

# **Mathematics**

# Year 10 Higher Scheme of Work 2023 - 2024

# 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	<b>7H – Area and Volume</b> 7a. Perimeter and Area 7b. Bounds 7c. Prisms 7d. Circles and sectors 7e. Cylinders, spheres, and cones Knowledge recall / Quiz	9H – Equations and Inequalities 9a . Solving quadratics 9b. Completing the square 9c. Simultaneous equations 9d. Linear and quadratic simultaneous equations. 9e. Solving inequalities Knowledge recall / Quiz	<ul> <li>10H – Probability</li> <li>10a. Product Rule for</li> <li>Outcomes</li> <li>10b. Outcomes and</li> <li>mutually exclusive events</li> <li>10c. Experimental</li> <li>Probability</li> <li>10d. Tree diagrams</li> <li>10e. Venn diagrams and</li> <li>Set notation</li> <li>Knowledge recall / Quiz</li> <li>12H-Similarity &amp; Congruence</li> <li>12.b. Similarity</li> <li>Knowledge Recall and Quiz</li> </ul>	<b>11H - Multiplicative</b> <b>Reasoning</b> 11a. Multipliers-Growth & Decay 11b. Compound measures 11c. Direct and inverse proportion Knowledge recall / Quiz	14H – Further Statistics 14a. Cumulative Frequency 14b. Box Plots 14c. Histograms 14d. Sampling 14e. Populations Knowledge recall / Quiz WTM – Higher papers	8H – Transformations and Constructions 8a. Reflections & rotations 8b. Enlargements 8c. Translations and combinations 8d. 3D Solids 8e. Bearings and Scales 8f. Constructions and Loci Knowledge recall / Quiz	

# Contents

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Use of Big Questions and Lesson Questions
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Consolidation and Review Activities
Homework
SMSC/ ICT/ Cross Curricular Connections

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 4-5 Most: grades 6-7 Some: grades 8-9 Examples	Key Terms/ concepts Literacy Numeracy	Assessment and homework tasks	Resources	Personal Development Curriculum links (SMSC, British Values, PSHE)			
Term 1										
	Topic 1: 7H -Are	a and Volume (6 V	Veeks)							
N8, N14, N15, R1, G1, G9, G14, G16, G17, G18, N16	What are the area formulae that you need to know? Yr7, Yr8 Ch2	7a. Perimeter and Area 7b. Bounds and Measures	Recall and use the formulae for the area of a triangle, rectangle, trapezium and parallelogram using a variety of metric measures; Calculate the area of compound shapes made from triangles, rectangles, trapezia and parallelograms using a variety of metric measures; Find the perimeter of a rectangle, trapezium and parallelogram using a variety of metric measures; Calculate the perimeter of compound shapes made from triangles and rectangles; Include the use of Pythaoras' Theorem to calculate dimensions required in area calculate dimensions required in area calculate dimensions required in area calculate of Pythaoras' Theorem to calculate dimensions required in area calculate dimensions required in area calculate of Pythaoras' Theorem to calculate dimensions required in area calculations. Estimate area and perimeter by rounding measurements to 1 significant figure to check reasonableness of answers.	Triangle, rectangle, parallelogram, trapezium, area, perimeter, formula, length, width, prism, compound, measurement, polygon, cuboid, volume, bounds, accuracy, surface area, volume, prism, nets, isometric, symmetry, vertices, edge, face, circle, segment, arc, sector, cylinder, circumference, radius, diameter, pi, composite, sphere, cone, capacity, hemisphere, segment, frustum, See command words	<ul> <li>Starter quizzes for the term should include:</li> <li>Required prior knowledge Mixed skills practice</li> <li>Focused accuracy drills</li> <li>Knowledge gap support</li> <li>Look, cover, write, check.</li> <li>Pupils are expected to complete purposeful exercises and repeated practice on: <ul> <li>Perimeter of shapes</li> <li>Area of rectangles and parallelogram</li> <li>Area of triangles,</li> <li>Area of trapezia</li> <li>Area of trapezia</li> <li>Area of compound shapes.</li> <li>Perimeter of compound shapes.</li> <li>Converting metric units</li> <li>Upper and Lower bounds</li> <li>Bound calculations</li> </ul> </li> <li>Practical problems involving area and perimeter with cost implications and metric units.</li> <li>Practical problems involving compound shape area and perimeter.</li> </ul>	<ul> <li>Pearson's GCSE Maths 9-1 Textbook: Ch7</li> <li>Purposeful Practice Book Ch7</li> <li>Edexcel Higher Linear Course Text Book Ch9, 16</li> <li>Common misconception information.</li> <li>Scientific Calculators</li> <li>Compasses</li> <li>Year 10 Term 1 Knowledge</li> <li>Organiser for key terms, recall and low stakes quizzing.</li> <li>N17 Bounds Edexcel (Resourceaholic)</li> <li>Mensuration – (resourceaholic)</li> <li>Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 style questions for assessment.</li> </ul>	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. <b>Gatsby Benchmarks:</b> <b>Careers</b> 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? ] <u>MYPATH Careers</u> <u>Resources</u> (mypathcareersuk.com)			

