



Year 8 Mathematics

Scheme of Work and Teaching Plan



GCSE Band	Starting Points				Place Value BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:	Homework Book Pages		
	4	3	2	1		Delta	Theta	Pi
3-1				A	Understand place value in numbers up to 1000; Read and write whole numbers in figures and words; know what each digit represents.			1-2
				A	Use place value to multiply and divide whole numbers by 10 or 100; Understand that multiplying/dividing a number moves digits left/right. Understand that multiplying by 100 is equivalent to multiplying by 10 and 10 again.			
GCSE Band	Starting Points				Written and Mental Methods BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
3-1				A	Add and subtract three digit numbers using written methods			1
				A	Multiply and divide integers by a single digit			
				A	Know the multiplication tables up to 10 x 10 and associated division facts			
				A	Solve whole-number problems involving multiplication or division; Including those that give rise to remainders			2, 7
5-3			A	M	Use written methods to add and subtract whole numbers of up to four digits; Include different numbers of digits and totals of more than two numbers.			1, 7
			A	M	Use written methods to multiply and divide whole numbers of up to four digits; Use a range of different methods, including the grid method, partitioning and repeated subtraction.			2, 7
			A	M	Use a range of mental methods of computation with all operations			2, 7
			A	M	Recall multiplication facts up to 12 x 12 and corresponding division facts			2, 7
7-5		A	M	E	Use efficient written methods for arithmetic of integers of any size		1	1-2, 7
9-7	A	M	E		Solve problems using written calculations in real-life contexts *		1	3, 9
GCSE Band	Starting Points				Decimals BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
3-1				A	Use decimal notation for tenths and hundredths; Know what each digit represents in numbers with up to two decimal places. Use decimals in contexts such as money. Know that £3.06 equals 306p			
5-3			A	M	Understand the difference between irrational and rational numbers			
			A	M	Use written methods to add and subtract decimal numbers with up to two places; Include sums and differences with different numbers of digits, and totals of more than two numbers			42, 46
			A	M	Multiply and divide decimal numbers with up to two places by a single digit		55-56	43
7-5		A	M	E	Use efficient written methods to add and subtract decimals of any size, including numbers with differing numbers of decimals			42
			A	M	E	Multiply and divide decimals by 10, 100, 1000 and explain the effect. Complete statements: e.g. $0.4 \times \underline{\quad} = 400$ and $0.4 \div \underline{\quad} = 0.004$		59
9-7	A	M	E		Multiply and divide decimals by 0.1 and 0.01		59	
	A	M	E		Multiply two decimal numbers together		55	43, 46
	A	M	E		Solve problems using decimal calculations in real-life contexts		56	45,48
9-8	M	E			Divide two decimals together by changing the divisor to an integer			

*Development of problem solving skills

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GCSE Band	Starting Points				Negatives BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:	Homework Book Pages		
	4	3	2	1		Delta	Theta	Pi
3-1				A	Recognise negative numbers in contexts such as temperature; Order positive and negative whole numbers on a number line or thermometer.			3
5-3				A	Add and subtract negative numbers			3
				M	Solve problems involving negative numbers in real-life contexts; Understand problems involving temperature and debt/overdrawn balances			3,11
7-5		A	M	E	Multiply and divide negative numbers			3
GCSE Band	Starting Points				Powers of 10 BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
7-5		A	M	E	Read and write positive integer powers of 10; Know that 1 hundred is $10 \times 10 = 10^2$, 1 thousand is $10 \times 10 \times 10 = 10^3$ etc.			
9-7	A	M	E		Multiply and divide by any integer power of 10, including negative powers; Understand the relationship between multiplying, dividing and fractional representations of decimals			43
9-8	M	E			Understand the effects of multiplying and dividing by numbers between 0 and 1; Multiplying by a number between 0 and 1 makes it smaller and dividing makes it larger. Use this to estimate magnitude of answers.			43
9	E				Convert between ordinary and standard index form numbers; Begin to write ordinary numbers in standard form, expressing them as $A \times 10^n$ where $1 \leq A < 10$, and n is an integer.	3		
GCSE Band	Starting Points				Ordering BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
3-1				A	Order integers with up to 4 digits			
5-3				M	Order decimals with up to three decimal places			44, 46-47
7-5		A	M	E	Compare and order decimals in different contexts; Know that it is necessary to convert into the same units when comparing			44,46-47
GCSE Band	Starting Points				Rounding and Estimating BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
3-1				A	Round positive whole numbers to the nearest 10, 100 or 1000			
5-3				M	Round positive numbers to any given power of 10			
				A	Round decimal numbers to the nearest whole number or one decimal place		54	44,46
7-5				M	Round decimal numbers to 2 or 3 decimal places		54	44,46
		A	M	E	Use above rounding to approximate the answer to calculations		56	45,46
9-7		A	M	E	Round integers and decimals to 1 significant number		59	
		A	M	E	Approximate calculations; Approximate by rounding numbers to 1 sig fig before calculating		59	
9-8	M	E			Solve problems using estimations in real-life contexts		61	
9-8	M	E			Approximate the result of calculations involving a number less than 1			
GCSE Band	Starting Points				Using a Calculator BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
3-1				A	Understand how to use all operation keys on a calculator			
5-3				M	Use the calculator and interpret the calculator display in different contexts;			
5-3				A	Use a calculator to square numbers and to find square roots			
7-5		A	M	E	Use the cube key on a calculator			
9-7		A	M	E	Know how to use the x^y key on a calculator to calculate powers			
		A	M	E	Know how to use the reciprocal key on a calculator			
		A	M	E	Use a calculator to evaluate complex expressions involving multiple functions			



