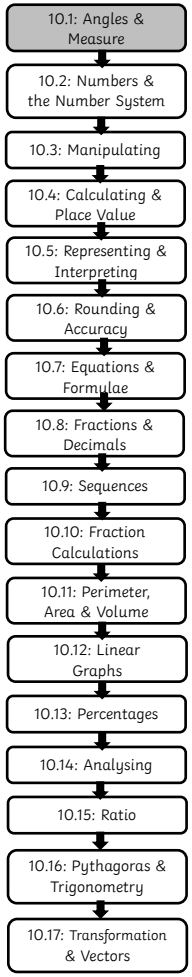
Personalised Learning Checklist (PLC): Year 10 Higher



Unit 1 – Angles and Measure	Sparx Codes
Notation for labelling lengths and angles, including the names of angles (acute, obtuse, right, reflex)	
Notation for labelling right angles, parallel lines and equal lengths or sides and angles in shapes	
Angle rule: vertically opposite angles are equal	U730
Angle rule: angles around a point add to 360	U390
Angle rule: angles at a point on a straight line add to 180	U390
Angles in parallel lines: alternate, corresponding and interior angles	U826
Combining angle facts	U655
Angle sum of a triangle is 180, and use of equilateral and isosceles	U628
Angle sum of quadrilateral is 360, and use of special quadrilaterals	U732 U329
Names and properties of triangles, quadrilaterals and polygons	U121
Angle sum of any polygon & interior or exterior angles in regular polygons	U427
Draw and measure line segments and angles accurately	U447
Bearings (8 compass bearings, and 3-figure bearings)	U525 U107
Scale factors, scale diagrams and maps	U257

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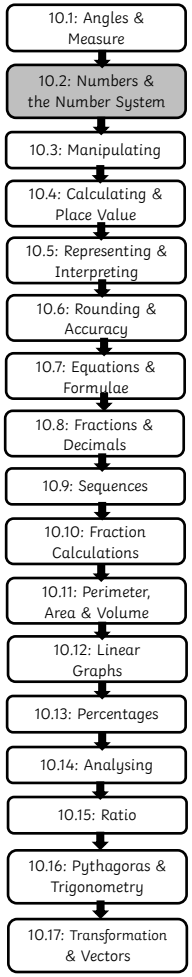

Unit 2 – Numbers & the Number System	Sparx Codes
Find multiples and lowest common multiples of numbers	U751
Find factors and use divisibility rules	U211
Find highest common factors of numbers	U529
Recognise prime numbers 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, …	U236
Find the prime factors of a number	U739
Use prime factors to calculate HCF and LCM	U250
Read, write and evaluate powers and roots	U851
Recognise and use square numbers up to 15^2, and their square roots, and cube numbers 1, 8, 27, 64, 125 and 1000 and their cube roots. Recognise powers of 2, 3, 4 and 5 Know that 1000 = 10^3 and 1 million = 10^6 Know that a number to the power zero is 1	U851
Read, write and evaluate negative powers	U694
Read, write and evaluate fractional powers	U985 U772
Use a scientific calculator to find powers and roots	U926
Convert a root to a rough decimal value	U299
Calculate exactly with surds (multiply/divide)	U633
Simplify surd expressions involving squares eg $\sqrt{12} = \sqrt{4} \times \sqrt{3} = 2\sqrt{3}$	U338

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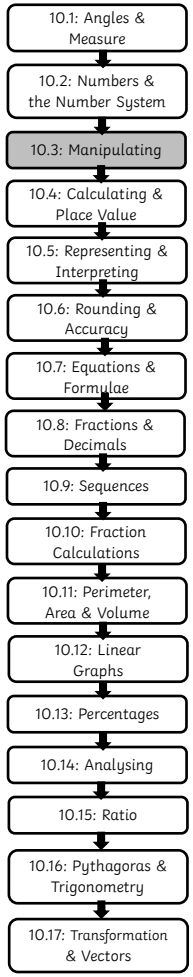

