



KENTUCKY CENTER
FOR MATHEMATICS

KCM Favorites

Math Fact Fluency:
60+ Games and Assessment Tools
to Support Learning and Retention

Jennifer Bay-Williams
and Gina Kling

Welcome!



Your host

Bonny Davenport

Regional Consultant
Kentucky Center for Mathematics
bonny.davenport@wkec.org

KCM Website

www.kentuckymathematics.org



HOME MAF PROFESSIONAL LEARNING+ RESOURCES+ ANNUAL CONFERENCE+ ABOUT US+



GOOD NEWS

KCM Launches Multi-Series Virtual PD

Find out more in this month's article!



Good News!

The KCM is hard at work to ensure Kentucky teachers have access to innovative professional development from home.

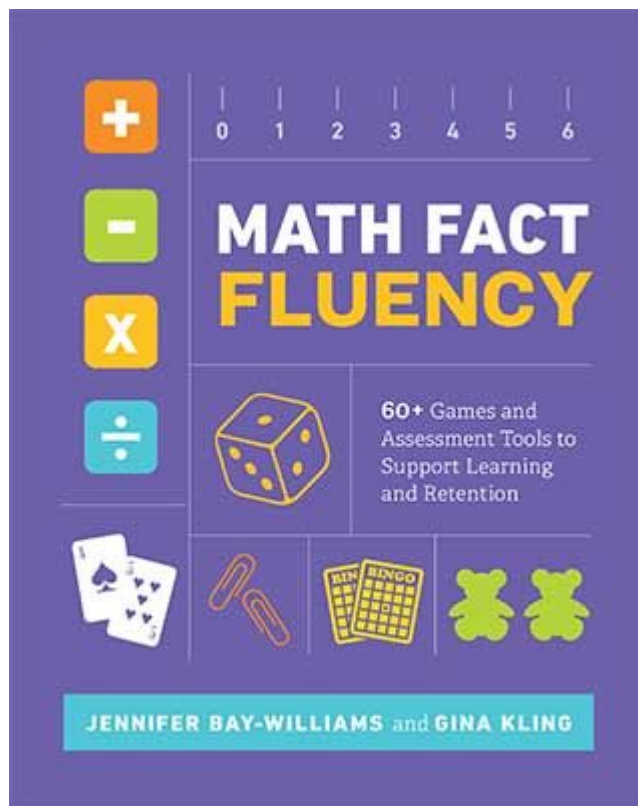
Through the newly launched [KCM Virtual](#) site, mathematics teachers from all grade levels will have access to live zoom meetings, video records and corresponding materials. [Read more.](#)

[KCM Favorites - Apr. 20 - Apr. 24](#)

[Developing Multiplicative Thinking - Apr. 27 - May 1](#)

[Focus on Fractions - May 4 - May 8](#)