			Find the upper and lower bounds of	Multistan problems in a range		
			Find the upper and lower bounds of	wullistep problems in a range		
			calculations involving perimeters, areas	of scenarios with reasoning,		
			and volumes of 2D and 3D shapes;	where necessary.		
			Calculate the upper and lower bounds of			
			calculations, particularly when working	Plenary style questions –		
			with measurements;	White Rose Maths -		
			,	Assessment Papers		
				https://www.missbsresources.c		
				om/> Geometry> skills review		
				$\underline{Siny}$ Scontery skinsteriew		
				Questions / Evit tickets		
				Questions / Exit tickets		
N8,	How does	/c. Prisms	Find the surface area of prisms using the	Pupils are expected to	<ul> <li>Pearson's GCSE Maths 9-1</li> </ul>	
N15,	calculating		formulae for triangles and rectangles, and	complete purposeful exercises	Textbook: Ch7	
G12,	the surface		other (simple) shapes with and without	and repeated practice on:	Purposeful Practice Book	
G13,	area and		a diagram;	<ul> <li>Surface area calculations</li> </ul>	Ch7	
G14,	volume of a		Draw sketches of 3D solids:	<ul> <li>Volume calculations</li> </ul>	• Edexcel Higher Linear	
G16.	prism relate		Identify planes of symmetry of 3D solids.		Course Text Book Ch22	
G17	to your area		and skotch planes of symmetry:	<ul> <li>Converting between</li> </ul>	Common missonsontion	
01/	knowledge?		Becall and use the formula for the volume	metric units	· common misconception	
	knowledge.		Recall and use the formula for the volume	<ul> <li>Estimating in area and</li> </ul>	mormation.	
	C		of a cubold or prism made from composite	volume problems		
	🗑 Yr8 Ch2		3D solids using a variety of		Scientific Calculators	
			metric measures;	Practical problems involving		
			Convert between metric measures of area.	area and volume with cost	3D solids / cardboard nets	
			Convert between metric measures of	implications		
			volume and capacity, e.g. $1 \text{ ml} = 1 \text{ cm}3$ ;	Implications.	Year 10 Term 1 Knowledge	
			Use volume to solve problems:		Organiser for key terms, recall	
			Estimating surface area incrimeter and	Practical problems involving	and low stakes quizzing	
			volume by rounding measurements to 1	metric units.		
			volume by founding measurements to 1		Surface Area Challenges -	
			significant figure to check reasonableness	Multistep problems in a range of	Surface Area Challenges –	
			of answers.	scenarios with reasoning, where	Solvemymaths.com	
				necessary.	Volume of Compound Objects	
			The Abbey Lens:		- Mathematics Assessment	
			Science – volume and surface area ratios.	Plenary style guestions –	Project	
				White Rose Maths -	Functional Volume Questions	
				Assessment Paners	<ul> <li>AccessMaths</li> </ul>	
				https://www.missbsrosourcos.c	Functional Volume – Access	
				am (> Coometrus shills review	Maths	
				<u>UIII/</u> > Geometry> Skills review		
				iviatnsbox > i opic resources > 4	Please see the Resources	
				Questions / Exit tickets	section for available materials	
					on practice questions and	
					A O1 (A O2 (A O2 stude stude start	
					AU1/AU2/AU3 style questions	
					for assessment.	
N8,	How do the	7d. Circles and	Recall the definition of a circle and name	Pupils are expected to	<ul> <li>Pearson's GCSE Maths 9-1</li> </ul>	Gatsby Benchmarks:
N14,	properties of	sectors	and draw parts of a circle;	complete purposeful exercises	Textbook: Ch7	Careers
N15, R1,	circles help us		Recall and use formulae for the	and repeated practice on:	Purposeful Practice Book	Use real-life contexts
G1, G9,	measure		circumference of a circle and the area		Ch7	wherever possible to

G14, G16, G17, G18, G13	objects with curved surfaces?	7e. Cylinders, spheres, and cones	enclosed by a circle (using circumference = $2\pi r = \pi d$ and area of a circle = $\pi r^2$ using a variety of metric measures; Use $\pi \approx 3.142$ or use the $\pi$ button on a calculator; Calculate perimeters and areas of composite shapes made from circles and parts of circles (including semicircles, quarter-circles, combinations of these and also incorporating other polygons); Calculate arc lengths, angles and areas of sectors of circles; Find radius or diameter, given area or circumference. Give answers in terms of $\pi$ ; Form equations involving more complex shapes and solve these equations. Find the volume and surface area of a cylinder; Recall and use the formula for volume of pyramid; Find the surface area of a pyramid; Use the formulae for volume and surface area of spheres and cones; Find the surface area and volumes of compound solids constructed from cubes, cuboids, cones, pyramids, spheres, hemispheres, cylinders; Form equations involving more complex shapes and solve these equations.		<ul> <li>Circumference and area calculations</li> <li>Sector calculations</li> <li>Volume of a cylinder</li> <li>Surface area of a cylinder</li> <li>Volume and surface area of a pyramid and cone</li> <li>Volume and surface area of a sphere and hemisphere.</li> <li>Practical problems involving use of the surface area and volume formulae.</li> <li>Practical problems involving metric units.</li> <li>Multistep problems in a range of scenarios with reasoning, where necessary.</li> <li>Plenary style questions – White Rose Maths - Assessment Papers</li> <li>https://www.missbsresources.cc om/ &gt; Geometry&gt; skills review Mathsbox &gt; Topic resources &gt; 4 Questions / Exit tickets</li> </ul>	<ul> <li>Edexcel Higher Linear Course Text Book Ch22</li> <li>Common misconception information.</li> <li>Scientific Calculators Compasses</li> <li>3D solids / cardboard nets</li> <li>Year 10 Term 1 Knowledge Organiser for key terms, recall and low stakes quizzing.</li> <li>Circle sector problems - Access Maths</li> <li>Paper clip - Illustrative Mathematics</li> <li>Mensuration – (resourceaholic)</li> <li>Functional Volume – Access Maths</li> <li>Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 style questions for assessment.</li> </ul>	help students to engage and relate learning to everyday and working life. E.g. Product and packaging design and cost. Maths, Why Bother? ]. MYPATH Careers Resources (mypathcareersuk.com)
		Knowledge Recall	shapes and solids, including segments of circles and frustums; If there is time left at the end of this unit, you should revisit the angle calculations from Ch5H, specifically focusing on trigonometry, angles in parallel lines and polygons. Big Questions of the unit are reviewed, and ke Worded problems should be used, as well as of Further examples could include, but should no Emphasis on the functional elements with car minimum cost can be incorporated too.	ey areas revisited. Planned co exam style questions from th ot be limited to: pets, tiles for walls, boxes in	onsolidation. e board. a larger box, etc. Best value and	Knowledge Recall Lesson – Unit 7H – Shared area. Pearson's GCSE Maths 9-1 Textbook: Problem solving,	

			Examples use different metric units of length, including decimals.			Check Up, Strengthen and	
			Lots of practical examples to ensure that students can distinguish between surface area and volume.		Extend questions.		
			Making solids using multi-link cubes can be	useful.			
		Knowledge	Knowledge Quiz and self-assessment.		Ch7H Knowledge Quiz – Shared		
		Quiz			area.		
Town 2		Asse	essments for the year group will take place in N	Neek 3 of each term, followe	d by feedback and focussed Pupil In	nprovement Time.	
Term 2	Topic 2: 0H Equ	uations and Inequal	itios (6 Wooks)				
N8, A4, A9, A11, A18, A19, A21	Topic 2: 9H -Eq What does it mean to 'solve a quadratic'? Yr9 Ch2	9a . Solving quadratics 9b. Completing the square	ities (6 Weeks) Revisit expanding and factorising single brackets and then quadratic expressions (Unit 2H). Factorise and solve quadratic expressions in the form x2+bx+c; Factorise and solve quadratic expressions in the form ax2+bx+c; Solve quadratic equations that need rearranging; Set up and solve quadratic equations; Solve quadratic equations by using the quadratic formula; Solve quadratic equations by completing the square; Solve quadratic equations that need rearranging;	Quadratic, solution, root, linear, solve, factorise, rearrange, surd, function, solve, simultaneous, inequality, variable, eliminate, rearrange, 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:         Factorising expressions         Solving quadratic equations         Use the quadratic formula         Rearranging quadratics in the form (x+a)^2+b         Solve quadratic equations by completing the square.         Understand when to use each method of solving to best suit the situation.         Multistep problems in a range of scenarios with reasoning, where necessary.         Plenary style questions –	<ul> <li>Pearson's GCSE Maths 9-1 Textbook: Ch7</li> <li>Purposeful Practice Book Ch7</li> <li>Edexcel Higher Linear Course Text Book Ch30</li> <li>Common misconception information.</li> <li>Scientific calculators</li> <li>Year 10 Term 2 Knowledge Organiser for key terms, recall and low stakes quizzing.</li> <li>Tap Top (includes questions with a &gt; 1) - Median Don Steward Factorising quadratics - SRWhitehouse on TES</li> <li>Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 style questions for assessment.</li> </ul>	Gatsby Benchmarks: Careers Introduce students to real examples of quadratic equations for context. Students might be unaware of opportunities for furthe r study and employment with advanced mathematical knowledge. Real World Examples of Quadratic Equations (mathsisfun.com) Maths, Why Bother?   MYPATH Careers Resources (mypathcareersuk.com)
					White Rose Maths -         Assessment Papers         https://www.missbsresources.c         om/ > Algebra> skills review         Mathsbox > Topic resources > 4         Questions / Exit tickets		

