A TEACHER REFLECTS

Working with the fraction designs in Lesson 6 greatly helped my students; their knowledge of fractions became much more concrete. The grids helped them to understand the relationships among fractional parts. For example, students quickly found that $\frac{1}{2}$ of the grid had twice as many squares as did $\frac{1}{4}$. We talked about why this was so. One student said that it is "because one half is twice as big as one fourth."

What confused some was that the denominator of $\frac{1}{2}$ is *smaller* than that of $\frac{1}{4}$. This led to a discussion of how fractions differ from whole numbers. One student pointed out, "When the number on the bottom is bigger, the fraction is smaller." I found this discussion interesting in the ways in which it illuminated the sixth-grade mind. Students know that 4 is bigger than 2, so why wouldn't $\frac{1}{4}$ be bigger as well?

Lesson 6 also served to help students further their understanding of factors and least common multiples. For example, when they worked with a 4-by-6 grid, they were easily able to see that the rectangle could be divided into halves, thirds, fourths, sixths, eighths, twelfths, and twenty-fourths. When asked, "How about fifths?," Michelle replied that you can't do fifths because 24 is not divisible by 5. Alonso pointed out that you could divide the rectangle into 5 parts, but that each part would consist of both whole and partial squares. This led to a discussion about factors and least common multiples and how those concepts relate to computation of fractions. We revisited this discussion frequently for the remainder of the unit.

As we finished Lesson 6, my students were showing such good understanding of fractional areas that I was able to have them look ahead briefly at adding and subtracting fractions. Looking at a 3-by-4 grid rectangle, they could easily see that $\frac{1}{4} + \frac{1}{2}$ was equal to 9 squares, which was $\frac{9}{12}$ of the whole rectangle. Many of the students were than able to reduce $\frac{9}{12}$ to $\frac{3}{4}$. Similarly, students were able to use the grid to find the answer to $\frac{1}{4} - \frac{1}{6}$ because 3 squares minus 2 squares was 1 square, or $\frac{1}{12}$ of the whole rectangle.

The card game in Lesson 9 was a lot of fun for my students. As more of a challenge, I had students try the game with the cards in a face-down stack. When they needed an even greater challenge, I had them double their stacks of cards by creating new cards that could be inserted *between* pairs of cards in their ordered, original sets. This took a bit of time and required quite a bit more thought.