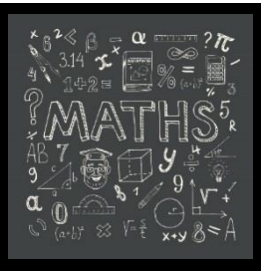

Mathematics Faculty Curriculum Overview

The Mathematics Faculty foundational principle 'Threshold Topics' are both defined on page 2 below and split between the core subject content strands of:

- Number (N)
- Algebra (A)
- Ratio and Proportion (R)
- Geometry and Measures (G)
- Probability and Statistics (P)

These Threshold Concepts are interwoven, interleaved and index-referenced throughout the curriculum plan to make explicit the 'conceptual gateways' and 'portals' which must be negotiated to arrive at important new mathematical understanding.

Additionally, the curriculum plan also categorises each unit by core subject content strand to show how new knowledge consolidates and builds upon prior knowledge. These core subject content strands are outlined below and illustrate how each unit is sequenced over the 5-year curriculum:

	Number	Algebra	Ratio and Proportion	Geometry and Measures	Probability and Statistics
1	Place Value and Proportion	Algebraic Thinking	Proportional Reasoning	Lines and Angles	Representation
2	Application of Number	Algebraic Techniques	Proportional Reasoning	Developing Geometry	Reasoning with Data
3	Directed Number and Fractional Thinking	Developing Algebra	Reasoning with Proportion	Constructing in 2 and 3 Dimensions	Representation
4	Reasoning with Number	Graphs	Similarity	Reasoning with Geometry	Delving into Data
5	Developing Number	Algebra	Proportions and Proportional Change	Geometry	
6	Reasoning with Number				
7	Using Number				
8	Reasoning				
9	Revision and Communication				

Threshold Concepts in Mathematics	Number	Algebra
The foundational principle of threshold concepts is that there are 'conceptual gateways' or 'portals' that must be negotiated to arrive at important new mathematical understanding. In crossing the portal, transformation occurs, both in new knowledge and subjectivity. Threshold concepts open a door into a new way of thinking about mathematics and therefore enhance the ability of learners to master the subject. Teachers will address, consolidate and reinforce these cornerstone topics in the following ways: • Retrieval practice starter activities • Warm-up activities prior to the main teaching • Retrieval practice formative assessments • Hegarty Maths homework assignments The Mathematics Curriculum Plan clearly references these Threshold Concepts below using the following codes.	N1 – Place Value N2 – Inverse operations N3 – Directed numbers N4 – Number bonds and basic calculations N5 – BODMAS N6 – Powers and roots N7 – Fraction, decimal and percentage equivalence N8 – Fluency of calculations (written and mental) N9 – Proficiency using a calculator N10 – Rounding	A1 – Basic algebra (simplifying, substitution etc.) A2 – Algebraic conventions (3n = 3 x n etc.) A3 – Using scientific formulae (S=D/T etc.) A4 – Algebraic manipulation (balancing etc.)

Geometry and Measures	**Probability and Statistics**	**Miscellaneous**
G1 – Angle rules G2 – Names and properties of shapes G3 – Units and unit conversions G4 – Use of mathematical equipment (ruler, compass, protractor etc.) G5 – Coordinates	P1 – Fractions, decimals and percentages fluency P2 – Ratio and proportion	M1 – Breaking down problems M2 – Use of key information M3 – Mathematical terminology M4 – Application of other Threshold Concepts and mathematical knowledge

Maths Faculty Assessment Timeline

Year	Method	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 7	Online Homework	Autumn 1 Topics	Autumn 2 Topics	Spring 1 Topics	Spring 2 Topics	Summer 1 Topics	Summer 2 Topics
	Paper Homework	KS2 QLA Topics	Autumn 1 Topics	Autumn 2 Topics	Spring 1 Topics	Spring 2 Topics	Summer 1 Topics
	Formative	KS2 QLA Topics	Autumn 1 Topics	Autumn 2 Topics	Spring 1 Topics	Spring 2 Topics	Summer 1 Topics
	Summative	Baseline		End of Term	End of Term		End of Term
Year 8	Online Homework	Autumn 1 Topics	Autumn 2 Topics	Spring 1 Topics	Spring 2 Topics	Summer 1 Topics	Summer 2 Topics
	Paper Homework	Summer 2 Topics	Autumn 1 Topics	Autumn 2 Topics	Spring 1 Topics	Spring 2 Topics	Summer 1 Topics
	Formative	Summer 2 Topics	Autumn 1 Topics	Autumn 2 Topics	Spring 1 Topics	Spring 2 Topics	Summer 1 Topics
	Summative		End of Term		End of Term		End of Term
Year 9	Online Homework	Autumn 1 Topics	Autumn 2 Topics	Spring 1 Topics	Spring 2 Topics	Summer 1 Topics	Summer 2 Topics
	Paper Homework	Summer 2 Topics	Autumn 1 Topics	Autumn 2 Topics	Spring 1 Topics	Spring 2 Topics	Summer 1 Topics
	Formative	Summer 2 Topics	Autumn 1 Topics	Autumn 2 Topics	Spring 1 Topics	Spring 2 Topics	Summer 1 Topics
	Summative		Past Paper		Past Paper		
Year 10	Online Homework	Autumn 1 Topics	Autumn 2 Topics	Spring 1 Topics	Spring 2 Topics	Summer 1 Topics	Summer 2 Topics
	Paper Homework	Summer 2 Topics	Autumn 1 Topics	Autumn 2 Topics	Spring 1 Topics	Spring 2 Topics	Summer 1 Topics
	Formative	Summer 2 Topics	Autumn 1 Topics	Autumn 2 Topics	Spring 1 Topics	Spring 2 Topics	Summer 1 Topics
	Summative		Past Paper	Past Paper			Mock Exam
Year 11	Online Homework	Autumn 1 Topics	Autumn 2 Topics	Spring 1 Topics	Spring 2 Topics	Summer 1 Topics	Summer 2 Topics
	Paper Homework	Summer 2 Topics	Autumn 1 Topics	Autumn 2 Topics	Spring 1 Topics	Spring 2 Topics	Summer 1 Topics
	Formative	Summer 2 Topics	Autumn 1 Topics	Autumn 2 Topics	Spring 1 Topics	Spring 2 Topics	Summer 1 Topics
	Summative		Mock Exam		Mock Exam	GCSE Exam	

