



Unit 1: Number		✓ SPARX
<b>1a. Calculations, Checking and Rounding</b>		
Addition & subtraction with decimals		U478
Multiplication with decimals		U293
Division with decimals		U868
Round integers		U480
Round decimals		U298
Round integers using significant figures		U731
Round decimals using significant figures		U965
Estimating calculations		U225
Error intervals		U657
Truncating decimals		U108
Related calculations		U735
Product rule for counting		U369
<b>1b. Indices, Roots, Reciprocals and BIDMAS</b>		
Calculating with roots and powers		U851
Estimating roots and powers		U299
Fractional unit indices (e.g. $\frac{1}{4}$ )		U985
Fractional indices		U772
Index rules with positive indices		U235
Index rules with negative indices		U694
Order of operations (BIDMAS)		U976
<b>1c. Factors, Multiples, Primes</b>		
Factors of a number		U211
Multiple of a number		U751
Prime numbers		U236
Prime factorisation		U739
Highest common factors		U529/ U250
Lowest common multiples		U751/ U250
<b>1d. Standard Form and Surds</b>		
Convert between ordinary and standard form – positive indices		U330
Convert between ordinary and standard form – negative indices		U534
Multiplying and dividing with standard form		U264
Adding and subtracting with standard form		U290
Use a calculator with standard form		U161
Simplifying Surds		U338
Multiplication & division with surds		U633
Adding and subtracting with surds		U872
Brackets Involving Surds		U499



## Unit 2: Algebra

✓ SPARX

### 2a. Basics, Setting Up, Rearranging and Solving Equations

Algebraic notation	U613
Substitute into expressions	U201
Substitute into algebraic formulae	U585
Substitute into real-life formulae	U144
Simplify expressions by collecting like terms	U105
Simplify expressions using index laws	U662
Expand single brackets	U179
Expand double brackets	U768
Factorise into single brackets	U365
Factorise quadratic expressions	U178
Factorise quadratic expressions with a coefficient of x squared	U858
Factorising the difference of two squares	U963
Solving linear equations - variable on one side	U325
Solving linear equations - variable on both sides	U870
Solving linear equations - variable in the denominator	U505
Form and solve equations	U599
Change the subject of a formula	U556
Algebraic Proof	U582

### 2b. Sequences

Term-to-term rules	U213
Using the nth term	U530
Nth term for arithmetic sequences (linear sequences)	U498
Nth term for sequences of patterns	U978
Nth term for quadratic sequences	U206
Special sequences (Fibonacci, fractional etc.)	U680
Nth term for geometric sequences	U958



<b>Unit 3: Averages and Range, Collecting and Interpreting Data</b>		✓ SPARX
<b>3a. Averages and Range</b>		
Types of data		U322
Calculate range		U526
Calculate mode		U260
Calculate median		U456
Calculate mean (incl. reverse mean)		U291
Averages from diagrams		U854
Averages from frequency tables		U569
Averages from grouped frequency tables		U877
Choose suitable averages/compare averages		U717
<b>3b. Representing and Interpreting Data</b>		
Two way tables		U981
Stem and Leaf Diagrams		U200/ U909
Draw bar charts		U363
Interpret bar charts		U557
Draw pie charts		U508
Interpret pie charts		U172
Draw and interpret frequency polygons		U840
Draw histograms with equal class width		U185
Draw line graphs		U590
Interpret line graphs (incl. time series)		U193
<b>3c. Scatter Graphs</b>		
Plot scatter graphs		U199
Interpret scatter graphs		U277
Use the line of best fit		U128



