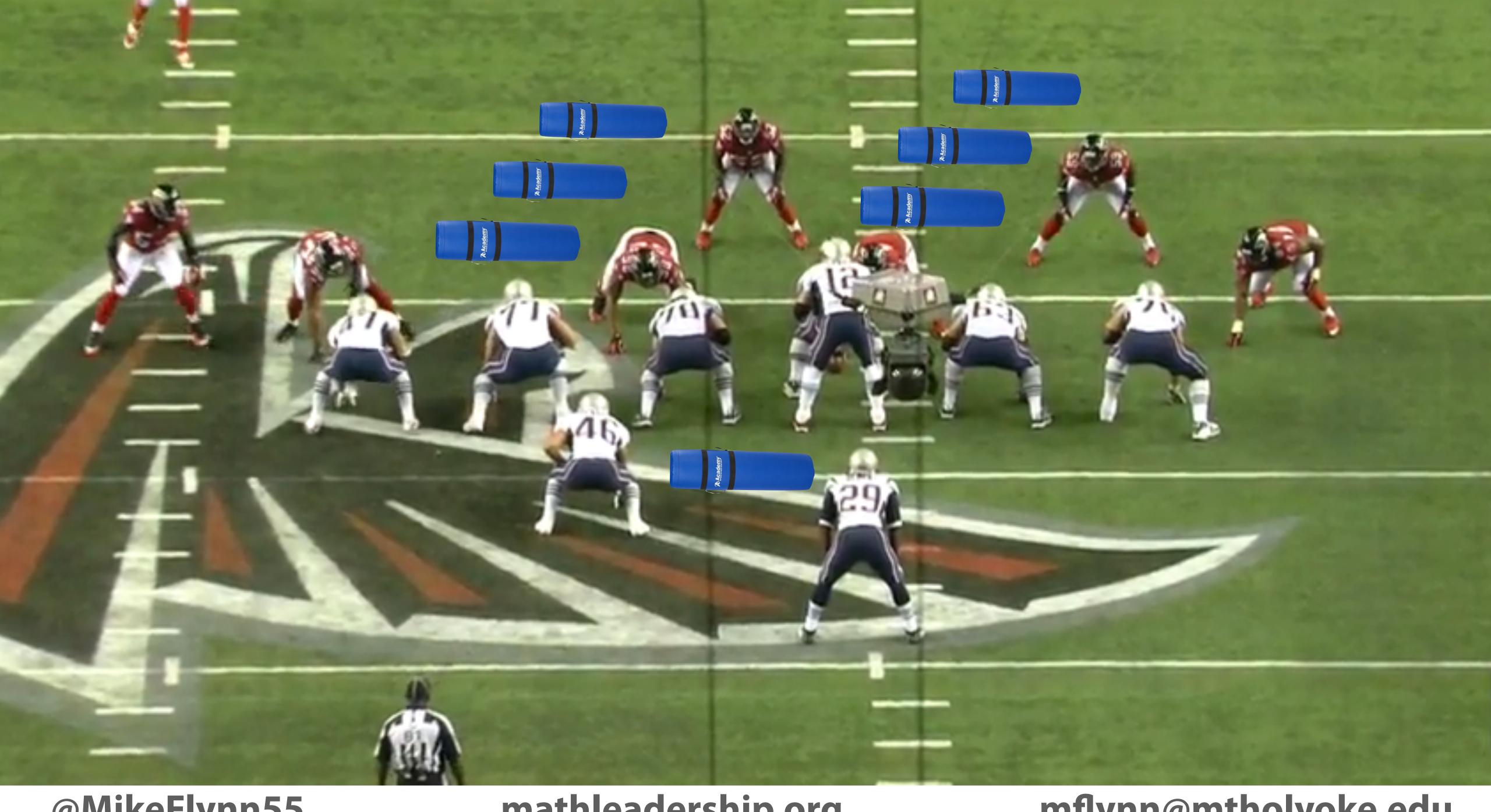
## Checking homework: Ohio dad's ridicule of Common Core goes viral

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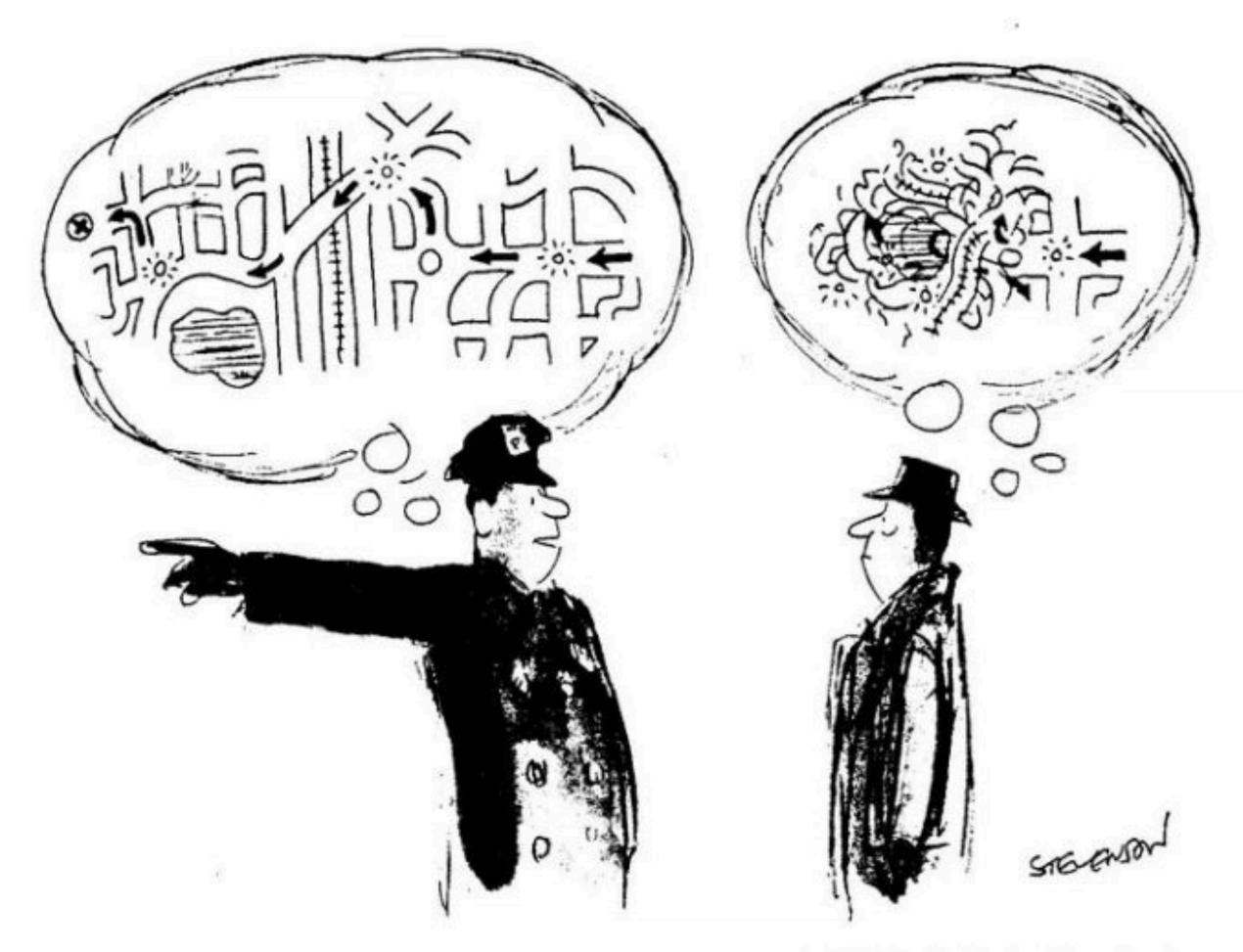




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#### The Curse of Knowledge



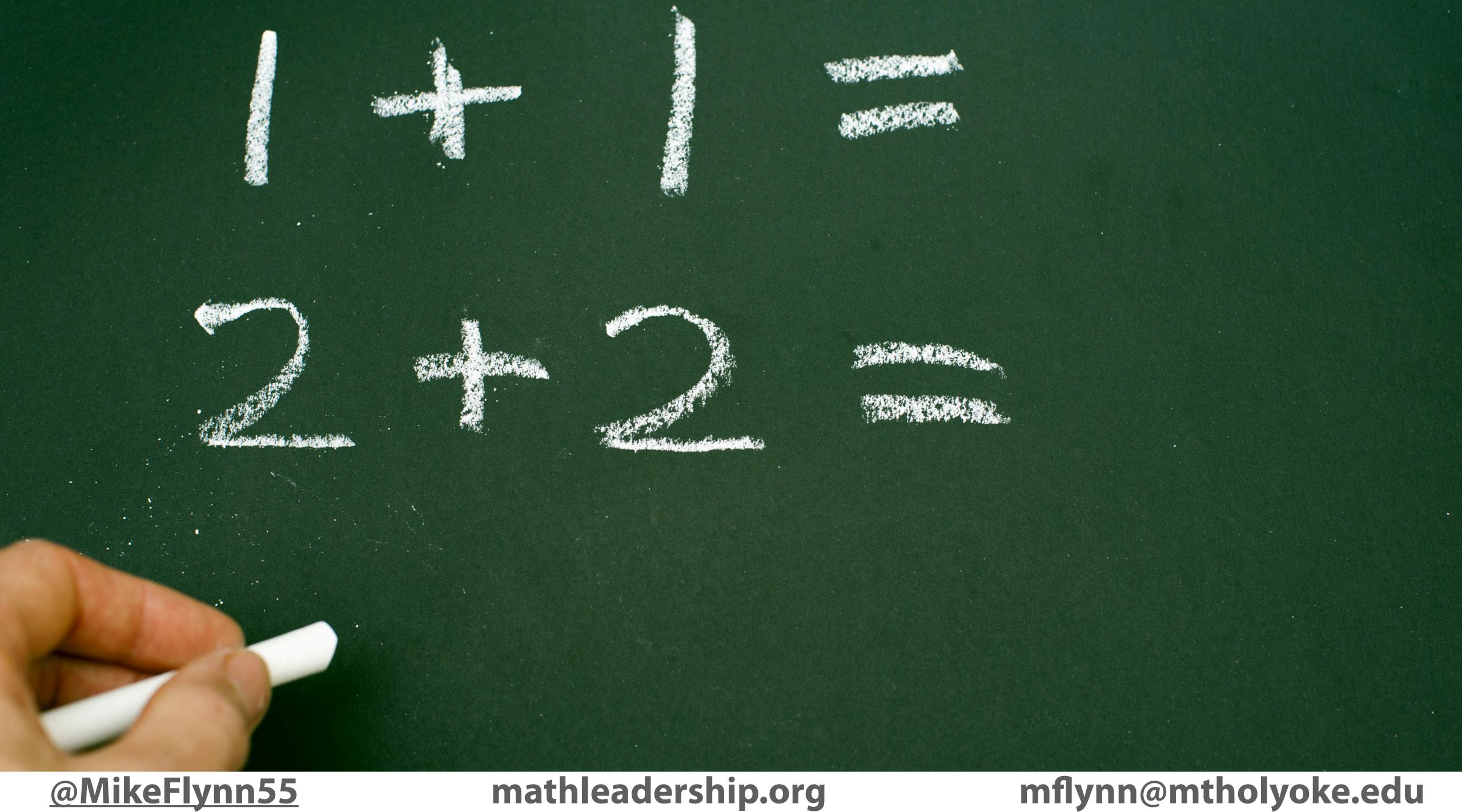
Drawing by Stevenson; © 1976 The New Yorker Magazine, Inc.

#### The Curse of Knowledge

The curse of knowledge is a cognitive bias that occurs when an individual, communicating with other individuals, unknowingly assumes that **the** others have **the** background to understand.

Heath & Heath (2007)



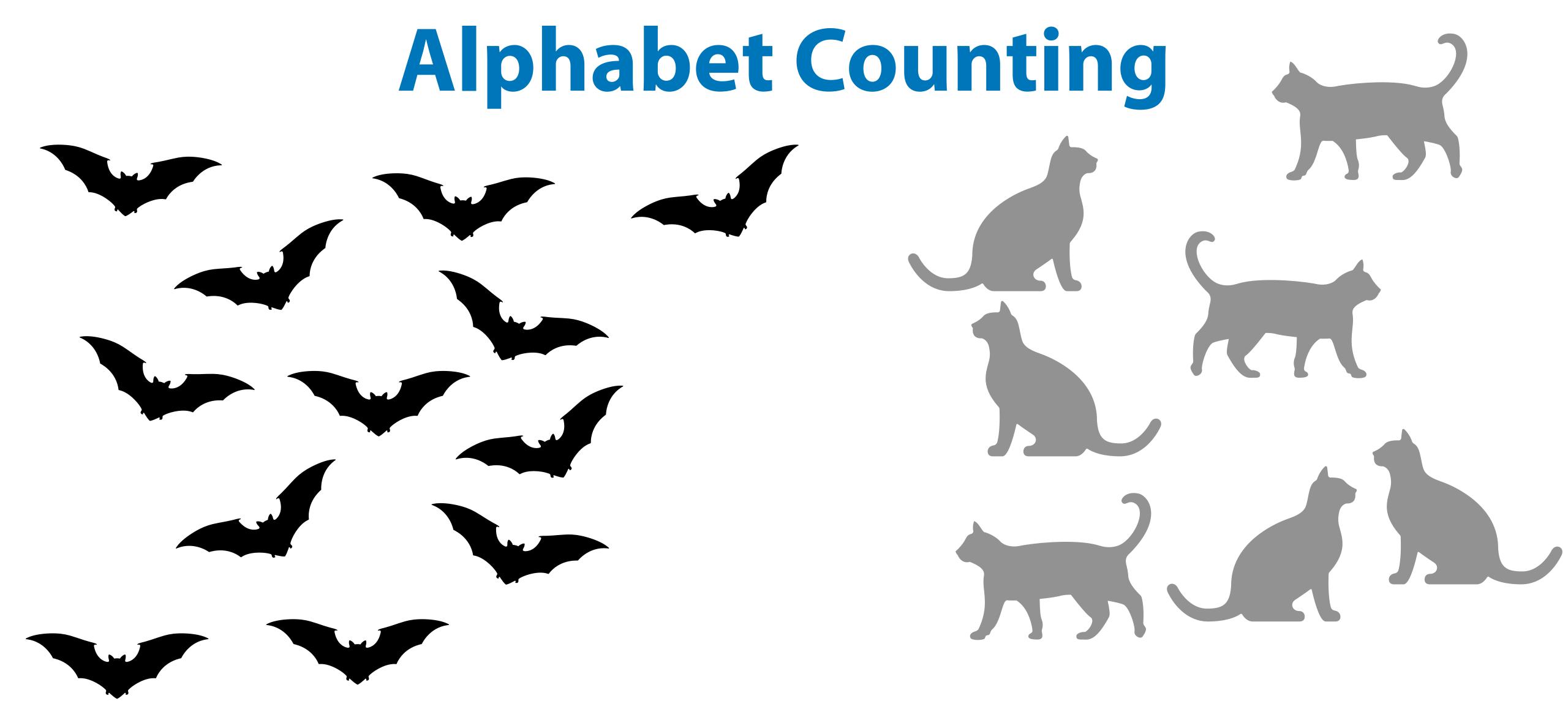


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#### Combatting the Curse of Knowledge

People need opportunities that put them in the learner's shoes so they experience productive struggle.



