



## The **Reality** of Making Math FUN.

Presented by:  
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NSPDK Regional Conference  
April 21, 2017  
[www.madaboutscience.org](http://www.madaboutscience.org)

○ There is no single method that will suit most of your students most of the time.

There is though, a way of looking at engagement that allows you to imagine how you want the students to interact with it.

This PD is to teach you how to find the *process that works best for your teaching style and your students.*



# Working Memory. How is it important to Learning?

## Exercise 1:

Stare at the number for 7 seconds, then look away and write it down.

9217503

# Working Memory. How is it important to Learning?

## Exercise 2:

Stare at the number for 7 seconds, then look away and write it down.

4915082637



# 3-ACTS

## ACT 1

What will come out of the other side?

## ACT 2

SEE HANDOUT

## ACT 3

THE ANSWER

## 3 Act Lesson

- Brainchild of Dan Meyer
- TED talk 2010
  - Act 1: Hook
    - Perplexing question
  - Act 2: Information
  - Act 3: Payoff





**WALK  
IN THEIR  
SHOES**



# BASIC FACTS

Why a fact table on a desk really doesn't help!



**Addition Table**

0	1	2	3	4	5
1	2	3	4	5	10
2	3	4	5	10	11
3	4	5	10	11	12
4	5	10	11	12	13
5	10	11	12	13	14

**Multiplication Table**

0	1	2	3	4	5
1	1	2	3	4	5
2	2	4	10	12	14
3	3	10	13	20	23
4	4	12	20	24	32
5	5	14	23	32	41

Problems:

1. 
$$\begin{array}{r} 11 \\ +11 \\ \hline \end{array}$$

2. 
$$\begin{array}{r} 21 \\ + 3 \\ \hline \end{array}$$

3. 
$$\begin{array}{r} 223 \\ +15 \\ \hline \end{array}$$

4. 
$$\begin{array}{r} 4522 \\ +2540 \\ \hline \end{array}$$

5. 
$$\begin{array}{r} 5230 \\ +3423 \\ \hline \end{array}$$

6. 
$$\begin{array}{r} 3 \\ \times 2 \\ \hline \end{array}$$

7. 
$$\begin{array}{r} 12 \\ \times 5 \\ \hline \end{array}$$

8. 
$$\begin{array}{r} 24 \\ \times 13 \\ \hline \end{array}$$

Addition Table

0	1	2	3	4	5
1	2	3	4	5	10
2	3	4	5	10	11
3	4	5	10	11	12
4	5	10	11	12	13
5	10	11	12	13	14

Multiplication Table

0	1	2	3	4	5
1	1	2	3	4	5
2	2	4	10	12	14
3	3	10	13	20	23
4	4	12	20	24	32
5	5	14	23	32	41

Answers:

$$\begin{array}{r} 1. \quad 11 \\ + 11 \\ \hline 22 \end{array}$$

$$\begin{array}{r} 2. \quad 21 \\ + 3 \\ \hline 24 \end{array}$$

$$\begin{array}{r} 3. \quad 223 \\ + 15 \\ \hline 242 \end{array}$$

$$\begin{array}{r} 4. \quad 4522 \\ + 2540 \\ \hline 11502 \end{array}$$

$$\begin{array}{r} 5. \quad 5230 \\ + 3423 \\ \hline 13053 \end{array}$$

$$\begin{array}{r} 6. \quad 3 \\ \times 2 \\ \hline 10 \end{array}$$

$$\begin{array}{r} 7. \quad 12 \\ \times 5 \\ \hline 104 \end{array}$$

$$\begin{array}{r} 8. \quad 24 \\ \times 13 \\ \hline 400 \end{array}$$



# Multi-Step Problems

Teaching with the Brain in Mind!

## Sequence Activity: Multistep Problems

Follow all four instructions below to solve **each** of the three problems. Enter your answer into the space provided.

1. Multiply the third number in the first row by the seventh number in the third row.
2. Add this result to the fifth number in the second row.
3. Add to this total ten times the fourth number in the third row.
4. Subtract the eighth number in the first row from the result.

