Fulford School – Department of Mathematics

A Scheme – NUMBER

Honesty
Empathy
Ambition
Respect
Tolerance

	Y7 students should be able to...	Y8 students should be able to...	Y9 students should be able to...	Y10 students should be able to...
1. Equivalence	Compare and order integers, fractions, and decimals Convert between improper fractions and mixed numbers Convert between simple fractions, decimals, and percentages Represent integers, fractions, and decimals on a number line	Convert fluently between fractions, decimals, and percentages Express one number as a fraction of percentage of another		
2. Calculations	Create equivalent fractions Find a fraction of a given amount Find a percentage of a given amount Represent any fraction as a diagram Simplify fractions Understand fractions as division Use a known calculation to perform a related calculation Use formal methods for the addition and subtraction of fractions Use formal methods for the addition, subtraction, multiplication, and division of integers and decimals	Calculate fractions, decimals, and percentages of amounts, with or without a calculator Understand and use the reciprocal Use a decimal multiplier to find a percentage Use a decimal multiplier to increase or decrease a number by a percentage Use formal methods for the multiplication and division of improper fractions	Calculate simple and compound interest, and depreciation Calculate the percentage change from one number to another Calculate wages and taxes Solve “original value” problems	Calculate a repeated percentage change Solve “original value” problems
3. Types of number	Find common factors of a set of numbers, including the HCF Find common multiples of a set of numbers, including the LCM Identify prime, square, and triangular numbers Write a number as a product of its prime factors			
4. Estimation	Round a number to 1 significant figure Round integers to the nearest power of ten Use estimation as a method for checking calculations	Estimate the answer to a calculation using number sense Round a number to a given number of decimal places		
5. Numbers in day-to-day life	Solve simple financial maths problems, including with bills and bank statements	Solve problems involving time and the calendar		
6. Order of operations	Understand and use the order of operations, including with directed number			
7. Directed number	Use formal methods for the addition, subtraction, multiplication, and division of directed number			
8. Standard form		Add and subtract numbers given in standard form Compare and order numbers in standard form Express any number in standard form Multiply and divide numbers given in standard form		

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B Scheme – NUMBER

	Y7 students should be able to...	Y8 students should be able to...	Y9 students should be able to...	Y10 students should be able to...
1. Equivalence				Convert recurring decimals to fractions
2. Calculations	Solve problems with fractions greater than 1 and percentages greater than 100% Use a given fraction to find the whole and/or other fractions	Solve "original value" problems Use formal methods for the multiplication an division of mixed numbers	Solve problems with repeated percentage change	
3. Types of number		Understand and use negative indices		Simplify surds
4. Estimation		Understand and use error interval notation		
5. Numbers in day-to-day life				
6. Order of operations				
7. Directed number				
8. Standard form	Express numbers above 1 in standard form			

C Scheme – NUMBER

1. Equivalence				
2. Calculations	Find a percentage of a given amount using a calculator	Calculate the percentage change from one number to another Use formal methods for the multiplication and division of simple algebraic fractions		
3. Types of number	Use a Venn diagram to calculate the HCF and LCM	Understand and use fractional indices	Define the sets of integers, real numbers, and rational numbers Simplify surds	Rationalise surds Recognise exponential growth and decay, and their graphs Solve an indices problem by changing bases Understand and use combinations of negative and fractional indices Use bounds (including with truncation) to solve limits of accuracy problems
4. Estimation				
5. Numbers in day-to-day life				
6. Order of operations				
7. Directed number	Use a calculator for directed number calculations			
8. Standard form	Add and subtract numbers given in standard form Express numbers between 0 and 1 in standard form			

