THE ABBEY SCHOOL
A BUSINESS & ENTERPRISE ACADEMY

Mathematics

Year 10 Foundation
Scheme of Work

Subject leader: K Ellender

Topics by term	Topic overview for Year 10 Foundation					
	Term 1	**Term 2**	**Term 3**	**Term 4**	**Term 5**	**Term 6**
Topics taught	**8F - Perimeter, Area and Volume** 8.a 2D Area 8.b Circle Formulae 8.c Area and length units 8.d Bounds 8.e Compound shapes 8.f Surface area 8.g Volume of prisms Knowledge recall / Quiz	**9F - Linear Graphs** 9.a Coordinates 9.b Linear graphs 9.c Gradients and y=mx+c 9.d Real-life graphs 9.e Distance-time graphs Knowledge recall / Quiz	**11F - Ratio and Proportion** 11.a Writing ratios 11.b Using ratios 1 11.c Ratios and measures 11.e Comparing using ratios 11.f Proportion & graphs 11.g Proportion problems Knowledge recall / Quiz	**14F - Multiplicative Reasoning** 14.a Percentages 14.b Growth & Decay 14.c Compound Measure 14.d Direct and Inverse Proportion Knowledge recall / Quiz **12F – Right Angled Triangles** 12.a Pythagoras' theorem 12.b Trigonometric ratios	Continued … 12.c Exact angles 12.d Trigonometry; problems Knowledge Recall / Quiz …… **13F - Probability** 13.a Calculating 13.b Two events 13.c Experimental 13.d Tree diagrams 13.e Venn diagrams Knowledge recall / Quiz **WTM – papers**	**10F – Transformations** 10.a Congruence. and Rotations. 10.b Reflections 10.c Translations. 10.d Enlargements and Similarity. 10.e Combinations 10.f Vectors Knowledge recall / Quiz **15F – Constructions & Regions** 15.a 3D solids 15.b Plans and Elevations 15.c Scale drawings 15.d Accurate drawings and Constructions 15ef Loci 15.f Bearings Knowledge Recall / Quiz

	Vital prerequisites	Vital prerequisites	Vital prerequisites	Vital prerequisites	Vital prerequisites	Vital prerequisites
	Basic arithmetic: addition, subtraction, multiplication, division, fractions, decimals, percentages. Understanding properties of geometric shapes: squares, rectangles, triangles, circles, polygons. Familiarity with units of length, area, and volume. Basic algebra: manipulating simple expressions. Knowledge of formulas for perimeter, area, and volume. Basic problem-solving strategies for real-world scenarios.	Understanding the x and y axes, and the ability to plot points on a Cartesian plane. Familiarity with algebraic expressions and simple equations, solving linear equations and understanding variables and constants. Basic concept of gradient. Plotting simple linear equations and knowledge of intercepts. Using tables to plot points and draw linear graphs. Understanding y = mx + c. Reading and interpreting graphs, and understanding how changes in the equation affect its graph.	Students should be familiar with foundational concepts such as basic arithmetic skills, understanding ratios, equivalent ratios, fraction and decimal conversion, multiples and factors, proportional relationships, unit rates, scaling, and solving word problems involving ratios and proportions.	14F - Understanding percentage changes, simplifying ratios, solving proportional problems, applying ratios practically (e.g., scaling recipes, maps), calculating unit rates, basic algebra (solving equations, word problems), applying multiplicative reasoning (finances, measurements), and resizing objects proportionally using scale factors.	12F - Understanding angles (acute, obtuse, right) and triangle types (equilateral, isosceles, scalene, right-angled). Solving simple algebraic equations and rearranging formulas. Knowledge of length and area units and their conversions. 13F - Understanding probability language and the scale from 0 to 1. Calculating the probability of a single event. Applying basic counting principles for simple events. Distinguishing between experimental and theoretical probability. Listing possible outcomes of simple events.	10F - Understanding geometric shapes (triangles, rectangles, circles) and properties like angles and symmetry. Using the Cartesian system for plotting points and transformations (translations, rotations, reflections, enlargements). 15F - Using tools like ruler, protractor, compass for constructions. Knowledge of angles, parallel/perpendicular lines, triangle properties, circle basics, loci concepts, and algebraic applications. Solving geometric problems accurately.
	Why are we teaching this now?	Why are we teaching this now?	Why are we teaching this now?	Why are we teaching this now?	Why are we teaching this now?	Why are we teaching this now?
	Understanding perimeter, area, and volume is essential for advanced geometry, complex figures, and algebraic applications. These concepts are foundational for trigonometry, calculus, and calculating areas and volumes. In physics, engineering, and design, they are crucial for calculating force, pressure, density, and optimising designs. In probability, they are used for geometric probability, and in environmental science, they measure land, water, and resources.	Understanding linear graphs is essential for more complex functions and coordinate geometry. These skills are foundational for solving simultaneous equations and inequalities, grasping calculus concepts, and modelling linear relationships in physics, engineering, statistics, economics, and computer science. Many advanced problem-solving scenarios also rely on graphing linear relationships.	Understanding ratios and proportions through basic algebraic manipulation is essential for solving complex equations and inequalities. These concepts scale figures in geometry and represent percentages and probabilities in statistics. Crucial in science, engineering, economics, finance, and business. Applying ratios to real-world problems is valuable across professions and lays the foundation for advanced mathematics topics like trigonometry, calculus, and linear algebra.	14F - Multiplicative reasoning is fundamental across disciplines: in algebra for equation solving, geometry for area and volume calculations, statistics for interpreting data and probabilities, and in science, engineering, and economics for scaling measurements, data analysis, trend analysis, and financial projections. These skills underpin advanced maths like calculus and linear algebra, solving diverse real-world problems across professions.	12F - Essential for learning trigonometric ratios, coordinate geometry. It also applies to physics concepts like vectors and engineering design. These principles form the foundation for advanced calculus and are crucial for modelling and transformations. 13F - Crucial across disciplines: statistics for data analysis and inference; science and engineering for modelling and decision-making under uncertainty; economics for risk assessment; computer science for AI and algorithms; healthcare for risk evaluation; and more.	10F - In geometry for spatial manipulation, physics for modelling rotations, computer graphics for rendering and effects, data analysis for preparing and analysing, and AI for enhancing model performance. They also support mathematical modelling and improve spatial reasoning in STEM education. 15F - Crucial for geometry, architecture, and engineering, involving precise measurements. It supports CAD in designing structures, GIS for mapping and planning, and enhances skills in art and design.

Contents

This symbol indicates that there are aspects of this curriculum area that pupils have previously practised. Pupils will be revisiting earlier content as part of their consolidation or in order to ensure knowledge is secure before expanding into new learning. References to these earlier SOL are noted for teachers to check specific objectives and content.

