

the problem-posing strategy identified by Brown and Walter (1990). Children and teachers identify attributes of a story, ask what-if questions, and investigate those questions that are of highest interest. For example, in *The Doorbell Rang*, 12 children share 12 chocolate-chip cookies. If the number of children is changed or if there is more than one kind of cookie, children may investigate how the story would turn out differently. The children's results may be presented in drawings, stories, charts or graphs, drama, or manipulation of objects, all with an accompanying explanation of the math involved.

By participating in this process and posing their own questions and searching for solutions, children are empowered. "Engaging in this kind of problem generation helps learners to break the right-answer syndrome and demonstrates the infinite array of possible modifications" (Whitin & Wilde 1992, 16). Children gain great satisfaction and confidence when they tackle these often difficult and ill-defined problems (Katz & Chard 2000). Rather than simply applying the formula or algorithm taught in the day's math class, they thoughtfully apply skills to solve problems they find important (NCTM 2000). They see themselves as mathematicians. Understanding is deepened and new ideas are cre-

ated (Brown & Walter 1990). Teachers, along with the children, become creators of curriculum rather than abdicating decisionmaking to textbook publishers.

General suggestions

When using children's books in math class, teachers should keep the following in mind.

- **Read books first for pleasure.** Avoid immediately following the initial reading with activities. When children are continually asked to do an activity after reading a book, their desire to read and be read to can diminish, and they eventually may dread the introduction of any new book.

- **Choose activities that are open-ended,** encourage multiple responses, and allow children to use and do math for authentic purposes. Any activity that follows the reading of a book should grow natu-

Thoughtful inclusion of high-quality children's books in the math curriculum significantly enhances children's interest and leads to meaningful investigations.

rally from the book to questions or insight.

- **Look for both fictional and informational texts** in which the asking of mathematical questions enhances children's understanding, provides new perspectives, or in-

stills a skeptical attitude.

- **Model a sense of wonder.** Demonstrate how to ask questions, search for solutions, and represent findings. Use charts, graphs, timelines, cross-sections, diagrams, illustrations, drama, music, poems, stories, and written explanations to show results of investigations.

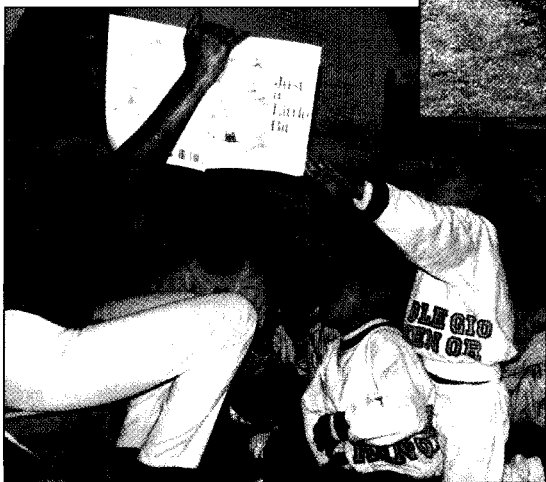
- **Beware of the use of KWL charts** (What do you Know? What do you Want to know or Wonder about? What have you Learned?). When children have little experience with a concept or topic, there is little they want to know. For them to know something or to have questions about a topic, they need experiences to draw upon (Helm & Katz 2001). Teachers often must introduce a new topic by providing new experiences. Only then can children ask meaningful questions that lead to interesting and productive investigations.

A cautionary note

Attention given to children's books by textbook publishers has resulted in a proliferation of trade books designed to be used across the curriculum. Unfortunately, publishers sometimes sacrifice the elements of good literature for elements they perceive to be highly marketable. As a result, many books are poorly written and illustrated, and others are merely workbooks in disguise. Such books, according to Austin, "distort the purpose of children's literature, are an insult to children's intelligence, and are potentially damaging



*Use of the book **Just a Little Bit for teaching balance provides children with the opportunity to live as well as learn mathematics***



to a child's motivation and interest in reading" (1998, 119).

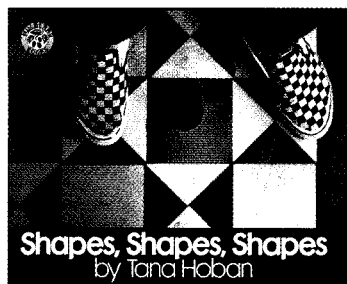
Books that force math content, such as *Just Enough Carrots* (Murphy 1997), *Mission Addition* (Leedy 1997), and *The M&M's Brand Chocolate Candies Counting Book*, are little more than collections of facts. In

the first story of *Mission Addition*, the children in Miss Prime's classroom try to solve the mystery of missing chocolate-chip cookies. They collect evidence and present it as sums; for example, one child's discovery of blond hairs is accompanied by a poster showing blond