Unit 3 – Manipulating	Sparx Codes
Recognise: expression, equation, inequality, term, formulae, function	
Know and use basic algebraic notation	U613
Simplify expressions by collecting like terms	U105
Simplify expressions using multiply and divide	
Use rules of indices to simplify expressions $a^m \times a^n = a^{m+n}$ $a^m \div a^n = a^{m-n}$ $(a^m)^n = a^{mn}$ $a^0 = 1$	U662
Multiply (expand) a single bracket and simplify expressions involving expanding a single bracket	U179
Expand and simplify two brackets (including those involving surds)	U768
Expand and simplify more than two brackets	U606
Factorise into single brackets by taking out common factors	U365
Factorise quadratic expressions of the form $x^2 + bx + c$	U178
Use the difference of two squares: $x^2 - a^2 = (x + a)(x - a)$	U963
Factorise quadratic expressions of the form $ax^2 + bx + c$	U858

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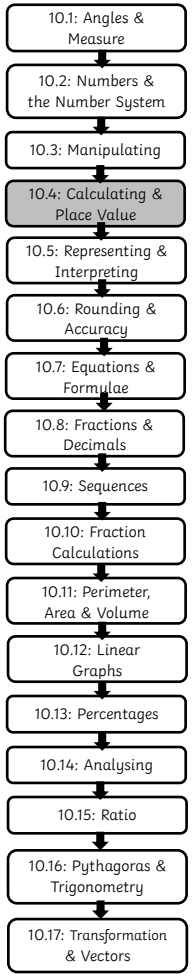

Unit 4 – Calculating & Place Value	Sparx Codes
Understand place value	
Use the signs $<$, $\leq$, $>$, $\geq$, $=$, $\neq$ to compare numbers, including compound inequalities to compare three or more numbers (e.g. $-1<0.5<4$)	
Order a set of integers and decimals	U435
Find the midpoint of two numbers	
Add, subtract, multiply and divide with negative numbers	U742 U548
Add and subtract with integers and decimals	U417 U478
Multiply with integers, and multiply integers and decimals by a decimal	U127 U293
Divide with integers, divide a decimal by an integer, an integer by a decimal, and a decimal by a decimal	U453 U868
Multiply and divide with place value	U735
Use a scientific calculator	U926
Apply BIDMAS to multi-step calculations	U976
Interpret, write and compare numbers in standard form (positive and negative indices)	U330 U534
Calculate with standard form	U264 U290
Enter numbers in standard form on a calculator	U161

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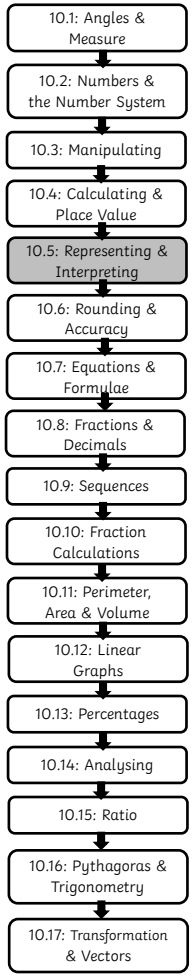

Unit 5 – Representing & Interpreting	Sparx Codes
Know that: discrete data is data which can be listed or counted; continuous data is measured data; primary data is data you have collected yourself; secondary data has been collected by someone else; qualitative data is descriptive; quantitative data is numerical	U322
Sampling from a population and its limitations	U162
Construct and interpret frequency tables	U981 U312 U653
Construct and interpret bar charts, comparative bar charts and vertical line charts	U363 U557
Construct and interpret pictograms	U506
Construct and interpret pie charts	U508 U172
Compare data using appropriate representations	U520
Construct and interpret line graphs for time series data	U590 U193
Construct histograms	U185 U814
Plot bivariate data on a scatter graph Understand positive and negative correlation Draw and use a line of best fit on a scatter graph	U199 U277 U128
Know interpolation is estimating within data values on a graph and this is generally reliable Know extrapolation is estimating outside data values on a graph and this is unreliable	

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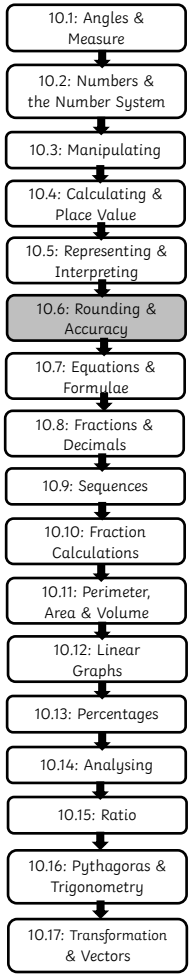

