Early Childhood Mathematics:  
Promoting Good Beginnings

A joint-position statement of the National Association for  
the Education of Young Children (NAEYC) and the National  
Council of Teachers of Mathematics (NCTM)

Recognizing and building on children's individual experiences and knowledge are central to effective early childhood mathematics education. While striking similarities are evident in the mathematical issues that interest children of different backgrounds, it is also true that young children have varying cultural, linguistic, home, and community experiences on which to build mathematics learning. To achieve equity and educational effectiveness, teachers must know as much as they can about such differences and work to build bridges between children's varying experiences and new learning.

Use curriculum and teaching practices that will strengthen children's problem-solving and reasoning processes as well as representing, communicating, and connecting mathematical ideas.

Problem solving and reasoning are the heart of mathematics. Teaching that promotes proficiency in these and other mathematical processes is consistent with national reports on mathematics education and recommendations for early childhood practice. While content represents the what of early childhood mathematics education, the processes—problem solving, reasoning, communication, connections, and representation—make it possible for children to acquire content knowledge. These processes develop over time and when supported by well-designed opportunities to learn.

Ensure that the curriculum is coherent and compatible with known relationships and sequences of important mathematical ideas.

In developing early mathematics curriculum, teachers need to be alert to children's experiences, ideas, and creations. To create coherence and power in the curriculum, however, teachers also must stay focused on the "big ideas" of mathematics and on the connections and sequences among those ideas.

The big ideas of vital understandings in early childhood mathematics are those that are mathe-
matically central, accessible to children at their present level of understanding, and generative of future learning. Research and expert practice indicate that certain concepts and skills are both challenging and accessible to young children. National professional standards outline core ideas in each of five major content areas: number and operations, geometry, measurement, algebra (including patterns), and data analysis. For example, the idea that the same pattern can describe different situations is a "big idea" within the content area of algebra and patterning.

Because curriculum depth and coherence are important, unplanned experiences with mathematics are clearly not enough. Effective programs also include intentionally organized learning experiences that build children's understanding over time. Thus, early childhood educators need to plan for children's involvement with mathematical ideas, including helping families extend and develop these ideas.

Provide for children's deep and sustained interaction with key mathematical ideas.

In some early childhood programs, mathematics makes only fleeting, random appearances. Other programs give mathematics adequate time in the curriculum but attempt to cover so many mathematical topics that the result is superficial and uninteresting to children. In a more effective third alternative, children encounter concepts in depth and in a logical sequence. Such depth and coherence allow children to develop, construct, test, and reflect on their mathematical understandings.

Integrate mathematics with other activities and other activities with mathematics.

Young children do not perceive their world as if it were divided into separate cubbyholes such as "mathematics" or "literacy." Likewise, effective practice does not limit mathematics to one specified period of time per day. Rather, early childhood teachers help children develop mathematical knowledge throughout the day and across the curriculum. Children's everyday activities can be used to develop important mathematical ideas.

Also important is weaving mathematics into children's experiences with literature, language, science, social studies, art, movement, music, and all parts of the classroom environment. There are books with mathematical concepts in the reading area, and clipboards and wall charts are placed where children are engaged in science observation and recording.

Provide ample time, materials, and teacher support for children to engage in play, a context in which they explore and manipulate mathematical ideas with keen interest.

Children become intensely engaged in play. Pursuing their own purposes, children tackle problems that are challenging enough to be engrossing yet not totally beyond their capabilities. Sticking with a problem—puzzling over it and approaching it in various ways—can lead to powerful learning. In addition, when several children grapple with the same problem, they often come up with different approaches, discuss, and learn from one another. These aspects of play tend to promote thinking and learning in mathematics and other areas.

Actively introduce mathematical concepts, methods, and language through a range of appropriate experiences and teaching strategies.

A central theme of this position statement is that early childhood curriculum needs to go beyond sporadic hit or miss mathematics. In effective programs, teachers make judicious use of a variety of approaches, strategies, and materials to support children's interest and ability in mathematics.

Besides embedding significant mathematics learning in play, classroom routines, and learning experiences across the curriculum, an effective mathematics program also provides carefully planned experiences that focus children's attention on a particular mathematical idea or set of related ideas.

Support children's learning by thoughtfully and continually assessing knowledge, skills, and strategies.

Assessment is crucial to effective teaching. Early childhood mathematics assessment is particularly useful when it aims to help young children by identifying their unique strengths and needs so as to inform teacher planning. Beginning with careful observation, assessment uses multiple sources of information that is gathered systematically over time—for example, a classroom book documenting the graphs made by children over several weeks. Mathematics assessment should follow widely accepted principles for varied and authentic early childhood assessment. ECT

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