GCSE Band	Starting Points				BIDMAS/BODMAS BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:	Homework Book Pages		
	4	3	2	1		Delta	Theta	Pi
5-3			M	E	Know and use the order of operations to work out calculations involving division, multiplication, addition and subtraction; For example: a. $16 \div 4 + 8 = 13$ b. $100/4 \times 5 = 5$			
7-5	A	M	E		Know and use the order of operations, including brackets and indices; For example: a. $3 \times (5 + 3) - (2 \times 7) + 1 = 11$ b. $3 \times (5 + 3) - 2 \times (7 + 1) = 8$ c. $(3^2 + 4^2)^2 = 625$			
GCSE Band	Starting Points				Number Facts BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
3-1				A	Find multiples of whole numbers			
				A	Find factors of a numbers less than 100			
				A	Understand the meaning of a square number and identify square numbers up to 100			3,4
5-3			A	M	Use the divisibility tests to see if numbers are divisible by 2, 3, 4, 5, 6 and 9			3,4
			A	M	Recognise square numbers up to 15 x 15 and their corresponding roots			3,4
7-5		A	M	E	Identify the cubes of 2, 3, 4, 5 and 10			3,4
		A	M	E	Understand and identify prime numbers	1		
9-7	A	M	E		Find the HCF and LCM of a pair of numbers	1	5	
9-8	M	E			Solve problems using HCF and LCM in real-life contexts		7,9	
GCSE Band	Starting Points				Powers BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
7-5		A	M	E	Write integers in a simpler form using index notation; e.g. $3 \times 3 \times 3 \times 3 \times 3 = 3^5$	2		
9-7	A	M	E		Use the law of indices to multiply and divide numbers written in index form; $p^a \times p^b = p^{a+b}$, $p^a \div p^b = p^{a-b}$, $(p^a)^b = p^{ab}$ $4^3 \times 4^2 = 4^5 = 4^{(3+2)}$ and $4^5 \div 4^2 = 4^3 = 4^{(5-2)}$	2		
	A	M	E		Find the prime factor decomposition of a number	1,5		
9-8	M	E			Use the prime factorisation of numbers to find the LCM and HCF of a pair of numbers	1,5		
9	E				Begin to extend the understanding of index notation to negative and fractional powers; Know the notation $5^{1/2} = \sqrt{5}$, $5^{1/3} = \sqrt[3]{5}$ and $2^{-4} = 1/2^4 = 1/16$			