- Online and paper homework assignments alternate weekly
- Online homework assignments are set and completed on Hegarty Maths based upon work currently being studied in class at the time
- Paper homework assignments are set and completed based upon work studied in the previous half-term (retrieval practice) and mirror the upcoming formative assessment
- Formative assessments are completed in class on a fortnightly basis and are based upon work studied in the previous half-term (retrieval practice) and mirror the paper homework assigned the week prior
- End of Block assessments in years 7 and 8 contain a 'core' assessment which all students sit followed by either a 'foundation' or a 'higher' tier assessment dependent upon ability set
- Past Papers in years 9 and 10 include all three GCSE papers (one non-calculator and two calculator papers)
- Mock Exams in years 10 and 11 include all three GCSE papers from the most recent up-to-date examination series (one non-calculator and two calculator papers)

Year Group	Prior Ability	Autumn Term Students should be able to:	Spring Term Students should be able to:	Summer Term Students should be able to:
7	Foundation LPAs to MPAs	**Autumn Term 1 – Algebra 1: Algebraic Thinking** Sequences (N348,A12): • Describe and continue sequences in diagram and number forms, both linear and non-linear Understanding and Using Algebraic Notation (N2345, A124, G5): • Use single function machines and series of two function machines with numbers, bar models and letters • Form and substitute into expressions, including generating sequences • Represent functions graphically Equality and Equivalence (N2578, A124, M14): • Understand equality and fact families • Form and solve one-step equations • Understand equivalence • Collect like terms **Autumn Term 2 – Number 1: Place Value and Proportion** Place Value and Ordering (N1347810, A12): • Describe and continue sequences in diagram and number forms, both linear and non-linear • Know integer place values up to one billion • Know decimal place values up to hundredths • Use number lines • Compare and order numbers • Work out the range and the median • Round to positive numbers of ten and to one significant figure Fraction, Decimal and Percentage Equivalence (N14789, G12, P1): • Represent tenths and hundredths on diagrams and number lines • Interchange between fractions, decimals and percentages for multiples of tenths and quarters • Interpret pie charts • Identify equivalent fractions • Convert between any fraction, decimal and percentage	**Spring Term 1 – Number 2: Application of Number** Addition and Subtraction (N12348, P1, M1234): • Use formal methods of addition with integers and decimals • Solve problems in the context of perimeter, money, frequency tables and frequency trees Multiplication and Division (N1245789, A124, G23): • Multiply by 10, 100 and 1000 • Convert units • Use formal methods of multiplication and division • Find the Highest Common Factor and the Lowest Common Multiple • Work out the areas of triangles, rectangles and parallelograms • Work out the mean • Find fractions and percentages of amounts • Solve two-step equations (with and without a calculator) • Calculate appropriately using the order of operations **Spring Term 2 – Number 3: Directed Number and Fractional Thinking** Negative Numbers (N234589): • Order directed numbers with and without context • Revisit four operations to include directed numbers • Use a calculator with directed numbers • Calculate appropriately using the order of operations Adding and Subtracting Fractions (N13478): • Represent tenths and hundredths on diagrams and number lines • Add and subtract fractions with a common denominator (including with answers greater than 1) • Revisit equivalent fractions • Add and subtract fractions with simple different denominators • Calculate with a mixture of fractions and decimals	**Summer Term 1 – Geometry and Measures 1: Lines and Angles** Drawing, Measuring and Notation (N1, G1234, P2, M3): • Draw and measure lines and angles using a ruler and a protractor • Understand and use notation for lines and angles • Understand parallel and perpendicular lines • Recognise different types of triangles, quadrilaterals and other polygons • Draw triangles given SSS, SAS and ASA • Draw and interpret pie charts Geometric Reasoning (N48, G123, M123): • Calculate using angles at a point, angles on a straight line and vertically opposite angles • Calculate missing angles in triangles and quadrilaterals **Summer Term 2 – Number 4: Reasoning with Number** Number Sense (N148, A12, M1): • Use mental arithmetic strategies • Use known facts to derive other facts, including algebraic expressions Sets and Probability (N248, P1, M12: • Understand and use set notation • Complete, use and interpret Venn Diagrams • Work out the probability of a single event Prime Numbers and Proof (N14689, M124): • Identify different types of number • Express a number as the product of its prime factors • Work out powers and roots • Use counterexamples