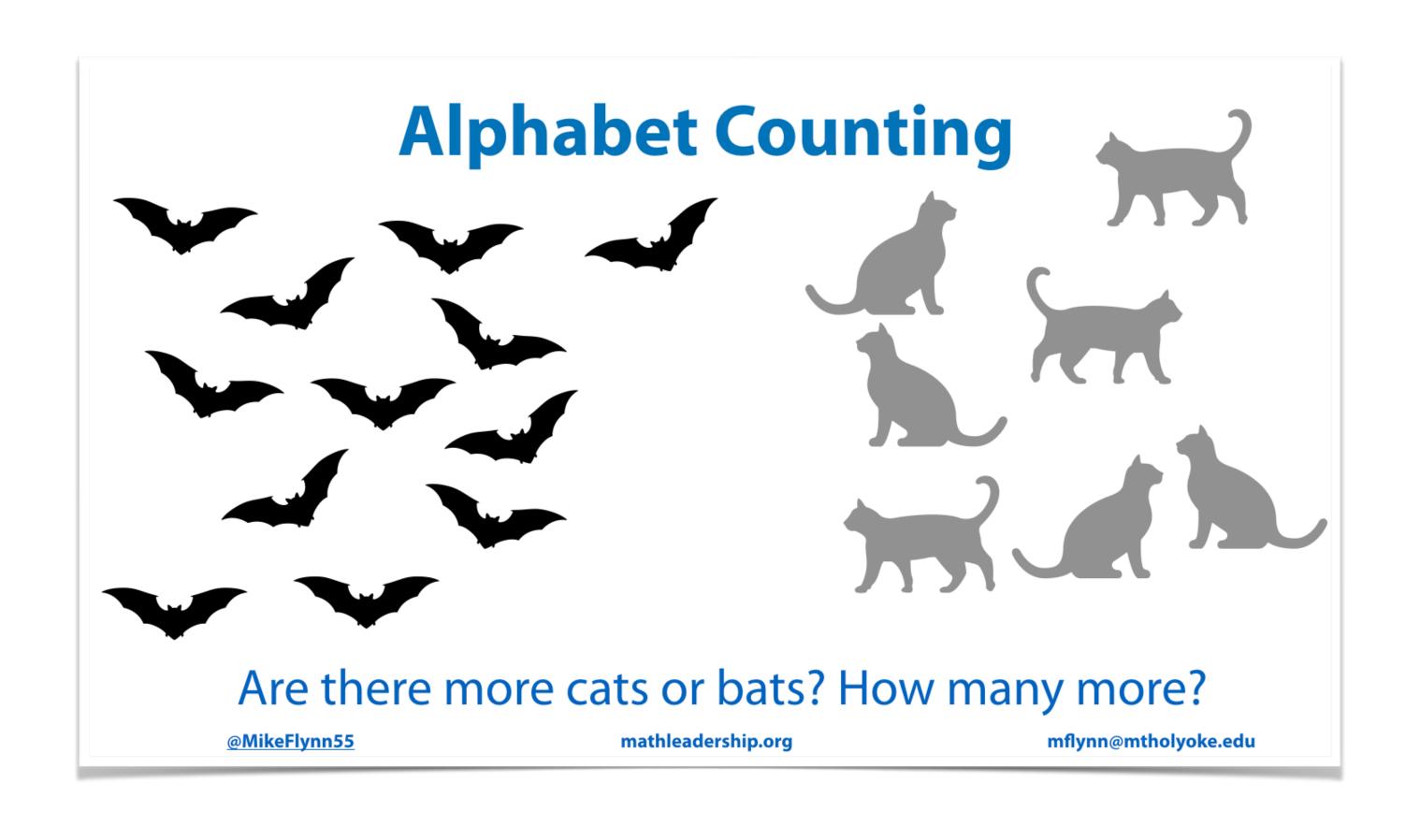
Are there more cats or bats? How many more?

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# Simple Unexpected Concrete Credible Emotional

Stories



#### Jared

Jake and Sally were collecting rocks.

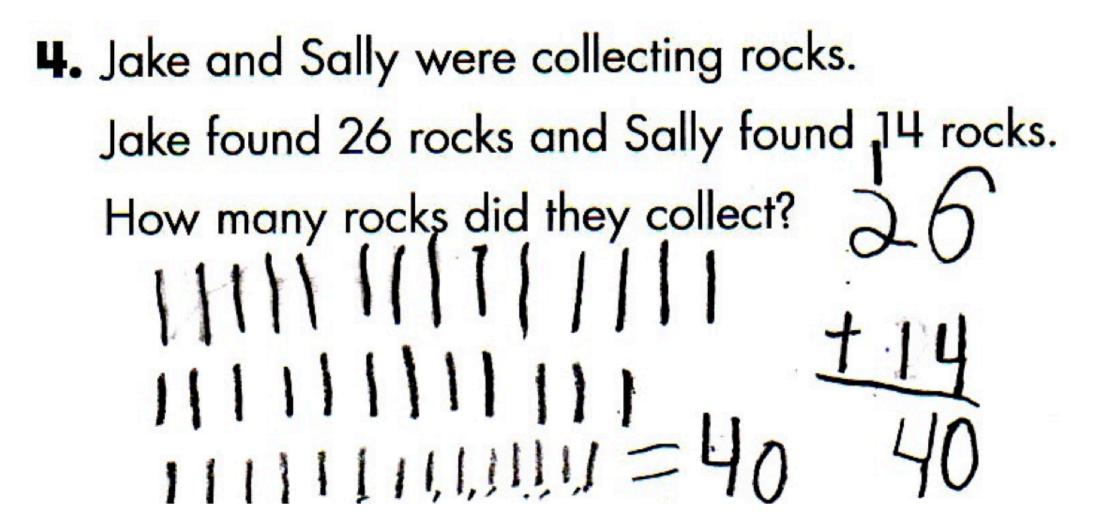
Jake found 26 rocks and Sally found 14 rocks.

How many rocks did they collect?

