

CURRICULUM AND ASSESSMENT PLAN

MATHS

YEAR 7

INTENT

In maths we have a spiral curriculum that is aimed at developing a love of and confidence for maths, giving students the tools to apply their mathematical knowledge and build resilience when solving problems in a range of situations. In Year 9 they continue mastering the essential mathematical skills to enable them to experience success and enjoyment of the subject, taking this passion forward into KS4 and beyond.

	Prior learning	The curriculum is designed so students will review topics taught from primary school, with interleaving learning to support the recall and retention of previously learned content.
	Conscious curriculum links	Consistent methods will be used across departments. Links can be made with science, geography, IT, engineering and PE.
	Extra-curricular	The UKMT run a variety of challenges throughout the year for students to get a wider knowledge and challenge their maths ability. Homework club will run throughout the year where students can get any help with their Sparx Maths work. π Day is marked with competitions each year.

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC/KNOWLEDGE	Students will consolidate number skills from primary school. Students will deepen their understanding and strengthen their skills. (NP 1, 2) All students will know: Writing integers in words. Placing integers and decimals on a number line. Ordering integers, decimals and negatives. Multiplying and dividing by powers of 10. Rounding (including decimal places and significant figures). Addition and subtraction of integers and decimals. Zero Pairs.	Students will focus on a range of number topics. (NP 2, 3) All students will know: Multiplication facts. Multiples and lowest common multiple. Multiplying and dividing integers and decimals. Factors and highest common factor.	Students will focus on a range of number topics. (NP 4, 5) All students will know: Powers and roots. Index laws with numbers. Prime numbers. Prime factors. Product of primes. Order of operations (including powers and brackets).	Students will focus on a range of number topics. Students will begin to explore the initial concepts of algebra. (NP 6, A 1) All students will know: Negative numbers in context and on a number line. Four operations with directed number. Powers of negative numbers. Generalising number to algebra. Introduce the concept of an unknown variable. Simplify simple linear expressions. Introduce the concept of solving an equation. Simple substitution.	Students will focus on a range of number topics. (NP 7, 8) All students will know: Identifying fractions. Converting between mixed and improper fractions. Equivalent fractions. Simplifying fractions. Ordering fractions. Adding and subtracting fractions. Finding fractions of amounts. Multiplying and dividing fractions. Equivalence of fractions, decimals and percentages. Converting and ordering fractions, decimals and percentages.	Students will focus on a range of number topics. (NP 8, GM 1) All students will know: Recognising recurring and terminating decimals. Finding percentages of amounts. Using decimal multipliers to find percentages of amounts, including increases and decreases. Use of a ruler and a protractor. Recognising and naming types of angles. Measuring and drawing angles. Using ruler and compass for construction of circles, arcs, angles and triangles.
SKILLS	Throughout every single topic in maths, students will apply problem solving techniques where applicable. Written and verbal communication will be applied through the course. Students will need to think logically and work accurately to find solutions. Applications of topics to contextual and geometrical problems will happen throughout most topics. Students will think critically, evaluating mathematical arguments and using mathematical data to ensure informed decision-making.					
ASSESSMENT	During lessons, teachers will assess students' understanding through directed questioning, using mini-whiteboards for instant feedback and live marking in lesson so teachers can adapt and help students progress. Every two weeks, students will sit a low-stakes quiz consisting of 10 questions which will assess students on the topics they have been taught over the two weeks, with some topics from previous weeks too as a way of helping with retention and assess students' knowledge. Every 6 – 8 weeks, students will sit a summative assessment based on topics they have been taught this year and from previous years. This will be teacher marked, and feedback will be given through a personalised question level analysis where students will be able to see what topics they are strong on and what topics they will need to work on to help them progress. Students will also sit a mid year assessment and an end of year assessment. This will be a common assessment across all OAT academies so we can assess where students are with the curriculum and can compare across the trust.					
VOCAB	Integer, natural numbers, round, placeholder, significant figures, sum, difference, summand, minuend, subtrahend, vector, complement, inverse, commutative, associative	Product, multiplier, multiplicand, commutative, associative, distributive, multiple, lowest common multiple (LCM), quotient, divisor, dividend, factor, highest common factor (HCF), coprime	Power, exponent, base, index, square, cube, root, surd, prime, commutative	Additive inverse, zero pair, unknown, term, expression, equation, variable, constant, identity	Numerator, denominator, proper, improper, coprime, complement, reciprocal, equivalent, recurring, terminating	Point, line, segment, ray, vertex, angle, acute, obtuse, reflex, circle, arc, construct, congruent, bisector, equidistant

READING SKILLS

Decoding, fluency, vocabulary, prior knowledge and summarising will all be necessary for this year.

CAREERS LINKS

Studying mathematics opens up a range of sectors such as IT, finance, engineering, space science and teaching.
Accountant, Actuary, Data Scientist, Financial Manager, Engineering, Financial Analyst, Operations Researcher, Quantity Surveyor, Software Engineer, Data Analyst...

CORE

Students will apply the skills they develop in maths to real life problems. They will think logically about different situations and solve problems. Students will learn about other mathematical skills to use in the real world such as budgeting, tax, bank interest/depreciation.