N8, A4, A9, A11, A18, A19, A21	How do we use algebraic manipulation to solve simultaneous equations? Yr9 Ch2	9c. Simultaneous equations 9d. Linear and quadratic simultaneous equations.	Revisit solving linear equations including brackets, fractions and variables on both sides. (Unit 2H) Find the exact solutions of two simultaneous equations in two unknowns; Use elimination or substitution to solve simultaneous equations; • linear / linear, including where both need multiplying; • linear / quadratic; • linear / $x2 + y2 = r2$ ; Set up and solve a pair of simultaneous equations in two variables for each of the above scenarios, including to represent a situation; Interpret the solution in the context of the problem;	<ul> <li>Pupils are expected to complete purposeful exercises and repeated practice on: <ul> <li>Solving linear simultaneous equations</li> <li>Solving linear and quadratic simultaneous equations</li> <li>Setting up simultaneous equations to represent a situation.</li> <li>Understand when to use differing methods of solving to best suit the situation.</li> </ul> </li> <li>Practical problems involving using simultaneous equations to represent a situation.</li> <li>Multistep problems in a range scenarios with reasoning, where necessary.</li> <li>Plenary style questions – White Rose Maths - Assessment Papers</li> <li>https://www.missbsresources om/ &gt; Algebra&gt; skills review Mathsbox &gt; Topic resources &gt; Questions / Exit tickets</li> </ul>	<ul> <li>Pearson's GCSE Maths 9-1 Textbook: Ch7</li> <li>Purposeful Practice Book Ch7</li> <li>Edexcel Higher Linear Course Text Book Ch32</li> <li>Common misconception information.</li> <li>Scientific calculators</li> <li>Year 10 Term 2 Knowledge Organiser for key terms, recall and low stakes quizzing.</li> <li>Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 style questions for assessment.</li> </ul>	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: Cost calculations from simultaneous equations
N1, A22	How does solving inequalities differ from solving equations?	9e. Solving inequalities	Show inequalities on number lines; Write down whole number values that satisfy an inequality; Solve simple linear inequalities in one variable, and represent the solution set on a number line; Solve two linear inequalities in <i>x</i> , find the solution sets and compare them to see which value of <i>x</i> satisfies both solve linear inequalities in two variables algebraically; Use the correct notation to show inclusive and exclusive inequalities	<ul> <li>Pupils are expected to complete purposeful exercises and repeated practice on:</li> <li>Representing inequalitie and use correct notation</li> <li>Solving linear inequalitie</li> <li>Solve multiple inequalities to find a value for x which satisfie both.</li> </ul>	<ul> <li>Pearson's GCSE Maths 9-1 Textbook: Ch7</li> <li>Purposeful Practice Book Ch7</li> <li>Edexcel Higher Linear Course Text Book Ch15</li> <li>Common misconception information.</li> <li>Scientific calculators</li> <li>Quadratic inequalities - mssteelmaths.com</li> </ul>	

					-	
				Multistep problems in a range of scenarios with reasoning where	Defining Regions Using Inequalities - Mathematics	
				nocossany	Assossment Project	
				necessary.	Assessment Project	
				Plenary style questions –	Year 10 Term 2 Knowledge	
				White Rose Maths -	Organiser for key terms, recall	
				Assessment Papers	and low stakes guizzing.	
				https://www.missbsresources.c		
				<u>om/</u> > Algebra> skills review	Please see the Resources	
				Mathsbox > Topic resources > 4	section for available materials	
				Questions / Exit tickets	on practice questions and	
					AO1/AO2/AO3 style questions	
					for assessment.	
	Knowledge	Big Questions of the unit are reviewed, and keep	ey areas revisited. Planned co	onsolidation.	Knowledge Recall Lesson – Unit	
	Recall				9H – Shared area.	
		Worded problems should be used, as well as	exam style questions from th	ne board.		
		Further examples could include, but should no	ot be limited to:		Pearson's GCSE Maths 9-1	
		Forming and solving quadratics for the area o	f rectangles/trapezia		Textbook: Problem solving,	
		Simultaneous equations formed from prices of items with varying units of pounds and pence.			Check Up, Strengthen and	
		Linking to Ch6H (quadratic graphs)		- •	Extend Questions	
	Knowledge Quiz	Knowledge Quiz and self-assessment.		Ch9H Knowledge Quiz – Shared		
				area.		