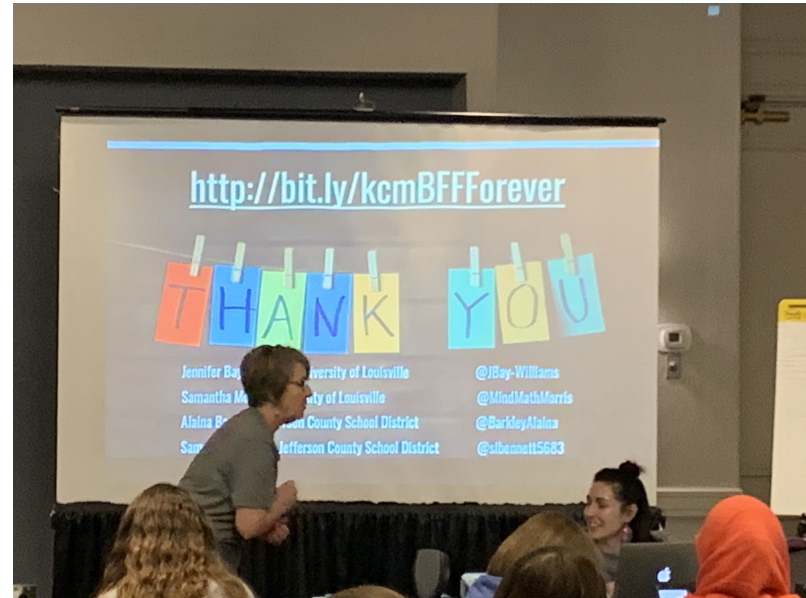
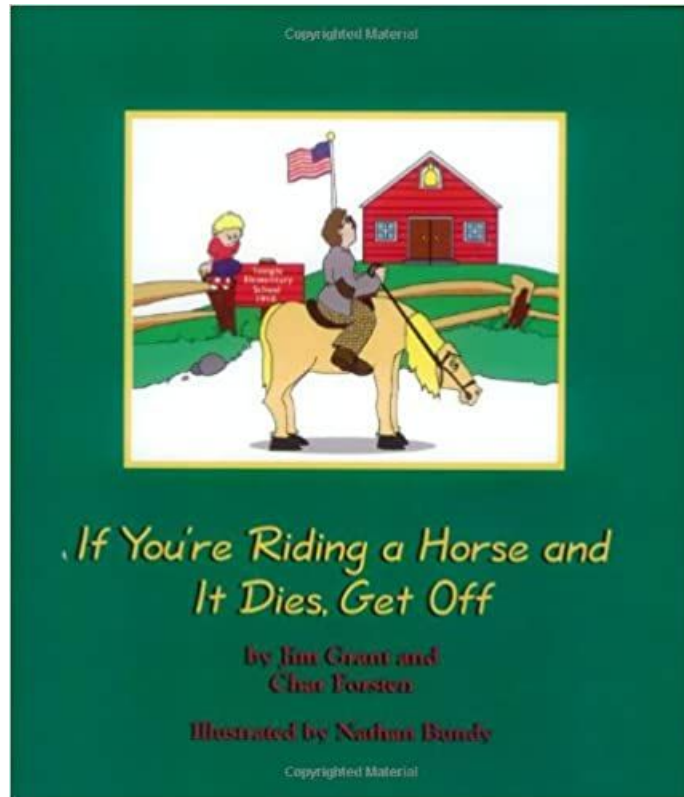
KCM Favorite



ASCDSTORE

by Jennifer Bay-Williams and Gina Kling

Reasons Why I Love This Book!



About the Authors

Jennifer M. Bay-Williams, PhD, is a mathematics teacher educator at the University of Louisville, Kentucky. She has written many articles and books related to K–12 mathematics education, including the popular *Elementary and Middle School Mathematics: Teaching Developmentally* and the related three-book series, *Teaching Student-Centered Mathematics*. Other recent books include *Everything You Need for Mathematics Coaching*, *On the Money* (financial literacy), and *Developing Essential Understanding of Addition and Subtraction*. Bay-Williams is a national leader in mathematics education, having served as a member of the National Council of Teachers of Mathematics (NCTM) Board of Directors, secretary and president of the Association of Mathematics Teacher Educators (AMTE), lead writer for the *Standards for Preparing Teachers of Mathematics* (AMTE, 2017), and a member of the TODOS: Mathematics for ALL Board of Directors. Bay-Williams taught elementary, middle, and high school students in Missouri and in Peru. She currently works in elementary classrooms in the Louisville area, helping teachers and students attain basic fact fluency while also developing strong mathematical identities. Follow Bay-Williams on Twitter (@JBayWilliams) or contact her directly at j.baywilliams@louisville.edu.