SUPPORTING STUDENTS AT HOME

Sparx Maths will continue to be our homework platform for your school journey. You will get compulsory homework every week. Along with this you can do as much independent learning as you like to support your learning in the classroom.

CURRICULUM AND ASSESSMENT PLAN

MATHS

YEAR 8

INTENT

In maths we have a spiral curriculum that is aimed at developing a love of and confidence for maths, giving students the tools to apply their mathematical knowledge and build resilience when solving problems in a range of situations. In Year 9 they continue mastering the essential mathematical skills to enable them to experience success and enjoyment of the subject, taking this passion forward into KS4 and beyond.

	Prior learning	The curriculum is designed so students will review topics taught from primary school, with interleaving learning to support the recall and retention of previously learned content.
	Conscious curriculum links	Consistent methods will be used across departments. Links can be made with science, geography, IT, engineering and PE.
	Extra-curricular	The UKMT run a variety of challenges throughout the year for students to get a wider knowledge and challenge their maths ability. Homework club will run throughout the year where students can get any help with their Sparx Maths work. π Day is marked with competitions each year.

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC/KNOWLEDGE	Students will focus on a range of number topics. (NP 8, 9) All students will know: Adding and subtracting fractions. Finding fractions of amounts. Multiplying and dividing fractions. Using decimal multipliers to find percentages of amounts, including increases and decreases. Use of a calculator. Using timetables. Metric and imperial conversions using approximations. Approximating powers and roots. Error intervals. Estimating answers to calculations.	Students will focus on a range of algebra topics to deepen their understanding. (A 2, 3, 4) All students will know: Algebraic notation for multiplication and division. Simplifying expressions using multiplication and division. Simplifying expressions using index laws. Expanding a term across a single bracket. Factorising into a single bracket. Expanding the product of two brackets. Understanding equality and balancing. Using formal solving steps to solve equations, including unknowns on both sides.	Students will focus on a range of number and geometry topics. (NP 10, GM 2) All students will know: Recognise and work with direct and inverse proportion. Compare quantities; best value, exchange rates, etc. Scale recipes up and down. Calculate percentage increases and decreases using decimal multipliers. Find a percentage change.	Students will begin to explore statistics and data handling. (SP 1) All students will know: The data handling cycle, including creating and testing a hypothesis using statistical diagrams and calculations. Recognise and interpret categorical (qualitative) data, and numerical (quantitative) data. Represent categorical data in bar charts, pictograms and pie charts. Working with discrete data, bar charts, pie charts, pictograms, stem and leaf. Measures of central tendency (mean, mode, median) and spread (range, recognise outliers by sight).	Students will focus on a range of number, algebra and statistics topics. (NP 11, A 5, SP 2) All students will know: Using ratio notation, expressing relationships using ratios and fractions. Simplifying ratios, including $n:1$ and $1:n$. Scale drawings and maps. Calculating parts of a ratio given other parts or the whole. Drawing and using ratio diagrams. Using ratio tables to solve a range of problems. Substitution into expressions and formulae. Writing common formulae in words and symbols (SDT/DMV/PFA). Changing the subject of a formula.	Students will focus on a range of algebra topics. (A6) All students will know: Reading and plotting coordinates on a Cartesian grid. Using and finding vectors. Midpoint of a line segment. Expressing number relationships algebraically and graphically. Reading values from a graph. Drawing and recognising graphs of $y = n$, $x = n$ Finding integer gradients using 1 across, 'm' up/down. Writing an equation of a line in the form $y = mx + c$.
SKILLS	Throughout every single topic in maths, students will apply problem solving techniques where applicable. Written and verbal communication will be applied through the course. Students will need to think logically and work accurately to find solutions. Applications of topics to contextual and geometrical problems will happen throughout most topics. Students will think critically, evaluating mathematical arguments and using mathematical data to ensure informed decision-making.					
ASSESSMENT	During lessons, teachers will assess students' understanding through directed questioning, using mini-whiteboards for instant feedback and live marking in lesson so teachers can adapt and help students progress. Every two weeks, students will sit a low-stakes quiz consisting of 10 questions which will assess students on the topics they have been taught over the two weeks, with some topics from previous weeks too as a way of helping with retention and assess students' knowledge. Every 6 – 8 weeks, students will sit a summative assessment based on topics they have been taught this year and from previous years. This will be teacher marked, and feedback will be given through a personalised question level analysis where students will be able to see what topics they are strong on and what topics they will need to work on to help them progress. Students will also sit a mid year assessment and an end of year assessment. This will be a common assessment across all OAT academies so we can assess where students are with the curriculum and can compare across the trust.					
VOCAB	Equivalent, recurring, terminating, round, surd, upper bound, lower bound, error interval, inequality	Expression, term, coefficient, variable, constant, monomial, binomial, polynomial, expand, factor, highest common factor (HCF), factorise	Proportion, scale factor, direct, inverse, value, increase, decrease, profit, loss, isosceles, scalene, equilateral, interior, parallel, quadrilateral, rhombus, parallelogram, trapezium, kite, regular, irregular, transversal, alternate, corresponding, co-interior, bearing	Data, hypothesis, categorical, qualitative, quantitative, numerical, frequency, tally, pictogram, bar chart, pie chart, stem and leaf, spread, range, mean, median, mode, modal, interquartile range, outlier	Part to part, part to whole, fraction, scale, scale factor, multiplier, subject, in terms of, variable, constant, rearrange, inverse, function, substitute, substitution, formula(e), bivariate, time series, scatter graph, relationship, correlation, causation, outlier, line of best fit, interpolate, extrapolate, trend, moving average	Quadrant, gradient, intercept, plot, y-intercept

READING SKILLS

Decoding, fluency, vocabulary, prior knowledge and summarising will all be necessary for this year.

