PROGRAMME OF STUDY FOR Mathematics

KEY STAGES 3-4

At Springwell Special Academy, we recognise the importance of delivering a broad Mathematics Programme of Study that will provide seamless progression from Year 7 all the way to GCSE. Our flexible, 5 year Programme of Study aims to ensure that all our students become **fluent** in the fundamentals of mathematics; can reason mathematically and can solve problems by applying their mathematics to a variety of routine and non-routine problems and contexts.

KS3: Maths Progress (2nd Edition) Course
In Year 7 and Year 8, pupils follow a 2 year scheme of work that identifies areas of overlap between the KS3 Maths Progress Core student books and the Edexcel GCSE (9-1) Mathematics Foundation student book. In Year 7 and Year 8, students cover all the core units that are required as prior knowledge before moving on to the GCSE course in Year 9, Year 10 and Year 11.
(This SOW incorporates the KS3 2014 Programme of Study [Learning Objectives], and links directly with the Pearson Progression Steps / grade mapping used at GCSE level.) Students are assessed against the Rising Stars Learning objectives.

In Year 9, pupils start to follow the GCSE bridging Scheme of work to enable them to access the full GCSE course in Y10/11 with greater confidence.

KS4: Edexcel GCSE (9-1) Mathematics Course
In Year 10 and Year 11, pupils follow the Edexcel Maths GCSE (9-1) Course (Foundation) based on the KS4 2014 Programme of Study, with 3 linear exams at the end of the course.

Alongside the GCSE qualification, we offer our pupils the opportunity to achieve Functional Skills qualifications, ranging from Entry Level 1 to 3, to Functional Skills Level 1/2.

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YEAR 11

SUMMER 2:

GCSE Paper 2: Calculator

GCSE Paper 3: Calculator

Final Functional Skills window (3)

SUMMER 1:

GCSE Practise Papers

PAPER 1: Non-Calculator

SPRING 2:

Revision and targeted intervention.

FUNCTIONAL SKILLS Window 2

SPRING 1:

Mock Exam reflection & discussion.

Revision & targeted intervention

FUNCTIONAL SKILLS Window 1

AUTUMN 2:
Unit: Standard Form

Revisions & targeted intervention

MOCK EXAM

AUTUMN 1:

Unit 18: Constructions

Unit 27: Pythagoras' Theorem

Unit: Trigonometry

YEAR 10

Edexcel GCSE 9-1
AUTUMN 1:

Consolidation & recap of Number, Decimals and Algebra 1.
Mathematical reasoning and problem solving - number/decimals.

AUTUMN 2:

Unit 9: Algebra 2

Unit 7: Angles 2

MOCK EXAM

SPRING 1:

Unit 8: Fractions - consolidation/recap.

Unit 19: Percentages

FUNCTIONAL SKILLS Window 1

SPRING 2:

Unit 24: Ratio & Proportion

Unit 15: Graphs 1

FUNCTIONAL SKILLS Window 2

SUMMER 1:

Unit 22: Graphs 2

Unit 23: Transformations

Unit 21: Equations and Inequalities

SUMMER 2:

Unit 25: Line diagrams and scatter graphs.

Unit 17: Circles

Unit 10: Using a calculator.

YEAR 9

SUMMER 2:

Unit 10: General calculator work

Maths Project: Budgets

SUMMER 1:

Unit 26: Probability

Unit 14: Perimeter and Area of 2D Shapes

Unit 20: 3D Shapes

SPRING 2:

Unit 13: Sequences

Unit 16: Averages and Range

SPRING 1:

Unit 11: Measure

Unit 8: Fractions

Unit 6: 2D Shapes

AUTUMN 2:

Unit 3: Data handling - collecting and recording data.

Unit 12: Processing, representing and interpreting data.

Unit 5: Decimals and Rounding

Edexcel GCSE 9-1
AUTUMN 1:

Unit 1: Number

Unit 2: Angles 1

Unit 3: Algebra 1

YEAR 8

Maths Progress CORE 2
AUTUMN 1:

1. Number

2. Area & Volume:

AUTUMN 2:

3. Statistics, graphs and charts:

4. Expressions and equations:

SPRING 1:

5. Real-life graphs:

6. Decimals and ratio:

SPRING 2:

7. Lines and angles

SUMMER 1:

8. Fractions:

9. Straight-line graphs

SUMMER 2:

10. Fractions, decimals and percentages:

YEAR 7

SUMMER 2:

10. Transformations

SUMMER 1:

8. Lines and angles

9. Sequences and graphs

SPRING 2:

7. Ratio and proportion

SPRING 1:

5: Fractions and percentages

6: Probability

AUTUMN 2:

3: Expressions, functions and formulae

4: Decimals and measures

Maths Progress CORE 1
AUTUMN 1:

1: Analysing and displaying data

2. Number Skills

Where learning matters for everyone.

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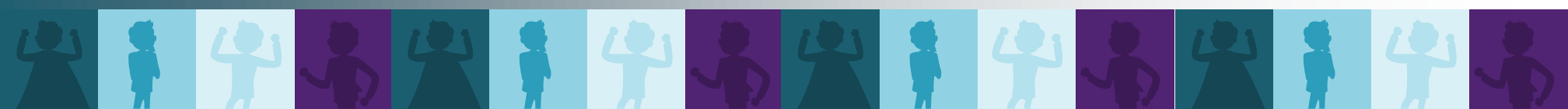
YEAR 7

AUTUMN 1	Knowledge	Skills	Assessment
GCSE (9-1) Spec Reference: S2 S4	**1. Analysing and displaying data** • Mode, median and range • Displaying data • Grouping data • Averages and comparing data • Line graphs and more bar charts	Students will be taught to; Interpret a range of data using methods including time graphs, bar charts, line graphs. They will be able to interpret the data considering the mean as an average. Students describe and interpret distributions of a single variable using mean, mode and range. They will then construct tables to collate data, before comparing observed distributions using mean, median, mode and range. Students will be able to add and subtract numbers up to 4 digits, using columnar addition and subtraction where needed. BE able to multiply and divide two and three digit numbers by one digit, before including long multiplication for two digit numbers.	UNIT 1: Test Classroom Monitor: Rising Stars (Statistics) Stage 4: 4.1.1; 4.2.1 Stage 5: 5.1.1; 5.2.1 Stage 6: 6.3.2 Stage 7: 1.1; 1.2; 2.1; 2.2; 3.1; 3.2
GCSE (9-1) Spec Reference: N1 N2 N3 N4 N6 N13 N14 N15	**2. Number Skills** • Mental maths • Addition and subtraction • Multiplication • Division • Money and time • Negative numbers • Factors, multiples and primes • Square numbers	Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. Read, write, order and compare numbers to 10 000 000 before rounding to whole numbers with a degree of accuracy. Students will be able to perform mental maths with mixed operations and large numbers. They will be able to identify common factors. Moving then to consolidate multiplying and dividing whole numbers and decimals by 10, 100 and 1000 They will be able to solve multi-step addition, subtraction, multiplication and divide problems in less familiar contexts, deciding which operations and methods to use and why. Recognise and use relationships between operations Appreciate the infinite nature of the set of integers Use integer powers and associated real roots, recognise powers of 2, 3, 4, 5	UNIT 2: Test Classroom Monitor: Rising Stars (Number) Stage 4: 4.2.e.1; 4.2.e.2; 4.2.e.3 Stage 5: 5.2.b.4; 5.2.e.2 Stage 6: 6.1.b.1; 6.1.b.3; 6.1.c.1; 6.1.e.1 6.2.a.1; 6.2.b.1; 6.2.b.3; 6.2.b.4 6.2.c.1; 6.2.c.3; 6.2.d.1; 6.2.d.2; 6.2.d.3 6.2.e.2; 6.2.e.3 Stage 7: 6.1; 6.3; 7.3; 9.2