# Multi-Step Problems

Problem 1: 6 5 8 7 4 5 6 8 4  
3 2 1 9 5 6 4 2 1  
6 5 1 5 1 3 2 3 5

Answer:

Problem 2: 7 5 4 9 9 5 4 4 1  
2 5 1 4 8 9 6 6 8  
5 7 5 7 5 7 6 8 2

Answer:

Problem 3: 1 2 3 7 6 5 4 3 2  
8 4 3 2 1 6 5 4 8  
6 5 5 8 1 7 5 12 6

Answer:



5:00

# Multi-Step Problems Solutions

## Question 1

Correct answer: **63.**

## Question 2

Correct answer: **98.**

## Question 3

No answer again? Why don't you go back and try again?

Problem 1: 6 5 8 7 4 5 6 8 4  
3 2 1 9 5 6 4 2 1  
6 5 1 5 1 3 2 3 5

Answer:

Problem 2: 7 5 4 9 9 5 4 4 1  
2 5 1 4 8 9 6 6 8  
5 7 5 7 5 7 6 8 2

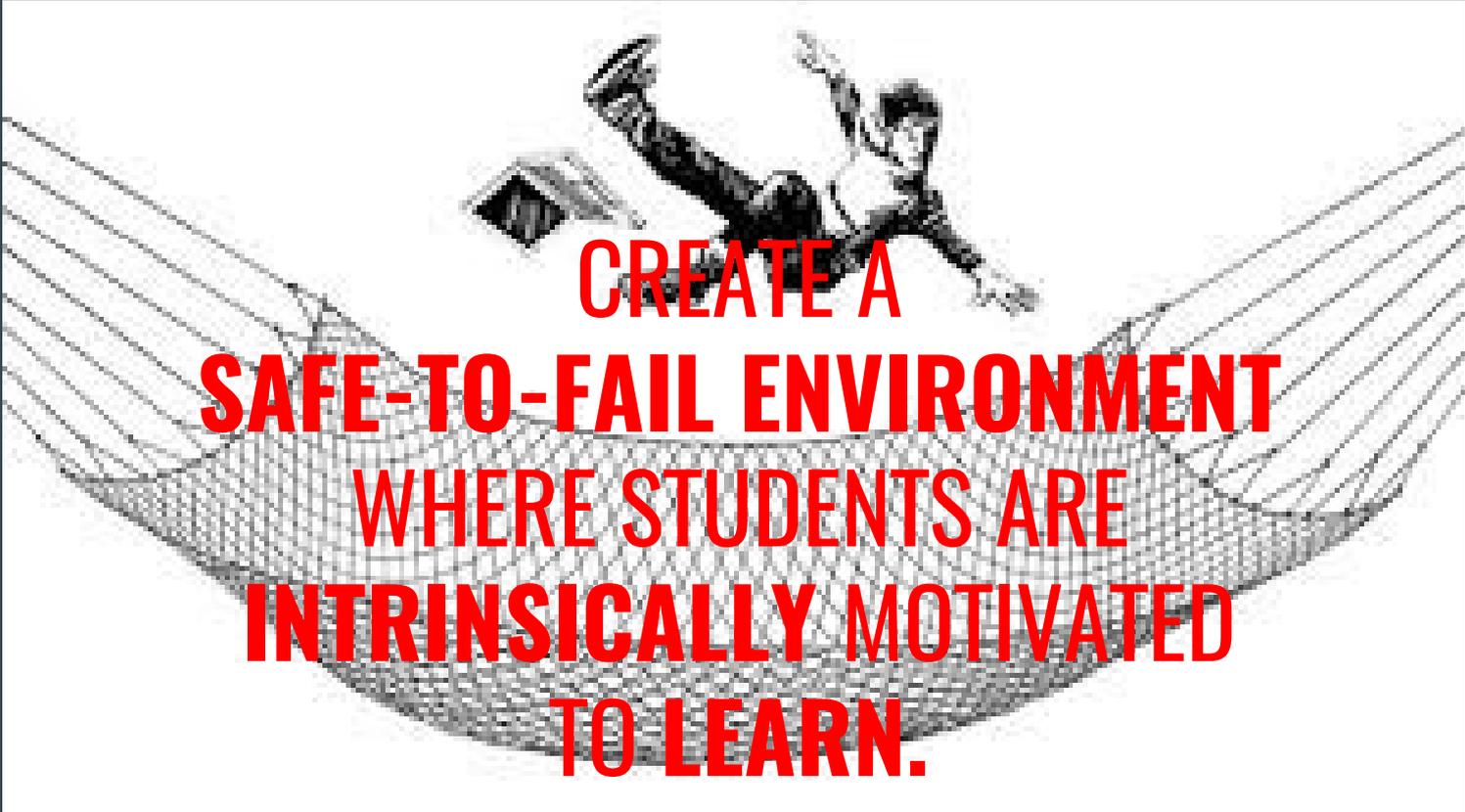
Answer:

Problem 3: 1 2 3 7 6 5 4 3 2  
8 4 3 2 1 6 5 4 8  
6 5 5 8 1 7 5 1 2 6

Answer:

- Nine-year-olds with math disabilities have, on average, a first-grade level of math knowledge.
- Seventeen-year-olds with math disabilities have, on average, a fifth-grade level of math knowledge.

