



KENTUCKY CENTER
FOR MATHEMATICS

Constructing Number Sense

Fluency with Multiplication and Division

Welcome!

Your host:

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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.

Visit Our Website

www.kentuckymathematics.org



HOME

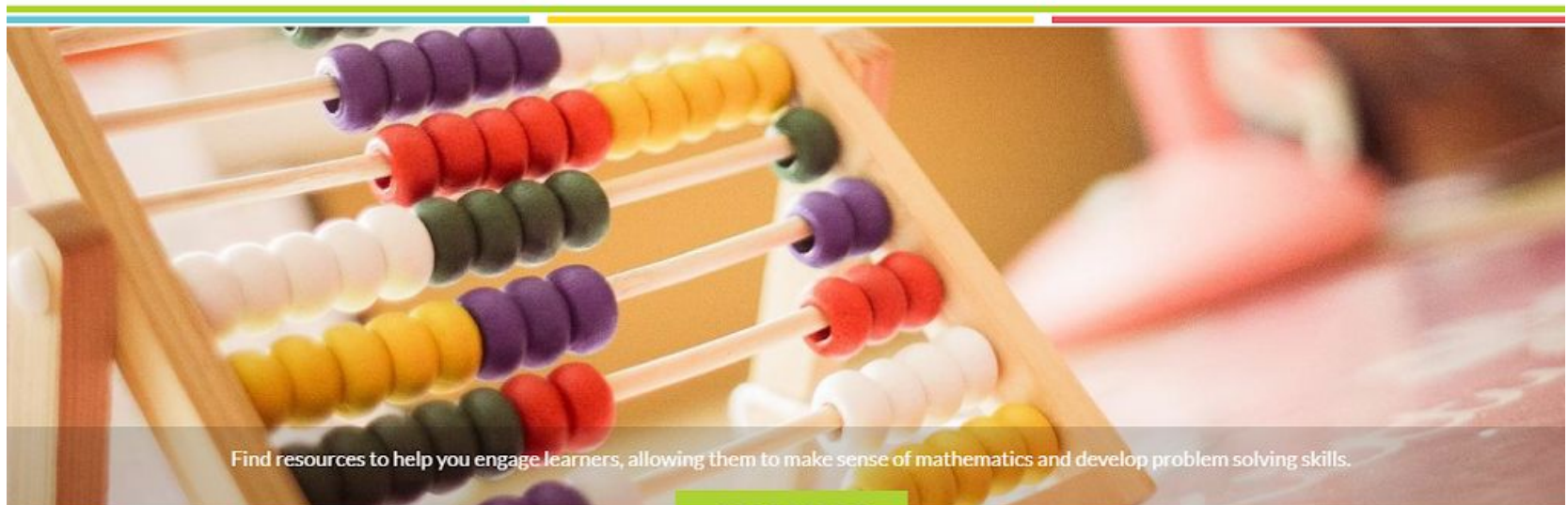
MAF

PROFESSIONAL
LEARNING▼

RESOURCES▼

ANNUAL
CONFERENCE▼

ABOUT US▼



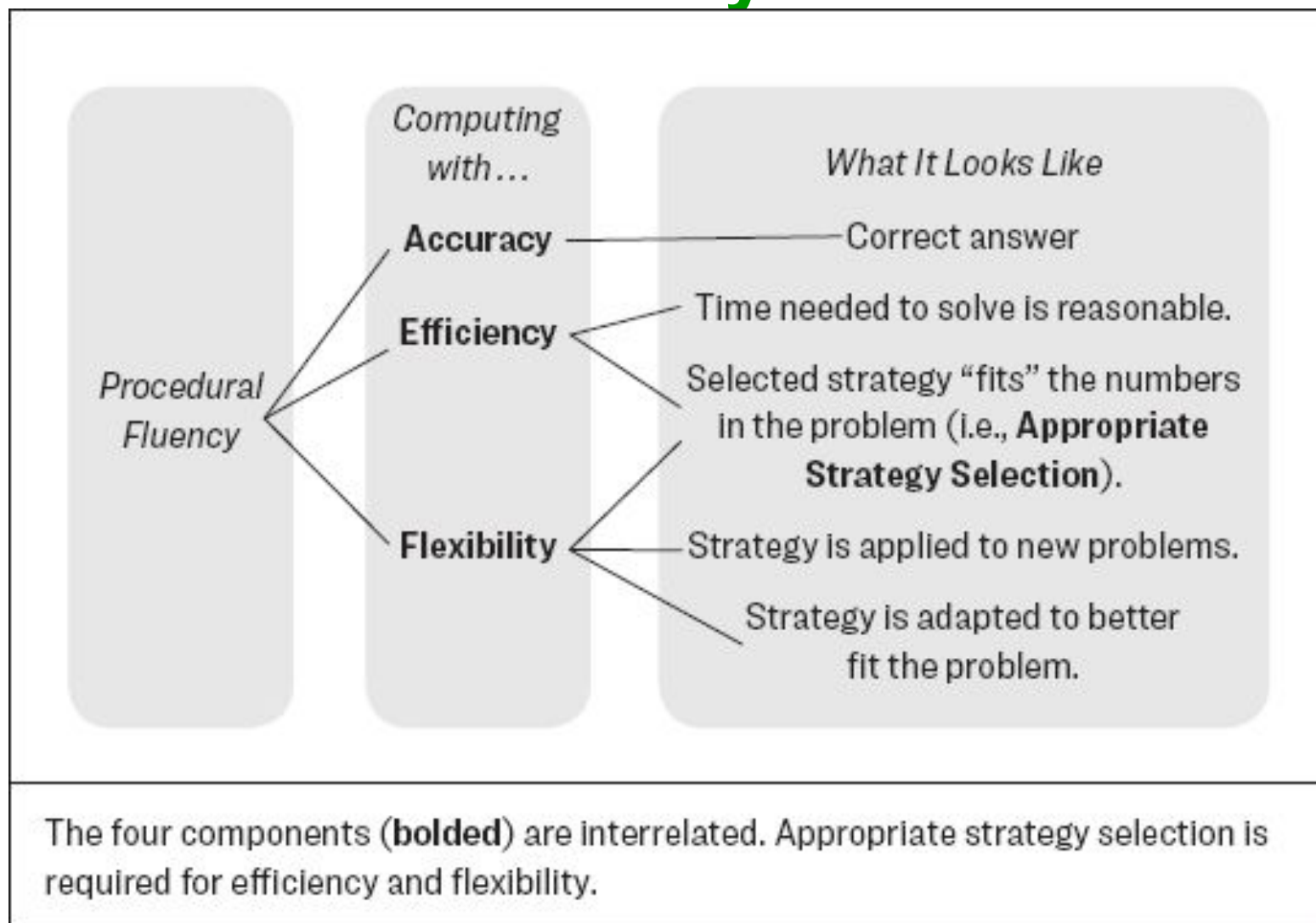
Today's Agenda

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

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.

