



Sequences

Students develop fluency and reasoning skills through recognising, describing and continuing numerical and pictorial sequences. Learning focuses on identifying patterns, comparing linear and non-linear sequences, and using mathematical vocabulary to describe relationships between terms. Students explore arithmetic, geometric and other non-linear sequences, including finding missing terms and identifying common differences. Formal exploration of n th terms is introduced in Year 8 Summer Block 5. Concrete and pictorial representations are recommended throughout to support reasoning, discussion and pattern spotting before moving towards more abstract representations.

National curriculum links

- Generate terms of a sequence from either a term-to-term or a position-to-term rule
- Recognise arithmetic sequences
- Recognise geometric sequences and appreciate other sequences that arise

Small steps

Step 1 Describe and continue sequences

Step 2 Find the next term(s)

Step 3 Linear and non-linear sequences

Step 4 Continue linear sequences

Step 5 Continue non-linear sequences

Step 6 Term-to-term rules

Step 7 Find missing terms (E)

Year 7 Autumn Term Block 2 Algebraic notation and substitution



Algebraic notation and substitution

Students are introduced to algebraic notation through function machines, substitution and inverse operations. Emphasis is placed on understanding variables, expressions and correct notation, alongside developing fluency in interpreting and forming algebraic expressions. Students move from numerical to algebraic representations, working with one-step and two-step function machines to develop understanding of how algebra can represent general mathematical relationships.

National curriculum links

- Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative
- Recognise and use relationships between operations including inverse operations
- Use a calculator and other technologies to calculate results accurately and then interpret them appropriately
- Use and interpret algebraic notation, including: ab in place of $a \times b$; $3y$ in place of $y + y + y$ and $3 \times y$; a^2 in place of $a \times a$; a^3 in place of $a \times a \times a$; a^2b in place of $a \times a \times b$; $\frac{a}{b}$ in place of $a \div b$ coefficients written as fractions rather than decimals; brackets
- Substitute numerical values into formulae and expressions, including scientific formulae

Small steps

Step 1 1-step function machines (number)

Step 2 1-step function machines (algebra)

Step 3 Find a function (one step)

Step 4 Substitution (one step)

Step 5 2-step function machines (number)

Step 6 2-step function machines (algebra)

Step 7 Find a function (two step)

Step 8 Substitution (two step)



Expressions and equations

Students develop understanding of equality and equivalence before progressing to simplifying expressions and solving equations. Teaching focuses on interpreting the equals sign correctly, identifying like and unlike terms, and simplifying expressions by collecting like terms while maintaining equivalence. Students then apply inverse operations to solve one-step and two-step equations using a range of concrete, pictorial and abstract representations to support conceptual understanding.

National curriculum links

- Understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors
- Use and interpret algebraic notation, including: ab in place of $a \times b$; $3y$ in place of $y + y + y$ and $3 \times y$; a^2 in place of $a \times a$; a^3 in place of $a \times a \times a$; a^2b in place of $a \times a \times b$; $\frac{a}{b}$ in place of $a \div b$ coefficients written as fractions rather than decimals; brackets
- Recognise and use relationships between operations including inverse operations
- Simplify and manipulate algebraic expressions to maintain equivalence by: collecting like terms; multiplying a single term over a brackets; taking out common factors; expanding products of two or more binomials

Small steps

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|--------|------------------------------|
| Step 1 | Equality and equivalence |
| Step 2 | Related facts |
| Step 3 | Like and unlike terms |
| Step 4 | Collect like terms |
| Step 5 | Solve 1-step equations (+/−) |
| Step 6 | Solve 1-step equations (×/÷) |
| Step 7 | Solve 2-step equations |

Year 7 Autumn Term Block 4 Place value, ordering and rounding



Place value, ordering and rounding

Students develop fluency and confidence with place value through reading, writing, comparing and ordering integers and decimal numbers. Teaching focuses on understanding the value of digits within a number, using place value charts and number lines to support reasoning about magnitude, intervals and position. Students apply this understanding when comparing and ordering numbers, interpreting decimal place value and rounding to different degrees of accuracy, including powers of 10, integers and decimal places. Work on positioning numbers accurately on number lines also lays important foundations for later learning with scales, coordinates and graph axes. Extend steps introduce powers of 10 and standard form, helping students make connections between place value and the representation of very large and very small numbers. Concrete, pictorial and contextual representations are used throughout to develop conceptual understanding, mathematical language and accuracy.