Unit 6 – Rounding & Accuracy	Sparx Codes
Round to the nearest 1000, 100, 10 or whole number	U480
Round to a specified number of decimal places	U298
Round to a specified number of significant figures	U731 U965
Round to an appropriate degree of accuracy	
Estimate calculations by rounding to one significant figure	U225
Estimate and check if solutions to problems are of the correct size	
Determine if an estimate is an overestimate or underestimate	
Express rounding errors as $a \leq x < b$ Understand error interval notation $a \leq x < b$ Understand the concept of upper and lower bounds	U657
Choose the correct combination of bounds to calculate an overall maximum or minimum for a situation	U587

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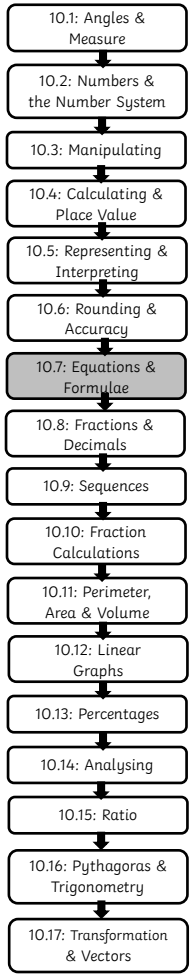

Unit 7 – Equations & Formulae	Sparx Codes
Express problems algebraically	U613
Solve equations when the solution is a positive or negative integer, or a fraction Solve equations involving brackets	U755 U325
Solve equations where the unknown is the numerator of a fraction	
Solve equations where the unknown appears on both sides	U870
Solve two simultaneous equations using the elimination method	U760
Solve two simultaneous equations using the substitution method	U757
Substitute integers into expressions and formulae Given a formula, find outputs from inputs, and inputs from outputs	U201 U585 U144
Rearrange a formula to change the subject	U556

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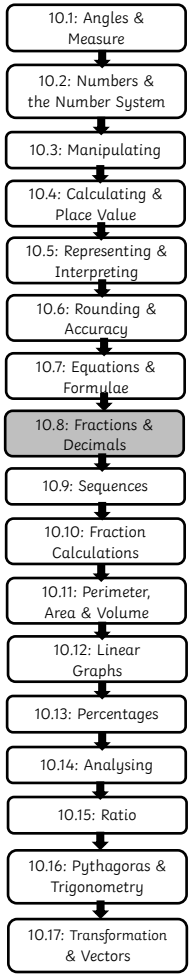

Unit 8 – Fractions & Decimals	Sparx Codes
Shade fraction diagrams or say what fraction of a diagram is shaded	U679 U163
Convert between improper and mixed numbers	U692
Equivalent fractions	U704
Simplify fractions	U646
Write fractions and mixed numbers in order of size using common denominators	U746 U439
Find a number between two fractions or integers	
Know fractions represent division with decimal answers	
Convert between fractions and decimals, with or without a calculator	U888
Identify if a fraction is terminating or recurring	
Convert recurring decimals to fractions on a calculator	
Convert recurring decimals to fractions using algebra	U689
Order fractions and decimals by converting to decimals	U746 U439

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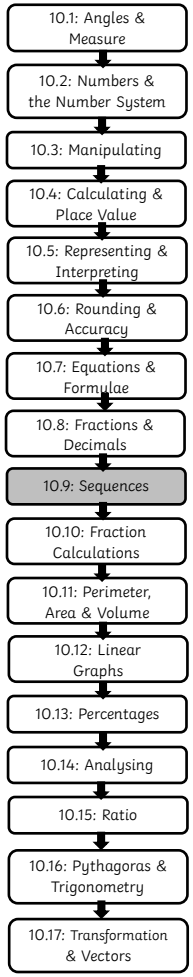

