

## LEARNING and TEACHING POINTS

### for Chapter 20 Algebra

If you introduce older primary children to the use of letters to express general statements emphasize the idea that a letter in algebra stands for 'whatever number is chosen', that is, a variable.

The *What's my rule?* game can be used in simple examples with quite young children to introduce them to algebraic thinking through making generalizations in words. Use the game with older, more able children to express their generalizations in symbols.

Avoid the fruit-salad approach to explaining algebraic statements, for example, referring to  $3a$  as '3 apples' and  $5b$  as '5 bananas', or anything that reinforces the ideas that the letters stand for objects or specific numbers.

Encourage children to tabulate results from investigations, to enable them to find and articulate patterns in the sequence of numbers obtained.

Reinforce through your own language the idea that the equals sign means 'is the same as', even in the early stages of recording the results of calculations.

Take children through this procedure, allowing children of differing abilities to reach different stages: tabulate results in an orderly fashion; articulate the up-and-down rule; check this with a few more results; predict the result for a big number, such as 100; articulate the left-to-right rule in words; check this on some results you know; and, for the most able children, express the left-to-right rule in symbols.

Use the question, 'What is the calculation you would enter on a calculator to solve this problem?', to help make the underlying structures of problems explicit (see Chapters 7 and 10).

Do not worry about precedence of operators when doing number work: the context giving rise to the calculation will determine the appropriate sequence of operations. The need to make this principle explicit arises when algebraic notation is introduced. Explain the different systems used by various calculators, and show how brackets can be used to make clear which operation has to be done first.

Entering formulas into cells in a spreadsheet is a powerful introduction for children to algebraic notation and conventions.

Use trial and improvement methods, with a calculator or a spreadsheet, to solve equations arising from practical or numerical problems, to reinforce the idea of a variable.