



Developing Operations Sense

by Stephanie Sheffield

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*Stephanie Sheffield begins this lesson in her first-grade classroom by reading aloud Ann Jonas's book *Splash!* Each page shows what is above and below the water of a young girl's backyard pond. This girl narrates the story about animals jumping into and out of the pond and continually asks the reader, "How many are in my pond?" This lesson provides an opportunity for children to experience addition and subtraction situations with a focus on the actions of the operations as well as on computing answers. It appears in Stephanie's new book, *Teaching Arithmetic: Lessons for First Grade* (Math Solutions Publications, 2001).*



I gathered the children on the rug and read *Splash!* aloud. The children were delighted by the story, and they enjoyed keeping up with the total number of animals in the pond to answer the question on each page, "How many are in my pond?"

After reading the book, I had the students return to their desks and I distributed a piece of 6-by-9-inch blue construction paper to each child. I also placed a container of color tiles at each table. I had sorted the color tiles so that each container had only one color. I've found that when students have an assortment of colors, they sometimes try to assign particular colors to particular animals and then try to keep track of the colors as animals go in and out of the pond. Having children use just one color eliminates this possible confusion.

I told the children, "As I read this book you'll use the color tiles to keep track of the action in the story." I read each page of the book aloud, stopping after I read the question, "How many are in my pond?" For the first page, we had to rely on the picture to determine how many were in the pond. But after that, children listened to the story to decide how to move their tiles to figure out the answer. I read slowly enough for children to carry out one action before I read another, and also to watch for children who were having difficulty. I also watched to see the ways students dealt with figuring out how many were in the pond.

By the time I reached the middle of the book, the children were accustomed to putting in and taking out tiles for every sentence. Then I read, "The bird flies away." This always catches a few children, who remove a tile from the pond. But at least one child always says, "Wait a minute. The bird wasn't in the pond!"

Each time I've read this book to a class, the first thing they've wanted to do at the end is to read it again. They seem to enjoy the interactive experience of answering the questions on each page. As I reread the story, the students are more familiar with the story and how to move the tiles into and out of their ponds, and they focus more on the mathematics involved. After the second reading, I begin to ask questions to further focus them on the mathematical action in the story.

“On this page, are we adding to the pond, or subtracting?” I asked.

“First we add,” Melony said, “when the frog jumps in.”

“What happened next, Antoine?” I continued.

“Then the turtle stays in, so we don’t put any in or take any out,” he replied.

“The little girl climbs out last,” Lori said. “So that’s subtracting, because you’re taking away.”

After reading the book to the whole class several times, I made an audiotape of myself reading it, using a bell to signal when to turn the page. I placed this tape, along with construction paper and tiles, in the class listening center. I put the book there as well for children to refer to if they got stuck. At the center, the children could listen to the tape and keep up with the action with the color tiles, just as we did in the whole-class lesson, but they could also stop the tape and take time to answer the questions. If they got confused, they could rewind the tape and listen again. This task was available to my students during math choice time, but other teachers in my building used it during literacy station work time.