	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	**Algebraic Thinking**						**Place Value and Proportion**					
	Sequences		Understand and use algebraic notation		Equality and equivalence		Place value and ordering integers and decimals			Fraction, decimal and percentage equivalence		
Spring	**Applications of Number**						**Directed Number**			**Fractional Thinking**		
	Solving problems with addition & subtraction		Solving problems with multiplication and division			Fractions& percentagesof amounts	Operations and equations with directed number			Addition and subtraction of fractions		

Summer	Lines and Angles		Reasoning with Number		
	Constructing, measuring and using geometric notation	Developing geometric reasoning	Developing number sense	Sets and probability	Prime numbers and proof

Autumn Term 1

Sequences

Small Steps

- Describe and continue a sequence given diagrammatically
- Predict and check the next term(s) of a sequence
- Represent sequences in tabular and graphical forms
- Recognise the difference between linear and non-linear sequences
- Continue numerical linear sequences
- Continue numerical non-linear sequences
- Explain the term-to-term rule of numerical sequences in words
- **Find missing numbers within sequences** H

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Understand and use notation

Small Steps

- Given a numerical input, find the output of a single function machine
- Use inverse operations to find the input given the output
- Use diagrams and letters to generalise number operations
- Use diagrams and letters with single function machines
- Find the function machine given a simple expression
- Substitute values into single operation expressions
- Find numerical inputs and outputs for a series of two function machines
- Use diagrams and letters with a series of two function machines
- Find the function machines given a two-step expression
- Substitute values into two-step expressions

Generate sequences given an algebraic rule

Represent one- and two-step functions graphically

Autumn Term 3

Equality and Equivalence

Small Steps

- Understand the meaning of equality
- Understand and use fact families, numerically and algebraically
- Solve one-step linear equations involving +/− using inverse operations
- Solve one-step linear equations involving ×/÷ using inverse operations
- Understand the meaning of like and unlike terms
- Understand the meaning of equivalence
- Simplify algebraic expressions by collecting like terms, using the ≡ symbol

Place Value

Small Steps

- Recognise the place value of any number in an integer up to one billion
- Understand and write integers up to one billion in words and figures
- Work out intervals on a number line
- Position integers on a number line
- Round integers to the nearest power of ten
- Compare two numbers using $=, \neq, <, >, \leq, \geq$
- Order a list of integers
- Find the range of a set of numbers
- Find the median of a set of numbers
- Understand place value for decimals
- Position decimals on a number line
- Compare and order any number up to one billion

4 Place Value and Ordering

Place Value

Small Steps

- Round a number to 1 significant figure
- **Write 10, 100, 1000 etc. as powers of ten** H
- **Write positive integers in the form A x 10^n** H
- **Investigate negative powers of ten** H
- **Write decimals in the form A x 10^n** H

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5 Fraction, decimal & percentage equivalence

FDP Equivalence

Small Steps

- Represent tenths and hundredths as diagrams
- Represent tenths and hundredths on number lines
- Interchange between fractional and decimal number lines
- Convert between fractions and decimals – tenths and hundredths
- Convert between fractions and decimals – fifths and quarters
- **Convert between fractions and decimals – eighths and thousandths**
- Understand the meaning of percentage using a hundred square
- Convert fluently between simple fractions, decimals and percentages

Use and interpret pie charts

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5 Fraction, decimal & percentage equivalence

FDP Equivalence

Small Steps

- Represent any fraction as a diagram
- Represent fractions on number lines
- Identify and use simple equivalent fractions
- Understand fractions as division
- Convert fluently between fractions, decimals and percentages

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Explore fractions above one, decimals and percentages

Addition and Subtraction

Small Steps

- Properties of addition and subtraction
- Mental strategies for addition and subtraction
- Use formal methods for addition of integers
- Use formal methods for addition of decimals
- Use formal methods for subtraction of integers
- Use formal methods for subtraction of decimals
- Choose the most appropriate method: mental strategies, formal written or calculator
- Solve problems in the context of perimeter
- Solve financial maths problems

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Addition and Subtraction

Small Steps

- Solve problems involving tables and timetables
- Solve problems with frequency trees
- Solve problems with bar charts and line charts
- Add and subtract numbers given in standard form