Term 3							
	Topic 3: 10H - P	Probability (4 Weeks	5)				
N2, N3,	How do I	10a. Product	List all outcomes for single events, and	Outcome,	Starter quizzes for the term	• Pearson's GCSE Maths 9-1	SMSC and BV
N5,	describe and	Rule for	combined events, systematically;	product,	should include:	Textbook: Ch10H	There may be
N14,	calculate	Outcomes	Use the product rule for counting (i.e. if	probability, even, certain,	Required prior knowledge	Purposeful Practice Book	opportunities to
N15,	probability for		there are m ways of doing one task and n	likely, impossible, scale,	Mixed skills practice	Ch7	challenge ideas and
P1, P2,	events?		ways of doing another, then the total	mutually exclusive,	Focused accuracy drills	Edexcel Higher Linear	support students to
P3, P4,			number of ways the two tasks can be done	sample space, outcomes,	Knowledge gap support	Course Text Book Ch24	think critically and not
P5, P6,	9 V7 Ch6		is m × n ways);	mutually exclusive,	Look, cover, write, check.	Common misconception	simply accept what
P7				independent, event,		information.	they are told. Use of
		10b. Outcomes	Revisit calculating with fractions/decimals	experiment, relative	Pupils are expected to		statistics and factual
		and mutually	(Unit 1H)	frequency, sample, trial,	complete purposeful exercises	Scientific calculators	probability can be a
		exclusive	Write probabilities using fractions,		and repeated practice on:		very valuable way to
		events	percentages or decimals;	See command words	Pupils are expected to	Great Expectations: Probability	show that claims and
			Find the probability of successive events,		complete purposeful exercises	Through Problems (maths.org)	assertions should be
			such as several throws of a single dice;		and repeated practice on:		critically analysed
			Draw sample space diagrams and use them		<ul> <li>Probability scale</li> </ul>	Year 10 Term 3 Knowledge	before being accepted.
			for adding simple probabilities;		<ul> <li>Listing outcomes,</li> </ul>	Organiser for key terms, recall	Equally, there may be
			Know that the sum of the probabilities of		<ul> <li>Systematic listing</li> </ul>	and low stakes quizzing.	times when discussions
			all outcomes is 1 and use this to calculate		<ul> <li>Theoretical probability</li> </ul>		with students can
			probability;				broaden their outlook
							to develop their

		10c. Experime ntal Probability	Use $1 - p$ as the probability of an event not occurring where $p$ is the probability of the event occurring; Find a missing probability from a list or two-way table inc. algebraic terms; Use a two-way table to calculate conditional probability; Understand conditional probabilities and decide if two events are independent; Understand and use experimental and theoretical measures of probability, including relative frequency to include outcomes using dice, spinners, coins, etc; Estimate the number of times an event will occur, given the probability and the number of trials; Compare experimental data and theoretical probabilities; Compare relative frequencies from samples of different sizes.	• • • • • • • • • • • • • • • • • • •	Mutually exclusive events Mutually exclusive calculations Two way tables and data tables Estimating probability, Sample spaces, Relative frequencies Estimating outcomes ical problems involving ability. tistep problems in a range enarios with reasoning, re necessary ary style questions – te Rose Maths - ssment Papers s://www.missbsresources.c > Data > skills review msbox > Topic resources > 4 stions / Exit tickets	Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 style questions for assessment.	resilience. <u>Home -</u> <u>Office for National</u> <u>Statistics (ons.gov.uk)</u> <b>Gatsby Benchmarks:</b> <u>Careers</u> Use real-life contexts with ratios wherever possible to help students to engage and relate learning to everyday and working life <u>Maths, Why Bother? ]</u> <u>MYPATH Careers Resources</u> (mypathcareersuk.com)
P1, P2, P3, P4, P5, P6, P7, P8, P9	How can we use diagrams to help us solve probability problems?	10d. Tree diagrams 10e. Venn diagrams and Set notation	Draw a probability tree diagram based on given information. Understand selection with or without replacement; Calculate the probability of independent and dependent combined events; Use a tree diagram to calculate conditional probability; Use Venn diagrams to group sets of numbers/values. Use Venn diagrams to represent real life situations. Work out probabilities from Venn diagrams to represent real-life situations and also 'abstract' sets of numbers/values; Use union and intersection notation;	Pupil comp and r Pupil comp and r • •	Is are expected to plete purposeful exercises repeated practice on: Is are expected to plete purposeful exercises repeated practice on: Tree diagrams for independent and dependent events Calculating probabilities from tree diagrams for multiple events Completing Venn diagrams Calculating probabilities from Venn diagrams Identification of values and probability with set notation	<ul> <li>Pearson's GCSE Maths 9-1 Textbook: Ch10H</li> <li>Purposeful Practice Book Ch7</li> <li>Edexcel Higher Linear Course Text Book Ch24</li> <li>Common misconception information.</li> <li>Scientific calculators</li> <li>Manipulatives to explore Venn properties <u>- Venn Diagrams</u> (mathsbot.com)</li> <li>Year 10 Term 3 Knowledge Organiser for key terms, recall and low stakes quizzing.</li> </ul>	

					Practical problems involving	Please see the Resources	
					Probability.	section for available materials	
						on practice questions and	
					Multistep problems in a range of	AO1/AO2/AO3 style questions	I
					scenarios with reasoning, where	for assessment.	I
					necessary		
					Plenary style questions –		
					White Rose Maths -		
					Assessment Papers		
					https://www.missbsresources.c		
					om/ > Data > skills review		
					Mathsbox > Topic resources > 4		
					Ouestions / Exit tickets		I
		Knowledge	Big Questions of the unit are reviewed, and k	ev areas revisited Planned c	onsolidation	Knowledge Becall Lesson – Unit	
		Recall		ey areas revisited. Fiamled e		10H – Shared area	
		needin	Worded problems should be used, as well as	exam style questions from th	he board	for shared area.	
			Further examples could include but should r	ot be limited to:		Pearson's GCSE Maths 9-1	
			Scenarios where the best method is to be de	cided by the student		Textbook: Problem solving	
			Three part Venn diagrams			Check Un Strengthen and	
			Tree and Venn diagram with algebraic notati	on		Extend Questions	
		Knowledge Quiz	Knowledge Quiz and self-assessment		Ch10H Knowledge Quiz -	Exterio Questions.	
		Kilowieuge Quiz	Knowledge Quiz and sen-assessment.		Shared area		
	Topic 4: 12H	Congruence and Sim	vilarity (2 Maaks)		Shared area.		
65.66	How do	12 a Congruenc	Understand and use SSS_SAS_ASA and RHS	Congruence side angle	Starter quizzes for the	Boarson's GCSE Maths H 9	
GJ, GU, G10	congruen	v and Similarity	conditions to prove the congruence of	bypotenuse	term should include:	• Fedison's GCSE Matris IT 5-	
019	congruen	y and Similarity	triangles using formal arguments	shana voluma longth	Required prior knowledge		
	cimilarity		Solvo anglo probloms by first	aroa volumo scalo	Mixed skills practice	Purposeful Practice Book	
	diffor2		proving congruonce:	factor onlargoment	Focused accuracy drills	Ch12H,	
	uner		proving congruence,	similar parimeter	Knowledge gen support	<ul> <li>Edexcel Higher Linear</li> </ul>	
				fructum		Course Text Book Ch27, 33	
			Understand similarity of triangles and of	Inustuin	LOOK, COVEL, WITE, CHECK.	<ul> <li>Common misconception</li> </ul>	
			other plane shapes, and use this to make	Soo commond words	Dunils are expected to	information.	
			geometric inferences;	See command words	semplete purposeful		
			Prove that two shapes are similar by		complete purposerul	Scientific calculators	
			showing that all corresponding angles are		exercises and repeated practice		I
			equal in size and/or lengths of sides are in			Similar triangles/shapes -	I
			the same ratio/one is an enlargement of		• Congruency recognition and	mathsmalakiss.com	I
			the other, giving the scale factor;		proof	Analysing congruency	I
R6, R12,	How	12.b Similarity	Identify the scale factor of an enlargement		<ul> <li>Similarity recognition and</li> </ul>	proofs - Mathematics	
G17	does the		of a similar shape as the ratio of the		proof	Assessment Project	l
	scale		lengths of two corresponding sides, using		<ul> <li>Formal notation practice</li> </ul>	Complete the congruence	l
	factor		integer or fraction scale factors;		• Linear scale factor	proof - topdrawer.aamt.edu.au	l
	affect		Write the lengths, areas and volumes of		manipulation		l
	the area		two shapes as ratios;		Area scale factor	Prove it! - MathsPad	l
	and				manipulation		l
				•			