Edexcel Foundation 1MA1							
Specification References	**Big questions**	**Topic area: Main Items**	**Learning Objectives /Outcomes** **All: grades 1-3** **Most: grades 4-5** **Examples**	**Key Terms/ concepts** **Literacy** **Numeracy**	**Assessment and homework tasks**	**Resources**	**Personal Development Curriculum links (SMSC, British Values, PSHE)**
Term 1							
	Topic 1: 8F - Perimeter, Area and Volume (6 Weeks)						
R1, G11, G14, N7, N8, N9, N14, G9, G16, G17, G18 G11, G14,	What are the Area formulae that you need to know? Yr7, Yr8 Ch2	8.a 2D Area 8.b Circle vocabulary and formulae 8.c Area and length units 8d. Bounds	**Students who require additional support at this stage may find it useful to firstly revisit:** • **Calculations (Unit 1F)** • **Substitution (Unit 2F)** Find and use the perimeter of rectangles, triangles, parallelograms and trapezia; Find and use the perimeter of compound shapes; Recall and use the formulae for the area of a triangle and rectangle; Find and use the area of a trapezium and recall the formula; Find the area of a parallelogram; Identify, name and draw basic parts of a circle including tangent, chord & segment; Recall and use formulae for the circumference and the area of a circle; Use π ≈ 3.142 or use the π button on a calculator; Give in terms of π Find radius or diameter, given area or perimeter; Indicate values on a scale, including decimals; Convert between units of measure within one system, including time; Convert metric units to metric units; Sensibly estimate measures in everyday settings; Measure shapes to find perimeters and areas using a range of scales; Convert between metric area measures	Triangle, rectangle, parallelogram, trapezium, area, perimeter, formula, length, width, circumference, radius, diameter, pi, Metric, conversion, estimate, Compound, measurement, Cuboid, prism, Volume, polygon, symmetry, vertices, edge, face, units, conversion, circle, circumference, radius, diameter, pi,. See command words	**Starter quizzes for the term should include:** **Required prior knowledge** **Mixed skills practice** **Focused accuracy drills** **Knowledge gap support** **Look, cover, write, check.** Pupils are expected to complete purposeful exercises and repeated practice on: • Perimeter of shapes • Area of rectangles and parallelogram • Area of triangles, • Area of compound shapes • Area of trapezia • Calculating area and circumference of a circle. • Converting metric units. • Area of compound shapes. • Perimeter of compound shapes. • Practical problems involving area and perimeter with cost implications. Practical problems involving metric units. Practical problems involving compound shape area and perimeter.	• Pearson's GCSE Maths F 9-1 Textbook: Ch8 & Ch17 (Circles) • Purposeful Practice Book Ch8F • Edexcel Higher Linear Course Text Book Ch9 • Common misconception information. Scientific Calculators Compasses Year 10 Term 1 Knowledge Organiser for key terms, recall and low stakes quizzing. Can They Be Equal? (maths.org) Warmsnug Double Glazing (maths.org) Circle sector problems - Access Maths Paper clip - Illustrative Mathematics All in a Jumble (maths.org) Illusion (maths.org) Mensuration – Resourceaholic L-emental (maths.org) Semicircle Shape (maths.org) Please see the Resources section for available materials	By maintaining high standards of behaviour, including mutual respect and tolerance for different ideas to their own, class teachers will be promoting British values. Throughout the year, students should be encouraged to actively listen to understand the viewpoint of others when learning involves opinions, interpretation of fact and alternative methods. **Gatsby Benchmarks: Careers** Use real-life contexts wherever possible to help students to engage and relate learning to everyday and working life. E.g. Area calculations linked to cost – design and construction. . Maths, Why Bother? | MYPATH Careers Resources (mypathcareersuk.com)

		8.e Compound shapes	Calculate the upper and lowers bounds of numbers given to varying degrees of accuracy; Use inequality notation to specify an error bound. Calculate the upper and lower bounds of an expression involving the four operations; Find the upper and lower bounds in real-life situations using measurements given to appropriate degrees of accuracy; Find the upper and lower bounds of calculations. Calculate areas and perimeters of compound shapes made from triangles and rectangles NB – This is covered separately to the initial area and perimeter work to revisit formulae again.		Multistep problems in a range of scenarios with reasoning, where necessary. Key & exemplar questions – WRM - SOL topics Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Geometry > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	on practice questions and AO1/AO2/AO3 style questions for assessment.	
N14, R1, G11, G14, G16, G17, N1, R1, G12, G16	How does calculating the surface area and volume of a prism relate to your area knowledge? Yr8 Ch2	8.f Surface Area 8.g Volume of Prisms	Estimate surface areas by rounding measurements to 1 significant figure; Find the surface area of a prism; Find surface area using rectangles and triangles; Identify and name common solids: cube, cuboid, cylinder, prism, pyramid, sphere and cone; Sketch nets of cuboids and prisms; Recall and use the formula for the volume of a cuboid; Find the volume of a prism, including a triangular prism, cube and cuboid; Calculate volumes of right prisms and shapes made from cubes & cuboids; Estimate volumes etc. by rounding measurements to 1 significant figure; Calculate volumes of cylinders. Convert between metric volume measures; Convert between metric measures of volume & capacity e.g. 1ml = 1cm3 **The Abbey Lens:** **Science – volume and surface area ratios.**		Pupils are expected to complete purposeful exercises and repeated practice on: • Calculating the surface area of cuboids. • Calculating the surface area of prisms. • Calculating the volume of cuboids. • Calculating the volume of prisms. Practical problems involving surface area, volume and cost. Multistep problems in a range of scenarios with reasoning, where necessary. Key & exemplar questions – WRM - SOL topics Plenary style questions – White Rose Maths - Assessment Papers	• Pearson's GCSE Maths F 9-1 Textbook: Ch8 & Ch17 (Circles) • Purposeful Practice Book Ch8F • Edexcel Higher Linear Course Text Book Ch9 • Common misconception information. Scientific Calculators 3D solids / cardboard nets Year 10 Term 1 Knowledge Organiser for key terms, recall and low stakes quizzing. Functional Volume – Access Maths Volume and Area - Mrsmorgan1 TES Changing Areas, Changing Volumes (maths.org) Cuboids (maths.org)	

					https://www.missbsresources.com/ > Geometry > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	Efficient Cutting (maths.org) Sending a Parcel (maths.org) Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 style questions for assessment.	
		Knowledge Recall	Big Questions of the unit are reviewed, and key areas revisited. Planned consolidation. Worded problems should be used, as well as exam style questions from the board. Further examples could include, but should not be limited to: Conversion between units, in a range of context in both directions. Consider 'how many small boxes fit in a larger box'-type questions. Practical examples should be used to enable students to understand the difference between perimeter, area and volume.			Knowledge Recall Lesson – Unit 8F – Shared area. Pearson's GCSE Maths F 9-1 Textbook: Problem solving, Check Up, Strengthen and Extend questions.	
		Knowledge Quiz	Knowledge Quiz and self-assessment.		Ch8F Knowledge Quiz – Shared area.		
Assessments for the year group will take place in Week 3 of each term, followed by feedback and focussed Pupil Improvement Time.							
Term 2							
	Topic 2: 9F - Linear Graphs (6 weeks)						
N13, A7, A8, A9, A10, A14, R1, R11, R14, G11, G14, A10, A12, A17	How do you plot, use and interpret a linear graph? Yr8, Ch9	9.a Coordinates 9.b Linear graphs	Identify points with given coordinates & coordinates of a given point; Find coordinates from geometrical information; Use axes and coordinates to specify points in all four quadrants in 2D; Find the coordinates of the midpoint of a line segment; Draw graphs of y = a, x = a, y = x and y = –x; Recognise straight-line graphs parallel to the axes; Use function machines and equations to find coordinates. Plot and draw graphs of straight lines of y = mx + c using a table of values; Plot and draw graphs with negative gradients. Recognise that equations of the form y = mx + c correspond to straight-line graphs in the coordinate plane;	Coordinate, quadrant, axis, origin, function, solution, horizontal, vertical, linear, graph gradient, intercept, parallel, solution, real-life graph, conversion, fixed-charge, Distance, time, velocity, speed. See Command words	**Starter quizzes for the term should include:** **Required prior knowledge** **Mixed skills practice** **Focused accuracy drills** **Knowledge gap support** **Look, cover, write, check.** Pupils are expected to complete purposeful exercises and repeated practice on: • Reading coordinates in four quadrants; • Plotting coordinates in four quadrants. • Complete table of values for x/y values from a linear equation. • Plot linear equations on a graph. • Find the gradient of lines on a graph. • Find the equation of lines on a graph.	• Pearson's GCSE Maths F 9-1 Textbook: Ch9 • Purposeful Practice Book Ch9F • Common misconception information Year 10 Term 2 Knowledge Organiser for key terms, recall and low stakes quizzing. GeoGebra – Graph the line Graph the Line – GeoGebra Desmos Graphing Calculator - Desmos | Graphing Calculator Treasure Hunt (maths.org) Spiral Snail (maths.org) Reflecting Lines (maths.org) Translating Lines (maths.org) Parallel Lines (maths.org)	

