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KENTUCKY CENTER FOR MATHEMATICS

# Constructing Number Sense

# Fluency with Multiplication and Division

# Welcome!

Your host:

## Bonny Davenport

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Kentucky Center for Mathematics
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# Kentucky Center for Mathematics

- KCM seeks to advance the knowledge and practice of effective mathematics teaching and learning, encompassing early childhood through adult education.
- KCM provides and develops statewide leadership, facilitate professional learning experiences, and cultivate innovation with the aim of improving mathematics education, practice and policy.

## KCM Yearly Numbers

29 math courses taught

73 cohorts of teachers

Over 1000 KY teachers attending

Over 182 days of math professional learning

Over $150,000 of math materials directly in the hands of teachers

109 school districts

300 KY schools

100 principals trained

>5000 students impacted

KCM Annual Math Conference national prominence

Closing the achievement gap for our KY math students.

Math Achievement Fund intervention students (3000) had an average of 10 percentile points gained as a direct result of KCM trained math interventionists.

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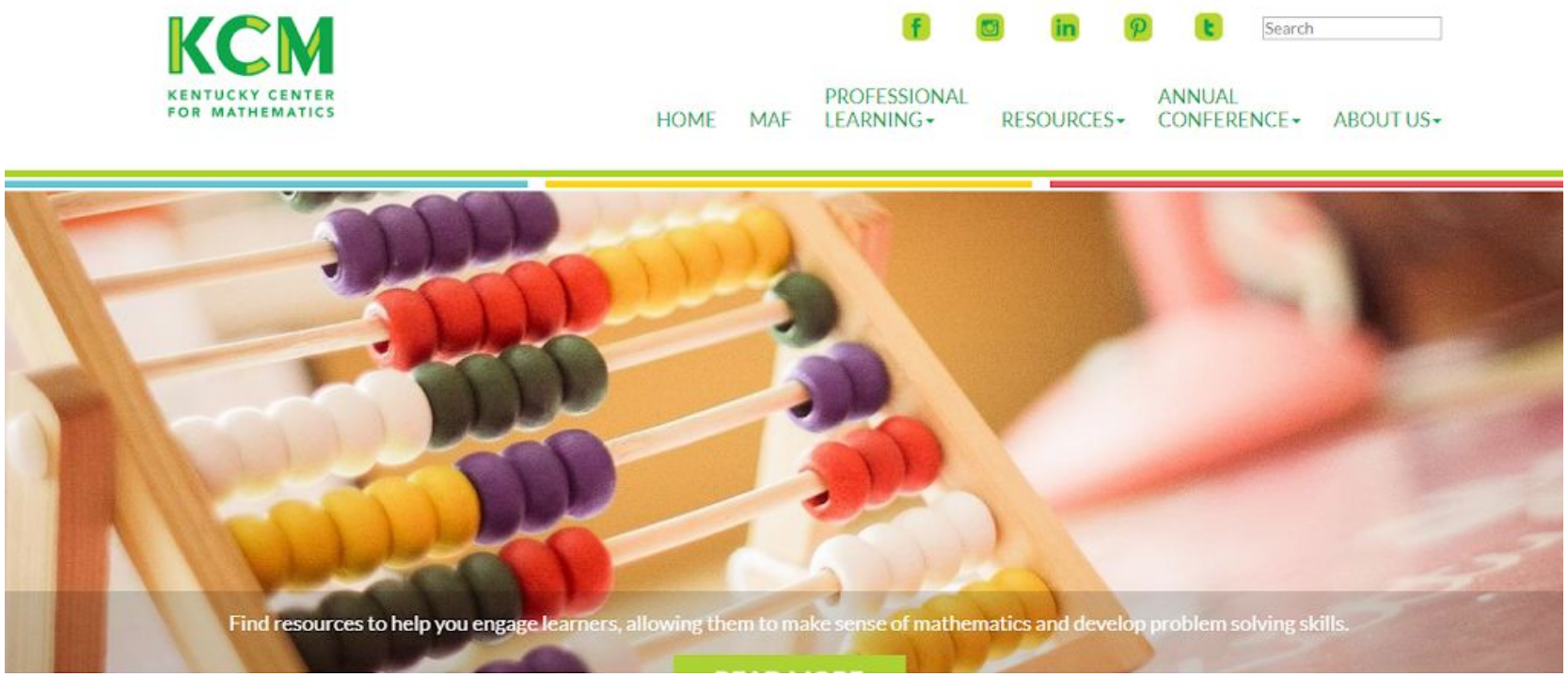
# Visit Our Website

www.kentuckymathematics.org

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# Today's Agenda

- Standards
- Research
- Quick Looks
- Math Stories
- Games

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# Selected Standards for Multiplication & Division

3.OA.7 **Fluently multiply and divide within 100**, using **strategies** such as the relationship between multiplication and division or properties of operations.

