

STUDENT
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The Developmental Appropriateness of the Common Core State Standards for Mathematics

by Jason Zimba

MYTHS VS FACTS



In my work, I travel the country helping educators understand the Standards and know how to implement them well. Earlier this year, I met a teacher who's been teaching kindergarten in the Chicago Public Schools for over 20 years. She told me she was amazed by how much her kindergarteners were learning now compared to in the past. I think she has a different view now about what young children are capable of. Closer to home, I'm a parent, and I use the Standards to know where my own kindergartener should be in her mathematical development. So from what I have seen, these Standards are indeed appropriate for kindergarteners, and they are a big improvement over the kindergarten standards we had before.

-Jason Zimba

Myth: Common Core ignores research about early childhood education.

Fact: The Common Core is grounded in early childhood research - much more so than previous state standards.

Research on early learning strongly informed the development of the Standards. One important source was the 2009 report, [Mathematics Learning in Early Childhood: Paths Toward Excellence and Equity](#)ⁱ, developed by the National Research Council's Committee on Early Childhood Mathematics. Additional sources are listed in the Standards Bibliography beginning on page 91 of the Common Core Math Standards.

Despite what some critics say, research shows that the expectations are grade-level appropriate. In fact, states were already including many of these expectations prior to the Common Core. For example, some critics say it is unrealistic to expect kindergarten students to count to 100 as the Standards expect, or indeed, to count beyond 20. This is false. While it is true that many of the oldest state standards only expected kindergarten students to count to 20, more recent standards went higher, to "at least 20" or "at least 31" or up to 100 (see Washington, D.C., Georgia, Minnesota, Virginia, and Washington). This expectation is well supported by the [research](#)ⁱⁱ.

Myth: Early childhood experts and practitioners were excluded from the Common Core development process.

Fact: Practicing teachers, early childhood educator organizations, and researchers were included in the process.

- 1) Members of the Working Group and Feedback Group included:
 - Directors of state PreK–16 and PreK–20 programs, who were responsible for early elementary education in their states;
 - Current and former public school elementary teachers;
 - National experts on early childhood math education, including
 - o [Douglas Clements](#)ⁱⁱⁱ, a former kindergarten teacher, a SUNY Distinguished Professor and now Kennedy Professor of Early Childhood Learning and Director of the Marsico Institute of Early Learning and Literacy at the University of Denver;
 - o [Karen Fuson](#)^{iv}, Professor Emerita at Northwestern University, who researches children’s mathematical understanding and the classroom conditions that support it.
 - o The full roster of the Working and Feedback groups is [here](#)^v.
- 2) Input from experienced K–2 teachers was solicited and used to improve drafts of the Standards. For example, the connections between numbers and the quantities they name was improved thanks to the input of K–2 teachers who were part of a larger group convened by the American Federation of Teachers to provide feedback on an early draft. Also, in individual states, public school teachers were asked by state education agencies to contribute to reviews of preliminary drafts prior to adoption.

“Input from experienced K-2 teachers was solicited and used to improve drafts of the Standards.”

- 3) Experts in early childhood education from educator organizations also gave feedback on the public draft. This led to concrete changes in the final version. For example, the concept of a tens unit was moved from kindergarten to grade 1 in response to feedback from early childhood educators. When the public draft of the Standards was released for public comment, The National Association for the Education of Young Children and the National Association of Early Childhood Specialists in State Departments of Education issued a [joint statement](#)^{vi} saying that it was “fair and age appropriate for Kindergarten through 3rd grade.”

“...research suggests that children in classrooms with a stronger emphasis on literacy or math are more likely to engage in a higher quality of social-dramatic play.”

Myth: The Common Core prevents teachers from incorporating play into their classrooms.

Fact: ‘Math’ versus ‘Play’ is a false dichotomy.

Counting to 100 is an interesting case in point, because the count sequence is really a kind of song—you sing it. Learning the words to this song does take practice, but just as in other songs there are refrains and patterns: “sixty-nine, seventy...seventy-nine, eighty...eighty-nine, ninety.” This is, or ought to be, a playful kind of learning. And it’s important learning too, because it helps prepare students for success with place value concepts in first grade.

Math can be playful! And research suggests that children in classrooms with a stronger emphasis on literacy or math are more likely to engage in a higher quality of social-dramatic play. In one kindergarten textbook, Math Expressions, the initial work with numbers has an animals theme: the children make the cow sound 2 times (“moo, moo”), then they do the cow movement 2 times (swish-tail, swish-tail). It teaches what two of something is, and it does

so in an engaging, age-appropriate way. Later in the year, the children get to help “Puzzled Penguin” correct his hapless mistakes in counting and solving—my kids love this.

Researchers tend to think of “play-vs.-academics” as a false dichotomy altogether. See the articles here:

- [Play, mathematics, and false dichotomies.](#) By Douglas H Clements & Julie Sarama^{vii}
- [What is developmentally appropriate math?](#) By Douglas H Clements^{viii}

“Focusing on arithmetic in elementary grades is part of the Standards’ evidence-based design for keeping students on track to success in math.”

Myth: There is no evidence that learning arithmetic skills in early elementary school will benefit students.

Fact: Research links early number sense to positive outcomes later in school and later in life.

The Math Standards invest in number sense and operations for good reason. A [recent longitudinal study](#)^{ix} (Geary, 2013) shows how early number sense predicts later functional literacy, as measured by an instrument linked to future economic/life outcomes.

There is [similar research](#)^x from Jordan et al., cited in the bibliography to the Standards, showing how early number sense predicts overall math achievement in later grades. So focusing on arithmetic in elementary grades is part of the Standards’ evidence-based design for keeping students on track to success in math.

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