Unit 4: Fractions, Ratio and Percentages		✓	SPARX
<b>4a Fractions and Percentages</b>			
Finding fractions of shapes			U679
Finding equivalent fractions			U704
Ordering fractions			U746
Ordering fractions and mixed numbers			U439
Simplifying fractions			U646
Constructing fractions			U163
Convert between mixed numbers and improper fractions			U692
Adding and subtracting fractions			U736
Adding and subtracting mixed numbers			U793
Multiplying fractions			U475
Multiplying with mixed numbers			U224
Dividing fractions			U544
Dividing with mixed numbers			U538
Problem solving: fractions and mixed numbers			U874
Finding fractions of amounts without a calculator			U881
Finding fractions of amounts with a calculator			U916
Converting between fractions, decimals and percentages			U888
Ordering fractions, decimals and percentages			U594
Converting fractions to recurring decimals			U550
Converting recurring decimals to fractions			U689
Writing numbers as percentages of other numbers			U925
Finding the percentage an amount has been changed by			U278
Finding percentages of amounts without a calculator			U554
Finding percentages of amounts with a calculator			U349
Percentage increase/decrease without a calculator			U773
Percentage increase/decrease with a calculator			U671
Reverse percentages			U286
Simple interest calculations			U533
Compound interest calculations			U332
Growth and decay			U988
<b>4b Ratio and Proportion</b>			
Write and simplify ratio			U687
Sharing amounts into a given ratio			U577
Using equivalent ratios to find unknown amounts			U753
Converting between ratios, fractions and percentages			U176
Combining ratios			U921
Calculating with ratio and algebra			U676
Changing ratios			U921
Problem solving with ratio			U865
Solving direct proportion word problems (incl. recipes)			U721
Currency conversion			U610
Calculating with rates			U256
Drawing and interpreting scale diagrams			U257



Unit 5: Angles and Trigonometry		✓	SPARX
<b>5a Polygons, Angles and Parallel Lines</b>			
Angles on a straight line and around a point			U390
Vertically opposite angles			U730
Angles in triangle			U628
Angles in parallel lines			U826
Combining angle facts			U655
Angles in quadrilaterals			U732
Angles in polygons			U427
<b>5b Pythagoras' Theorem and Trigonometry</b>			
Use Pythagoras' theorem in 2D			U385
Understanding sin, cos and tan			U605
Trigonometry (finding sides)			U283
Trigonometry (finding angles)			U545
Angles of elevation and depression			U967
Using the exact values of trigonometric values			U627



Unit 6 Graphs		✓	SPARX
<b>6a Graphs: the basics and real-life graphs</b>			
Cartesian axis & coordinates		U789	
Plot linear real-life graphs		U652	
Using and interpreting linear real-life graphs		U638	
Plotting distance-time graphs		U403	
Interpreting distance-time graphs		U914	
Calculating speed from distance-time graphs		U462	
Plotting distance-time graphs using speeds		U966	
Plotting velocity-time graphs		U937	
Calculating acceleration from velocity-time graphs		U562	
Calculating distances from velocity-time graphs		U611	
Calculating midpoints		U933	
Solving shape problems involving coordinates		U889	
Calculate the length of a line segment		-	
<b>6b Linear Graphs and Coordinate Geometry</b>			
Plotting straight line graphs		U741	
Finding equations of straight line graphs		U315	
Using the equation of a line to find y-intercepts and gradients		U669	
Finding the equation of a line from its gradient and a point		U477	
Finding the equation of a line from two points		U848	
Equations of parallel lines		U377	
Equations of parallel and perpendicular lines		U898	
<b>6c Quadratic, Cubic and Other Graphs</b>			
Plotting graphs of quadratic functions		U989	
Find the y-intercept of a quadratic graph		U667	
Find the x-intercept (roots) of a quadratic graph		U667	
Using a quadratic graph to solve a related quadratic equation		-	
Graphs of cubic functions		U980	
Graphs of reciprocal functions		U593	
Draw circles with centre origin (0,0)		U567	



<b>Unit 7: Perimeter, Area and Volume, Prisms, Circles, Cylinders, Spheres, Cones; Accuracy and Bounds</b>		<input checked="" type="checkbox"/> SPARX
<b>7a Perimeter, Area and Circles</b>		
Mixed problems: Finding the area and perimeter of simple shapes	U993	
Finding the area of compound shapes	U970	
Finding the perimeter of compound shapes	U351	
Problem <u>solving</u> : area/perimeter of rectangles/compound shapes	U934	
Finding the area of triangles	U945	
Finding the area of compound shapes containing triangles	U575	
Finding the area of parallelograms	U424	
Finding the area of trapeziums	U265	
Problem <u>solving</u> : area of triangles, parallelograms and trapeziums	U904	
Identifying parts of a circle	U767	
Finding the circumference of circles	U604	
Finding the area of circles	U950	
Finding the arc length of sectors	U221	
Finding the area of sectors	U373	
Converting units of area	U248	
<b>7b 3D Forms and Volume, Cylinders, Cones and Spheres</b>		
Finding the volume of cubes and cuboids	U786	
Finding the surface area of cubes and cuboids	U929	
Finding the volumes of prisms	U174	
Finding the surface area of prisms	U259	
Finding the volume of a cylinder	U915	
Finding the surface area of a cylinder	U464	
Finding the volume of pyramids	U484	
Finding the surface area of pyramids	U871	
Finding the volume of cones	U116	
Finding the surface area of cones	U523	
Finding the volume of spheres	U617	
Finding the surface area of spheres	U893	
Finding the surface area of prisms	U259	
Finding the volume of a cylinder	U915	
Finding the surface area of a cylinder	U464	
Finding the volume of pyramids	U484	
Mixed problems: finding the volume of cones and spheres	U426	
Mixed problems: finding the surface area of cones and spheres	U771	
Finding the volume of frustums	U350	
Finding the surface area of frustums	U334	
Finding the volume of composite shapes	U543	
Finding the surface area of composite shapes	U561	
Converting units of volume	U468	
<b>3c Accuracy and Bounds</b>		
Finding bounds for additions and subtractions	U587	
Finding bounds for multiplying and dividing	U587	
Problem solving with bounds	U587	



