STANTONBURY
SCHOOL

Edexcel (9-1)

Mathematics- KS3 (Year 9)

Scheme of learnin

STANTONBURY SCHOOL

Scheme of learning – Subject Intent

Our Year 9 curriculum ensures students continue to revisit knowledge learnt throughout Years 7 and 8 so we can further deepen understanding and give students the opportunity to develop their reasoning and problem solving skills. We also introduce new and challenging content such as recurring decimals, compound measures, Venn diagrams, shape transformations and trigonometry. These topics will challenge students and develop resilience and confidence before moving into Year 10. In the units on similarity, congruence, angles and bearings, students start to develop chains of reasoning, preparing them for the complex geometrical proofs they will construct at Key Stage 4 and beyond. In Year 9 students will consolidate the mathematics they have learnt in Key Stages 2 and 3 and start to develop their exam technique ahead of their GCSE course.

Here are some suggestions for fitting the content into the suggested teaching times:

● Lessons where the content has previously been taught at KS3 can be combined, particularly in the earlier units.

● The Prior knowledge check, Check up and/or Unit test could be set as homework rather than taking up teaching time.

● It may not be necessary to cover all strategy problem-solving lessons in full with students who used our KS3 Maths Progress course as they will already be familiar with many of the strategies.

● The functional problem-solving lessons could be omitted, or saved for the revision period. These lessons provide richer activities in real-life contexts but do not contain any new teaching.

TERM 1 Yr 9 Higher	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
AUTUMN 1 HIGHER Weeks 1-3				
3 Weeks (12 hrs)	**1 Powers and roots** 1.1 Reciprocals 1.2 Indices	1. Find the reciprocal of a number. 2. Work with reciprocals. 1. Use negative indices. 2. Work out powers of fractions.	Building on… Year 7 and 8 work on manipulating algebraic expressions that include powers. Building towards… Working with surds and more complex indices at Key Stage B4.	**N3 N6 N7 N8 N9 A4 A5**

	1.3 Standard form 1.4 STEM: Calculating with standard form 1.5 Fractional indices 1.6 Surds	1. Write numbers using standard form. 2. Order numbers written in standard form. 1. Calculate with numbers written in standard form. 1. Calculate with fractional indices. 1. Use surds. 2. Understand the difference between rational and irrational numbers.	This unit revisits the concepts of place value, the four operations, powers and roots covered in Years 7 & 8. Building towards… Using standard form in physics, plus further work on standard form in Key Stage 4 maths Building on… Year 8 laws of indices and Year 9 algebraic manipulation including factorising. Building towards… These skills will be used in numerous topics throughout Year 10 and 11 including trigonometry and quadratics. Students will need to be able to work comfortably with surds in order to perform exact calculations. A strong understanding of surds and indices is also vital for the study of calculus at A level.	
		Learning Checkpoint 1 Unit 1 : End of Unit Assessment and Feedback		

TERM 1 Yr 9H	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
AUTUMN 1 HIGHER Weeks 4-5				
2 Weeks (8 hrs)	**2 Quadratics** 2.1 Sequences 2.2 Expanding 2.3 Factorising 2.4 Solving quadratic equations	1. Generate sequences using quadratic expressions. 2. Find an expression for the nth term of a quadratic sequence. 1. Multiply pairs of brackets. 2. Square a linear expression. 3. Use quadratic identities. 1. Factorise quadratic expressions into two brackets. 1. Solve quadratic equations by factorising.	Building on… Basic algebraic manipulation in year 7 and working with expanding quadratics in year 8. Building towards… This unit is a skill that will be used in multiple KS4 topics such as; solving quadratic simultaneous equations, sketching quadratics, roots etc. …	
		Learning Checkpoint 2 Unit 2: End of Unit Assessment and Feedback		
	HALF TERM TEST			

TERM 1 Yr 9H	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
AUTUMN 2 HIGHER Week 7-9				
3 Weeks (12 hrs)	**3 Inequalities, equations, and formulae** 3.1 Inequalities 3.2 Using index laws 3.3 Solving equations 3.4 Changing the subject 3.5 Algebraic fractions	1. Solve linear equations and represent the solution on a number line. 2. Multiply both sides of an inequality by a negative number. 1. Use index laws with zero and negative powers. 1. Explain the difference between equations, formulae and functions. 2. Construct and solve complex equations. 1. Change the subject of a formula 1. Change algebraic fractions to equivalent fractions.	Building on… Solving equations covered in Years 7 and 8 as well the Year 7 on order of operations. This unit will also require some factorising skills covered in previous unit. Building on… Year 7 work on manipulating algebraic expressions that include powers. Building towards… Working with surds and more complex indices at Key Stage 4. Building towards… Rearranging formulae in contextual problems in Key Stage 4	**A3 A5 A6 A17 A18 A19 A20 A21 A22**

		2. Solve problems with fractions in formulae.		
		Learning Checkpoint 3 Unit 3: End of Unit Assessment and Feedback		

TERM 1 Yr 9H	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
AUTUMN 2 HIGHER Week 10-13				
3 Weeks (12 hrs)	**4 Collecting and analysing data** 4.1 STEM: Data collection 4.2 Presenting and comparing data	1. Identify sources of primary and secondary data. 2. Choose a suitable sample size. 3. Understand how to reduce bias in sampling and questionnaires. 4. Identify a random sample. 1. Draw and interpret stem and leaf diagrams. 2. Construct and interpret frequency polygons. 3. Use frequency polygons to compare data.	Building on… Students started to understand the data handling cycle and were introduced to averages in Year 6 and 7. Building towards …. This unit will cover concepts that students will need to apply throughout the year and KS4 unit on statistical measures.	**A3 A5 A6 A17 A18 A19 A20 A21 A22**