Fulford School – Department of Mathematics

A Scheme – ALGEBRA

Honesty
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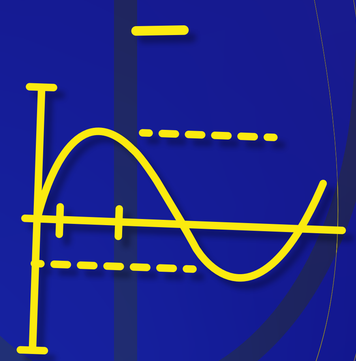
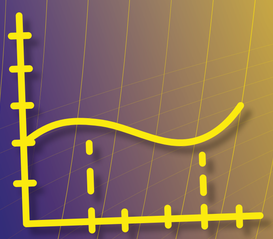
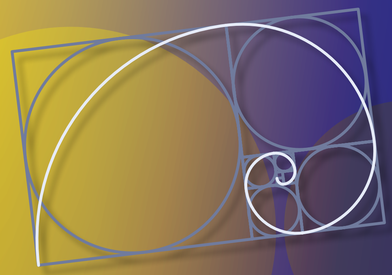
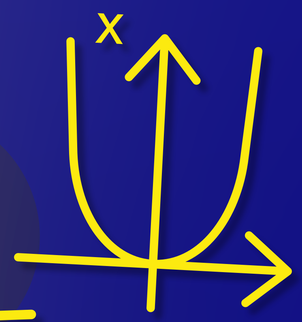
Tolerance

	Y7 students should be able to...	Y8 students should be able to...	Y9 students should be able to...	Y10 students should be able to...	Y11 students should be able to...
1. Algebraic manipulation	Collect like terms Substitute values into one- and two-step expressions Understand and use simple algetbraic notation Understand the meaning of equality and equivalence	Expand a pair of brackets Expand a single bracket Factorise into a single bracket Form algebraic expressions Simplify algebraic expressions by multiplying and dividing indices Understand the difference between equations, expressions, formulae, and identities Use the addition and subtraction laws for indices	Rearrange one-step formulae	Rearrange two-step formulae Solve prolems with basic algebraic fractions Understand and use the basic laws of indices	
2. Solving	Solve one- and two-step equations Understand and use “fact families” Understand and use function machines	Solve equations with brackets Solve simple inequalities	Represent inequalities on a number line Solve equations and inequalities with unknowns on both sides Solve inequalities with negative coefficients	Solve two-part inequalities	Factorise and solve quadratics where a=1 Form and solve linear simultaneous equations
3. Sequences	Continue a sequence and find missing terms within a sequence Describe a sequence using the term-to-term rule Understand the difference between a linear and a non-linear sequence	Find the nth term of a linear sequence Generate a sequence given a rule in words or algebraically		Find the nth term of a linear sequence Recognise Fibonacci, geometric, and quadratic sequences, and find a specific term of these	
4. Algebraic graphs		Calculate a positive gradient Identify and draw lines that are parallel to the axes Plot graphs of the form y=mx+c using a table of values Recognise lines of the form y=kx and y=x+a Work with coordinates in all four quadrants	Compare the gradients and intercepts of lines Understand and use y=mx+c	Find the equation of a line, given two points on the line	Plot quadratic graphs using a table of values Recognise cubic and reciprocal graphs
5. Conjectures and proof	Make and test simple conjectures		Determine whether a simple statement is always, sometimes, or never true		



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B Scheme – ALGEBRA

	Y7 students should be able to...	Y8 students should be able to...	Y9 students should be able to...	Y10 students should be able to...	Y11 students should be able to...
1. Algebraic manipulation	Add and subtract simple algebraic fractions Evaluate algebraic expressions with directed number	Expand muliple single brackets and simplify	Rearrange two-step formulae	Add, subtract, multiply, and divide algebraic fractions Factorise quadratics using the difference of two squares Factorise quadratics, including where a≠1 Rearrange complex formulae (where factorising is necessary) Understand and use fractional indices	
2. Solving		Form and solve equations and inequalities with one unknown	Use a graph to solve simultaneous equations	Solve linear simultaneous equations algebraically and graphically	Factorise and solve quadratics by completing the square Solve linear inequalities graphically Solve quadratics by factorising Solve quadratics by using the difference of two squares Solve quadratics by using the quadratic formula
3. Sequences					
4. Algebraic graphs		Calculate a negative gradient Link graphs to direct proportion Link graps to sequences	Find the equation of a line from its graph Plot quadratic graphs using a table of values Recognise the graphs of reciprocal and piece-wise functions	Find the solutions and turning point of a quadratic graph by inspection	Find the turning point of a quadratic graph by completing the square
5. Conjectures and proof	Use counterexamples to disprove a conjecture				