National curriculum links

- Understand and use place value for decimals, measures and integers of any size
- Order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols $=$, $\neq$, $<$, $>$, $\leq$, $\geq$
- Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures]
- Use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations
- Interpret and compare numbers in standard form $A \times 10^n$ $1 \leq A < 10$, where n is a positive or negative integer or zero

Small steps

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|---------|--|
| Step 1 | Write integers in numerals and words |
| Step 2 | Intervals on a number line |
| Step 3 | Compare and order integers |
| Step 4 | Place value for decimals |
| Step 5 | Decimals on a number line |
| Step 6 | Compare and order decimals |
| Step 7 | Round to powers of 10 |
| Step 8 | Round to the nearest integer |
| Step 9 | Round to decimal places |
| Step 10 | Powers of 10 (E) |
| Step 11 | Numbers greater than 1 in standard form (E) |
| Step 12 | Negative powers of 10 (E) |
| Step 13 | Numbers between 0 and 1 in standard form (E) |



Four operations

Students develop fluency and confidence with the four operations through a progression from integer calculations to working with decimals and more complex operations. Teaching focuses on developing conceptual understanding alongside formal written methods, using place value charts, counters, bar models and mathematical discussion to support reasoning and accuracy. Students build understanding of place value through multiplying and dividing by powers of 10, before applying this knowledge to decimal calculations and problem solving. Emphasis is placed on selecting efficient calculation strategies, estimating and checking answers using inverse operations, and understanding the structure of calculations through the order of operations. Extend steps deepen understanding of multiplication and division with decimals, helping students make connections between place value, equivalence and proportional reasoning.

National curriculum links

- Understand and use place value for decimals, measures and integers of any size
- Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative
- Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and $\frac{7}{2}$ or 0.375 and $\frac{3}{8}$)
- Interpret fractions and percentages as operators

Small steps

Step 1

Add and subtract integers

Step 2

Add and subtract decimals

Step 3

Multiply and divide by 10, 100 and 1000

Step 4

Multiply by 0.1 and 0.01 (E)

Step 5

Multiply integers

Step 6

Divide integers

Step 7

Multiply decimals

Step 8

Divide decimals by integers

Step 9

Divide by a decimal (E)

Step 10

Order of operations



Averages and range

Students develop understanding of averages and range through calculating, interpreting and comparing different measures from a range of data sets. Teaching focuses on understanding the purpose of averages and recognising the similarities and differences between the mean, median, mode and range. Concrete resources and real-life contexts support understanding, helping students make connections between numerical calculations and the data they represent. Students calculate the mean, median, mode and range, identify these measures from data presented in a variety of forms, and solve problems involving missing values.

National curriculum links

- Describe, interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of central tendency (mean, mode, median) and spread (range, consideration of outliers)

Small steps

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| Step 1 | Mode |
| Step 2 | Mean |
| Step 3 | Median |
| Step 4 | Range |
| Step 5 | Solve problems with averages and range |



Rounding and estimation

Students develop understanding of rounding and estimation through rounding numbers to significant figures and using approximation to estimate answers to calculations and problems. This block builds on earlier work with place value and the four operations, as students apply their understanding of digit value, ordering and calculation strategies when rounding and estimating. Teaching focuses on identifying significant figures accurately, understanding when estimates are overestimates or underestimates, and recognising when estimation is useful for checking whether answers are reasonable. Number lines, mathematical discussion and contextual problems are used throughout to support conceptual understanding and develop fluency with approximation and accuracy. The block culminates in solving estimation problems in a variety of contexts, encouraging students to reflect on the suitability and reasonableness of their estimates. The extend step introduces error interval notation and upper and lower bounds, building on students' understanding of rounding and inequalities.