14

#### What is it like to be a Jared?

Jared



$$24 4+3=12$$

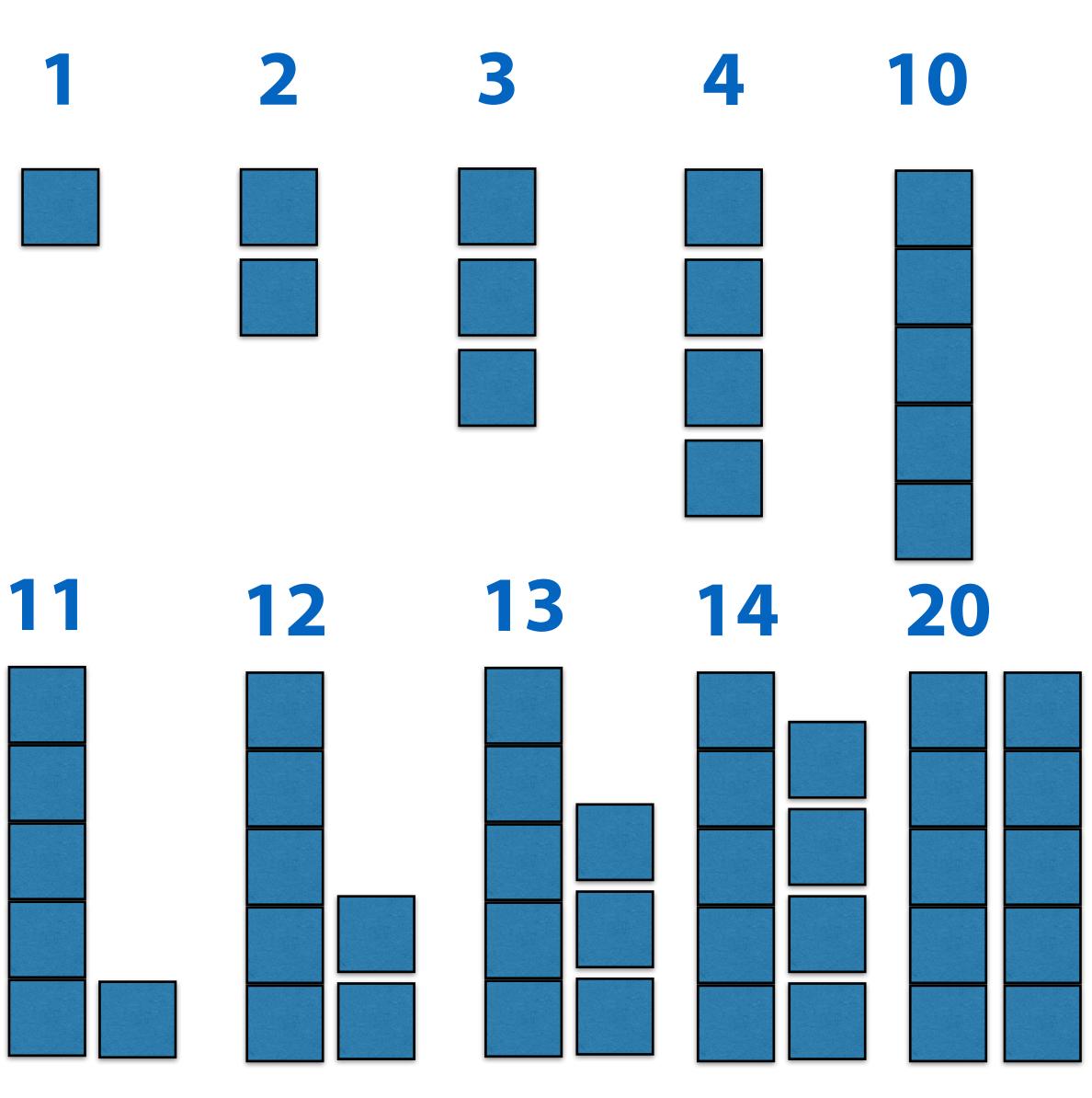
$$+ 13 2+1=3$$

$$42 4+4=13$$

$$+ 14 1+1=2$$

$$33$$

#### Base 5

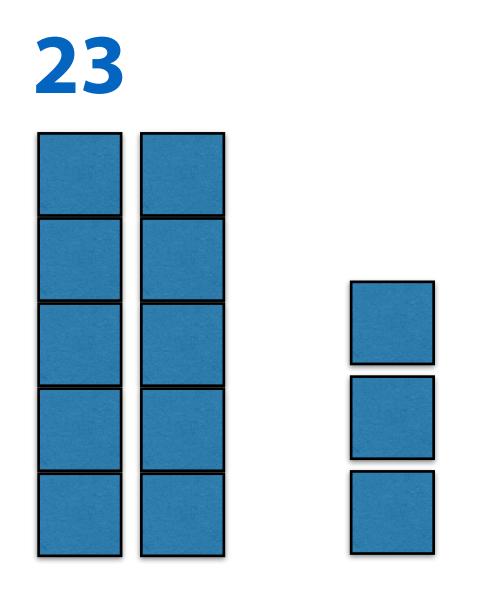


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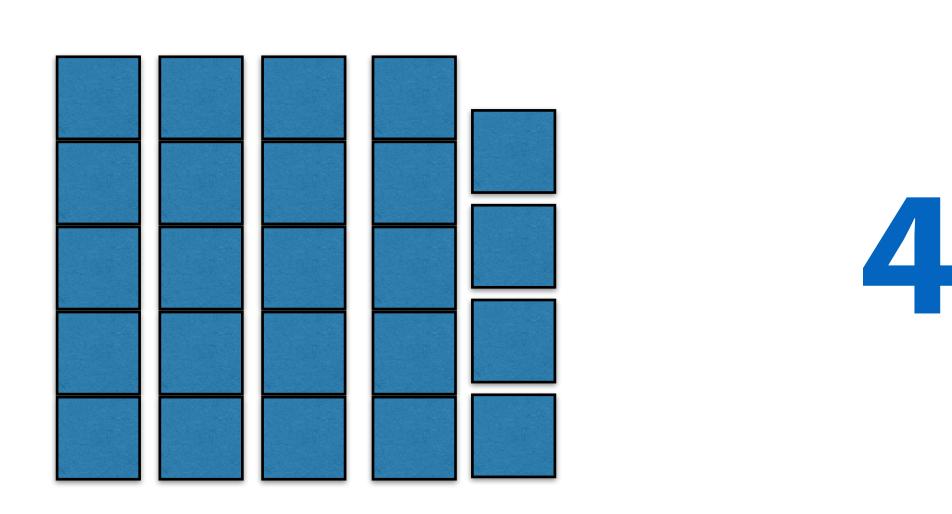
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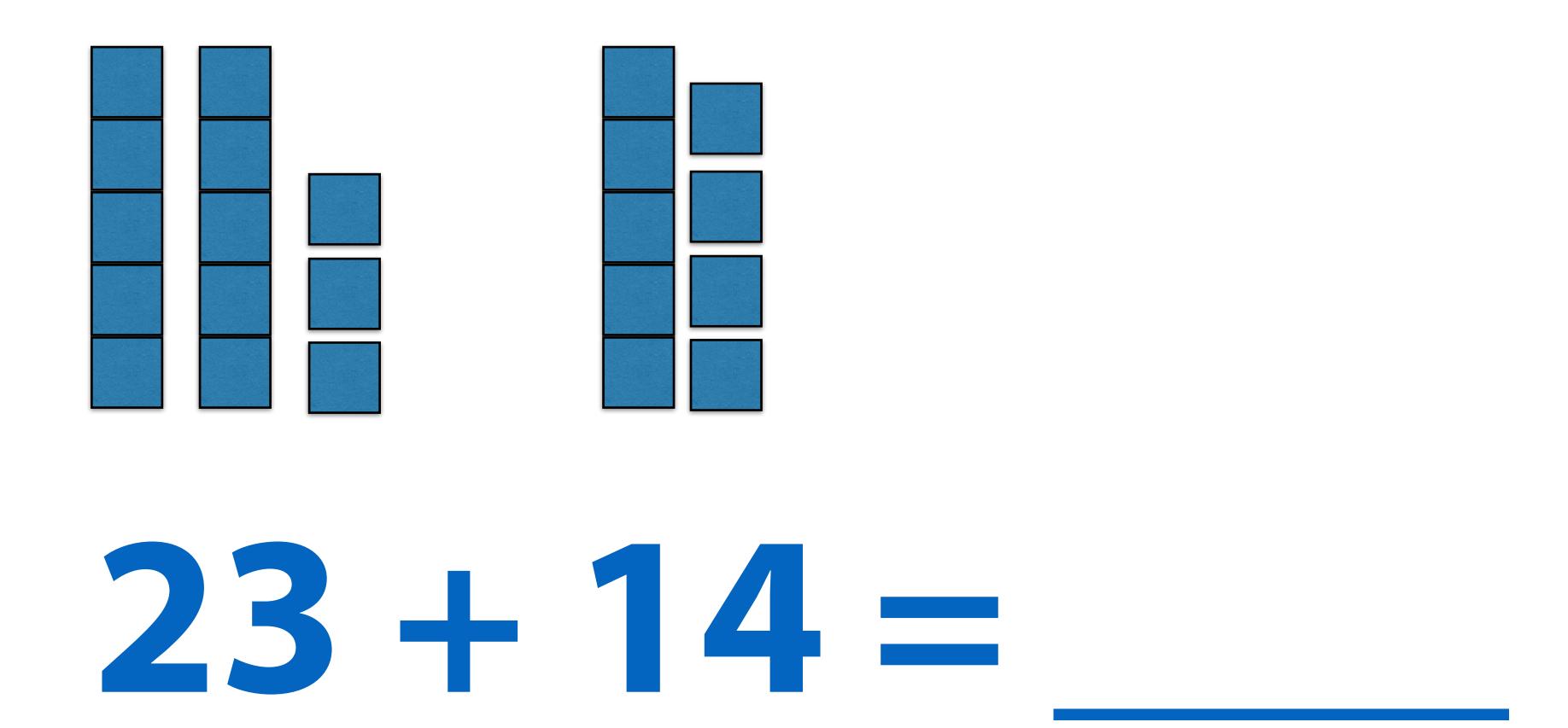
#### What would 23 look like?

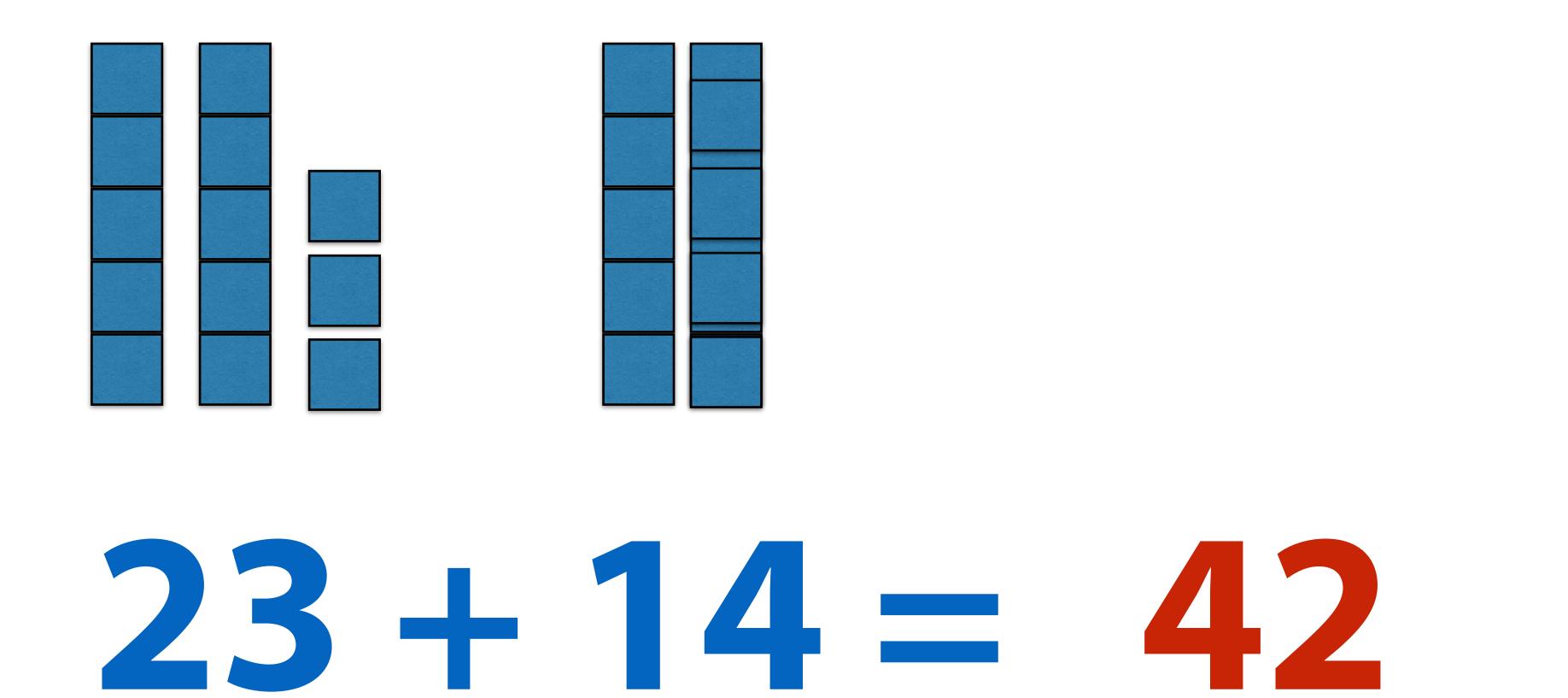


#### What number does this represent?



#### What number comes after it?



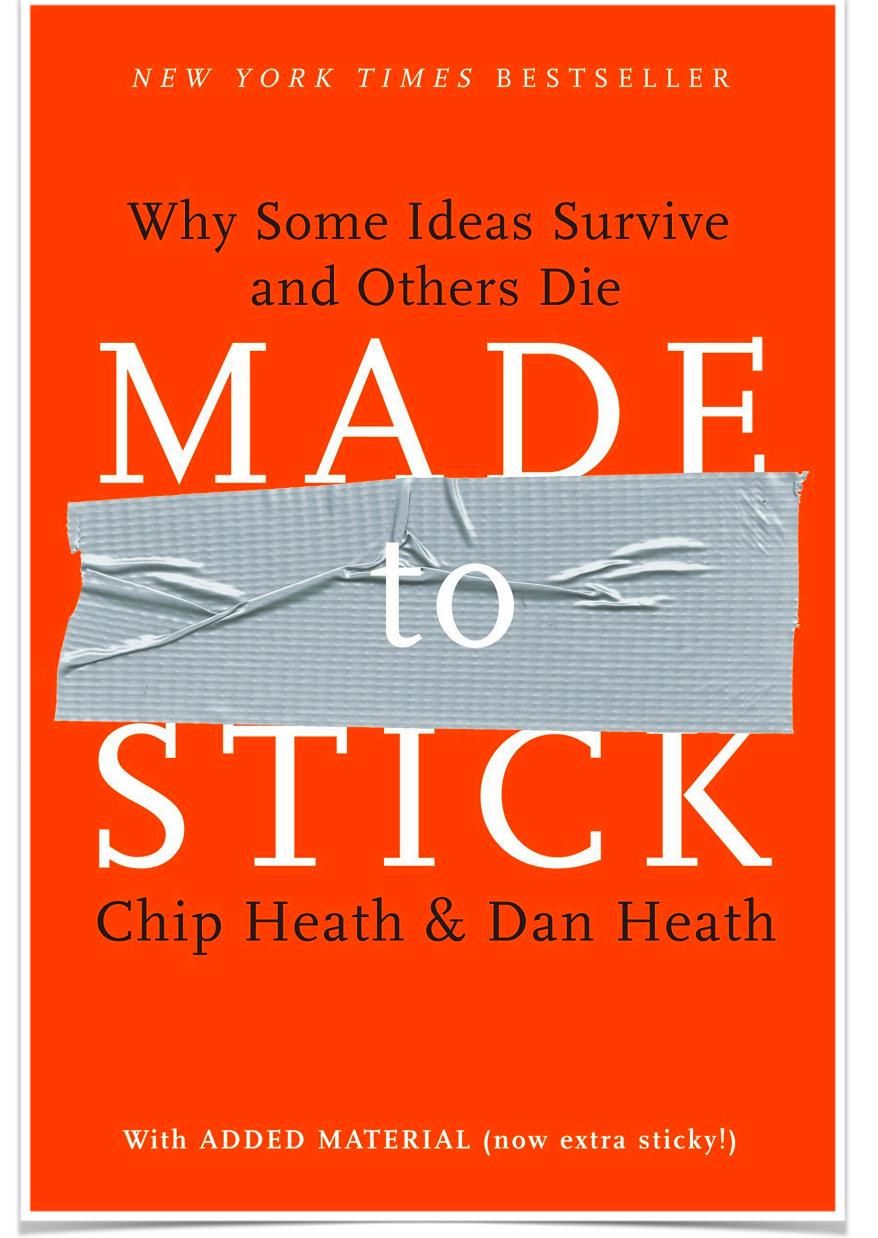




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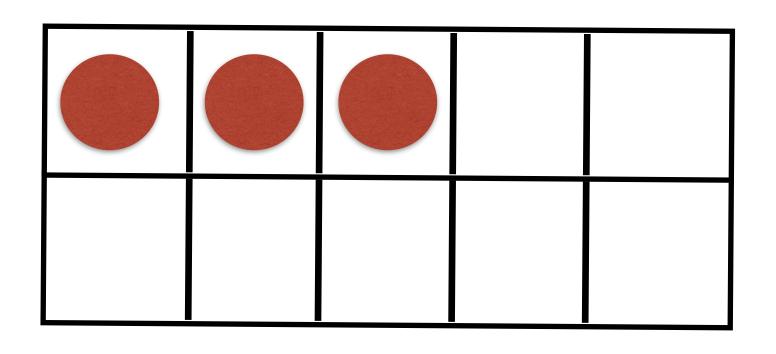
# Simple Unexpected Concrete Credible Emotional



Heath, C. & Heath, D. (2008) Made to Stick: Why Some Ideas Survive and Others Die. Simon and Schuster, New York, NY

<a href="mailto:omnore;">MikeFlynn55</a>
<a href="mailto:mathleadership.org">mathleadership.org</a>
<a href="mailto:mailto:mildo:norg">mflynn@mtholyoke.edu</a>

