

## Working Mathematically in Algebra at Stage 4

### PAS 4.1 Algebraic techniques

- B generate a variety of equivalent expressions that represent a particular situation or problem
- A describe relationships between the algebraic symbol system and number properties
- B link algebra with generalised arithmetic
- B determine equivalence of algebraic expressions by substituting a given number for the letter

### PAS 4.2 Number patterns

- A ask questions about how number patterns have been created and how they can be continued
- A generate a variety of number patterns that increase or decrease and record them in more than one way
- A model and then record number patterns using diagrams, words and algebraic symbols
- A check pattern descriptions by substituting further values
- A describe the pattern formed by plotting points from a table and suggest another set of points that might form the same pattern
- A describe what has been learnt from creating patterns, making connections with number facts and number properties
- A play 'guess my rule' games, describing the rule in words and algebraic symbols where appropriate
- A represent and apply patterns and relationships in algebraic forms
- B explain why a particular relationship or rule for a given pattern is better than another
- A distinguish between graphs that represent an increasing number pattern and those that represent a decreasing number pattern
- A determine whether a particular number pattern can be described using algebraic symbols

### PAS 4.3 Algebraic techniques

- B determine and justify whether a simplified expression is correct by substituting numbers for letters
- B check expansions and factorisations by performing the reverse process
- A interpret statements involving algebraic symbols in other contexts
- B explain why a particular algebraic expansion or factorisation is incorrect

### PAS 4.4 Algebraic techniques

- A compare and contrast different methods to solve a range of linear equations
- A create equations to solve a variety of problems, clearly stating the meaning of introduced letters as 'the number of ...', and verify solutions
- B use algebraic techniques as a tool for problem solving
- B construct formulae for finding areas of common geometric figures
- B determine equations that have a given solution
- B substitute into formulae used in other strands or in KLA's and interpret the solutions
- B describe the process of solving simple inequalities and justifying solutions

### PAS 4.5 Linear relationships

- A relate the location of points on a number plane to maps, plans, street directories and theatre seating and note the different recording conventions
- A compare similarities and differences between sets of linear relationships
- A sort and classify equations of linear relationships into groups to demonstrate similarities and differences
- A question whether a particular equation will have a similar graph to another equation and graph the line to check
- A recognise and explain that not all patterns form a linear relationship
- A determine and explain differences between equations that represent linear relationships and those that represent non-linear relationships
- B explain the significance of the point of intersection of two lines
- A question if the graphs of all linear relationships that have a negative  $x$  term will decrease
- A reason and explain which term affects the slope of a graph, making it either increasing or decreasing
- B use a graphics calculator and spreadsheet software to graph and compare a range of linear relationships