Multiplication and Division

Small Steps

- Properties of multiplication and division

Understand and use factors

Understand and use multiples

Multiply and divide integers and decimals by powers of 10

Multiply by 0.1 and 0.01 H

Convert metric units

Use formal methods to multiply integers

Use formal methods to multiply decimals

Use formal methods to divide integers

Use formal methods to divide decimals

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Multiplication and Division

Small Steps

- Understand and use order of operations
- Solve problems using the area of rectangles and parallelograms
- Solve problems using the area of triangles
- **Solve problems using the area of trapezia**
- Solve problems using the mean
- **Explore multiplication and division in algebraic expressions**

Fractions & Percentages of Amounts

- Find a fraction of a given amount
- Find a percentage of a given amount using mental methods
- Use a given fraction to find the whole and/or other fractions
- **Solve problems with fractions greater than 1 and percentages greater than 100%** H
- Find a percentage of a given amount using a calculator

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Term 4 Directed Number

Directed Number

Small Steps

- Understand and use representations of directed numbers
- Order directed numbers using lines and appropriate symbols
- Perform calculations that cross zero
- Add directed numbers
- Subtract directed numbers
- Multiplication of directed numbers
- Multiplication and division of directed numbers
- Use a calculator for directed number calculations
- Evaluate algebraic expressions with directed number
- Introduction to two-step equations

Term 4 Directed Number

Directed Number

Small Steps

- Solve two-step equations
- Use order of operations with directed numbers
- **Roots of positive numbers** H
- **Explore higher powers and roots** H

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Term 5 Fractional Thinking

Fractional Thinking

Small Steps

- Understand representations of fractions
- Convert between mixed numbers and fractions
- Add and subtract unit fractions with the same denominator
- Add and subtract fractions with the same denominator
- Add and subtract fractions from integers expressing the answer as a single fraction
- Understand and use equivalent fractions
- Add and subtract fractions where denominators share a simple common multiple
- Add and subtract fractions with any denominator

Add and subtract improper fractions and mixed numbers

Use fractions in algebraic contexts

Use equivalence to add and subtract decimals and fractions

Add and subtract simple algebraic fractions

Term 5 Fractional Thinking

Fractional Thinking

Small Steps

- Use fractions in algebraic contexts
- Use equivalence to add and subtract decimals and fractions
- **Add and subtract simple algebraic fractions**

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Construction and Measuring

Small Steps

- Understand and use letter and labelling conventions including those for geometric figures
- Draw and measure line segments including geometric figures
- Understand angles as a measure of turn
- Classify angles
- Measure angles up to 180°
- Draw angles up to 180°
- Draw and measure angles between 180° and 360°
- Identify perpendicular and parallel lines
- Recognise types of triangle
- Recognise types of quadrilateral

Construction and Measuring

Small Steps

- Identify polygons up to a decagon
- Construct triangles using SSS
- Construct triangles using SSS, SAS and ASA
- Construct more complex polygons
- Interpret simple pie charts using proportion
- Interpret pie charts using a protractor
- Draw pie charts

Geometric Reasoning

Small Steps

- Understand and use the sum of angles at a point
- Understand and use the equality of vertically opposite angles
- Know and apply the sum of angles in a quadrilateral
- Solve complex angle problems

Understand and use the sum of angles on a straight line

Know and apply the sum of angles in a triangle

Solve angle problems using properties of triangles and quadrilaterals

Geometric Reasoning

Small Steps

- Find and use the angle sum of any polygon
- Investigate angles in parallel lines
- Use known facts to obtain simple proofs. H
- Understand and use parallel line angle rules

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Summer Term 3 Developing Number Sense

Developing Number Sense

Small Steps

- Know and use mental addition and subtraction strategies for integers

- Know and use mental multiplication and division strategies for integers
- Know and use mental arithmetic strategies for decimals
- Know and use mental arithmetic strategies for fractions
- Use factors to simplify calculations
- Use estimation as a method for checking mental calculations
- Use known number facts to derive other facts
- Use known algebraic facts to derive other facts
- Know when to use a mental strategy, formal written method or a calculator Summer Term 4 Sets and Probability

Sets and Probability

Small Steps

- Identify and represent sets

Understand and use the intersection of sets

Interpret and create Venn diagrams

Understand and use the union of sets

Understand and use the complement of a set H

Know and use the vocabulary of probability

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Year 7

Sets and Probability

Small Steps

- Generate sample spaces for single events
- Understand and use the probability scale