Gina Kling is fortunate to serve the mathematics education community in a variety of ways. Since 2011, she has worked as a curriculum developer for the elementary mathematics curriculum *Everyday Mathematics* (based at the University of Chicago) with a focus on grades K–3. Recently she served as the grade 1 lead author for the *Everyday Mathematics 4 State Editions*, the author of the *Everyday Mathematics 4 Quick Looks Activity Book*, and one of the authors of *Everyday Mathematics for Parents: What You Need to Know to Help Your Child Succeed*. Kling has taught mathematics content and methods courses for the past 15 years at Western Michigan University in Kalamazoo, Michigan, and is also currently completing a doctoral degree in K–12 mathematics education at Western Michigan University. For more than a decade, Kling has focused her research on helping children learn basic math facts in meaningful ways and often shares her work through professional development with practicing teachers across the country. She has authored numerous articles on teaching and assessing basic facts and remains active in the elementary classroom today as a mathematics coach, engaging children in developing fact fluency. Kling can be contacted directly at



Podcast With the Authors

The image shows a podcast cover for 'The TeacherCast Podcast'. The left side is a dark blue vertical banner. At the top is a red apple icon with a green leaf. Below it, the text 'THE TeacherCast PODCAST' is written in white. The main title 'Do Your Students Have Math Fact Fluency?' is in white. Below that, it says 'Episode: 192' and 'Featuring Jennifer Bay-Williams and Gina Kling'. At the bottom is the ASCD logo with the tagline 'LEARN. TEACH. LEAD.'. The right side is a purple banner. At the top is a horizontal number line from 0 to 6. Below it, the title 'MATH FACT FLUENCY' is written in large white and yellow letters. Below the title are several icons: a yellow speech bubble, a blue square with a white division symbol, a yellow die, a white Ace of Spades and 5 of Hearts playing cards, two orange paper clips, two yellow bingo cards, and two green teddy bears. On the right side of the purple banner is a red apple icon with a green leaf and the letters 'TC' in white.

THE TeacherCast
PODCAST

Do Your Students Have Math Fact Fluency?

Episode: 192
Featuring Jennifer Bay-Williams
and Gina Kling

ASCD[®]
LEARN. TEACH. LEAD.