C Scheme – ALGEBRA

1. Algebraic manipulation	Identify factors of expressions Perform multiplication and division in algebraic expressions Use fractions in simple algebraic contexts	Use the power of a power law for indices	Rearranged complex formulae (where factorising is necessary)		Work with functions, including composite and inverse
2. Solving		Form and solve equations and inequalities with unknowns on both sides		Factorise and solve quadratics by completing the square Solve quadratics by factorising Solve quadratics by using the difference of two squares Solve quadratics by using the quadratic formula	Solve simultaneous equations where one or both are non-linear Understand iteration and its applications
3. Sequences					
4. Algebraic graphs		Find the midpoint of a line segment	Know that the gradients of perpendicular lines multiply to -1 Represent inequalities as regions on coordinate axes	Find the equation of a tangent to a circle Find the equation of parallel and perpendicular lines Find the turning point of a quadratic graph by completing the square Know and apply the formula for the equation of a circle (with centre the origin) Recognise the graphs of trigonometric functions	Describe and perform transformations of graphs given in function notation
5. Conjectures and proof					Prove by deduction

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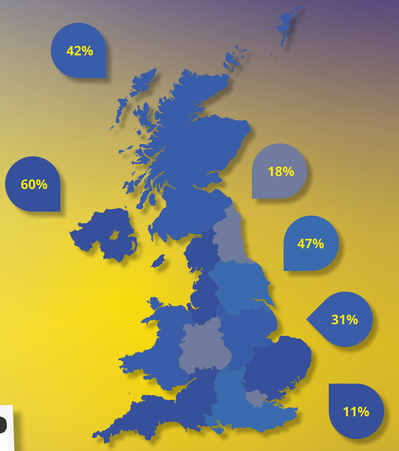
A Scheme – RATIO AND PROPORTION

	Y8 students should be able to...	Y9 students should be able to...	Y10 students should be able to...	Y11 students should be able to...
1. Ratio	Divide in a given ratio Interpret and create scale drawings Express ratios in the form 1:n or n:1 Express ratios in their simplest integer form Interpret maps using scale factors Understand and use ratio notation Understand gradient as a ratio Understand pi as a ratio			Solve ratio problems given in the form a:b and b:c
2. Proportional reasoning	Compare ratios and fractions Convert between currencies Interpret and create conversion graphs	Solve "best buy" problems Use the unitary method to solve proportion problems		
3. Direct and inverse proportion	Solve problems using numerical direct proportion	Interpret gradients and intercepts of "real life" graphs Solve problems using numerical inverse proportion		
4. Compound measures		Solve density, mass, volume problems Solve speed, distance, time problems		Interpret and draw distance-time graphs Solve pressure, force, area problems



B Scheme – RATIO AND PROPORTION

1. Ratio	
2. Proportional reasoning	
3. Direct and inverse proportion	Solve problems using algebraic direct and inverse proportion Understand the capture-recapture method and its applications
4. Compound measures	

C Scheme – RATIO AND PROPORTION

1. Ratio		Solve problems that combine ratio and algebra
2. Proportional reasoning		
3. Direct and inverse proportion	Recognise graphs of direct proportion	Model "real life" situations graphically Recognise graphs of inverse proportion Solve flow problems and recognise their graphs
4. Compound measures		Convert between compound units

Fulford School – Department of Mathematics

A Scheme – GEOMETRY AND MEASURE

Honesty
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REALISING POTENTIAL
FULFORD SCHOOL
CREATING THE FUTURE