7	Higher MPAs to HPAs	**Autumn Term 1 – Algebra 1: Algebraic Thinking** Sequences (N348,A12): • Describe and continue sequences in diagram and number forms, both linear and non-linear Understanding and Using Algebraic Notation (N2345, A124, G5): • Use single function machines and series of twofunction machines with numbers, bar models and letters • Form and substitute into expressions, including generating sequences • Represent functions graphically Equality and Equivalence (N2578, A124, M14): • Understand equality and fact families • Form and solve one-step equations • Understand equivalence • Collect like terms **Autumn Term 2 – Number 1: Place Value and Proportion** Place Value and Ordering (N1347810, A12): • Describe and continue sequences in diagram and number forms, both linear and non-linear • Know integer place values up to one billion • Know decimal place values up to hundredths • Use number lines • Compare and order numbers • Work out the range and the median • Round to positive numbers of ten and to one significant figure Fraction, Decimal and Percentage Equivalence (N14789, G12, P1): • Represent tenths and hundredths on diagrams and number lines • Interchange between fractions, decimals and percentages for multiples of tenths and quarters • Interpret pie charts • Identify equivalentfractions • Convert between anyfraction, decimal and percentage Additional Higher Content (N14679, A2): • Explore and use standard index form • Explore fractions greater than 1	**Spring Term 1 – Number 2: Application of Number** Addition and Subtraction (N12348, P1, M1234): • Use formal methods of addition with integers and decimals • Solve problems in the context of perimeter, money, frequency tables and frequency trees Multiplication and Division (N1245789, A124,G23): • Multiply by 10, 100 and 1000 • Convert units • Use formal methods of multiplication and division • Find the Highest Common Factor and the Lowest Common Multiple • Work out the areas of triangles, rectangles and parallelograms • Work out the mean • Find fractions and percentages of amounts • Solve two-step equations (with and without a calculator) • Calculate appropriately using the order of operations Additional Higher Content (N1468, A124, G23, P1): • Add numbers in standard form • Work out the area of a trapezium • Find the Highest Common Factor and Lowest Common Multiple in algebraic form • Work out the areas of polygons in algebraic form • Calculate using improper fractions **Spring Term 2 – Number 3: Directed Number and Fractional Thinking** Negative Numbers (N234589): • Order directed numbers with and without context • Revisit four operations to include directed numbers • Use a calculator with directed numbers • Calculate appropriately using the order of operations Adding and Subtracting Fractions (N13478): • Represent tenths and hundredths on diagrams and number lines • Add and subtract fractions with a common denominator (including with answers greater than 1) • Revisit equivalent fractions	**Summer Term 1 – Geometry and Measures 1: Lines and Angles** Drawing, Measuring and Notation (N1, G1234, P2, M3): • Draw and measure lines and angles using a ruler and a protractor • Understand and use notation for lines and angles • Understand parallel and perpendicular lines • Recognise different types of triangles, quadrilaterals and other polygons • Draw triangles given SSS, SAS and ASA • Draw and interpret pie charts Geometric Reasoning (N48, G123, M123): • Calculate using angles at a point,angles on a straight line and vertically opposite angles • Calculate missing angles in triangles and quadrilaterals Additional Higher Content (N146, A124, G12, M3): • Add numbers written in standard form • Understand parallel line angle rules • Work out the sum total of angles inpolygons • Algebraically prove angle rules **Summer Term 2 – Number 4: Reasoning with Number** Number Sense (N148, A12, M1): • Use mental arithmetic strategies • Use known facts to derive other facts, including algebraic expressions Sets and Probability (N248, P1, M12: • Understand and use set notation • Complete, use and interpret Venn Diagrams • Work out the probabilityof a single event Prime Numbers and Proof (N14689, M124): • Identify different types of number • Express a number as the product of its prime factors • Work out powers and roots • Use counterexamples Additional Higher Content (N468): • Use Venn Diagrams to work out the Highest Common Factor and Lowest Common Multiple

			? Add and subtract fractions with simple different denominators ? Calculate with a mixture of fractions and decimals Additional Higher Content (N3467, A124, P1): ? Identify both positive and negative solutions to squareroots ? Add and subtract fractions with any denominators ? Add and subtract simple algebraic fractions	