AUTUMN 2	Knowledge	Skills	Assessment
GCSE (9-1) Spec Reference: A1 A2 A3 A4 A7	**3. Expressions, functions and formulae** • Functions • Simplifying expressions • Writing expressions • Substitution • Writing formulae.	Students will be able to; Express problems algebraically. Use simple formulae and solve algebra problems. They will be able to Find pairs of numbers that satisfy an equation with two unknowns. They will be able to use and interpret algebraic notation, including: ab in place of a × b; 3y in place of y + y + y and 3 × y; a^2 in place of a × a; a^3 in place of a × a × a; a^2b in place of a × a × b; a/b in place of a ÷ b. Further to this they will be able to Use and interpret all algebraic notation, including brackets before Simplifying and manipulating algebraic expressions to maintain equivalence by multiplying a single term over a bracket and taking out common factors	UNIT 3: Test Classroom Monitor: Rising Stars (Algebra) Stage 6: 6.1.1; 6.1.2 Stage 7: 1.1; 1.2; 1.3; 1.4; 2.2 Stage 8: 1.1; 1.4
GCSE (9-1) Spec Reference: N1 N2 N13 N15 R1 R2 G14 G15 G16	**4. Decimals and measures** • Decimals and rounding • Length,mass and capacity • Scales • Mental maths with decimals • Perimeter and area, • Units of measure.	Students will be able to read, write, order, compare and round numbers up to the nearest whole number and to one and up to three decimal place. They will be able to multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places and round decimals to three decimal places or other approximations depending on the context They will be able to calculate the perimeter of a rectilinear shape, calculate and compare the area of rectangles measure using different units before consolidate skills in calculating perimeter, they will then be able to solve the problems involving perimeters of circles and composite shapes.	UNIT 4: Test Classroom Monitor: Rising Stars (Number) Stage 5: 5.3.c.4; 5.3.c.5 Stage 6: 6.3.a.3; 6.3.a.4; 6.3.c.5; 6.3.c.7; 6.3.d.2 Stage 7: 14.7 *(Measurement)* Stage 5: 5.3.5; 5.3.6 Stage 6: 6.2.3; 6.3.5 Stage 7: 3.5; 3.6 **TERM TEST**



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YEAR 7

SPRING 1	Knowledge	Skills / Objectives	Assessment
GCSE (9-1) Spec Reference: N2 N8 N10 N12 R3 R9	**5. Fractions and percentages** • Comparing fractions • Simplifying fractions • Working with fractions • Fractions and decimals • Understanding percentages • Percentages of amounts	Students will be taught to Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths before being able recognise mixed numbers and improper fractions and convert from one form to the other. Students will be able to read and write decimal numbers as fractions, including percentages and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5 and those with a denominator of a multiple of 10 or 25. They will be able to compare, order, add and subtract fractions with the same denominator or multiples of the same number including calculations > 1. Students will be able to consolidate their understanding of fractions. They will recognise and understand the percent symbol. They will use common and multiples to express fractions. They will be able to calculate and consolidate and understand the connections between fractions, decimals and percentages. Finally they will be able to Interpret percentages as a fraction or a decimal, interpret these multiplicatively.	UNIT 5: Test Classroom Monitor: Rising Stars (Number) Stage 5: 5.3.b.1; 5.3.b.2; 5.3.b.4; 5.3.b.5; 5.3.b.6; 5.3.c.1; 5.3.c.2 Stage 6: 6.3.a.2; 6.3.a.5; 6.3.b.1; 6.3.b.2; 6.3.b.4; 6.3.b.5; 6.3.b.6; 6.3.c.1; 6.3.c.2 Stage 7: 12.5; 13.5
GCSE (9-1) Spec Reference: P2 P3 P4	**6. Probability** • The language of probability • Calculating probability • More probability calculations • Experimental probability • Expected outcomes	Students will be able to record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, and equally likely outcomes using appropriate language and the 0-1 probability scale They will understand that the probabilities of all possible outcomes sum to 1 and generate theoretical sample spaces for single events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities. They will then be able to develop precision in analysing the outcomes of simple probability experiments	UNIT 6: Test Classroom Monitor: Rising Stars (Statistics) Stage 7: 4.1; 4.2; 4.3 Stage 8: 4.1

SPRING 2	Knowledge	Skills/ Objectives	Assessment
GCSE (9-1) Spec Reference: A1 A2 A3 A4 A7	**7. Ratio and proportion** • Direct proportion • Writing ratios • Using ratios • Ratios, proportions and fractions • Proportions and percentages	Students will be able to : Solve calculation problems involving multiplying and adding, including integer scaling and harder correspondence problems such as n objects are connected to m objects. Multiply numbers up to 4 digits by a one- or two-digit number using a formal method, including long multiplication for two-digit numbers and divide numbers up to 4 digits by a one-digit number using formal short division, interpreting non-integer answers to division according to context. They will be able to recognise the percent symbol and understand that per cent relates to ''number of parts per hundred''. Use multiplication and division as inverses and solve calculation problems involving scaling by simple fractions and simple rates Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts. They will be able to solve problems involving the calculation of percentages and the use of percentages for comparison. Solve problems involving similar shapes where the scale factor is known or can be found Before beginning to recognise and use ratio notation.	UNIT 7: Test Classroom Monitor: Rising Stars (Ratio) Stage 4: 4.1.1 Stage 5: 5.1.1; 5.1.2; 5.1.3; 5.1.4 Stage 6: 6.1.1; 6.1.2; 6.1.3 Stage 7: 13.1 **TERM TEST**

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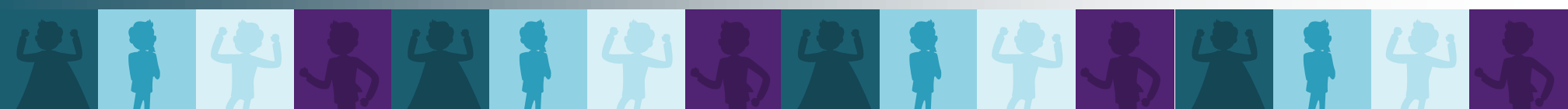
YEAR 7

SUMMER 1	Knowledge	Skills / Objectives	Assessment
GCSE (9-1) Spec Reference: G1 G3 G4 G15	**8. Lines and Angles** • Measuring and drawing angles • Lines, angles and triangles • Drawing triangles accurately • Calculating angles • Angles in a triangle • Quadrilaterals	Students will be able to; Identify acute and obtuse angles and continue to identify types of angles and to reason about their sizes. They will draw given angles, and measure them in degrees (*) and draw shapes with sides measured to the nearest millimetre, before using conventional markings for parallel lines and right angles. They will begin to identify angles at a point and one whole turn, angles at a point on a straight line and ½ a turn and other multiples of 90º. Estimate and compare acute, obtuse and reflex angles. Use the properties of rectangles to deduce related facts and find missing lengths and angles They will use conventional markings and labels for lines and angles Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles Check solutions to missing angle problems by estimating Find unknown angles and lengths in triangles, quadrilaterals, and regular polygons . They will then derive and use the sum of angles in a triangle and use it to deduce the angle sum in a quadrilateral	UNIT 8: Test Classroom Monitor: Rising Stars (Geometry) Stage 4: 4.3.1; 4.3.3 Stage 5: 5.1.1; 5.1.2; 5.3.1; 5.3.2; 5.3.3 Stage 6: 6.1.2; 6.3.1; 6.3.2; 6.3.3 Stage 7: 3.1
GCSE (9-1) Spec Reference: A8 A9 A23 A24 A25	**9. Sequences and graphs** • Sequences • Pattern sequences • Coordinates and midpoints • Extending sequences • Straight-line graphs • Position-to-term rules	Students will continue to use coordinates in the first quadrant to become fluent in their use Use positions on the full coordinate grid (all four quadrants). Recognise and describe linear number sequences and find the term to term rule. Before being able to generate and describe linear number sequences they will then generate terms of a sequence from a term - to-term or a position-to-term rule. Students will begin to reason deductively in algebra by searching for patterns in sequences. Model situations or procedures by using graphs Find approximate solutions to contextual problems from given graphs of a variety of functions, including piecewise linear, exponential and reciprocal graphs. Interpret mathematical relationships graphically Develop algebraic and graphical fluency, including understanding linear functions	UNIT 9: Test Classroom Monitor: Rising Stars (Geometry) Stage 5: 5.4.1, Stage 6: 6.4.1 (Algebra) Stage 5: 5.3.1 Stage 6: 6.3.1 Stage 7: 3.1; 3.2; 4.1; 4.2; 4.3; 4.4