	Y7 students should be able to...	Y8 students should be able to...	Y9 students should be able to...	Y10 students should be able to...	Y11 students should be able to...
1. Angles and bearings	Classify angles Measure and draw angles Understand and use the equality of vertically opposite angles Understand and use the sum of angles at a point and on a straight line Understand and use the sum of angles in a triangle and in a quadrilteral	Find the sum of the interior angles in any polygon Understand and use parallel line angle rules Use the sum of exterior angles of a polygon	Solve angle problems in an algebraic context Solve complex (multi-step) angle problems	Measure and draw bearings	
2. Shape properties and conventions	Identify parallel and perpendicular lines Identify polygons up to a decagon Recognise the different types of triangles and quadrilaterals Understand and use letter and labelling conventions in geometry	Identify the parts of a circle Recognise line symmetry Understand and use the properties of special quadrilterals	Understand the language of faces, edges, and vertices		Identify congruent triangles using SSS, SAS, ASA, and RHS Test simple conjectures with angles and shapes
3. Space and measure	Calculate the area of rectangles, parallelograms, and triangles Calculate the perimeter of any shape Convert between metric units of lengths	Calculate the area of circles Calculate the area of trapezia Calculate the circumference of circles Calculate the perimeter and area of compound shapes (without circles) Convert between metric units of weight and capacity	Calculate the area of compound shapes (with circles) Calculate the surface area of cubes, cuboids, and triangular prisms Calculate the volume of cubes, cuboids, prisms, and cylinders	Calculate the perimeter and area of sectors Calculate the surface area of prisms and cylinders Calculate the volume of pyramids, cones, and spheres	
4. Constructions and loci	Construct SSS, SAS, and ASA triangles Measure and draw line segments	Construct a perpendicular bisector of a line segment Construct an angle bisector	Draw accurate nets of cuboids and other 3D shapes Draw plans and elevations of 3D shapes Find the locus equidistant from two points Find the locus of distance from a point, one straight line, and two straight lines		
5. Transformations and vectors		Find missing lengths in similar shapes using scale factors Reflect a shape in a horizontal or vertical line	Enlarge a shape by a positive integer scale factor Identify the order of rotational symmetry of a shape Rotate a shape about a point Translate a shape using a vector		Find and describe the result of a series of transformations Perform simple vector arithmetic Represent a vector as a diagram Solve simple geometric problems with vectors
6. Pythagoras' theorem and trigonometry			Calculate any missing side in a right-angled triangle using Pythagoras' theorem Determine whether or not a triangle is right-angled using Pythagoras' theorem		Find the missing side or angle of a right-angled triangle using trigonometry (SOHCAHTOA) Know the exact trigonometric values

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B Scheme – GEOMETRY AND MEASURE

	Y7 students should be able to...	Y8 students should be able to...	Y9 students should be able to...	Y10 students should be able to...	Y11 students should be able to...
1. Angles and bearings				Know and apply the circle theorems	
2. Shape properties and conventions		Understand and use the properties of diagonals of quadrilaterals			Prove congruency and similarity
3. Space and measure	Calculate the area of trapezia	Calculate the perimeter and area of compound shapes (with circles) Convert between metric units of area and volume			
4. Constructions and loci	Construct complex polygons		Identify congruent shapes		
5. Transformations and vectors		Reflect a shape in a diagonal line	Enlarge a shape by a positive fractional scale factor Find the result of a series of transformations		Enlarge a shape by a negative scale factor Solve parallel and ratio vector problems
6. Pythagoras' theorem and trigonometry			Use Pythagoras' theorem on coordinate axes	Find the missing side or angle of a right-angled triangle using trigonometry (SOHCAHTOA) Know the exact trigonometric values	Know and apply the sine and cosine rules, and the formula for the area of a triangle

C Scheme – GEOMETRY AND MEASURE

1. Angles and bearings	Solve angle problems using properties of triangles and quadrilaterals Solve complex (multi-step)angle problems Understand and use parallel line angle rules		Apply trigonometric reasoning to circle theorem problems Solve problems of elevation and depression	Prove the circle theorems
2. Shape properties and conventions		Identify congruent triangles using SSS, SAS, ASA, and RHS Test simple conjectures with angles and shapes		
3. Space and measure		Calculate the surface area of cylinders Calculate the volume of cones, pyramids, and spheres		
4. Constructions and loci				
5. Transformations and vectors				Produce a geometric proof using vectors
6. Pythagoras' theorem and trigonometry		Apply Pythagoras' theorem in 3D		Combine Pythagoras' theorem with trigonometry, and apply both in 3D