National curriculum links

- Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures]
- Use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation $a < x \leq b$

Small steps

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|--------|--|
| Step 1 | Round to 1 significant figure |
| Step 2 | Round to 2 or more significant figures |
| Step 3 | Estimate answers to calculations |
| Step 4 | Solve problems with estimation |
| Step 5 | Understand and use error interval notation (E) |



Graphing data

Students develop understanding of how data can be represented and interpreted through a range of graphs and charts. This block builds on earlier work with place value and averages, as students apply their understanding of scales, intervals and accurate plotting when constructing and interpreting graphs. Teaching focuses on drawing and interpreting graphical representations, including pictograms, bar charts, scatter graphs and time series graphs. Mathematical discussion and contextual data are used throughout to support reasoning and develop fluency with statistical vocabulary and graphical conventions, including accurate labelling, scales and keys. Students interpret and compare data, describe correlations and draw lines of best fit to identify patterns and make estimates. The block culminates in exploring linear and non-linear relationships, helping students recognise how graphs can represent different types of relationships between variables.

National curriculum links

- Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data
- Work with coordinates in all four quadrants
- Describe simple mathematical relationships between two variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs
- Interpret mathematical relationships both algebraically and graphically

Small steps

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|---------|-----------------------------------|
| Step 1 | Pictograms |
| Step 2 | Bar charts |
| Step 3 | Dual bar charts |
| Step 4 | Composite bar charts |
| Step 5 | Coordinates in the first quadrant |
| Step 6 | Scatter graphs |
| Step 7 | Correlation |
| Step 8 | Lines of best fit |
| Step 9 | Time series graphs |
| Step 10 | Non-linear relationships |

Year 7 Spring Term Block 2 Fractions, decimals and percentages



Fractions, decimals and percentages

Students develop an understanding of fractions, decimals and percentages through representations, number lines and equivalence. This block builds on earlier work with place value and fractions, as students connect different forms and move fluently between them. Teaching focuses on understanding relationships between representations, comparing and ordering values, and interpreting fractions as both numbers and division. Visual models, number lines and mathematical discussion are used throughout to support conceptual understanding and develop fluency with conversion and equivalence. The extend step explores fractions, decimals and percentages greater than 1, building on students' understanding of equivalence and conversion.

National curriculum links

- Define percentage as “number of parts per hundred”, interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express one quantity as a percentage of another, compare two quantities using percentages, and work with percentages greater than 100%
- Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and $\frac{7}{2}$ or 0.375 and $\frac{3}{8}$)
- Understand and use place value for decimals, measures and integers of any size
- Interpret fractions and percentages as operators
- Order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols $=$, $\neq$, $<$, $>$, $\leq$, $\geq$
- Understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction

Small steps

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|---------|--|
| Step 1 | Represent tenths and hundredths |
| Step 2 | Number lines with fractions and decimals |
| Step 3 | Tenths, hundredths, fifths and quarters |
| Step 4 | Eighths and thousandths |
| Step 5 | Understand percentages |
| Step 6 | Convert simple fractions, decimals and percentages |
| Step 7 | Fractions as diagrams |
| Step 8 | Fractions on a number line |
| Step 9 | Equivalent fractions |
| Step 10 | Compare and order fractions |
| Step 11 | Fractions as division |
| Step 12 | Convert fractions, decimals and percentages |
| Step 13 | Fractions, decimals and percentages greater than 1 (E) |



Directed number

Students develop understanding of directed numbers through representations, calculations and problem solving with positive and negative values. This block builds on earlier work with number lines, ordering, four operations and the order of operations, as students compare, order and calculate with directed numbers in a range of contexts. Teaching focuses on developing conceptual understanding through number lines, zero pairs and double-sided counters, helping students make sense of calculations that cross zero and the relationships between positive and negative numbers. Students explore addition, subtraction, multiplication and division with directed numbers, before applying the order of operations and calculator methods to more complex calculations.

National curriculum links

- Order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols $=$, $\neq$, $<$, $>$, $\leq$, $\geq$
- Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative
- Use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals

Small steps

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|--------|---|
| Step 1 | Directed number and number lines |
| Step 2 | Compare and order directed numbers |
| Step 3 | Calculations that cross zero |
| Step 4 | Directed number and zero pairs |
| Step 5 | Add directed numbers |
| Step 6 | Subtract directed numbers |
| Step 7 | Multiply and divide directed numbers |
| Step 8 | Order of operations with directed numbers |
| Step 9 | Use a calculator with directed numbers |

Year 7 Spring Term Block 4 Fractions and percentages of amounts



Fractions and percentages of amounts

Students develop an understanding of fractions and percentages as operators through calculating fractions and percentages of amounts and solving problems in context. This block builds on earlier work with fractions, equivalence and the four operations, as students find parts and wholes using proportional reasoning. Teaching focuses on using bar models and representations to support conceptual understanding, helping students connect fractions, percentages and their equivalent forms. Students explore non-calculator and calculator methods, percentage increase and decrease, and finding the whole from a given fraction or percentage. The extend steps introduce percentages and fractions greater than 1, building on students' understanding of equivalence, scaling and proportional relationships.