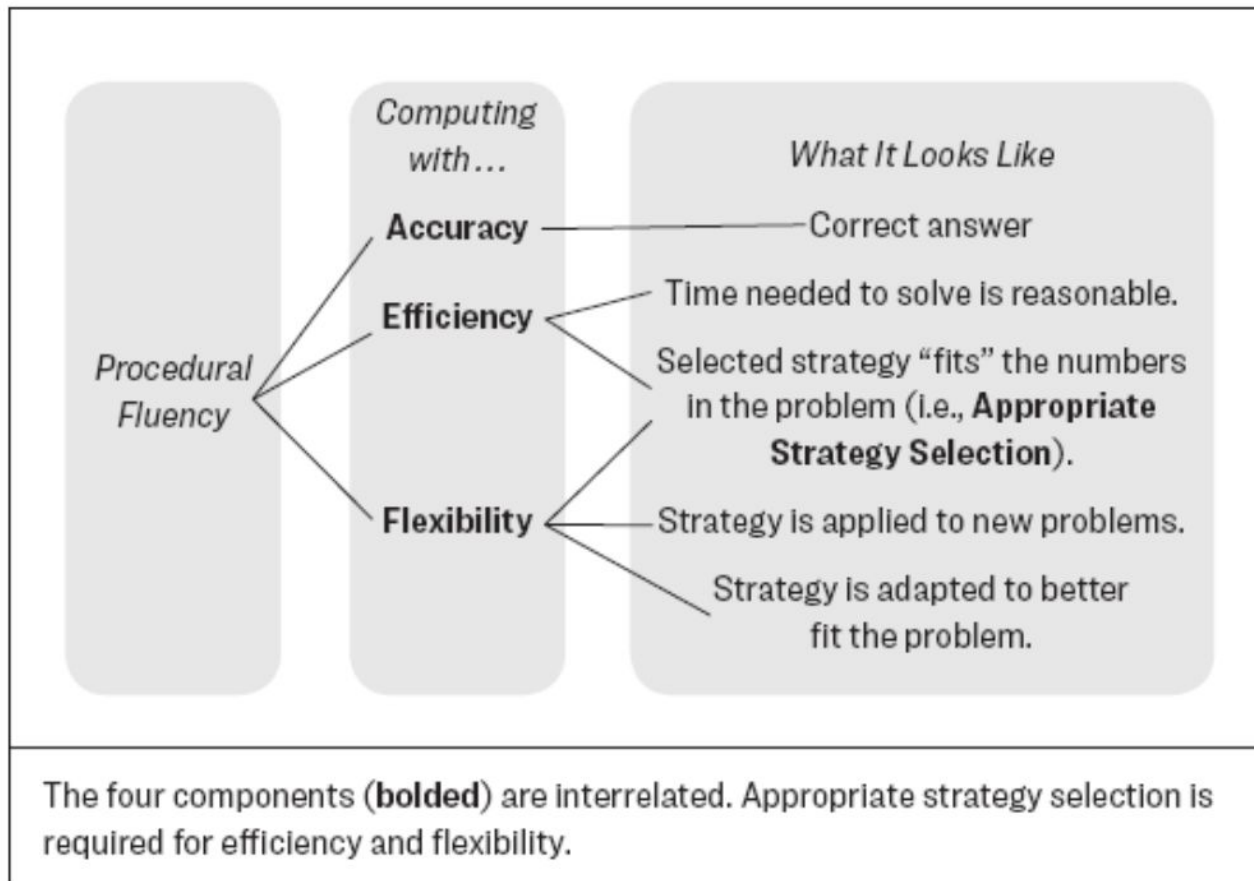
MATH FACT FLUENCY

60+ Games and Assessment Tools to Support Learning and Retention

TC

Fundamental 1: Mastery Must Focus on Fluency

Figure 1.1. What Procedural Fluency Is and What It Looks Like



Our Standards

Addition & Subtraction Fluency Standards

KY.K.OA.5	Within 5	Represent add. & sub. with objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, expressions, or equations. (KY.K.OA.1)
KY.1.OA.6	Within 10	Relate counting to addition & subtraction (KY.1.OA.5) Use a range of strategies including • Counting on • Referencing a 10 • Relating to known or easier facts • Using the relationship between add. & sub.
KY.2.OA.2	Within 20	Mental Strategies (see above)
KY.2.NBT.5	Within 100	Strategies based upon: • Place Value • Add/subtract chunks of 10 (1.NBT.5) • Properties of Operations • Relationships between add. & sub.
KY.3.NBT.2	Within 1000	Strategies (see above) & algorithms A range of algorithms may be used

Build procedural fluency from conceptual understanding.

Effective teaching of mathematics builds fluency with procedures on a foundation of conceptual understanding so that students, over time, become skillful in using procedures flexibly as they solve contextual and mathematical problems.

Fundamental 2: Fluency

Develops in Three Phases

Phase 1: Counting

Student counts with objects or mentally.

