

Subject: Mathematics

Year group: 7

Department Curriculum Vision: Northwood Mathematicians work towards fluency in Mathematics, and focus on mastering the resilience and problem solving skills essential for life beyond secondary school.

	Autumn Term 1	Autumn Term 2
Content: (Know what...)	Calculation Written methods for the four operations, mental methods, divisibility tests. Negative numbers, place value, rounding and estimating.	Types of Number Odd, even, square, cube and prime numbers, HCF/LCM, prime factorisation, order of operations.
Skills: (know how...)	• Add and subtract numbers using the column method • Develop mental strategies for addition/subtraction • Multiply by powers of 10 • Multiply a number by a single digit • Multiply two digit numbers together • Multiply a decimal by a single digit integer • Complete long multiplication with decimals • Complete short division (times tables) • Identify numbers which are divisible by 2, 5 and 10 • Use the bus stop for single digit division and long division • Divide a decimal by an integer • Know and use number bonds up to 10 • Order positive and negative numbers (and decimals) • Use negative numbers given in pictorial representation (temperature scales)	• Identify even and odd numbers • Identify square and cube numbers • Generate multiples of a number • Find factors of any number • Define and understand why 2, 3, 5 and 7 are prime • List the first 10 prime numbers • Write numbers as products of their prime factors in index notation • Find the HCF and LCM of pairs of numbers using prime factor decomposition • Use the four operations, brackets and squares in the correct order • Use the four operations, brackets, fractions and negatives on a calculator • Identify square, cube and triangular numbers

	• Add and subtract negative numbers • Multiply and divide negative numbers • Solve problems involving negative numbers in context • Round numbers to the nearest 10, 100 and 1000 • Round numbers to the nearest integer • Estimate answers using rounding • Apply estimation skills to worded problems • Use bar modelling to solve addition/subtraction problems • Solve missing digit puzzles • Use the bus stop method for short division of decimals • Understand the effects of multiplying and dividing by numbers less than 1 • Understand and show commutativity • Use the associative law for multiplication • Identify numbers which are divisible by 2, 5, 10, 3 and 9 • Round numbers to a specified number of decimal places • Round numbers to one significant figure • Estimate answers using rounding (including division by a decimal) • Solve worded problems involving written calculations	• Understand and use square numbers, cube numbers, square roots and cube roots • Generate multiples of a number and find the LCM of a pair of numbers by listing • Find the HCF of a pair of numbers by listing • Find prime numbers up to 100 • Prove why a number isn't prime using a counter example • Prove that numbers are square and cube using prime factor decomposition • Solve worded HCF and LCM problems • Use the four operations, brackets, negatives, squares, roots and other powers • Use the four operations, brackets, fractions, negatives, powers and roots on a calculator • Use a scientific calculator fluently and efficiently to solve problems
Key vocabulary	Operation, Inverse, Long multiplication, Short division, Long division, Remainder, Approximate (noun and verb), Round, Decimal place, Check, Solution, Answer, Estimate (noun and verb), Order of magnitude, Accurate, Accuracy, Significant figure, Cancel, Positive number, Negative number, Integer	((Lowest) common) multiple and LCM, ((Highest) common) factor and HCF, Power, (Square and cube) root, Square number, Cube number, Prime number, Triangular number

Mid Term Assessment	Calculation (to date)	Types of Number (to date)
End Term Assessment	Calculation	Types of Number
	Spring 1	Spring 2
Content: (Know what...)	Geometry - Perimeter and Area Perimeter and area of triangles, squares and rectangles including compound shapes.	Geometry - Angles Angle notation, Properties of 2D Shapes Angles on a straight line, around a point, triangles, quadrilaterals

Skills: (Know how...)	• Measure and draw straight lines accurately using a ruler: mm and cm • Identify common 2D Shapes • Make reasonable estimates using mm, cm, m, km, g, kg • Convert between mm/cm/m/km and g/kg and ml/cl/l • Find the perimeter of a shape by counting squares • Find the perimeter of 2D shapes - including worded problems • Find the area of 2D shapes by counting squares • Find the area of squares and rectangles using the formula • Find the area of parallelograms using the formula • Find the area of triangles using the formula • Understand what polygon, parallel, and perpendicular mean • Use mathematical notation on diagrams • Name all common polygons and their properties • Convert between metric units of area and volume • Find the perimeter of composite shapes - including worded problems • Find the area of rectangles, parallelograms and triangles using the formula • Find the area of trapeziums using the formula • Find the area of composite shapes • Use algebra to find missing lengths • Solve problems involving the area of composite	• Recall 2D shape facts • Know what polygon, parallel, and perpendicular mean • Know the number of degrees in a quarter, half or full turn • Calculate missing angles around a point and on a straight line • Calculate missing angles in different types of triangles • Calculate missing angles in quadrilaterals • Calculate vertically opposite angles • Calculate missing angles around a point, on a straight line, vertically opposite, in a triangle and in a quadrilateral and give reasons
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	shapes • Solve challenging problems involving area and perimeter	
Key vocabulary	Edge, Face, Vertex (Vertices), Plane, Cube, Cuboid, Prism, Cylinder, Pyramid, Cone, Sphere, Quadrilateral, Square, Rectangle, Parallelogram, (Isosceles) Trapezium, Kite, Rhombus, Delta, Arrowhead, Diagonal, Perpendicular, Parallel, Triangle, Scalene, Right-angled, Isosceles, Equilateral, Square millimetre, square centimetre, square metre, square kilometre, Cubic centimetre, centimetre cube, Formula, formulae, Length, breadth, depth, height, width	Angle, Degrees, Right angle, Acute angle, Obtuse angle, Reflex angle, Protractor, Vertically opposite, Geometry, geometrical
Mid Term Assessment	Geometry - Perimeter and Area (to date)	Geometry - Angles (to date)
End Term Assessment	Geometry - Perimeter and Area	Geometry - Angles

