# **Virtual Kit: Mathematics**

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What do we know about young children and math? Recent research tells us that we have underestimated the ability of young children to do math, problem solve and reason. Traditionally, preschool math has been focused on skill-based instruction embedded within calendar time and centers. However, research is finding that it is not enough to simply weave mathematics into other activities. Time must be allotted for explicit math instruction during group time, which incorporates hands on manipulatives, and interaction by the children with the material presented, along with teacher supported follow-up and practice during play.

It is the follow-up and time to practice through play that is critical and helps children build their ideas, solidify their understanding and increase fluency in math. The time to practice and play with new ideas helps to move young children's learning past a given set of skills to a deeper conceptual understanding of mathematics (Cross C., Woods, H., & Schweingruber, H. 2009). It is important that we help children make connections to math through real world applications such as cooking and playing games that have number and set recognition as well as counting and problem solving.

We must also support children in making connections when teaching math in the context of other domains. For example, as they play house in the dramatic play area, the focus can become how many candles should be on the birthday cake to represent a person's age instead of just making a cake. Or at the block center, discussions could be centered on the size and shape of the creations.

Young children are born with an innate sensitivity to math, and they are naturally curious about it. Children love to learn by doing, and when teachers and caregivers provide environments rich in mathematical experiences, they have the ability to improve a young child's success, not only in math but also in a variety of areas across the curriculum. Early childhood math skills have been shown to be a very strong predictor of later achievement. This kit was designed to provide resources and information for professionals to guide them as they work to incorporate mathematics into their daily curriculum and ensure we are providing our young children with the appropriate instruction and support to build on their innate love of math, leading them to a conceptual understanding and creating a foundation for success for their future.

#### Show me now! (I need this information tomorrow)

* [NAEYC's Executive Summary on Early Childhood Mathematics: Promoting Good Beginnings](http://www.naeyc.org/files/naeyc/file/positions/Mathematics_Exec.pdf) (.pdf)
* [Where we stand: NAEYC and NCTM on Early Childhood Mathematics](http://www.naeyc.org/files/naeyc/file/positions/ecmath.pdf) (.pdf)
* [NIEER Policy Brief- Math and Science in Preschool: Policies and Practice](http://nieer.org/policy-issue/policy-brief-math-and-science-in-preschool-policies-and-practice)
* [Author Doug Clements explains why meaningful mathematics in the early grades is important.](https://www.youtube.com/watch?v=NVIXJRJEdmQ)

#### What does this look like in practice? (I have a little more time to read about this)

* [NAEYC'S complete position statement on Early Childhood Mathematics: Promoting Good Beginnings](http://www.naeyc.org/files/naeyc/file/positions/psmath.pdf) (.pdf)
* [NIEER Working Paper-Mathematics and Science in Preschool: Policy and Practice](http://nieer.org/research-report/nieer-working-paper-mathematics-and-science-in-preschool-policy-and-practice)
* [Mathematics In Young Children: What is it and How to Promote it.](http://www.srcd.org/sites/default/files/documents/22-1_early_childhood_math.pdf)
* [National Research Council's Mathematics Learning in Early Childhood: Paths Toward Excellence and Equity. Available as a free download](http://www.nap.edu/catalog.php?record_id=12519#toc)

#### What does ECRC have on this topic?

Clements, D. (2009). Learning and teaching early math: the learning trajectories approach. New York, NY:Rutledge.

Dougherty, B. (2010). Developing essential understanding of number and numeration for teaching mathematics in prekindergarten--grade 2. Reston, VA: National Council for Teachers of Mathematics.

Fuson, K. (2010). Focus in prekindergarten: teaching with curriculum focal Points. Washington, DC: NAEYC.

Ginsburg, H., Greenes, C., & Balfanz, R. (2003). Big math for little kids. Minneapolis, MN: Pearson Learning.

Koralek, D., (2003) Spotlight on young children and math. Washington, DC: NAEYC.

Moomaw, S. (2011). Teaching mathematics in early childhood. Baltimore, MD: Paul H. Brookes Pub. Co.

Richardson, K. (2008). Developing math concepts in pre-kindergarten. Bellingham, WA: Math Perspectives

Wilburne, J. (2011). Cowboys count, monkeys measure, and princesses problem solve: building early math skills through story books. Baltimore, MD: Paul H. Brookes Pub. Co.

Visit the [KITS Early Childhood Resource Center](http://opac.libraryworld.com/opac/home) for a complete listing.

#### How can I find training on this topic?

Visit theKITS online Collaborative Calendar to find out if there might be an upcoming training related to this topic.

#### What if I still need help?

You may request technical assistance from [KITS](mailto:kskits@ku.edu), just click here for contact information.

#### Evaluation

Please take a few minutes to complete a brief survey located on the Virtual Kits page on the website to let us know what you think about this virtual kit, and what other topics you would like to see addressed in the future.

#### Reference:

Cross, C., Woods, T., & Schweingruber, H. (Ed.) (2009). Mathematics learning in early childhood: paths toward excellence and equity. Washington, DC: The National Academies Press.