Medium Term Planning Document: Maths Year 9

Maths Curriculum Intent:

The Northampton Academy curriculum enables all of our students to thrive and to enjoy learning mathematics. When students start in year 7, we ensure they have the building blocks needed to successfully access and succeed in the secondary curriculum. We prioritise developing students' proficiency in number, geometry and algebra. Topics are regularly revisited and built upon throughout Key Stage 3, for example algebraic manipulation is taught in year 7 and then extended in years 8 and 9 through solving equations and further again when applied to angles problems which require students to create and solve equations.

Students develop an appreciation for the wider uses of mathematics. Not only are they exposed to concepts that they will apply in other subjects in school, but they will also develop the financial and literacy skills required to function successfully in the modern world. Students will be able to read and interpret statistics, they will consider the validity and reliability of the data and be able to question and form a logical argument based upon it. We also aim to show students the historical and cultural influences that maths has had on the world around them.

At Key Stage 4 we aim to add to the foundations that pupils have laid during KS3 by developing both their subject knowledge and the skills needed to solve complex, multi-facetted problems. For example, ratio is introduced in year 8 but revisited in year 10 where students are encouraged to apply this knowledge to increasingly difficult problems.

Students develop their confidence and resilience by being taught difficult concepts in depth, they experience a high volume of practise of these difficult concepts and embrace the fact that they will go wrong at times and will learn from their mistakes. At all points during their mathematics education, students are supported and encouraged to be resilient and independent learners who take responsibility for their education, for example through their revision and home learning. We aim to develop ambitious learners who want to study the subject at Key Stage 5 and beyond.

Students who choose to study Mathematics at a post 16 level have different options including Maths Studies, A Level Maths and A Level Further Maths. Whichever option is chosen, students will learn advanced skills and become increasingly independent mathematicians capable of applying their knowledge in increasingly complex and varied situations.

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The Medium Term Planning document below is designed to show the journey that every student takes through our curriculum. Some elements of the curriculum may be taught over several lessons, others in a single lesson.

Maths	Year 9 - Half Term 1		
Topic	**Content**	**Formative Assessments?**	
9.01 – Decimal Manipulation	Apply all four operations using non calculator methods when working with decimals, this includes both dividing a decimal by an integer and dividing a number by a decimal.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=117762 https://curriculum.unitedlearning.org.uk/Pupil?r=117763 https://curriculum.unitedlearning.org.uk/Pupil?r=117764 https://curriculum.unitedlearning.org.uk/Pupil?r=117765
	Key words: decimal, add, subtract, multiply, divide, compare, order, ascending, descending		
9.02 – Estimation and Limits of Accuracy	Use rounding in order to complete estimations (rounding to both one significant figure and applying sensible rounding), using inequality notation to write error intervals from both rounding and truncation.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=117766 https://curriculum.unitedlearning.org.uk/Pupil?r=117767 https://curriculum.unitedlearning.org.uk/Pupil?r=117768
	Key words: round, decimal place, significant figure, truncation, error intervals, estimate, overestimate, underestimate		
9.03 – Related Calculations	Recognise and use relationships between operations in order to write down the answer to a related calculation from a given calculation.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=117761
	Key words: place value, related calculations, inverse operations, commutative law		
9.04 – HCF and LCM of Large Num	Use prime factor decomposition and Venn diagrams in order to find the HCF and LCM of large values.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=117775 https://curriculum.unitedlearning.org.uk/Pupil?r=117776 https://curriculum.unitedlearning.org.uk/Pupil?r=117777
	Key words: Multiple, factor, prime, LCM, HCF, prime factor decomposition		
9.05 – Fraction Calculations	Apply all four operations using non calculator methods when working fractions and mixed numbers involving different denominators, finding the fraction of an amount, writing one number as a fraction of another and to find the reciprocal of an integer, decimal or fraction.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=117786 https://curriculum.unitedlearning.org.uk/Pupil?r=117787 https://curriculum.unitedlearning.org.uk/Pupil?r=117788 https://curriculum.unitedlearning.org.uk/Pupil?r=117789 https://curriculum.unitedlearning.org.uk/Pupil?r=117790 https://curriculum.unitedlearning.org.uk/Pupil?r=117791
	Key words: fraction, numerator, denominator, proper fraction, improper fraction, mixed number, simplify, equivalent, integer		