CAREERS LINKS

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Accountant, Actuary, Data Scientist, Financial Manager, Engineering, Financial Analyst, Operations Researcher, Quantity Surveyor, Software Engineer, Data Analyst...

CORE

Students will apply the skills they develop in maths to real life problems. They will think logically about different situations and solve problems. Students will learn about other mathematical skills to use in the real world such as budgeting, tax, bank interest/depreciation.

SUPPORTING STUDENTS AT HOME

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CURRICULUM AND ASSESSMENT PLAN

MATHS

YEAR 9



INTENT

In maths we have a spiral curriculum that is aimed at developing a love of and confidence for maths, giving students the tools to apply their mathematical knowledge and build resilience when solving problems in a range of situations. In Year 9 they continue mastering the essential mathematical skills to enable them to experience success and enjoyment of the subject, taking this passion forward into KS4 and beyond.

	Prior learning	The curriculum is designed so students will review topics taught from Y7 and Y8 with interleaving learning to support the recall and retention of previously learned content.
	Conscious curriculum links	Consistent methods will be used across departments. Links can be made with science, geography, IT, engineering and PE.
	Extra-curricular	The UKMT run a variety of challenges throughout the year for students to get a wider knowledge and challenge their maths ability. There are different competitions run throughout the year by OAT for students to take part in. The school runs different activities and competitions throughout the year too, such as on pi day, for students to enjoy!

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC/KNOWLEDGE	Students will focus on a range of number topics, algebra topics and statistics topics. (NP11, A5, SP2, A6). All students will know: Reading and writing ratio notation. Finding equivalent ratios. Simplifying ratios. Working and finding unit ratios. Scale drawings and maps. Fractional relationships from ratios. Finding ratio of amounts. Understanding formulae and expressions. Substitution. Writing formulae in words and letters. Rearranging formulae. Drawing a scatter graph. Interpreting a scatter graph. Lines of best fit, correlation and outliers. 2D co-ordinates in the four quadrants. Finding the midpoints of line segments. Understanding equations of line in the form $y = mx + c$. Drawing linear graphs. Interpreting graphs. Finding the gradient and the y-intercept from a graph and its equation.	Students will focus on a range of algebra topics. (A6, A7, A8). All students will know: 2D co-ordinates in the four quadrants. Finding the midpoints of line segments. Understanding equations of line in the form $y = mx + c$. Drawing linear graphs. Interpreting graphs. Finding the gradient and the y-intercept from a graph and its equation. Continuing and finding terms of a sequence. Generating a sequence from its nth term. Finding the nth term of a linear sequence. Pictorial representations of sequences. Recognising non-linear sequences. Representing inequalities on a number line. Solving inequalities going up to unknowns on both sides. Setting up inequalities from context. Representing inequalities on a graph (horizontal and vertical lines only).	Students will focus on a range of algebra topics and number topics. (A8, NP12, A9). All students will know: Representing inequalities on a number line. Solving inequalities going up to unknowns on both sides. Setting up inequalities from context. Representing inequalities on a graph (horizontal and vertical lines only). Converting numbers into standard form. Converting numbers into ordinary form. Adding and subtracting in standard form. Multiplying and dividing in standard form. Reading and interpreting from conversion/contextual graphs. Speed, distance, time. Drawing and interpreting distance-time graphs. Drawing and interpreting velocity-time graphs.	Students will focus on a range of algebra topics and statistics topics. (A9, SP3). All students will know: Reading and interpreting from conversion/contextual graphs. Speed, distance, time. Drawing and interpreting distance-time graphs. Drawing and interpreting velocity-time graphs. Listing systematically. Product rule for counting. Simple probability experiments. Language of probability. Theoretical probability. Mutually exclusive events. Sum of probabilities sum to 1. Sample space diagrams. Frequency trees. Two-way tables. Simple Venn Diagrams.	Students will focus on a range of geometry topics. (GM4, GM5). All students will know: Congruence. Tessellation. Translation. Reflection. Rotation. Combining transformations. Enlargement. Similarity. Using Pythagoras' Theorem to find missing sides. Proving right-angled triangles. Distance between two points. Using trigonometric ratios to find a missing side. Using trigonometric ratios to find a missing angle. Exact trig values.	Students will focus on a range of geometry topics and number topics. (GM6, NP13). All students will know: Properties of a circle. Find the area of circles including semi/quarter circles. Finding the circumference of circles and the perimeter of semi/quarter circles. Finding the area of a sector. Finding arc length and the perimeter of sectors. Identifying and using circle theorems. Percentage change. Simple interest. Direct proportion – numerical, graphically and algebraic. Inverse proportion – numerical, graphically and algebraic. Compound units – density, pressure and speed. Combining ratios, finding parts, differences and wholes. Mixing ratios with fractions.
SKILLS	Throughout every single topic in maths, students will apply problem solving techniques where applicable. Written and verbal communication will be applied through the course. Students will need to think logically and think accurately to find solutions. Applications of topics to contextual and geometrical problems will happen throughout most topics. Students will think critically, evaluating mathematical arguments and using mathematical data to ensure informed decision-making.					
ASSESSMENT	During lessons, teachers will assess students' understanding through directed questioning, using mini-whiteboards for instant feedback and live marking in lesson so teachers can adapt and help students progress. Every two weeks, students will sit a low-stakes quiz consisting of 10 questions which will assess students on the topics they have been taught over the two weeks, with some topics from previous weeks too as a way of helping with retention and assess students' knowledge. Every 6 – 8 weeks, students will sit a summative assessment based on topics they have been taught this year and from previous years. This will be teacher marked, and feedback will be given through a personalised question level analysis where students will be able to see what topics they are strong on and what topics they will need to work on to help them progress. Students will also sit a mid year assessment and an end of year assessment. This will be a common assessment across all OAT academies so we can assess where students are with the curriculum and can compare across the trust.					
VOCAB	Ratio, equivalent, scale, formulae, substitution, expressions, rearrange, solve, outlier, correlation, quadrants, co-ordinates, linear, gradient, y -intercept.	Quadrants, co-ordinates, linear, gradient, y -intercept, term, linear, arithmetic, sequence, inequalities, regions.	Inequalities, regions, standard form, ordinary form, powers, index, speed, units, velocity, convert.	Convert, speed, units, velocity, product, combinations, order, probability, mutually exclusive, frequency, outcome.	Congruence, tessellation, translation, reflection, rotation, enlargement, similarity, Pythagoras, sin, cos, tan, hypotenuse, adjacent, opposite.	Circle, radius, diameter, chord, tangent, sector, arc, segment, alternate, interest, direct, inverse, proportion, density, pressure, speed, ratios.