SUMMER 2	Knowledge	Skills/ Objectives	Assessment
GCSE (9-1) Spec Reference: G5 G7 G8	**10. Transformations** • Congruence and enlargements • Symmetry • Reflection • Rotation • Translations and combined transformations	Student will be able to complete a simple symmetric figure with respect to a specific line of symmetry, and measure angles using a protractor. They will then be able to Identify lines of symmetry in 2-D shapes presented in different orientations, including where the line of symmetry does not dissect the original shape. Students will Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed. Draw and translate simple shapes on the coordinate plane, and reflect them in the axes, before then being able to describe, sketch and draw using conventional terms and notations, polygons that are rotationally symmetric, and those that are reflectively symmetric. They will Identify properties of, and describe the results of rotations, applied to given figures and use scale factors. Finally students will be able to construct similar shapes by enlargement with coordinate grids	UNIT 10: Test Classroom Monitor: Rising Stars (Geometry) Stage 4: 4.1.1; 4.1.2 Stage 5: 5.5.1 Stage 6: 6.5.1 Stage 7: 1.1; 5.1; 5.2 Stage 8: 4.2 **TERM TEST** **END OF YEAR TEST**



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YEAR 8

AUTUMN 1	Knowledge	Skills / Objectives	Assessment
GCSE (9-1) Spec Reference: N2 N3 N4 N6	**1. Number** • Calculations • Divisibility and division • Calculating with negative integers • Powers and roots • Powers, roots and brackets • Multiples and factors	Students will be able to recall multiplication and division facts for multiplication tables up to 12 × 12. Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate. Before then being able to multiply two-digit and three-digit numbers by a one-digit number using formal written layout. Multiply and divide numbers mentally drawing upon known facts. Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. Solve addition and subtraction multi-step problems in familiar contexts, deciding which operations and methods to use and why Students will be able to Identify multiples and factors, including all factor pairs of a number, and common factors of 2 numbers. Recall square numbers and cube numbers and the notation for them. Recall prime numbers up to 19. Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction). Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers. Divide numbers up to 4 digits by a one-digit number using formal written method of short division and interpret remainders appropriately for the context Students will Consolidate adding and subtracting whole numbers with more than 4 digits, including using formal written columnar addition and subtraction. Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication. Check answers to calculations with mixed operations and large numbers, choosing the most appropriate method, including estimation, and determining, in the context of a problem, an appropriate degree of accuracy.	UNIT 1: Test Classroom Monitor: Rising Stars (Number) <u>Stage 4:</u> 4.2.d.2; 4.2.e.1; 4.2.e.2 <u>Stage 5:</u> 5.2.b.3; 5.2.b.4; 5.2.c.1; 5.2.d.1; 5.2.d.2; 5.2.d.3; 5.2.e.1; 5.2.e.2; 5.2.e.3; 5.3.c.6 <u>Stage 6</u>: 6.2.e.1; 6.2.e.2; 6.2.f.1 <u>Stage 8:</u> 6.1
GCSE (9-1) Spec Reference: G12 G13 G14 G16	**2. Area and Volume** • 2.1 Area of a triangle • 2.2 Area of a parallelogram and trapezium • 2.3 Volume of cubes and cuboids • 2D representations of 3D solids • Surface area of cubes and cuboids • Measures	Students will estimate the area of irregular shapes and volume and capacity; Calculate the perimeter of composite rectilinear shapes. Calculate and compare the area of rectangles. Estimate volume of cubes and cuboids , before they calculate the area of parallelograms and triangles. (6.3.7 / 6.3.8) They will be able to derive and apply formulae to calculate perimeter and area of triangles, parallelograms, trapezia. Apply formulae to solve problems involving perimeter and area of triangles, parallelograms, trapezia. Apply understanding of standard units to units of volume. Before being able to use language and properties precisely to analyse 2-D and 3-D shapes that are familiar, such as those associated with triangles, cubes and cuboids.	UNIT 2: Test Classroom Monitor: Rising Stars (Measurement) <u>Stage 5:</u> 5.2.5; 5.3.5; 5.3.6 <u>Stage 6:</u> 6.2.5; 6.3.6; 6.3.7; 6.3.8 <u>Stage 7:</u> 3.6; 3.7; 3.8 <u>Stage 8</u>: 3.6; 3.7; 3.8 (Geometry) <u>Stage 5:</u> 5.1.3 <u>Stage 6:</u> 6.1.3; 1.3 <u>Stage 7:</u> 1.3 Please ensure you cross-reference the SOW with the Learning Map.

AUTUMN 2	Knowledge	Skills/ Objectives	Assessment
GCSE (9-1) Spec Reference: S2 S4 S5 S6	**3. Statistics, graphs and charts** • Pie charts • Using tables • Stem and leaf diagrams • Comparing data • Scatter graphs • Misleading graphs	Students will be able to; Interpret data in pie charts, consolidate skills in interpreting more complex tables, including timetables. Present data using pie charts and line graphs. Consolidate skills in completing tables, including timetables they will be able to solve problems using pie charts and line graphs. Calculate and interpret the mean as an average Interpret appropriate charts and diagrams, including vertical line charts for ungrouped numerical data. Interpret appropriate charts and diagrams, including pie charts for categorical data. Describe and interpret observed distributions of a single discrete variable using mean, median, mode and range from a frequency table. Construct appropriate charts and diagrams, including pie charts for categorical data. Construct grouped frequency tables for numerical data. They will be able to describe simple mathematical relationships between two variables in observational and experimental contexts and illustrate using scatter graphs. Compare observed distributions of a single discrete variable using mean, median, mode and range from a grouped frequency table	UNIT 3: Test Classroom Monitor: Rising Stars (Statistics) <u>Stage 6:</u> 6.1.1; 6.1.2; 6.2.1; 6.2.2; 6.3.1; 6.3.2 <u>Stage 7:</u> 1.1 <u>Stage 8:</u> 1.1; 1.2; 2.1; 2.2; 3.1; 3.2
GCSE (9-1) Spec Reference: A1 A2 A3 A4 A5 A6 A7 A17	**4. Expressions and equations** • Algebraic powers • Expressions and brackets • Factorising expressions • One-step equations • Two-step equations • The balancing method	Use and interpret algebraic notation, including: ab in place of a × b; 3y in place of y + y + y and 3 × y; a^2 in place of a × a; a^3 in place of a × a × a; a^2b in place of a × a × b; a/b in place of a ÷ b; coefficients written as fractions rather than as decimals. Students will use and interpret all algebraic notation, including brackets. Understand and use the concepts and vocabulary of equations. Simplify and manipulate algebraic expressions to maintain equivalence by multiplying a single term over a bracket and taking out common factors. Use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement)	UNIT 4: Test Classroom Monitor: Rising Stars *(Algebra)* <u>Stage 6:</u> 6.2.1 <u>Stage 7</u>: 1.1 <u>Stage 8</u>: 1.1; 1.3; 1.4; 2.1 **TERM TEST**