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Maths	Year 9 – Half Term 2		
Topic	**Content**	**Formative Assessments?**	**Link(s) to an example lesson**
9.06 – Algebraic Manipulation	Collecting like terms and simplifying expressions involving all four operations, the identity symbol, adding fractions with algebraic numerators, multiplying and dividing simple algebraic fractions.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=117803 https://curriculum.unitedlearning.org.uk/Pupil?r=117804 https://curriculum.unitedlearning.org.uk/Pupil?r=117805 https://curriculum.unitedlearning.org.uk/Pupil?r=117806 https://curriculum.unitedlearning.org.uk/Pupil?r=117807
	Key words: Variable, coefficient, term, expression, equation, formula, identity		
9.07 – Index Laws	Working with the laws of indices, this includes negative and fractional indices, using index notation for integer powers of 10, including negative powers.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=117811 https://curriculum.unitedlearning.org.uk/Pupil?r=117812 https://curriculum.unitedlearning.org.uk/Pupil?r=117813 https://curriculum.unitedlearning.org.uk/Pupil?r=117814 https://curriculum.unitedlearning.org.uk/Pupil?r=117815
	Key words: Index notation, square, cube, reciprocal, fractional indices, base, changing base		
9.08 – Standard Form	Converting between ordinary numbers and standard form. Calculating with standard form including multiplication, division, addition and subtraction.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=111891 https://curriculum.unitedlearning.org.uk/Pupil?r=111892 https://curriculum.unitedlearning.org.uk/Pupil?r=111893 https://curriculum.unitedlearning.org.uk/Pupil?r=111894 https://curriculum.unitedlearning.org.uk/Pupil?r=111895
	Key words: standard form, base, index number		
9.09 – Expanding and Factorising	Expanding double brackets, factorising quadratics (where the coefficient of x^2 is 1), difference of two squares. **Key words: multiply, expand, factorise, single brackets, double brackets, quadratic expression, product, sum**	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=117813 https://curriculum.unitedlearning.org.uk/Pupil?r=117814 https://curriculum.unitedlearning.org.uk/Pupil?r=117815 https://curriculum.unitedlearning.org.uk/Pupil?r=117816 https://curriculum.unitedlearning.org.uk/Pupil?r=117817 https://curriculum.unitedlearning.org.uk/Pupil?r=117818

Summative Assessment:

Pupil Mid-Year Assessments will take place at the end of half term 2. These will cover all content taught in the first 2 half terms. This assessment will inform pupil Rank Order in the subject.

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Maths	Year 9 – Half Term 3		
Topic	**Content**	**Formative Assessments?**	**Link(s) to an example lesson**
9.10 – Expressions and Substitution	Substitution into algebraic formulae, basic functions - inputs and outputs, use algebra to show expressions are equivalence, know the difference between an equation and an identity.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=117819 https://curriculum.unitedlearning.org.uk/Pupil?r=117820 https://curriculum.unitedlearning.org.uk/Pupil?r=117821 https://curriculum.unitedlearning.org.uk/Pupil?r=117822 https://curriculum.unitedlearning.org.uk/Pupil?r=117823 https://curriculum.unitedlearning.org.uk/Pupil?r=117824 https://curriculum.unitedlearning.org.uk/Pupil?r=117825 https://curriculum.unitedlearning.org.uk/Pupil?r=117826
9.11 – Proportion	Use proportion to answer problems involving exchange rates and best buys. Introduction to inverse proportion, interpret conversion graphs.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=117797 https://curriculum.unitedlearning.org.uk/Pupil?r=117798 https://curriculum.unitedlearning.org.uk/Pupil?r=117799 https://curriculum.unitedlearning.org.uk/Pupil?r=117800 https://curriculum.unitedlearning.org.uk/Pupil?r=117801 https://curriculum.unitedlearning.org.uk/Pupil?r=117802
9.12 – Probability	Describe probability using the probability scale, calculate expected outcomes, mutually exclusive outcomes, experimental probabilities, probability from two way tables, sample spaces, samples, set notation and Venn diagrams. Product rule for counting.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=111880 https://curriculum.unitedlearning.org.uk/Pupil?r=111881 https://curriculum.unitedlearning.org.uk/Pupil?r=111882 https://curriculum.unitedlearning.org.uk/Pupil?r=111883 https://curriculum.unitedlearning.org.uk/Pupil?r=111884 https://curriculum.unitedlearning.org.uk/Pupil?r=111885 https://curriculum.unitedlearning.org.uk/Pupil?r=111886 https://curriculum.unitedlearning.org.uk/Pupil?r=111887 https://curriculum.unitedlearning.org.uk/Pupil?r=111888 https://curriculum.unitedlearning.org.uk/Pupil?r=111889 https://curriculum.unitedlearning.org.uk/Pupil?r=111890

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Maths	Year 9 – Half Term 4		
Topic	**Content**	**Formative Assessments?**	**Link(s) to an example lesson**
9.13 – Linear Equations	Solve linear equations which contain brackets, fractional coefficients, negativ signs, negative solutions. Solving linear equations in one unknown with unknowns on both sides, solving equations that require fraction manipulation.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=117827 https://curriculum.unitedlearning.org.uk/Pupil?r=117828 https://curriculum.unitedlearning.org.uk/Pupil?r=117829 https://curriculum.unitedlearning.org.uk/Pupil?r=117830 https://curriculum.unitedlearning.org.uk/Pupil?r=117831 https://curriculum.unitedlearning.org.uk/Pupil?r=117832 https://curriculum.unitedlearning.org.uk/Pupil?r=117833 https://curriculum.unitedlearning.org.uk/Pupil?r=117834
9.14 – Linear Inequalities	Solve linear inequalities in one variable, represent and interpret solutions sets on a number line, solve two inequalities in one variable and compare to see which value(s) satisfy both.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=117837 https://curriculum.unitedlearning.org.uk/Pupil?r=117838 https://curriculum.unitedlearning.org.uk/Pupil?r=117839 https://curriculum.unitedlearning.org.uk/Pupil?r=117840 https://curriculum.unitedlearning.org.uk/Pupil?r=117841 https://curriculum.unitedlearning.org.uk/Pupil?r=117841
9.15 – Sequences	Recognise and use the sequence of triangular, square and cube numbers. Generate terms of a term-to-term sequence. Find the nth term of a linear sequence, use the nth term of a linear sequence to determine whether a given number is in that sequence.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=117889 https://curriculum.unitedlearning.org.uk/Pupil?r=117890 https://curriculum.unitedlearning.org.uk/Pupil?r=117891 https://curriculum.unitedlearning.org.uk/Pupil?r=117892 https://curriculum.unitedlearning.org.uk/Pupil?r=117893 https://curriculum.unitedlearning.org.uk/Pupil?r=117894

