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ALGEBRA WITH REAL DATA

Modelling the behaviour of real things with algebraic functions is fundamental to applications of mathematics. Using real data to teach about functions is therefore important in the curriculum, and can also be highly motivating for students. Moreover, new devices (such as data loggers) and new communications technologies (such as the internet) provide new opportunities for bringing real data into the classroom. Questions such as the following arise:

- What new opportunities for using real data have proved to be successful and how do they relate to research on students' learning of functions and other algebraic concepts?
- What are the strengths and weaknesses of using real data and how are these best managed in the classroom and in the curriculum?
- A commitment to using real data may lead to significant changes in curriculum content and sequence, for example by giving prominence to the exponential function over the quadratic. What changes may be required and what are their consequences?
- Interpreting real data can lead students and teachers to question why the world is as it is. What is the role of algebra education in the development of critical thinking about social issues such as economics, health and environment?

USING THE HISTORY OF ALGEBRA

The history of algebra has been used extensively to identify epistemological obstacles in the learning of algebra and to characterise ruptures in the development of algebraic notions. Drawing on the history (or histories) of algebra from around the world, this section aims to analyse significant contributions and the value of these previous uses and also to reflect on possible avenues for research based on new areas, including:

- the history of symbolism; that is, the history of ways of representing quantities and operations in calculations;
- the history of methods for solving problems;
- the history of methods for solving equations;
- the history of the interactions of algebra with other mathematical domains (such as geometry); and
- the development of the idea of algebraic structures.