volume of similar shapes?		Know the relationships between linear, area and volume scale factors of mathematically similar shapes and solids; Use the relationship between enlargement and areas and volumes of simple shapes and solids; Find missing lengths, areas and volumes in similar 3D solids; Understand the effect of enlargement on angles, perimeter, area and volume of shapes and solids; Solve problems involving frustums of cones where you have to find missing lengths first using similar triangles.		<ul> <li>Volume scale factor manipulation</li> <li>Scale factor ratios and applications</li> <li>Linear, area and volume relationships.</li> <li>Practical problems involving linear, area and volume relationships for contextual problems.</li> <li>Multistep problems in a range of scenarios with reasoning, where necessary.</li> <li>Plenary style questions – White Rose Maths - Assessment Papers</li> <li>https://www.missbsresources.c om/ &gt; Geometry&gt; skills review Mathsbox &gt; Topic resources &gt; 4 Questions / Exit tickets</li> </ul>	Year 11 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 style questions for assessment.	
	Knowledge Recall	Big Questions of the unit are reviewed, and k Worded problems should be used, as well as Further examples could include, but should n Formal notation for geometric proof, compar Ensure that examples involving given volume length scale factor. Make links between similarity and trigonome Show why SSA and AAA are not proof of cong	ey areas revisited. Planned co exam style questions from th ot be limited to: re to exam mark schemes. s are used, requiring the cube etric ratios. gruency.	ponsolidation. The board. E root being calculated to find the	Knowledge Recall Lesson – Unit 12H – Shared area. Pearson's GCSE Maths H 9-1 Textbook: Problem solving, Check Up, Strengthen and Extend questions.	
	Knowledge Quiz	Knowledge Quiz and self-assessment.		Ch12H Knowledge Quiz – Shared area.	Knowledge Quiz and self- assessment.	

Term 4								
	Topic 5: 11H – Multiplicative Reasoning (6 Weeks)							
R16, N3, N12, R6	How are multipliers used in real life?	11a. Multipliers- Growth & Decay	Express a given number as a percentage of another number in more complex situations; Calculate percentages with a multiplier. Calculate reverse percentages	Profit, original, increase, decrease, annual, ratio, proportion, best value, proportional change, compound measure, density, mass, volume.	Starter quizzes for the term should include: Required prior knowledge Mixed skills practice Focused accuracy drills Knowledge gap support	<ul> <li>Pearson's GCSE Maths F 9-1 Textbook: Ch11</li> <li>Purposeful Prac Book Ch11H</li> </ul>	Gatsby Benchmarks:           Personal Finance           Discuss the importance           of Maths skills           to develop and           demonstrate	

			Work out the multiplier for repeated	speed, distance, time,	Look, cover, write, check.	Edexcel Higher Linear	confidence and
	6		proportional change as a single	density, mass, volume,		Course Text	competence in personal
	Yr9 Ch4		decimal number;	pressure,	Pupils are expected to	Book Ch12	finance/planning.
			Calculate percentage profit or loss;	acceleration, velocity, Inv	complete purposeful	Common	Relatable examples
			Find the original amount given the final	erse, direct,	exercises and repeated practice	misconception	within the context of
			amount after a percentage increase		on:	information	outcomes listed could
			or decrease;	See Command words	<ul> <li>Calculating percentages</li> </ul>		include:
			Calculate simple interest		• FDP conversion revision	Year 10 Term 4 Knowledge	Percentages – including
			Calculate compound interest		• Express a given number as a	Organiser for key terms recall	taxation, sales,
			Understand the difference between simple		percentage of another.	and low stakes quizzing	inflation, interest
			and compound interest.		<ul> <li>Repeated percentage</li> </ul>	and fow states quizzing.	rates, loans
			Use compound interest to determine the		changes.	Percentage Unchanged	Compound increase
			best investments when presented		Reverse percentages	(maths org)	and depreciation
			with choices;		Calculating interest	Retiring to Paradise	Percentage change
			Make calculations involving repeated		Calculate percentage profit	(maths.org)	problems including
			percentage change, including depreciation.		or loss	Roasting Old Chestnuts 4	price and salary
			Set up, solve and interpret the answers in		Compound growth or	(maths.org)	changes.
			growth and decay problems;		depreciation	Compound percentage	Maths KS3 / GCSE:
						activities (Teachit Maths)	Finance - BBC Teach
					Practical problems	,	
			Abbey Lens:		involving percentages.	Please see the Resources	
			Business Studies – Salary, profit and			section for available materials	
			loss, interest rates.		Multistep problems in a range	on practice questions and	
					of scenarios with reasoning.	AO1/AO2/AO3 questions for	
					where necessary	practice and assessment.	
					,		
N13, R1,	What does it	11b. Compound	Understand and use compound measures,		Pupils are expected to	• Pearson's GCSE Maths F 9-	
R11	mean for a	measures	including the need to use multiple		complete purposeful	1 Textbook: Ch11	
	unit to be		formulae in one problem.		exercises and repeated practice	<ul> <li>Purposeful Practice Book</li> </ul>	
	'compound'?		Convert between metric speed measures;		on:	Ch11H	
			Convert between density measures;		<ul> <li>Compound calculations of</li> </ul>	• Edexcel Higher Linear	
			Convert between pressure measures;		density, volume and mass	Course Text Book Ch6	
					values.	Common misconception	
			Use kinematics formulae from the		<ul> <li>Compound calculations of</li> </ul>	information	
			formulae sheet to calculate speed,		pressure, force and area		
			acceleration, etc (with variables defined in		values.	Year 10 Term 4 Knowledge	
			the question);		<ul> <li>Compound calculations of</li> </ul>	Organiser for key terms, recall	
					speed, distance and time	and low stakes guizzing.	
			Abbey Lens:		values.		
			Science – Compound measurements and		<ul> <li>Converting units</li> </ul>		
			units.		and problems.	Please see the Resources	
					• Use of the kinematics	section for available materials	
					formulae	on practice questions and	
					iornalae.	A01/A02/A03 auestions for	
						practice and assessment	