	4.3 Estimating statistics 4.4 Box plots 4.5 Cumulative frequency graphs 4.6 Histograms	1. Estimate the mean and range from a grouped frequency table. 2. Draw conclusions from tables and charts. 1. Interpret statistics. 2. Draw and interpret box plots. 3. Compare data using box plots. 1. Draw cumulative frequency graphs for grouped data. 2. Interpret cumulative frequency graphs. 1. Construct and interpret histograms.		
		Learning Checkpoint 4 Unit 4: End of Unit Assessment and Feedback		
	END OF TERM TEST			

TERM 2 Yr 9H	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
SPRING	**1 HIGHER**	**WEEK 14-16**		

3 Weeks (12 hours)	**5 Multiplicative reasoning** 5.1 Direct proportion 5.2 Solving problems using direct proportion 5.3 Non-linear proportion 5.4 Arcs and sectors of circles 5.4 Arcs and sectors of circles	1. Recognise data sets that are in proportion. 2. Set up equations that show direct proportion 1. Set up equations that show direct proportion. 2. Use algebra to solve problems involving proportion. 1. Use algebra to solve problems involving different types of proportion. 1. Work out the length of an arc. 1. Work out the area of a sector. 2. Solve problems involving arcs and sectors.	Building on… Direct and inverse proportion covered in Year 8 as well as solving equations and substitution. Building towards… Solve problems involving direct and inverse proportion, including graphical and algebraic representations at Key Stage 4. Building on… Students did a lot of work on proportion at Key Stage 2, both directly and indirectly through other topics. They have already used proportion reasoning to solve many problems in Year 7 and 8, for examples in unit conversion. Building towards… This unit builds towards algebraic proportion in Year 9 and Key Stage 4, but also covers a fundamental skill that can be applied to many units throughout Key Stage 3 and 4. Building on… In Year 8 students completed a unit on circles that involved area and circumference as well as fractions of circles i.e. half, quarter etc. They will now answer more complex questions. Building towards… This unit provide students with the skills to answer complex they will meet later KS4 involving area and perimeter.	**R10 R13 G9 G17 G18**

		Learning Checkpoint 5 Unit 5: End of Unit Assessment and Feedback		
TERM	**TOPIC**	**CORE LEARNING**	**SEQUENCING**	**SPECIFICATION LINK**
SPRING	**1 HIGHER**	**WEEK 17-18**		
2 Weeks	**6 Non-linear graphs** 6.1 Graphs of quadratic functions 6.2 Solving quadratic equations 6.3 Graphs of cubic functions	1. Understand and draw graphs of quadratic functions 2. Identify quadratic graphs and their features. 3. Solve problems using quadratic graphs. 1. Use quadratic graphs to solve equations.	Building on… Plotting coordinates and substitution into expressions. Building towards… Solving simultaneous equations at Key Stage 4, and further work on linear and non-linear graphs at Key Stage 4.	**A11 A12 A13 A14 R10**

	6.4 STEM: Graphs of reciprocal functions	1. Understand and draw graphs of cubic functions. 2. Identify cubic graphs and their features. 1. Identify and draw graphs of reciprocal functions 2. Solve problems using reciprocal graphs		
	HALF TERM TEST	**Learning Checkpoint 6 Unit 6: End of Unit Assessment and Feedback**		
TERM 2 Yr 9H	**TOPIC**	**CORE LEARNING**	**SEQUENCING**	**SPECIFICATION LINK**
SPRING	**2 HIGHER**	**WEEK 20-23**		
2 Weeks (8 hrs)	**7 Accuracy and measures** 7.1 Rates of change 7.2 Density and pressure 7.3 Upper and lower bounds	1. Solve problems involving rates of change. 2. Convert units with compound measures. 1. Calculate density and pressure. 2. Solve problems involving compound measures.	Building on… This aspect of the unit pulls together multiple units that were covered throughout Years 7 and 8 such as fractions, proportion, substitution, units and solving equations. Students will also have to round answers to a specified number of significant figures or decimal places, as taught in the previous unit. Building Towards Further work on compound measures in physics at Key Stage 3 and 4. Plus working with kinematic graphs at Key Stage 4 in maths. Building on ….	**N15 N16 R1 R11 R14**

TERM 3 Yr 9H	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
SUMMER	**1 HIGHER**	**WEEK 24-27**		
3 Weeks (12 hrs)	**8 Graphical solutions** 8.1 Simultaneous equations 8.2 Using $y = mx + c$	1. Solve a pair of simultaneous equations. 1. Rearrange equations of graphs to find the gradient and the y-intercept.	Building on… Plotting coordinates and substitution into expressions. Building towards… Solving simultaneous equations at Key Stage 4, and further work on linear and non-linear graphs at Key Stage 4.	**A3 A9 A14 A19**