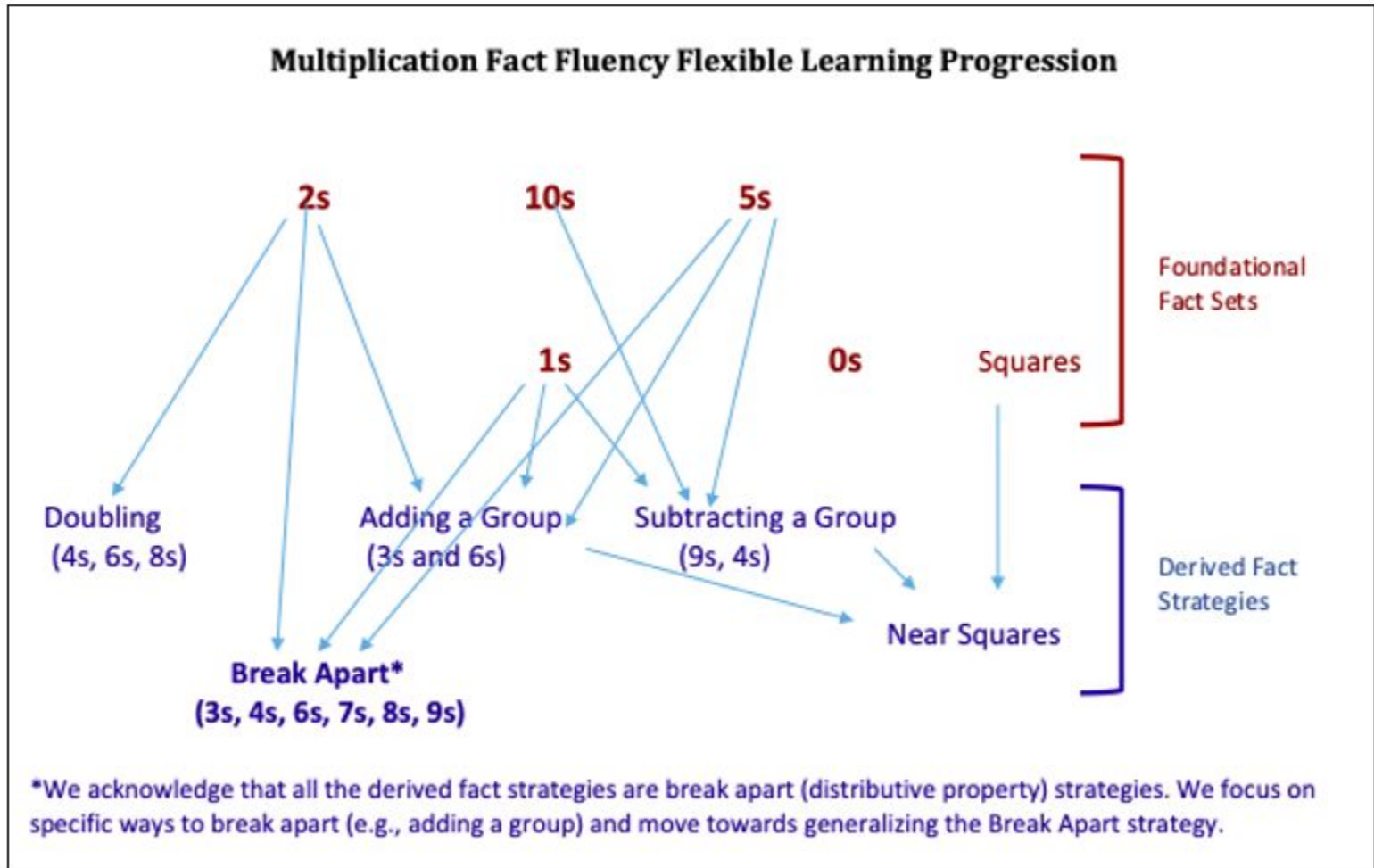
What the research says...



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.

Multiplication Fact Fluency Learning Progression



Quick Looks with Math Flips

How many?
How do you know?

A

•••	•••			

How many *NOW*?
How do you know?

B

••	••	••	••	••

How does A help you with B?
What is the same and different about A and B?

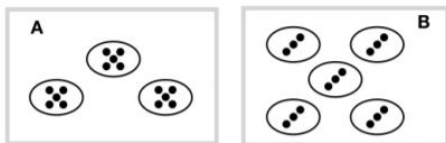
Math Flips: Multiplication 2s, 5s, 10s, Commutative Property MathVisuals.wordpress.com

< ▶ > | Slide 3 | ⚡ □ ⚙️ Google Slides

Multiplication Math Flips

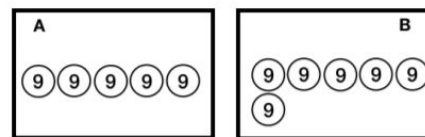
Math Flips: Multiplication

2s, 5s, and 10s,
Commutative Property



Math Flips: Multiplication

Friendly Numbers
with 3s and 6s



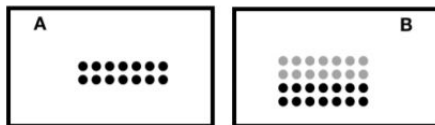
Math Flips: Multiplication

Friendly Numbers
with 9s and 4s



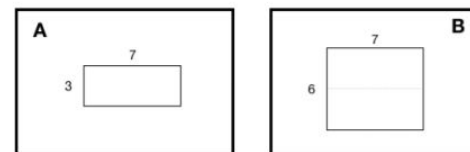
Math Flips: Multiplication

Doubling, with
4s, 6s, and 8s



Math Flips: Multiplication

Hardest Facts




Stories: KNP Task 4404

I can represent a word problem using different methods to find the product or quotient.