		9.c Gradients and y=mx+c	Identify and interpret gradient and intercept from an equation y = mx + c; Identify parallel lines from their equations; Interpret gradient of a graph from practical application Sketch graphs of straight lines of y = mx + c without a table of values using the gradient and intercept; Find the equation of a straight line from a graph; Sketch a graph of a linear function, using the gradient and y-intercept; Plot and draw graphs of straight lines in the form ax + by = c; Find the equation of lines with one point and gradient; Find solutions to a linear equation from a graph;		• Plot and interpret graphs of linear functions in context. Multistep problems in a range of scenarios with reasoning, where necessary. Key & exemplar questions – WRM - SOL topics Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Algebra > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	How Steep Is the Slope? (maths.org) Graph Triangles (maths.org) Graphical Triangle (maths.org) Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 questions for practice and assessment.	
N13, A7, A8, A9, A10, A14, R1, R11,R14, G11, G14	How can we represent real life in a graph? Yr8 Ch5	9.d Real-life graphs 9.e Distance-time graphs	Draw, label and scale axes; Read values from straight-line graphs for real-life situations; Draw straight line graphs for real-life situations, including ready reckoner graphs, conversion graphs, fuel bills graphs, fixed charge and cost per unit. **The Abbey Lens: Geography – Countries and cities.** Work out time intervals for graph scales; Draw distance–time graphs Draw velocity–time graphs; Interpret distance–time graphs, and calculate: the speed of individual sections, total distance and total time; Interpret gradient as the rate of change in distance–time Interpret information presented in a range of linear & non-linear graphs; Interpret graphs with negative values on axes;		Pupils are expected to complete purposeful exercises and repeated practice on: • Reading real life graphs. • Plotting real life graphs. • Reading distance-time graphs. • SDT from distance-time graphs. Practical problems involving real-life graphs in context such as conversion, fixed costs and speed and time. Multistep problems in a range of scenarios with reasoning, where necessary. Key & exemplar questions – WRM - SOL topics Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Algebra > skills review	• Pearson's GCSE Maths F 9-1 Textbook: Ch9 • Purposeful Practice Book Ch9F • Common misconception information Year 10 Term 2 Knowledge Organiser for key terms, recall and low stakes quizzing. Maths Filler Fill Me Up (maths.org) How Far Does it Move? (maths.org) Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 questions for practice and assessment.	**Gatsby Benchmarks: Personal Finance** Discuss the importance of Maths skills to develop and demonstrate confidence and competence in personal finance/planning. Relatable examples within the context of outcomes listed could include: Interpreting graphs is a financial context - bills, currency conversions, unit prices. Use currency conversion graphs in contexts to explore and expose students to global currencies and the idea of exchange rates. Currency Converter - Foreign Exchange Rates Calculator | Xe

					Mathsbox > Topic resources > 4 Questions / Exit tickets		
		Knowledge Recall	Big Questions of the unit are reviewed, and key areas revisited. Planned consolidation. Worded problems should be used, as well as exam style questions from the board. Further examples could include, but should not be limited to: Plotting a range of linear graphs with lots of negative gradients and fractions. Correct use of vocabulary to describe trends. Interpretation of distance –time graphs. Completing of distance time graphs with information given on the speed Graphs of scenarios with initial charges / call out charges of the intercept. Forming equations of y=mx+c for parallel graphs. Recognising parallel graphs using rearrangement.			Knowledge Recall Lesson – Unit 9F – Shared area. Pearson's GCSE Maths F 9-1 Textbook: Problem solving, Check Up, Strengthen and Extend questions.	
		Knowledge Quiz	Knowledge Quiz and self-assessment.		Ch9F Knowledge Quiz – Shared area.		
Assessments for the year group will take place in Week 3 of each term, followed by feedback and focussed Pupil Improvement Time.							
Term 3							
	Topic 3: 11F Ratio and Proportion (6 weeks)						
N11, N13, R1, R4, R5, R6, R8, R12	How can I use ratio knowledge to solve practical, real life problems? Yr7, Yr8 Ch6	11.a Writing ratios 11.b Using Ratios 11.c Ratios and measures	Understand the division of a quantity into a of number parts as a ratio; Write ratios in their simplest form; Simplifying ratios with different units; Write/interpret a ratio to describe a situation; Write a ratio as a fraction; Write a ratio as a linear function; Compare ratios; Write ratios in form 1 : *m* or *m* : 1; Share a quantity in a given ratio including three-part ratios; Solve a ratio problem in context: Use a ratio to find one quantity when the other is known; Using a ratio to find values when only the difference between quantities is known. Use ratio to compare scale models to a real-life; Use a ratio to convert between measures and currencies; Problems involving mixing, e.g. paint colours, cement and conclusions; Write lengths, areas and volumes of two shapes as ratios in simplest form; Express a multiplicative relationship between two quantities as a ratio or a fraction.	Ratio, proportion, share, parts, fraction, function, compare, linear, direct proportion, inverse proportion, graphical, linear, compare See Command words	**Starter quizzes for the term should include:** **Required prior knowledge** **Mixed skills practice** **Focused accuracy drills** **Knowledge gap support** **Look, cover, write, check.** Pupils are expected to complete purposeful exercises and repeated practice on: • Writing and simplifying ratio. • Comparing with ratio. • Use ratios involving decimals. • Sharing in a ratio. • Work out one quantity of a ratio when another is known. • Converting between units using ratio. Practical problems involving ratio in real life contexts. Multistep problems in a range of scenarios with reasoning, where necessary.	• Pearson's GCSE Maths F 9-1 Textbook: Ch11 • Purposeful Practice Book Ch11F • Common misconception information Year 10 Term 3 Knowledge Organiser for key terms, recall and low stakes quizzing. Mixing Paints (maths.org) Triathlon and Fitness (maths.org) Mixing More Paints (maths.org) Fractions Rectangle (maths.org) All in a Jumble (maths.org) Olympic Measures (maths.org) Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 questions for practice and assessment.	**Gatsby Benchmarks: Careers** Use real-life contexts with ratios wherever possible to help students to engage and relate learning to everyday and working life Maths, Why Bother? | MYPATH Careers Resources (mypathcareersuk.com)

					Key & exemplar questions – WRM - SOL topics Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Number > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets		
R1, R5, R7, R10, R14	How does understanding proportion help us to solve problems? Yr7, Yr8 Ch6	11.d Using proportion 11.e Proportion and graphs	Understand and use proportion as equality of ratios; Convert between currencies; Work out which product is the better buy; Scale up recipes; Find amounts for 3 people when amount for 1 given; Solve proportion problems using the unitary method; Recognise when values are in direct and indirect proportion by reference to the graph form; Understand inverse proportion: as x increases, y decreases; Solve word problems involving direct and indirect proportion; **Abbey Lens:** **Business – Converting currencies and economies of scale (best buys)**		Pupils are expected to complete purposeful exercises and repeated practice on: • Solve proportion problems (inc. Unitary method). • Best buy problems. • Recipe problems • Recognise and understand direct proportion on a graph. • Solving worded problems involving direct and inverse proportion. Practical problems involving ratio. Multistep problems in a range of scenarios with reasoning, where necessary Key & exemplar questions – WRM - SOL topics Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Number > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	• Pearson's GCSE Maths F 9-1 Textbook: Ch11 • Purposeful Practice Book Ch11F • Common misconception information Year 10 Term 3 Knowledge Organiser for key terms, recall and low stakes quizzing. Tray Bake (maths.org) Mixing Lemonade (maths.org) Ratio, Proportion and Rates of Change - Short Problems (maths.org) Toad in the Hole (maths.org) Ratio, Proportion and Rates of Change - Short Problems (maths.org) A Little Light Thinking (maths.org) Which Spinners? (maths.org) Ratio, Proportion and Rates of Change - Short Problems (maths.org) Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 questions for practice and assessment.	**Gatsby Benchmarks: Personal Finance** Discuss the importance of Maths skills to develop and demonstrate confidence and competence in personal finance/planning. Relatable examples within the context of outcomes listed could include: 50:30:20 rule of budgeting. Best buy problems with multiples or unitary costs. Currency Conversions – including graphs
		Knowledge Recall	Big Questions of the unit are reviewed, and key areas revisited. Planned consolidation. Worded problems should be used, as well as exam style questions from the board.			Knowledge Recall Lesson – Unit 11F – Shared area.	