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YEAR 8

SPRING 1	Knowledge	Skills / Objectives	Assessment
GCSE (9-1) Spec Reference: A10 A14	**5. Real-life graphs** • Conversion graphs • Distance-time graphs • Line graphs • More line graphs • Real-life graphs • Curved graphs	Students will be able to; Convert between miles and kilometres and use a conversion graph. Model situations or procedures by using graphs. Find approximate solutions to contextual problems from given graphs of a variety of functions, including piecewise linear, exponential and reciprocal graphs. Students will begin to round decimals with one decimal place to the nearest whole number and compare numbers with the same number of decimal places up to two decimal places. They will round decimals with two decimal places to the nearest whole number and to one decimal place. Read, write, order and compare numbers with up to three decimal places. Solve problems involving addition and subtraction involving numbers up to three decimal places.	UNIT 5: Test Classroom Monitor: Rising Stars (Measurement) Stage 6 : 6.1.5 (Algebra) Stage 7: 4.1; 4.2
GCSE (9-1) Spec Reference: N1 N2 N15 R5	**6. Decimals and ratio** • Ordering decimals and rounding • Place-value calculations • Calculations with decimals • Ratio and proportion with decimals	Multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places Multiply one-digit numbers with up to two decimal places by whole numbers. Round numbers to a given number of significant figures . They will use knowledge of number facts and place value to multiply and divide decimals mentally Round numbers to an appropriate number of significant figures Use ratio notation, including reduction to simplest form Use multiplication and division, including formal written methods, applied to decimals Divide a given quantity into two parts in a given part:part or part:whole ratio; express the division of a quantity into two parts as a ratio	UNIT 6: Test Classroom Monitor: Rising Stars (Number) Stage 4: 4.3.c.4; 4.3.c.5 Stage 5: 5.3.c.4; 5.3.c.5 Stage 6: 6.3.a.4; 6.3.c.7 Stage 7: 5.1; 14.7 Stage 8: 5.1; 13.1; 14.7; 15.1

SPRING 2	Knowledge	Skills/ Objectives	Assessment
GCSE (9-1) Spec Reference: G3 G4	**7. Lines and angles** • Quadrilaterals • Alternate angles and proof • Angles in parallel lines • Exterior and interior angles • Solving geometric problems	Students will be able to compare and classify geometric shapes, including different types of quadrilaterals and triangles, based on their properties and sizes. Use the vocabulary of the different types of triangle and quadrilateral. Use conventional markings for parallel lines and right angles. They will recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. Find unknown angles and lengths in triangles, quadrilaterals, and regular polygons Students will use and interpret algebraic versions of geometrical relationships involving Stage 7 content. They will illustrate properties of quadrilaterals using appropriate language and technologies. Understand and use the relationship between parallel lines and alternate and corresponding angles Before applying angle facts and properties of quadrilaterals to derive results about angles and sides.	UNIT 7: Test Classroom Monitor: Rising Stars (Geometry) Stage 4: 4.2.1; 4.2.2 Stage 5: 5.1.2 Stage 6: 6.3.1; 6.3.3 Stage 7: 4.2 Stage 8: 2.2; 3.1; 3.3 **TERM TEST**

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YEAR 8

SUMMER 1	Knowledge	Skills / Objectives	Assessment
GCSE (9-1) Spec Reference: N2 N8	**8. <u>Calculating with fractions</u>** • Ordering fractions • Adding and subtracting fractions • Multiplying fractions • Dividing fractions • Calculating with mixed numbers	Students will continue to compare and order unit fractions, and fractions with the same denominators. Add and subtract fractions with the same denominator. Add and subtract fractions with the same denominator and denominators that are multiples of the same number, including calculations > 1. Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. Students will consolidate understanding of equivalent fractions by extending to improper fractions. Compare and order fractions, including fractions > 1. Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions. Before being able to multiply simple pairs of proper fractions. Divide proper fractions by whole numbers. Students will use addition, subtraction, including informal mental methods, applied to improper fractions and mixed numbers. Multiply simple pairs of improper fractions. Use addition, subtraction, including formal written methods, applied to improper fractions and mixed numbers. Use multiplication including formal written methods, applied to improper fractions and mixed numbers. Use division including formal written methods, applied to proper and improper fractions and mixed numbers.	UNIT 8: Test Classroom Monitor: Rising Stars (Number) <u>Stage 4:</u> 4.3.c.1; 4.3.c.2 <u>Stage 5:</u> 5.3.c.2; 5.3.c.3 <u>Stage 6</u>: 6.3.a.2; 6.3.c.1; 6.3.c.2; 6.3.c.3; 6.3.c.4 <u>Stage 7:</u> 14.2; `4.3 <u>Stage 8:</u> 14.2; 14.3; 14.3
GCSE (9-1) Spec Reference: A9 A10 R10 R11 R14	**9. <u>Straight-line graphs</u>** • Direct proportion on graphs • Gradients • Equations of straight lines	Students will be able to reduce a given linear equation in two variables to the standard form y = mx + c. Recognise, sketch and produce graphs of linear functions of one variable with appropriate scaling, using equations in x and y and the Cartesian plane. Use linear graphs to estimate values of y for given values of x and vice versa Students will calculate and interpret gradients and intercepts of graphs of linear equations in the standard form y = mx + c numerically, graphically and algebraically. Solve problems involving direct proportion, including graphical and algebraic representations.	UNIT 9: Test Classroom Monitor: Rising Stars (Algebra) <u>Stage 8:</u> 1.2; 4.1; 4.2 <u>Stage 9:</u> 4.3; 8.4

SUMMER 2	Knowledge	Skills/ Objectives	Assessment
GCSE (9-1) Spec Reference: N1 N10 N12 R9	**10. <u>Percentages, decimals and fractions</u>** • Fractions and decimals • Equivalent proportions • Writing percentages • Percentages of amounts	Students will be able to ; recognise the per cent symbol and understand that per cent relates to ''number of parts per hundred. Know percentage and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5 and those with a denominator of a multiple of 10 or 25. Solve problems which require knowing key percentage and decimal equivalents. They will consolidate their understanding of the connection between fractions, decimals and percentages and compare and order fractions, including fractions > 1 They will be able to express one quantity as a percentage of another, compare two quantities using percentages. Work interchangeably with terminating decimals and their corresponding fractions. Interpret percentages as a fraction or a decimal, interpret these multiplicatively Before solving problems involving the use of a percentage as an operator. They will continue to work interchangeably with terminating decimals and their corresponding fractions. Interpret percentage changes as a decimal multiplier, calculating the change itself in one step. Solve problems involving percentage change, including original value problems	UNIT 10: Test Classroom Monitor: Rising Stars (Number) <u>Stage 5:</u> 5.3.a.4; 5.3.b.6; 5.3.d.3 <u>Stage 6:</u> 6.3.b.5; 6.3.c.1 <u>Stage 7:</u> 12.5; 13.4; 13.5; 15.3 <u>Stage 8:</u> 13.4; 13.5 <u>Stage 9:</u> 15.3 **TERM TEST** **END OF YEAR TEST**