Support learning Common Core standards: 3.OA.2, 3.OA.3, & 3.OA.4

Setting/Materials: Word Problem Cards: 30 cards in total, 2 sheets; 19 Grasshopper Game Cards & 15 Bee Game Cards; Grasshopper Work Mat: one per person; Optional: 100 bead rack

KNP Task # M 4404.4
Solving Bug Word Problems





Matching Bug Word Problems
KNP Task # M 4404.6

I can match various representations to a single word problem.

Supports learning Common Core Standards: 3.OA.3, 3.OA.4, & 3.OA.6

This is the last and most challenging activity of the Swimmer's Out Task Group.

Printables, Student Worksheets, and Lesson Plan provided by the Kentucky Center for Mathematics.


Solving Bug Word Problems
KNP Task # M 4404.5

I can represent a word problem using different methods to find the product or quotient.

Supports learning Common Core Standards: 3.OA.2, 3.OA.4, & 3.OA.5

This activity contains two sets of word problem cards based off the common multiplication and division situations. These problem types can be found in the table on page 89 in the Common Core State Standards for Mathematics.

Ruggin' Out Outdoorsy Work Mat



Substantial Enjoyable Practice

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



Virtual Manipulatives

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



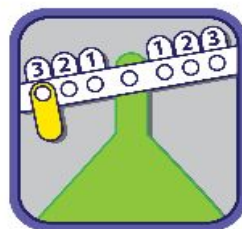
120 Number Board



Color Tiles



Base Ten Blocks



Math Balance



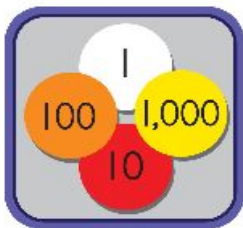
Dice



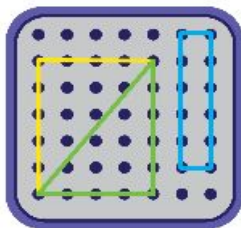
Spinners



Pattern Blocks



Place Value Disks



Geoboard



Prime Factor Tiles



Algebra Tiles

Toy Theater



MATH

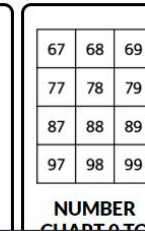
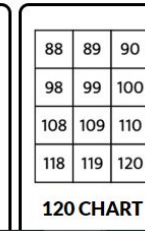
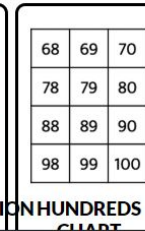
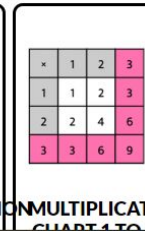
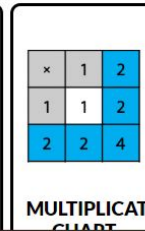
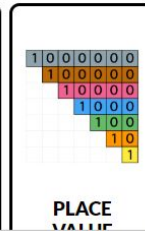
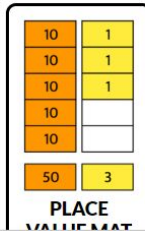
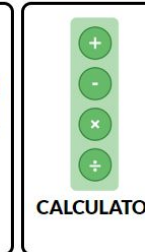
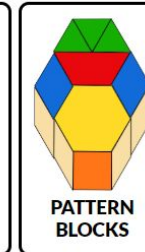
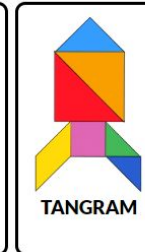
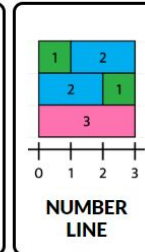
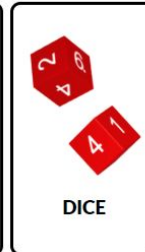
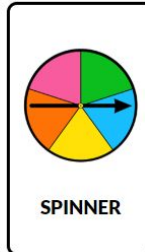
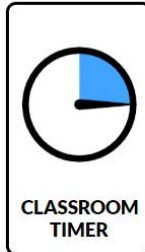
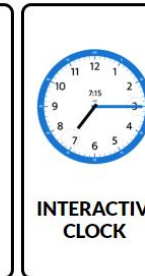
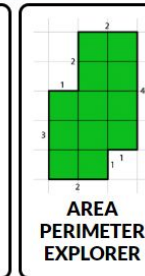
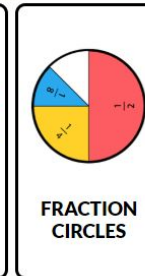
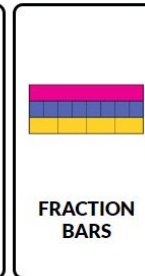
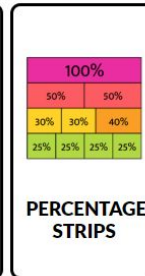
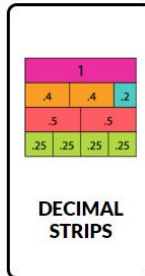
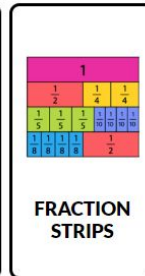
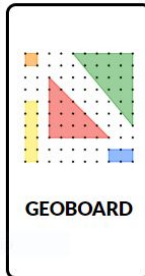
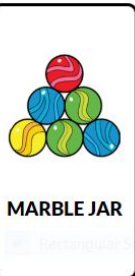
READ

