

## EDUCATION

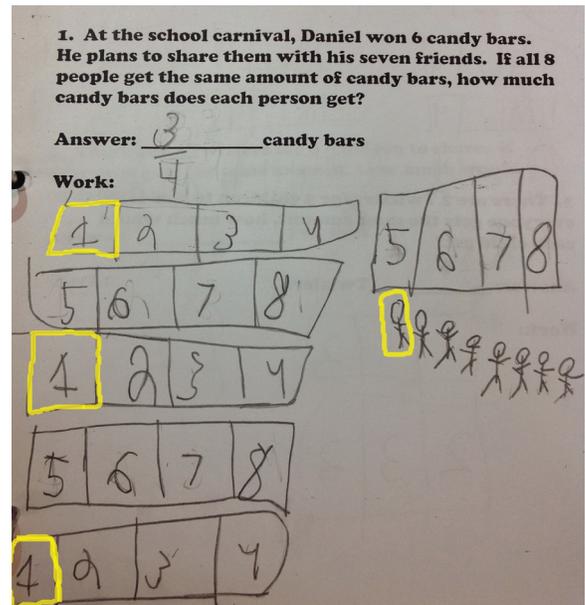
### Thinking Strategies Used by Third Graders When Solving Fair-Sharing Problems with Fractions

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What thinking strategies do third graders use to solve fair-sharing word problems? Through understanding students' thinking strategies, teachers can construct lessons that can accommodate students' various levels of knowledge. For our research, we observed third grade students at different levels of understanding as they worked collaboratively to solve fair-sharing word problems. Using an iPad, we captured the students' work, small group discussions with their peers and teacher, as well as the whole class discussion. Based on our analysis of the collected data, we found that students worked best when pictures of shapes were provided for them to use to solve the fair-sharing problems. Additionally, we found that the picture representations gave us a better idea of what each student understood. The students who used consistent methods for each problem and were able to explain their work showed more progress through the study. By the end of the experiment, these students broke the wholes into portions, distributed the equal portions, and then recombined the distributed portions into wholes when possible. They answered with appropriate mixed numbers. Other students would break apart the wholes and distribute the pieces equally, giving them an improper fraction, or they would distribute the wholes and only portion what could not be distributed, giving them a mixed number. The students' picture representations gave us insight into how they approached

these problems. We can use this insight to assess our students better and give support where it is most needed.

*Research advisors Gayle Millsaps and Diana Underwood say, "By observing third grade students solving fair-sharing problems over time, Jacqueline and Nicole documented that students' pictorial representations provide teachers with important insights into students' rational number reasoning. In particular, students' interpretations of their own pictures can be indicators of their rational number development."*



Examples of a student's work, showing how he portioned the wholes into equal pieces and then distributed the pieces equally between each person in the word problem.

Campos, J., & Gonzalez, N. (2013). Thinking strategies used by third graders when solving fair-sharing problems with fractions. *Journal of Purdue Undergraduate Research*, 3, 82. <http://dx.doi.org/10.5703/1288284315148>