*Development of problem solving skills



GCSE Band	Starting Points				Units BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:	Homework Book Pages		
	4	3	2	1		Delta	Theta	Pi
3-1				A	Use standard units of time; Read the time in a 24-hour digital clock and use 24-hour clock notation			
				A	Read and use timetables and calculate journey times			
5-3				A	Read and interpret scales on a range of measuring instruments			
				A	Choose and use names and abbreviations of units of measurement; Find appropriate units to measure, estimate, calculate and solve problems			
				A	Convert one metric unit to another; Convert units of length, volume and mass		16	
				A	Convert from one unit to another unit by using a graph		43	
7-5		A	M	E	Convert between area and volume measures		16,43	19
9-7	A	M	E		Plot a conversion graph to convert between two units			
	A	M	E		Solve problems involving measurements in a variety of contexts		16	19
GCSE Band	Starting Points				Area and Perimeter BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
3-1				A	Estimate the area of an irregular 2D shape by counting squares			
				A	Find the area and perimeter of simple shapes by counting squares			
5-3				A	Find the perimeter of 2-D shapes and compound shapes; Including problems where lengths of certain sides need to be found			
				A	Know and use the formula for the area of a rectangle			14
7-5				A	Know and use the formula for the area of a triangle; Including triangles where the height needs to be identified		11	
		A	M	E	Use the area of rectangles and triangles to solve problems; Solve problems such as cost of mowing a lawn or amount of paint required		11	
9-7	A	M	E		Calculate areas of compound shapes made from rectangles and triangles		12,19	
	A	M	E		Know and use the formulae for the area of a parallelogram and a trapezium		12,19	
	A	M	E		Use the formulae for the circumference and area of a circle	22	12,19	
9-8	M	E			Solve problems involving area and perimeter in real-life contexts	23	17,19	
9	E				Calculate arc lengths, areas of sectors and angles of circles	26		
GCSE Band	Starting Points				Surface Area and Volume BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
7-5		A	M	E	Calculate the volume of cubes and cuboids;		13	15
9-7	A	M	E		Calculate the surface area of cubes and cuboids; Identify cubes and cuboids as six rectangles		15	14
	A	M	E		Calculate the surface area of cuboids and shapes made from cuboids			14
	A	M	E		Solve problems involving volume and surface area in real-life contexts; Solve problems involving painting of surfaces or capacity of containers	21	17-18	15,17-21
9-8	M	E			Calculate the surface area and volume of prisms; Including problems where areas of complex faces is provided	21		17-19,20
9	E				Use the formulae for volumes of spheres, pyramids and cones; Students will not need to remember the formulae, just use them		30	

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GCSE Band	Starting Points				Fractions BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:	Homework Book Pages		
	4	3	2	1		Delta	Theta	Pi
3-1				A	Recognise what fraction of a shape has been shaded			82
				A	Shade a given simple fraction of a shape			82
				A	Use fraction notation to describe a proportion of a shape; Understand a fraction as part of a whole			82
				A	Recognise when two simple fractions are equivalent; Use diagrams to compare simple fractions			87
				A	Relate fractions to division; Know that $4 \div 8$ is another way of writing $4/8$, which is the same as $1/2$.			
5-3				A	M Identify and find equivalent fractions			87
				A	M Reduce a fraction to its simplest form by cancelling common factors		93	87
				A	M Convert mixed numbers to improper fractions, and vice versa			
				A	M Calculate fractions of quantities/measurements; Use written methods to calculate simple fractions of a number/quantity e.g. $\frac{3}{8}$ of 400g			82
				A	M Add and subtract simple fractions with common denominators			
7-5		A	M	E	Add and subtract simple fractions by writing them with a common denominator			83
		A	M	E	Express a smaller quantity as a fraction of a larger one			
		A	M	E	Multiply a fraction by an integer; Recognise an integer as a fraction over one			89
		A	M	E	Use division to convert a fraction to decimal		93	
		A	M	E	Convert terminating decimals to fractions	53	93	
		A	M	E	Order Fractions by writing as decimals or writing with same denominator		93	
		A	M	E	Solve problems involving fraction calculations in real-life contexts		97	
9-7		A	M	E	Add and subtract more complex fractions, including mixed fractions			
		A	M	E	Calculate fractions of quantities with fractional answers			
		A	M	E	Multiply a fraction by a fraction			
9-8		M	E		Divide an integer or a fraction by a fraction by multiplying by the reciprocal			