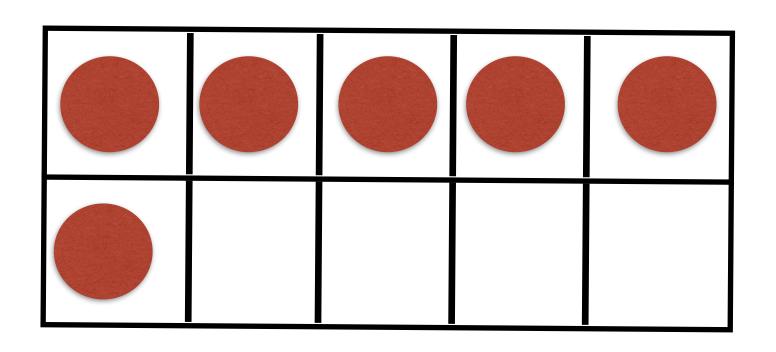
# Ten Frames

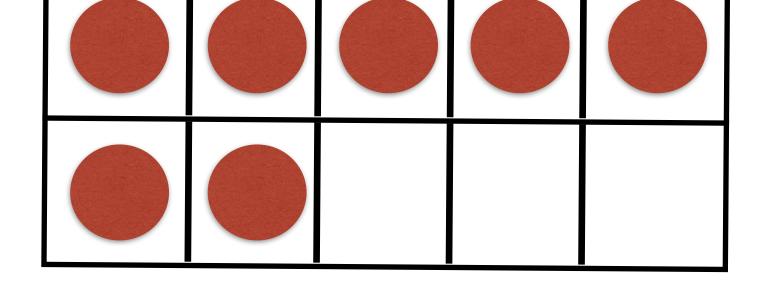


3

70

# Ten Frames





6

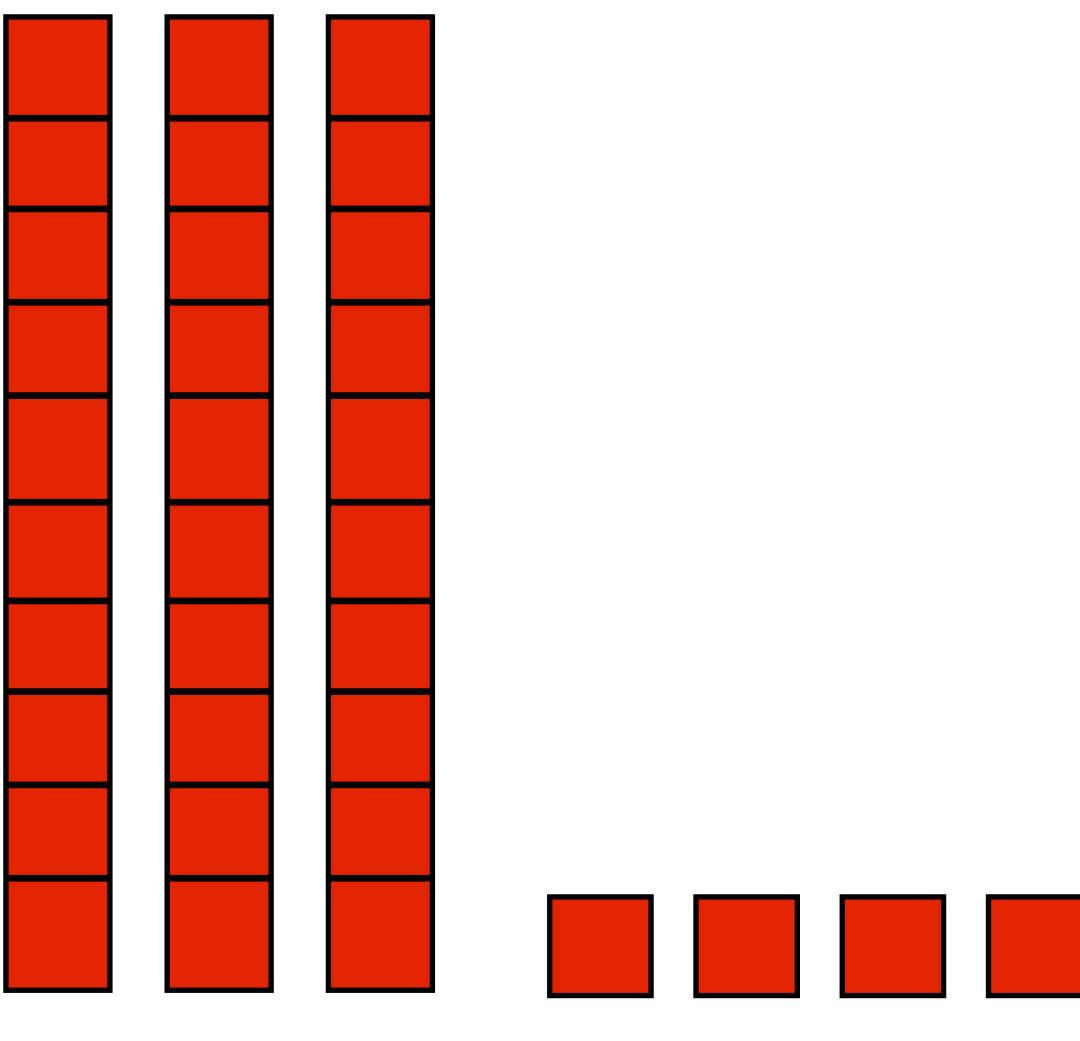
# Base Ten Blocks

Tens Ones

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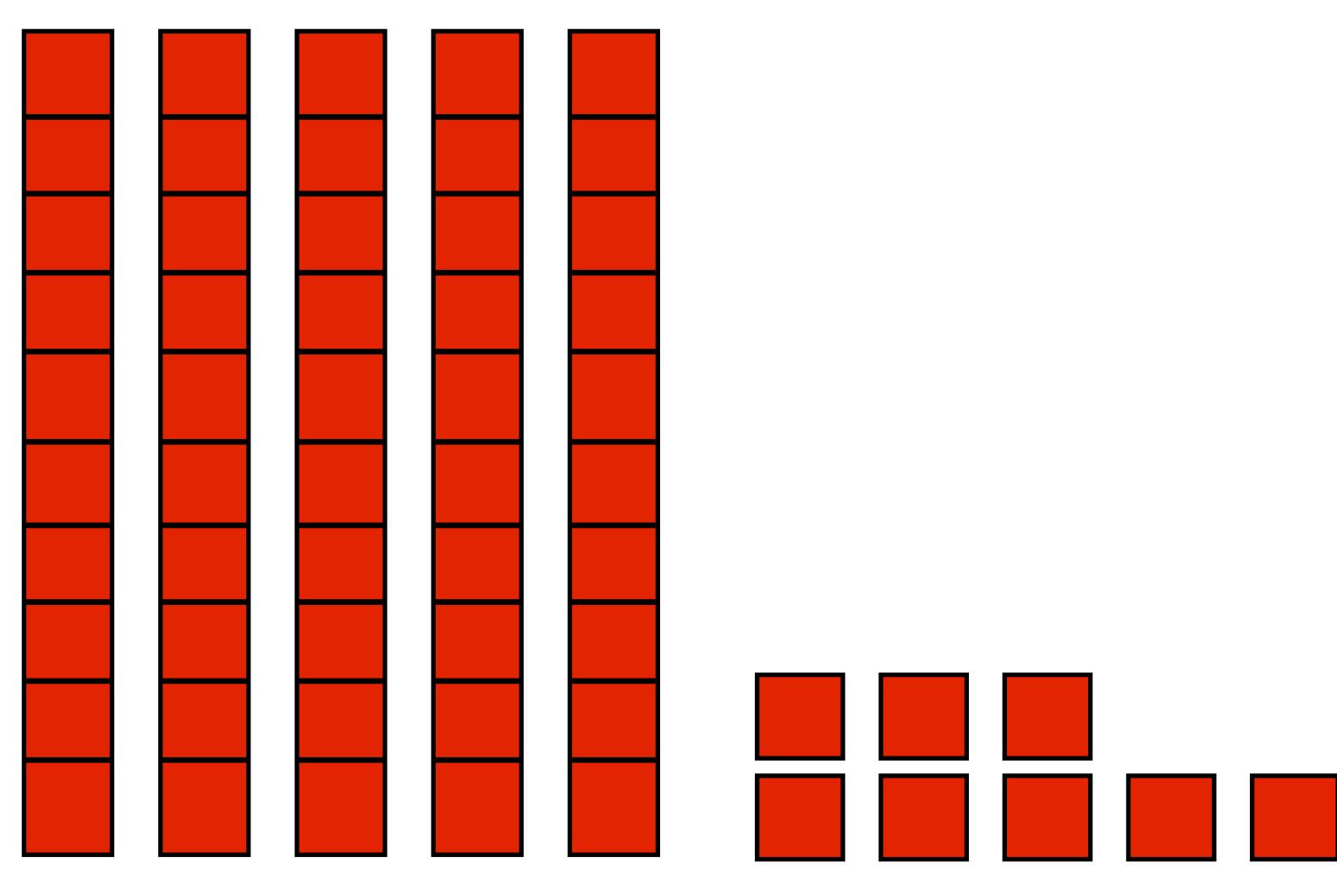
## 34



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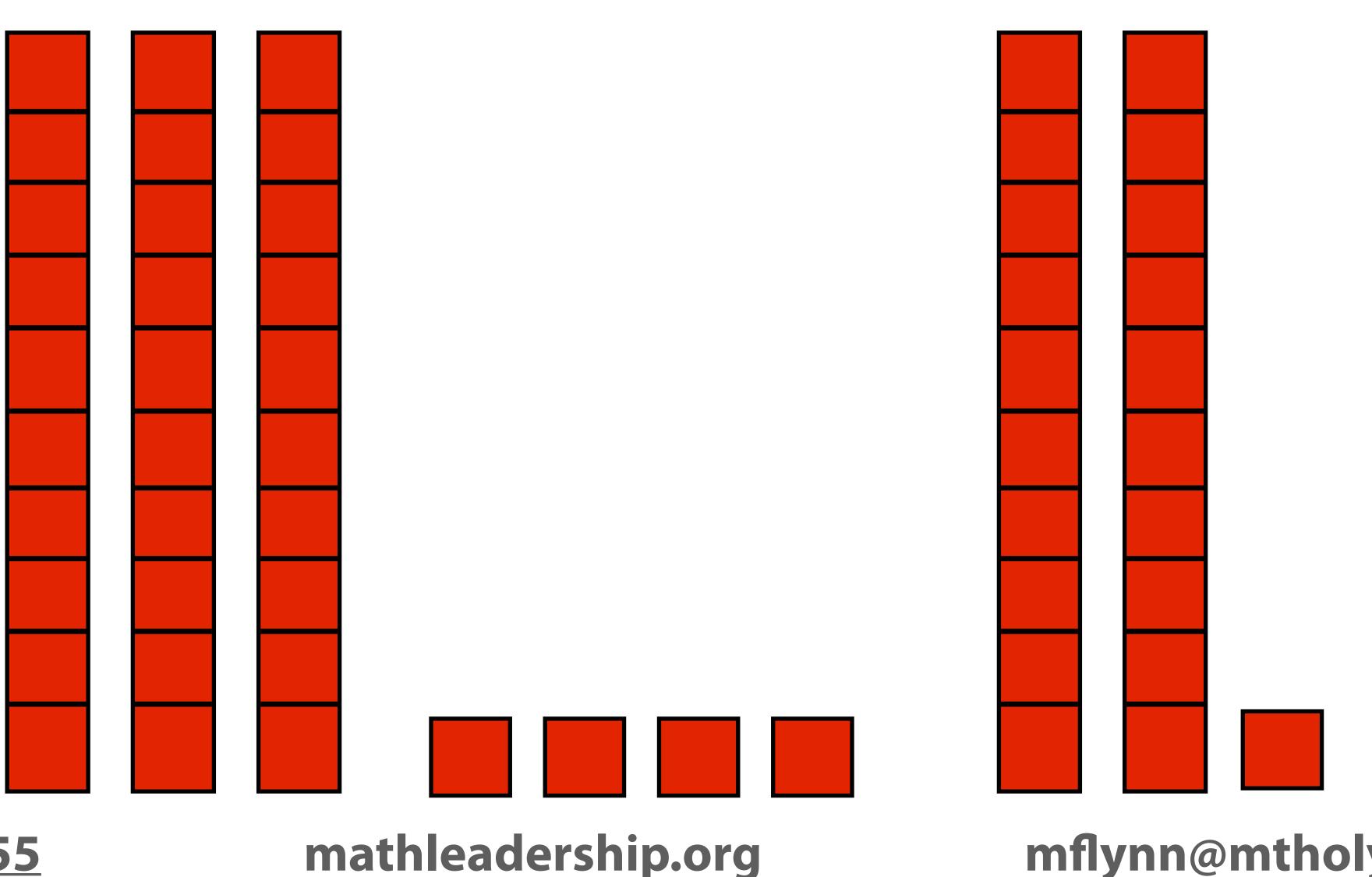
### 58