National curriculum links

- Interpret fractions and percentages as operators
- Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative
- Define percentage as “number of parts per hundred”, interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express one quantity as a percentage of another, compare two quantities using percentages, and work with percentages greater than 100%
- Solve problems involving percentage change, including: percentage increase, decrease and original value problems and simple interest in financial mathematics

Small steps

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|--------|--|
| Step 1 | Fraction of an amount |
| Step 2 | Use a fraction to find the whole |
| Step 3 | Percentage of an amount (non-calculator) |
| Step 4 | Percentage of an amount (calculator) |
| Step 5 | Percentage increase and decrease |
| Step 6 | Use a percentage to find the whole (E) |
| Step 7 | Solve problems with fractions and percentages greater than 1 (E) |



Perimeter and area

Students develop an understanding of perimeter and area through calculating and solving problems with a range of 2-D shapes. This block builds on earlier work with the four operations and rounding, as students apply calculation strategies when working with measures and geometric problems. Teaching focuses on unit conversion, deriving and using formulae for rectangles, parallelograms, triangles and trapezia. Diagrams, grids and mathematical discussion support students in identifying perpendicular height, unknown lengths and efficient strategies when solving problems. Students apply their understanding to compound shapes and contextual problems involving perimeter and area. The extend step introduces forming algebraic expressions for perimeter and area, building on students' understanding of algebraic notation and simplifying expressions.

National curriculum links

- Change freely between related standard units [for example, time, length, area, volume/capacity, mass]
- Derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia, volume of cuboids (including cubes) and other prisms (including cylinders)
- Calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes
- Model situations or procedures by translating them into algebraic expressions or formulae and by using graphs
- Understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors

Small steps

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|--------|--|
| Step 1 | Convert metric units of length |
| Step 2 | Perimeter of a polygon |
| Step 3 | Perimeter of a compound shape |
| Step 4 | Area of rectangles and parallelograms |
| Step 5 | Area of a triangle |
| Step 6 | Area of a trapezium |
| Step 7 | Solve problems with perimeter and area |
| Step 8 | Form expressions with perimeter and area (E) |



Speed, distance and time

Students develop an understanding of speed, distance and time through unit conversion, calculation and interpreting journeys in context. This block builds on earlier work with the four operations and graphs, as students apply calculation strategies when working with compound measures. Teaching focuses on converting between units of time, interpreting tables and timetables, and understanding the relationships between speed, distance and time through representations such as bar models, number lines and distance–time graphs. Students solve problems involving average speed, distance and time in a range of contexts, while developing fluency with compound units and graphical interpretation. The extend step introduces calculating speed from distance–time graphs, building on students’ understanding of graphs and rates of change.

National curriculum links

- Use standard units of mass, length, time, money and other measures, including with decimal quantities
- Change freely between related standard units [for example, time, length, area, volume/capacity, mass]
- Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data
- Use compound units such as speed, unit pricing and density to solve problems
- Model situations or procedures by translating them into algebraic expressions or formulae and by using graphs
- Interpret mathematical relationships both algebraically and graphically

Small steps

Step 1

Convert between milliseconds, seconds, minutes and hours

Step 2

Convert between hours, days and years

Step 3

Solve problems with tables and timetables

Step 4

Solve problems with time and the calendar

Step 5

Calculate speed

Step 6

Calculate time and distance

Step 7

Solve problems with speed, distance and time

Step 8

Interpret distance-time graphs

Step 9

Draw distance-time graphs

Step 10

Calculate speed from a distance-time graph (E)



Properties of number

Students develop an understanding of the properties of numbers through exploring multiples, factors and prime numbers, building on their fluency with multiplication and division. Teaching focuses on identifying factors and multiples, recognising prime numbers, and expressing numbers as a product of prime factors using representations such as arrays and prime factor trees. They apply their understanding to finding the highest common factor and lowest common multiple of two or more numbers. Students explore square, cube and triangular numbers, alongside square and cube roots, developing an understanding of numerical patterns and relationships. The extend steps introduce higher powers and roots, using Venn diagrams to find HCF and LCM, and simplifying calculations using factors, building on students' understanding of inverse operations, multiplication and number structure.