READING SKILLS

Decoding, fluency, vocabulary, prior knowledge and summarising will all be necessary for this year.

CAREERS LINKS

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Accountant, Actuary, Data Scientist, Financial Manager, Engineering, Financial Analyst, Operations Researcher, Quantity Surveyor, Software Engineer, Data Analyst...

CORE

Students will apply their skills they get from maths to real life problems and think logically about different situations and problems.
Students will learn about other mathematical skills to use in the real world such as budgeting, tax, bank interest/depreciation.

SUPPORTING STUDENTS AT HOME

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CURRICULUM AND ASSESSMENT PLAN

MATHS

YEAR 10 FOUNDATION

INTENT

In maths we have a spiral curriculum that is aimed at developing a love of and confidence for maths, giving students the tools to apply their mathematical knowledge and build resilience when solving problems in a range of situations. KS4 is split into 3 bands which is designed to foster the curiosity of all students through appropriate challenge, in order for them to progress and succeed.

	Prior learning	The curriculum is designed so students will review topics taught from Y7, 8 and 9 with interleaving learning to support the recall and retention of previously learned content.
	GCSE Course	Exam Board: Edexcel Paper 1: Non-Calculator (1 hour 30 minutes). Paper 2: Calculator (1 hour 30 minutes). Paper 3: Calculator (1 hour 30 minutes).
	Extra-curricular	There are different competitions run throughout the year by OAT for students to take part in. The school runs different activities and competitions throughout the year too, such as on pi day, for students to enjoy!