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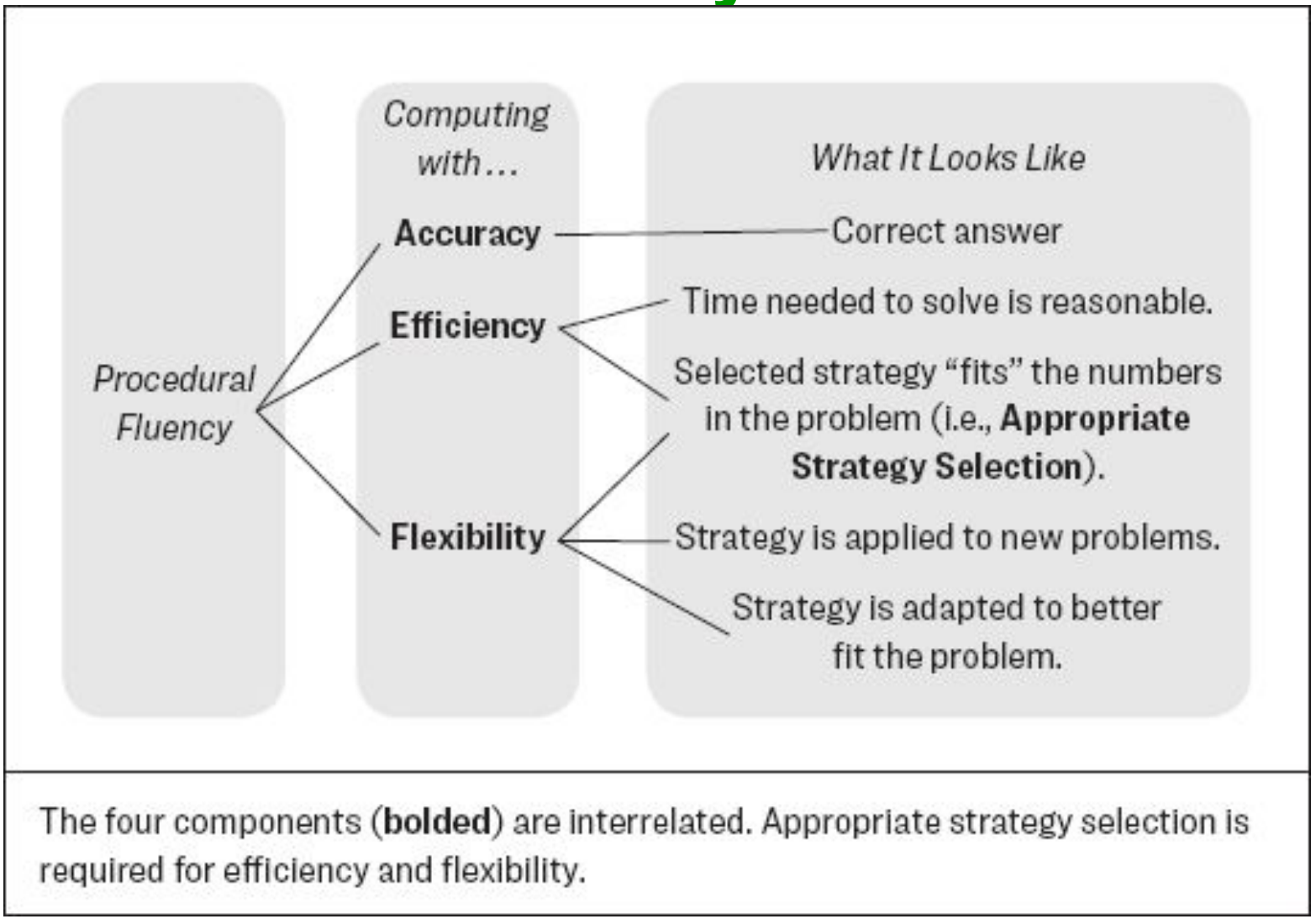
# What the research says...




