
PART I

Here's the Story: Fundamental Components for Developing Number Sense Using Children's Literature

1 The Young Child and Mathematics

WHY MATHEMATICS FOR YOUNG CHILDREN?

Young children live in a world permeated with mathematics. When they play in the sandbox, pour water, sort forks and knives, build with blocks, count steps as they walk up stairs, collect leaves, and share their toys, they are measuring, sorting, counting, noticing shapes and patterns, and making fair shares. These everyday experiences along with their natural curiosity and enthusiasm for learning provide the foundation for children's mathematical development.

Besides the mathematics children experience everywhere in their lived world, their more formal mathematics, such as reasoning, problem solving, spatial visualization, identification of patterns and relationships are valued for further education and in society (Van de Walle, 2003). It is the gateway to many careers, such as medicine, engineering, architecture, computer science, economics, social sciences, and other areas not usually associated with mathematics, such as the fine arts and interior design.

Often children do not recognize that mathematics is all around them, but with adult support, they can come to appreciate that mathematics is a common human activity that plays a major role in their lives and helps them make sense of their lived world.

LEARNING MATHEMATICS IN THE EARLY YEARS

Preschool Years

It is during the preschool years that the foundation for mathematical development is established. Based on everyday experiences, formal and informal, children develop a rather complex set of informal ideas about numbers, patterns,

shapes, quantities, data, and size (National Council of Teachers of Mathematics [NCTM], 2000, p. 21). Kilpatrick, Swafford, and Findell (2001) confirm this by saying, “Starting from infancy and continuing throughout the preschool period, [children] develop a base of skills, concepts, and misconceptions” (p. 5). The informal mathematics that children experience in the early years is analogous to how they learn to speak. Just as one learns to talk—and spoken language is a foundation of reading—so one develops an informal mathematics that serves as the foundation for the more abstract mathematics they learn in school (Ginsburg & Baron, 1993, p. 3).

Early School Years

“At no time in schooling is cognitive growth so remarkable” (NCTM, 2000, p. 76) as during the first years of formal schooling, prekindergarten to Grade 2. In this regard, such growth in mathematics, as stated in the Learning Principle (NCTM, 2000), depends on the children learning mathematics with understanding, actively building new knowledge from experience and prior knowledge. They do this by building and extending on their informal mathematical learning and on their enthusiasm and curiosity from their preschool years. It is well recognized in the literature that children develop this understanding of mathematics by being actively involved, physically and mentally, in their own learning, trying “to make sense of methods and explanations they see or hear from others” (Yackel, Cobb, Wood, Wheatley, & Merkel, 1990, p. 13).