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC/KNOWLEDGE	Students will focus on a range of number topics. (NP1, 2, 3, 4, 5, 6, 7). All students will know: Writing integers in words. Placing integers and decimals on a number line. Ordering integers, decimals and negatives. Multiplying and dividing by powers of 10. Rounding (including decimal places and significant figures). Addition and subtraction. Zero Pairs. Common factors and common multiples. Multiplying and dividing integers and decimals. Powers and roots. Index laws. Prime numbers. Prime factors. Order of operations (including powers and brackets). Four operations with directed number. Powers of negative numbers. Identifying fractions. Converting between mixed and improper fractions. Simplifying fractions. Adding and subtracting fractions. Finding fractions of amounts. Multiplying and dividing fractions.	Students will focus on a range of algebra topics and geometry topics. (A1, 2, 3, 4, and 5, GM1, 2 and 3). All students will know: Simplifying expressions and like terms. Basic substitution. Solving one and two step equations. Adding and subtracting expressions. Multiplying and dividing expressions. Writing expressions. Expand a single bracket. Factorising a single bracket. Equality and equations. Solving one and two step equations. Solving equations with unknowns on both sides. Solving equations containing brackets. Forming equations. Substitution. Rearranging formulae. Measuring and naming angles. Constructing and drawing triangles. Bisecting angles and lines. Angles around a point and on straight lines. Vertically opposite angles. Angles in triangles and quadrilaterals. Properties of quadrilaterals. Area of rectangles, triangles, parallelograms, trapeziums, rectilinear shapes. Area of a circle.	Students will continue some geometry topics, statistics topics and number topics. (GM 1-3, SP1-2, NP8-10). All students will know: Angles in triangles and quadrilaterals. Properties of quadrilaterals. Area of rectangles, triangles, parallelograms, trapeziums, rectilinear shapes. Area of a circle. Collecting and processing data. Stem and leaf diagrams. Drawing and using pie charts. Mode, median, range and mean. Summary statistics from frequency tables. Reading and drawing a scatter graph. Correlation and outliers. Lines of best fits. Converting between decimals, fractions and percentages. Finding a percentage of an amount. Decimal multipliers. Increasing and decreasing by a percentage. Use of a calculator. Rounding (including decimals and significant figures). Error intervals. Estimation. Direct and inverse proportion. Value for money and exchange rates.	Students will continue with number topics and algebra topics. (NP8-10, A9-10). All students will know: Converting between decimals, fractions and percentages. Finding a percentage of an amount. Decimal multipliers. Increasing and decreasing by a percentage. Use of a calculator. Rounding (including decimals and significant figures). Error intervals. Estimation. Direct and inverse proportion. Value for money and exchange rates. Coordinates in all four quadrants. Midpoints of lines. Horizontal and vertical lines. Plotting linear graphs. Plotting quadratic graphs. Finding gradient and y-intercept. Solving equations graphically. Recognising simultaneous equations.	Students will continue with algebra topics and geometry topics. (A9-10, GM4). All students will know: Coordinates in all four quadrants. Midpoints of lines. Horizontal and vertical lines. Plotting linear graphs. Plotting quadratic graphs. Finding gradient and y-intercept. Find numbers in a sequence. Generating terms of a sequence. Finding the nth term. Representing inequalities on a number line. Solving inequalities. Ratio problems. Congruence. Tessellation. Translation. Reflection. Rotation. Rotational and reflective symmetry. Combinations of transformations. Similarity. Enlargement.	Students will continue with statistics topics and number topics. (SP3, NP11). All students will know: Systematic listing. Recording outcomes of experiments. Language of probability. Theoretical probability. Sum of probability equals 1. Mutually exclusive events. Sample space diagrams. Frequency trees. Two-way tables. Venn Diagrams. Simplifying ratios. Ratios and fractions. Finding parts of a ratio given the whole. Finding parts of a ratio given another part. Finding the parts of a ratio given the difference.
SKILLS	Throughout every single topic in maths, students will apply problem solving techniques where applicable. Written and verbal communication will be applied through the course. Students will need to think logically and think accurately to find solutions. Applications of topics to contextual and geometrical problems will happen throughout most topics. Students will think critically, evaluating mathematical arguments and using mathematical data to ensure informed decision-making.					
ASSESSMENT	For each lesson, teachers will assess students understanding through directed questioning, using mini-whiteboards for instant feedback and live marking in lesson so teachers can adapt and help students progress. Every two weeks, students will sit a low-stakes quiz consisting of 10 questions which will assess students on the topics they have been taught over the two weeks with some topics from previous weeks too as a way of helping with retention and assess student's knowledge. Every 6 – 8 weeks, students will sit a summative assessment based on topics they have been taught this year and from previous years. This will be teacher marked, and feedback will be given through a personalised question level analysis where students will be able to see what topics they are strong on and what topics they need will need to work on to help the, progress In summer term A, students will sit a common assessment across OAT consisting of two papers. This will assess what students know about the curriculum and how they compare to students across the OAT trust. In summer term B, students will sit a full set of mock papers (3 papers) so students can experience a full GCSE paper to fully prepare them for Y11 and assess the level they are working at against real grade boundaries and papers.					
VOCAB	Integer, decimal, negative, directed number, factors, multiples, primes, index, improper, ascending, descending.	Term, expression, expand, factorise, solve, variable, acute, obtuse, reflex, measure, bisect, perpendicular, vertical, opposite.	Triangles, quadrilaterals, radius, diameter, correlation, outlier, sectors, qualitative, quantitative, discrete, continuous, mean, median, mode, range, key.	Converting, fraction, decimal, percentage, rounding, significant figure, linear, quadratic, gradient, y-intercept, direct, inverse proportion.	Coordinate, quadrant, linear, quadratic, gradient, y-intercept, sequence, term, inequality, congruence, tessellation, translation, reflection, rotation, symmetry, enlargement.	Listing, logical, experiment, probability, theoretical, mutually exclusive, ratio, parts.

READING SKILLS

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CURRICULUM AND ASSESSMENT PLAN

MATHS

YEAR 10 HIGHER

INTENT In maths we have a spiral curriculum that is aimed at developing a love of and confidence for maths, giving students the tools to apply their mathematical knowledge and build resilience when solving problems in a range of situations. KS4 is split into 3 bands which is designed to foster the curiosity of all students through appropriate challenge, in order for them to progress and succeed.

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	Extra-curricular	The UKMT run a variety of challenges throughout the year for students to get a wider knowledge and challenge their maths ability. There are a various competitions for students run by OAT and the school for students to enjoy!

