

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
<b>Autumn</b>	<b>Proportional Reasoning</b>						<b>Representations</b>					
	Ratio and scale		Multiplicative change		Multiplying and dividing fractions		Working in the Cartesian plane			Representing data		Tables & Probability
<b>Spring</b>	<b>Algebraic techniques</b>						<b>Developing Number</b>					
	Brackets, equations and inequalities				Sequences	Indices	Fractions and percentages			Standard index form		Number sense
<b>Summer</b>	<b>Developing Geometry</b>						<b>Reasoning with Data</b>					
	Angles in parallel lines and polygons			Area of trapezia and circles		Line symmetry and reflection	The data handling cycle				Measures of location	

# Ratio and Scale

## Small Steps

- ▶ Understand the meaning and representation of ratio
- ▶ Understand and use ratio notation
- ▶ Solve problems involving ratios of the form  $1 : n$  (or  $n : 1$ )
- ▶ Solve proportional problems involving the ratio  $m : n$
- ▶ Divide a value into a given ratio
- ▶ Express ratios in their simplest integer form
- ▶ Express ratios in the form  $1 : n$  H
- ▶ Compare ratios and related fractions
- ▶ Understand  $\pi$  as the ratio between diameter and circumference
- ▶ Understand gradient of a line as a ratio H

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# Multiplicative Change

## Small Steps

- ▶ Solve problems involving direct proportion
- ▶ Explore conversion graphs
- ▶ Convert between currencies
- ▶ Explore direct proportion graphs H
- ▶ Explore relationships between similar shapes
- ▶ Understand scale factors as multiplicative representations
- ▶ Draw and interpret scale diagrams
- ▶ Interpret maps using scale factors and ratios

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# Multiplying & Dividing Fractions

## Small Steps

- ▶ Represent multiplication of fractions
- ▶ Multiply a fraction by an integer
- ▶ Find the product of a pair of unit fractions
- ▶ Find the product of a pair of any fractions
- ▶ Divide an integer by a fraction
- ▶ Divide a fraction by a unit fraction
- ▶ Understand and use the reciprocal
- ▶ Divide any pair of fractions

# Multiplying & Dividing Fractions

## Small Steps

- ▶ Multiply and divide improper and mixed fractions H
- ▶ Multiply and divide algebraic fractions H

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# Working in the Cartesian Plane

## Small Steps

- ▶ Work with coordinates in all four quadrants
- ▶ Identify and draw lines that are parallel to the axes
- ▶ Recognise and use the line  $y = x$
- ▶ Recognise and use lines of the form  $y = kx$
- ▶ Link  $y = kx$  to direct proportion problems
- ▶ **Explore the gradient of the line  $y = kx$**  H
- ▶ Recognise and use lines of the form  $y = x + a$
- ▶ Explore graphs with negative gradient ( $y = -kx, y = a - x, x + y = a$ )

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# Working in the Cartesian Plane

## Small Steps

- ▶ Link graphs to linear sequences
- ▶ Plot graphs of the form  $y = mx + c$
- ▶ **Explore non-linear graphs**
- ▶ **Find the midpoint of a line segment**

H

H

H

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# Representing Data

## Small Steps

- ▶ Draw and interpret scatter graphs
- ▶ Understand and describe linear correlation
- ▶ Draw and use line of best fit
- ▶ Identify non-linear relationships
- ▶ Identify different types of data
- ▶ Read and interpret ungrouped frequency tables
- ▶ Read and interpret grouped frequency tables
- ▶ Represent grouped discrete data
- ▶ Represent continuous data grouped into equal classes
- ▶ Represent data in two-way tables



# Tables and Probability

## Small Steps

- ▶ Construct sample spaces for 1 or more events
- ▶ Find probabilities from a sample space
- ▶ Find probabilities from two-way tables
- ▶ Find probabilities from Venn diagrams
- ▶ **Use the product rule for finding the total number of possible outcomes** H

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# Brackets, Equations & Inequalities

## Small Steps

- ▶ Form algebraic expressions
- ▶ Use directed number with algebra
- ▶ Multiply out a single bracket
- ▶ Factorise into a single bracket
- ▶ Expand multiple single brackets and simplify
- ▶ **Expand a pair of binomials**
- ▶ Solve equations, including with brackets
- ▶ Form and solve equations with brackets
- ▶ Understand and solve simple inequalities

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# Brackets, Equations & Inequalities

## Small Steps

- ▶ Form and solve inequalities
- ▶ **Solve equations and inequalities with unknowns on both sides** H
- ▶ **Form and solve equations and inequalities with unknowns on both sides** H
- ▶ Identify and use formulae, expressions, identities and equations

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# Sequences

## Small Steps

- Generate sequences given a rule in words
- Generate sequences given a simple algebraic rule
- Generate sequences given a complex algebraic rule
- Find the rule for the  $n^{\text{th}}$  term of a linear sequence**