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GCSE Band	Starting Points				Percentages BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:	Homework Book Pages		
	4	3	2	1		Delta	Theta	Pi
3-1				A	Understand percentage as the number of parts per 100		95	84
5-3			A	M	Convert a percentage to a fraction and a decimal and vice versa		95	84
			A	M	Calculate percentages of whole number quantities (whole number answers); Use mental calculations and written methods, to calculate simple percentages (50%, 25%, 10%, 1%)			85
7-5		A	M	E	Calculate percentages of numbers, quantities, measurements (fractional answers); Use both non-calculator and calculator methods, with and without the % key	54	95	85
9-7	A	M	E		Express a given number as a percentage of another	54	95	84
	A	M	E		Use percentages to compare simple proportions	54	94	86
	A	M	E		Order a combination of fractions, decimals and percentages			
	A	M	E		Increase and decrease quantities by a percentage; Use both methods: work out the increase/decrease and then add/subtract, or use a multiplier	55	96,99	
9-8	M	E			Solve problems involving percentage change; Understand and use percentage change, including using multipliers.	55,56,59	97,99	
	M	E			Calculate the original value after an increase/decrease using reverse percentages	55,59		
	M	E			Use percentages to solve problems in real-life contexts	59	97-99	
9	E				Set up and solve problems with repeated percentage change; Solve problems regarding compound interest, depreciation of values, and growth/decay	59	99	

*Development of problem solving skills



GCSE Band	Starting Points				Lines BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:	Homework Book Pages		
	4	3	2	1		Delta	Theta	Pi
3-1				A	Use a ruler to draw and measure lines to the nearest millimeter			
				A	Understand the words line segments, intersection, horizontal, vertical and diagonal			
				A	Identify parallel and perpendicular lines			
GCSE Band	Starting Points				Angles BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
3-1				A	Describe position and movement; Use the eight compass directions N, S, E, W, NE, NW, SE, SW			
				A	Name and identify the different types of angles – acute, obtuse, reflex and right			
5-3			A	M	Use ruler and protractor to measure and draw angles to the nearest degree			51
			A	M	Find missing angles on a straight line;			
			A	M	Find missing angles around a point; Use vertically opposite angles to help solve problems			52
		A	M	Understand and know the difference between an interior and exterior angle		67,70	53	
7-5		A	M	E	Find the size of a missing angle in any given triangle			53
		A	M	E	Find the size of missing angles in any given quadrilateral		64	
9-7	A	M	E		Find missing angles in parallel lines; Identify and use alternate, corresponding and allied angles, giving reasons		65	
	A	M	E		Find the interior and exterior angles in polygons given the number of sides		67-68	
9-8	M	E			Use the interior and exterior angles to find the number of sides of a regular polygon		67-68	
GCSE Band	Starting Points				Bearings BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
7-5		A	M	E	Estimate and measure bearings of two points	91		
9-7	A	M	E		Use three-figure bearings	91		
	A	M	E		Solve problems using bearings, including making simple scale drawings	93		
GCSE Band	Starting Points				Construction and Loci BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
7-5		A	M	E	Make scale drawings; Use and interpret maps and scale drawings in the any real-life context	63		
9-7	A	M	E		Construct triangles using a compass, a protractor and a ruler; Be able to construct all three types: SAS, ASA, and SSS	64-65		
9-8	M	E			Use a ruler and compass to make special constructions; Construct perpendicular bisectors, angle bisectors and perpendicular lines from points	66		

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GCSE Band	Starting Points				Shapes	Homework Book Pages		
	4	3	2	1		Delta	Theta	Pi
BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:								
3-1				A	Visualise and identify common 2-D shapes and 3-D solids			
				A	Use Venn and Carroll diagrams to sort and classify shapes based on properties			
5-3			A	M	Use correctly the vocabulary, notation and labelling conventions for shapes; Know the labelling convention for equal sides and parallel sides in shapes			
			A	M	Recognise congruent shapes			
			A	M	Know the definition of a circle and the names of its parts; Be able to draw a circle given its centre and diameter or radius			
7-5		A	M	E	Draw and recognise shapes from their nets	19		13
		A	M	E	Use ruler and protractor to construct simple nets of 3-D shapes, e.g. cuboid, regular tetrahedron, square-based pyramid, triangular prism.	19		13
9-7	A	M	E		Draw plans and elevations of 3-D	19		
	A	M	E		Classify quadrilaterals by their geometric properties Know properties (sides, angles, diagonals and reflection/rotation symmetry) of: isosceles trapezium, parallelogram, rhombus, kite, arrowhead or delta		64	
	A	M	E		Solve geometrical problems involving special triangles and quadrilaterals; Use side and angle properties of equilateral, isosceles and right-angled triangles and special quadrilaterals, explaining reasoning with diagrams and text		66	
9-8	M	E			Use Pythagoras' theorem in right-angled triangle; Including problems where the shorter side needs to be found	25		
	M	E			Solve problems in real-life contexts using Pythagoras' theorem in 2D	25		