	8.3 More simultaneous equations 8.4 Graphs and simultaneous equations 8.5 Solving inequalities	2. Find the equation of the line between two points. 1. Solve more complex simultaneous equations. 1. Solve simultaneous equations by drawing graphs. 1. Solve inequalities by graphing straight lines. 2. Solve inequalities that involve quadratic graphs.		
		Learning Checkpoint 8 **Unit 8: End of Unit Assessment and Feedback**		

TERM 3 Yr 9H	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK

SUMMER	1 HIGHER	WEEK 28-31		
3 Weeks (12 hrs)	**9 Trigonometry** 9.1 The tangent ratio	1. Use conventions for naming sides of a right-angled triangle. 2. Work out the tangent of any angle. 3. Use the tangent ratio to work out an unknown side of a right-angled triangle.	Building on… The use of Pythagoras to work out missing lengths in Year 8 as well as solving equations from Year 7 and 8. Building towards… Trigonometry in non-right angled triangles and in 3 Dimensions in Key Stage 4.	**A3 A9 A14 A19**
	9.2 The sine ratio	1. Work out the sine of any angle. 2. Use the sine ratio to work out an unknown side of a right-angled triangle.		
	9.3 The cosine ratio	1. Work out the cosine of any angle. 2. Use the cosine ratio to work out an unknown side in a right-angled triangle.		
	9.4 Using trigonometry to find angles	1. Use the trigonometric ratios to work out an unknown angle in a right-angled triangle.		
	9.5 Solving problems using trigonometry	1. Use trigonometry to solve problems involving missing lengths and angles.		

	9.6 Trigonometric graphs	1. Plot and sketch graphs of the trigonometric functions. 2. Use the trigonometric ratios with any angle from 0 to 360°		
HIGHER Yr 9	**HALF TERM TEST**	**Learning Checkpoint 9 Unit 9: End of Unit Assessment and Feedback**		

TERM 3 Yr 9H	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
SUMMER	**2 HIGHER**	**WEEK 33-34**		
2 Weeks (8 hrs)	**10 Mathematical reasoning** 10.1 Explain, show and justify 10.2 MODELLING: Real-life situations 10.3 Proof	1. Explain, show and justify a mathematical solution. 2. Draw graphs to solve mathematical problems.		**A6 A14 G6 G25**

	10.4 More proof	1. Identify the difference between giving an example and proving a theory. 2. Understand how to use mathematical proof. 1. Present a logical argument using algebra.		
HIGHER Yr 9	**END OF YEAR HIGHER YEAR 9**	**Learning Checkpoint 10 Unit 10: End of Unit and Year Assessment and Feedback**		

FOUNDATION Yr 9

TERM 1 Yr 9F	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
AUTUMN 1 FOUNDATION Week 1-3				
3 Weeks (12 hours)	**1 Number calculations** 1.1 Adding and subtracting	1. Solve problems by adding and subtracting.	Building on… Arithmetical operations at Key Stage 2. Students will revisit and deepen their understanding of written methods of arithmetic and the order of operations.	**N2 N3 N4 N6 N7 N14 N15**

	1.2 Multiplying 1.3 Dividing 1.4 Multiplying and dividing negative numbers 1.5 Squares, cubes and roots 1.6 More powers 1.7 Calculations	2. Add and subtract decimal numbers. 1. Multiply numbers including decimals. 2. Use multiplicative reasoning to multiply numbers. 1. Divide by a decimal number. 1. Multiply and divide with negative numbers. 1. Know all square numbers to 16^2 2. Find all positive and negative square roots of square numbers. 3. Use mental methods to find cubes and cube roots. 4. Work out calculations involving squares and brackets. 1. Find the prime factor decomposition of a number. 2. Know and use the index notation and laws for positive powers.	Building towards… Solving more complex problems in Key Stage 3 and Key Stage 4. Building towards… Solving more complex problems in Key Stage 3 and Key Stage 4. Building on… Arithmetical operations at Key Stage 2. Students will revisit and deepen their understanding of written methods of arithmetic and the order of operations. Building on… Work on factors and multiples down at primary school, plus prime factorisation and divisibility laws taught in Year 7. Building towards… Algebraic HCF and LCM, plus more complex problem solving at Key Stage 4.	

		3. Work out the LCM and HCF from prime factor decomposition. 1. Work out calculations involving brackets, squares, cubes and square roots. 2. Estimate answers.	Building on… Manipulating algebraic expressions in year 7. Building towards… Manipulating more complex algebraic expressions in year 9 including factorizing quadratics.	
		Learning Checkpoint 1 **Unit 1 : End of Unit Assessment and Feedback**		

TERM 1 Yr 9F	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
AUTUMN 1 FOUNDATION Week 4-6				
3 Weeks (12 hours)	**2 Sequences and equations** 2.1 Algebraic expressions		Building on…	**A1 A2 A4 A5 A23 A24 A25**

	2.2 Using the nth term 2.3 Finding the nth term 2.4 Solving equations	1. Write expressions given a description in words. 2. Simplify expressions. 1. Use algebra to generate the terms of a sequence. 2. Solve problems involving sequences. 1. Work out the nth term of a linear sequence. 1. Solve more complex equations.	Patterns and sequences introduced at Key Stage 2, plus algebraic expressions and substitution taught in Year 7. Students will also work with sequences involving fractions decimals and negative numbers. Building towards… Quadratic sequences at Key Stage 4 Building on… Solving one and two step equations and solving equations with variables on both sides covered in Year 7. Building towards… This aspect covers fundamental skills needed for many other units covered throughout Key Stage 3 and Key Stage 4. Students will need to be able to solve equations of all types	
	HALF-TERM TEST	**Learning Checkpoint 2 Unit 2: End of Unit and HT Assessment and Feedback**		