- Experts estimate that for every two years of school, children with math disabilities acquire about one year of mathematical proficiency.
- Children with math disabilities often reach a learning plateau in seventh grade, and acquire only one year's worth of mathematical proficiency in grades seven through twelve.



**CREATE A  
SAFE-TO-FAIL ENVIRONMENT  
WHERE STUDENTS ARE  
INTRINSICALLY MOTIVATED  
TO LEARN.**

# RIDDLES



MYSTERY  
PHOTOS

CREATE A CAPTION FOR  
A PICTURE

FIND THE  
MISSING ITEM  
IN A PICTURE

THEME THE DAYS  
OF THE WEEKS  
FOR OPENERS



DAN MEYER

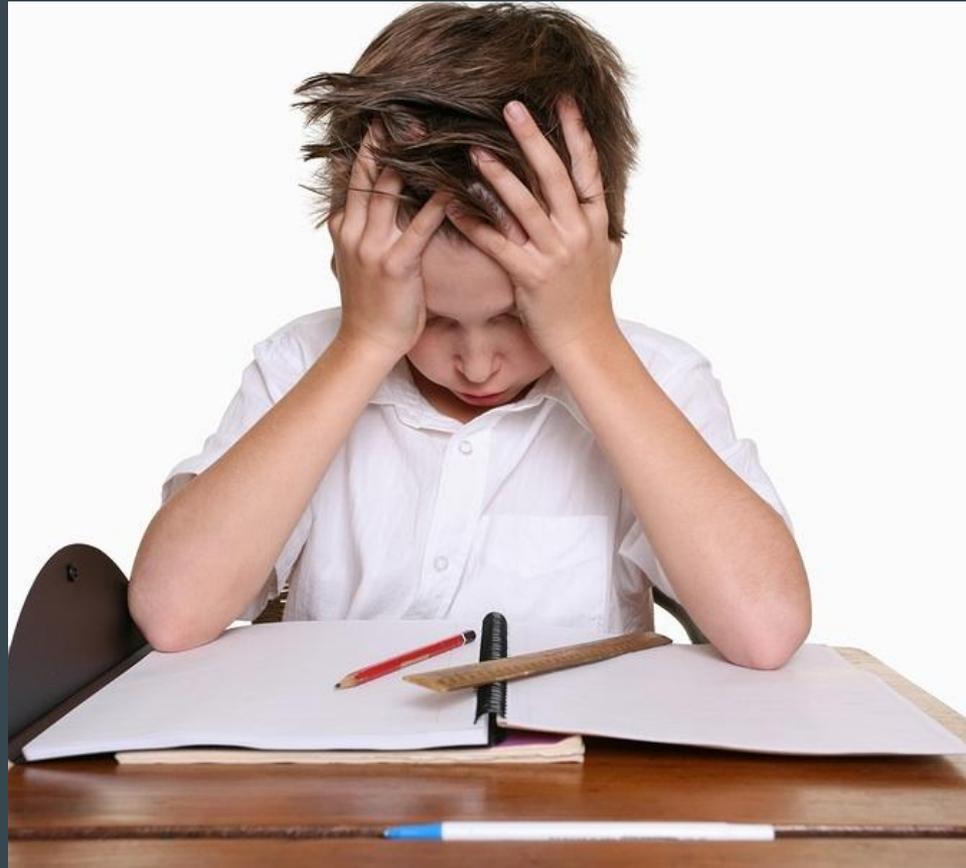
INNOVATIVE APPROACHES  
TO MATHEMATICAL  
THINKING AND  
ACTIVITIES!

