St George's School
Mathematics and Computing Faculty
Year 9 Curriculum Map for MATHEMATICS

HIGHER	**Autumn 1**	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
THE BIG IDEAS & KNOWLEDGE *Overview of topics or key questions*	Calculations, checking and rounding; Indices, roots, reciprocals and hierarchy of operations; Factors, multiples, primes, standard form and surds; Algebra: the basics, setting up, rearranging and solving equations	Sequences; Averages and range; Representing and interpreting data and scatter graphs	Fractions and percentages; Ratio and proportion	Polygons, angles and parallel lines; Pythagoras' theorem and trigonometry	Linear graphs and coordinate geometry; Graphs: the basics and real-life graphs	Quadratic, cubic and other graphs; Perimeter, area and circles
SKILLS & STRATEGIES *Procedural knowledge, literacy and numeracy skills*	Creativity is developed in lessons by exploring concepts through different visual representations. The students are sometimes tasked with open-ended problems whereby there are multiple solutions possible. Our students may also at times be asked to problem-pose whereby they come up with their own question for a peer to solve. Our department looks to encourage flexible thinking in lessons through effective questioning. Critical thinking skills are developed as we nurture a classroom culture in which mathematical discussion is part of the daily routine. We also at times use open-ended questions and present problems for which our students have no predetermined solution strategy. Communication skills are developed in every lesson through group discussions. The examples chosen to probe such discussion have been carefully selected in advance in order to increase the fruitfulness of conversation. Collaboration skills are developed during our allocated Extension and Enrichment lessons as our students work in groups of between two and four to tackle various problem-solving style questions. Reasoning skills are developed in lessons through our teachers asking their students to conjecture abstract generalised techniques from an initial visual methodological approach. We always encourage our students to focus on 'why does this work' as opposed to 'how does this work'. Reflection skills are encouraged through tasks at the end of each lesson which can take various different forms. Students are encouraged to spend time reflecting upon their teacher's feedback following an end-of-topic homework or year-group assessment. During times where multiple solutions are possible, a discussion is encouraged among our students as to the benefits and drawbacks. Problem-solving skills are developed through the more challenging questions in each lesson, but also through tackling questions during the allocated Extension and Enrichment lessons. Our students are encouraged to use different strategies such as visualising the problem, working backwards, working systematically, reasoning logically and looking for patterns.					

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
FEEDBACK *Noteworthy tasks and assessments*	Separate end of topic preps	Separate end of topic preps Year-group checkpoint	Separate end of topic preps	Separate end of topic preps Year-group checkpoint	Separate end of topic preps	Separate end of topic preps Year-group checkpoints
BREADTH *Opportunities, trips, wider reading, cultural capital*	"The Indisputable Existence of Santa Claus: The Mathematics of Christmas" by Dr Thomas Oleron Evans and Hannah Fry "Today Programme: Puzzle Book 2" by BBC Radio 4			UKMT Intermediate Maths Challenge	"1089 and All That" by David Acheson "Alex's Through the Looking Glass" by Alex Bellos	
KEY VOCABULARY *Important words and phrases*	Integer, number, digit, negative, decimal, addition, subtraction, multiplication, division, remainder, operation, estimate, power, roots, factor, multiple, primes, square, cube, even, odd, surd, rational, irrational standard form, simplify, Expression, identity, equation, formula, substitute, term, 'like' terms, index, power, negative and fractional indices, collect, substitute, expand, bracket, factor, factorise, quadratic, linear, simplify, approximate.	Arithmetic, geometric, function, sequence, *n*th term, derive, Mean, median, mode, range, average, discrete, continuous, qualitative, quantitative, data, scatter graph, line of best fit, correlation, positive, negative, sample, population, stem and leaf, frequency, table, sort, pie chart, estimate.	Addition, subtraction, multiplication, division, fractions, mixed, improper, recurring, reciprocal, integer, decimal, termination, percentage, VAT, increase, decrease, multiplier, profit, loss, ratio, proportion, share, parts.	Quadrilateral, angle, polygon, interior, exterior, proof, tessellation, symmetry, parallel, corresponding, alternate, co-interior, vertices, edge, face, sides, Pythagoras' Theorem, sine, cosine, tan, trigonometry, opposite, hypotenuse, adjacent, ratio, elevation, depression, segment, length.	Coordinate, axes, 3D, Pythagoras, graph, speed, distance, time, velocity, linear, circle, approximate, gradient, perpendicular, parallel, equation.	Quadratic, solution, root, function, triangle, rectangle, parallelogram, trapezium, area, perimeter, formula, length, width, polygon, circle, segment, arc, sector, circumference, radius, diameter, pi, composite.