TERM 1 Yr 9F	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
AUTUMN 2 FOUNDATION Week 8-10				
3 Weeks (12 hrs)	**3 Statistics** 3.2 Statistics from tables	1. Interpret frequency tables. 2. Find the range and mean from a frequency tables.	Building on…	**S1 S2 S4 S5 S6**

	3.3 Comparing data 3.4 Tables 3.5 Pie charts and scatter graphs 3.6 FINANCE: Misleading graphs	1. Use the median, mean and range to compare sets of data. 1. Use two-way tables. 2. Group discrete and continuous data. 1. Construct pie charts. 2. Interpret and construct scatter graphs. 1. Understand what makes graphs and charts misleading.	Students started to understand the data handling cycle and were introduced to averages in Year 6 and 7. Building towards… This unit will cover concepts that students will need to apply in their Year 11 unit on statistical graphs. Building on …. Statistical analysis skills developed throughout Key Stage 2 and 3. Building towards… Analysing data in order to make conclusions, which is a vital skill in numerous subjects including science and geography. It's also a fundamental life skill. Building on… Work on pie charts in Year 6. Coordinates and drawing graphs in Year 7. Proportional reasoning earlier in Year 8. Building towards… More complex statistical graphs at Key Stage 4. Also, these data representations will be used in other subjects.	
		Learning Checkpoint 3 Unit 3: End of Unit Assessment and Feedback		

TERM 1 Yr 9F	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK

AUTUMN 2 FOUNDATION Week 11-13				
3 Weeks (12 hours)	**4 Fractions, decimals and percentages** 4.1 Equivalent proportions 4.2 Recurring decimals 4.3 Adding and subtracting fractions 4.4 Multiplying fractions 4.5 Dividing fractions 4.6 Comparing proportions 4.7 FINANCE: Percentage change	1. Convert between fractions, decimals and percentages. 2. Compare fractions, decimals and percentages. 3. Write a fraction as a decimal. 1. Write recurring decimals as fractions. 1. Add and subtract fractions. 2. Add and subtract mixed numbers. 1. Use strategies for multiplying fractions. 1. Divide by fractions. 1. Use a calculator to work out percentages. 2. Compare proportions. 1. Work out a percentage increase or decrease.	Building on… Number work and operations with decimals in Year 6 and 7. Building towards… This unit covers a fundamental skill that is needed for many other units covered throughout Key Stage 3 and 4. Students will also build on the concept of recurring decimals in our next unit on bounds. Building on …. Building towards…	**N1 N2 N3 N8 N10 N11 N12 R9**
	END OF AUTUMN TERM TEST	**Learning Checkpoint 4 Unit 4: End of Unit and EOT Assessment and Feedback**		

TERM 1 Yr 9F	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
SPRING 1	**FOUNDATION** Week			
3 Weeks (12 hrs)	**5 Geometry in 2D and 3D** 5.1 Angles 5.2 Maps and scales 5.3 Constructions 5.4 3D solids 5.5 MODELLING: Pythagoras' theorem	1. Identify alternate and corresponding angles. 2. Work with angles in polygons. 1. Use scales in maps and plans. 2. Draw diagrams to scale. 1. Use a ruler and compasses to bisect a line segment 2. Use a ruler and compasses to bisect an angle. 1. Use 2D representations of 3D objects. 2. Work out the volume of shapes made from cuboids. 1. Use Pythagoras' theorem to work out missing lengths.	Building on… Basic angles rules covered at Key Stage 2 and in Year 7. Angles in parallel lines in Year 8, and protractor and measurement skills from Building towards… Angles in polygons and bearings in Year 9 as well as multistep angle questions and circle theorems at Key Stage 4. Students will start to construct chains of reasoning, leading to geometric proof at Key Stage 4 and beyond. Building on …. Angles in parallel lines in Year 8, and protractor and measurement skills from Key Stage 2 and Year 7. Scale drawings will also draw on pupils' prior knowledge of proportion and units from Year 7 and 8. Building towards… Trigonometric problems including those involving bearings at Key Stage 4 Building on… The area of 2D shapes covered at Key Stage 2 and in Year 7, plus areas of circles covered earlier in Year 8. This unit also draws on other previously taught skills including substitution, equations and rounding. Building towards… Answering questions that require the	**G1 G2 G3 G4 G14 G15 G16**

			application of volume and surface area in various contexts in Key Stage 4 as well as working with area and volume of similar shapes. Building on… Understanding of powers, roots, substitution, equations and rounding. Building towards… Pythagoras' Theorem features in numerous topics that follow at Key Stage 3 and 4, including surface area, coordinate geometry and trigonometry. At Key Stage 4 students will also work with Pythagoras in 3 Dimensions.	
		Learning Checkpoint 5 **Unit 5: End of Unit Assessment and Feedback**		