Calculate the probability of a single event

Know that the sum of probabilities of all possible outcomes is 1

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Prime Numbers and Proof

Small Steps

- Find and use multiples
- Identify factors of numbers and expressions

- Recognise and identify prime numbers
- Recognise square and triangular numbers
- Find common factors of a set of numbers including the HCF
- Find common multiples of a set of numbers including the LCM
- Write a number as a product of its prime factors
- **Use a Venn diagram to calculate the HCF and LCM** H
- Make and test conjectures
- Use counterexamples to disprove a conjecture

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	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	**Proportional Reasoning**						**Representations**					
	Ratio and scale		Multiplicative change		Multiplying and dividing fractions		Working in the Cartesian plane			Representing data		Tables & Probability
Spring	**Algebraic techniques**						**Developing Number**					
	Brackets, equations and inequalities				Sequences	Indices	Fractions and percentages			Standard index form		Number sense
	Developing Geometry						**Reasoning with Data**					

Summer	Angles in parallel lines and polygons	Area of trapezia and circles	Line symmetry andreflection	The data handling cycle	Measures of location

Autumn Term 1 Ratio and Scale

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)

Divide a value into a given ratio

Solve proportional problems involving the ratio m : n

Express ratios in the form 1 : n H

Express ratios in their simplest integer form

Understand π as the ratio between diameter and circumference

Compare ratios and related fractions

Understand gradient of a line as a ratio H

2 Multiplicative Change

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Multiplicative Change

Small Steps

- Solve problems involving direct proportion
- Convert between currencies

Explore conversion graphs

Explore direct proportion graphs

- Explore relationships between similar shapes
- Draw and interpret scale diagrams

Understand scale factors as multiplicative representations

Interpret maps using scale factors and ratios

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3 Multiplying and Dividing Fractions

Multiplying & Dividing Fractions

Small Steps

- Represent multiplication of fractions
- 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
- Multiply a fraction by an integer

3 Multiplying and Dividing Fractions

Multiplying & Dividing Fractions

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R denotes “review step” – content should have been covered earlier in KS3

Multiply and divide improper and mixed fractions H

Multiply and divide algebraic fractions

4 Working in the Cartesian Plane

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 ($y = -kx, y = a - x, x + y = a$)

(H) denotes higher strand and not necessarily content for Higher Tier GCSE

Working in the Cartesian Plane

Link graphs to linear sequences

Explore non-linear graphs H

Plot graphs of the form $y = mx + c$

Find the midpoint of a line segment

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Representing Data

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

Tables and Probability

Construct sample spaces for 1 or more events

Find probabilities from two-way tables

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- Find probabilities from a sample space
- Find probabilities from Venn diagrams
- **Use the product rule for finding the total number of possible outcomes** H

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

Sequences

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Sequences

Generate sequences given a rule in words

Generate sequences given a complex algebraic rule

Generate sequences given a simple algebraic rule

Find the rule for the n^{th} term of a linear sequence

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Indices

Small Steps

Adding and subtracting expressions with indices

Simplifying algebraic expressions by dividing indices

Using the addition and subtraction law for indices

Simplifying algebraic expressions by multiplying indices

Using the addition law for indices

Exploring powers of powers

Fractions and Percentages

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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
- 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

Spring Term 4 Fractions and Percentages

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R GCSE denotes “review step” – content should have been covered earlier in KS3

Fractions and Percentages

Work with percentage change

Find the original amount given the percentage less than 100% H

Choose appropriate methods to solve percentage problems

Find the original amount given the percentage greater than 100%

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 (H)
- Understand and use fractional indices (H)

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Spring Term 6 Number Sense

Number Sense

Small Steps

- Round numbers to powers of 10, and 1 significant figure R
- **Convert metric units of area** H
- **Convert metric units of volume**
- Estimate the answer to a calculation
- Solve problems involving time and the calendar
- 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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Angles in parallel lines & polygons

Understand and use basic angles rules and notation R

Identify and calculate with alternate and corresponding angles

Solve complex problems with parallel line angles

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Investigate angles between parallel lines and the transversal