8	Foundation LPAs to MPAs	**Autumn Term 1 – Ratio and Proportion 1: Proportional Reasoning** Ratio and Scale (G2, P2, M1): • Understand ratio and its link to multiplication • Work out the circumference of a circle • Use ratio notation • Reduce ratios to their simplest form • Solve ratio problems Multiplicative Change (N4, G23, P2): • Use scale factors, linking to ratio, to solve simple direct proportion problems • Use scale diagrams and maps Multiplying and Dividing Fractions (N4, P1): • Multiply and divide a fraction by an integer • Multiply and divide a fraction by a fraction **Autumn Term 2 – Probability and Statistics 1: Representation** Working in the Cartesian Plane (N4, A124, G15, M3): • Plot and interpret straight line graphs • Work out the equations of lines parallel to the axes • Model situations by translating them into expressions, formulae and graphs Representing Data (N4, G5, M3): • Draw and use scatter graphs and infer correlation • Design and use one and two-way tables • List outcomes Probability (N4, P1, M2): • Use sample space diagrams • Use tables	**Spring Term 1 – Algebra 2: Algebraic Techniques** Brackets, Equations and Inequalities (N34, A1234): • Expand single brackets • Form and use expressions, formulae and identities • Form and solve equations and inequalities with and without brackets Sequences (N6, A124): • Use more complex rules (for example, with brackets and squared terms) Indices (N6, A12): • Write expressions with powers **Spring Term 2 – Number 5: Developing Number** Fractions and Percentages (N79, P2): • Revisit fraction, decimal and percentage equivalence • Write one number as a percentage of another Standard Index Form (N16): • Convert between numbers in ordinary and standard form • Compare numbers in standard form Number Sense (N45810, G3): • Develop mental strategies • Use appropriate measures and units • Estimate calculations (including rounding to a given number of decimal places) • Revisit order of operations	**Summer Term 1 – Geometry and Measures 2: Developing Geometry** Angles in Parallel Lines and Polygons (N4, G12, M3): • Review year 7 angle rules • Identify parallel lines and angles in parallel lines • Revisit geometric notation • Work out angles in special quadrilaterals • Work out angles in a polygon Area of Trapezia and Circles (N4910, G23, M13): • Review year 7 area of shapes • Work out the area of a trapezium • Work out the area of a circle and parts of a circle • Use significant figures • Work out the area of compound shapes Line Symmetry and Reflection (G12, M3): • Identify line symmetry in polygons and other shapes • Reflect shapes in horizontal, vertical and diagonal lines **Summer Term 2 – Probability and Statistics 2: Reasoning with Data** The Data Handling Cycle (G14, P2, M2): • Collect data • Interpret statistical diagrams • Draw, use and interpret dual bar charts • Construct and interpret pie charts Measures of Location and Dispersion (N48910, M23): • Revisit the median and the mean • Work out the mean from grouped data • Work out the mode • Choose the appropriate average • Revisit the range • Compare distributions

8	Higher MPAs to HPAs	**Autumn Term 1 – Ratio and Proportion 1: Proportional Reasoning** Ratio and Scale (G2, P2, M1): • Understand ratio and its link to multiplication • Work out the circumference of a circle • Use ratio notation • Reduce ratios to their simplest form • Solve ratio problems Multiplicative Change (N4, G23, P2): • Use scale factors, linking to ratio, to solve simple direct proportion problems • Use scale diagrams and maps Multiplying and Dividing Fractions (N4, P1): • Multiply and divide a fraction by an integer • Multiply and divide a fraction by a fraction Additional Higher Content (N47, G23, P12): • Write ratios in the form 1:n • Compare ratios • Work out the area of a circle • Multiply and divide mixed numbers **Autumn Term 2 – Probability and Statistics 1: Representation** Working in the Cartesian Plane (N4, A124, G15, M3): • Plot and interpret straight line graphs • Work out the equations of lines parallel to the axes • Model situations by translating them into expressions, formulae and graphs Representing Data (N4, G5, M3): • Draw and use scatter graphs and infer correlation • Design and use one and two-way tables • List outcomes Probability (N4, P1, M2): • Use sample space diagrams • Use tables Additional Higher Content (N4, A124, G5): • Find the equation of a straight line • Find the midpoint of a line segment • Draw quadratic graphs • Use the product rule for counting	**Spring Term 1 – Algebra 2: Algebraic Techniques** Brackets, Equations and Inequalities (N34, A1234): • Expand single brackets • Form and use expressions, formulae and identities • Form and solve equations and inequalities with and without brackets Sequences (N6, A124): • Use more complex rules (for example, with brackets and squared terms) Indices (N6, A12): • Write expressions with powers Additional Higher Content (N246, A124): • Factorise expressions into single brackets • Expand binomials • Solve equations with unknowns on both sides • Find the rule for the nth term of a linear sequence **Spring Term 2 – Number 5: Developing Number** Fractions and Percentages (N79, P2): • Revisit fraction, decimal and percentage equivalence • Write one number as a percentage of another Standard Index Form (N16): • Convert between numbers in ordinary and standard form • Compare numbers in standard form Number Sense (N45810, G3): • Develop mental strategies • Use appropriate measures and units • Estimate calculations (including rounding to a given number of decimal places) • Revisit order of operations Additional Higher Content (N6910, G3, P1): • Find the original number, given any percentage • Use simple surds • Calculate with standard form • Understand negative and simple fractional indices • Convert area units • Write down error intervals	**Summer Term 1 – Geometry and Measures 2: Developing Geometry** Angles in Parallel Lines and Polygons (N4, G12, M3): • Review year 7 angle rules • Identify parallel lines and angles in parallel lines • Revisit geometric notation • Work out angles in special quadrilaterals • Work out angles in a polygon Area of Trapezia and Circles (N4910, G23, M13): • Review year 7 area of shapes • Work out the area of a trapezium • Work out the area of a circle and parts of a circle • Use significant figures • Work out the area of compound shapes Line Symmetry and Reflection (G12, M3): • Identify line symmetry in polygons and other shapes • Reflect shapes in horizontal, vertical and diagonal lines Additional Higher Content (G1245, M3): • Construct perpendicular lines and perpendicular bisectors • Know the diagonal properties of quadrilaterals **Summer Term 2 – Probability and Statistics 2: Reasoning with Data** The Data Handling Cycle (G14, P2, M2): • Collect data • Interpret statistical diagrams • Draw, use and interpret dual bar charts • Construct and interpret pie charts Measures of Location and Dispersion (N48910, M23): • Revisit the median and the mean • Work out the mean from grouped data • Work out the mode • Choose the appropriate average • Revisit the range • Compare distributions Additional Higher Content (N89, M13): • Work out the mean from grouped data • Find unknown data values given the mean or changes in the mean