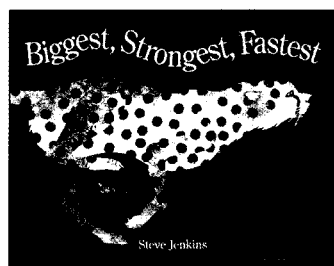
hairs and the sum $3 + 5 = 8$. The investigative nature of the story is sacrificed so that sums can be shown. To top it off, the story ends with a mathematics lesson: "The numbers you add together are called addends. The answer is the sum." And to cement the workbook

A Sampler of Math Books for Young Children

- Allen, P. 1982. *Who sank the boat?* New York: Putman & Grosset. (balance, capacity)
- Appelt, K. 1999. *Bats on parade.* New York: Morrow. (square numbers)
- Aubinai, M. 1996. *The farm.* Illustrations by J.F. Martin. New York: Abbeville. (size relationships)
- Baker, J. 1991. *Window.* New York: Greenwillow. (environmental awareness, change, growing up, timelines)
- Barry, D. 1994. *The rajah's rice.* New York: Freeman. (large numbers, powers of two)
- Bonsall, C. 1974. *And I mean it, Stanley.* New York: Harper & Row. (balance)
- Brett, J. 1987. *Goldilocks and the three bears.* New York: Dodd, Mead. (temperature, size)
- Briggs, R. 1970. *Jim and the beanstalk.* New York: Coward-McCann. (size comparisons, measurement)
- Brooks, A. 1996. *Frogs jump: A counting book.* New York: Scholastic. (counting)
- Burns, M. 1994. *The greedy triangle.* New York: Scholastic. (environmental shapes)
- Clement, R. 1991. *Counting on Frank.* Milwaukee: Gareth Stevens. (sense of wonder, estimation)
- Dee, R. 1988. *Two ways to count to ten.* New York: Henry Holt. (contests, finding alternatives, counting)
- Galdone, P. 1970. *The three little pigs.* New York: Clarion. (wind force)
- Hoban, T. 1986. *Shapes, shapes, shapes.* New York: Greenwillow. (geometric shapes)
- Hoban, T. 1998. *More, fewer, less.* New York: Greenwillow. (everyday experiences, comparisons)



- Hoose, P., & H. Hoose. 1998. *Hey, little ant.* Berkeley, CA: Tricycle. (ant behavior, size relationships)
- Hutchins, P. 1986. *The doorbell rang.* New York: Greenwillow. (division, sharing)
- Jenkins, S. 1995. *Biggest, strongest, fastest.* New York: Ticknor & Fields. (measurement, animal characteristics)
- Jonas, A. 1983. *Round trip.* New York: Greenwillow. (family trips, measurement, symmetry)
- Lester, H. 1988. *Tacky the penguin.* Boston: Houghton Mifflin. (penguin behavior and habitat)
- Machotka, H. 1991. *What neat feet!* New York: Morrow Junior. (animals, function of shapes)
- Machotka, H. 1992. *Breathtaking noses.* New York: Morrow Junior. (animals, function of shapes)
- McMillan, B. 1986. *Counting wildflowers.* New York: William Morrow. (numbers in the world around us)
- Merriam, E. 1995. *The hole story.* New York: Simon & Schuster. (what, where, and why of holes, geometric shapes)
- Most, B. 1984. *Whatever happened to the dinosaurs?* New York: Harcourt Brace Jovanovich. (hypotheses on dinosaur disappearance)
- Myller, R. 1990. *How big is a foot?* New York: Dell. (measurement, communication)
- Paul, A. 1991. *Eight hands round.* New



- York: HarperCollins. (traditions, quilting, geometric shapes)
- Rice, D. 1997. *Lifetimes.* Nevada City, CA: Dawn. (plant characteristics, animal behavior, measurement)
- Rylant, C. 1993. *The relatives came.* New York: Aladdin. (family vacations, visitors, measurement)
- Schwartz, D. 1999. *If you hopped like a frog.* New York: Scholastic. (measurement)
- Schwartz, D. 1993. *How much is a million?* New York: Mulberry. (large numbers, computations)
- Scieszka, J. 1995. *Math curse.* New York: Viking. (asking mathematical questions)
- Shields, C. 1997. *Saturday night at the dinosaur stomp.* Cambridge, MA: Candlewick. (dinosaur size and behavior)
- Spier, P. 1980. *People.* Garden City, NY: Doubleday. (multicultural connections, classifying human activities)
- Toft, K., & A. Sheather. 1998. *One less fish.* Watertown, MA: Charlesbridge. (counting, coral reef life, environment)
- Tompert, A. 1993. *Just a little bit.* Boston: Houghton Mifflin. (balance, fulcrum, animal weights)
- Trivas, I. 1988. *Emma's Christmas.* New York: Orchard. (counting and adding large numbers)
- Van Allsburg, C. 1988. *Two bad ants.* Boston: Houghton Mifflin. (insects, perspective, comparisons, measurement)
- Viorst, J. 1978. *Alexander, who used to be rich last Sunday.* New York: Atheneum. (money)
- Wood, A. 1985. *King Bidgood's in the bathtub.* New York: Harcourt Brace Jovanovich. (time, liquid measurement, volume, capacity)