*Development of problem solving skills



GCSE Band	Starting Points				Expressions	Homework Book Pages		
					BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:	Delta	Theta	Pi
3-1				A	Use letter symbols to represent unknown numbers or variables;			
5-3				A	Know the meanings of the words: term, expression and equation; Sort given examples between the three types			35
				M	Use letters, numbers and mathematical symbols to write expressions in meaningful contexts; e.g. subtract 4 from a number: $n - 4$, 4 minus a number: $4 - n$, a number multiplied by 2 and then 5 added $(n \times 2) + 5$ or $2n + 5$			
7-5				A	Use a formula expressed in words; Find values given the formula and express the formula algebraically			
				M	Simplify algebraic expressions by multiplying terms and collecting like-terms			33
9-7	A	M		E	Simplify algebraic expressions using index notation; e.g. $3ab^2 \times 2a^3b^2$	10-11	33	
	A	M		E	Multiply a single term over a bracket; Include problems where the single term has multiple letters	12	34	36,38,39
	A	M		E	Factorise simple expressions; 'Reverse' the process of expanding brackets by taking out one common factor from each term in an expression	12	35	
9-8	M	E			Factorise expressions; Solve problems by taking out two common factors from each term in an expression	12,15	35	
	M	E			Expand and simplify linear expressions including negative signs; e.g. Simplify $3(2x - 5) - 2(x + 5)$ by expanding then simplifying	12,15	34	
9	E				Expand the product of two polynomials; Expand and simplify the product of two linear expressions of the form $x \pm n$			
	E				Factorise quadratic expressions of the form $x^2 + bx + c$, including the difference of two squares;			
GCSE Band	Starting Points				Equations			
	4	3	2	1	BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
3-1				A	Begin to understand the role of the 'equals' sign; e.g. $\blacktriangledown + \blacklozenge = 4$. What numbers could \blacktriangledown and \blacklozenge be?			
5-3				A	Solve one-step linear equations with whole number coefficients; Questions with the unknown on one side only and involving one operation		36	35
7-5		A	M	E	Solve two-step linear equations with whole number coefficients; Questions with the unknown on one side only and involving two operations	13	37	40
		A	M	E	Use equations to solve problems in a range of contexts; Construct equations from a given scenario and solve the equation/problem	13,15	37,41	39-40
9-7	A	M		E	Solve more complex, three-step, linear equations; Include equations with brackets and unknown on both sides	15-17		
	A	M		E	Construct and solve more complex linear equations; Include equations with brackets, unknown on both sides and negative signs anywhere in the equation	16-17	41	
9-8	M	E			Solve linear equations with fractional coefficients			
	M	E			Change the subject of a formula by using the same methods as solving equations; Include questions where the subject is on both sides of the formula			
	M	E			Solve simple linear inequalities and represent the solution set on a number line; Use the same techniques as linear equations to solve the inequalities			
9	E				Solve quadratic equations using factorisation where the co-efficient of x^2 is 1			
GCSE Band	Starting Points				Substitution			
	4	3	2	1	BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
7-5	A	M		E	Substitute integers into simple linear expressions and formulae	13		
9-7	M	E			Substitute positive and negative numbers into complex expressions and formulae; Include questions involving brackets and powers	13		