			Further examples could include, but should not be limited to: Using a ratio to find one quantity when the other is known. Using a ratio to find one quantity when the difference between two parts is known. Vocabulary of the question to determine what do to. Emphasise the importance of reading the question carefully. Ratios with decimals 0.2 : 1. Converting imperial units to imperial units are not specifically in the programme of study, but still useful and provide a good context for multiplicative reasoning. It is also useful generally for students to know rough metric equivalents of commonly used imperial measures, such as pounds, feet, miles and pints. Scale up recipes with decisions on if there is enough.			Pearson's GCSE Maths F 9-1 Textbook: Problem solving, Check Up, Strengthen and Extend questions.	
		Knowledge Quiz	Knowledge Quiz and self-assessment.		Ch11F Knowledge Quiz – Shared area.		
Assessments for the year group will take place in Week 3 of each term, followed by feedback and focussed Pupil Improvement Time.							
Term 4							
	Topic 4: 14F Multiplicative Reasoning (5 weeks)						
R13, R16, G14, R14	How are multipliers used in real life? Yr8 Ch10	14.a Percentages 14.b Growth and decay	**Students who require additional support at this stage may find it useful to firstly revisit:** • **Calculating block percentages (Unit 4F)** • **Converting FDP (Unit 4F)** Express a given number as a percentage of another number in more complex situations; Calculate percentages with a multiplier. Calculate percentage profit or loss; Make calculations involving repeated percentage change, not using the formula; Set up, solve and interpret the answers in growth and decay problems; Find the original amount given the final amount after a percentage increase or decrease; Calculate simple interest Calculate compound interest Understand the difference between simple and compound interest. Use compound interest to determine the best investments when presented with choices; **Abbey Lens:**	Profit, original, increase, decrease, annual, ratio, proportion, best value, proportional change, compound measure, density, mass, volume, speed, distance, time, density, mass, volume, pressure, acceleration, velocity, Inverse, direct. See Command words	**Starter quizzes for the term should include:** **Required prior knowledge** **Mixed skills practice** **Focused accuracy drills** **Knowledge gap support** **Look, cover, write, check.** Pupils are expected to complete purposeful exercises and repeated practice on: • Calculating percentages • FDP conversion revision • Express a given number as a percentage of another. • Repeated percentage changes. • Reverse percentages • Calculating interest • Calculate percentage profit or loss. Practical problems involving percentages.	• Pearson's GCSE Maths F 9-1 Textbook: Ch14 • Purposeful Practice Book Ch14F • Common misconception information Year 10 Term 4 Knowledge Organiser for key terms, recall and low stakes quizzing. Percentage Unchanged (maths.org) Retiring to Paradise (maths.org) Roasting Old Chestnuts 4 (maths.org) Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 questions for practice and assessment.	**SMSC & BV** Students might explore and discuss the extent of individual liberty bearing in mind legal constraints that are numerical in nature, e.g.,taxation levels, or the financial links to education choices and careers. **Gatsby Benchmarks: Personal Finance** Discuss the importance of Maths skills to develop and demonstrate confidence and competence in personal finance/planning. Relat able examples within the context of outcomes listed could include:

			Business Studies – Salary, profit and loss, interest rates.		Multistep problems in a range of scenarios with reasoning, where necessary Key & exemplar questions – WRM - SOL topics Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Number > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets		Percentages – including taxation, sales, inflation, interest rates, loans Compound increase and depreciation Percentage change problems including price and salary changes. Maths KS3 / GCSE: Finance - BBC Teach
N13, R1, R9, R11, G14	What does it mean for a unit to be 'compound'?	14.c Compound measures	Understand and use compound measures: • density; pressure; speed: • convert between metric speed measures; • read values in km/h and mph from a speedometer; • calculate average speed, distance, time – in mph as well as metric measures; • use kinematics formulae from the formulae sheet to calculate speed, acceleration (with variables defined in the question); • change d/t in m/s to a formula in km/h, i.e. d/t × (60 × 60)/1000 – with support; **Abbey Lens:** **Science – Compound measurements and units.**		Pupils are expected to complete purposeful exercises and repeated practice on: • Compound calculations of density, volume and mass values. • Compound calculations of pressure, force and area values. • Compound calculations of speed, distance and time values. • Converting units and problems. Practical problems involving compound measures. Multistep problems in a range of scenarios with reasoning, where necessary	• Pearson's GCSE Maths F 9-1 Textbook: Ch14 • Purposeful Practice Book Ch14F • Common misconception information Year 10 Term 5 Knowledge Organiser for key terms, recall and low stakes quizzing. Dangerous Driver? (maths.org) Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 questions for practice and assessment.	
R13, R16, G14, R14	What does direct and indirect proportion look like on a graph and what does it mean?	14.d Direct and inverse proportion	Understand the direct proportion relationship as y = kx Understand that X is inversely proportional to Y is equivalent to X is proportional to 1/Y; Interpret equations that describe direct and inverse proportion. Solve word problems involving direct and indirect proportion algebraically; See 11e. for existing knowledge.		Pupils are expected to complete purposeful exercises and repeated practice on: • Direct and inverse proportion. Practical problems involving proportion.	• Pearson's GCSE Maths F 9-1 Textbook: Ch14 • Purposeful Practice Book Ch14F • Common misconception information Year 10 Term 5 Knowledge Organiser for key terms, recall and low stakes quizzing.	

					Multistep problems in a range of scenarios with reasoning, where necessary Key & exemplar questions – WRM - SOL topics Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Geometry > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	Understanding Inverse Relationships (maths.org) • Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 questions for practice and assessment.	
		Knowledge Recall	Big Questions of the unit are reviewed, and key areas revisited. Planned consolidation. Worded problems should be used, as well as exam style questions from the board. Further examples could include, but should not be limited to: Pythagoras' Theorem in monetary calculations, using Pythagoras' Theorem and trigonometry together, with the introduction of bearings, drawings to be used to display information, proof of exact values.			Knowledge Recall Lesson – Unit 14F – Shared area. Pearson's GCSE Maths F 9-1 Textbook: Problem solving, Check Up, Strengthen and Extend questions.	
		Knowledge Quiz	Knowledge Quiz and self-assessment.		Ch14F Knowledge Quiz – Shared area.	Knowledge Quiz and self-assessment.	
	Topic 5: 12F - Right Angled Triangles (4 weeks)						
N7, N15, A4, G6, G20, G21	How do we calculate sides and angles for (right angle) triangles?	12.a Pythagoras' theorem 12.b Trigonometric ratios	**Students who require additional support at this stage may find it useful to firstly revisit:** • **Triangle properties (Unit 6F)** • **Calculating missing angles in triangles, quadrilaterals, straight lines and points. (Unit 6F)** • **Square numbers (Unit 1F)** Understand, recall and use Pythagoras' Theorem in 2D, including leaving answers in surd form; Apply Pythagoras' Theorem with a triangle drawn on a coordinate grid; Given 3 sides of a triangle, justify if it is right-angled or not; Calculate the length of a line segment AB given pairs of points; Understand, use and recall the trigonometric ratios sine, cosine and tan, and apply them to find angles and lengths in general triangles in 2D figures;	Hypotenuse, scalene, isosceles, equilateral, triangle, square, ratio, sine, cosine, tangent, Pythagoras, segment, degrees, See command words	Pupils are expected to complete purposeful exercises and repeated practice on: • Pythagoras' Theorem • Trigonometric angles • Trigonometric lengths • Angles of elevation and depression • Mixed problems • Exact angle recognition and recall • Calculations with exact answers. Practical problems involving Pythagoras' Theorem and Trigonometry. Multistep problems in a range of scenarios with reasoning, where necessary.	• Pearson's GCSE Maths F 9-1 Textbook: Ch12 • Purposeful Practice Book Ch12F • Edexcel Higher Linear Course Text Book Ch19 • Edexcel Foundation Linear Course Text Book Ch31 • Common misconception information Pythagoras visualisation - Pythagorean theorem water demo - YouTube Pythagorean stacks (equationfreak.blogspot.com) Pythagoras and surd form (Median Don Steward). How many ways can we write 1 million? - mathspad.co.uk	**SMSC & BV** Pythagroas' Theorem is an opportunity to discuss the cultural influence of mathematics on ancient societies and the varied contributions of other cultures to modern mathematics from an historical perspective. BBC - Historic Figures: Pythagoras Pythagoras (st-andrews.ac.uk)