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FOUNDATION	**Autumn 1**	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
THE BIG IDEAS & KNOWLEDGE *Overview of topics or key questions*	Integers and place value; Decimals; Indices, powers and roots; Factors, multiples and primes; Algebra: the basics	Expressions and substitution into formula; Tables, charts and graphs	Stem and leaf diagrams and pie charts; Scatter graphs; Fractions, decimals and percentages	Percentages; Equations and inequalities	Sequences; Properties of shapes, parallel lines and angle facts; Interior and exterior angles of polygons	Statistics, sampling and the averages
SKILLS & STRATEGIES *Procedural knowledge, literacy and numeracy skills*	Creativity is developed in lessons by exploring concepts through different visual representations. The students are sometimes tasked with open-ended problems whereby there are multiple solutions possible. Our students may also at times be asked to problem-pose whereby they come up with their own question for a peer to solve. Our department looks to encourage flexible thinking in lessons through effective questioning. Critical thinking skills are developed as we nurture a classroom culture in which mathematical discussion is part of the daily routine. We also at times use open-ended questions and present problems for which our students have no predetermined solution strategy. Communication skills are developed in every lesson through group discussions. The examples chosen to probe such discussion have been carefully selected in advance in order to increase the fruitfulness of conversation. Collaboration skills are developed during our allocated Extension and Enrichment lessons as our students work in groups of between two and four to tackle various problem-solving style questions. Reasoning skills are developed in lessons through our teachers asking their students to conjecture abstract generalised techniques from an initial visual methodological approach. We always encourage our students to focus on 'why does this work' as opposed to 'how does this work'. Reflection skills are encouraged through tasks at the end of each lesson which can take various different forms. Students are encouraged to spend time reflecting upon their teacher's feedback following an end-of-topic homework or year-group assessment. During times where multiple solutions are possible, a discussion is encouraged among our students as to the benefits and drawbacks. Problem-solving skills are developed through the more challenging questions in each lesson, but also through tackling questions during the allocated Extension and Enrichment lessons. Our students are encouraged to use different strategies such as visualising the problem, working backwards, working systematically, reasoning logically and looking for patterns.					

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BREADTH *Opportunities, trips, wider reading, cultural capital*	"The Indisputable Existence of Santa Claus: The Mathematics of Christmas" by Dr Thomas Oleron Evans and Hannah Fry "Today Programme: Puzzle Book 2" by BBC Radio 4			UKMT Intermediate Maths Challenge	"1089 and All That" by David Acheson "Alex's Through the Looking Glass" by Alex Bellos	
KEY VOCABULARY *Important words and phrases*	Integer, number, digit, negative, decimal, addition, subtraction, multiplication, division, remainder, operation, estimate, power, roots, factor, multiple, primes, square, cube, even, odd, surd, simplify, highest common factor, lowest common multiple, expression, identity, equation, formula, index, power, collect.	Substitute, term, like terms, expand, bracket, factor, factorise, quadratic, linear, simplify, approximate, mean, median, mode, range, average, discrete, continuous, qualitative, quantitative, data, frequency, table, sort, pie chart, estimate.	Correlation, scatter graph, line of best fit, sample, population, stem and leaf diagram, fractions, mixed number, proper, improper, recurring, reciprocal, integer, decimal, termination, percentage.	VAT, increase, decrease, multiplier, profit, loss, ratio, proportion, share, parts.	Arithmetic sequence, geometric, function, sequence, nth term, derive, triangle, rectangle, parallelogram, trapezium, area, perimeter, length, width, polygon, circle, segment, arc, sector, circumference, radius, diameter, pi, composite, quadrilateral, angle, polygon, interior, exterior, proof, tessellation, symmetry, parallel, corresponding, alternate, co-interior, vertices, edge, face, sides, Pythagoras' theorem, hypotenuse.	Bivariate data, census, population, sample, average, outlier, bias.