The four components (**bolded**) are interrelated. Appropriate strategy selection is required for efficiency and flexibility.

*Math Fact Fluency* (Bay-Williams & Kling 2019)

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# Five Fundamentals of Math Fluency

1. Mastery must focus on fluency!
2. Fluency develops in three phases.

    Phase 1: Counting (counts with objects or mentally)

    Phase 2: Deriving (uses reasoning strategies based on known facts)

    Phase 3: Mastery (efficiently produces answers)

3. Knowing foundational facts must precede derived facts.
4. Timed tests do not assess fluency.
5. Students need ***substantial*** and ***enjoyable*** practice.

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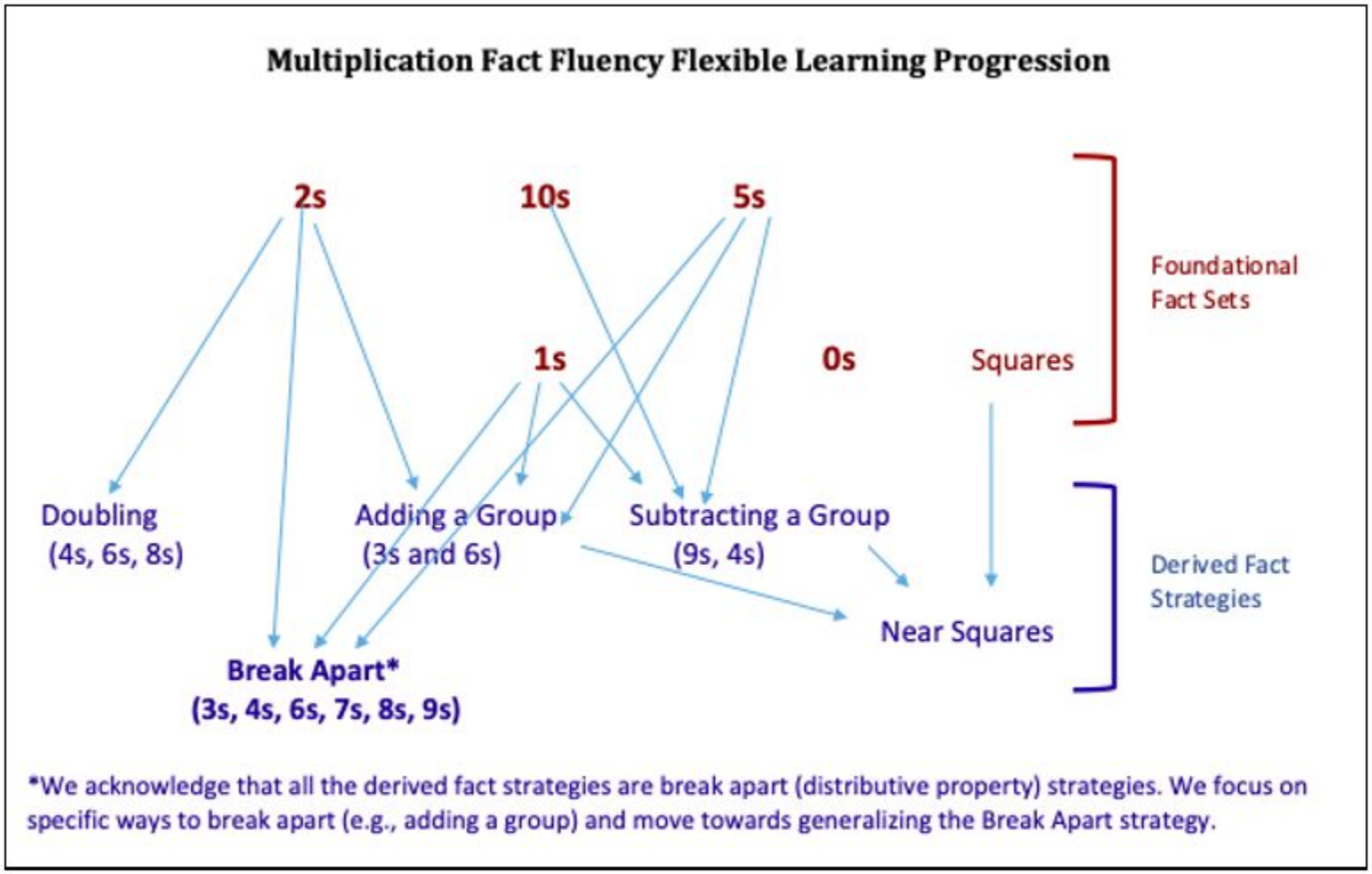
*Math Fact Fluency* (Bay-Williams & Kling 2019)