National curriculum links

- Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property
- Simplify and manipulate algebraic expressions to maintain equivalence by: collecting like terms; multiplying a single term over a bracket; taking out common factors; expanding products of two or more binomials
- Use integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5 and distinguish between exact representations of roots and their decimal approximations

Small steps

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|---------|--|
| Step 1 | Multiples |
| Step 2 | Factors |
| Step 3 | Prime numbers |
| Step 4 | Write a number as a product of prime factors |
| Step 5 | Square, cube and triangular numbers |
| Step 6 | Square roots and cube roots |
| Step 7 | Explore higher powers and roots (E) |
| Step 8 | Highest common factor (HCF) |
| Step 9 | Lowest common multiple (LCM) |
| Step 10 | HCF and LCM from a Venn diagram (E) |
| Step 11 | Use factors to simplify calculations (E) |



Add and subtract fractions

Students develop an understanding of simplifying, converting and calculating with fractions. This block builds on earlier work with factors, multiples and equivalence, as students simplify fractions and find common denominators. Teaching focuses on converting between mixed numbers and improper fractions and adding and subtracting fractions with the same and different denominators. The extend steps introduce decimals, algebraic fractions and equations with fractions.

National curriculum links

- Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property
- Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative
- Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and $\frac{7}{2}$ or 0.375 and $\frac{3}{8}$)
- Use and interpret algebraic notation, including: ab in place of $a \times b$; $3y$ in place of $y + y + y$ and $3 \times y$; a^2 in place of $a \times a$; a^3 in place of $a \times a \times a$; a^2b in place of $a \times a \times b$; $\frac{a}{b}$ in place of $a \div b$ coefficients written as fractions rather than decimals; brackets
- Substitute numerical values into formulae and expressions, including scientific formulae
- Use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement)

Small steps

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|---------|--|
| Step 1 | Simplify fractions |
| Step 2 | Convert between mixed numbers and improper fractions |
| Step 3 | Add and subtract fractions with the same denominator |
| Step 4 | Add and subtract with fractions and integers |
| Step 5 | Add and subtract fractions where denominators share a simple common multiple |
| Step 6 | Add and subtract fractions with any denominator |
| Step 7 | Add and subtract improper fractions and mixed numbers |
| Step 8 | Use equivalence to add and subtract decimals and fractions (E) |
| Step 9 | Add and subtract simple algebraic fractions (E) |
| Step 10 | Substitution and solving equations with fractions (E) |



Angles and polygons

Students develop an understanding of angles and polygons through measuring, calculating and applying angle facts in geometric contexts. Students use known facts to derive further facts, calculate unknown angles and classify polygons. Teaching focuses on angles around a point, angles on a straight line, vertically opposite angles, and angles in triangles and quadrilaterals. The extend steps introduce angles in parallel lines, interior angles in polygons and simple geometric proofs, building on students' understanding of angle relationships and reasoning.

National curriculum links

- Draw and measure line segments and angles in geometric figures, including interpreting scale drawings
- Describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric
- Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles
- Derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon, and to derive properties of regular polygons
- Derive and illustrate properties of triangles, quadrilaterals, circles, and other plane figures [for example, equal lengths and angles] using appropriate language and technologies
- Apply angle facts, triangle congruence, similarity and properties of quadrilaterals to derive results about angles and sides, including Pythagoras' theorem, and use known results to obtain simple proofs

Small steps

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|---------|---|
| Step 1 | Draw and measure line segments and angles |
| Step 2 | Understand and use geometric notation |
| Step 3 | Angles around a point |
| Step 4 | Angles on a straight line |
| Step 5 | Vertically opposite angles |
| Step 6 | Recognise and name polygons |
| Step 7 | Angles in a triangle |
| Step 8 | Angles in a quadrilateral |
| Step 9 | Solve problems with angles |
| Step 10 | Parallel and perpendicular lines |
| Step 11 | Investigate angles in parallel lines (E) |
| Step 12 | Angles in any polygon (E) |
| Step 13 | Simple proofs (E) |