			Use the trigonometric ratios to solve 2D problems; Round answers to appropriate degree of accuracy, either to a given number of significant figures or decimal places, or make a sensible decision on rounding in context of question;		Key & exemplar questions – WRM - SOL topics Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Geometry > skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	Large and Small - Nuffield Foundation Year 10 Term 4 Knowledge Organiser for key terms, recall and low stakes quizzing Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 questions for practice and assessment.	
Assessments for the year group will take place in Week 3 of each term, followed by feedback and focussed Pupil Improvement Time.							
Term 5							
	Topic 5: 12F - Right Angled Triangles (4 weeks) - Continued						
N7, N15, A4, G6, G20, G21	How do we calculate sides and angles for (right angle) triangles?	12.c Exact angles 12.d Trigonometry; problems	**Revision of Pythagoras' Theorem and the Trigonometric Ratios from Term 4.** Find angles of elevation and depression; Know the exact values of sin θ and cos θ for θ = 0°, 30°, 45°, 60° and 90°; know the exact value of tan θ for θ = 0°, 30°, 45° and 60° Determine if a problem requires the use of Pythagoras' Theorem or Trigonometric ratios and the indications of when to use each method.		**Starter quizzes for the term should include:** **Required prior knowledge** **Mixed skills practice** **Focused accuracy drills** **Knowledge gap support** **Look, cover, write, check.** See above	See above	**Gatsby Benchmarks: Careers** Use real-life contexts wherever possible to help students to engage and relate learning to everyday and working life. E.g. Design and construction applications, Electrical appliance dimension design. Golden_Gate_Trig.pdf (thechalkface.net) Maths, Why Bother? | MYPATH Careers Resources (mypathcareersuk.com)
		Knowledge Recall	Big Questions of the unit are reviewed, and key areas revisited. Planned consolidation. Worded problems should be used, as well as exam style questions from the board. Further examples could include, but should not be limited to: Multistep problems where students can use a single multiplier. Include simple fractional percentages of amounts with compound interest and encourage use of single multipliers. Questions involving money, without rounding until the answer and why this is so. Using the formulae triangles to help students see the relationship for compound measures – this will help them evaluate which inverse operations to use. Help students to recognise the problem they are trying to solve by the unit measurement given, e.g. km/h is a unit of speed as it is speed divided by a time.			Knowledge Recall Lesson – Unit 12F – Shared area. Pearson's GCSE Maths F 9-1 Textbook: Problem solving, Check Up, Strengthen and Extend questions.	
		Knowledge Quiz	Knowledge Quiz and self-assessment.		Ch12F Knowledge Quiz – Shared area.		
	Topic 6: 13F Probability (4 weeks)						

P1, P2, P3, P4, P6, P7 , P8, N5	How do I describe and calculate probability for events?  Yr7 Ch6	13.a Calculating probability 13.b Two events 13.c Experimental probability	**Students who require additional support at this stage may find it useful to firstly revisit:** • **Calculating with fractions (Unit 4F)** • **Converting with decimals (Unit 1/4F)** Distinguish between events which are impossible, unlikely, even chance, likely, and certain to occur; Mark events and probabilities on a scale of 0 to 1; Write probabilities in words or FDPs Find the probability of an event happening using theoretical probability; Use theoretical models to include outcomes (dice, spinners, coins); List all outcomes for single events systematically; Work out probabilities from frequency tables; Calculate quantities and work out probabilities from frequency trees. Work out probabilities from two-way tables; Record outcomes of probability experiments in tables; Find a missing probability from a list or table including algebraic terms. Identify different mutually exclusive outcomes and know that the sum of probabilities of all outcomes is 1; Using 1 – p as the probability of an event not occurring where p is the probability of the event occurring; List all outcomes for combined events systematically; Use and draw sample space diagrams; Add simple probabilities; Calculate the probability of two simple independent events happening together; Find the probability of an event happening using relative frequency; Compare experimental data and theoretical probabilities; Compare relative frequencies from samples of different sizes; Estimate the number of times an event will occur, given the probability and the number of	Probability, dependent, independent, conditional, outcomes, theoretical, sample space, theoretical, relative frequency, fairness, experimental Probability, intersection, Union, element, universal tree diagrams. See Command words	Pupils are expected to complete purposeful exercises and repeated practice on: • Probability scale • Theoretical probability • Mutually exclusive events • Mutually exclusive calculations • Systematic listing • Two way tables and data tables • Estimating probability, • Listing outcomes, • Sample spaces, • Relative frequencies Practical problems involving Probability. Multistep problems in a range of scenarios with reasoning, where necessary Key & exemplar questions – WRM - SOL topics Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Data> skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	• Pearson's GCSE Maths F 9-1 Textbook: Ch13 • Purposeful Practice Book Ch13F • Common misconception information Year 10 Term 5 Knowledge Organiser for key terms, recall and low stakes quizzing. Great Expectations: Probability Through Problems (maths.org) Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 questions for practice and assessment.	**SMSC and BV** There may be opportunities to challenge ideas and support students to think critically and not simply accept what they are told. Use of statistics and factual probability can be a very valuable way to show that claims and assertions should be critically analysed before being accepted. Equally, there may be times when discussions with students can broaden their outlook to develop their resilience. Home - Office for National Statistics (ons.gov.uk) **Gatsby Benchmarks: Careers** Use real-life contexts with ratios wherever possible to help students to engage and relate learning to everyday and working life Maths, Why Bother? | MYPATH Careers Resources (mypathcareersuk.com)