# Multiplication Fact Fluency Learning Progression

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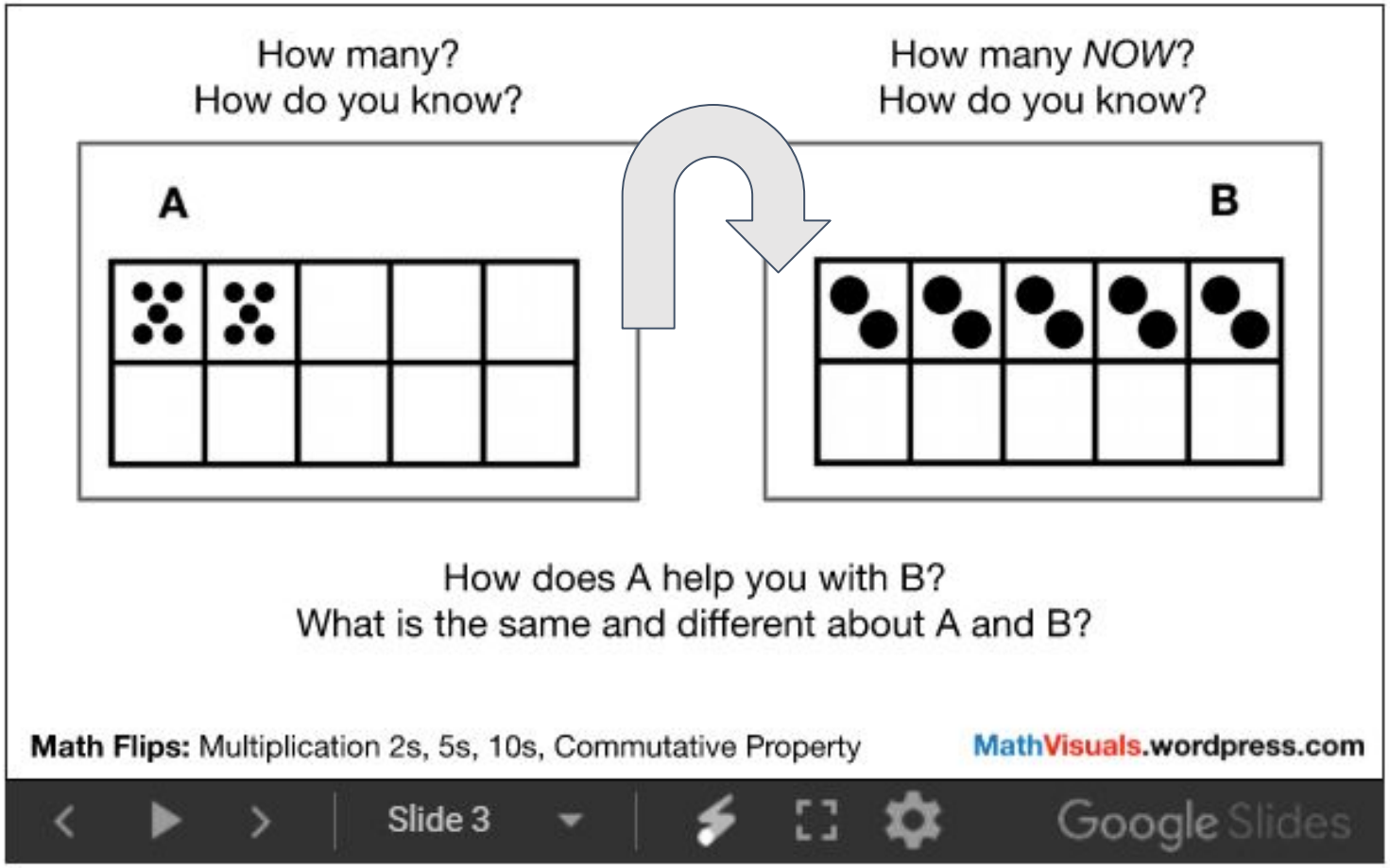
*Math Fact Fluency* (Bay-Williams & Kling 2019)