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AUTUMN 1	Knowledge	Skills/ Key Learning Objectives	Assessment
GCSE COURSE **GCSE (9-1) Spec Reference: N1, N2, N3, N13, N14, N15**	**1. <u>Unit 1: NUMBER</u>** ● Understanding digits and place value ● Reading, writing and ordering whole numbers ● The number line ● Adding and subtracting ● Multiplying and dividing ● Rounding ● Negative numbers ● Working with negative numbers ● Calculating with negative numbers	Having previously built up the skills throughout lower KS3 the students will begin to; • Identify factors, multiples and prime numbers • Find the prime factor decomposition of positive integers • Find common factors and multiples • Find LCM and HCF • Recall integer squares up to 15 x 15 and corresponding roots • Recall cube numbers • Find square and cube roots They will begin to; • Recall and use properties of angles at a point, on a straight line, vertically opposite angles. • Use two letter notation for a line, three letter notation for an angle • Estimate sizes of angles • Measure and draw lines and angles • Find the missing angles at a point or on a line, and give reasons for calculations • Distinguish between scalene, equilateral, isosceles and right-angled triangles. • Use side/angle properties of isosceles and equilateral triangles • Understand and use the angle sum of triangles • Understand and use the angle properties of intersecting lines	UNIT 1: Test **APP: 9-1 Progression Scale** *STRAND: Number*
GCSE (9-1) Spec Reference: G1, G3, G6, G15	**1. <u>Unit 2: ANGLES 1</u>** ● Fractions of a turn and degrees ● What is an angle ● Naming sides and angles ● Estimating angles ● Measuring angles ● Drawing angles ● Special triangles		UNIT 2: Test **APP: 9-1 Progression Scale** *Strand: Geometry and Measure*
GCSE (9-1) Spec Reference: A1, A2, A3, A4	**1. <u>Unit 4: ALGEBRA 1</u>** ● Using letters to represent numbers ● Variables, terms and expressions ● Collecting like terms ● Multiplying with letters and numbers ● Dividing with letters and numbers	Before being able to; • Use notation and symbols correctly • Write expressions using squares and cubes • Manipulate algebraic expressions by collecting like terms (adding and subtracting) • Multiply and divide with variables and numbers	UNIT 4: Test **APP: 9-1 Progression Scale** *Strand: Algebra*

AUTUMN 2	Knowledge	Skills/ Key Learning Objectives	Assessment
GCSE (9-1) Spec Reference: S2, S4, S5	**4. <u>Unit 3: COLLECTING AND RECORDING DATA</u>** ● Introduction to data ● Collecting data ● Questionnaires ● Sampling ● Two-way and other tables	Students will continue to build on existing knowledge before;# • Specify the problem and plan • Decide what data to collect and what statistical analysis is needed. • Collect data from a variety of primary and secondary sources • Process and represent the data • Understand biased data (sources) • Consider fairness • Understand sample and population • Design / criticise questions for a questionnaire • Design and use data-collection sheets for grouped, discrete and continuous data • Sort, classify and tabulate data (discrete or continuous) • Group discrete/continuous data into class intervals of equal width • Design and use two-way tables for discrete and grouped data • Complete a two-way table	UNIT 3: Test **APP: 9-1 Progression Scale** *Strand: Statistics*
GCSE (9-1) Spec Reference: S2, S3, S4, S5	**5. <u>Unit 12: PROCESSING, REPRESENTING AND INTERPRETING DATA</u>** ● Pictograms ● Pie Charts ● Bar charts ● Comparative/Composite charts ● Line diagrams/Histograms ● Frequency polygons	They will be able to; **Draw:** • Pictograms; Composite bar charts; Comparative and dual bar charts • Pie charts; Histograms with equal class intervals • Frequency diagrams for grouped discrete data; Line graphs **Interpret:** • Pie charts; Composite bar charts; Comparative and dual bar charts • Frequency polygons **From diagrams:** • Read off frequency values; Calculate total population • Find greatest and least values **From pie charts:** • Find the total frequency; find the size of each category; • understand that the frequency represented by sectors in two pie charts is dependant upon the total populations represented by each of the pie charts	UNIT 12: Test **APP: 9-1 Progression Scale** *Strand: Statistics*

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AUTUMN 2	Knowledge	Skills/ Key Learning Objectives	Assessment
GCSE COURSE **GCSE (9-1) Spec Reference: N1, N2, N3, N5, N6, N13, N14, N15**	**6. Unit 5: DECIMALS** ● Understanding place value ● Writing decimals in order of size ● Adding and subtracting decimals ● Multiplying decimals ● Dividing decimals ● Rounding decimals ● Rounding to significant figures	Students will be able to • Order decimals • Add, subtract, multiply and divide with decimals • Multiply and divide decimals by powers of 10 • Solve problems involving division by a decimal • Round decimals to the nearest integer • Round decimals to a given number of decimal places • Round to 1 Significant figure or to a given number of significant figures • Check answers by rounding (29 x 31 = 30 x 30)	UNIT 5: Test **APP: 9-1 Progression Scale** *STRAND: Number*

SPRING 1	Knowledge	Skills/ Key Learning Objectives	Assessment
GCSE (9-1) Spec Reference: N2, N13, N16, G14, G15	**7. Unit 11: MEASURES** ● Reading scales ● Time ● Metric units and Imperial units	Students will be able to • Indicate given values on a scale • Interpret a range of measuring instruments with different units of measure • Know that measurements using real numbers depend upon the choice of unit • Convert between units of measure within one system • Estimate conversions • Make sensible estimates, including units, of a range of measures in everyday settings • Understand and use compound measures, including speed • Convert between metric speed measures	UNIT 11: Test **APP: 9-1 Progression Scale** *Strand: Number,* *Geometry and Measure*
GCSE (9-1) Spec Reference: N1, N2, N3, N4, N5, N8, N10, N11, R3, R6, R8, R9	**8. Unit 8: FRACTIONS** ● Understanding fractions ● Equivalent fractions ● Ordering fractions ● Improper and mixed fractions ● Multiplying and dividing fractions ● Adding and subtracting fractions ● Converting between fractions and decimals	They will also; • Visualise a fraction diagrammatically • Order and compare fractions • Convert between mixed numbers and improper fractions • Add and subtract fractions • Multiply and divide fractions • Find fractions of amounts • Convert between fractions and decimals • Recall the fraction-to-decimal conversion of familiar simple fractions • Write terminating decimals to fractions • Recognise that recurring decimals are exact fractions and vice versa	UNIT 8: Test **APP: 9-1 Progression Scale** *Strand: Number* *Ratio & Proportion*
GCSE (9-1) Spec Reference: G1, G4, G5, G6, G7, G9	9. **Unit 6: 2D SHAPES** ● Triangles ● Quadrilaterals ● Congruency and similar shapes ● Accurate drawings ● Circles ● Drawing circles ● Line symmetry	Students will: • Recall the properties and definitions of special types of quadrilaterals • List the properties and names of each quadrilateral • Classify quadrilaterals by their geometric properties • Make accurate drawings of other 2-D shapes using a ruler/protractor • Understand congruence • Identify shapes which are congruent • Use ruler and compasses to do standard construction • Construct a triangle (including equilateral triangle) • Construct special types of triangles (SSS, SAS, ASA, RHS, SSA) • Draw and construct diagrams from given instructions • Recall the definition of a circle and identify (name) and draw parts of a circle • Draw a circle given the radius or diameter • Recognise reflection symmetry of 2D shapes • Identify and draw lines of symmetry on a shape • Draw and complete diagrams with a given number of lines of symmetry • Recognise rotation symmetry of 2D shapes • Identify the order of rotation symmetry of a 2D shape • Draw or complete diagrams with a given order of rotation symmetry	UNIT 6: Test **APP: 9-1 Progression Scale** *Strand: Geometry & Measure*

