Constructing Number
Sense
Fluency within 100
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

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math courses taught</td>
<td>29</td>
</tr>
<tr>
<td>Cohorts of teachers</td>
<td>73</td>
</tr>
<tr>
<td>Teachers attending</td>
<td>Over 1000</td>
</tr>
<tr>
<td>Math professional learning</td>
<td>182 days</td>
</tr>
<tr>
<td>Math materials directly in hands of teachers</td>
<td>Over $150,000</td>
</tr>
</tbody>
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<thead>
<tr>
<th>Category</th>
<th>Number</th>
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</thead>
<tbody>
<tr>
<td>School districts</td>
<td>109</td>
</tr>
<tr>
<td>Kentucky schools</td>
<td>300</td>
</tr>
<tr>
<td>Principals trained</td>
<td>100</td>
</tr>
<tr>
<td>Students impacted</td>
<td>&gt;5000</td>
</tr>
</tbody>
</table>

- 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
Today’s Agenda

- Where is the Research?
- Looking at where the standards live
- Video of using the Math Rack
- Move Along
- Ten More or Ten Less
- Make My Number
- Questions or comments
Research

What the research says...

History of Manipulatives

- The ancient Civilizations of Asia used counting boards.
- The ancient Romans modified counting boards to create the world’s first abacus.
- The Chinese abacus, which came centuries later, may have been an adaptation of the Roman abacus.
- Mayans and Aztecs both had counting devices that featured corn kernels strung on string or wires that were stretched across a wooden frame.
- The late 1800’s saw the invention of the first true manipulatives for teaching mathematical concepts.
- Since the early 1900’s, manipulatives have come to be considered essential in teaching mathematics at all grade levels.
Research continued:

- To gain a deep understanding of mathematical ideas, students need to be able to integrate and connect a variety of concepts in many different ways. Clements (1999) calls this type of deep understanding “Integrated-Concrete” knowledge.

- The effective use of manipulatives can help students connect ideas and integrate their knowledge so that they gain a DEEP understanding of mathematical concepts.
## Moving students through the stages of mathematics

<table>
<thead>
<tr>
<th>Concrete stage</th>
<th>Representational stage</th>
<th>Abstract stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A mathematical concept is introduced with manipulatives; students explore the concept using the manipulatives in purposeful activity.</td>
<td>A mathematical concept is represented using pictures of some sort to stand for the concrete objects (the manipulatives) of the previous stage; students demonstrate how they can both visualize and communicate the concept at a pictorial level.</td>
<td>Mathematical symbols (numerals, operation signs, etc.) are used to express the concept in symbolic language; students demonstrate their understanding of the mathematical concept using the language of mathematics.</td>
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</tbody>
</table>
Standards we will cover today

KY.2. NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations and/or the relationship between addition and subtraction.

KY.2.NBT.9 Explain why addition and subtraction strategies work, using place value and the properties of operations.
Introduction to the Rekenrek
Move Along

- Move Along is an addition activity, not a game. You are going to place your marker on the START space of your activity sheet.
- In the first START space, you see ‘24 Make 50.’ Use your Rekenreks to make 24 first. Then figure out what you need to do to make 50.
- On a separate sheet of paper, write a number sentence that shows your addition.
- Then move to the next space.

Image and activity used with permission from Didax From Working with 100-Bead Rekenrek
Ten More or Ten Less

“I’m going to show you a Number Card between 20 and 100.

When I do, I want you to show me 10 more or 10 less than this number on your Math Rack.”

When you finish, write a number sentence comparing the two numbers. Use the correct symbol for greater than or less than.

Continue the same way for different numbers.

http://www.didax.com/apps/100-bead-rekenrek/
Read a “Make My Number Card.”

The child will start with 15 (for example.) Ask the child to make it 40.

Pay attention how the child builds 40 from 15. Ask the child “How can you add in the least amount of pushes?”

Write a number sentence to make the operation just performed.

Image and activity used with permission from Didax
From Working with 100-Bead Rekenrek
Second grade student using math rack
Visit Our Website

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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 24th    More fluency with x and /
https://nku.zoom.us/j/311187020
KCM is here to support teachers!

Contact me:

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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