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC/KNOWLEDGE	Students will focus on geometry topics primarily this half term. (GM5, GM6, GM7) All students will know: Applying Pythagoras' theorem. Trigonometry of right-angled triangles. Exact trigonometric values. Parts and properties of circles. Finding the circumference and area of circles. Finding arc length. Finding the area of sectors. Identifying and using circle theorems. Interior and exterior angles of polygons and regular polygons.	Students will continue to focus on geometry topics and some statistics and probability topics. (GM7, SP4, SP5) All students will know: Continued work on interior and exterior angles of polygons and regular polygons. Solving problems with parallel lines and bearings. Naming and recognising polyhedra. Drawing and identifying planes of symmetry. Drawing 3D shapes sketching and isometric. Making 2D representations of 3D shapes, such as plans and elevations. Understanding the difference between discrete and continuous data. Working out measures of central tendency of grouped data; mean, median and mode. Drawing and interpreting/using cumulative frequency graphs. Drawing and interpreting boxplots. Working with measures of spread; interquartile range. Comparing data sets through graphs, central tendency and spread. Thinking logically. Representing sets with set notation. Representing sets with Venn diagrams.	Students will continue to work on Venn Diagrams and then move onto some number and algebra work. (SP5, NP14, A11) All students will know: Set notation with Venn Diagrams. Probability involving Venn diagrams. Prime factor decomposition. Finding the highest common factors and the lowest common multiple of sets of numbers using prime factor decomposition. Solving problems involving HCF and LCM. Identifying recurring and terminating decimals. Converting recurring decimals into fractions. Writing error intervals for rounding and truncating. Calculating upper and lower bounds. Finding the percentage error of calculations with bounds. Applying the rules of indices to algebraic expressions (multiplication and division of powers, power of a power, power of zero.)	Students will continue work started on algebra last term and move onto different algebraic topics. (A11, A12) All students will know: Continue applying rules of indices to algebraic expressions. Multiplying two and three brackets together, including adding expressions which need expanding first. Factorising a quadratic where x^2 has a co-efficient of 1. Factorising a difference of two squares. Factorising a quadratic where x^2 has a co-efficient of more than 1. Simplifying algebraic fractions. Rearranging formulae, including non-linear formulae, those with the subject in the denominator. And those where the subject appears twice. Simplifying an expression by factorising out a bracket. Plotting and reading from a quadratic graph. Solving quadratic equations graphically, by factorising and by using the quadratic formula. Completing the square. Producing a sketch of a quadratic with all relevant points labelled. Rearranging and solving quadratics.	Students will continue work started on algebra topics from last half term and move onto geometry topics. (A12, GM8) All students will know: Completing the square. Producing a sketch of a quadratic with all relevant points labelled. Rearranging and solving quadratics. Converting between 2D and 3D units of measurement. Finding the surface area of prisms and cylinders. Finding the surface area of spheres, pyramids, cones, composite solids, frustums and other polyhedra. Finding the volume of prisms and cylinders. Finding the volume of spheres, pyramids, cones, composite solids, frustums and other polyhedra. Finding lengths, area and volume of similar solids.	Students will continue work on geometry from last half term and move onto algebra and different geometry topics. (GM8, A13, GM9) All students will know: Finding the volume of spheres, pyramids, cones, composite solids, frustums and other polyhedra. Finding lengths, area and volume of similar solids. Visual representations of arithmetic, quadratic and geometric sequences. Working with Fibonacci-style sequences, both numerical and algebraic. Finding and using the n th term of a quadratic sequence. Finding the common ratio of a geometric sequence. Using recurrence relations (iteration.)
SKILLS	Throughout every single topic in maths, students will apply problem solving techniques where applicable. Written and verbal communication will be applied through the course. Students will need to think logically and think accurately to find solutions. Applications of topics to contextual and geometrical problems will happen throughout most topics. Students will think critically, evaluating mathematical arguments and using mathematical data to ensure informed decision-making.					
ASSESSMENT	For each lesson, teachers will assess students understanding through directed questioning, using mini-whiteboards for instant feedback and live marking in lesson so teachers can adapt and help students progress. Every two weeks, students will sit a low-stakes quiz consisting of 10 questions which will assess students on the topics they have been taught over the two weeks with some topics from previous weeks too as a way of helping with retention and assess student's knowledge. Every 6 – 8 weeks, students will sit a summative assessment based on topics they have been taught this year and from previous years. This will be teacher marked, and feedback will be given through a personalised question level analysis where students will be able to see what topics they are strong on and what topics they need will need to work on to help the, progress In summer term A, students will sit a common assessment across OAT consisting of two papers. This will assess what students know about the curriculum and how they compare to students across the OAT trust. In summer term B, students will sit a full set of mock papers (3 papers) so students can experience a full GCSE paper to fully prepare them for Y11 and assess the level they are working at against real grade boundaries and papers.					
VOCAB	Hypotenuse, opposite, adjacent, tan, sine, cosine, radius, diameter, circumference, chord, tangent, sector, segment, interior, exterior, polygon, alternate, centre, perpendicular.	interior, exterior, polygon, alternate, corresponding, co-interior, plan, symmetry, rotational, reflective, elevations, mean, mode, median, interquartile range, cumulative, frequency	set, union, intersection, complement, Product, factor, multiple, terminating, recurring, bound, error interval, power, indices, index,	Solve, linear, quadratic, expand, factorise, rearrange, co-efficient, numerator, denominator, sketch, turning point, formula, plotting, coordinates, roots, y-intercept	Solve, linear, quadratic, expand, factorise, rearrange, co-efficient, numerator, denominator, sketch, turning point, formula, plotting, coordinates, roots, y-intercept measurements, convert, cross-section, height, perpendicular, face, edges, vertices, vertex, composite	Linear, quadratic, rearrange, co-efficient, measurements, convert, cross-section, height, perpendicular, face, edges, vertices, vertex, composite, term, difference, common ratio, geometric, Fibonacci, iteration, recurrence.