# Quick Looks with Math Flips

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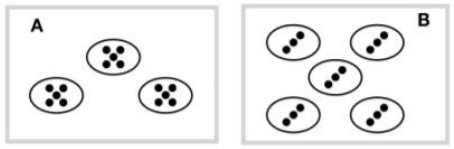
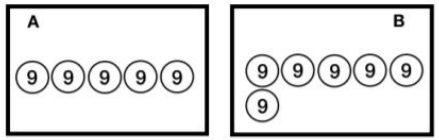
# Multiplication Math Flips

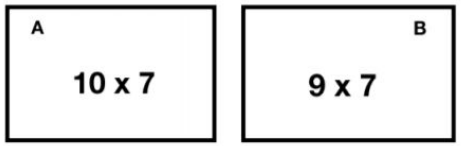
**Math Flips: Multiplication**
2s, 5s, and 10s,
Commutative Property



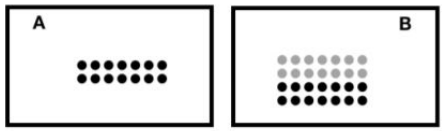

**Math Flips: Multiplication**
Friendly Numbers
with 3s and 6s



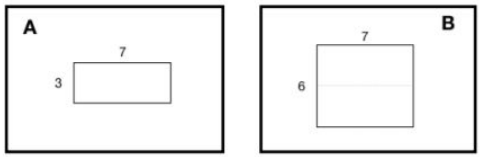

**Math Flips: Multiplication**
Friendly Numbers
with 9s and 4s




**Math Flips: Multiplication**
Doubling, with
4s, 6s, and 8s




**Math Flips: Multiplication**
Hardest Facts

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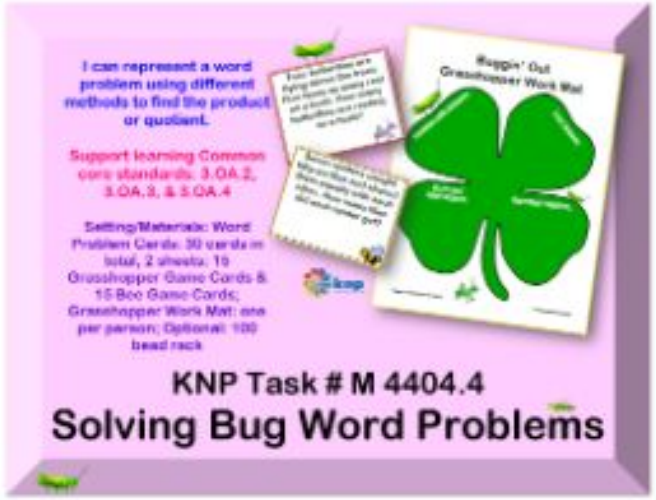
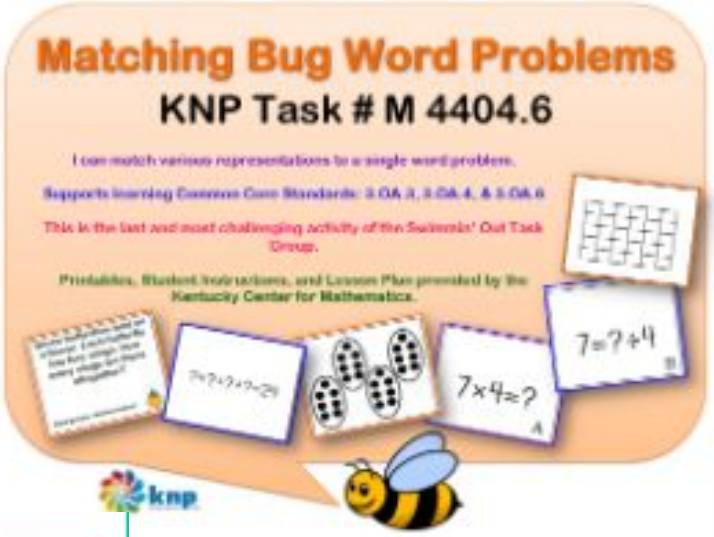
# Stories: KNP Task 4404