Phase 2: Deriving

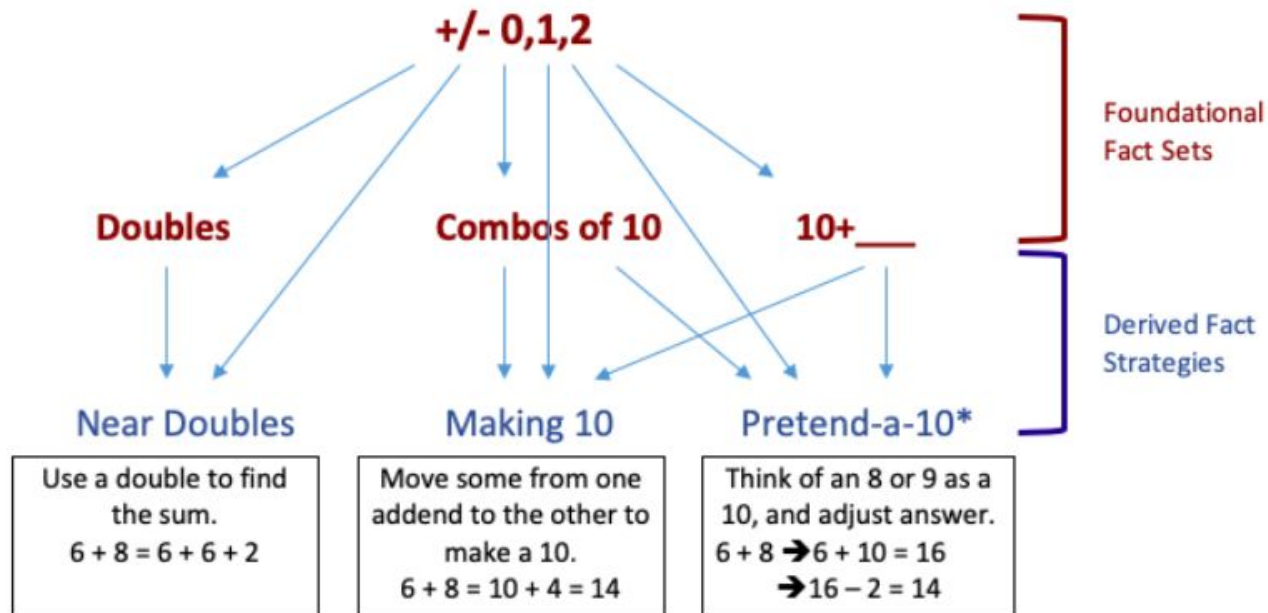
Uses reasoning strategies based on known facts.

Phase 3: Mastery

Efficiently produces answers

Fundamental 3: Foundational Facts Must Precede Derived Facts

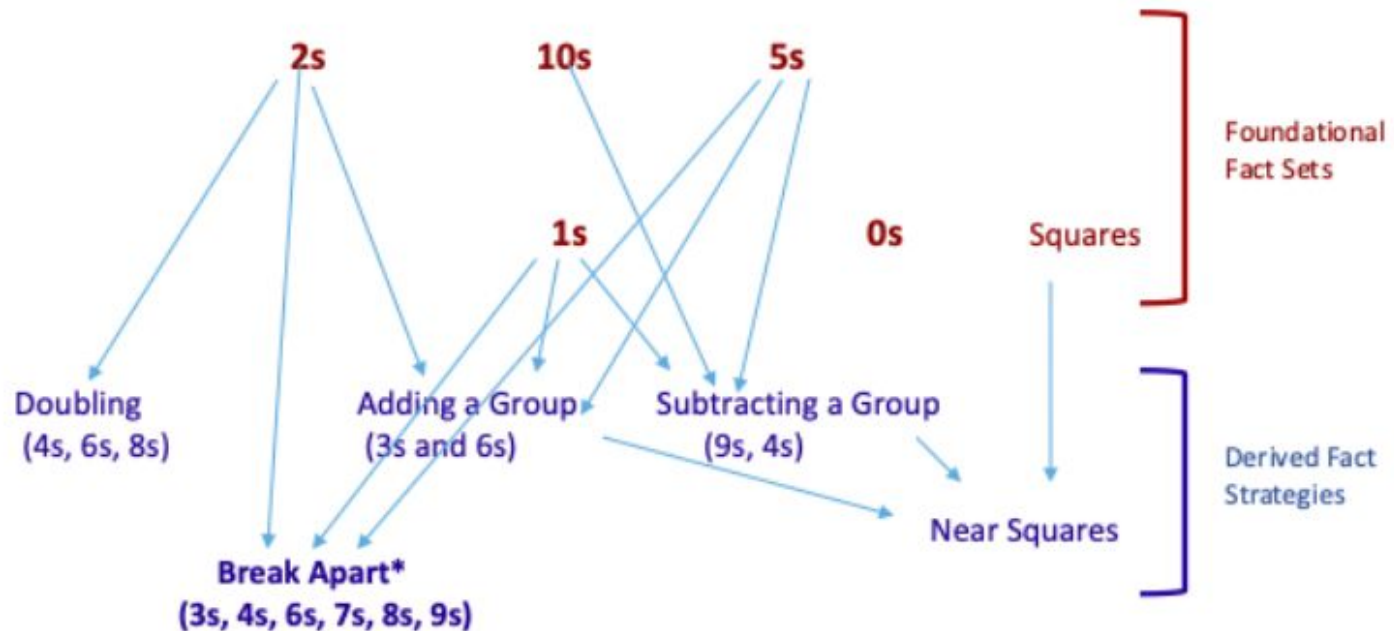
Addition Fact Fluency Flexible Learning Progression