9	Foundation LPAs to MPAs	**Autumn Term 1 – Ratio and Proportion 2: Proportional Reasoning** Straight Line Graphs (A124): • Interpret straight line graphs • Find the equation of a straight line graph • Compare the equations of straight line graphs to linear sequences and finding the rule for the nth term Forming and Solving Equations (A124, G12, P12): • Use all previous contexts – angles, probability and area Testing Conjectures (A124, G1, M124): • Make conjectures about odd, even and prime numbers • Work out whether a term is in the sequence • Work out whether lines are parallel • Make inferences when asked, 'What would happen if…?' **Autumn Term 2 – Geometry and Measures 3: Constructing in 2 and 3 Dimensions** Three-Dimensional Shapes (G23, M34): • Identify faces, edges and vertices • Know the names of prisms and non-prisms • Identify 2D shapes within 3D shapes • Work out the volume and surface area of cuboids and cylinders • Work out the volume of any prism Constructions and Congruency (G234, P2, M3): • Draw and identify the nets of 3D shapes • Draw and interpret scale drawings • Construct perpendiculars and bisectors • Explore congruency via construction	**Spring Term 1 – Number 6: Reasoning with Number** Numbers (N1346): • Identify different types of number • Work out the Highest Common Factor and Lowest Common Multiple • Revisit standard form Using Percentages (N14789): • Increase and decrease by a given percentage • Work with percentages greater than 100% • Find percentage change • Use multipliers Mathematics and Money (N14789, M1234): • Work with wages and taxes • Work with bills and bank statements • Work with interest • Work out the best value for money **Spring Term 2 – Geometry and Measures 4: Reasoning with Geometry** Deduction (A124, G12, M124): • Revisit angle rules (including within special quadrilaterals and algebraic situations) Rotation and Translation (G245): • Identify the order of rotational symmetry • Rotate shapes • Translate points and shapes Pythagoras' Theorem (N2468910, G2, M1234): • Identify the hypotenuse of a right-angled triangle • Determine whether a triangle is right-angled • Calculate missing sides in right-angled triangles	**Summer Term 1 – Ratio and Proportion 3: Reasoning with Proportion** Enlargement and Similarity (N4789, P2): • Enlarge shapes by a positive scale factor (including from a given point) • Calculate the lengths of missing sides in similar shapes Solving Ratio and Proportion (G5, P2, M2): • Understand direct proportion problems and graphs • Draw, use and interpret conversion graphs • Solve ratio problems given the whole or a part Rates (N289, A1234, G3, P2, M1234): • Work out speed, distance and time using the formula • Work out density, mass and volume using the formula • Work with compound units **Summer Term 2 – Probability and Statistics 3: Representations** Solving Problems Using Graphs, Tables and Algebra (N69, A124, P12, M1234): • Revisit data charts and graphs including bivariate data • Revisit sequences • Revisit frequency trees • Revisit standard form • Use and interpret tables and timetables • Draw and read inequalities on number lines and write down error intervals • Interpret misleading graphs • Represent word problems in a variety of forms (graphs, tables, expressions etc.) • Interpret graphs of any form • Work with probability

9	Higher MPAs to HPAs	**Autumn Term 1 – Ratio and Proportion 2: Proportional Reasoning** Straight Line Graphs (A124): • Interpret straight line graphs • Find the equation of a straight line graph • Compare the equations of straight line graphs to linear sequences and finding the rule for the nth term Forming and Solving Equations (A124, G12, P12): • Use all previous contexts – angles, probability and area Testing Conjectures (A124, G1, M124): • Make conjectures about odd, even and prime numbers • Work out whether a term is in the sequence • Work out whether lines are parallel • Make inferences when asked, 'What would happen if…?' Additional Higher Content (N2, A124): • Solve simultaneous equations graphically • Change the subject of a formula **Autumn Term 2 – Geometry and Measures 3: Constructing in 2 and 3 Dimensions** Three-Dimensional Shapes (G23, M34): • Identify faces, edges and vertices • Know the names of prisms and non-prisms • Identify 2D shapes within 3D shapes • Work out the volume and surface area of cuboids and cylinders • Work out the volume of any prism Constructions and Congruency (G234, P2, M3): • Draw and identify the nets of 3D shapes • Draw and interpret scale drawings • Construct perpendiculars and bisectors • Explore congruency via construction Additional Higher Content (G23, M3): • Convert between volume units • Work out the surface area of any prism • Construct loci	**Spring Term 1 – Number 6: Reasoning with Number** Numbers (N1346): • Identify different types of number • Work out the Highest Common Factor and Lowest Common Multiple • Revisit standard form Using Percentages (N14789): • Increase and decrease by a given percentage • Work with percentages greater than 100% • Find percentage change • Use multipliers Mathematics and Money (N14789, M1234): • Work with wages and taxes • Work with bills and bank statements • Work with interest • Work out the best value for money Additional Higher Content (N2789, P2): • Work out reverse percentage problems • Calculate repeated percentage change **Spring Term 2 – Geometry and Measures 4: Reasoning with Geometry** Deduction (A124, G12, M124): • Revisit angle rules (including within special quadrilaterals and algebraic situations) Rotation and Translation (G245): • Identify the order of rotational symmetry • Rotate shapes • Translate points and shapes Pythagoras' Theorem (N2468910, G2, M1234): • Identify the hypotenuse of a right-angled triangle • Determine whether a triangle is right-angled • Calculate missing sides in right-angled triangles Additional Higher Content (A1234, G124, M13): • Complete angle proofs • Combine transformations • Explore proofs of Pythagoras' Theorem • Use Pythagoras' Theorem in 3D shapes	**Summer Term 1 – Ratio and Proportion 3: Reasoning with Proportion** Enlargement and Similarity (N4789, P2): • Enlarge shapes by a positive scale factor (including from a given point) • Calculate the lengths of missing sides in similar shapes Solving Ratio and Proportion (G5, P2, M2): • Understand direct proportion problems and graphs • Draw, use and interpret conversion graphs • Solve ratio problems given the whole or a part Rates (N289, A1234, G3, P2, M1234): • Work out speed, distance and time using the formula • Work out density, mass and volume using the formula • Work with compound units Additional Higher Content (N3489, G123, P2, M12): • Enlarge shapes by a negative scale factor • Identify and work with similar triangles • Draw, use and interpret inverse proportion graphs • Convert compound units **Summer Term 2 – Probability and Statistics 3: Representations** Solving Problems Using Graphs, Tables and Algebra (N69, A124, P12, M1234): • Revisit data charts and graphs including bivariate data • Revisit sequences • Revisit frequency trees • Revisit standard form • Use and interpret tables and timetables • Draw and read inequalities on number lines and write down error intervals • Interpret misleading graphs • Represent word problems in a variety of forms (graphs, tables, expressions etc.) • Interpret graphs of any form • Work with probability Additional Higher Content (N2, A124, M12): • Form and solve linear simultaneous equations