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# Substantial Enjoyable Practice

- Rectangle Fit
- Fixed Factor War
- Trios
- Softball Hits

*Math Fact Fluency*
(Bay-Williams & Kling 2019)

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# Virtual Manipulatives

https://www.didax.com/math/virtual-manipulatives.html

120 Number Board

Color Tiles

Base Ten Blocks

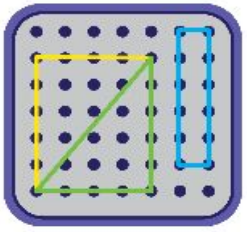
Math Balance

Dice

Spinners

Pattern Blocks

Place Value Disks



Geoboard

Prime Factor Tiles

Algebra Tiles

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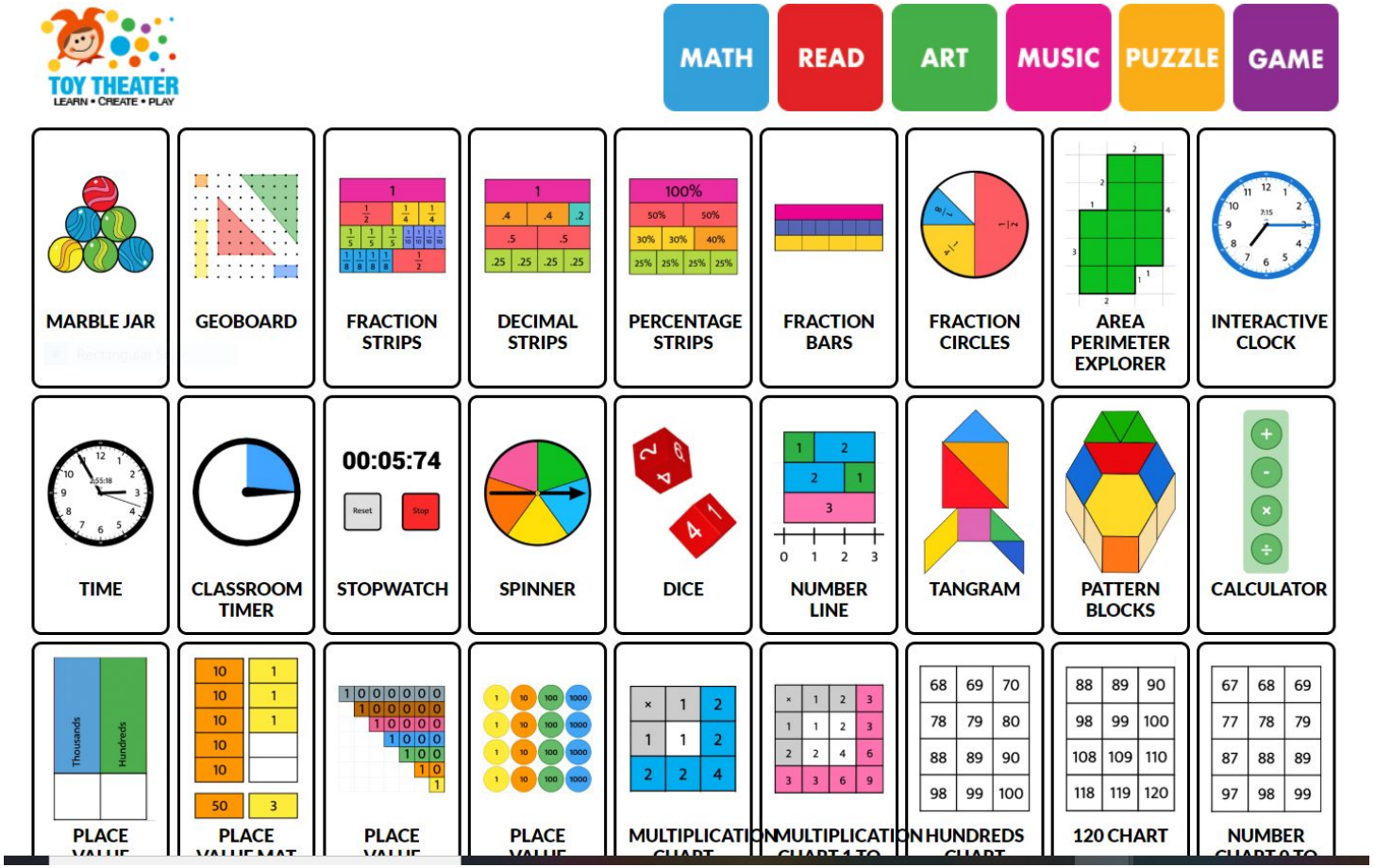
# Toy Theater