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A Scheme – STATISTICS AND PROBABILITY

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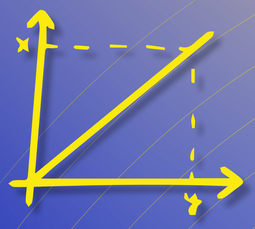
FULFORD SCHOOL
CREATING THE FUTURE

	Y7 students should be able to...	Y8 students should be able to...	Y9 students should be able to...	Y10 students should be able to...	Y11 students should be able to...
1. Probability and sets	Calculate the probability of a single event Identify and represent sets Interpret Venn diagrams Know and use the vocabulary of probability Know that the sum of probabilities for all possible outcomes is 1 Understand and use the intersection and union of sets Understand and use the probability scale	Find probabilities from sample spaces, two-way tables, and Venn diagrams Generate a sample space for multiple events Interpret and create two-way tables	Calculate an expected outcome Understand the concept of relative frequency		Create a Venn diagram and use it to calculate probabilities Interpret and draw tree diagrams of independent and dependent events
2. Averages and the range	Find the mean of a set of numbers Find the median of a set of numbers Find the mode of a set of numbers Find the range of a set of numbers	Use the mean, median, and mode in context		Find the mean from an ungrouped frequency table, and estimate the mean from a grouped frequency table	
3. Statistical graphs, charts, and tables	Interpret and create frequency trees Interpret and create single bar charts Interpret and draw line graphs Interpret pie charts using proportional reasoning Solve problems involving tables and timetables	Interpret and create ungrouped and grouped frequency tables Interpret and draw multiple bar charts Interpret and draw pictograms Interpret and draw pie charts Interpret and draw scatter graphs Understand and describe linear correlation Use and draw a line of best fit		Interpret and draw a frequency polygon Interpret and draw a pie chart Interpret and draw a stem and leaf diagram	
4. Types of data and sampling techniques		Identify the different types of data Understand and replicate the data handling cycle		Know the different sample techniques and their advantages/disadvantages	



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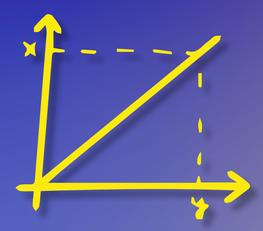
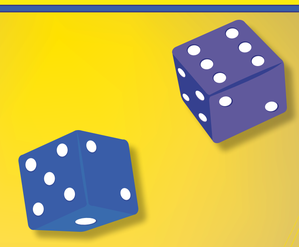
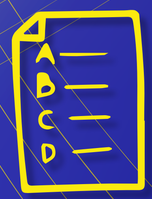
B Scheme – STATISTICS AND PROBABILITY

	Y7 students should be able to...	Y8 students should be able to...	Y9 students should be able to...	Y10 students should be able to...	Y11 students should be able to...
1. Probability and sets	Generate a sample space for a single event	Use the product rule for counting	Interpret tree diagrams of independent events	Use the product rule for counting	
2. Averages and the range		Choose the most appropriate average for a given context Compare distributions using averages and the range Find the mean from an ungrouped frequency table			
3. Statistical graphs, charts, and tables		Choose the most appropriate diagram for a given context Compare distributions using charts Identify misleading graphs Identify non-linear relationships Identify outliers		Interpret and draw a box plot Interpret and draw a cumulative frequency diagram Interpret and draw a histogram	
4. Types of data and sampling techniques					





C Scheme – STATISTICS AND PROBABILITY

1. Probability and sets	Understand and use the complement of a set		Interpret and draw tree diagrams of independent and dependent events	Interpret and draw Venn diagrams for conditional probability
2. Averages and the range		Estimate the mean from a grouped frequency table		
3. Statistical graphs, charts, and tables	Draw pie charts Interpret pie charts using a protractor			
4. Types of data and sampling techniques		Represent continuous data