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SPRING 2	Knowledge	Skills/ Key Learning Objectives	Assessment
GCSE COURSE **GCSE (9-1) Spec Reference: A7, A23, A24, A25**	**10. Unit 13: SEQUENCES** ● Sequences (number patterns) ● Input & output machines ● Finding the nth term for a sequence ● Deciding if a number is part of a number pattern	Students will be able to; • Recognise sequences of odd and even numbers • Generate arithmetic sequences of numbers, squared integers and sequences derived from diagrams • Continue a sequence derived from diagrams • Write the term-to-term definition of a sequence in words • Find a specific term in the sequence using position-to-term or term-to-term rules • Find the nth term of an arithmetic sequence • Use the nth term of an arithmetic sequence to find other values • Identify which terms cannot be in a sequence • Use a calculator to produce a sequence of numbers	UNIT 13: Test **APP: 9-1 Progression Scale** *STRAND: Algebra*
GCSE (9-1) Spec Reference: S2, S4, S5	**11. Unit 16: AVERAGES AND RANGE** ● Mode, median and mean ● Range ● Stem and leaf diagrams to find averages ● Frequency tables to find averages ● Grouped data ● Estimating the mean of grouped data	Students will be able to; • *Calculate:* Mean, mode, median, range, modal class, interval containing the median • *Calculate:* Mean, mode, median and range from an ordered stem and leaf diagram • Calculate: The modal class and interval containing the median for continuous data • Produce and order stem and leaf diagram • Recognise the advantages and disadvantages between measures of average. • Compare the mean and range of two distributions • Find the median for large data sets with grouped data • Produce frequency diagrams for grouped discrete data • Estimate the mean of grouped data using mid-interval value • Use quartiles and interquartile range to discuss averages.	UNIT 16: Test **APP: 9-1 Progression Scale** *STRAND: Statistics*

SUMMER 1	Knowledge	Skills/ Key Learning Objectives	Assessment
GCSE (9-1) Spec Reference: P1, P2, P3, P4, P6, P7	**12. Unit 26: PROBABILITY** ● The probability scale ● Writing probabilities as numbers ● The probability that something will not happen ● Tree diagrams	Students will be able to: • Distinguish between events which are impossible, unlikely, even chance, likely and certain to occur. • Mark events and/or probabilities on a probability scale of 0 to 1 • Write probabilities in words or fractions, decimals and percentages • Find the probability of an event happening using theoretical probability • Use theoretical models to include outcomes using dice, spinners and coins • List all outcomes for single events systematically • List all outcomes for two successive events systematically • Use and draw sample space diagrams • Find the probability of an event happening using relative frequency • Add simple probabilities • Identify mutually exclusive outcomes and know that the sum of the probabilities of all outcomes is 1 • Use 1-p as the probability of an event not occurring where p is the probability of the event occurring • Find a missing probability from a list or table	UNIT 26: Test **APP: 9-1 Progression Scale** *Strand: Probability*
GCSE (9-1) Spec Reference: G4, G14, G16, G17	**13. Unit 14: PERIMETER AND AREA** ● Perimeter and area ● Formulas and complex problems	Before being able to; • Measure shapes to find perimeters and areas • Find the perimeter fo rectangles and triangles • Find the perimeter of compound shapes • Find the area of a rectangle and triangle • Recall and use the formulae for the area of a triangle, rectangle and parallelogram • Find the area of a trapezium • Find the area of compound shapes • Solve problems involving area and perimeter • Convert between units of measure	UNIT 14: Test **APP: 9-1 Progression Scale** *Strand: Geometry and Measure*
GCSE (9-1) Spec Reference: G12, G13, G16, G17, G19,	**14. Unit 20: 3-D SHAPES** ● Recognising 3-D shapes ● Drawing 3-D shapes ● Plans and elevations ● Volume ● Surface area ● Density	They will then • Know the terms face, edge and vertex • Use isometric grids • Draw nets of 3-D Shapes and show how they fold to make shapes • Understand and draw front and side elevations and plans of shapes made from simple solids • Given the front and side elevations and the plan of a solid, draw a sketch of the 3-D solid • Find the volume of a right prism, other prisms, cube and cuboid (formulae) and cylinder • Find the surface area of a prism • Find the surface area and volume of a cylinder	UNIT 20: Test **APP: 9-1 Progression Scale** *Strand: Geometry and Measure*

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SUMMER 2	Knowledge	Skills/ Key Learning Objectives	Assessment

GCSE COURSE
 	
GCSE (9-1) Spec Reference: N2, N6, N7, N8, N9, N10, N13, N14
	15. Unit 10: USING A CALCULATOR
	
	● Recognising terminating and recurring decimals
	● Finding reciprocals
	● Interpreting a calculator display
	● Working with powers and roots
	● Using a calculator to work out complex calculations
	
	16. Maths Project / Functional Maths
	
	● Functional Skills based activities
	● Area, perimeter, surface area
	● Units of measure & conversions
	● 2-D & 3-D representation
	● Budgets & costing
	● Time & costing
		Students will be able to;
		• Use the four operations on a calculator
		• Writing terminating decimals as fractions
		• Convert between fractions and decimals
		• Find reciprocals
		• Use inverse operations
		• Able to use brackets
		• Able to find powers, roots, cubes and squares on a calculator
		• Enter a range of calculations including those involving time and money
		• Understand how to interpret a calculator display
		• Calculate percentages on a calculator
		• Problem solving on a calculator
		
		They will then;
		
		• Apply and use a range of skills acquired during the course of the year to:
		  • Solve problems mathematically;
		  • Explain and reason mathematically.
		• Functional skills
			Unit 10: Test
			
			APP: 9-1 Progression Scale
			
			STRAND: Number
			
			APP: 9-1 Progression Scale
			
			End of year Assessment

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AUTUMN 1	Knowledge	Skills/ Key Learning Objectives	Assessment
GCSE COURSE **GCSE (9-1) Spec Reference:** **N1, N2, N3, N13, N14, N15**	**1. Unit 1: NUMBER (Consolidation/new)** ● Understanding digits and place value ● Reading, writing and ordering whole numbers ● The number line ● Adding and subtracting ● Multiplying and dividing ● Rounding ● Negative numbers ● Working with negative numbers ● Calculating with negative numbers ● **Factors, multiples and prime numbers** ● **LCM and HCF** ● **Square and cube numbers**	Building on their previous learning the students will; • Identify factors, multiples and prime numbers • Find the prime factor decomposition of positive integers • Find common factors and multiples • Find LCM and HCF • Recall integer squares up to 15 x 15 and corresponding roots • Recall cube numbers • Find square and cube roots They will then continue to; • Understand place value, understand the value of digits • Order decimals • Add, subtract, multiply and divide with decimals • Multiply and divide decimals by powers of 10 • Solve problems involving division by a decimal • Round decimals to the nearest integer • Round decimals to a given number of decimal places • Round to 1 Significant figure or to a given number of significant figures • Use one calculation to find the answer to another • Check answers by rounding (29 x 31 = 30 x 30) • Estimate answers to calculations, including the use of rounding	UNIT 1: Test **APP: 9-1 Progression Scale** *STRAND: Number*
GCSE (9-1) Spec Reference: **N1, N2, N3, N5, N6, N13, N14, N15**	**1. Unit 5: DECIMALS (Recap/consolidate)** ● Understanding place value ● Writing decimals in order of size ● Adding and subtracting decimals ● Multiplying decimals ● Dividing decimals ● Rounding decimals ● Rounding to significant figures	Deepening their understanding through; • Use notation and symbols correctly • Write and expression • Write expressions using squares and cubes • Manipulate algebraic expressions by collecting like terms (adding and subtracting) • Multiply and divide with variables and numbers • Multiply a single algebraic term over a bracket • Factorise algebraic expressions by taking out common factors • Select an expression/equation/formula/identity from a list	UNIT 5: Test **APP: 9-1 Progression Scale** *STRAND: Number*
GCSE (9-1) Spec Reference: **A1, A2, A3, A4, A6**	**1. Unit 4: ALGEBRA 1 (Consolidation/new)** ● Using letters to represent numbers ● Variables, terms and expressions ● Collecting like terms ● Multiplying with letters and numbers ● Dividing with letters and numbers ● **Expanding single brackets** ● **Factorising** ● **Understanding equations, expressions and formulas (identity)** ● **Substitution**		UNIT 4: Test **APP: 9-1 Progression Scale** *Strand: Algebra*

