



# KENAN FELLOWS PROGRAM

FOR CURRICULUM AND LEADERSHIP DEVELOPMENT

# Making Math Count

A project from the Kenan Fellows Program in conjunction with the Department of Public Instruction



Public Schools of North Carolina  
State Board of Education  
Department of Public Instruction



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Making Math Count: A three-part professional development series focusing on assessment and instruction in grades K-2.

Part 1: The Current Climate of Mathematics and the Importance of Early Number Concepts



Public Schools of North Carolina  
State Board of Education  
Department of Public Instruction

# Introduction of the Kenan Fellows

- ▶ **Alexandra Humphries**
  - Graduated from the University of North Carolina – Chapel Hill (2010) with a degree in Elementary Education.
  - Currently in 4<sup>th</sup> year of teaching and teaching 2<sup>nd</sup> grade in Wake County Public Schools.



# Introduction of the Kenan Fellows

## ▶ Christina Lowman

- Graduated from Salisbury University (2006) with a degree in Elementary Education. Continued at University of North Carolina– Chapel Hill (2013) with a master's degree in Elementary Mathematics.
- Currently in 8<sup>th</sup> year of teaching and teaching 5<sup>th</sup> grade in Chatham County Schools.



# Introduction of the Kenan Fellows

## ▶ Katherine Phelps

- Graduated from the University of Michigan (2006) with a degree in Elementary Education. Continued at University of North Carolina– Chapel Hill (2011) with a master’s degree in Elementary Mathematics.
- Currently in 8<sup>th</sup> year of teaching and teaching K–5 Mathematics in Orange County Schools.



In their 2007 research, Duncan et. al found that “the best predictor of later achievement– as gauged by reading success in 3<sup>rd</sup> grade and beyond– was early numeracy performance.”

–<http://www.myigdis.com/learn-more/ask-the-researcher/what-is-early-numeracy-and-why-is-it-so-important/>

The researchers reported that, “One of our noteworthy results is that early math is a more powerful predictor of later reading achievement than early reading is of later math achievement” and that “the results show that early math skills have the greatest predictive power, followed by reading and then attention skills.”

–[http://www.ncpat.org/blockfest/assets/docs/duncan-et-al\\_school-readiness-math.pdf](http://www.ncpat.org/blockfest/assets/docs/duncan-et-al_school-readiness-math.pdf)



# Our Current Mathematics Climate: What the Research Shows

Constance Kamii has done extensive research on how young children learn mathematics. Students are given a pile of counters to complete the following task:

Students are shown this number. Teacher points to the 6 and says, “Can you show me this many?”

16



**Then, the teacher points to the 1 in the  
tens place and asks,  
“Can you show me this many?”**

 **16**

Kamii found that essentially **no first graders** could correctly complete this task.

By **third grade** nearly half the students **still** do not 'get' this concept of place value...

16

**..and many 4th-5th graders cannot give a correct answer either.**



# More Research– It Gets Worse!

Grayson Wheatly gave 5,000 middle school students the following task:

A number contains 18 tens,  
2 hundreds, and 4 ones.  
What is that number?

1824

Some students gave this answer. Others knew the tens had to be in the middle, so...



A number contains 18 tens, 2 hundreds, and 4 ones. What is that number?

**2184** - the tens are in the middle of the number now!

**218.4** - many gave this answer, knowing that you could only have 3 digits if a number was in the hundreds, and knowing about decimals.

**384** - and only about 50% of middle school students gave the correct response.



# And Even Worse!

$$8 + 4 = [ \quad ] + 5$$



$$8 + 4 = [ \quad ] + 5$$

	<b>Student Responses:</b>			
<b>Grade</b>	<b>7</b>	<b>12</b>	<b>17</b>	<b>12 &amp; 17</b>
<b>1<sup>st</sup> - 2<sup>nd</sup></b>				
<b>3<sup>rd</sup> - 4<sup>th</sup></b>				
<b>5<sup>th</sup> - 6<sup>th</sup></b>				

Thinking Mathematically: Integrating Arithmetic & Algebra in  
Elementary School.  
Carpenter, Franke, & Levi  
Heinemann, 2003

$$8 + 4 = [ \quad ] + 5$$

	<b>Percent of Students with each Response</b>			
<b>Grade</b>	<b>7</b>	<b>12</b>	<b>17</b>	<b>12 &amp; 17</b>
<b>1<sup>st</sup> - 2<sup>nd</sup></b>	<b>5 %</b>	<b>58 %</b>	<b>13 %</b>	<b>8 %</b>
<b>3<sup>rd</sup> - 4<sup>th</sup></b>				
<b>5<sup>th</sup> - 6<sup>th</sup></b>				

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<b>5<sup>th</sup> - 6<sup>th</sup></b>	2 %	76 %	21 %	2 %

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- ▶ One early childhood expert says, “if you have a problem in high school algebra, fix it in K-2.”<sup>1</sup>

<sup>1</sup> Kathy Richardson, NCTM Conference



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3/7/2014

17

# What's "the Fix"?

- ▶ The Department of Public Instruction has been piloting a system of assessment and instruction for 4 years that will lead us to a solution to these problems.