ART

MUSIC

PUZZLE

GAME



At-Home Math Resources

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

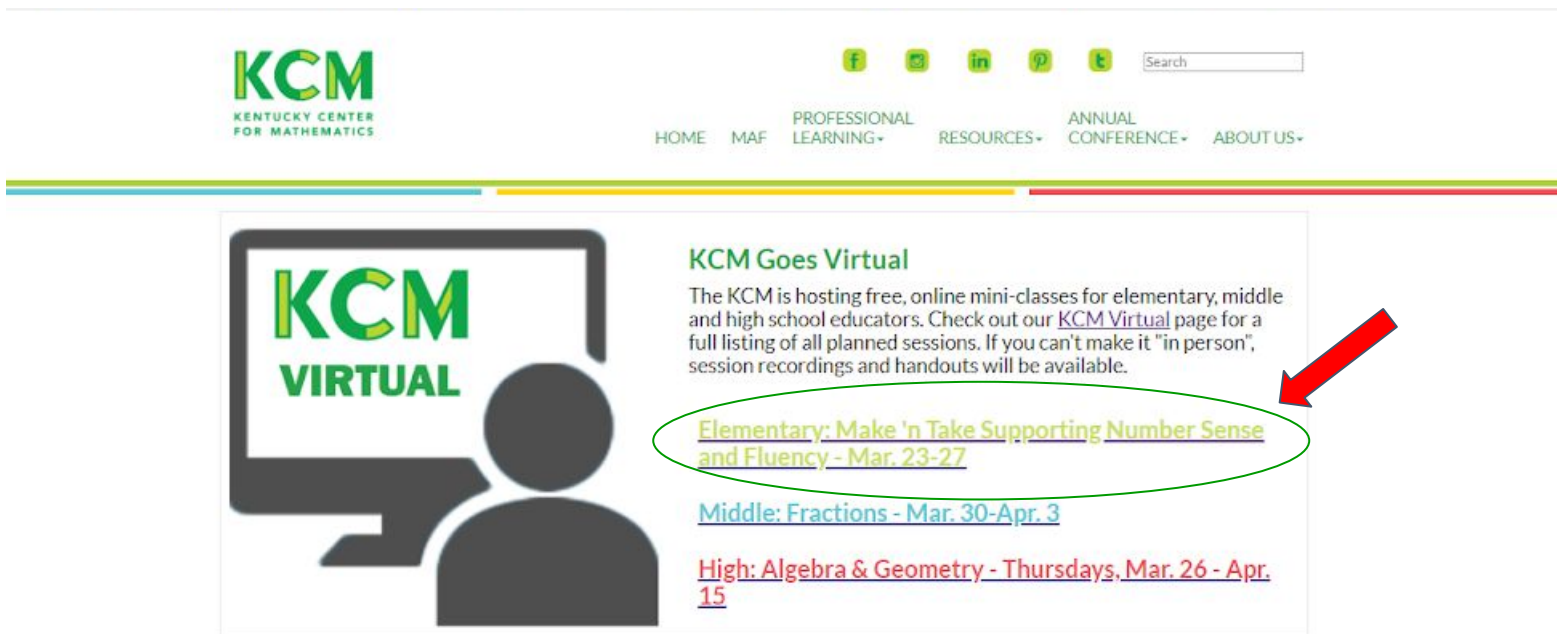


Multiplication Games



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KCM
VIRTUAL

KCM Goes Virtual

The KCM is hosting free, online mini-classes for elementary, middle and high school educators. Check out our [KCM Virtual](#) page for a full listing of all planned sessions. If you can't make it "in person", session recordings and handouts will be available.

[Elementary: Make 'n Take Supporting Number Sense and Fluency - Mar. 23-27](#)

[Middle: Fractions - Mar. 30-Apr. 3](#)

[High: Algebra & Geometry - Thursdays, Mar. 26 - Apr. 15](#)

Upcoming Virtual Professional Learning