AUTUMN 2	Knowledge	Skills/ Key Learning Objectives	Assessment
GCSE (9-1) Spec Reference: **N3, N4,** **A1, A2, A3, A4**	**4. Unit 9: ALGEBRA 2** ● Calculating with powers ● Writing expressions as a single power of the same number ● Using powers to simplify algebraic expressions ● BIDMAS ● Multiplying out double brackets ● Factorising expressions ● Index Laws/ Rules of Indices ● Factorising a square	They will expand their key skills and embed their understanding of; • Use index notation for squares and cubes • Use index notation for powers of 10 • Find the value of calculations using indices • Use index laws to simplify and calculate the value of expressions - multiplying, dividing of integer powers, and powers of a power • Calculations with negative powers • Use brackets and the order of operations • Multiply a single term over a double bracket • Factorise algebraic expressions by taking out common factors, including double brackets • Factorise a quadratic expression (a square)	UNIT 9: Test **APP: 9-1 Progression Scale** *Strand: Number* *Algebra* **ENTRY LEVEL (E1, E2, E3) exams** **MOCK EXAM**

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AUTUMN 2	Knowledge	Skills/ Key Learning Objectives	Assessment
GCSE COURSE **GCSE (9-1) Spec Reference:** **G1, G3, G4, G15**	**5. Unit 7: ANGLES 2** ● Angles in quadrilateral ● Polygons ● Exterior and interior angles ● Tessellations ● Perpendicular and parallel lines ● Corresponding and alternate angles ● Bearings ● Maps and scale drawings	They will then continue to; • Use the fact that angle sum of a quadrilateral is 360 • Understand and use the angle properties of quadrilaterals • Calculate and use the sums of the interior angles of polygons • Use geometrical language appropriately and recognise pentagons, hexagons, heptagons, octagons and decagons • Use the sum of angles of irregular polygons • Calculate and use the angles of regular polygons • Can work out the relationship between the number of sides of a polygon and the sum of its angles (sum of interior angles of an n-sided polygon) • Understand tessellations of regular and irregular polygons • Tessellate combinations of polygons • Explain why some shapes tessellate and some not • Mark perpendicular and parallel lines on a diagram • Understand and use the angle properties of parallel lines • Find missing angles using properties of corresponding and alternate angles • Use three figure-bearings to specify direction • Mark on a diagram the position of point B given its bearing from point A • Give bearings between two points, from A to B, or A from B • Use accurate drawing to solve bearings problem • Use and interpret maps and scale drawings • Read and construct scale drawings • Draw lines and shapes to scale	UNIT 7: Test **APP: 9-1 Progression Scale** *STRAND: Geometry and Measure* **ENTRY LEVEL (E1, E2, E3) exams** **MOCK EXAM**

SPRING 1	Knowledge	Skills/ Key Learning Objectives	Assessment
GCSE (9-1) Spec Reference: **N1, N2, N3, N4, N5, N8, N10, N11,** **R3, R6, R8, R9**	**6. Unit 8: FRACTIONS (Recap/consolidate)** ● Understanding fractions ● Equivalent fractions ● Ordering fractions ● Improper and mixed fractions ● Multiplying and dividing fractions ● Adding and subtracting fractions ● Converting between fractions and decimals	Students will continue to consolidate; • Visualise a fraction diagrammatically • Express a given number as a fraction of another • Find equivalent fractions • Convert between mixed numbers and improper fractions • Convert between fractions and decimals • Recall the fraction-to-decimal conversion of familiar simple fractions • Write terminating decimals to fractions • Recognise that recurring decimals are exact fractions and vice versa • Convert between fractions, decimals and percentages • Order fractions, decimals and percentages • Find a percentage of a quantity • Use percentages in real-life situations - VAT, profit/loss, simple interest, income tax calculations • Use percentages to solve problems • Use a multiplier to increase or decrease by a percentage. • Use decimals to find quantities • Write one number as a percentage of another number • Use multi-step problem solving skills or apply a formula to calculate compound interest • Work out the original amount (reverse percentages)	UNIT 8: Test **APP: 9-1 Progression Scale** *Strand: Number* *Ratio & Proportion*
GCSE (9-1) Spec Reference: **N2, N12,** **R9, R16**	**7. Unit 19: PERCENTAGES** ● Converting between Percentages, decimals and fractions ● Finding percentages of quantities ● Using percentages ● Compound interest ● Reverse percentages		UNIT 19: Test **APP: 9-1 Progression Scale** *Strand: Number* *Ratio & Proportion* **FUNCTIONAL SKILLS WINDOW 1**

SPRING 2	Knowledge	Skills/ Key Learning Objectives	Assessment
GCSE (9-1) Spec Reference: **R4, R5, R6, R7, R8, R10, R12,R13**	**8. Unit 24: RATIO AND PROPORTION** ● Introducing a ratio ● Solving ratio problems ● Sharing in a given ratio ● The unitary method	Students will then continue to; • Use ratio • Write ratios in their simplest form • Solve a ratio problem in context, like recipes • Divide a quantity into a given ratio • Understand and use examples of direct and inverse proportion • Use and apply the unitary method to find the cost of 1	UNIT 24: Test **APP: 9-1 Progression Scale** *Strand: Ratio & Proportion*

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SPRING 2	Knowledge	Skills/ Key Learning Objectives	Assessment
GCSE COURSE **GCSE (9-1) Spec Reference: A2,A7, A8, A9, A10, A12, A14**	**9. Unit 15: GRAPHS 1** ● Coordinates in all four quadrants ● Finding the midpoint of a line ● Drawing and naming horizontal and vertical lines ● Drawing graphs with a table of values ● Drawing graphs without a table of values ● Finding the equation of a line	They will then; • Draw, label and scale axes • Use axes and coordinates to specify points in all four quadrants in 2-D • Identify points with given coordinates • Identify coordinates of given points (all four quadrants) • Find the coordinates of points identified by geometrical information in 2-D • Find the coordinates of the midpoint of a segment • Recognise that equations of the form y=mc+c correspond to straight-line graphs in the coordinate plane • Plot and draw graphs of functions (y=mx+c) • Find the gradient of a line from a graph	UNIT 15: Test **APP: 9-1 Progression Scale** *STRAND: Algebra* **FUNCTIONAL SKILLS WINDOW 2**