Identify and calculate with co-interior, alternate and corresponding angles

Construct triangles and special quadrilaterals

Identify and calculate with sides and angles in special quadrilaterals

Investigate the properties of 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

Calculate the area of triangles, rectangles and parallelograms R

Calculate the perimeter and area of compound shapes (1)

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

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Calculate the area of a trapezium

Investigate the area of a circle

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

Calculate the perimeter and area of compound shapes (2)

Line symmetry and reflection

Recognise line symmetry

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

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The Data Handling Cycle

Small Steps

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

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Measures of Location

Understand and use the mean, median and mode

Find the mean from an ungrouped frequency table H

Choose the most appropriate average

Identify outliers

Find the mean from an grouped frequency table

Compare distributions using averages and the range

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	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	**Reasoning with Algebra**						**Constructing in 2 and 3 Dimensions**					
	Straight line graphs		Forming and solving equations		Testing conjectures		Three-dimensional shapes			Constructions and congruency		
Spring	**Reasoning with Number**						**Reasoning with Geometry**					
	Numbers		Using percentages		Maths and money		Deduction		Rotation and translation		Pythagoras' Theorem	

Year 9

Summer	Reasoning with Proportion			Representations and Revision		
	Enlargement and similarity	Solving ratio & proportion problems	Rates	Probability	Algebraic representation	Revision

Autumn Term 1 Straight line graphs

Straight line graphs

Lines parallel to the axes, $y=x$ and $y=-x$ R

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Year 9

- Using tables of values
- Compare gradients
- Compare intercepts
- Understand and use $y = mx + c$
- **Write an equation in the form $y=mx+c$**
- Find the equation of a line from a graph
- Interpret gradient and intercepts of real-life graphs

Autumn Term 1 Straight line graphs

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Year 9

Straight line graphs

Small Steps

Model real-life graphs involving inverse proportion H

Explore perpendicular lines

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Forming and solving equations

Solve one- and two-step equations and inequalities	R
Inequalities with negative numbers	
Solve inequalities with unknowns on both sides	

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Solve one- and two-step equations and inequalities with brackets

Solve equations with unknowns on both sides

Solving equations and inequalities in context

Rearrange formulae (one-step)

2 Forming and solving equations

Substituting into formulae and equations

Forming and Solving Equations

Small Steps

Rearrange formulae (two-step)

Rearrange complex formulae including brackets and squares

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Testing conjectures

Factors, Multiples and Primes	R
Always, Sometimes, Never true	
Conjectures about number	

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- True or False?
- Show that
- Expand a pair of binomials
- Explore the 100 grid

3 Testing Conjectures

Conjectures with algebra

Testing conjectures

Small Steps

- **Expand three binomials** H

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Three-dimensional shapes

Know names of 2-D and 3-D shapes

Accurate nets of cuboids and other 3-D shapes

Plans and elevations

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Recognise prisms

Sketch and recognise nets of cuboids and other 3-D shapes

Find area of 2-D shapes

Surface area of triangular prisms

4 Three-Dimensional Shapes

Surface area of cubes and cuboids

Three-dimensional shapes

Small Steps

Surface area of a cylinder

Volume of other 3-D shapes – prisms and cylinders

H denotes higher strand and not necessarily content for Higher Tier

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Volume of cubes and cuboids

Explore volumes of cones, pyramids and spheres

5 Constructions and congruency

Constructions & congruency

Draw and measure angles R

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R GCSE denotes “review step” – content should have been covered earlier in KS3

- Construct and interpret scale drawings

- Locus of distance from a point

- Locus of distance from a straight line/shape

- Locus equidistant from two points

- Construct a perpendicular bisector

- Construct a perpendicular from a point

- Construct a perpendicular to a point

5 Constructions and congruency

H denotes higher strand and not necessarily content for Higher Tier

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Constructions & congruency

- Locus of distance from two lines
- Construct triangles from given information R
- Construct an angle bisector
- Explore congruent triangles
- Identify congruent figures
- Identify congruent triangles

H denotes higher strand and not necessarily content for Higher Tier

R GCSE denotes “review step” – content should have been covered earlier in KS3

Integers, real and rational numbers

Spring Term 1 Numbers

- Work with directed number R
- **Understand and use surds**
- Solve problems with decimals
- Solve problems with integers
- Adding and subtracting fractions R