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# 34+21

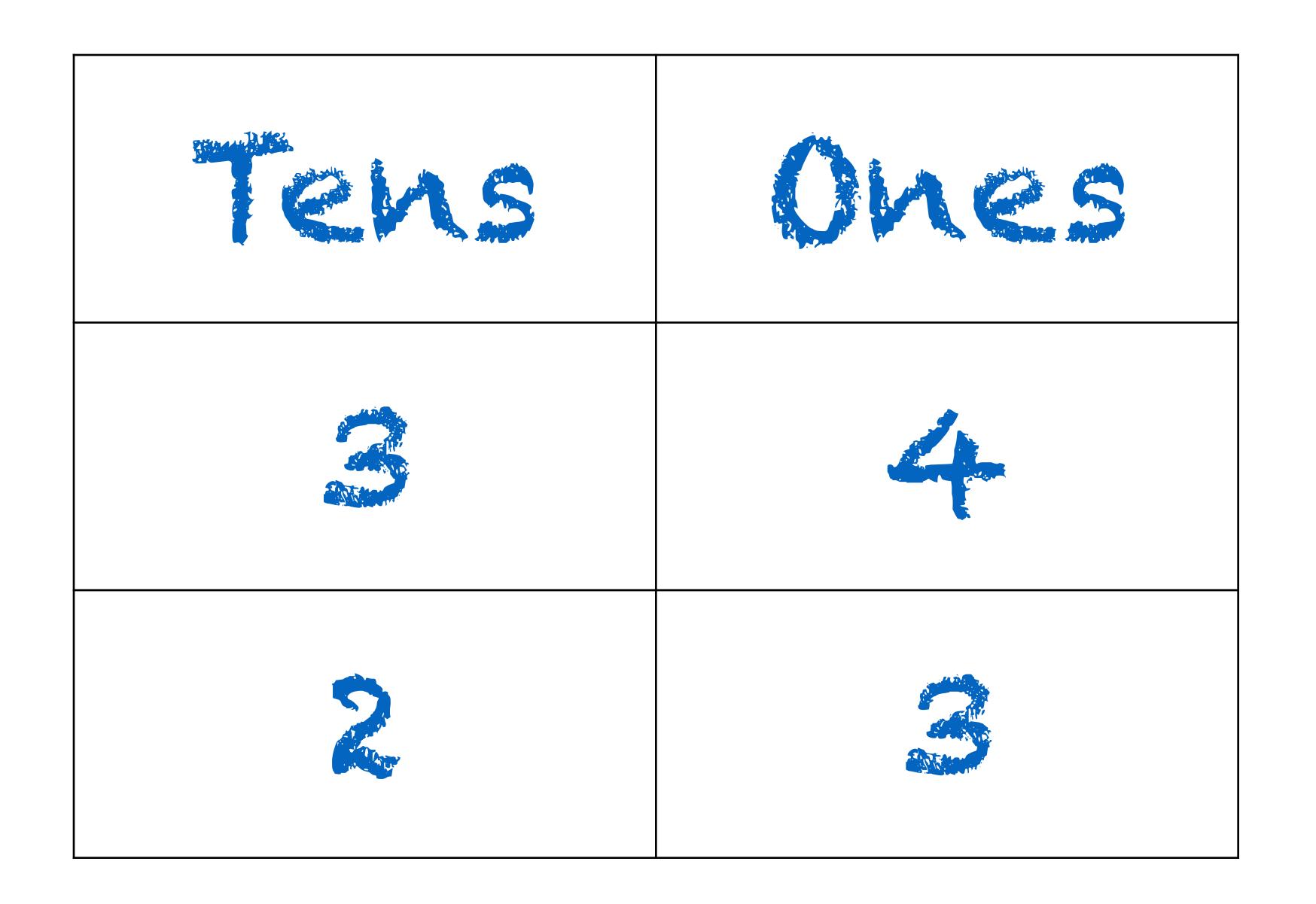


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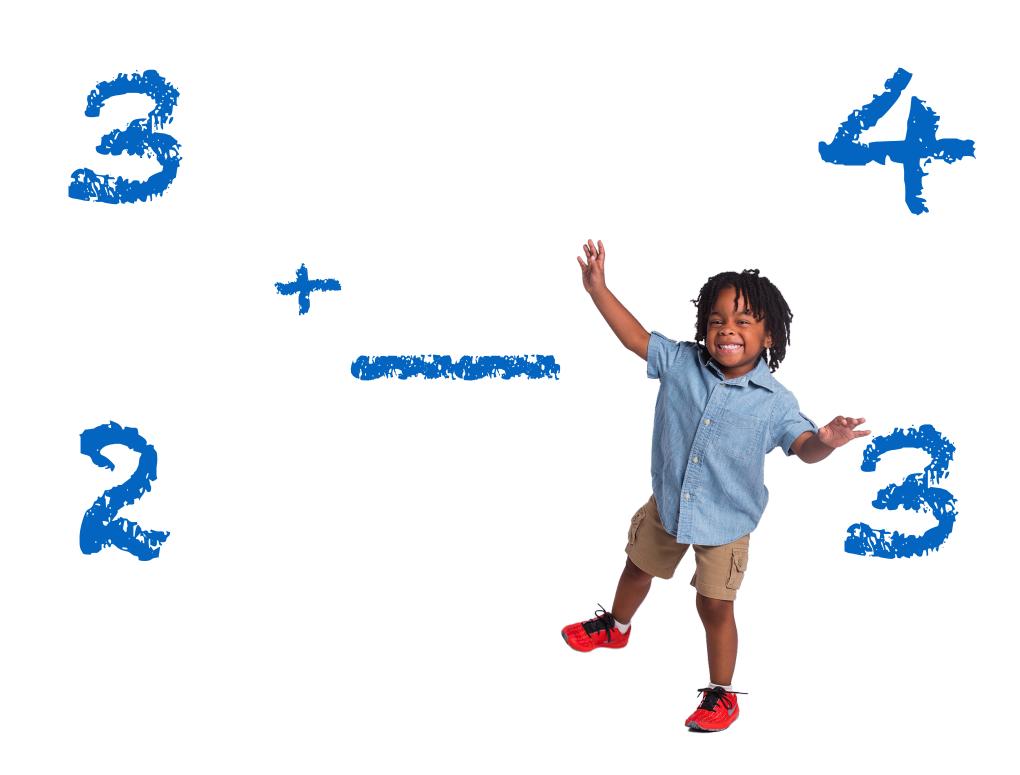
$$\begin{vmatrix}
30 + 20 &= 50 \\
4 + 3 &= 7 \\
50 + 7 &= 57 \\
30 + 4 & 20 + 3
\end{vmatrix}$$





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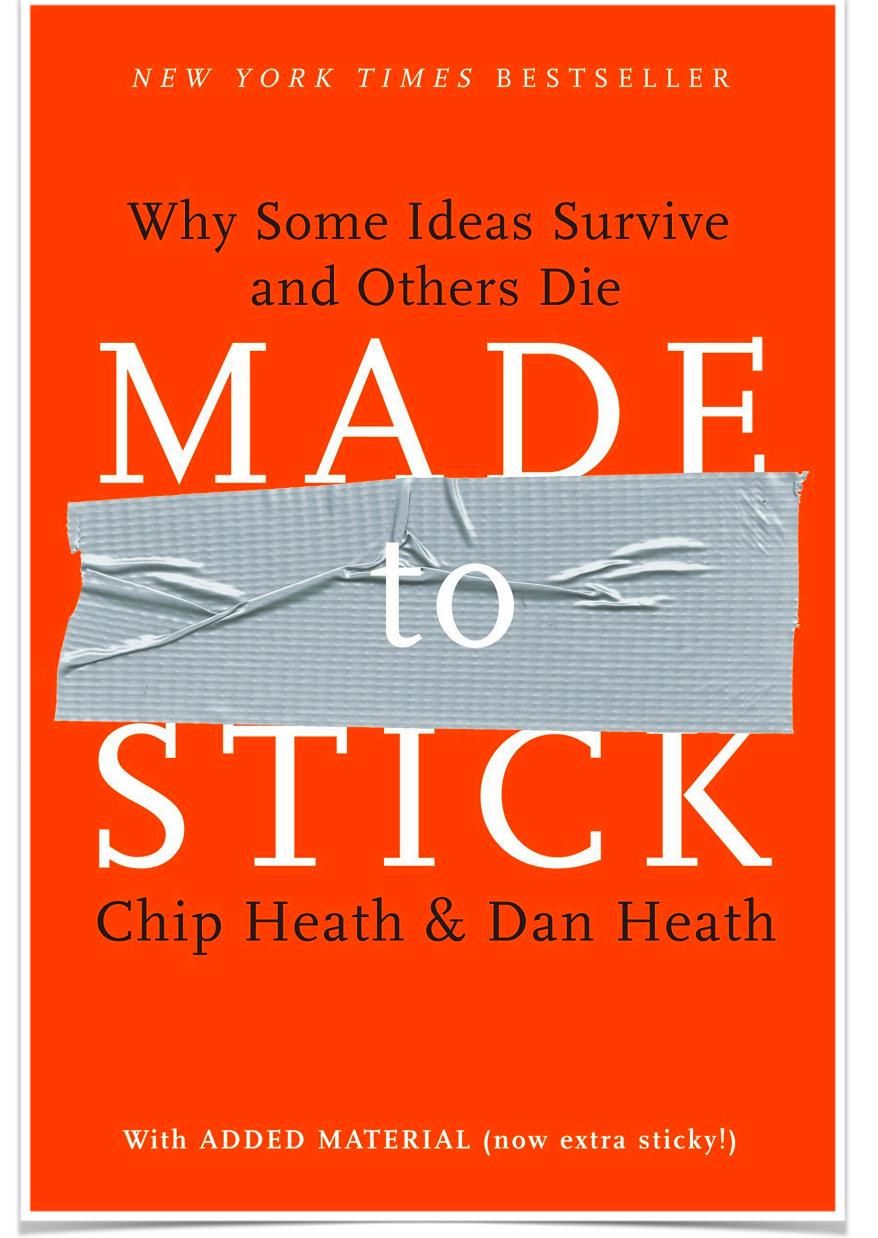
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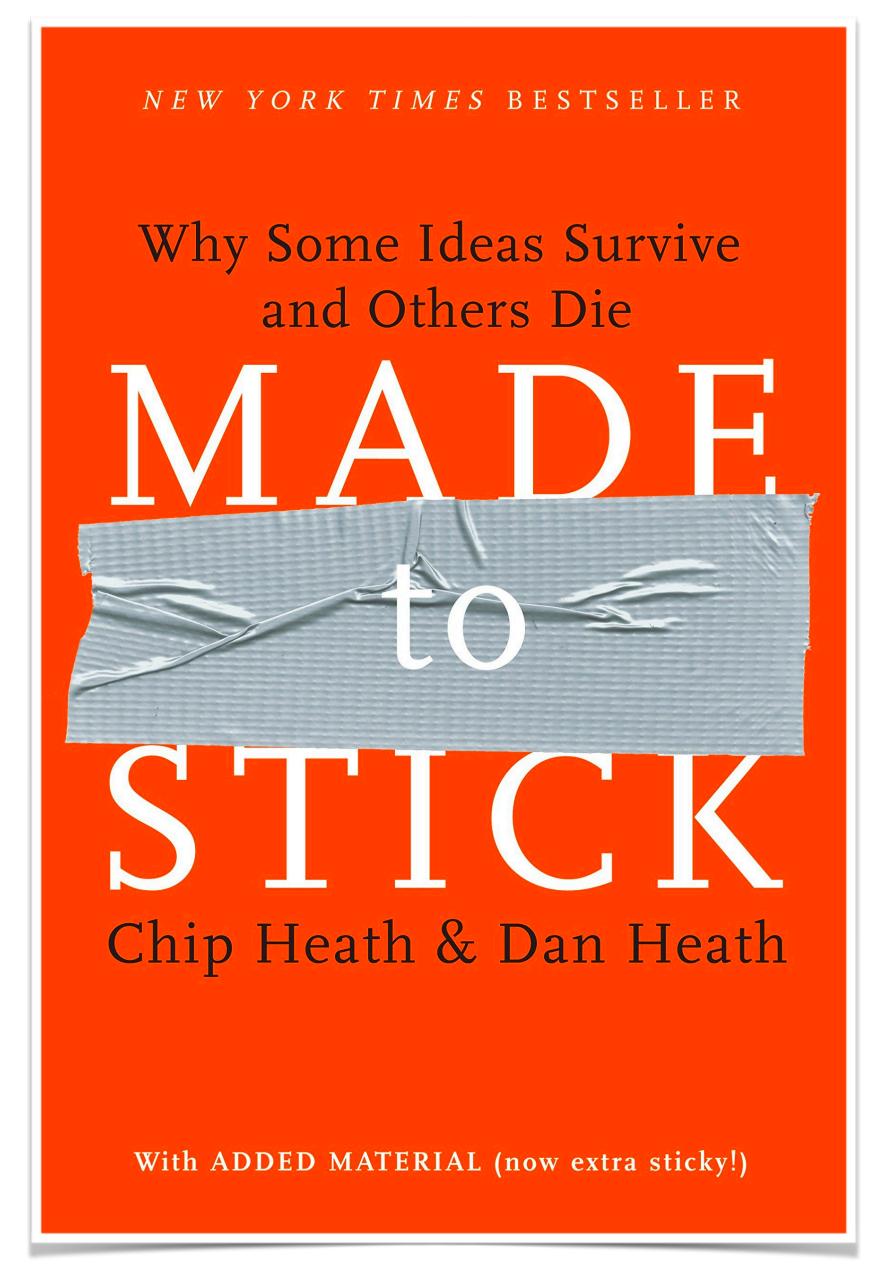
# Simple Unexpected Concrete Credible Emotional



Heath, C. & Heath, D. (2008) Made to Stick: Why Some Ideas Survive and Others Die. Simon and Schuster, New York, NY

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# Simple



#### Find the Core

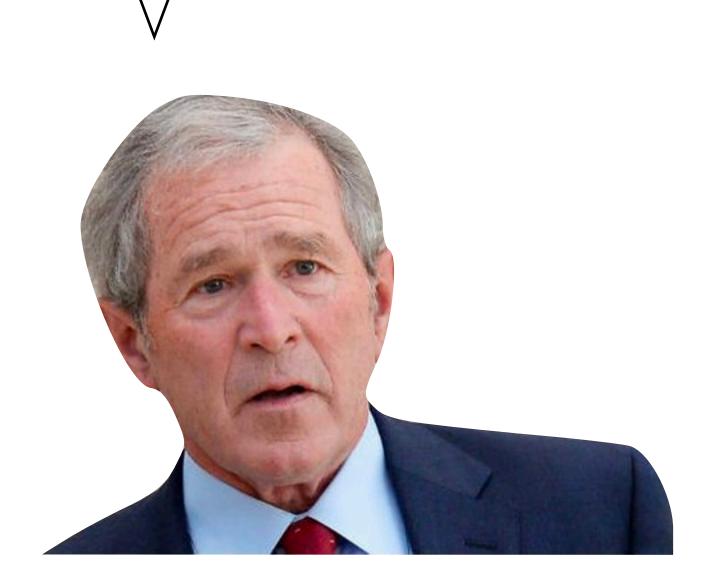
"To make a profound idea compact, one must pack a lot of meaning into a little bit of messaging."

### Bush Versus Kerry





"My administration has a job to do and we're going to do it. We will rid the world of evil-doers."



POSIT

Security (DISEC) committee Col Emerging Weapons Race of

Country: United States of America



e issue of new and emerging weapon technologies and the challenge of non-proliferation.

1.1 Synopsis

During 2017 the world woke up to a new kind of terrorism – cyber terrorism - one of the most destructive 'worms' - 'WannaCry' was launched - across 150 countries. Cyber risk modelling firm Cyence estimates the losses from hacks of this nature to be of 4 Billion \$!

Prominent figures in their open letter "Research Priorities for Robust and Beneficial Artificial Intelligence" warned about the potential pitfalls (that is it "... might threaten humanity") of Emerging Technology.

These provide warning signs of the threat that can be unleashed by the emerging technologies. The winner of the next war – if it happens – is the one who has technological might, not necessarily one who has the largest army! In this paper, I am going to bring out our country's position on Emerging Weapons and strategies for controlling the same.

#### 1.2 What are Emerging Weapon

Let us first see what are Emerging Weapons – a few major categories are given below:

- a. Cyber Attacks on utilities: New threat to a nation is by attacks on Power Grid (two attacks in 2017

   Ireland & USA). This destabilizes not only normal life but also cripple defence systems.
- b. Biological / Chemical Weapons: Though not new, today, ever more potent forms of biological organisms which can proliferate in any environments are being developed. One accidental release of Anthrax virus from Russian facility in 1979 killed 66 people.
- c. Autonomous Weapons: Also called Killer Robots, they are weapons that do not need human intervention to work except to start. The best examples for this is the Harop a fully autonomous drone developed by Israel. These are also called Lethal Autonomous Weapons (LAW).