READING SKILLS

Decoding, fluency, vocabulary, prior knowledge and summarising will all be necessary for this year.

CAREERS LINKS

Studying mathematics opens up a range of sectors such as IT, finance, engineering, space science and teaching.

Accountant, Actuary, Data Scientist, Financial Manager, Engineering, Financial Analyst, Operations Researcher, Quantity Surveyor, Software Engineer, Data Analyst...

CORE

Students will apply their skills they get from maths to real life problems and think logically about different situations and problems.

Students will learn about other mathematical skills to use in the real world such as budgeting, tax, bank interest/depreciation.

SUPPORTING STUDENTS AT HOME

Sparx Maths will continue to be our homework platform. You will get compulsory homework every week. Along with this you can do as much independent learning as you like to support your learning in the classroom.

CURRICULUM AND ASSESSMENT PLAN

ORMISTON
SWB
ACADEMY

MATHS

YEAR 11 FOUNDATION

INTENT

In maths we have a spiral curriculum that is aimed at developing a love of and confidence for maths, giving students the tools to apply their mathematical knowledge and build resilience when solving problems in a range of situations. KS4 is split into 3 bands which is designed to foster the curiosity of all students through appropriate challenge, in order for them to progress and succeed.

	Prior learning	The curriculum is designed so students will review topics taught from Y7, 8, 9 and 10 with interleaving learning to support the recall and retention of previously learned content.
	GCSE Course	Exam Board: Edexcel Paper 1: Non-Calculator (1 hour 30 minutes). Paper 2: Calculator (1 hour 30 minutes). Paper 3: Calculator (1 hour 30 minutes).
	Extra-curricular	There are different competitions run throughout the year by OAT for students to take part in. The school runs different activities and competitions throughout the year too, such as on pi day, for students to enjoy!

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC/KNOWLEDGE	Students will focus on geometry topics and number topics. (GM4, NP11, NP12, N13) All students will know: Congruence. Tessellation. Translation. Reflection. Rotation. Rotational and reflective symmetry. Combinations of transformations. Similarity. Enlargement. Simplifying ratios. Ratios and fractions. Finding parts of a ratio given the whole. Finding parts of a ratio given another part. Finding the parts of a ratio given the difference. Converting numbers into standard form. Converting numbers into ordinary form. Adding and subtracting in standard form. Multiplying and dividing in standard form. Reverse percentages. Simple interest.	Students will focus on number topics and algebra topics. (NP13, A9,10). All students will know: Reverse percentages. Simple interest. Real life graphs. Drawing and reading from conversion graphs. Speed distance time. Distance time graphs. Finding the gradient of a line. Using $y=mx+c$ to draw lines. Identifying parallel lines. Solving simultaneous equations graphically. Recognising and solving simultaneous equations.	Students will focus on algebra topics, number topics and geometry topics. (A11-12, NP14,15,16, GM5). All students will know: Applying rules of indices to algebraic expressions. Expanding single and double brackets. Factorising a quadratic Plotting and reading from a quadratic graph. Prime factor decomposition. Finding the highest common factors and the lowest common multiple of sets of numbers using prime factor decomposition. Solving problems involving HCF and LCM. Identifying recurring and terminating decimals. Percentage change. Error intervals.	Students will focus on geometry topics. (GM6,7,8) All students will know: Knowing circle properties. Area and circumference of a circle. Interior and exterior angles of polygons and regular polygons. Plans and elevations. Bearings. Finding surface area of prisms and cylinders. Finding volume of prisms and cylinders.	Students will be following a bespoke revision path based on mock assessments and other skills checks in preparation for GCSE's.	Students will be following a bespoke revision path based on mock assessments and other skills checks in preparation for GCSE's.
SKILLS	Throughout every single topic in maths, students will apply problem solving techniques where applicable. Written and verbal communication will be applied through the course. Students will need to think logically and think accurately to find solutions. Applications of topics to contextual and geometrical problems will happen throughout most topics. Students will think critically, evaluating mathematical arguments and using mathematical data to ensure informed decision-making.					
ASSESSMENT	For each lesson, teachers will assess students understanding through directed questioning, using mini-whiteboards for instant feedback and live marking in lesson so teachers can adapt and help students progress. Every two weeks, students will sit a low-stakes quiz consisting of 10 questions which will assess students on the topics they have been taught over the two weeks with some topics from previous weeks too as a way of helping with retention and assess student's knowledge. Students will sit mock exams in November and February, consisting of a full set of three papers. This is to fully prepare them for the real thing in the summer and to assess student's knowledge and pick up any topics that need to be re-taught.					
VOCAB	Congruence, tessellation, translation, reflection, rotation, symmetry, transformation, ratio, parts, standard form, ordinary number.	Percentage, interest, intercept, gradient, units, convert, parallel, simultaneous, solve	Index, indices, expression, term, plotting, quadratic, parabola, decomposition, prime, factor, multiple, recurring, terminating, error interval, bound	Circumference, radius, diameter, interior, exterior, polygon, plan, elevation, surface, vertices, edge, cross-section		

READING SKILLS

Decoding, fluency, vocabulary, prior knowledge and summarising will all be necessary for this year.