Numbers

Small Steps

HCF and LCM

H denotes higher strand and not necessarily content for Higher Tier

R GCSE denotes “review step” – content should have been covered earlier in KS3

Numbers

Small Steps

Solving problems with fractions

Numbers in standard form

H denotes higher strand and not necessarily content for Higher Tier

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Using percentages

Use the equivalence of fractions, decimals and percentages	R
Express a change as a percentage	R
Recognise and solve percentage problems (non-calculator)	

H denotes higher strand and not necessarily content for Higher Tier

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Calculate percentage increase and decrease

Solve ‘reverse’ percentage problems

Recognise and solve percentage problems (calculator)

Solve problems with repeated percentage change H

H denotes higher strand and not necessarily content for Higher Tier

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Maths and Money

Solve problems with bills and bank statements

Calculate compound interest

Calculate wages and taxes

H denotes higher strand and not necessarily content for Higher Tier

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Calculate simple interest

Deduction

Small Steps

Solve problems with Value Added

Solve unit pricing problems

Tax

Solve problems with exchange rates

Angles in parallel lines R

Deductions

Angles problems with algebra

H denotes higher strand and not necessarily content for Higher Tier

R GCSE denotes “review step” – content should have been covered earlier in KS3

Solving angles problems (using chains of reasoning)

Conjectures with angles

Link constructions and geometrical reasoning

Conjectures with shapes

Rotation and Translation

Rotation and Translation

Identify the order of rotational symmetry of a shape

Rotate a shape about a point on a shape

H denotes higher strand and not necessarily content for Higher Tier

R GCSE denotes “review step” – content should have been covered earlier in KS3

Compare and contrast rotational symmetry with line symmetry

Rotate a shape about a point not on a shape

Translate points and shapes by a given vector

Compare rotation and reflection of shapes

Find the result of a series of transformations H

Pythagoras' Theorem

Pythagoras' Theorem

Squares and square roots R

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- Identify the hypotenuse of a right-angled triangle
- Determine whether a triangle is right-angled
- Calculate the hypotenuse of a right-angled triangle
- Calculate missing sides in right-angled triangles
- Use Pythagoras theorem on coordinate axes
- Explore proofs of Pythagoras' theorem
- **Use Pythagoras' theorem in 3-D shapes**

H denotes higher strand and not necessarily content for Higher Tier

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Summer Term 1 Enlargement and Similarity

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Enlargement and Similarity

Small Steps

- Recognise enlargement and similarity
- Enlarge a shape by a positive integer scale factor
- Enlarge a shape by a positive integer scale factor from a point
- Enlarge a shape by a positive fractional scale factor
- **Enlarge a shape by a negative scale factor** H
- Work out missing sides and angles in a pair of given similar shapes
- **Solve problems with similar triangles** H
- **Explore ratios in right-angled triangles** H

Ratio and Proportion

H denotes higher strand and not necessarily content for Higher Tier

R GCSE denotes "review step" – content should have been covered earlier in KS3

Ratio and Proportion

Small Steps

- Solve problems with direct proportion (R)
- Direct proportion and conversion graphs (R)
- Solve problems with inverse proportion
- **Graphs of inverse relationships** (H)
- Solve ratio problems given the whole or a part (R)
- Solve 'best buy' problems
- **Solve problems ratio and algebra** (H)

- **Convert compound units** (H)

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R denotes "review step" – content should have been covered earlier in KS3

Rates

Small Steps

Solve speed, distance and time problems without a calculator

Use distance/time graphs

Solve flow problems and their graphs

Solve speed, distance and time problems with a calculator

Solve problems with density, mass and volume

Rates of change and their units

H denotes higher strand and not necessarily content for Higher Tier

R GCSE denotes “review step” – content should have been covered earlier in KS3

Probability

Small Steps

- Single event probability (R)
- Relative frequency – include convergence
- Expected outcomes
- Independent events
- **Use tree diagrams** (H)
- **Use tree diagrams to solve 'without replacement' problems** (H)
- Use diagrams to work out probabilities

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Algebraic representation

Draw and interpret quadratic graphs

Investigate graphs of simultaneous equations H

Interpret graphs, including reciprocal and piece-wise

Represent inequali

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H denotes Higher Tier GCSE content

R denotes 'review step' – content should have been covered at KS3