			trials – experimental and theoretical probabilities; Find the probability of successive events, such as throws of a single dice;				.
N5, P1, P2, P3, P5, P7, P8	How can we use diagrams to help us solve probability problems?	13.d Tree Diagrams 13.e Venn Diagrams	Correctly draw and label a tree diagram. Use tree diagrams to calculate the probability of two independent events; Use tree diagrams to calculate the probability of two dependent events; Use tree diagrams to calculate the probability of two events from multiple possible outcomes; Create Venn diagrams to represent real-life situations and also 'abstract' sets of numbers/values with labels; Work out probabilities from Venn diagrams. Use union and intersection notation;		Pupils are expected to complete purposeful exercises and repeated practice on: • Set notation • Venn diagrams Practical problems involving Probability. Multistep problems in a range of scenarios with reasoning, where necessary Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Data> skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	• Pearson's GCSE Maths F 9-1 Textbook: Ch13 • Purposeful Practice Book Ch13F • Common misconception information Year 10 Term 5 Knowledge Organiser for key terms, recall and low stakes quizzing. Great Expectations: Probability Through Problems (maths.org) Manipulatives to explore Venn properties - Venn Diagrams (mathsbot.com) Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 questions for practice and assessment.	**Gatsby Benchmarks: Careers** Discussing statistics in the real world at this point is a useful way to remind students of the link between Maths and other areas of interest such as the growing field of Sports Analytics. Learn the Role of Maths in Sport | Importance of Maths (superprof.co.in)
		Knowledge Recall	Big Questions of the unit are reviewed, and key areas revisited. Planned consolidation. Worded problems should be used, as well as exam style questions from the board. Further examples could include, but should not be limited to: Mark events on a probability scale and use the language of probability. If the probability of outcomes are x, 2x, 4x, 3x calculate x. Calculate the probability of an event from a two-way table or frequency table. Decide if a coin, spinner or game is fair. Use this as an opportunity for practical work. Probabilities written in fraction form should be cancelled to simplest form			Knowledge Recall Lesson – Unit 13F – Shared area. Pearson's GCSE Maths F 9-1 Textbook: Problem solving, Check Up, Strengthen and Extend questions.	
		Knowledge Quiz	Knowledge Quiz and self-assessment.		Ch13F Knowledge Quiz – Shared area.		
Assessments for the year group will take place in Week 3 of each term, followed by feedback and focussed Pupil Improvement Time.							
Term 6							
	Topic 7: 10F – Transformations (3 weeks)						
G1, G7, G24, R6	What are the 4	10.a Congruent shapes. Drawing	Identify congruent shapes by eye;	Transformation, rotation, translation, single, centre	**Starter quizzes for the term should include:**	• Pearson's GCSE Maths F 9-1 Textbook: Ch10	

	types of transformation and how do we describe them?  Yr7 Ch10	and describing rotations. 10.b Drawing and describing reflections. 10.c Drawing and describing translations. 10.d Drawing and describing enlargements.	Understand clockwise and anticlockwise; Understand that rotations are specified by a centre, an angle and a direction of rotation; Draw the position of a shape after rotation about a centre (not on a coordinate grid); Rotate a shape about a point on a grid; Find the centre of rotation, angle and direction of rotation and describe rotations; Describe a rotation fully using the angle, direction of turn, and centre; Identify correct rotations. Understand that reflections are specified by a mirror line; Identify correct reflections from a choice of diagrams; Identify the equation of a line of symmetry; Transform 2D shapes using single reflections (including those not on coordinate grids) with vertical, horizontal and diagonal mirror lines; Describe reflections on a coordinate grid; Understand that translations are specified by a distance and direction using a vector; Translate a given shape by a vector; Describe and transform 2D shapes using single translations on a coordinate grid; Use column vectors to describe translations; Understand that distances and angles are preserved under rotations and translations, so that any figure is congruent under either of these transformations. Scale a shape on a grid (without a centre specified); Understand that an enlargement is specified by a centre and a scale factor; Enlarge a given shape using (0, 0) as the centre of enlargement, and enlarge shapes with a centre other than (0, 0); Find the centre of enlargement by drawing; Describe and transform 2D shapes using enlargements by: a positive integer scale factor; a fractional scale factor; Identify the scale factor of an enlargement of a shape as the ratio of the lengths of two	of rotation, column vector, vector, similarity, congruent, angle, direction, coordinate, describe, reflection, enlargement, scale factor, mirror line, centre of enlargement, See command words	**Required prior knowledge** **Mixed skills practice** **Focused accuracy drills** **Knowledge gap support** **Look, cover, write, check.** Pupils are expected to complete purposeful exercises and repeated practice on: • Drawing rotations • Describing rotations • Drawing translations • Describing translations • Drawing reflections • Describing reflections • Drawing enlargements • Describing enlargements • Combining transformations Multistep problems in a range of scenarios with reasoning, where necessary. Key & exemplar questions – WRM - SOL topics Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Geometry> skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	• Purposeful Practice Book Ch10F • Edexcel Foundation Linear Course Text Book Ch26 • Edexcel Higher Linear Course Text Book Ch14 • Common misconception information Tracing Paper Pre-prepared printed worksheets for practice. Year 10 Term 6 Knowledge Organiser for key terms, recall and low stakes quizzing. Reflecting diagonally (Median Don Steward) Transformation Package (@Tristan Jones TES) Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 questions for practice and assessment. .	

		Similar shapes. 10.e Combining Transformations	corresponding sides, simple integer scale factors, or simple fractions; Understand that distances and angles are preserved under reflections, so that any figure is congruent under this transformation; Understand that similar shapes are enlargements of each other and angles are preserved – define similar in this unit; Investigate the relationship of the perimeters similar shapes and understand why the area value does not follow the same pattern. Describe and transform 2D shapes using combined rotations, reflections, translations, or enlargements.				
G24, G25	How else can we use vectors?	10.f Vector Notation	Understand and use column notation in relation to vectors; Be able to represent information graphically given column vectors; Identify two column vectors which are parallel; Calculate using column vectors, and represent graphically, the sum of two vectors, the difference of two vectors and a scalar multiple of a vector. **The Abbey Lens: Scientific vectors – momentum, velocity.**	Vector, direction, magnitude, scalar, multiple, parallel, collinear, ratio, column vector, See command words	Pupils are expected to complete purposeful exercises and repeated practice on: • Identification and representation of vectors • Vector arithmetic Key & exemplar questions – WRM - SOL topics Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Geometry> skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	• Pearson's GCSE Maths F 9-1 Textbook Ch19 • Purposeful Practice Book Ch19F • Edexcel Higher Linear Course Text Book Ch35 • Common misconception information Adding and Subtracting with Vectors - Peter Mattock on TES Year 10 Term 6 Knowledge Organiser for key terms, recall and low stakes quizzing. Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 questions for practice & assessment.	
		Knowledge Recall	Big Questions of the unit are reviewed, and key areas revisited. Planned consolidation. Worded problems should be used, as well as exam style questions from the board. Further examples could include, but should not be limited to: Using vector addition to describe consecutive translations of the same shape. Successive reflections in different lines. Finding negative fractional scale factors when describing enlargement. Plotting a linear graph (e.g. y = 2x + 1) before finding a reflection in this line.			Knowledge Recall Lesson – Unit 10F – Shared area. Pearson's GCSE Maths F 9-1 Textbook: Problem solving, Check Up, Strengthen and Extend questions.	
		Knowledge Quiz	Knowledge Quiz and self-assessment.		Ch10F Quiz – Shared area.		

