

## Achievement band 135–144

### Number and algebra

#### *Whole number operations*

Students in this band typically are able to work flexibly with all four operations with multi-digit numbers and integers (including negative numbers). They recognise the inverse property of the addition/subtraction and multiplication/division operations and are able to use these efficiently to solve problems. They are also typically able to employ the associative and distributive laws to identify equivalent expressions.

#### *Fractions and decimals*

Students in this band typically are able to interpret and use complex ideas of place value in decimal numbers, including by rounding to a given degree of precision, ordering decimal numbers and representing these on a number line. They are also able to identify and use an appropriate formulation to carry out arithmetic operations with fractions, decimals and percentages, and use proportional reasoning in contexts with more than two variables.

#### *Money and financial mathematics*

Students are typically able to work out the size of a percentage reduction given the original price and the sale price.

#### *Patterns and algebra*

Students in this band typically are able to recognise and use a simple non-linear relationship (for example, a quadratic sequence expressed in a table of values). They can formulate algebraic expressions to represent relationships in real-life problem situations (for example, formulae for area and volume calculations). They can use knowledge of number properties (for example, commutative, associative and distributive laws) to manipulate linear algebraic expressions, equations and inequations (for example, to expand, factorise, simplify, substitute and solve). They can interpret graphical representations of functional relationships derived from familiar contexts (for example, find the distance travelled in a given time from a distance–time graph).

### Measurement and geometry

#### *Measurement*

Students in this band typically are able to use measures expressed as rates, ratios and proportions in a range of contexts (for example, speed, fuel consumption, scale factors in maps and similar figures). They can also apply spatial reasoning and knowledge of properties of shapes and objects (for example, perimeter, area, surface area and volume) with irregular and compound shapes in a range of contexts.

#### *Geometry*

Students in this band typically are able to recognise and use the angle relations in polygons, and with lines and points in a plane. They can also derive and recognise trigonometric ratios (for example, in unit circle and in right-triangles) and apply shape transformations (that is, reflection, rotation, translation and enlargement/reduction) to compound shapes and packaging design (for example, where specific markings on a net need to be matched with specific faces on a folded box). They can also apply spatial reasoning and knowledge of properties of shapes and objects (for example, relationships between side-length, and relationships between angles, and similar and congruent figures).

### Statistics and probability

#### *Statistics*

Students in this band typically can retrieve data from a variety of statistical representations, including line graphs, box plots, stem-and-leaf plots, segmented (stacked) column graphs, frequency tables of grouped data and two-way tables. They can calculate and use the mean, median and mode for ungrouped data in a variety of contexts. They can also compare two sets of data to solve problems or draw conclusions.

#### *Probability*

Students in this band typically are able to use a wide range of techniques such as tree diagrams, Venn diagrams and two-way tables to represent and explore possible outcomes of chance events and experiments, including compound events.