#### These are only a few types of weapons, but have already demonstrated their deadly poten

1.3 The Potential Impact of these Emerging Weapons

One of the major terrorist attacks in the world (9/11) needed terrorists to hijack flights physically to cause destruction. Today, you may cause such damage remotely just hacking into infrastructure like Power Gric or a Dam.

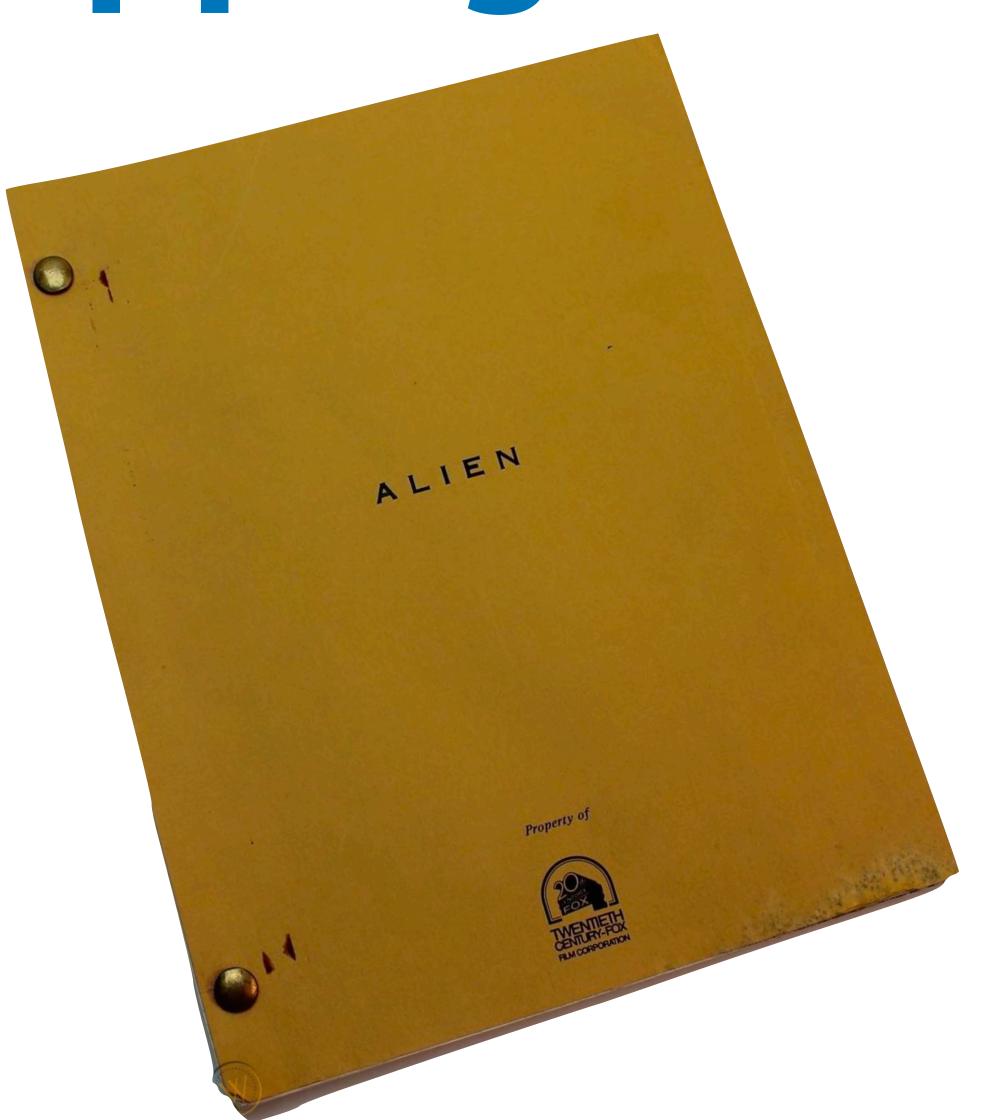
Today, most businesses and public infrastructure are managed by computers, a simple hack is enough to throw life out of order. A cyber-attack that can hack into banks, ATMs or other resources would cause internal strife within a country, incapacitating it, leaving it open for other countries to attack.

 $Autonomous\ we apons\ run\ by\ operators,\ lift\ the\ burden\ of\ the\ operator\ of\ being\ responsible\ for\ the\ deaths\ caused\ by\ the\ LAW.$ 

Page#1



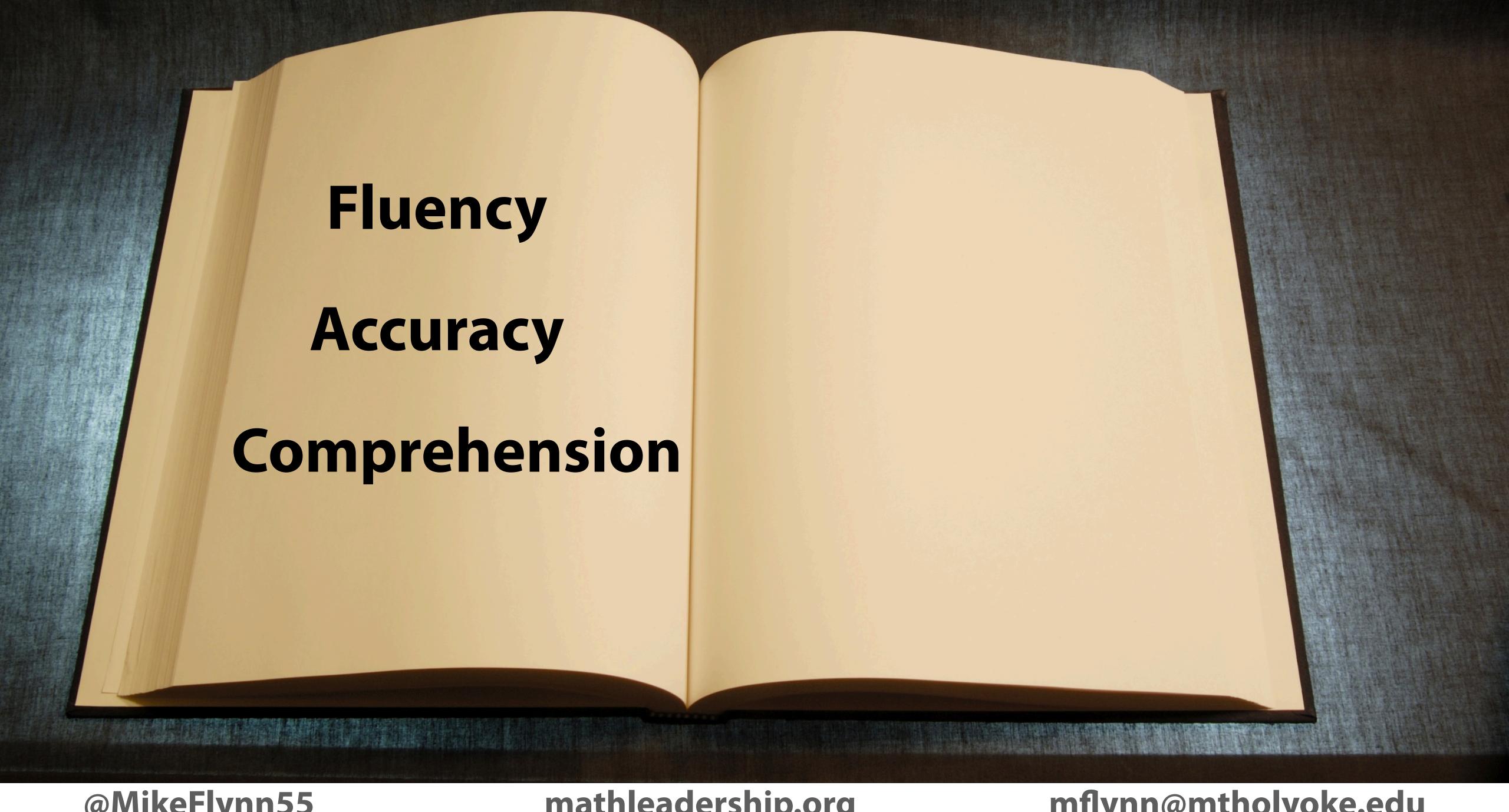
Tapping Into Schemas

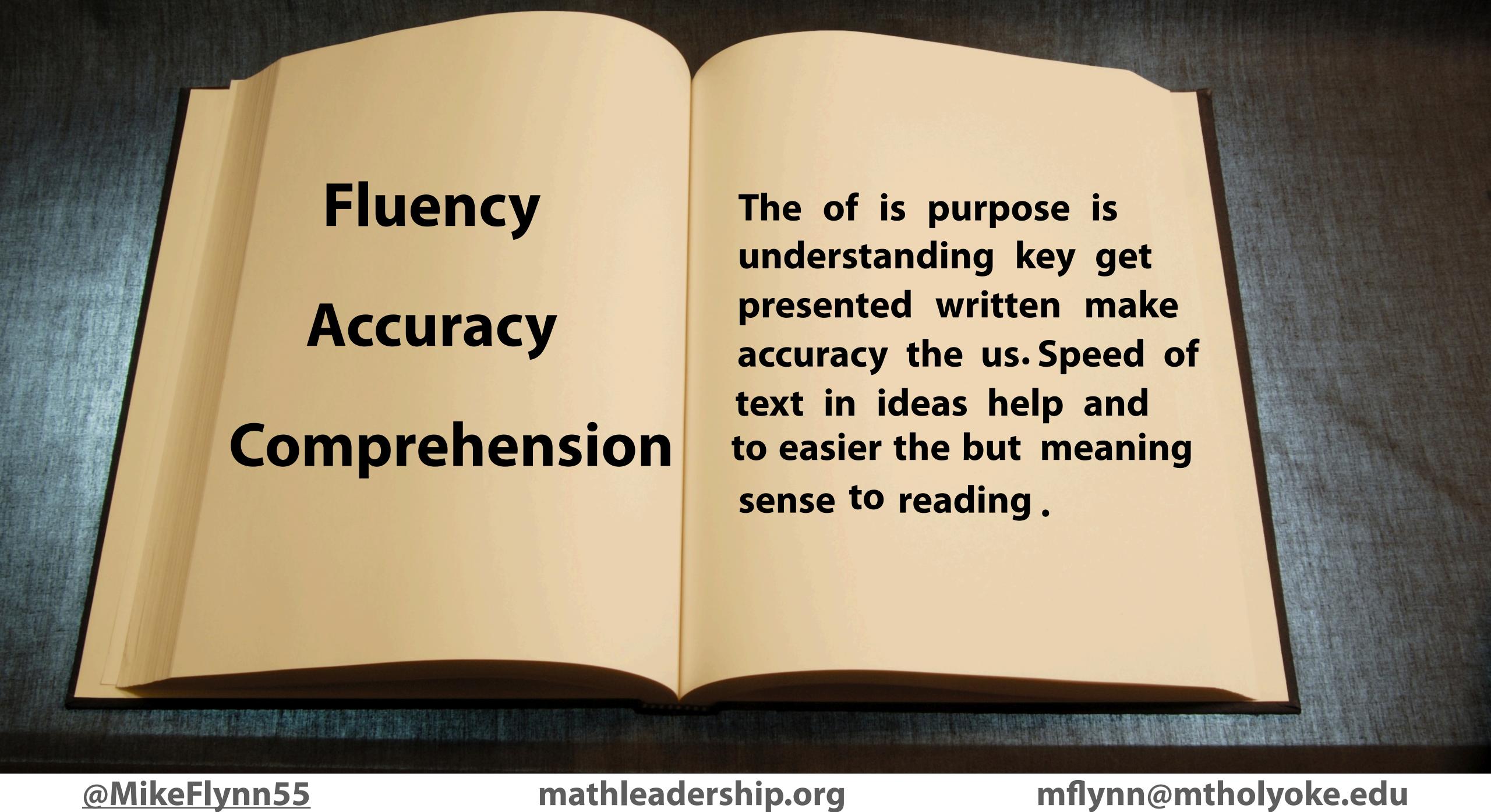


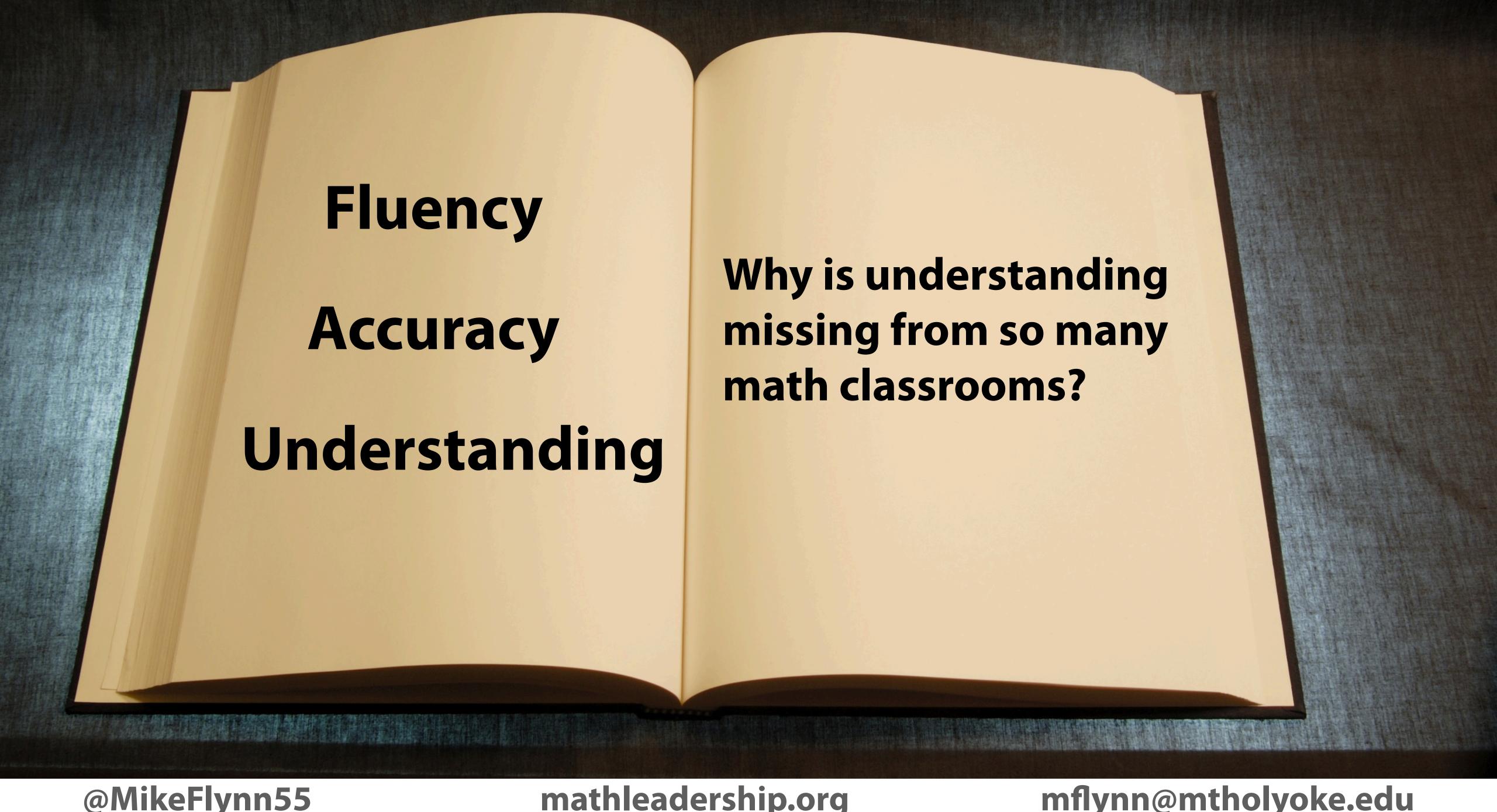
"It's like Jaws on a spaceship."