*Development of problem solving skills



GCSE Band	Starting Points				Ratios BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:	Homework Book Pages		
	4	3	2	1		Delta	Theta	Pi
5-3			A	M	Use ratio notation; e.g. given a selection of cubes, write the ratio of red cubes to blue cubes			4
7-5			A	M	Simplify a ratio by cancelling common factors			4
			A	M	Simplify a ratio expressed in different units; e.g. 2 m : 50cm, 450g : 5kg, 500mm : 75cm : 2.5m			4
			A	M	Simplify a ratio expressed in fractions or decimals			
9-7	A	M	E		Divide a quantity into two parts in a given ratio and solve problems; e.g. 28 pupils are going on a visit. They are in the ratio of 3 girls to 4 boys. How many boys are there?		57,58	5-6
	A	M	E		Compare ratios by changing them to the form m : 1 or 1 : m		58	
9-8	M	E			Solve problems with ratios when only part of the information, instead of a total, is known; Potting compost is made from loam, peat and sand in the ratio 7:3:2 respectively. A gardener used 1.5 litres of peat to make compost. How much loam did she use?		58	
	M	E			Solve problems involving ratios in real-life contexts; Consider numerical, algebraic and pictorial solutions to challenging problems. Including examples of bar modelling.		58	
GCSE Band	Starting Points				Proportion BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
5-3			A	M	Convert ratios into fractions of a whole; Use conversion to fractions, decimals or percentages to compare ratios		57	
7-5			A	M	Solve simple problems involving direct proportion; e.g. 3 bars of chocolate cost 90p. How much will six bars cost? 1 litre of fruit drink contains 200 ml of orange juice. How much orange juice is there in 1.5 litres of fruit drink?	32	60	
	A	M	E		Use unitary method to solve problems involving proportion in real-life contexts		58	
9-7	A	M	E		Find the Best Buys; Find the cost per unit weigh and use the above to find which product is the cheaper			
	M	E			Solve direct proportion problems algebraically; Make use of the proportionality sign and constant			
GCSE Band	Starting Points				Rates of Change BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
9-7	A	M	E		Recognise and use the relationship between speed, distance and time; Calculate one variable given the other two.			
	A	M	E		Solve problems involving speed, distance and time in real-life contexts			
9-8	M	E			Solve problems involving other compound measures; Know how to find the density (mass and volume) and pressure (force and area)			

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GCSE Band	Starting Points				Sequences BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:	Homework Book Pages		
	4	3	2	1		Delta	Theta	Pi
3-1				A	Recognise a wider range of sequences; Know and use Fibonacci sequences and the list of triangle numbers.			73
5-3			A	M	Generate simple integer sequences; Explore and predict terms in sequences generated by counting and from flow charts. Generate sequences by multiplying or dividing by a constant factor.			71-72
			A	M	Generate terms of a sequence by looking at differences; Continue sequences and explain in words how the sequence is formed			71-72
7-5		A	M	E	Use rules expressed in words to solve problems with sequences; Generate the first few terms, and any term, of a sequence. Check if a term is in the sequence and explain how you know.			71-72
9-7	A	M	E		Use an algebraic rule for the nth term of a sequence to solve problems; Use the nth term to find the first few or specific terms and test whether given numbers are in a sequence			74-75
	A	M	E		Generate sequences from simple practical contexts; Find the first few terms of the sequence arising from patterns or real-life scenarios. Describe the general term, first using words, then symbols.			76
	A	M	E		Find an algebraic rule for the nth term of a sequence; Use the nth term to find solve problems as above			77
9-8	M	E			Begin to generate a quadratic sequence given an nth term rule			
	M	E			Recognise the difference between an arithmetic and geometric sequence; Understand and use common difference/ratio			
	M	E			Solve problems involving linear sequences in real-life contexts			
9	E				Find the nth term of a sequence where the rule is quadratic			
GCSE Band	Starting Points				Functions BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1		Delta	Theta	Pi
5-3			A	M	Express simple functions in words and using symbols; Explore simple function machines by: finding outputs (y) for different inputs (x) and finding inputs for different outputs. Given inputs and outputs, find the function			34,37
			A	M	Find simple functions given inputs and outputs;			34,37
			A	M	Express one-step functions algebraically			34,37
7-5		A	M	E	Express two-step functions algebraically			
		A	M	E	Represent functions in mapping diagrams; Create diagrams with given outputs/inputs sections and arrows for a given function			
9-7	A	M	E		Find the inverse of a linear function; Use algebra and mapping diagrams			
GCSE Band	Starting Points				Coordinates BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1		Delta	Theta	Pi
5-3			A	M	Use and interpret coordinates in the first quadrant; Given the coordinates of three vertices of a rectangle, find the fourth			
7-5		A	M	E	Use and interpret coordinates in all four quadrants			
		A	M	E	Given the coordinates of points A and B, find the mid-point of the line segment AB			