Unit 9 – Sequences	Sparx Codes
Term-to-term rules: generate a sequence or identify a rule and continue a sequence	U213
Understand position-to-term rules (nth term) and substitute numbers in	U530
Know the features of an arithmetic sequence (terms have a common difference)	
Arithmetic sequences – nth term (use or find) Determine if a number is a term of a sequence	U498
Sequences of patterns – nth term	U978
Know the features of a quadratic sequence (differences have equal gaps)	
Quadratic sequences – nth term (use or find)	U206
Special sequences – know features of, & recognise (eg) Square numbers (1, 4, 9, 16, 25, 36, 49, 64, 81, 100…) Cube numbers (1, 8, 27, 64, 125, …) Triangle numbers (1, 3, 6, 10, 15, 21, 28, 36, 45, …)	U680
Knows the features of a geometric sequence (terms have a common ratio)	
Geometric sequences – recognise, find common ratio, continue and use nth term	U958
Know the features of a Fibonacci sequence (each term is the sum of the previous two terms)	
Fibonacci sequences – recognise and continue the sequence	

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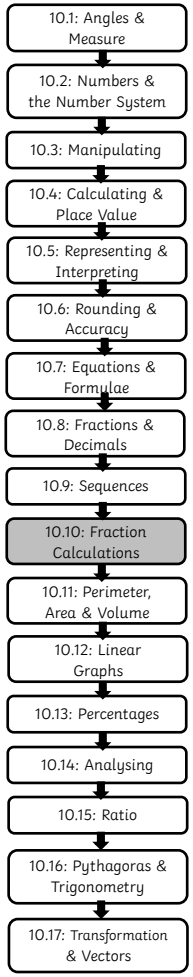

Unit 10 – Fraction Calculations	Sparx Codes
Find fractions of amounts, with or without a calculator	U881 U916
Given a fraction, and the result, find the original amount or answer word problems related to fractions	
Express one quantity as a fraction of another	
Add and subtract fractions Add and subtract mixed numbers	U736 U793
Multiply with fractions Multiply mixed numbers	U475 U224
Divide with fractions Divide with mixed numbers	U544 U538
Solve problems involving fractions and mixed numbers	U874
Add and subtract algebraic fractions	U685
Multiply algebraic fractions	U457
Divide algebraic fractions	U824
Complete fraction calculations on a calculator	

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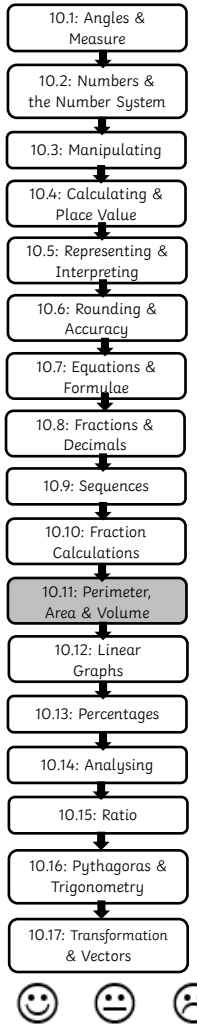

Unit 11 – Perimeter, Area and Volume	Sparx Codes
Find area and perimeter of simple shapes	U993
Area of a rectangle (Area = length x width)	
Area and perimeter of compound shapes	U970 U351
Problem solving: Area & perimeter of rectangles and compound shapes	U226 U934
Area of a triangle (Area = $\frac{1}{2}$ x base x height)	U945
Area of a parallelogram (Area = base x height)	U424
Area of a trapezium (Area = $\frac{1}{2}$(a + b) x height)	U265
Problem solving: Area of triangles, parallelograms & trapeziums	U343 U904
Circumference of a circle C = 2πr = πd	U604
Area of a circle A = πr^2	U950
Arc length & perimeter of sectors of circles Area of sectors of circles	U221 U373
Volume of cuboids (V = length x width x height)	U786
Volume of a prism (V = area of cross-section x height) Volume of a cylinder (V = πr^2 x height)	U174 U915
Volume of a sphere Volume of a pyramid Volume of cone Mixed problems involving volume of cones & spheres	U617 U484 U116 U426
Sketch the net of a solid	U761
Surface area of a cuboid Surface area of prisms Surface area of a cylinder Surface area of a sphere Surface area of a pyramid Surface area of a cone	U929 U259 U464 U893 U871 U523