TERM 2 Yr 9 F	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
SPRING 1	**FOUNDATION** **Week**			
2 Weeks (8 hrs)	**6 Algebraic and real-life graphs** 6.1 Reading graphs 6.2 Plotting graphs	Read information from graphs. Plot graphs of simple functions.	Building on… Plotting coordinates and substitution into expressions. Building towards…	**A8 A9 A10 A14**

	6.3 Distance-time graphs 6.4 Midpoints 6.5 Intercepts and gradients	Draw and interpret distance–time graphs. Find the midpoint of a line segment. Work out the y-intercept of a line. Work out the gradient of a line.	Solving simultaneous equations at Key Stage 4, and further work on linear and non-linear graphs at Key Stage 4.	
	HALF-TERM TEST	**Learning Checkpoint 6** **Unit 6: End of Unit and HT Assessment and Feedback**		

TERM 2 Yr 9F	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
SPRING 2	**FOUNDATION Week**			
2 Weeks (8 hrs)	**7 Multiplicative reasoning** 7.1 STEM: Using ratios 7.2 Using proportions	1. Share a quantity in a given ratio. 2. Simplify ratios with different units. 1. Solve problems using ratio and proportion.	Building on… Solving problems that involve unequal sharing and grouping using knowledge of fractions and multiples at Key Stage 2. Building towards… Application of ratios to geometrical, statistical and numerical problems at Key Stage 4.	**R1 R4 R5 R6 R7 R8 R10 R11 G14**

	7.3 Problem-solving with proportions 7.4 Measures and conversions	1. Solve problems using direct and inverse proportions. 2. Use graphs to solve proportion problems. 1. Use units of measurement to solve problems. 2. Convert between metric and imperial measurements.	Building on …. Students did a lot of work on proportion at Key Stage 2, both directly and indirectly through other topics. They have already used proportion reasoning to solve many problems in Year 7 and 8, for examples in unit conversion. Building towards… This unit builds towards algebraic proportion in Year 9 and Key Stage 4, but also covers a fundamental skill that can be applied to many units throughout Key Stage 3 and 4. Building on… An introduction to metric and imperial units at Key Stage 2. Building towards… Working with units when calculating area and volume. Fluency in working with units is also necessary for future topics such as solving compound measure problems in both maths and science	
	END OF SPRING TERM TEST	**Learning Checkpoint 7 Unit 7: End of Unit Assessment and Feedback**		

TERM 3 Yr 9 F	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
SUMMER 1	**FOUNDATION** Week			
3 Weeks (12 hrs)	**8 Algebraic and geometric formulae** 8.1 Substituting into formulae 8.2 More complex formulae 8.3 Formulae in geometry 8.4 Compound shapes 8.5 Circles	1. Substitute into formulae. 1. Substitute into complex formulae and solve equations. 2. Construct complex formulae. 1. Use inverse operations in formulae. 2. Know and use the formula for the area of a triangle. 1. Work out the area and perimeter of shapes made from rectangles and triangles. 1. Work out the circumference of a circle. 2. Work out the area of a circle.	Building on… Direct and inverse proportion covered in Year 8 as well as solving equations and substitution. Building towards… Solve problems involving direct and inverse proportion, including graphical and algebraic representations at Key Stage 4. Building on… Concepts of area and perimeter from Key Stage 2 and Year 7, plus previously taught skills involving metric units and rounding. Students will also be able to apply their skills of solving equations in order to work out missing values. Building towards… Working out the volume of a cylinder later in Year 8, and the surface area of a cylinder in Year 9. At Key Stage 4, students will solve complex problems involving sectors, arcs and segments.	**G1 G2 G3 G4 G14 G15 G16**
		Learning Checkpoint 8		

		Unit 8: End of Unit Assessment and Feedback		

TERM 3 Yr 9 F	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
SUMMER 1	**FOUNDATION Week**			
2 Weeks (8 hrs)	**9 Probability** 9.1 Probability experiments 9.2 Sample space diagrams 9.3 MODELLING: Two-way tables 9.4 Tree diagrams	1. Work out the expected results when an experiment is repeated. 2. Compare experimental and theoretical probabilities. 1. List all the possible outcomes of two events in sample space diagrams. 2. Work out the theoretical probability of an outcome from two events. 3. Decide whether a game is fair. 1. Calculate estimates of probability from experiments or survey results. 2. Use experimental probabilities to predict outcomes.	Building on… Working with fraction, decimal and percentage equivalents from earlier in Year 7. Building towards… Calculating the probability of dependent events using tree diagrams in Year 8 as well as working with set notation and Venn Diagrams in Year 9. Building on… Basic probability concepts and the probability of single events covered in Year 7. Building towards… More complex probability problems at Key Stage 4.	**P1 P2 P3 P4 P6 P7 P8**

		1. Use tree diagrams. 2. Work out probabilities from tree diagrams.		
SUMMER	**HALF-TERM TEST**	**Learning Checkpoint 9 Unit 9: End of Unit HT Assessment and Feedback**		