*Development of problem solving skills



GCSE Band	Starting Points				Graphs BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:	Homework Book Pages		
	4	3	2	1		Delta	Theta	Pi
5-3			A	M	Use a graph to convert one unit to another unit		84,90	
7-5		A	M	E	Recognise straight line graphs parallel to the x-axis or y-axis and $y = x$			
9-7	A	M	E		Plot the graphs of linear functions; By completing a table of values when y is given explicitly in terms of x		85-86	
	A	M	E		Interpret travel graphs; Read information from a travel graph and find an average speed from a travel graph			
	A	M	E		Interpret graphs arising from real situations; e.g. sketch a line graph to show the depth of water against time when water runs steadily from a tap into different types of jars.		90	
9-8	M	E			Draw straight line graphs using the gradient-intercept method; e.g. for $y = 3x - 1$, start at -1 on the y -axis, move one square across and three squares up and mark this point with a dot and repeat again		85-86	
	M	E			Find the gradient of a given line		85	
	M	E			Investigate the gradient of parallel lines		85	
	M	E			Understand and use $y = mx + c$; Know what m and c represent, on a graph and in real-life situations. e.g. y -intercept is the base price and gradient is the price each minute		86	
	M	E			Find the equation of a line by finding its gradient and y -intercept; Use the graphs of straight lines to find m and c , then find the equation of the line		86	
9	E				Find the equation of a line going through one point with a given gradient; Use $y = mx + c$ and the given point to find the variables, or use $y_1 - y_1 = m(x - x_1)$			
	E				Find the equation of a line going through two points; Use $y = mx + c$ and the given point to find the variables, or use $y_1 - y_1 = m(x - x_1)$		86	

*Development of problem solving skills



GCSE Band	Starting Points				Translations BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:	Homework Book Pages		
	4	3	2	1		Delta	Theta	Pi
5-3			A	M	Translate 2-D shapes; Understand translations in words as well as vectors	42		
7-5		A	M	E	Tessellate a 2-D shape			
9	E				Manipulate vectors arithmetically and diagrammatically; Understand addition and subtraction of vectors, multiplication of vectors by a number and diagrammatic and column representation of vectors			
GCSE Band	Starting Points				Reflections BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
3-1				A	Identify line symmetry in patterns and 2-D shapes; Draw lines of symmetry on basic shapes			
				A	Recognise shapes with reflective symmetry			
				A	Reflect 2-D shapes in a mirror line along one side; Be comfortable with both horizontal and vertical mirror lines	42		
5-3			A	M	Reflect 2-D shapes in a diagonal line along one side	42		
9-7	A	M	E		Identify plane symmetry in 3-D shapes			
GCSE Band	Starting Points				Rotations BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
5-3			A	M	Recognise shapes with rotational symmetry			
			A	M	Find the order of rotational symmetry for a 2-D shape			
			A	M	Rotate 2-D shapes in any position given a direction; Understand how the orientation of a shape changes with rotation of 90° or 180°	43		
7-5		A	M	E	Rotate 2-D shapes in any position, given a direction and centre of rotation; Rotate given an angle (90° or 180°), a direction (acw/cw) and a centre of rotation. Understand how to use tracing paper to help rotations.	43		
GCSE Band	Starting Points				Descriptions and Combinations BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
9-7	A	M	E		Describe transformations in simple cases; Write translations as descriptions and vectors, identify the mirror line in a reflection and find the angle, direction or centre of rotation.	46		
	A	M	E		Transform 2-D shapes by combinations of rotations, reflections and translations	46		
	A	M	E		Describe combined transformations	46		
GCSE Band	Starting Points				Enlargements BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
9-7	A	M	E		Enlarge a 2-D shape given a centre of enlargement and a scale factor; Work with positive whole-number scale factors. Know the Ray method, coordinate method and counting squares method.	44-45		
	A	M	E		Describe an enlargement; Find the centre of enlargement and/or the scale factor from the object and image	44-45		
9-8	M	E			Enlarge 2-D shapes, using fractional and negative scale factors	45		
	M	E			Understand and use the effects of enlargement on areas and volumes	46		