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Maths	Year 9 – Half Term 5		
Topic	**Content**	**Formative Assessments?**	**Link(s) to an example lesson**
9.16 – Pythagoras	Use Pythagoras' Theorem to find missing sides in a right-angled triangle and to find the distance between two points. Justify whether a triangle with three given sides in right-angled or not.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=117847 https://curriculum.unitedlearning.org.uk/Pupil?r=117848 https://curriculum.unitedlearning.org.uk/Pupil?r=117849 https://curriculum.unitedlearning.org.uk/Pupil?r=117850 https://curriculum.unitedlearning.org.uk/Pupil?r=117851 https://curriculum.unitedlearning.org.uk/Pupil?r=117852
9.17 – Angles in Polygons	To calculate interior and exterior angles of (regular) polygons, find the total angle sum of a given polygon.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=117703 https://curriculum.unitedlearning.org.uk/Pupil?r=117704 https://curriculum.unitedlearning.org.uk/Pupil?r=117705 https://curriculum.unitedlearning.org.uk/Pupil?r=117706
9.18 – Column Vectors	To use column vectors, addition and subtraction of column vectors and interpretation of diagrammatic vectors. To identify whether a pair of column vectors are equal or not.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=117895 https://curriculum.unitedlearning.org.uk/Pupil?r=117896 https://curriculum.unitedlearning.org.uk/Pupil?r=117897 https://curriculum.unitedlearning.org.uk/Pupil?r=117898 https://curriculum.unitedlearning.org.uk/Pupil?r=117899 https://curriculum.unitedlearning.org.uk/Pupil?r=117900
9.19 – Transformations	Reflection and rotational symmetry, understand all 4 Transformations - rotation, reflection, translation, enlargement (with a positive scale factor), identify the equation of a line of symmetry	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=111954 https://curriculum.unitedlearning.org.uk/Pupil?r=111955 https://curriculum.unitedlearning.org.uk/Pupil?r=111956 https://curriculum.unitedlearning.org.uk/Pupil?r=111957 https://curriculum.unitedlearning.org.uk/Pupil?r=111958 https://curriculum.unitedlearning.org.uk/Pupil?r=111959 https://curriculum.unitedlearning.org.uk/Pupil?r=111960

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Summative Assessment:

Pupil End of Year Assessments will take place at the start of half term 6. These will cover all content taught in the first 5 half terms. This assessment will inform pupil Rank Order in the subject. As well as the content listed below, there is an expectation that staff will work with pupils to improve knowledge in areas of weakness identified in the summative assessments. This may include in school and out of school intervention, and collaborative and independent study.

Maths	Year 9 – Half Term 6		
Topic	**Content**	**Formative Assessments?**	**Link(s) to an example lesson**
9.20 – plans and elevations	Construct plans and elevations of 3D shapes, draw sketches of 3D solids from plans and elevations.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=117901 https://curriculum.unitedlearning.org.uk/Pupil?r=117902 https://curriculum.unitedlearning.org.uk/Pupil?r=117903
9.21 – Arcs and sectors	Define all parts of a circle and know key definitions including, tangent, arc, sector and segment. Use the formula for area and circumference of a circle to find the area of circle and sectors and calculate the circumference and arc lengths of circles.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=117735 https://curriculum.unitedlearning.org.uk/Pupil?r=117736 https://curriculum.unitedlearning.org.uk/Pupil?r=117708 https://curriculum.unitedlearning.org.uk/Pupil?r=117710
9.22 – Surface area	Sketch the nets of cuboids and prisms. Find the surface areas of cuboids, pyramids, spheres, cones and composite solids.	Mini WB formative assessment in lessons Bell Work (starter booklet) Exam style questions	https://curriculum.unitedlearning.org.uk/Pupil?r=117883 https://curriculum.unitedlearning.org.uk/Pupil?r=117884 https://curriculum.unitedlearning.org.uk/Pupil?r=117885 https://curriculum.unitedlearning.org.uk/Pupil?r=117886 https://curriculum.unitedlearning.org.uk/Pupil?r=117887 https://curriculum.unitedlearning.org.uk/Pupil?r=117888