Disciplinary Literacy			
Year Group	**Autumn Term**	**Spring Term**	**Summer Term**
7	**<u>Autumn Term 1 – Algebra 1: Algebraic Thinking</u>** *Sequences:* Sequence, Term, Position, Rule, Term-to-Term, Table, Graph, Axes, Linear, Non-Linear, Difference, Constant Difference, Second Difference, Ascending, Descending, Arithmetic, Geometric, Fibonacci. *Understand and Use Algebraic Notation:* Function, Input, Output, Estimate, Operation, Square, Inverse, Bar Model, Variable, Coefficient, Commutative, Expression, Evaluate, Substitute, Order, Bracket, Constant, Sequence, Non-Linear, Linear, Rule, Term-to-Term, Position-to-Term, Graph, Axis, Axes, Scale, Equation, Curve. *Equality and Equivalence:* Equality, Equation, Equals, Is Equal to, Fact Family, Bar Model, Equation, Solve, Solution, Unknown, Inverse, Term, Like, Unlike, Coefficient, Index, Expression, Equivalent, Simplify, Collect. **<u>Autumn Term 2 – Number 1: Place Value and Proportion</u>** *Place Value and Ordering Integers and Decimals:* Place Value, Digit, Billion, Placeholder, Integer, Equal Division, Interval, Scale, Gap, Spaces, Approximate, Round, Nearest, Convention, Halfway, Compare, Digit, Equal, Not Equal, Greater Than, Less Than, Order, Ascending, Descending, Leading Digit, Range, Greatest, Least, Difference, Median, Middle, Order, Average, Tenth, Hundredth, Decimal, Decimal Point, Interval, Significant Figure, Power, Index, Million, Standard Form, Scientific Notation, Negative. *Fraction, Decimal and Percentage Equivalence:* Place Value, Digit, Placeholder, Tenths, Hundredths, Interval, Fraction, Decimal, Number Line, Fifth, Quarter, Equivalent, Percentage, Shaded, Out of One Hundred, Convert, Equivalent, Half, Pie Chart, Equal Parts, Sector, Denominator, Numerator, Part, Whole, Division, Quotients, Operator, Improper, Mixed Number, Rational, Recurring.	**<u>Spring Term 1 – Number 2: Application of Number</u>** *Solving Problems with Addition and Subtraction:* Total, Sum, Difference, Number Line, Commutative, Associative, Inverse, Bridging, Compensation, Partition, Difference, Count On, Number Bonds, Column Method, Place Value, Carrying, Exchange, Decimal Point, Equivalence, Estimating, Equation, Subtraction, Digit, Formal Method, Mental, Written, Jottings, Calculator, Length, Path, Distance, Units, Edges, Polygon, Profit, Loss, Balance, Credit, Debit, Statement, Change, Bill, Row, Column, Entry, Total, Hours, Minutes, Frequency, Frequency Tree, Sum, Part-Whole, Axis, Scale, Dual, Multiple, Standard Form, Power, Exponent, Significant Figure, Million, Billion. *Solving Problems with Multiplication and Division:* Product, Multiply, Divide, Inverse, Quotient, Commutative, Factor, Array, Venn Diagram, Odd, Even, Integer, Multiple, Common, Lowest Common Multiple, Place Value, Ones, Tenths, Hundredths, Metric, Convert, Litre, Gram, Metre, Integer, Efficient, Estimate, Adjust, Divisor, Dividend, Remainder, Order, Operation, Priority, Base, Perpendicular Height, Parallelogram, Parallel, Trapezium, Mean, Average, Median, Range, Expression, Simplify, Term. *Fractions and Percentages of Amounts:* Fraction, Equivalent, Numerator, Denominator, Whole, Original, Place Value, Percent, Percentage, Decimal, Convert. **<u>Spring Term 2 – Number 3: Directed Number and Fractional Thinking</u>** *Operations and Equations with Directed