*Development of problem solving skills



GCSE Band	Starting Points				Probability BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:	Homework Book Pages		
	4	3	2	1		Delta	Theta	Pi
3-1				A	Understand the basic language of probability; Understand and use descriptions such as impossible/unlikely/even/likely/certain			92
5-3			A	M	Understand that the probability scale runs from 0 to 1; Represent events and descriptions on a probability scale			92,
7-5		A	M	E	Calculate the probability of simple outcomes of events; e.g. Find the probability of picking a red counter			93,94,97
		A	M	E	Find and justify probabilities based on equally likely outcomes in simple contexts; Understand the probabilities are 'number of successes over number of trials'			93-94
		A	M	E	Understand experimental probability; Calculate relative frequencies from experiments and compare experimental and theoretical probabilities in different contexts.	78		95,98
9-7	A	M	E		Identify all the possible mutually exclusive outcomes of a single event; Use the addition rule to find probabilities of outcomes	76		
	A	M	E		Understand and use sample spaces; Find and record all possible outcomes for two events in a systematic way, using diagrams and tables.	79		
	A	M	E		Understand the total probability of all possible outcomes is 1; Calculate the probability of an event happening when the probability that it does not happen is known. Find missing probabilities given a table of outcomes and probabilities.			
	A	M	E		Estimate probabilities from experimental data; Understand that if an experiment is repeated there may be different outcomes and know how to get better estimates of probability.	78		
	A	M	E		Predict the expected number of successes from a given number of trials	82		
9-8		M	E		Recognise the difference between independent and dependent events; Understand and identify mutually exclusive events			
9		E			Use the and/or rule to find the probability of simple combined events	76		
		E			Calculate probabilities of events using tree diagrams and other representations; Solve problems involving independent and dependent events	80-82		

*Development of problem solving skills

May include some lessons/investigations after the exams



GCSE Band	Starting Points				Planning and Collecting Data BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:	Homework Book Pages		
	4	3	2	1		Delta	Theta	Pi
3-1				A	Use Venn Diagrams and Two-Way Tables to sort and classify information			23
5-3				A M	Collect and represent discrete data using tally charts and frequency tables			23
7-5		A	M	E	Collect and represent data using grouped tally charts and frequency tables; Use equal class intervals and discuss appropriate groupings		23	
9-7	A	M	E		Construct frequency tables for gathering continuous data			
	A	M	E		Discuss the use of surveys; Design a survey to capture relevant data from one or more sources. Design a suitable data collection sheet.			
	A	M	E		Design and criticise questions for questionnaires; Understand the requirements; clear, specific, all possibilities and no overlaps. Know about bias in questionnaires.			
	A	M	E		Understand the difference between population and sample; Know the different sampling techniques and discuss limitations. Determine appropriate sample sizes.			
9-8	M	E			Use the data-handling cycle to test a hypothesis			
GCSE Band	Starting Points				Representing Data BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
3-1				A	Read, draw and interpret a simple pictogram			
5-3				A M	Read, draw and interpret a bar chart			24
				A M	Read, draw and interpret a dual bar chart			25
7-5		A	M	E	Read, draw and interpret simple time series (line) graphs		25	
		A	M	E	Construct simple scatter graphs by plotting points		26	
		A	M	E	Construct and interpret pie charts		22,29	26
		A	M	E	Use a stem-and-leaf diagram to find the median, range and mode		24	26
9-7	A	M	E		Construct an ordered stem-and-leaf diagram		24	
	A	M	E		Construct and interpret a back to back stem-and-leaf diagram		24	
	A	M	E		Understand the uses of a scatter diagram; Develop further the understanding of correlation. Draw and use a line of best fit by inspection.		26	
	A	M	E		Construct and use simple two-way tables for discrete data.		28	
9-8	M	E			Construct a frequency polygon for continuous data			
9	E				Construct a cumulative frequency diagram and use it to find the median			
GCSE Band	Starting Points				Interpreting Data BY THE END OF THIS TOPIC YOU WILL BE ABLE TO:			
	4	3	2	1				
3-1				A	Calculate the mode, median and range for small sets of discrete data		28	
5-3				A M	Calculate the mean for a small set of discrete data		28	
7-5		A	M	E	Find the modal class and range from a grouped table of continuous data		28	
9-7	A	M	E		Compare different sets of data using the mean and the range		28	
	A	M	E		Calculate the mean, median and mode from a frequency table of discrete data			
9-8	M	E			Calculate an estimate of the mean from a grouped table of continuous data			
	M	E			Find the median and modal class from a grouped table			
	M	E			Understand the advantages and disadvantages of each type of average; Decide which average to use in different situations.			
9-7	E				Use averages and range of different sets of data to make conclusions			

*Development of problem solving skills

Includes investigations after the exams