### Concepts Versus Facts

# JFK EXF









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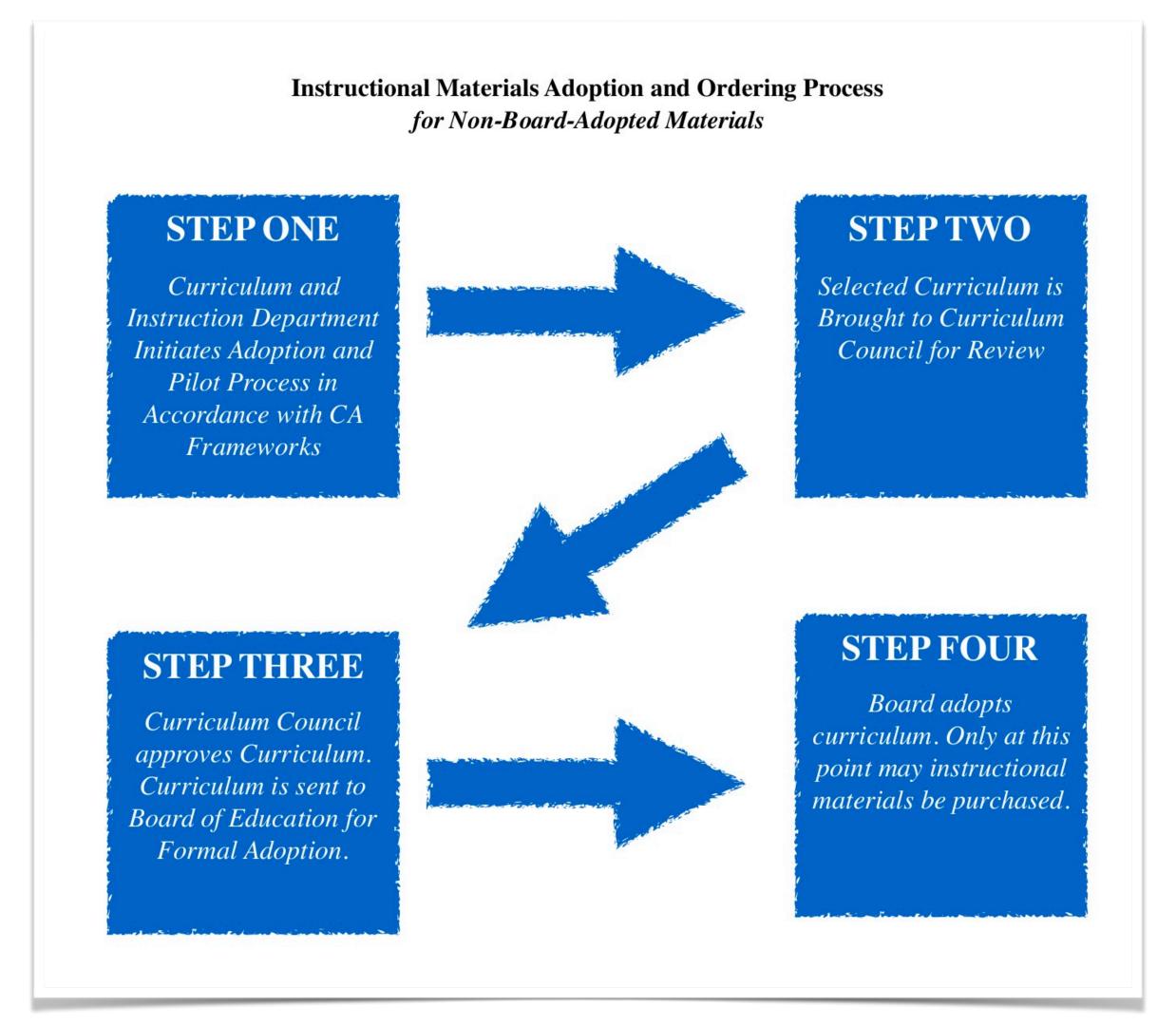
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## Curriculum Adoption





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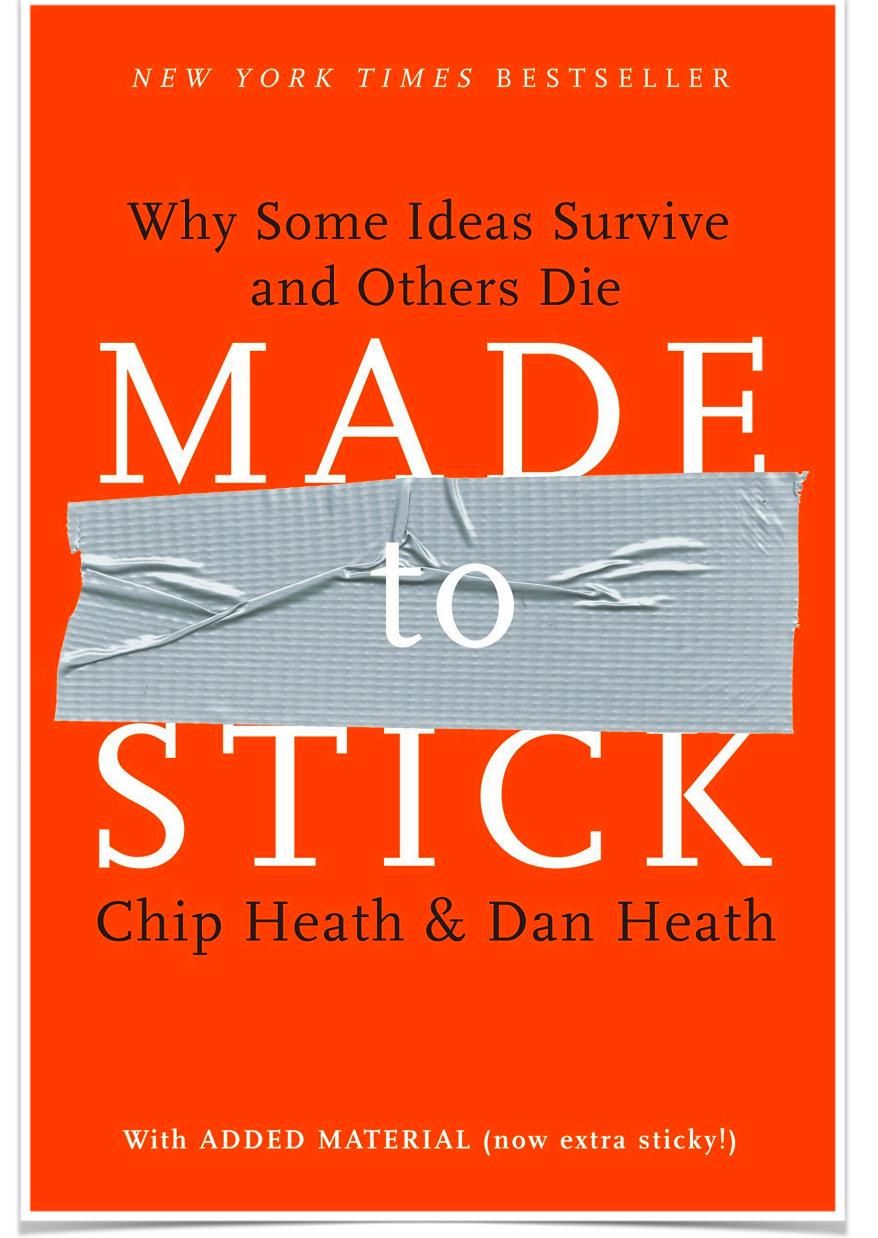
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Expecting better results from only buying a new textbook is like expecting better furniture by getting the carpenter a new saw.

You have to invest in developing people's craft if you want to change the results.

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### Gap Theory



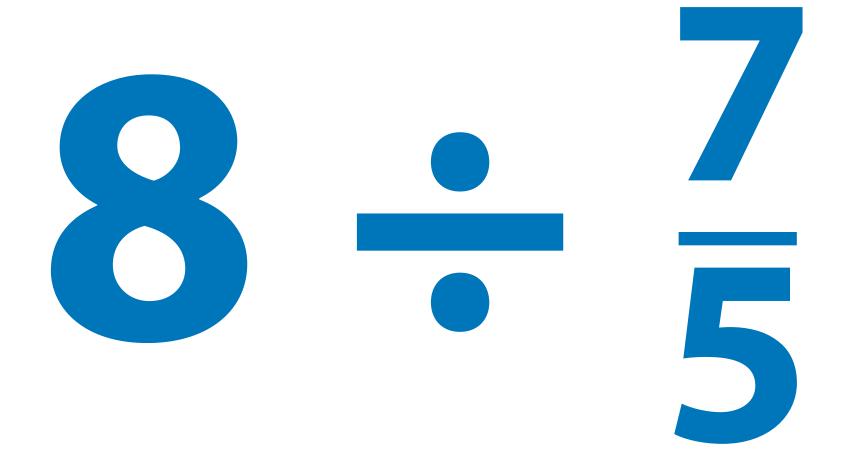




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## Homer's Cakes

Draw a diagram to model this situation.

Solve the problem arithmetically.

How does your arithmetic sentence match your diagram?

Adapted from Russell, S.J., Schifter, D., & Bastable, V. (2017) Making Meaning for Operations in the Domains of Whole Numbers and Fractions

## Homer's Cakes



Homer really likes cakes. He decides that one serving should be  $\frac{3}{5}$  of a cake. He has 4 cakes, all the same size. How many servings does he have?

Adapted from Russell, S.J., Schifter, D., & Bastable, V. (2017) Making Meaning for Operations in the Domains of Whole Numbers and Fractions

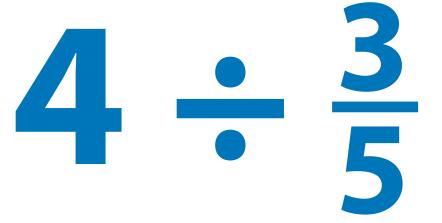
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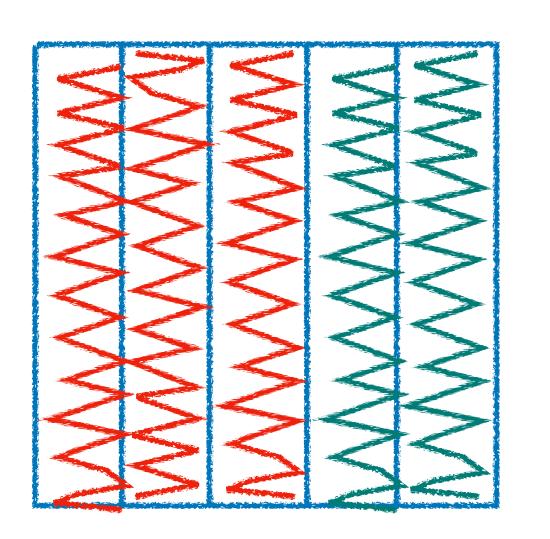
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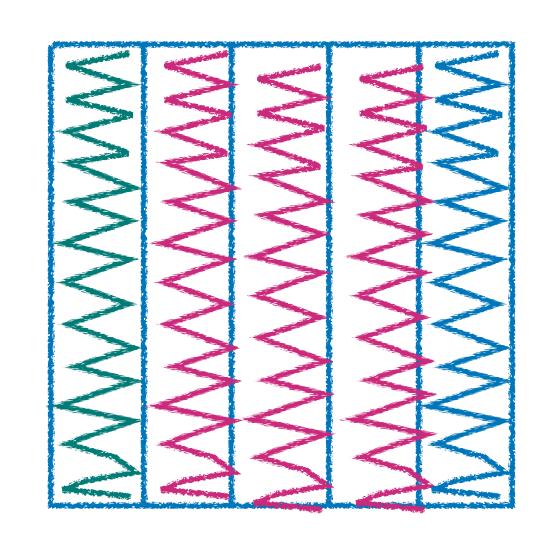
Solve the problem arithmetically.