				Practical problems		
				involving compound measures.		
				Multisten problems in a range		
				of scenarios with reasoning		
				where necessary		
				where necessary		
				Plenary style questions –		
				White Rose Maths -		
				Assessment Papers		
				https://www.missbsresources.c		
				om/ > Geometry> skills review		
				Mathsbox $>$ Topic resources $> 4$		
				Questions / Exit tickets		
R10,	What does	11c. Direct and	Recognise when values are in direct	Pupils are expected to	• Pearson's GCSE Maths F 9-	
R14	direct and	inverse	proportion by reference to the graph form,	complete purposeful	1 Textbook: Ch11	
	indirect	proportion	and use a graph to find the value	exercises and repeated practice	Purposeful Practice Book	
	proportion		of k in $y = kx$ ;	on:		
	look like on a		Recognise when values are in inverse	<ul> <li>Calculating values through</li> </ul>		
	graph and		proportion by reference to the	direct and inversely	Edexcel Higher Linear	
	what does it		graph form:	proportionato	Course Text Book Ch34	
	mean?		Understand that X is inversely proportional	rolationships	Common misconception	
	incuir.		to V is equivalent to X is proportional to	relationships.	information	
	6			• Set up and use proportion		Gatsby
	👻 Yr9 Ch4		1/1, Calculate an unknown quantity from	formulae.	Year 10 Term 4 Knowledge	Benchmarks: Personal
			calculate an unknown qualitity norm		Organiser for key terms, recall	Finance
			quantities that vary in direct of	Practical problems	and low stakes quizzing.	Discuss the importance of
			Set up and up a subtiens to aske word	involving compound		Maths skills to develop
			Set up and use equations to solve word	proportion.	Physics in proportion	and demonstrate
			and other problems involving direct		(Resourceaholic)	confidence and
			proportion (this is covered in more detail in	Multistep problems in a range		competence in personal
			unit 19);	of scenarios with reasoning,	Please see the Resources	finance/planning. Relatabl
				where necessary	section for available materials	e examples within the
			Extension encerturity from Ch10		on practice questions and	could include: Business
			Extension opportunity from Ch19.	Plenary style questions –	AO1/AO2/AO3 questions for	and project staff
			set up and use equations to solve word and	White Rose Maths -	practice and assessment	requirements through
			other problems involving direct proportion	Assessment Papers		direct and inverse
			including square, cube or other power of	https://www.missbsresources.c		proportion.
			another quantity;	<u>om/</u> > Number > skills review		
			Use y = kx to solve direct proportion	Mathsbox > Topic resources > 4		
			problems, including questions where	Questions / Exit tickets		
			students find k, and then use k to find			
			another value;			
			Solve problems involving inverse proportion			
			using graphs by plotting and reading values			
			from graphs;			
			Solve problems involving			
			inverse proportionality;			

		Knowledge Recall	Set up and use equations to solve word and other problems involving direct or inverse proportion. Big Questions of the unit are reviewed, and ke Worded problems should be used, as well as Further examples could include, but should ne Multiple unit changes for compound measure Solve word problems involving direct and inve	ey areas revisited. Planned of exam style questions from th ot be limited to: 25. erse proportion.	onsolidation. ne board.	Knowledge Recall Lesson – Unit 11H – Shared area. Pearson's GCSE Maths H 9-1 Textbook: Problem solving, Check Up, Strengthen and Extend questions.	Links to our Personal Development Curriculum will be populated during the 2022-23 academic year.
		Quiz	Kilowieuge Quiz and sen-assessment.		Shared area.	assessment.	
Term 5							
C1 C2	Topic 6: 14H – F	urther Stats (6 Wee	Planned concelidation Firstly resists that	Comple nonviction	Sharkan muinnaa far tha		SMCC and DV
S1, S3, S4	How do we visually represent the spread of data? Yr9 Ch3	14a. Cumulative Frequency 14b. Box Plots 14c. Histograms	Planned consolidation. Firstly revisit Unit 3H:Averages from data and tables Combined meanEstimating averages from grouped frequency tablesFrequency polygonsKnow the appropriate uses of cumulative frequency diagrams; Construct and interpret cumulative frequency tables; Construct and interpret cumulative frequency graphs/diagrams and from the graph: -estimate frequency greater/less than a given value; -find the median and quartile values and interquartile range;Produce box plots from raw data and when given quartiles, median and identify any outliers; Interpret box plots to find median, quartiles, range and interquartile range of two distributions, or median and interquartile range as appropriate:	Sample, population, fraction, decimal, percentage, bias, stratified sample, random, cumulative frequency, box plot, frequency, mean, median, mode, range, lower quartile, upper quartile, interquartile range, spread, comparison, outlier, histogram, frequency density, See command words	<ul> <li>Starter quizzes for the term should include:</li> <li>Required prior knowledge</li> <li>Mixed skills practice</li> <li>Focused accuracy drills</li> <li>Knowledge gap support</li> <li>Look, cover, write, check.</li> <li>Pupils are expected to complete purposeful exercises and repeated practice on:</li> <li>Calculating cumulative frequency values</li> <li>Plotting and interpreting cumulative frequency graphs.</li> <li>Calculating quartile values</li> <li>Plotting / interpreting box plots.</li> <li>Calculating histogram values including frequency density and frequencies.</li> <li>Plotting and interpreting histograms.</li> </ul>	<ul> <li>Pearson's GCSE Maths F 9- 1 Textbook: Ch14</li> <li>Purposeful Practice Book Ch14H</li> <li>Edexcel Higher Linear Course Text Book Ch21</li> <li>Common misconception information</li> <li>Year 10 Term 5 Knowledge Organiser for key terms, recall and low stakes quizzing.</li> <li>Box plots - <u>Box plots: increase,</u> decrease, same? – Variation <u>Theory</u></li> <li><u>GCSE questions on histograms</u> - mathsteaching.wordpress.com</li> <li><u>GCSE 9 - 1 exam questions</u> - Maths4Everyone on TES</li> <li>Please see the Resources section for available materials on practice questions and AO1/AO2/AO3 questions for practice and assessment</li> </ul>	SMSC and BV Use recent and relevant statistical representations in the media for discussion and context. Home - Office for National Statistics (ons.gov.uk) Opportunities to discuss data connections to individual liberty and the rule of law. Activity 1.2 and 1.2 - Democracy and Law – General Elections British values maths resources Gatsby Bench marks: 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
			Know the appropriate uses of histograms;				such as the growing field of Sports Analytics.