*Also called Compensation and Use 10; we have found that young learners remember the strategy and distinguish it from Making 10 when we use this name. Research indicates that this strategy is more accessible than Making 10, and therefore should be explicitly taught (Baroody, Eiland, Reid, & Paliwal, 2016).

Fundamental 3: Foundational Facts Must Precede Derived Facts

Multiplication Fact Fluency Flexible Learning Progression



*We acknowledge that all the derived fact strategies are break apart (distributive property) strategies. We focus on specific ways to break apart (e.g., adding a group) and move towards generalizing the Break Apart strategy.

Fundamental 4: Timed Tests Do Not Assess Fluency



If timed tests are not aligned with fluency, are ineffective formative assessment tools, may impede progress, and cause anxiety, why do we use them?

Timed Test Alternatives

1. Journal Writing
2. Observations
3. Interviews
4. Self Assessments
5. Strategy Quizzes



Fundamental 5: Students Need Substantial and Enjoyable Practice

Stories



Quick Looks



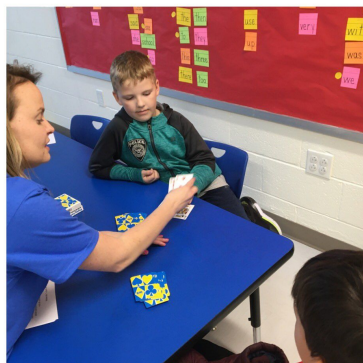
Games

TRIOS Game Board

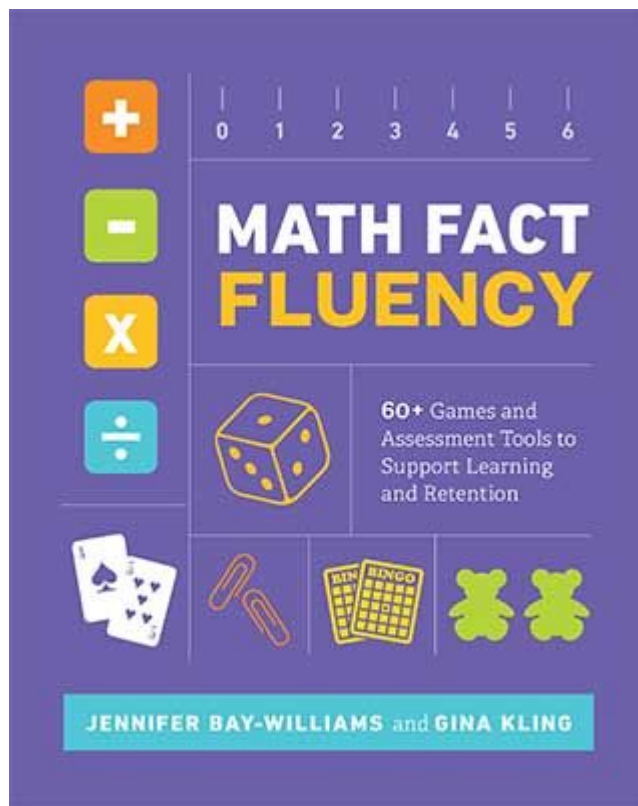
15	40	25	0	30
45	20	10	5	25
5	35	0	50	45
40	15	30	25	20
20	50	45	10	35

More than 40 easy-to-make, easy-to-use games that provide engaging fact practice!