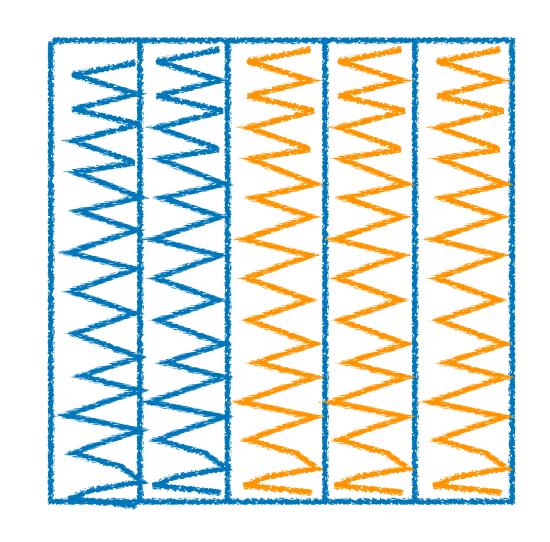
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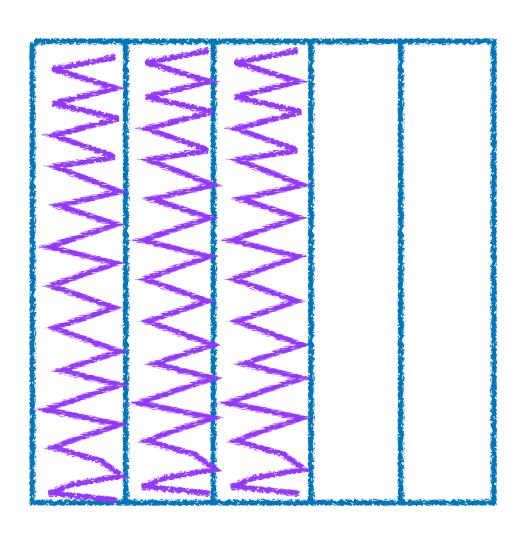
Adapted from Russell, S.J., Schifter, D., & Bastable, V. (2017) Making Meaning for Operations in the Domains of Whole Numbers and Fractions











4 x \frac{5}{3}

## Simple Unexpected Concrete Credible Emotional



# It's your turn!

#### **NCTM Position**

Procedural fluency is a critical component of mathematical proficiency. Procedural fluency is the ability to apply procedures accurately, efficiently, and flexibly; to transfer procedures to different problems and contexts; to build or modify procedures from other procedures; and to recognize when one strategy or procedure is more appropriate to apply than another. To develop procedural fluency, students need experience in integrating concepts and procedures and building on familiar procedures as they create their own informal strategies and procedures. Students need opportunities to justify both informal strategies and commonly used procedures mathematically, to support and justify their choices of appropriate procedures, and to strengthen their understanding and skill through distributed practice.

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#### **Teacher-Proof Textbooks**

#### Student-Centered Learning



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#### Listened

Gained perspective

Set a positive frame

Disrupted belief systems

Implemented SUCCESS

Created a room of allies

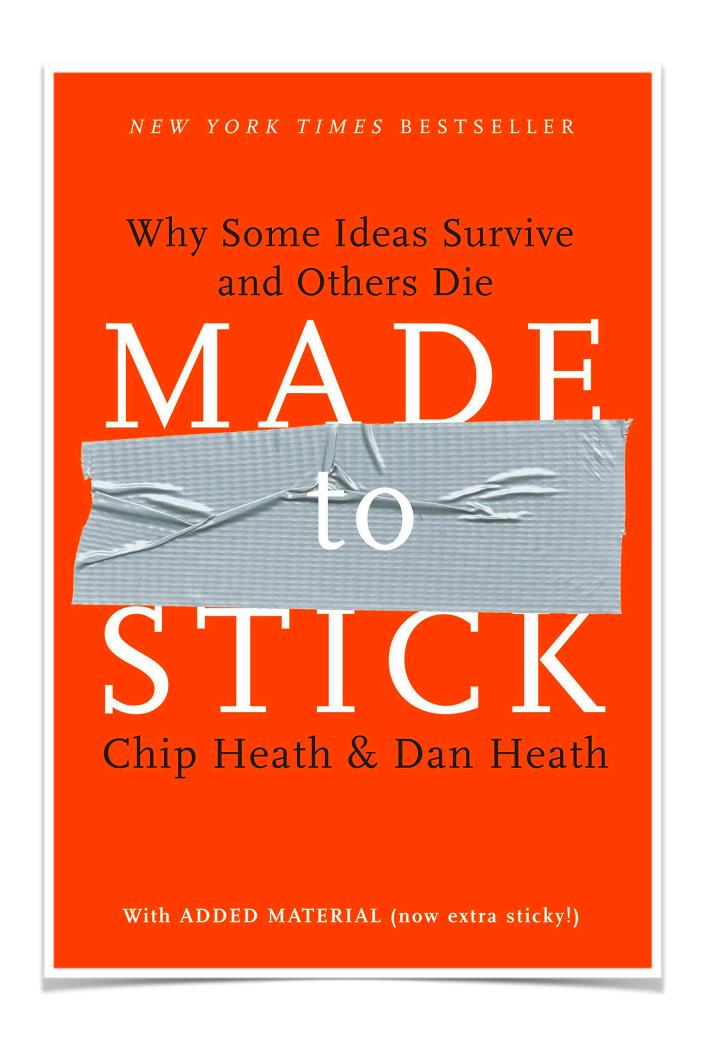




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### Simple Unexpected Concrete Credible Emotional Stories





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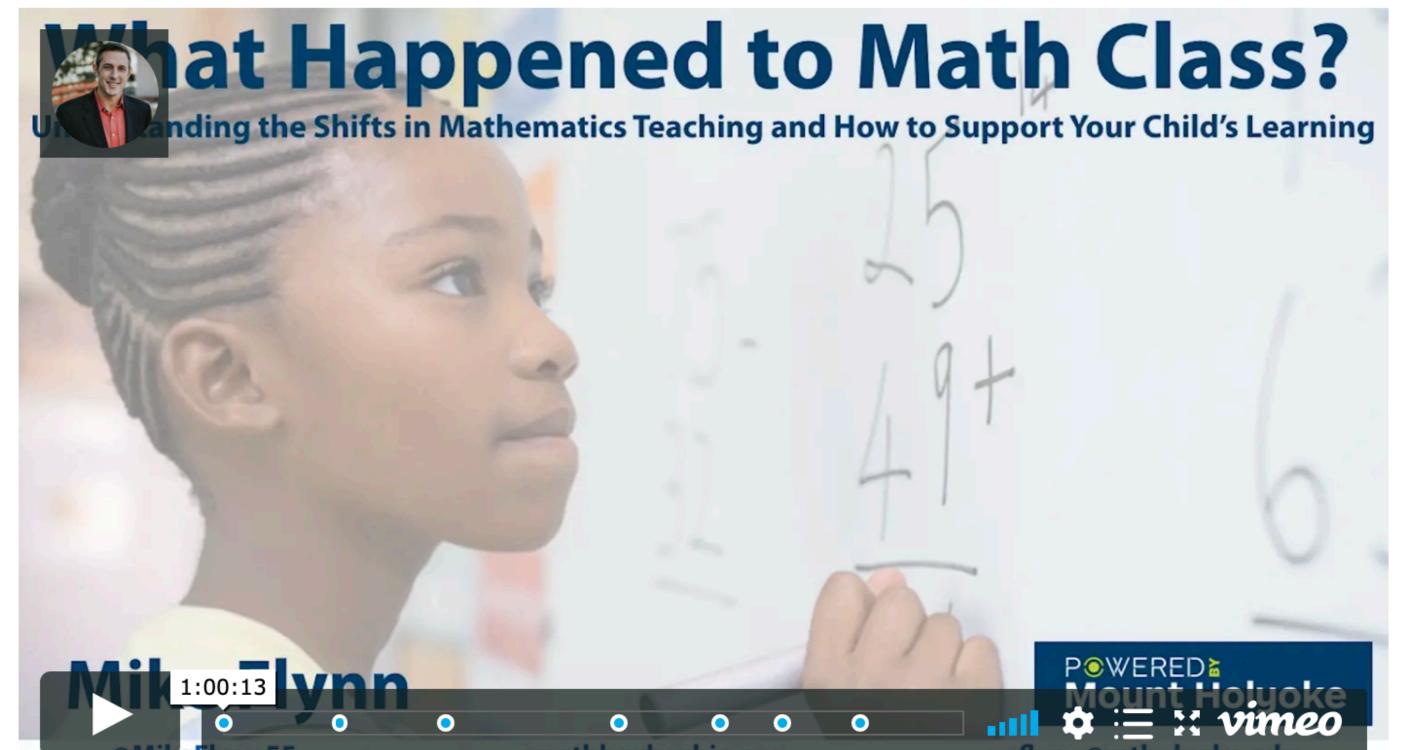
**WMMP** 

**Effective Practices** 

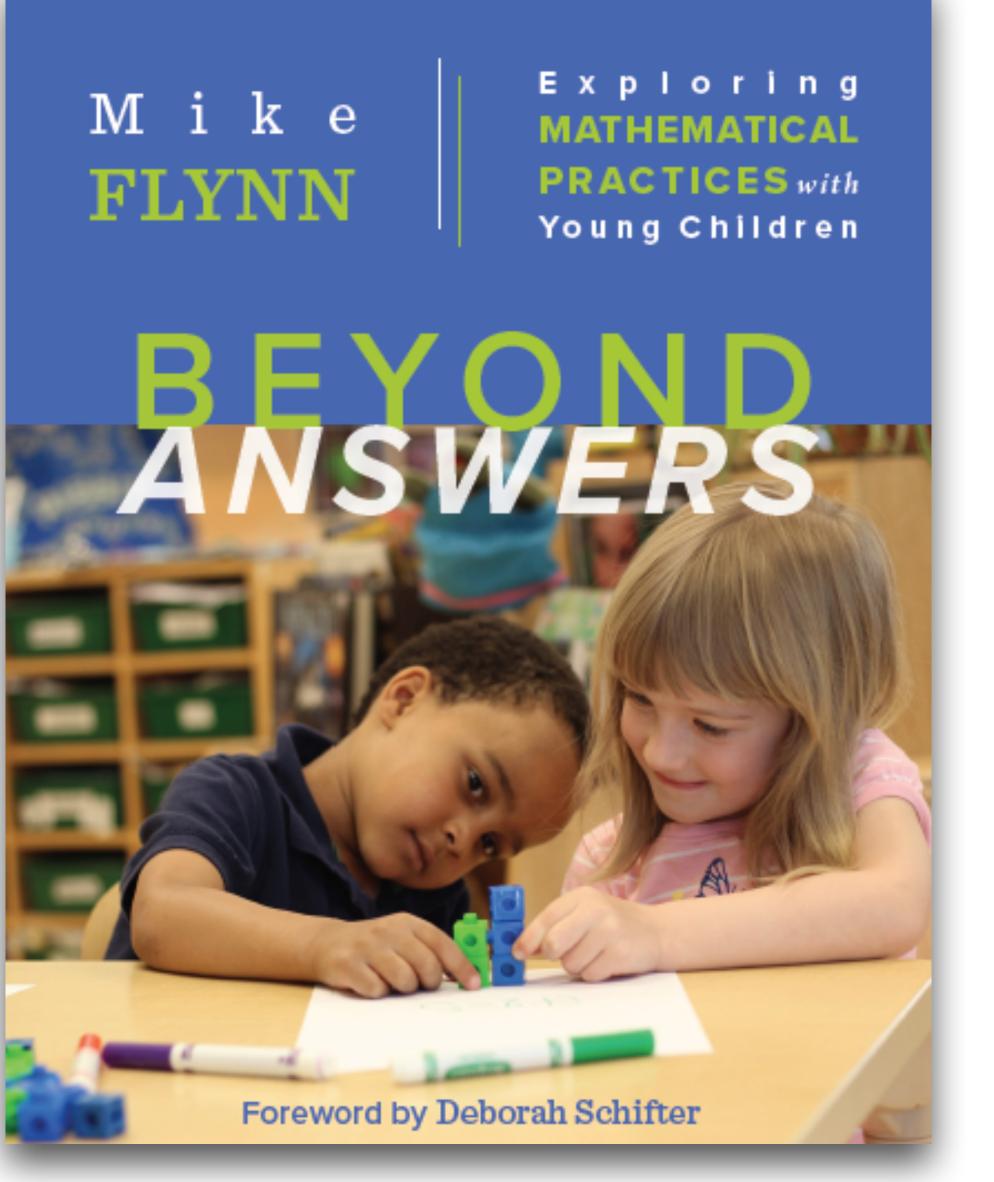
**About** 

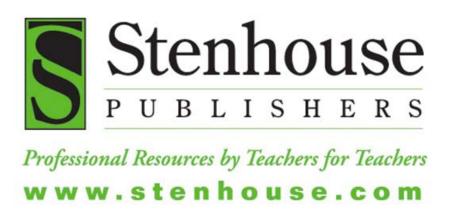
#### What Happened to Math Class?

Understanding the Shifts in Mathematics Teaching and How to Support Your Child's Learning









#### Mike Flynn Mount Holyoke College



Text allies to 44222 to get the slides and resources from this session

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The PDF version of these slides are shared to support your learning from the session. Please do not use them to give your own version of my presentation.

This presentation was the result of a yearlong project and I give this presentation in districts throughout the county. If you would like me to come to your district to share this work, please contact me at <a href="mailto:mff">mff</a>ynn@mtholyoke.edu

Thank you so much for your support.

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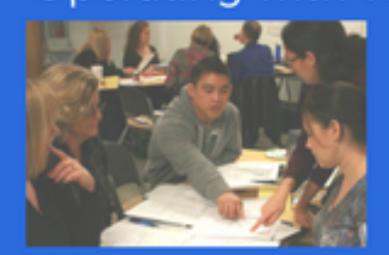
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Dive into a deep conceptual exploration of the four basic operations and consider how students progress in their understanding of them from kindergarten through 8th grade. We will then examine the four operations in the context of fractions.

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