Andrew Stadel

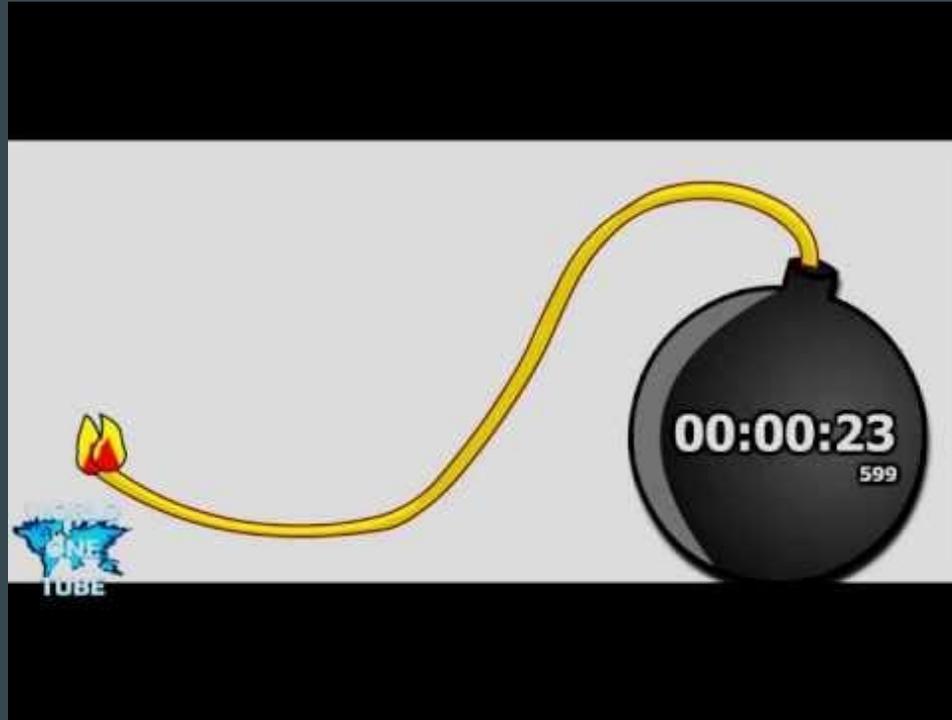
DR. ERIC MILOU

# 5 REASONS TO LEARN BASIC FACTS

1. Knowledge of simple facts is needed for proper use of calculators.
2. Ability to estimate implies mastery of single digit facts.
3. Students slow at facts are **less likely** to learn more complex math problem types.
4. Students must know multiplication quickly to be able to master fractions.
5. Algebra is **not open** to those who haven't mastered fractions.



# SPRINTS EXPERIENCE



# MATH SPRINTS QUOTE

“In every school we’ve ever worked, nearly all students enjoy sprints. They don’t see them as tests if the teacher doesn’t present them as tests. They see them as another fun game they can play against themselves (or against the teacher). Practice makes permanent their knowledge, and students love knowing they have knowledge. Knowledge is power.”

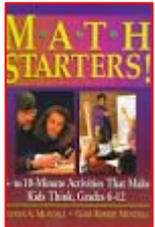
<http://www.mathwalk.org/>

# Classroom Activities!

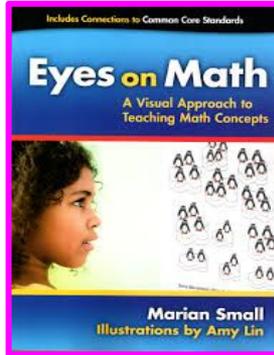
## Collaborative

Please sit in your LETTER GROUP (Vertical Groups)

	A	B	C	D	E
1	SS	CK	AE	BT	JA
2	DL	BG	JW	IC	NS
3	MD	CA	KS	RM	AH
4	RT	DJ	KM	JD	MJ

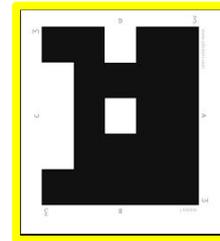


## Promote Discourse



Gallery Walk  
Wall Walk

## Interactive Activities..Get them excited and moving



# Organized Grouping of Students

Please sit in your LETTER GROUP (Vertical Groups)

	A	B	C	D	E
1	SS	CK	AE	BT	JA
2	DL	BG	JW	IC	NS
3	MD	CA	KS	RM	AH
4	RT	DJ	KM	JD	MJ

# Creating a Classroom of Mathematical Discourse



Three shelves of flowers are shown. The top shelf has two groups of flowers, one labeled \$2 and one labeled \$30. The middle shelf has two groups of flowers, one labeled \$7 and one labeled \$30. The bottom shelf has two groups of flowers, one labeled \$2 and one labeled \$30.