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# Indices

## Small Steps

- ▶ Adding and subtracting expressions with indices
- ▶ Simplifying algebraic expressions by multiplying indices
- ▶ Simplifying algebraic expressions by dividing indices
- ▶ Using the addition law for indices
- ▶ Using the addition and subtraction law for indices
- ▶ **Exploring powers of powers**

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# Fractions and Percentages

## Small Steps

- Convert fluently between key fractions, decimals and percentages R
- Calculate key fractions, decimals and percentages of an amount without a calculator R
- Calculate fractions, decimals and percentages of an amount using calculator methods R
- Convert between decimals and percentages greater than 100%
- Percentage decrease with a multiplier
- Calculate percentage increase and decrease using a multiplier
- Express one number as a fraction or a percentage of another without a calculator
- Express one number as a fraction or a percentage of another using calculator methods

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# Fractions and Percentages

## Small Steps

- ▶ Work with percentage change
- ▶ Choose appropriate methods to solve percentage problems
- ▶ **Find the original amount given the percentage less than 100%** H
- ▶ **Find the original amount given the percentage greater than 100%** H
- ▶ **Choose appropriate methods to solve complex percentage problems** H

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# Standard Form

## Small Steps

- Investigate positive powers of 10
- Work with numbers greater than 1 in standard form
- Investigate negative powers of 10
- Work with numbers between 0 and 1 in standard form
- Compare and order numbers in standard form
- Mentally calculate with numbers in standard form
- Add and subtract numbers in standard form
- Multiply and divide numbers in standard form
- Use a calculator to work with numbers in standard form

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# Standard Form

## Small Steps

- ▶ Understand and use negative indices
- ▶ Understand and use fractional indices

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# Number Sense

## Small Steps

▶ Round numbers to powers of 10, and 1 significant figure R

▶ Round numbers to a given number of decimal places

▶ Estimate the answer to a calculation

▶ **Understand and use error interval notation** H

▶ Calculate using the order of operations R

▶ Calculate with money

▶ Covert metric measures of length

▶ Convert metric units of weight and capacity

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# Number Sense

## Small Steps

- ▶ **Convert metric units of area** H
- ▶ **Convert metric units of volume** H
- ▶ **Solve problems involving time and the calendar**

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# Angles in parallel lines & polygons

## Small Steps

- ▶ Understand and use basic angles rules and notation R
- ▶ Investigate angles between parallel lines and the transversal
- ▶ Identify and calculate with alternate and corresponding angles
- ▶ Identify and calculate with co-interior, alternate and corresponding angles
- ▶ Solve complex problems with parallel line angles
- ▶ Construct triangles and special quadrilaterals R
- ▶ Investigate the properties of special quadrilaterals
- ▶ Identify and calculate with sides and angles in special quadrilaterals

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# Angles in parallel lines & polygons

## Small Steps

- ▶ **Understand and use the properties of diagonals of quadrilaterals** H
- ▶ Understand and use the sum of exterior angles of any polygon
- ▶ Calculate and use the sum of the interior angles in any polygon
- ▶ Calculate missing interior angles in regular polygons
- ▶ **Prove simple geometric facts** H
- ▶ **Construct an angle bisector** H
- ▶ **Construct a perpendicular bisector of a line segment** H

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# Area of Trapezia and Circles

## Small Steps

▶ Calculate the area of triangles, rectangles and parallelograms

R

▶ Calculate the area of a trapezium

▶ Calculate the perimeter and area of compound shapes (1)

▶ Investigate the area of a circle

▶ Calculate the area of a circle and parts of a circle without a calculator

▶ Calculate the area of a circle and parts of a circle with a calculator

▶ Calculate the perimeter and area of compound shapes (2)

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# Line symmetry and reflection

## Small Steps

- ▶ Recognise line symmetry
- ▶ Reflect a shape in a horizontal or vertical line 1 (shapes touching the line)
- ▶ Reflect a shape in a horizontal or vertical line 2 (shapes not touching the line)
- ▶ Reflect a shape in a diagonal line 1 (shapes touching the line)
- ▶ Reflect a shape in a diagonal line 2 (shapes not touching the line)

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# The Data Handling Cycle

## Small Steps

- ▶ Set up a statistical enquiry
- ▶ Design and criticise questionnaires
- ▶ Draw and interpret pictograms, bar charts and vertical line charts R
- ▶ Draw and interpret multiple bar charts
- ▶ Draw and interpret pie charts R
- ▶ Draw and interpret line graphs
- ▶ Choose the most appropriate diagram for given set of data
- ▶ Represent and interpret grouped quantitative data

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# The Data Handling Cycle

## Small Steps

- Find and interpret the range
- Compare distributions using charts
- Identify misleading graphs

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# Measures of Location

## Small Steps

- Understand and use the mean, median and mode
- Choose the most appropriate average
- Find the mean from an ungrouped frequency table** H
- Find the mean from an grouped frequency table** H
- Identify outliers
- Compare distributions using averages and the range

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