

Early Algebra, Early Arithmetic

Principal Investigator: [David Carraher](#)

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Website: <http://ase.tufts.edu/education/earlyalgebra/default.asp>

Early Algebra is an approach to early mathematics teaching and learning. It includes many topics in arithmetic, such as the four operations, but it does so in novel ways. Consider the operation of addition. By second grade most students know how to add 3 to another number. But they probably have not been asked to consider expressions such as " $n + 3$ ", where n might refer to any number. As surprising as it may seem, we are finding that young learners from typical public schools can understand such expressions and use them to describe relations among numbers and quantities. In doing so they go beyond computational fluency: they begin to develop the ability to make mathematical generalizations using algebraic notation.

Early algebra does not aim to increase the amount of mathematics students must learn. Rather, it is about teaching time-honored topics of early mathematics in deeper, more challenging ways. We have good reason to suspect that children who become familiar with algebraic concepts and tools from an early age and in meaningful contexts will do better in mathematics, regardless of the criteria used.

Early Algebra is also an area of research. The research from our project and others should help to clarify what works and what does not work. But more importantly, it should help to clarify the issues young learners inevitably face when they attempt to apply their present modes of representation and reasoning to new circumstances--and to reconcile their prior knowledge and experience with new ideas and concepts being introduced in Mathematics classes. And it should help to identify fruitful types of learning activities for educators and curriculum developers.