Number:* Positive, Negative, Reflection, Symmetric, Sea Level, Ascending, Descending, Smaller/Bigger Than, Greater/Less Than, Increase, Decrease, Difference, Add, Subtract, Negative, Minus, Partition, Zero Pair, Product, Multiply, Commutative, Inverse, Calculator, Sign Change, Substitute, Expression, Order of Operations, Solve, Equation, Balance, Solution, Function Machine, Zero Pair, Positive/Negative Solution, Indices, Brackets, Priority, Square, Square Root, Power, Exponent. *Addition and Subtraction of Fractions:* Equal Parts, Congruent, Divide, Denominator, Numerator, Ascending, Descending, Smaller/Bigger Than, Positive, Negative, Greater/Less Than, Unit Fraction, Denominator, Whole, Numerator, Multiple, Mixed Number, Whole, Addition, Subtraction, Integer, Partition, Equivalent, Multiple, Lowest Common Multiple/Denominator, Commutative, Improper Fraction, Sequence, Substitute, Solve, Equation, Linear, Geometric, Inverse, Expression, Place Value, Tenths, Hundredths, Decimal, Equivalent, Simplify, Like Terms, Collect, In Terms Of.	**<u>Summer Term 1 – Geometry and Measures 1: Lines and Angles</u>** *Constructing, Measuring and Using Geometric Notation:* Line, Line Segment, Geometric Figure, Notation, Polygon, Length, Height, Width, Figure, Turn, Degrees, Angles, Rotation, Acute, Obtuse, Right-Angle, Reflex, Interior, Exterior, Protractor, Sum, Measure, Construct, Parallel, Perpendicular, Intersect, Equilateral, Isosceles, Scalene, Square, Kite, Rhombus, Parallelogram, Trapezium, Polygon, Edges, Vertices, Equal, Triangle, Decagon, Pair of Compasses, Side, Vertex, Point, Diagonals, Compound, Proportion, Frequency, Fraction, Total, Comparison, Sector, Degrees. *Developing Geometric Reasoning:* Sum, Angle, Degrees, Line Segment, Notation, Adjacent, Vertically Opposite, Line, Intersect, Isosceles, Equilateral, Scale, Right-Angled, Quadrilateral, Convex, Concave, Parallelogram, Rhombus, Vertically Opposite, Point, Straight Line, Polygon, Interior, Conjecture, Equal, Opposite, Transversal, Co-Interior, Corresponding, Alternate, Proof, Demonstration, Opposite, Parallel. **<u>Summer Term 2 – Number 4: Reasoning with Number</u>** *Developing Number Sense:* Compensation, Number Line, Addition, Subtraction, Associative, Commutative, Partition, Multiply, Divide, Factors, Place Value, Estimate, Tenths, Hundredths, Thousandths, Whole, Equal Parts, Numerator, Denominator, Equivalent, Rounding, Place Value, Overestimate, Underestimate, Addend, Compensate, Product, Quotient, Equation, Expression, Equal, Equality, Mental, Formal, Efficient, Interpret. *Sets and Probability:* Universal Set, Inclusive, Element, Member, Set, Venn Diagram, Intersection, Mutually Exclusive, Union, Element, Complement, And/Or/Not, Union, Universal Set, Impossible, Likely, Even, Unlikely, Certain, Random, Bias, Event, Sample Space, Possibilities, Outcomes, Scale, Certain, Fair. *Prime Numbers and Proof:* Multiples, Integer, Positive, Zero, Factor, Divisible, Remainder, Term, Factorise, Divisor, Prime Number, Odd, Even, Digit, Triangular Number, Relationship, Investigate, Square Number, Expression, Factor, Highest Common Factor, Factorise, Product, Multiple, Lowest Common Multiple, Express, Union, Intersection, Conjecture, Explain, Relationship, True, False, Proof, Demonstration, Always, Systematic, Never, Sometimes, Assumption, Counterexample.