How are the three pictures represented on the graph? Why is the graph a line?

Includes Connections to Common Core Standards

## Eyes on Math

A Visual Approach to Teaching Math Concepts



Marian Small  
Illustrations by Amy Lin

### How many people could share 18 marbles fairly?



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FACTORS: WHAT THEY ARE • Grades 3–5 • CCSS 4.OA

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# FACEing MATH



Lesson 1  
Factors



Lesson 2  
Factors



Lesson 3  
Word Problems

## How It Works

Each student receives a 2-sided worksheet and a blank face template.

- 1
- 2
- 3



Worksheet

Face template

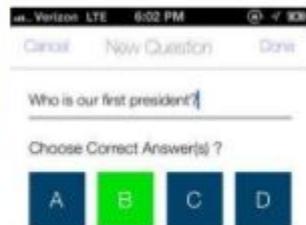


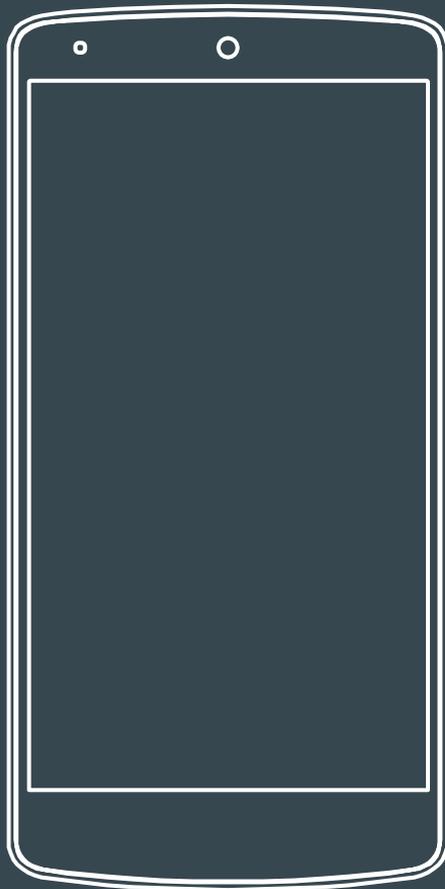
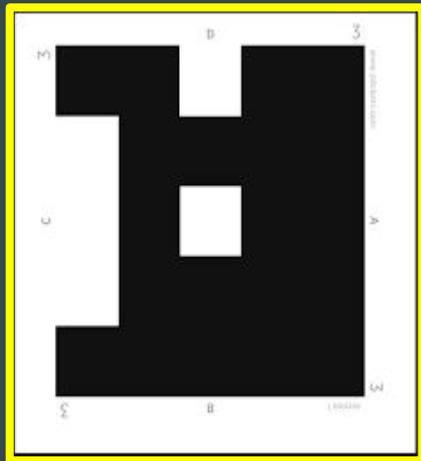
# plickers

What is it?



Plickers is a classroom response app that teachers can use very easily without having devices for each student.





### Why Plickers?

1. Works offline
2. Privacy for student responses
3. Free app that can be downloaded from the App Store and Google Play
4. Only teacher needs the app
5. Unique number assigned to each student
6. Can use it casually or set up a class if you want to use it for data.
7. Great for FA, Exit Ticket, Refresher
8. Can add photos with questions

Test your Knowledge! Go to Kahoot.it or Google Kahoot, then click on Kahoot!



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# Top Learning Strategies

(Haystead, M.W. & Marzano, R.J. 2009)

## Strategies That Most Impact Achievement

RANK	STRATEGY	PERCENTILE GAIN
1	Tracking Student Progress	34
2	Setting Goals and Objectives	25
3	Building Vocabulary	20
3	Identifying similarities and Differences	20
3	Interactive Games	20
5	Summarizing	19



3...2...1

# Resources

You can find them at

[www.madaboutscience.org](http://www.madaboutscience.org)

# RESOURCES

Click on the titles below:

[Anticipation Guide from The teacher toolkit](#)

[Eyes on Math](#)

[The Math Explorer](#)

[Math Starters](#)

[Math Games for Independent Practice Book](#)

[Math Games for Independent practice reproducibles](#)

- Be sure to visit our webpage at:

**[www.madaboutscience.org](http://www.madaboutscience.org)**