Week of March 23-27, 2020 2:00 -2:30 pm EST



Virtual Make 'n Take

With KCM Regional Consultants

Monday, March 23rd Fluency within 10
<https://nku.zoom.us/j/557268655>

Tuesday, March 24th Fluency within 20
<https://nku.zoom.us/j/827307599>

Wednesday, March 25th Fluency within 100
<https://nku.zoom.us/j/310467581>

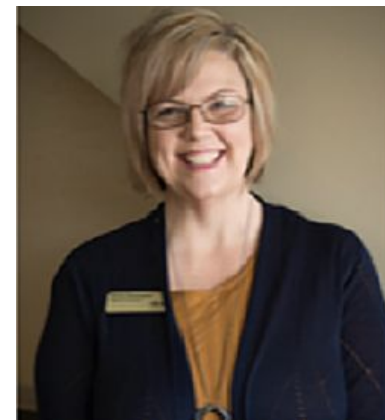
Thursday, March 26th Fluency with x and /
<https://nku.zoom.us/j/290819568>

Friday, March 27th More fluency with x and /
<https://nku.zoom.us/j/311187020>

KCM is here to support you!

Your host:

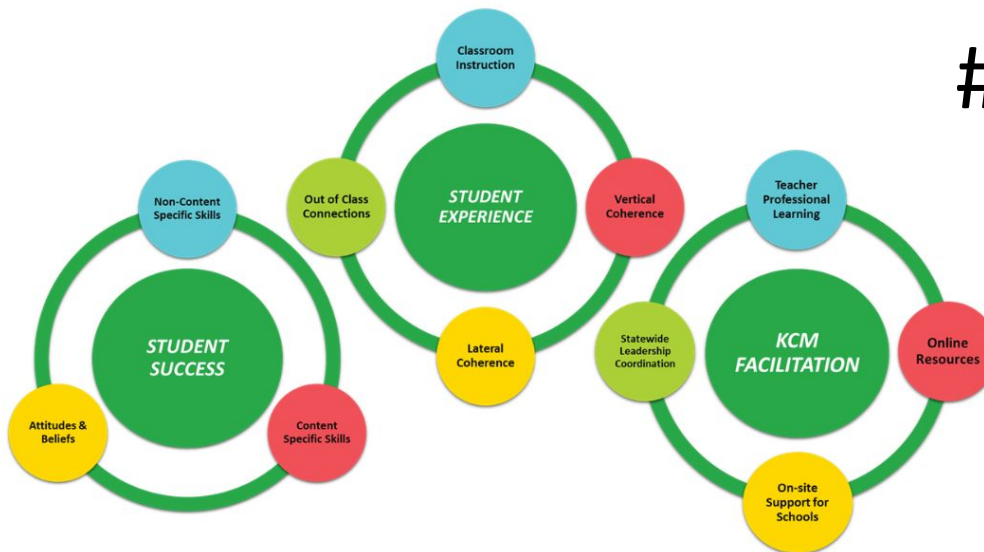
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KCM Support for Educators

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



#BetterTogether
#TeamKCM