SUMMER 1	Knowledge	Skills/ Key Learning Objectives	Assessment
GCSE (9-1) Spec Reference: A2, A7, A8, A9, A10, A12, A14	**10. Unit 22: GRAPHS 2** ● Interpreting and drawing real-life graphs ● Conversion graphs ● Distance-time graphs ● Quadratic graphs	• Plot linear graphs • Interpret straight-line graphs for real-life situations - fuel bills; conversions graphs, fixed charge and cost per unit, height of bath water vs time • Solve problems involving money conversions • Interpret information presented in a range of linear and non-linear graphs • Draw distance-time graphs, including quadratic functions • Generate points and plot graphs of simple quadratic functions • Find approximate solutions of a quadratic equation from the graph of the corresponding quadratic function	UNIT 22 : Test **APP: 9-1 Progression Scale** *Strand: Algebra*
GCSE (9-1) Spec Reference: G7, G8, G24 R2, R7, R10	**11. Unit 23: TRANSFORMATIONS** ● Translations ● Rotations ● Reflections ● Enlargements (incl fractional scales)	Before; • Describe and transform 2-D shapes using single translations • Understand that translations are specified by a distance and direction (vector) • Translate shapes by the vector • Describe and transform 2-D shapes using simple rotations • Understand that rotations are specified by a centre and an angle • Find the centre of rotation • Rotate a shape about the origin, or any other point • Describe and transform 2-D shapes using single reflections • Understand that reflections are specified by a mirror line • Identify the equation of a line of symmetry • Describe and transform 2-D shapes using enlargements by a scale factor • Understand that an enlargement is specified by a centre and a scale factor • Scale a shape on a grid • Enlarge a shape by a negative or fractional scale factor • Draw an enlargement • Enlarge shapes using (0,0) or a centre other than (0,0) • Find the centre of enlargement • Identify the scale factor of an enlargement as the ratio of the lengths of two corresponding sides. • Describe and transform 2-D shapes using a combination of transformations • Describe a transformation (s)	UNIT 22 : Test **APP: 9-1 Progression Scale** *Strand: Geometry and Measure* *Ratio & Proportion*
GCSE (9-1) Spec Reference: N15, A3, A5, A6, A8, A9, A14, A17, A18, A19, A20, A21, A22,	**12. Unit 21: EQUATIONS AND INEQUALITIES** ● Using simple equations ● Solving equations - 1 operation ● Solving equations - 2 operations ● Solving equations - with brackets ● Solving equations with letters on both sides ● Trial & Improvement to solve equations ● Inequalities ● Representing inequalities on a number line ● Solving inequalities ● Solving simultaneous equations	Finally; • Set up simple equations • Rearrange simple equations • Solve simple equations • Solve linear equations in one unknown, with integer or fractional coefficients • Solve linear equations which contain brackets, including those that have negative signs occurring anywhere in the equation, and those with a negative solution • Solve linear equations, with integer coefficients, in which the unknown appears on either side or on both sides of the equation • Write expression to solve problems • Use algebraic manipulation to solve problems • Use systematic trial and improvement to find approximate solutions of equations • Solve algebraic equations involving squares and cubes • Use the correct notation to show inclusive and exclusive inequalities • Solve simple linear inequalities in one variable, and represent the solution set on a number line • Solve simultaneous equations by drawing a graph or algebraically	UNIT 21 : Test **APP: 9-1 Progression Scale** *Strand: Algebra* *Number*

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SUMMER 2	Knowledge	Skills/ Key Learning Objectives	Assessment
GCSE COURSE **GCSE (9-1) Spec Reference: S2, S5, S5 A14**	**13. Unit 25: LINE DIAGRAMS AND SCATTER GRAPHS** ● Drawing and using line graphs ● Drawing and using scatter graphs ● Correlation ● Lines of best fit ● Using lines of best fit to make predictions	Students will; • Present findings from databases, tables and charts • Look at data to find patterns and exceptions • Produce line graphs and scatter graphs • Interpret scatter graphs • Interpret scatter graphs in terms of the relationship between two variables • Distinguish between positive, negative and zero correlation using lines of best fit • Interpret correlation in terms of the problem • Draw lines of best fit by eye, understanding what these line represent • Use a line of best fit to predict values of a variable given values of the other variable	UNIT 25: Test **APP: 9-1 Progression Scale** *STRAND: Statistics* *Algebra*
GCSE (9-1) Spec Reference: G9, G10, G17, G18	**14. Unit 17: CIRCLES** ● Circumference of a circle ● Area of a circle ● Area and perimeter of half and quarter circles	They will then; • Find circumferences and areas enclosed by circles • Recall and use formulae for the circumference of a circle and the area enclosed by a circle • Use Pie = 3.142 or use the 'Pie' button on a calculator • Find the perimeters and areas of semicircles and quarter circles	UNIT 17: Test **APP: 9-1 Progression Scale** *STRAND: Geometry and Measure*
GCSE (9-1) Spec Reference: N2, N6, N7, N8, N9, N10, N13, N14	**15. Unit 10: USING A CALCULATOR** ● Recognising terminating and recurring decimals ● Finding reciprocals ● Interpreting a calculator display ● Working with powers and roots ● Using a calculator to work out complex calculations	Before; • Use the four operations on a calculator • Writing terminating decimals as fractions • Convert between fractions and decimals • Find reciprocals • Use inverse operations • Able to use brackets • Able to find powers, roots, cubes and squares on a calculator • Enter a range of calculations including those involving time and money • Understand how to interpret a calculator display • Calculate percentages on a calculator • Problem solving on a calculator	UNIT 10: Test **APP: 9-1 Progression Scale** *Strand: Number* **END OF TERM / YEAR TEST** **MOCK EXAM**

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AUTUMN 1 /2	Knowledge	Skills/ Key Learning Objectives	Assessment
GCSE COURSE **GCSE (9-1) Spec Reference:** **G2**	**1. Unit 18: CONSTRUCTIONS** ● Angle constructions ● Loci ● Regions	Students will continue to consolidate the following; • Construct a regular hexagon inside a circle • Construct the perpendicular bisector of a given line • Construct the perpendicular from a point to a line • Construct the bisector of a given angle • Construct diagrams of everyday 2-D situations involving rectangles, triangles, perpendicular and parallel lines • Construct Loci: a given distance from a point and a given distance from a line • Construct Loci: equal distances from two points or two line segments • Construct Loci: regions • Construct Loci: regions bounded by a circle and an intersecting line • Find and describe regions satisfying a combination of loci	UNIT 18: Test **APP: 9-1 Progression Scale** *STRAND: Geometry and Measure*
GCSE (9-1) Spec Reference: **N7, N15** **G6, G11, G20**	**1. Unit 27: PYTHAGORAS' THEOREM** ● Finding the length of the Hypotenuse ● Finding the length of the other sides ● Checking to see if a triangle is right-angled	They will be able to; • Understand Pythagoras' theorem. • Calculate the length of the hypotenuse in a right-angled triangle. • Solve problems using Pythagoras' theorem. • Calculate the length of a line segment AB. • Calculate the length of a shorter side in a right-angled triangle. They will also; • Use the sine ratio to solve problems. • Use the sine ratio to calculate an angle in a right-angled triangle. • Use the sine ratio to solve problems. • Understand and recall the cosine ratio in right-angled triangles. • Use the cosine ratio to calculate the length of a side in a right-angled triangle. • Use the cosine ratio to calculate an angle in a right-angled triangle. • Use the cosine ratio to solve problems. • Understand and recall the tangent ratio in right-angled triangles. • Use the tangent ratio to calculate the length of a side in a right-angled triangle • Use the tangent ratio to calculate an angle in a right-angled triangle. • Solve problems using an angle of elevation or depression. • Understand and recall trigonometric ratios in right-angled triangles. • Use trigonometric ratios to solve problems. • Know the exact values of the sine, cosine and tangent of some angles.	UNIT 27: Test **APP: 9-1 Progression Scale** *Strand: Number* *Geometry and Measure*
GCSE (9-1) Spec Reference: **R12, N15, G20**	1. **TRIGONOMETRY** ● The sine ● The sine ratio (2) ● The cosine ratio ● The tangent ratio ● Finding lengths and angles using trigonometry		Unit Test **APP: 9-1 Progression Scale** *Strand: Geometry and Measure*

SPRING 1 /2	Knowledge	Skills/ Key Learning Objectives	Assessment
GCSE (9-1) Spec Reference: **N9**	**4. STANDARD FORM** ● Writing large numbers in standard form ● Writing small numbers in standard form ● Calculating with standard form	Students will continue to; • Write large numbers in standard form. • Convert large numbers from standard form into ordinary numbers. • Write small numbers in standard form. • Convert numbers from standard form with negative powers of ordinary numbers • To multiply and divide numbers in standard form. • To add and subtract numbers in standard form.	Unit Test **APP: 9-1 Progression Scale** *Strand: Number* **ENTRY LEVEL EXAMS** **MOCK EXAM**

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SUMMER 1	Knowledge	Skills/ Key Learning Objectives	Assessment
GCSE COURSE	Students will Continue to consolidate and revise the previous topics by having access to; Revision Sessions Practise exam papers 1:1 Intervention	❑ GCSE Practise Papers ❑ Revision & targeted intervention (topic / strand)	**GCSE PAPER 1: Non Calculator**