CAREERS LINKS

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CORE

Students will apply their skills they get from maths to real life problems and think logically about different situations and problems.
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SUPPORTING STUDENTS AT HOME

Sparx Maths will continue to be our homework platform for your school journey. You will get compulsory homework every week. Along with this you can do as much independent learning as you like to support your learning in the classroom.

CURRICULUM AND ASSESSMENT PLAN

MATHS

YEAR 11 HIGHER

INTENT

In maths we have a spiral curriculum that is aimed at developing a love of and confidence for maths, giving students the tools to apply their mathematical knowledge and build resilience when solving problems in a range of situations. KS4 is split into 3 bands which is designed to foster the curiosity of all students through appropriate challenge, in order for them to progress and succeed.

	Prior learning	The curriculum is designed so students will review topics taught from Y7, 8, 9 and 10 with interleaving learning to support the recall and retention of previously learned content.
	GCSE Course	Exam Board: Edexcel Paper 1: Non-Calculator (1 hour 30 minutes). Paper 2: Calculator (1 hour 30 minutes). Paper 3: Calculator (1 hour 30 minutes).
	Extra-curricular	There are different competitions run throughout the year by OAT for students to take part in. The school runs different activities and competitions throughout the year too, such as on pi day, for students to enjoy!

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC/KNOWLEDGE	Students will focus on number topics, algebra topics and geometry topics. (NP15, A14, NP16, GM10). All students will know: Rational and irrational numbers. Introduction to surds. Multiplying and dividing surds. Simplifying surds. Adding and subtracting surds. Expanding with surds. Rationalising the denominator. Fractional and negative indices. Changing the base. Forming and solving quadratics. Completing the square. Solving quadratic inequalities. Solving quadratic simultaneous equations. Problems with direct and inverse proportion involving squares, roots and cubes. Compound interest and repeated percentage change. Advanced ratio and proportion problems. Representing a path/translation as a vector. Understanding column vectors. Adding and subtracting vectors. Geometrical vectors. Parallel vectors. Magnitude of vectors. Geometric proofs and arguments using vectors.	Students will focus on geometry topics and statistic topics. (GM10, SP7). All students will know: Representing a path/translation as a vector. Understanding column vectors. Adding and subtracting vectors. Geometrical vectors. Parallel vectors. Magnitude of vectors. Geometric proofs and arguments using vectors. Drawing and interpreting tree diagrams for independent events. Drawing and interpreting tree diagrams for dependent events. Solving probability problems with Venn Diagrams. Solving probability problems involving. Forming and solving quadratic equations.	Students will focus on algebra topics. (A15, A16, A17). All students will know: Reading and writing function notation. Substituting numbers and expressions into functions. Finding inverse and composite functions. Cubic, reciprocal and exponential graphs. Sketching and interpreting graphs of sin, cos and tan. Equations of circles. Tangents and equations of circles. Transformations of functions and graphs. Estimating rates of change at certain points. Estimating areas under curves. Adding and subtracting algebraic fractions. Multiplying and dividing algebraic fractions. Rearranging formulae involving fractions. Algebraic proof.	Students will focus on algebra topics and geometry topics. Once finished students will be following a bespoke revision path based on mock assessments and other skills checks. (A17, GM11). All students will know: Adding and subtracting algebraic fractions. Multiplying and dividing algebraic fractions. Rearranging formulae involving fractions. Algebraic proof. Solving loci and bearings problems. Proving congruence of triangles. More geometric proof.	Students will be following a bespoke revision path based on mock assessments and other skills checks in preparation for GCSE's.	Students will be following a bespoke revision path based on mock assessments and other skills checks in preparation for GCSE's.
SKILLS	Throughout every single topic in maths, students will apply problem solving techniques where applicable. Written and verbal communication will be applied through the course. Students will need to think logically and think accurately to find solutions. Applications of topics to contextual and geometrical problems will happen throughout most topics. Students will think critically, evaluating mathematical arguments and using mathematical data to ensure informed decision-making.					
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VOCAB	Surd, rational, irrational, rationalise, index, quadratic, root, solution, vector, translation, scalar, magnitude, parallel, inequality, compound interest	Vector, translation, scalar, magnitude, parallel, dependent, independent, quadratic, roots, outcome, probability	Function, inverse, composite, cubic, reciprocal, exponential, sin, cos, tan, tangent, radius, numerator, denominator, solving, express	Numerator, denominator, solving, express, congruent, loci, bearing, clockwise, similar, hypotenuse		

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