TERM 3 Yr 9 F	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
SUMMER 2	**FOUNDATION** **Week**			
3 Weeks (12 hrs)	**10 Polygons and transformations** 10.1 Quadrilaterals 10.2 Triangles 10.3 Transformations 10.4 Enlargement 10.5 Congruent shapes	1. Identify the properties of quadrilaterals. 1. Calculate missing angles in triangles. 2. Find the length of missing sides in triangles. 1. Transform shapes on the coordinate axis. 2. Use combinations of transformations. 1. Enlarge 2D shapes.	Building on… Basic angle rules covered in Year 7 and angle in parallel lines from Year 8. Pupils will use their reasoning skills and apply their previously learnt angles rules to solve more complex angle problems. Building towards… Multi-step angle questions and circle theorems at Key Stage 4. Students will start to construct chains of reasoning, leading to geometric proof at Key Stage 4 and beyond. Building on …. Translation, reflection and symmetry at Key Stage 3, as well as equations of horizontal and vertical lines taught earlier in Year 9. Building towards…	**G3 G4 G5 G7**

		1. Solve problems using congruent shapes. 2. Recognise when triangles are congruent.	More complex transformations and invariance at Key Stage 4 Building on …. Similar shapes and length scale factors from Key Stage 2 as well proportional reasoning covered in Year 8. Building towards… Problems involving similar area and volume at Key Stage 4, and loci problems at Key Stage 4. The skill of building a chain of reasoning will also develop understanding of geometrical proofs in Key Stage 4 and beyond.	
	END OF TERM TEST **END OF YEAR TEST**	**Learning Checkpoint 10** **Unit 10: End of Unit Assessment and Feedback**		

TERM 1 Yr 9M	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
Autumn 1	**MIDDLE Weeks 1-3**			
3 Weeks (12 hrs)	**1 Indices and standard form** 1.1 Indices	1. Calculate combinations of indices, fractions and brackets.	Building on…	**N3 N6 N7 N9**

	1.2 Calculations and estimates 1.3 More indices 1.4 STEM: Standard form	2. Use index laws to simplify expressions. 1. Calculate combinations of powers, roots, fractions and brackets. 2. Estimate answers to calculations. 1. Understand negative and 0 indices. 2. Use powers of 10 and their prefixes. 1. Write large and small numbers using standard form. 2. Enter and read standard form numbers on your calculator. 3. Order numbers written in standard form.	Manipulating algebraic expressions in Year 7 and substituting in expressions with indices in Year 8. Building towards… Manipulating more complex algebraic expressions in later Year 9 and KS4 including factorizing quadratics and working with non-linear graphs. Building on… Key Stage 3 unit on standard form in maths and in science. Building towards… Answering GCSE exam questions involving standard form in both maths and science	
		Learning Checkpoint 1 **Unit 1 : End of Unit Assessment and Feedback**		

TERM 1 Yr 9M	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
Autumn 1	**MIDDLE Weeks 4-6**			
3 Weeks (12 hrs)	**2 Expressions and formulae** 2.1 Substituting into expressions 2.2 Writing expressions and formulae 2.3 STEM: Using formulae 2.4 Rules of indices and brackets	1. Substitute into algebraic expressions involving powers. 2. Write expressions and formulae. 3. Change the subject of a formula. 4. Simplify expressions involving brackets, use rules for indices and factorise expressions. 5. Multiply out double brackets and collect like terms. 1. Substitute into algebraic expressions involving powers. 2. Write expressions and formulae. 3. Change the subject of a formula. 4. Simplify expressions involving brackets, use rules for indices and factorise expressions. 5. Multiply out double brackets and collect like terms.	Building on… Area of 2D shapes from Year 7 and the volume of prisms in Year 8 as well as substitutions into formula. Students will also be able to apply their Pythagoras skills when finding missing lengths in a triangular prism. Building towards… Surface area of a cone, sphere and pyramid at Key Stage 4. Building on… Basic algebraic manipulation in year 7 and working with expanding quadratics in year 8.	**A2 A4 A5**

	2.5 Expanding double brackets	1. Substitute into algebraic expressions involving powers. 2. Write expressions and formulae. 3. Change the subject of a formula. 4. Simplify expressions involving brackets, use rules for indices and factorise expressions. 5. Multiply out double brackets and collect like terms. 1. Substitute into algebraic expressions involving powers. 2. Write expressions and formulae. 3. Change the subject of a formula. 4. Simplify expressions involving brackets, use rules for indices and factorise expressions. 5. Multiply out double brackets and collect like terms.	Building towards… This unit is a skill that will be used in multiple KS4 topics such as; solving quadratic simultaneous equations, sketching quadratics, roots etc.	
AUTUMN 1	**HALF-TERM TEST**	**Learning Checkpoint 2** **Unit 2: End of Unit Assessment and Feedback**		

TERM 1 Yr 9M	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
Autumn 2	**MIDDLE Weeks 8-10**			
3 Weeks (12 hrs)	**3 Dealing with data** 3.1 Calculating averages 3.2 Display and analyse data	1. Find mean, mode, median and range of discrete data. 2. Find the modal class of a set of grouped data. 3. Estimate the mean form a large set of grouped data. 1. Construct and use a line of best fit to estimate missing values. 2. Identify and explain outliers in data. 3. Identify further lines of enquiry. 4. Construct and use frequency polygons.	Building on… Building on …. Building towards…	**G1 G2 G3 G4 G14 G15 G16**