			Construct and interpret histograms from		Multistep problems in a range of		Learn the Role of Maths
			class intervals with unequal width;		scenarios with reasoning, where		in Sport   Importance
			Use and understand frequency density;		necessary		of Maths
			From histograms:				(superprof.co.in)
			-complete a grouped frequency table;		Plenary style guestions –		
			-understand and define frequency density;		White Rose Maths -		
			Estimate the mean from a histogram;		Assessment Papers		
			Estimate the median from a histogram with		https://www.missbsresources.c		
			unequal class widths or any other		om/ > Data > skills review		
			information from a histogram, such as the		Mathsbox > Topic resources > 4		
			number of people in a given interval.		Questions / Exit tickets		
\$1 \$3	How do	14d Sampling	Understand what is meant by sample	-	Pupils are expected to		
S4 S5	hiologists	140. Sumpling	and population:		complete nurnoseful	<ul> <li>Fedisoli's GCSE Matris F 9-</li> <li>1 Toythook: Ch14</li> </ul>	
54,55	predict the		Understand how different sample sizes may		exercises and repeated practice	I TEXTBOOK. CI114	
	number of		affect the reliability of conclusions drawn:		on.	Purposeful Practice Book	
	tigers left in		Identify possible sources of bias and plan to		Key definitions and	Cn14H	
	the world?		minimise it:		examples in context	Edexcel Higher Linear	
			Specify the problem and plan:		Calculating sample	Course Text Book Ch11	
			<ul> <li>decide what data to collect and</li> </ul>		sizes	Common misconception	
			analysis needed:			information	
			• understand primary and capandary		nonulation sizes		
			• understand primary and secondary		population sizes.	Year 10 Term 5 Knowledge	
			data sources,		Practical problems involving the	Organiser for key terms, recall	
			• consider fairness;		interpretation from real life	and low stakes quizzing.	
			write questions to eliminate blas, and		data		
			understand now the timing and location of			Capture-mark-recapture -	
			a survey can ensure a sample is		Multisten problems in a range of	Investigating ecosystems -	
		1/0	representative (see note);		scenarios with reasoning where	GCSE Biology (Single Science)	
		Populations	the statistic found to all mouth fabrate to		necessary	Revision - BBC Bitesize	
		Populations	Use statistics found in all graphs/charts in		necessary		
			this unit to describe a population;		Plenary style questions –	Please see the Resources	
			Do oble to estimate the size of a negative		White Rose Maths -	section for available materials	
			Be able to estimate the size of a population		Assessment Papers	on practice questions and	
			discuss limitations		https://www.missbsresources.c	A01/A02/A03 questions for	
			discuss inflications.		om/ > Data > skills review	practice and assessment	
			The Abbey Lens Biological ecosystems		Mathsbox $>$ Topic resources $> 4$		
			The Abbey Lens - Biological ecosystems		Questions / Exit tickets		
		Knowledge	Big Questions of the unit are reviewed, and k	key areas revisited. Planned co	nsolidation.	Knowledge Recall Lesson	
		Recall				– Unit 14H – Shared area.	
			Worded problems should be used, as well as	exam style questions from the	e board.		
			Further examples could include, but should n	not be limited to:		Pearson's GCSE Maths H 9-1	
			Sampling in various contexts.			Textbook: Problem solving,	
			Completing and interpreting a range of histor	grams and box plots.		Check Up, Strengthen and	
			Use of the exam mark schemes.			Extend questions.	

Knowledge	Knowledge Quiz and self-assessment.	Ch14H Knowledge Quiz –	Knowledge Quiz and self-	
Quiz		Shared area.	assessment.	

Term 6							
Topic 7:8	H – Transformati	ons and Construction	ons (6 Weeks)				
R6, G5, G6, G7, G8, G24, G25	What are the 4 types of transformatio n and how do we describe them? Yr7 Ch10	8a. Reflections & rotations 8b. Enlargements	Identify the equation of a line of symmetry; Recognise and describe reflections on a coordinate grid – know to include the mirror line as a simple algebraic equation, $x = a$ , $y = a$ , $y = x$ , $y = -x$ and lines not parallel to the axes; Reflect 2D shapes using specified mirror lines including lines parallel to the axes and also $y = x$ and $y = -x$ ; Recognise and describe rotations – know that that they are specified by a centre and an angle; Rotate 2D shapes using the origin or any other point (not necessarily on a coordinate grid); Enlarge a shape on a grid without a centre specified; Describe and transform 2D shapes using enlargements by a positive integer, positive fractional, and negative scale factor; Know that an enlargement on a grid is specified by a centre and a scale factor; Identify the scale factor of an enlargement of a shape; Enlarge a given shape using a given centre as the centre of enlargement by counting distances from centre, and find the centre of enlargement and compare with before enlargement, to deduce multiplicative relationship (area scale factor); given the areas of two shapes, one an enlargement of the other, find the scale factor of the enlargement (whole number values only);	Transformation, rotation, reflection, centre, angle, direction, mirror line, centre of enlargement, describe, distance, congruence, similar, combination, single, corresponding, congruen t, enlargement, scale factor, translate, vector, similar, invariance, constructions, compasses, protractor, perpendicular, bearing, bisector, bisect, line segment, loci, bearing, plan, elevation, dimension, sketch, isometric 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: Pupils are expected to complete purposeful exercises and repeated practice on: • Drawing reflections • Describing reflections • Describing rotations • Describing rotations • Drawing translations • Describing translations • Describing enlargements • Describing enlargements • Describing enlargements • Combining transformations • Area calculations from enlargements. • Multistep problems in a range of scenarios with reasoning, where necessary. Plenary style questions – White Rose Maths - Assessment Papers https://www.missbsresources.c	<ul> <li>Pearson's GCSE Maths F 9- 1 Textbook: Ch8</li> <li>Purposeful Practice Book Ch8H</li> <li>Edexcel Higher Linear Course Text Book Ch14</li> <li>Common misconception information</li> <li>Transformation workbook – Maths4everyone.com</li> <li>Year 10 Term 6 Knowledge Organiser for key terms, recall and low stakes quizzing.</li> </ul>	