	Topic 8: 15F – Constructions and Regions (2 weeks)						
G1, G4, G12, G13,	How do we describe and draw 3D solids?	15.a 3D solids 15.b Plans and Elevations	Understand clockwise and anticlockwise; Draw circles and arcs to a given radius or given the diameter; Measure and draw lines, to the nearest mm; Measure and draw angles, to the nearest degree; Know and use compass directions; Draw sketches of 3D solids; Know the terms face, edge and vertex; Identify and sketch planes of symmetry of 3D solids; Use isometric grids to draw 2D representations of 3D solids; 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 3D solid.	Construct, circle, arc, sector, face, edge, vertex, two dimensional, three dimensional, solid, elevations, congruent, angles, regular, irregular, bearing, degree, Perpendicular, parallel, Map, scale, plan, region, loci, locus, equidistant , See command words	Pupils are expected to complete purposeful exercises and repeated practice on: • 3D solid properties • Plans and Elevations Key & exemplar questions – WRM - SOL topics Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Geometry> skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	• Pearson's GCSE Maths F 9-1 Textbook Ch15 • Purposeful Practice Book Ch15F • Edexcel Higher Linear Course Text Book Ch 25, • Common misconception information Multi-link cubes Isometric paper Year 10 Term 6 Knowledge Organiser for key terms, recall and low stakes quizzing. Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 questions for practice & assessment	**Gatsby Benchmarks: Careers** Use real-life contexts wherever possible to help students to engage and relate learning to everyday and working life. E.g. Town and city planning, Architecture design, Maths, Why Bother? | MYPATH Careers Resources (mypathcareersuk.com)
2,R2, R6, G5, G6,G7, G13, G15	How do we use mathematical tools to draw accurately? Yr8 Ch7	15.c Scale drawings 15.d Accurate drawings and constructions. 15.e Loci	Use and interpret maps and scale drawings; Estimate lengths using a scale diagram; Make an accurate scale drawing from a diagram **The Abbey Lens:** **Technology – Potential here for some cross curricular opportunities with scales and models. TBC** Make accurate drawings of triangles and other 2D shapes using a ruler and a protractor; Construct diagrams of everyday 2D situations involving rectangles, triangles, perpendicular and parallel lines. Use straight edge and a pair of compasses to do standard constructions: • perpendicular bisector of a line. • bisector of a given angle; • perpendicular from a point to a line. • angles of 90°, 45°; Draw and construct diagrams from given instructions, including the following:		Pupils are expected to complete purposeful exercises and repeated practice on: • Scale drawings • Constructions with accuracy • Drawing triangles • Dr4awing loci • Region identification • Drawing and reading bearings Practical problems involving loci descriptions. Multistep problems in a range of scenarios with reasoning, where necessary. Key & exemplar questions – WRM - SOL topics Plenary style questions –	• Pearson's GCSE Maths F 9-1 Textbook Ch15 • Purposeful Practice Book Ch15F • Edexcel Higher Linear Course Text Book Ch15 Compass and protractors – class sets Construct a scenario - Teachit Maths Bearings Challenges - solvemymaths.com Find the Treasure – MathsPad Angle properties and bearings - pas1001 on TES Year 10 Term 6 Knowledge Organiser for key terms, recall and low stakes quizzing.	

		15.f Bearings	• a region bounded by a circle and an intersecting line; • a given distance from a point and a from a line; • equal distances from two points or two line segments; • regions may be defined 'nearer to' or 'greater than'; Use constructions to solve loci problems (2D only); Find/describe regions satisfying a combination of loci; Use three-figure bearings to specify direction; Mark on a diagram the position of point B given its bearing from point A; Give a bearing between the points on a map or scaled plan; Given the bearing of a point A from point B, work out the bearing of B from A; Use accurate drawing to solve bearings problems; Solve locus problems including bearings and Trigonometry. **The Abbey Lens:** **Geography – Locations (Cities, Landmarks etc.)**		White Rose Maths - Assessment Papers https://www.missbsresources.com/ > Geometry> skills review Mathsbox > Topic resources > 4 Questions / Exit tickets	Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 questions for practice and assessment	**Gatsby Benchmarks: Careers** Use real-life contexts wherever possible to help students to engage and relate learning to everyday and working life. E.g. Armed forces, Aeronautical planning. Maths, Why Bother? | MYPATH Careers Resources (mypathcareersuk.com)
		Knowledge Recall	Big Questions of the unit are reviewed, and key areas revisited. Planned consolidation. Worded problems should be used, as well as exam style questions from the board. Further examples could include, but should not be limited to: Estimating the size of given angles. Convert fluently between metric units of length. Use bearings in a real-life context to describe the bearing between two towns on a map. Sketch the locus of point on a vertex of a rotating shape as it moves along a line, i.e. a point on the circumference or at the centre of a wheel. Familiarisation of command words.			Knowledge Recall Lesson – Unit 15F – Shared area. Pearson's GCSE Maths F 9-1 Textbook: Problem solving, Check Up, Strengthen and Extend questions.	
		Knowledge Quiz	Knowledge Quiz and self-assessment.		Ch15F Quiz – Shared area.		
Assessments for the year group will take place in Week 3 of each term, followed by feedback and focussed Pupil Improvement Time.							

Use of Big Questions and Lesson Questions

Please refer to the department document on using Big Questions as part of The Abbey Lesson – "What does an Abbey Lesson look like in Maths?".

Big Questions are designed to build upon pupils' prior knowledge and link topics across KS2, 3 and 4. Big Questions will connect a series of learning outcomes, as opposed to focussing on individual objectives. All students, regardless of ability will be exposed to the same knowledge within reason, but able to explore Mathematical concepts to varying depths and wider applications. The spectrum of the Big Question focus allows for this to happen. This is where Lesson Questions are used to tailor the approach, level of detail and depth of knowledge to suit the ability, attainment, and confidence of individual classes.

Common Misconceptions Notes

Ch8F

Shapes involving missing lengths of sides often result in incorrect answers.
Students often confuse perimeter and area. Volume often gets confused with surface area.

Ch9F

When not given a table of values, students rarely see the relationship between the coordinate axes.
Emphasise the importance of drawing a table of values when not given one. Students forget this.
Values for a table should be taken from the x-axis.

Ch11F

Students find three-part ratios difficult.
Using a ratio to find one quantity when the other is known often results in students 'sharing' the known amount.
Vocabulary of the question to determine what do to. Emphasise the importance of reading the question carefully.
Ratios with decimals 0.2 : 1 often misused. Converting monetary values is good for this.

Ch12F

Answers may be displayed on a calculator in surd form, causing confusion.
Students forget to square root their final answer or round their answer prematurely.
Drawing the squares on the 3 sides will help to illustrate the theorem. Scale drawings are not acceptable.
Calculators need to be in degree mode.
To find in right-angled triangles the exact values of sin θ and cos θ for θ = 0°, 30°, 45°, 60° and 90°, use triangles with angles of 30°, 45° and 60°.
Use a suitable mnemonic to remember SOHCAHTOA.

Ch14F

Some students may think that compound interest and simple interest are the same method of calculating interest.
Incomplete methods when using multipliers are common, i.e. reduce £80 by 15% = 80 × 0.15.

Ch13F

Not using fractions or decimals when working with probability trees. Probabilities written as ratios.

Ch10F

The directions on a column vector often get mixed up.
Student need to understand that the 'units of movement' are those on the axes, and care needs to be taken to check the scale.
Correct language must be used: students often use 'turn' rather than 'rotate'.
If they need to describe the transformations fully, and asked to describe a 'single' transformation they should not include two types.
Methods to include rotations with the centre of rotation inside the shape.
Forgetting to use tracing paper to find the centre of rotation.
Checking the increments on the coordinate grid when translating shapes.
Students may need reminding about how to find the equations of straight lines, including those parallel to the axes.
When reflecting shapes, the students must include mirror lines on or through original shapes.
NB enlargement using negative scale factors is not included.

Ch15F

Some pupils may use the wrong scale of a protractor. For example, they measure an obtuse angle as 60° rather than as 120°.
Often 5 sides only are drawn for a cuboid net. Correct use of a protractor may be an issue.

GCSE – Command Words

Please note that this table is not exhaustive but uses the most commonly used command words. These should be highlighted, explained and demonstrated when giving out problem solving work and GCSE questions.

Command word	**Comments**
Write down... Write...	No working will be needed
Find...	Some working will be needed but will be minimal
Work out...	Used interchangeably with 'calculate', it will be necessary to do some working out
Calculate...	Used interchangeably with 'work out' but use of 'calculate' suggests that a calculator will be needed, it will be necessary to do some workings.
Explain...	Explanation needed – may be a sentence or could be a mathematical statement
Give a reason...	Clear reasons needed; if geometrical reasons then must link into working
Draw...	Implies accuracy is important
Sketch...	Less formal than 'draw'...(no accurate measurements needed)
Complete...	Usually means that some values need filling in, for example, on a probability tree diagram or a table of values
Show...	All working needed to get to the required answer must be shown
Prove...	More formal than 'show', all steps must be present and, in the case of a geometrical proof, reasons must be given
Prove algebraically...	Algebra must be used in the proof
Describe...	Words needed to describe, for example, a transformation
Justify...	Show all working or give a written explanation
Expand...	Remove brackets
Expand and simplify...	Remove brackets and simplify
Factorise...	Straight forward factorisation
Factorise fully...	More complex factorisation, more than one factor to consider
Simplify...	Simplify the given expression

Simplify fully....	Likely to be more than one stage needed to simplify expression
Solve...	Solve an equation / inequality

General Resources Bank

Teachers will select the resources required for individual lessons. These will be fit for purpose for their class in order to promote the best progress and understanding for individual objectives, whilst still working towards the Big Question.