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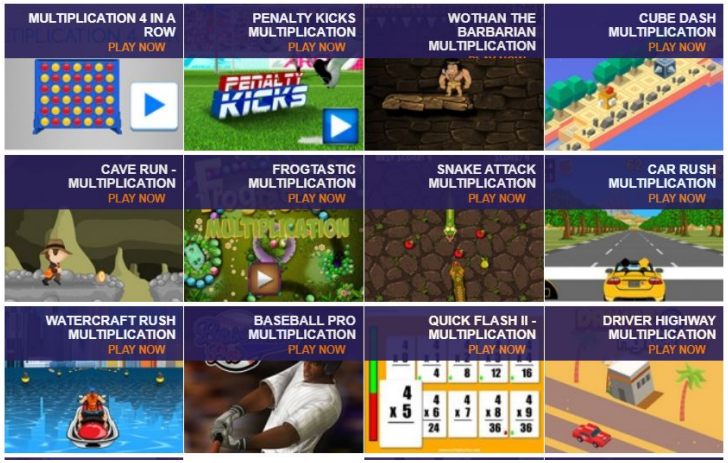
# At-Home Math Resources

https://www.dreambox.com/at-home

dreambox® LEARNING

Multiplication Games




Math Playground
Give your Brain a Workout

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# Upcoming Virtual Professional Learning

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# KCM is here to support you!

Your host:

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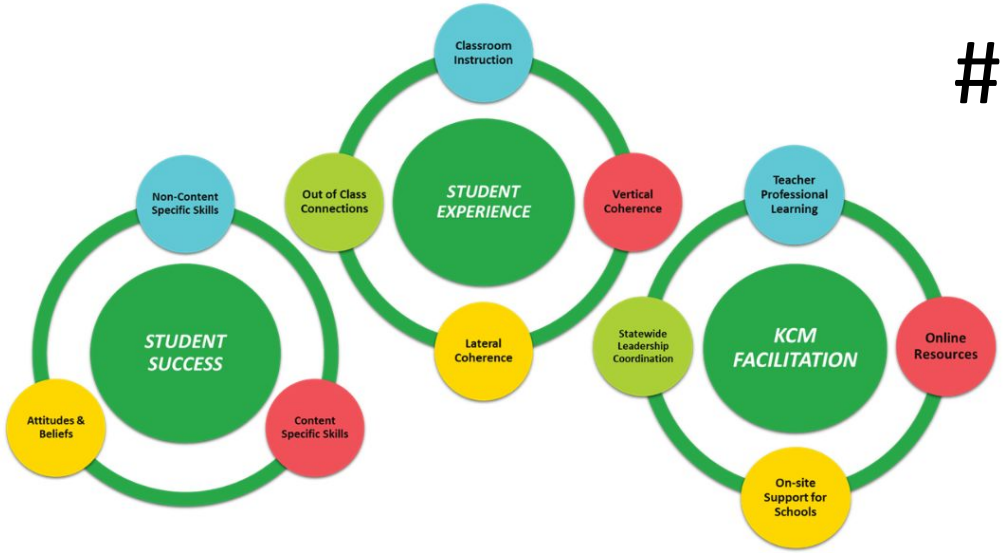
# KCM Support for Educators

- Kentucky Center for Mathematics is here to support our KY educators
- We are aspire to be a national leader in mathematics education




#BetterTogether

#TeamKCM

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