8	**Autumn Term 1 – Ratio and Proportion 1: Proportional Reasoning** *Ratio and Scale:* Ratio, Equal Parts, For Every, Proportion, Relationship, Ratio, Colon, Divide, Multiply, Part, Proportional, Multiplier, Placeholder, Units, Share, Total, Label, Factors, Equivalent, Common Factors, Scale, Compare, Denominator, Numerator, Perimeter, Circumference, Constant, Pi, Regular, Diameter, Right-Angled Triangle, Gradient, Slope, Steep. *Multiplicative Change:* Proportion, Ratio, Double, Triple, Linear, Variable, Axes, Labelling, Units, Conversion, Approximation, Exchange Rate, Sterling, Currency, Rate, Directly Proportional, Origin, Constant, Relationship, Orientation, Similar, Corresponding, Scale Factor, Enlargement, Object, Image, Length, Not To Scale, Plan, Image, Distance, Metric. *Multiplying and Dividing Fractions:* Unit Fraction, Numerator, Denominator, Product, Repeated Addition, Product, Square, Whole, Unit Fraction, Non-Unit Fraction, Commutative, Quotient, Divide, Estimate, Reciprocal, Convert, Simplify, Factors, Generalise, Cancel, Term, Expression, Simplest Form. **Autumn Term 2 – Probability and Statistics 1: Representation** *Working in the Cartesian Plane:* Quadrant, Coordinates, Horizontal, Vertical, Axis, Origin, Parallel, Straight Line, Equation, Graph, Diagonal, Multiple, Steep, Linear, Substitute, Table, Slope, Scale, Axes, Proportion, Unitary, Multiplier, Direct, Gradient, Equation, Input, Output, Intercept, Incline, Ratio, Sequence, Multiple, Integer, Table of Values, Curve, Symmetrical, Midpoint, Equidistant, Segment, Mean. *Representing Data:* Variable, Relationship, Origin, Scale, Coordinate, Axis, Correlation, Negative, Line of Best Fit, Estimate, Extrapolate, Outlier, Variable, Discrete, Continuous, Qualitative, Quantitative, Frequency, Total, Subtotal, Grouped, Tally, Range, Equal, Class Boundary, Ratio, Fraction, Percentage. *Tables and Probability:* Outcomes, Sample Space, Set, Probability, Systematic, Chance, Event, Equally Likely, Unbiased, Two-Way Table, Denominator, Intersection, Union, Region, Total, Possibilities, Outcomes, Product.	**Spring Term 1 – Algebra 2: Algebraic Techniques** *Brackets, Equations and Inequalities:* Expression, Simplify, Term, Substitute, Coefficient, Equivalent, Positive, Negative, Directed, Solve, Expand, Multiply Out, Coefficient, Bracket, Identity, Product, Factor, Factorise, Common, Highest Common Factor, Like and Unlike Terms, Binomial, Quadratic, Solve, Unknown, Solution, Inequality, Satisfy, Solution Set, Balance, Formula, Subject. *Sequences:* Sequence, Position, Term, Linear, Non-Linear, Fibonacci, Constant, Term-to-Term, Algebraic, Integer, Non-Integer, Substitute, Bracket, Expand, Coefficient, Position-to-Term. *Indices:* Expression, Simplify, Term, Coefficient, Index, Indices, Power, Multiply, Product, Expand, Simplify, Numerator, Denominator, Factor, Common Factor, Base, Exponent. **Spring Term 2 – Number 5: Developing Number** *Fractions and Percentages:* Fraction, Decimal, Percentage, Equivalent, Denominator, Numerator, Fraction key, Estimate, Rounding, Conversion, Hundredth, Tenth, Reduce, Decrease, Multiplier, Increase, Growth, Express, Factor, Multiple, Round, Integer, Profit, Loss, Interest, Change, Original, Invest, Reverse. *Standard Index Form:* Base, Index/Indices, Power, Exponent, Standard Form, Negative, Place Value, Commutative, Scientific Notation, SCI/EXP, Reciprocal, Zero, Fraction, Root. *Number Sense:* Round, Significant, Power, Nearest, Integer, Number line, Decimal Point, Decimal Place, Estimate, Over/Underestimate, Root, Discrete, Continuous, Bound, Integer, Operation, Order, Priority, Index/Indices, Change, Deposit, Interest, Debit, Credit, Balance, Metric, Metre, Prefix, Kilo, Milli, Centi, Area, Perpendicular, Units, Dimensions, Week, Month, Year, Leap Year.	**Summer Term 1 – Geometry and Measures 2: Developing Geometry** *Angles in Parallel Lines and Polygons:* Adjacent, Vertically Opposite, Straight, Acute, Obtuse, Reflex, Right-Angle, Parallel, Transversal, Alternate, Corresponding, Supplementary, Co-Interior, Isosceles, Equilateral, Scalene, Rhombus, Parallelogram, Trapezium, Kite, Perpendicular, Bisect, Delta, Exterior, Interior, Polygon, Sum, Total, Pentagon etc., Demonstration, Justification, Proof, Line Segment. *Area of Trapezia and Circles:* Trapezium, Parallel, Perpendicular Height, Formula, Compound, Component Shapes, Parallelogram, Sector, Rectangle, Estimate, Infinity, Radius, Pi, Approximately, Diameter, In Terms of Pi, Decimal Place, Substitute, Significant Figures. *Line Symmetry and Reflection:* Line symmetry, Regular, Polygon, Isosceles, Equilateral, Rhombus, Reflect, Line Symmetry, Congruent, Object, Image, Vertical/Horizontal, Reflect, Vertex, Perpendicular Distance. **Summer Term 2 – Probability and Statistics 2: Reasoning with Data** *The Data Handling Cycle:* Hypothesis, Investigation, Enquiry, Primary/Secondary Data, Sample, Questionnaire, Questions, Design, Multiple Choice, Response Box, Biased, Pictogram, Bar Chart, Line Chart, Tally, Frequency, Scale, Axes, Comparison, Key, Pie Chart, Fraction, Full Turn, Proportion, Change, Scatter Graph, Bivariate, Grouped Data, Discrete, Continuous, Intervals, Range, Spread, Consistent, Average, Distribution, Broken Axis, Mislead. *Measures of Location:* Average, Mean, Median, Mode, Modal Value, Total, Frequency, Represent, Subtotal, Estimate, Midpoint, Estimate, Outliers, Range, Average, Consistent.