R2, G1, G2, G3, G12, G13, G15, G19	How do we describe and draw 3D solids?	8c. Translations and combinations 8d. 3D solids	Recognise and describe single translations using column vectors on a coordinate grid; Translate a given shape by a vector; Understand the effect of one translation followed by another, in terms of column vectors (to introduce vectors in a concrete way); Distinguish properties that are preserved under particular transformations; Use congruence to show that translations, rotations and reflections preserve length and angle, so that any figure is congruent to its image under any of these transformations; Describe and transform 2D shapes using combined rotations, reflections, translations, or enlargements; Describe the changes and invariance achieved by combinations of rotations, reflections and translations. Know the terms face, edge and vertex; Identify and sketch planes of symmetry 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. Use isometric grids to draw 2D representations of 3D solids;	Mathsbox > Topic resources > 4 Questions / Exit tickets	<ul> <li>Pearson's GCSE Maths F 9- 1 Textbook: Ch8</li> <li>Purposeful Practice Book Ch8H</li> <li>Edexcel Higher Linear Course Text Book Ch22</li> <li>Common misconception information</li> <li>Year 10 Term 6 Knowledge Organiser for key terms, recall and low stakes quizzing.</li> </ul>	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)
R2, G1, G2, G3, G12, G13, G15, G19	How do we use mathem atical tools to draw accuratel y?	8e. Bearings and scale drawings	Use and interpret maps and scale drawings, using a variety of scales and units; Read and construct scale drawings, drawing lines and shapes to scale; Estimate lengths using a scale diagram; Understand, draw and measure bearings;	Pupils are expected to complete purposeful exercises and repeated practice on: • Scale drawings • Constructions with accuracy • Drawing triangles • Drawing loci	<ul> <li>Pearson's GCSE Maths F 9- 1 Textbook: Ch8</li> <li>Purposeful Practice Book Ch8H</li> <li>Edexcel Higher Linear Course Text Book Ch27</li> <li>Common misconception information</li> </ul>	

		Calculate bearings and solve bearings		Region identification	Construct o	
		problems, including on scaled maps, and		Drawing		
		find/mark and measure bearings		and reading bearings	scenario - Teachit Maths	
		Thearings will be relevant to the			Bearings Challenges -	
		Advanced Trigonometry Chapter at the		Practical problems involving	solvemymaths.com	
		start of year 11.		loci descriptions.	Find the Treasure - MathsPad	
					Angle properties and bearings -	
		The Abbey Lens:		Multistep problems in a range	pas1001 on TES	Gatsby Benchmarks:
		Geography – Locations (Cities, Landmarks		of scenarios with reasoning,		Careers
		etc.)		where necessary.	Year 10 Term 6 Knowledge Organiser for key terms, recall	Use real-life contexts wherever possible to
		Use the standard ruler and compass		Plenary style questions -	and low stakes quizzing.	help students to engage
	8f.Construction	constructions:		White Rose Maths -		and relate learning to
	s and loci	<ul> <li>bisect a given angle;</li> </ul>		Assessment Papers		everyday and working
		<ul> <li>construct a perpendicular to a given line</li> </ul>		https://www.missbsresources.c		life. E.g. Town and city
		from/at a given point;		om/>Geometry>skills review		planning, Architecture
		<ul> <li>construct angles of 90°, 45°;</li> </ul>		Mathshox > Topic resources > 4		design,
		• perpendicular bisector of a		Questions / Exit tickets		Maths, Why Bother?
		line segment;				MYPATH Careers
		• a region bounded by a circle and an				<u>Resources</u>
		intersecting line;				(mypathcareersuk.com)
		• a given distance from a point and a given				
		distance from a line;				
		• equal distances from two points or two				
		line segments:				
		<ul> <li>regions which may be defined by 'nearer</li> </ul>				
		to' or 'greater than';				
		Find and describe regions satisfying a				
		combination of loci, including in3D;				
		Use constructions to solve loci problems				
		including with bearings;				
		Know that the perpendicular distance from				
		a point to a line is the shortest distance to				
		the line.				
	Knowledge	Big Questions of the unit are reviewed, and keep	ey areas revisited. Planned co	onsolidation.	Knowledge Recall Lesson	
	Recall	Worded problems should be used, as well as	exam style questions from th	e board.	– Unit 8H – Shared area.	
		Further examples could include, but should no	ot be limited to:			
		Large variety of transformation for practice –	drawing and describing.		Pearson's GCSE Maths H 9-1	
		Resultant transformations from a combinatio	n of others.		Textbook: Problem solving,	
		Bearings with Pythagoras / Trigonometry calc	ulations.		Check Up, Strengthen and	
		Relate loci problems to real-life scenarios, inc	luding mobile phone masts a	nd coverage.	Extend questions.	
		Large variety of loci scenarios for practice.				
T	Knowledge	Knowledge Quiz and self-assessment.		Ch8H Knowledge Quiz – Shared	Knowledge Quiz and self-	
	Quiz			area.	assessment.	

#### **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

#### Ch7H

Students often get the concepts of area and perimeter confused.
Shapes involving missing lengths of sides often result in incorrect answers.
Diameter and radius are often confused, and recollection of area and circumference of circles involves incorrect radius or diameter.
Students often get the concepts of surface area and volume confused.
Students readily accept the rounding for lower bounds, but take some convincing in relation to upper bounds.

#### Ch9H

Using the formula involving negatives can result in incorrect answers.

If students are using calculators for the quadratic formula, they can come to rely on them and miss the fact that some solutions can be left in surd form. When solving inequalities students often state their final answer as a number quantity, and exclude the inequality or change it to =. Some students believe that -6 is greater than -3

#### Ch10H

Probability without replacement is best illustrated visually and by initially working out probability 'with' replacement. Not using fractions or decimals when working with probability trees.

#### Ch12H

Students commonly use the same scale factor for length, area and volume.

#### Ch11H

Recall of basic formula can be poor – use of formulae triangles can help. Students needs to be reminded of the importance of not rounding until the end of the calculation if doing in stages

#### Ch14H

Labelling axes incorrectly in terms of the scales, and also using 'Frequency' instead of 'Frequency Density' or 'Cumulative Frequency'. Students often confuse the methods involved with cumulative frequency, estimating the mean and histograms when dealing with data tables. Often not aware of what a census is: the whole population (the UK census takes place every 10 years in a year ending with a 1 – the next one is due in 2021). Specifying the problem and planning for data collection is not included in the programme of study, but is a prerequisite to understanding the context of the topic. Writing a questionnaire is also not included in the programme of study, but remains a good topic for demonstrating bias and ways to reduce bias in terms of timing, location and question types.

#### Ch8H

Students often use the term 'transformation' when describing transformations instead of the required information. Correct use of a protractor may be an issue. Lines parallel to the coordinate axes often get confused

# **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 <u>ActiveLearn (pearsonactivelearn.com)</u>
- Pearson's Purposeful Practice book <u>ActiveLearn (pearsonactivelearn.com)</u>
- MathsBox <u>Mathsbox</u>

- 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
  - o Interactive tools and activites to aid the teaching of mathematics. Hundreds of randomly generated questions and answers and Mathematics Manipulatives for mastery.
- Corbett maths <u>Corbettmaths Videos, worksheets, 5-a-day and much more</u>
  - 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 <u>Maths Genie Learn GCSE Maths for Free</u>
  - 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. (The Abbey Lens)