A **sample** list of resource materials is given as a starting point or for new ideas and are used by the department:

- Pearson's Edexcel 9-1 Textbook Series 1 and 2 - ActiveLearn (pearsonactivelearn.com)
- Pearson's Purposeful Practice book - ActiveLearn (pearsonactivelearn.com)
- MathsBox - Mathsbox
  - A wide-ranging selection of mixed quizzes, repeated practice and differentiated questions for use in the classroom, including short term cover work.
- MathsBot - MathsBot.com - Tools for Maths Teachers
  - Interactive tools and activites to aid the teaching of mathematics. Hundreds of randomly generated questions and answers and Mathematics Manipulatives for mastery.
- Corbett maths Corbettmaths – Videos, worksheets, 5-a-day and much more
  - Video tutorials, questions, revision resources and puzzles.
- Maths 4 Everyone - Maths Worksheets [Primary and Secondary] (maths4everyone.com)
  - Carefully thought-out questions that are designed for the different stages of learning a topic. Typically, there is one sheet that focuses on the First Steps, and then other sheets that contain questions which help students to Strengthen and then Extend their understanding.
- Go Teach Maths - Go Teach Maths: 1000s of free resources
  - Animated PowerPoint slides to demonstrate a mathematical method within lessons and supporting activities with an individual or paired consolidation focus.
- Maths Genie – Maths Genie • Learn GCSE Maths for Free
  - GCSE revision videos, exam style questions and solutions.
- Oak Academy - Oak National Academy (thenational.academy)
  - Online lessons and resources to support independent study – particularly useful for students who are having to spend significant amounts of time outside of the classroom.
- Mr Barton – Variation Theory - Variation Theory
  - A collection of high-quality, sequences of questions and examples using key principles from Variation Theory. Holds questions and examples constant, together with the mathematical behaviour of *reflect, expect, check, explain*.
- Dr Frost Maths - DrFrostMaths.com
  - A diverse set of free teaching resources and tools including downloadable teaching slides/worksheets for KS3-5, teaching videos and an online platform for whiteboard practice and exam questions.
- Edexcel Exam Wizard- ExamWizard :: Index
  - ExamWizard is a free exam preparation tool containing a bank of past Edexcel exam questions, mark schemes and examiners' reports for a range of GCSE subjects.

- Additional Maths Blogs and other online resources include:

Solvemymaths
Resouraholic
Colleenyoung.wordpress
missquinnmaths.wordpress
Just Maths
Mathed Up
Miss B resources
Boss Maths
SavemyExams
Nrich

Pret Homework
BBC Bitesize
GCSE POD

Assessments/ Quizzes / Walking Talking Mocks / Pre-Public Examinations

Through the GCSE syllabus, pupils are assessed regularly to monitor progress, understanding and make predictions.

- **Formal Graded Assessments**

Formal assessments will occur once a term, during week 3 for monitoring purposes and formal feedback. It will be a mixed topic assessment to mimic the mixed topics they will need to answer for their end of year and public examinations. It is to support a more active attitude to revision in small, manageable tasks, as well as allowing students to revisit topics in a formal setting and identify gaps in knowledge.

- **Topic Quizzes**

Other assessment will be end of unit quizzes to assess recent learning and conducted when learning of that sequence is concluded.

For an improved response to revision and independent study, students are expected to undertake guided revision tasks through the year before assessments as part of their homework. Staff will support students with effective techniques and resources offered where required. These revision homework tasks will consist of:

- *Directions to important online videos and tasks to consolidate knowledge or expose students to a higher-level task or topic.*
- *Pre-prepared practice questions on the relevant topics, such as the Active Learn assessment materials and Hegarty Maths.*
- *GCSEPOD with videos and related questions.*

- **Walking, Talking Mocks**

Year 11 will have a Walking Talking Mock as a method of revisiting public exam formats and good exam technique. During the WTM, the teacher will model an approach to questions on an examination paper and guide students to complete it, with a large focus on areas that students struggle with and/or do not perform their best. Dates TBC following the publication of the exam schedule.

- **End of Year Assessments**

GCSE Public Examinations – dates to follow.

Consolidation and Review Activities

As part of each chapter of work, the students will need to undertake consolidation and review activities of their learning before moving on to new topics. This will be done as a Knowledge Recall activity.

This should consist of the following:

a. Revisiting the Big Questions, answered with new knowledge and connections reinforced. The focus here is on questioning of students and consolidation the sequences of lessons from the chapter.

b. Problem solving / literacy based questions with emphasis placed on highlighting key words and data, before undertaking problems as a sequence of steps. This is only if appropriate for the topic and required as additional work to lesson content.

c. Depending out the outcome of the Knowledge Recall, students can be directed on to either the strengthen exercise for any gaps in understanding or the extension activity work.

A topic quiz will then be set to assess understanding.

Starter activities should include topics identified in PIT from earlier assessments, as well as a constant revision of previous topics for assessment for learning.

Homework

Mathematics homework is designed and set to promote students' understanding and their ability to use mathematics in a variety of situations.
Homework should be set once per week and consist of:

- Online homework through Hegarty Maths *Trial beginning in September 2021.
- Preparation and Revision for assessments and quizzes, with particular reference to the Knowledge Organisers.
- Written homework when the teacher feels it is necessary or beneficial
- Past paper practice
- Research or Investigative Tasks.

It is expected that KS4 students will undertake a minimum of 45 minutes homework per week.

All students are given individual logins to a variety of virtual learning environments, which give them access to video tutorials, practice questions and answers. The main programmes being used are: Hegarty Maths, GCSE POD, Active Learn

For the majority of the time, homework will support in-class learning and reinforce topics that students have studied recently within the classroom.
If students fail to complete homework, staff will follow procedures outlined in the Behaviour Policy.

SMSC/ ICT/ Cross Curricular Connections

The programme of study is designed to encourage the development of wider problem solving as the mathematical knowledge of the student advances. Students must look for action points and next steps that are not explicit, in order to solve increasingly complex problems.
Lessons should :

- Value listening and respecting the viewpoint of others in problem solving.
- Promote the discussion of mathematical understanding and challenge assumption.
- Support students to question information and data that they are presented with.
- Discourage jumping to conclusions.
- Seek opportunities to build self-confidence.
- Include questions chosen based on prior lack of confidence,
- Encourage collaborative learning in the classroom – in the form of listening and learning from each other and paired discussion.
- Develop powers of logic, reasoning and explanation.
- Build competence – every student is good at something, and students struggle when connections between their strengths are not obvious or of a clear use.
- Allow choices to promote self-determination, and deal with the consequences, however minor. Giving authentic (not false) choices doesn't have to be complex—for example, choices around how to complete a multi-step problem.

Staff will seek out opportunities to encourage these values within individual lessons.

Staff should also seek out opportunities to link learning to other subjects as part of the ongoing cross -curricular cohesion project. This is ongoing but some existing links are referred to in this document as examples. By maintaining high standards of behaviour, including mutual respect and tolerance for different faiths and beliefs and encouraging learners to respect the protected characteristics, class teachers will be promoting British values. Specific examples relating to the British Values are detailed in certain chapters.