	Summer 1	Summer 2
Content: (Know what...)	Introduction to Algebra Mathematical notation, collecting like terms, expanding and factorising, substitution, substitution with negative numbers.	Fractions, Decimals and Percentages Operations with fractions, ordering fractions, convert FDP, fraction and percentage of an amount, fraction and percentage change. Data Handling and Averages Testing Hypothesis, Drawing and Interpreting common graphs, Calculating & Comparing Averages.
Skills: (Know how...)	- Understand why and how variables are used in mathematics - Understand the keywords term and expression - Use bar modelling to write equivalent expressions - Understand and apply the rules of algebra (add, subtract, multiply and divide) - Match equivalent expressions - Simplify algebraic expressions using addition and subtraction (more than one variable) - Understand that brackets are used for multiplication (e.g. $2(3) = 6$) - Expand single brackets with positive and negative terms (e.g. $2(3x - 5) = 6x - 10$) - Expand and simplify more than one single bracket with positive terms (e.g. $2(x + 5) + 3(2 + 5x)$) <u>Match</u>/write algebraic expressions in contexts (four operations only) - Substitute positive integers into expressions with four operations (e.g. $3a + 2$) - Understand how variables are used in mathematics (include keywords for term, variable, expression, equation, formula and identity)	- Understand what a fraction is - Write and represent a fraction/equivalent fractions from a diagram or a bar model - Find equivalent fractions - Simplify fractions - Identify and write mixed numbers from diagrams - Add and subtract fractions with common and different denominators - Multiply and divide fractions by whole numbers - Multiply and divide fractions by fractions - Multiply and divide whole numbers by mixed numbers - Represent fractions of whole numbers and fractions by shading - Find the reciprocal of a whole number and fraction - Find unit fractions of amounts - halves, quarters - Understand and define what a percentage is - Write a percentage as a fraction and simplify it - Write a decimal as a fraction and simplify it - Find 50%, 10% and 25% of an amount - Find multiples of 5% and 10% of an amount - Convert percentages to decimals using a calculator - Calculate integer percentages of amounts using a calculator

	• Simplify expressions using addition and subtraction (positive and negative answers) • Expand and simplify more than one single bracket with positive and negative terms • Factorise algebraic expressions with integers and variables • Write algebraic expressions for contexts (four operations and brackets) • Substitute <u>any</u> integers into expressions with four operations and brackets (e.g. $3(a + 5)$) including indices (e.g. $(ab^2 - 7)/c$)	• Increase or decrease an amount by 10% • Convert between mixed numbers and improper fractions • Order 3 or more fractions by finding a common denominator • Find the multiples of 10%, 25%, 50% of amounts • Compare percentages of amounts • Calculate decimal percentages of amounts using a calculator • Write percentages as a decimal multiplier • Increase or decrease an amount by multiples of 5% and 10% • Increase or decrease an amount by any percentage (calc. include decimal multipliers) • Testing Hypothesis • Drawing and Interpreting common graphs • Calculating Mean, Mode, Median and Range • Comparing Averages
Key vocabulary	Expression, Term, Formula (formulae), Equation, Function, Variable, Mapping diagram, Input, Output, Represent, Substitute, Evaluate, Like terms, Simplify / Collect, Brackets, Operation, Inverse, Solution, Symbol, Solve	Fraction, Numerator, Denominator, Improper fraction, Proper fraction, Top-heavy fraction, Mixed number, Equivalent fraction, Simplify, cancel, lowest terms, Percent, percentage, Multiplier, Increase, decrease Data, Categorical data, Discrete data, Pictogram, Symbol, Key, Frequency, Table, Frequency table, Tally, Bar chart, Time graph, Time series, Bar-line graph, Vertical line chart, Scale, Graph, Axis, axes, Line graph, Pie chart, Sector, Angle, Maximum, minimum
Mid Term Assessment	Algebra (to date)	Fractions (to date)

End Term Assessment	Algebra	End of Year Exam (all topics)
Additional information		
Homework	Sparx: Ensure you attempt all questions, watch the videos if you are unsure or seek help from your teacher if you still require help after watching the videos. You must write each bookwork code in your Sparx book and show all working out.	
Extra curricular and enrichment opportunities	Mathematics masterclasses: club for students who enter the UKMT challenge, 24 game Hillingdon challenge. Times Tables Rockstars House competition.	
Useful links that will support learning	Sparx Independent Learning	
How parents can support learning	Check students' Sparx homework weekly to ensure that it is complete. Look at assessments and feedback in students' books. Encourage pupils to do Independent Learning on Sparx to further their knowledge and retain prior skills.	