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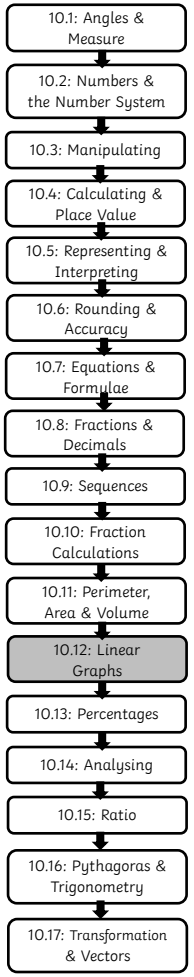

Unit 12 – Linear Graphs	Sparx Codes
Work with coordinates in all four quadrants	U789
Plot graphs of linear functions written in the form: y = ax + b or ax + by + c = 0	U741
Use linear graphs to estimate values of y for given values of x and vice versa	
Understand intercept and rate of change (gradient) of a graph	
Use the form y = mx + c to identify gradient and intercept algebraically	
Find the equation of a straight line graph	U315
Interpret the equation of a straight line graph	U669
Equations of parallel lines, including use of y = mx+c	U377
Equations of perpendicular lines, including use of y = mx+c	U898
Find the equation of a line through one point with a given gradient	U477
Find the equation of a line through two given points	U848

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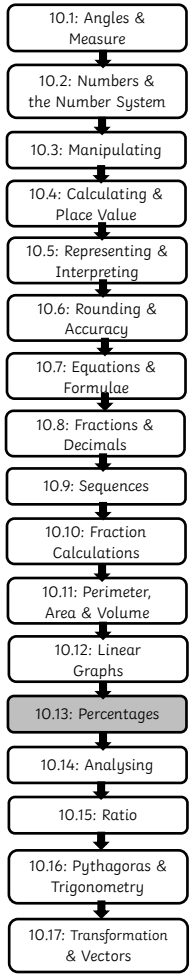

Unit 13 – Percentages	Sparx Codes
Convert between fractions, decimals and percentages with or without a calculator	U888
Know the calculator converter function keys	
Find a percentage of an amount without a calculator	U554
Calculate the percentage of an amount with a calculator using a decimal or fraction multiplier	U349
Increase or decrease by a percentage without a calculator	U773
Use fraction/decimal multipliers to increase or decrease by a percentage	U671
Work with percentages over 100% and decimal percentages	
Express one number/quantity as a percentage of another	U925
Compare quantities using percentages	
Find the percentage an amount has changed by (percentage change = actual ÷ original or percentage change = finish ÷ start)	U278
Solve simple interest problems	U533
Solve compound interest problems	U332
Find the original value in percentage problems	U286
Growth and decay problems	U988

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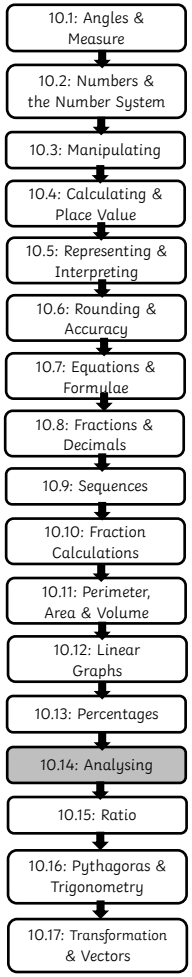

Unit 14 – Analysing	Sparx Codes
Know averages are a measure of central tendency and give a summary of a set of data	
Know a range is a measure of spread (consistency) Calculate the range from a list, table or diagram	U526
Calculate the median	U456
Find upper and lower quartile from a list of data using the positions $\frac{1}{4}(n+1)$ and $\frac{3}{4}(n+1)$	
Find the mode from a list or diagram	U260
Calculate the mean from a list or diagram	U291
Averages from frequency tables	U569
Averages from diagrams	U854
Averages from grouped data	U877
Choose a suitable average and solve problems Understand outliers and their effect on calculations	U717
Compare sets of data using mean and range	
Draw a cumulative frequency graph	U182
Interpret a cumulative frequency graph	U642
Draw a box plot	U879
Interpret box plots	U837
Compare populations using box plots and cumulative frequency graphs	U507
Interpret histograms	U983
Calculate averages from histograms	U267

