

ZMATH 2010c.00298

Moseley, Bryan; Okamoto, Yukari

Identifying fourth graders' understanding of rational number representations: A mixed methods approach.

Sch. Sci. Math. 108, No. 6, 238-250 (2008).

Summary: This study examined average-, high- and top-performing US fourth graders' rational number problem solving and their understanding of rational number representations. In phase one, all students completed a written test designed to tap their skills for multiplication, division and rational number word-problem solving. In phase two, a subset of students sorted cards that showed part-whole, ratio, quotient, measure, and operator perspectives of rational number representations. Each perspective was shown in numerical notational, word-problem, and visual formats. The results indicated that top-performing students scored significantly higher in problem solving and showed more effectively linked rational number representations than the other groups. The results imply that successful rational number problem solving is intertwined with representational knowledge for a wide range of rational numbers and that the bulk of US students do not possess effective skills for working with rational number representations. (ERIC)

Classification: F42 D62

Keywords: rational numbers; problem solving; grade 4; numeracy; concept formation; student evaluation; word problems; knowledge level; mathematics skills

doi:10.1111/j.1949-8594.2008.tb17834.x