		Learning Checkpoint 3 Unit 3: End of Unit Assessment and Feedback		

TERM 1 Yr 9M	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
Autumn 2	**MIDDLE Weeks 11-13**			
3 Weeks (12 hrs)	**4 Multiplicative reasoning** 4.1 Enlargement	1. Enlarge 2D shapes using positive, negative and fractional scale factors. 2. Find the centre of enlargement by drawing lines on a grid.	Building on… Translation, reflection and symmetry at Key Stage 3, as well as equations of horizontal and vertical lines taught in Year 8. Building towards…	**N3 N15 R6 R9 R11 R12 G7**

	4.2 Negative and fractional scale factors 4.3 FINANCE: Percentage change 4.4 Rates of change 4.5 Problem-solving	1. Enlarge 2D shapes using positive, negative and fractional scale factors. 2. Enlarge 2D shapes using a fractional scale factor. 3. Understand that the scale factor is the ratio of the lengths of corresponding slides. 1. Find an original value using inverse operations. 2. Calculate percentage change. 1. Solve problems using compound measures, percentage change and rates of change. 2. Solve problems using constant rates and related formulae. 1. Round numbers to a given number of significant figures. 2. Solve problems using percentage change and rates of change. 3. Solve problems using ratio and scale factors.	More complex transformations and invariance at Key Stage 4. Building on …. Basic percentage work throughout Year 7 and 8 that includes percentages of amounts, percentage increase and decrease, multipliers and reverse percentages. Also, percentage change has been taught in science. Building towards… Set up, solve and interpret the answers in exponential growth and decay problems and work with general iterative processes in Key Stage 4. Building on… This aspect will revisit concepts of place value and integer rounding learned in Year 6 and 7. Pupils will also get opportunities to use their knowledge from units such as perimeter, area and money calculations.	
	END OF AUTUMN 2 TERM TEST	**Learning Checkpoint 4**		

		Unit 4: End of Unit and HT Assessment and Feedback		

TERM 2 Yr 9M	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
SPRING 1	**MIDDLE Weeks 15-17**			
3	**5 Constructions** 5.1 Using scales			**N3 N6 N7 N9**

Weeks (12 hrs)	5.2 Basic constructions 5.3 Constructing triangles 5.4 Loci	1. Use scales on maps and diagrams. 2. Draw diagrams to scale. 1. Make accurate constructions using drawing equipment. 1. Construct accurate triangles. 2. Construct accurate nets of solids involving triangles. 1. Draw loci for the paths of points.	Building on… Angles in parallel lines in Year 8, and protractor and measurement skills from Key Stage 2 and Year 7. Scale drawings will also draw on pupils' prior knowledge of proportion and units from Year 7 and 8. Building towards… Trigonometric problems including those involving bearings at Key Stage 4.	
		Learning Checkpoint 5 **Unit 5: End of Unit Assessment and Feedback**		

TERM 2 Yr 9M	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK

SPRING 1 MIDDLE Weeks 18-20				
3 Weeks (12 hrs)	**6 Equations, inequalities and proportionality** 6.1 Solving equations 6.2 Using equations 6.3 Trial and improvement 6.4 Using and solving inequalities 6.5 STEM: Proportion 6.6 Simultaneous equations	1. Construct and solve equations with the unknown on both sides. 2. Construct and solve equations including brackets, powers and fractions. 1. Convert a recurring decimal to a fraction. 2. Know the difference between equations and identities. 1. Use trial and improvement methods to find solutions to equations. 1. Solve linear equalities. 2. Represent solutions to inequalities on a number line. 1. Set up equations to show direct proportion. 2. Recognise data sets that are proportional.	Building on… Solving missing number problems at Key Stage 2 as well as the Year 7 and 8 units on algebraic notation and manipulation. Building towards… This unit covers a fundamental skill that is needed for many other units covered throughout Key Stage 3 and Key Stage 4. Students will need to be able to solve equations of all different types and in various contexts and will specifically use this skills in the upcoming Years on area and angles Building on …. Number work and operations with decimals in Year 6 and 7. Building towards… This unit covers a fundamental skill that is needed for many other units covered throughout Key Stage 3 and 4. Students will also build on the concept of recurring decimals in our next unit on bounds. Building on… Students will build on their equation solving skills developed at Key Stage as well as their knowledge of place value and number lines. Building towards…	**A3 A6 A17 A18 A19 A20 A21 A22**

		3. Use algebra to solve problems involving proportion. 1. Solve a pair of simultaneous equations.	This unit will provide students with skills needed to answer Key Stage 4 exam questions that involve inequalities.	
	HALF-TERM TEST	**Learning Checkpoint 1** **Unit 1 : End of Unit Assessment and Feedback**		

TERM 2 Yr 9M	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
SPRING 1	**MIDDLE Weeks 18-20**			
3 Weeks (12 hrs)	**7 Circles, Pythagoras and prisms** 7.1 Circumference of a circle 7.2 Area of a circle 7.3 Pythagoras' theorem 7.4 Prisms and cylinders 7.5 STEM: Errors and bounds	1. Calculate the circumference of a circle. 2. Estimate calculations involving p. 3. Solve problems involving the circumference of a circle. 1. Calculate the area of a circle. 2. Solve problems involving the area of a circle. 1. Find the length of an unknown side of a right-angled triangle. 2. Solve problems involving right-angled triangles. 1. Calculate the volume and surface area of a right prism. 2. Calculate the volume and surface area of a cylinder. 1. Find the lower and upper bounds for a measurement.	Building on… In Year 8 students completed a unit on circles that involved area and circumference as well as fractions of circles i.e. half, quarter etc. Building towards… This unit provide students with the skills that will be required to answer complex questions in KS4 that involve area and perimeter. Building on… Area of 2D shapes from Year 7 and the volume of prisms in Year 8 as well as substitutions into formula. Students will also be able to apply their Pythagoras skills when finding missing lengths in a triangular prism. Building towards… Surface area of a cone, sphere and pyramid at Key Stage 4.	**G6 G9 G16 G17 G18 G20 N15 N16**

