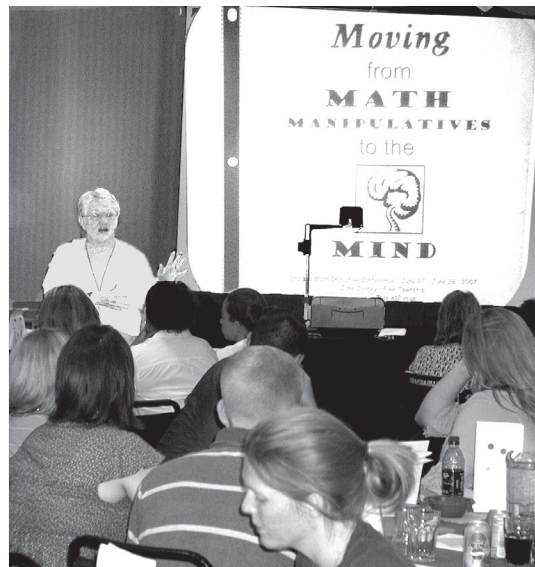


M⁴: Moving from Math Manipulatives to the Mind

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Audience: Elementary

The goal of this presentation was to share ideas about how to move mathematical understanding from concrete manipulatives to the abstract symbols of math. During this presentation, I tried to link the research base from the NCTM Standards for representation to practical tips that can be used to help make math real and make it stick with our students.

Always begin with the concrete representation before moving to the pictorial and finally to the abstract--this was the mantra for this presentation.

“It has been said that on the average we remember:

- 20% of what we read
- 30% of what we hear
- 40% of what we see
- 50% of what we say
- 60% of what we do
- 90 of what we see, hear, say, and do”

(from *Accelerated Learning for the 21st Century: The Six-Step Plan to Unlock Your Master Mind* by Colin Rose and Malcolm J. Nicholl, published in 1997 by Dell, NY).

Teachers were encouraged not to overlook the need for using concrete materials with students in the elementary grades. Conceptual understanding for most of the students in this age range is seldom achieved without first using concrete representation. A model for representation, the 2006–2007 NCTM’s Professional Development Focus for the Year, was shared. Representation refers to the many ways that students process math concepts, and then how they share what they have learned.

Students need a variety of tools and strategies modeled for them so that they can access their learning from multiple entry points. Successful students have available to them a variety of tools and strategies for representing mathematical ideas. Some of these are:

purchased manipulatives, number lines, Foldables (hands-on manipulatives designed by Dinah Zike, see www.dinah.com), body movements, and mnemonics. Ideas were shared for using this theory in practice within the context of *Everyday Math*. The participants were provided with pre-cut materials to make one handmade manipulative and websites to find others (see below). Also the teachers were given common objects and shown how they could be used to connect mathematical ideas.

Additional Resources:

“Representation—Show Me the Math!” by Francis (Skip) Fennell, from the September, 2006 NCTM news bulletin. Available online:

http://www.nctm.org/uploadedFiles/About_NCTM/President/2006_09pres.pdf
or <http://www.nctm.org/about/content.aspx?id=9500> .

“7 Must for Using Manipulatives” by Marilyn Burns. Available online:

<http://content.scholastic.com/browse/article.jsp?id=4003>.

Dinah Zike’s Big Book of Elementary Math K-6 (2003), published by Dinah-Might Adventures, LP, San Antonio, TX. (See also www.dinah.com.)

Websites:

<http://www.kathimitchell.com/mathfolder/mathpage.htm>. This website has manipulatives, games, and strategies from John A. Van de Walle and *Everyday Math*.

<http://mathcentral.uregina.ca/RR/database/RR.09.98/loewen2.html>.

This website has manipulatives for grades 4-6.

<http://mason.gmu.edu/~mmankus/Handson/manipulatives.htm>.

This site has manipulatives that you can print and cut.

<http://www.center.k12.mo.us/Edtech/everydaymath.htm>.

The Center School District has adopted the *Everyday Math* Series for grades K-5. This page lists resources relating to *Everyday Math*.

http://mathforum.org/library/resource_types/manipulatives/.

Math Forum — this site is a wealth of information and resources.

<http://matti.usu.edu/nlvm/nav/vlibrary.html>. National Library of Virtual Math

Manipulatives. This website has manipulatives for PreK to grade 12. They also include additional materials, including lesson plans and links to appropriate NCTM Standards.

<http://illuminations.nctm.org/>. NCTM Illuminations. This website also includes lesson for PreK to grade 12 and many additional materials.

http://www.ct4me.net/math_manipulatives.htm. Computing Technology for Math Excellence. This site includes some discussion about using virtual manipulatives in the classroom and lists several resources for online tools and virtual manipulatives.

www.explorelearning.com.

This online resource for science and math “Gizmos” provides a free 30-day trial.