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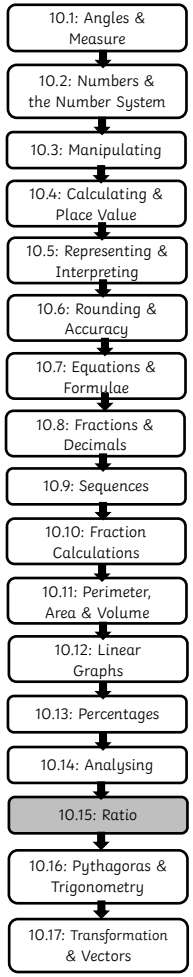

Unit 15 – Ratio	Sparx Codes
Compare 2 or more quantities using ratio notation (eg lengths, areas and volumes)	U687
Simplify a ratio, including those with units	
Write a ratio in the form 1 : n or n : 1	
Ratios and fractions	U176
Sharing amounts in a ratio	U577 U595
Solve problems involving ratios, including comparing ratios and considering the difference between values	U921 U676 U865
Use ratios in real contexts such as conversion, comparison, scaling, mixing and concentrations	
Solve better value or best-buy problems	
Solve problems involving unit pricing	

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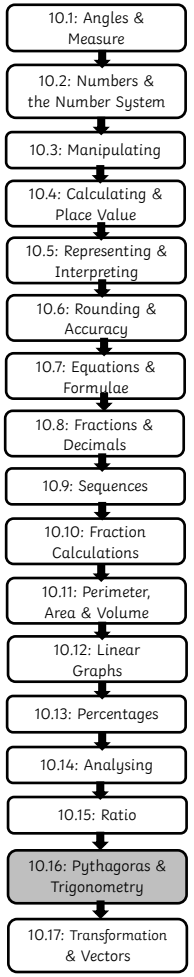

Unit 16 – Pythagoras & Trigonometry	Sparx Codes
Identify the hypotenuse in a right-angled triangle (the longest side, opposite the right-angle)	
Know the formula for Pythagoras' Theorem: $c^2 = a^2 + b^2$ where c is the hypotenuse	U385
Use the formula for Pythagoras' Theorem to find lengths in right-angled triangles	
Know the term surd and give exact answers in surd form when required (eg $\sqrt{10}$)	
Label a right-angled triangle with hypotenuse (H), opposite (O) and adjacent (A)	
Know that the ratio O/H is sine/sin of the angle	U605
Know that the ratio A/H is cosine/cos of the angle	
Know that the ratio O/A is tangent/tan of the angle	
Know the trigonometric ratios SOH CAH TOA	
Use trigonometry to calculate missing lengths in right-angled triangles	U283
Use trigonometry to calculate missing angles in right-angled triangles	U545
Use Pythagoras' Theorem to calculate missing lengths in 3D shapes	U541
Use trigonometry to calculate missing lengths and angles in general triangles in 3D shapes	U170

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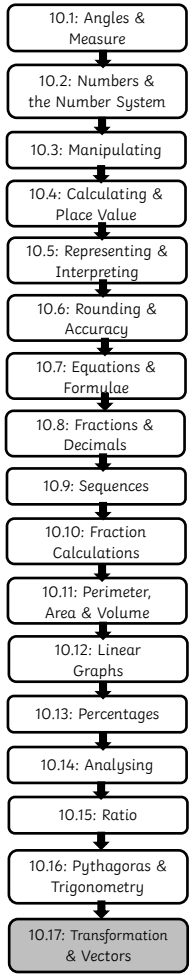

Unit 17 – Transformations and Vectors	Sparx Codes
Line symmetry and rotational symmetry	U849
To draw and describe a translation of a shape	U196
To draw and describe a reflection of a shape	U799
To draw and describe a rotation of a shape	U696
Enlarge a shape using a centre and scale factor	U519 U134
Carry out combinations of transformations Describe the resultant of multiple transformations as a single transformation	U766
Understand invariant points of a transformation	
Add and subtract vectors	U903
Multiply a vector by a scalar	U564
Draw vectors on a diagram and describe them Solve problems using vectors	U781
Identify parallel vectors	U660
Use vectors to construct geometric arguments and proofs	U560

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Notes