

## **Moving from arithmetic to algebra: changes in meaning for processes and concepts**

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### **Abstract**

This talk will discuss the transitions in thinking about symbolism in arithmetic and algebra that occur in the curriculum in the middle years of compulsory schooling (around age 11-13). I shall consider how the symbols have different kinds of meaning that are easy for some but cause subtle difficulties for many, from the calculations of whole number arithmetic, fractions, and the manipulations of early algebra, including major changes of meaning in dealing with algebraic expressions and particularly with powers. I shall show how these conceptual changes are part of a wider theory of symbols as procepts (a term referring to a symbol that operates dually as process and concept, developed in collaboration with Eddie Gray).