Families and Facts



KCM Favorite



ASCDSTORE

by Jennifer Bay-Williams and Gina Kling

KCM Favorite

APRIL 20 - 24
2:00-2:30 PM EST



KCM Favorites!

w/ KY Math Leaders

Monday, April 20 - Thinking Together- 9 Beliefs for Building a Mathematical Community

Tuesday, April 21 - Routines for Reasoning: Fostering the Mathematical Practices in All Students

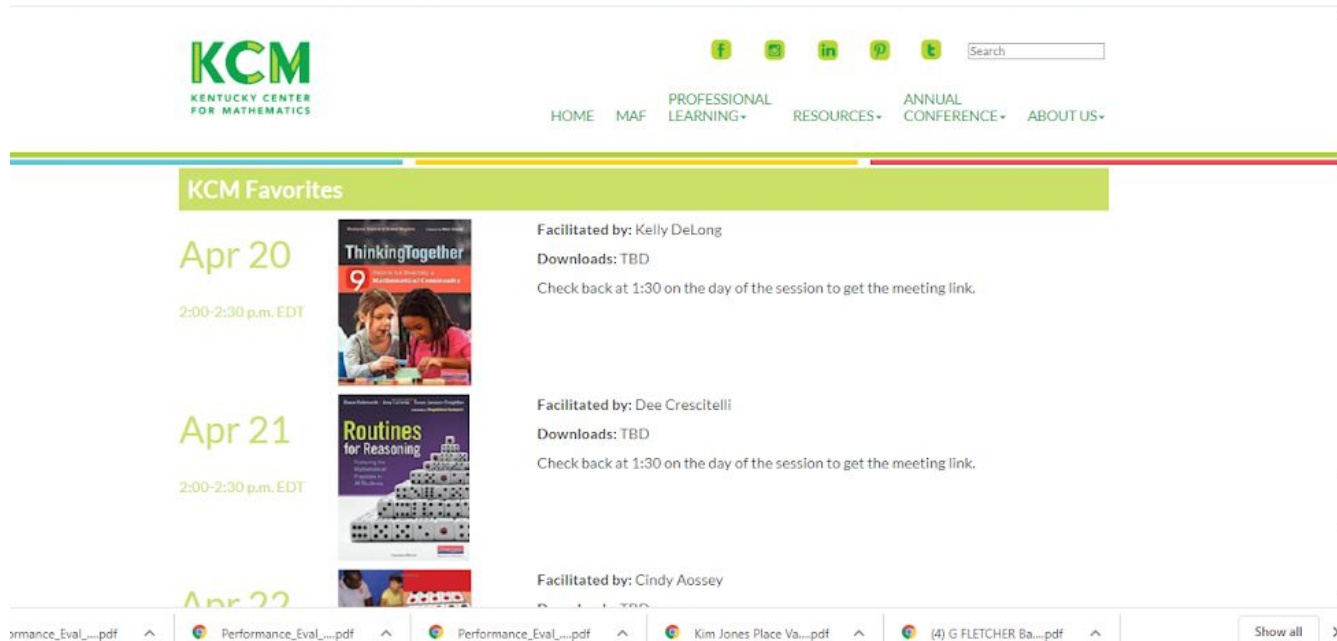
Wednesday, April 22 - Developing Number Knowledge

Thursday, April 23 - Math Fact Fluency

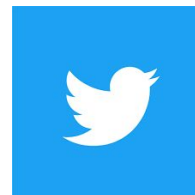
Friday, April 24 - Taking Action Implementing Effective Mathematics Teaching Practices Grades 9-12

Follow Us!

www.kentuckymathematics.org



@KyMath



@KyCenterforMath

KCM is here to support you!



Contact me

Bonny Davenport

Regional Consultant
Kentucky Center for Mathematics
bonny.davenport@wkec.org