		2. Calculate percentage error intervals.		
SPRING	**END OF TERM TEST**	**Learning Checkpoint 1 Unit 1 : End of Unit Assessment and Feedback**		

TERM 3 Yr 9M	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
SUMMER 1	**MIDDLE Weeks 18-20**			
3 Weeks (12 hrs)	**8 Sequences and graphs** 8.1 *nth* term of arithmetic sequences	1. use the nth term to generate a sequence. 2. find the nth term of a sequence.	Building on… Patterns and sequences introduced at Key Stage 2, plus algebraic expressions and substitution taught in Year 7. Students will also work with sequences involving fractions decimals and negative numbers.	**A9 A10 A11 A12 A13 A14 A18 A19 A23 A24 A25**
	8.2 Non-linear sequences	1. recognise and continue geometric sequences. 2. recognise and continue quadratic sequences.	Building towards… Quadratic sequences at Key Stage 4	
	8.3 Graphing rates of change	1. use distance-time graphs to solve problems. 2. recognise graphs showing constant rates of change. 3. interpret graphs showing rates of change.	Building on… Plotting coordinates and substitution into expressions.	
	8.4 Using y = mx + c	1. draw a graph from its equation, without working out points.	Building towards… Solving simultaneous equations at Key Stage 4, and further work on linear and non-linear graphs at Key Stage 4.	

	8.5 More straight-line graphs 8.6 More simultaneous equations 8.7 Graphs of quadratic functions 8.8 Non-linear graphs	2. write the equation of a line parallel to another line. 3. compare graph lines using their equations. 1. plot graphs with equations like ax + by = c. 2. rearrange equations of graphs into y = mx + c. 3. find inverse functions and plot their graphs. 1. solve simultaneous equations by drawing graphs. 2. find the equation of a line through two points. 1. draw graphs with quadratic equations like $y = x^2$. 2. interpret graphs of quadratic functions. 1. draw graphs of cubic equations like $y = x^3$. 2. interpret non-linear graphs.		
		Learning Checkpoint 8 **Unit 8: End of Unit Assessment and Feedback**		

TERM 3 Yr 9M	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
SUMMER 1	**MIDDLE Weeks 18-20**			
3 Weeks (12 hrs)	**9 Probability** 9.1 Calculating probabilities 9.2 Experimental probability 9.3 Probability diagrams	1. calculate probabilities from tables. 2. compare probabilities. 1. calculate estimates of probability from experiments or survey results. 2. use experimental probabilities to predict outcomes. 1. list all the possible outcomes of one or two events in Venn diagrams, tables and sample space diagrams.	Building on… Basic probability concepts and the probability of single events covered in Year 7 and working with sample space diagrams and tree diagrams in Year 8. Building towards… More complex probability problems at Key Stage 4, including those involving conditional probability.	**P1 P2 P3 P4 P5 P6 P7 P8 P9**

	9.4 Independent events	2. compare experimental and theoretical probabilities. 3. You will decide if a game is fair. 1. calculate the probability of two independent events. 2. use tree diagrams.		
	HALF-TERM TEST	**Learning Checkpoint Unit 9 End of Unit Assessment and Feedback**		

TERM 3 Yr 9M	TOPIC	CORE LEARNING	SEQUENCING	SPECIFICATION LINK
SUMMER 2	**MIDDLE Weeks 18-20**			
3 Weeks (12 hrs)	**10 Comparing Shapes** 10.1 Congruent and similar shapes 10.2 Ratios in triangles 10.3 The tangent ratio	1. Use congruent shapes to solve problems about triangles and quadrilaterals. 2. Work out whether shapes are similar, congruent or neither. 1. Solve problems involving similar triangles.	Building on… Similar shapes and length scale factors from Key Stage 2 as well proportional reasoning covered in Year 8. This unit also builds on previous units on ratio. Building towards… This unit will provide students with essential skills needed to access Key Stage 4 exam style questions.	**G5 G6 G7 G19 G20 G21 G24 G25**

	10.4 The sine ratio 10.5 The cosine ratio	1. Use conventions for naming sides of a right-angled triangle. 2. Work out the tangent of any angle. 3. Use the tangent to work out an unknown side of a triangle. 1. Work out the sine ratio of any angle. 2. Use sine to work out the opposite side in a right-angled triangle. 1. Work out the cosine ratio of any angle. 2. Use the cosine ratio to work out the adjacent side in a right-angled triangle.	Building on… The use of Pythagoras to work out missing lengths in Year 8 as well as solving equations from Year 7 and 8. Building towards… Trigonometry in non-right angled triangles and in 3 Dimensions in Key Stage 4.	
	END OF TERM TEST **END OF YEAR TEST**	**Learning Checkpoint 10** **Unit 10: End of Unit Assessment and Feedback**		