SVC Mathematics Learning Pathway – Year 8

LP	Key Skills Students will:	Essential Knowledge Students will:
8-9	• Apply the four operations with negative numbers • Convert numbers into standard form and vice versa • Apply the multiplication, division and power laws of indices • Convert between terminating decimals and fractions • Find a relevant multiplier when solving problems involving proportion • Solve problems involving percentage change, including original value problems • Factorise an expression by taking out common factors • Change the subject of a formula when two steps are required • Find and use the nth term for a linear sequence • Solve linear equations with unknowns on both sides • Plot and interpret graphs of linear functions • Apply the formulae for circumference and area of a circle • Calculate theoretical probabilities for single events	• Know how to write a number as a product of its prime factors • Know how to round to significant figures • Know the order of operations including powers • Know how to enter negative numbers into a calculator • Know that $a^0 = 1$ • Know percentage and decimal equivalents for fractions with a denominator of 3, 5, 8 and 10 • Know the characteristic shape of a graph of a quadratic function • Know how to measure and write bearings • Know how to identify alternate angles • Know how to identify corresponding angles • Know how to find the angle sum of any polygon • Know that circumference $= 2\pi r = \pi d$ • Know that area of a circle $= \pi r^2$ • Know that volume of prism = area of cross-section × length • Know to use the midpoints of groups to estimate the mean of a set of grouped data • Know that probability is measured on a 0-1 scale • Know that the sum of all probabilities for a single event is 1
6-7	• Use positive integer powers and associated real roots • Apply the four operations with decimal numbers • Write a quantity as a fraction or percentage of another • Use multiplicative reasoning to interpret percentage change • Add, subtract, multiply and divide with fractions and mixed numbers • Check calculations using approximation, estimation or inverse operations • Simplify and manipulate expressions by collecting like terms • Simplify and manipulate expressions by multiplying a single term over a bracket • Substitute numbers into formulae • Solve linear equations in one unknown • Understand and use lines parallel to the axes, y = x and y = -x • Calculate surface area of cubes and cuboids • Understand and use geometric notation for labelling angles, lengths, equal lengths and parallel lines	• Know the first 6 cube numbers • Know the first 12 triangular numbers • Know the symbols =, ≠, <, >, ≤, ≥ • Know the order of operations including brackets • Know basic algebraic notation • Know that area of a rectangle = l × w • Know that area of a triangle = b × h ÷ 2 • Know that area of a parallelogram = b × h • Know that area of a trapezium = ((a + b) ÷ 2) × h • Know that volume of a cuboid = l × w × h • Know the meaning of faces, edges and vertices • Know the names of special triangles and quadrilaterals • Know how to work out measures of central tendency • Know how to calculate the range
4-5	• Multiply and divide numbers with up to three decimal places by 10, 100, and 1000 • Use long division to divide numbers up to four digits by a two-digit number • Use simple formulae expressed in words • Generate and describe linear number sequences • Use simple ratio to compare quantities • Write a fraction in its lowest terms by cancelling common factors • Add and subtract fractions and mixed numbers with different denominators • Multiply pairs of fractions in simple cases • Find percentages of quantities • Solve missing angle problems involving triangles, quadrilaterals, angles at a point and angles on a straight line • Calculate the volume of cubes and cuboids • Use coordinates in all four quadrants • Calculate and interpret the mean as an average of a set of discrete data	• Know percentage and decimal equivalents for fractions with a denominator of 2, 3, 4, 5, 8 and 10 • Know the rough equivalence between miles and kilometres • Know that vertically opposite angles are equal • Know that the area of a triangle = base × height ÷ 2 • Know that the area of a parallelogram = base × height • Know that volume is measured in cubes • Know the names of parts of a circle • Know that the diameter of a circle is twice the radius • Know the conventions for a 2D coordinate grid • Know that mean = sum of data ÷ number of pieces of data

LP	Key Skills Students will:	Essential Knowledge Students will:
2-3	• Identify multiples and factors of a number • Count forwards and backwards through zero • Round to one decimal place • Use columnar addition and subtraction with numbers of any size • Multiply a three- or four-digit number by a two-digit number using long multiplication • Divide numbers up to four-digits by a single-digit number using short division and interpret the remainder • Add and subtract fractions with denominators that are multiples of the same number • Write decimals as fractions • Understand that per cent relates to number of parts per hundred • Convert between adjacent metric units of measure for length, capacity and mass • Measure and draw angles • Calculate the area of rectangles • Distinguish between regular and irregular polygons	• Know the place value headings up to millions • Recall primes to 19 • Know the first 12 square numbers • Know the Roman numerals I, V, X, L, C, D, M • Know percentage and decimal equivalents for 1/2, 1/4, 1/5, 2/5, 4/5 • Know rough conversions between metric and Imperial units • Know that angles are measured in degrees • Know angles in one whole turn total 360° • Know angles in half a turn total 180° • Know that area of a rectangle = length × width
0-1	• Round any number to the nearest 10, 100, 1000 and round a number with one decimal place to the nearest whole number • Count backwards through zero • Use columnar addition and subtraction with numbers up to four digits • Multiply two- and three-digit numbers by a one-digit number • Use known and derived facts to multiply and divide mentally • Write any number of tenths or hundredths as a decimal • Find families of common equivalent fractions • Add and subtract fractions with the same denominator • Find areas of rectilinear shapes by counting squares • Use a line of symmetry to complete a symmetric shape or pattern • Identify lines of symmetry in 2D shapes • Use coordinates in the first quadrant • Interpret and construct bar charts and time graphs	• Know the place value headings of ones, tens, hundreds and thousands • Know the Roman numerals I, V, X, L, C • Know the % symbol • Know multiplication facts up to 12 × 12 • Know division facts related to tables up to 12 × 12 • Know decimals equivalents of 1/2, 1/4, 3/4 • Know adjacent time facts involving years, months, weeks, days, hours, minutes and seconds • Know 12- and 24-hour clock conversions • Know the names and connected properties of triangles and quadrilaterals • Know the definitions of acute and obtuse angles • Know that area is measured in squares • Know that perimeter is a measure of length