<b>Unit 8: Transformations and Constructions</b>		✓	SPARX
<b>8a Transformations</b>			
Translations			U196
Reflections			U799
Rotations			U696
Enlargement by a positive scale factor			U519
Enlargement by a negative scale factor			U134
Combining transformations			U766
<b>8b Constructions, Loci and Bearings</b>			
Nets of 3D shapes			U761
Plans and elevations			U743
Drawing and interpreting scale drawings			U257
Measuring and drawing bearings			U525
Calculating bearings			U107
Using a pair of compasses			U678
Constructing triangles			U187
Constructing bisectors of angles			U787
Constructing perpendicular bisectors and lines			U245
Mixed problems: constructing bisectors and perpendicular lines			U979
Constructing loci			U820



## Unit 9: Algebra

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### 9a. Solving Quadratics and Simultaneous Equations

Factorise and solve quadratic equations	U228
Factorise and solve quadratic equations – coefficient of x squared	U960
Solve quadratic equations by completing the square	U589
Solve quadratic equations using the quadratic formula	U665
Form and solve quadratic equations	U150
Solve simultaneous equations using elimination	U760
Solve simultaneous equations using substitution	U757
Solve simultaneous equations involving quadratics	U547
Form and solve simultaneous equations	U137

### 9b. Inequalities

Read and draw inequalities on number lines	U509
Solve single inequalities	U759
Solve inequalities with the variable on both sides	U738
Solve double inequalities	U145
Form and solve inequalities	U337



## Unit 10: Probability



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### 10 Probability

Using probability phrases	U803
Writing probabilities as fractions	U408
Writing probabilities as fractions/decimals/percentages	U510
Probabilities of mutually exclusive events	U683
Expected results from repeated experiments	U166
Experimental probabilities	U580
Sample space diagrams	U104
Frequency trees	U280
Tree diagrams for independent events	U729
Tree diagrams for dependent events	U558
Using set notation	U296
Venn diagrams	U476
Venn diagrams with set notation	U748
Conditional probability from tables	U246
Conditional probability from tree diagrams	U806
Conditional probability from Venn diagrams	U699



## Unit 11: Multiplicative Reasoning



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### 11 Direct and Inverse Proportion, Direct Proportional Graphs, Compound Measures, Repeated Proportional Change

Solving direct proportional word problems	U721
Solving inverse proportional word problems	U357
Percentage change with a calculator	U671
Compound interest calculations	U332
Growth and Decay	U988
Calculating with speed (incl. converting speed units)	U151
Calculating with rates	U256
Calculating with density (incl. converting density units)	U910
Calculating with pressure (incl. converting pressure units)	U527
Mixed problems: Calculating density and pressure	U842
Interpreting direct proportion equations	U640
Constructing direct proportion questions	U407
Interpreting inverse proportion equations	U364
Constructing inverse proportion equations	U138
Graphs of direct and inverse proportion	U238



## Unit 12: Similarity and Congruence



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### 12 Similarity and Congruence in 2D and in 3D

Understanding congruence		U790
Congruent triangles		U866
Understanding similarity		U551
Finding unknown sides in similar shapes		U578
Finding the perimeter and area of similar shapes		U630
Finding the surface area and volume of similar shapes		U110
Mixed problems: understanding similarity and congruence		U112



<b>Unit 13: Further Trigonometry, Pythagoras in 3D, Accuracy and Bounds</b>		<input checked="" type="checkbox"/> SPARX
<b>13a Graphs of Trigonometric Functions</b>		
Graphs of trigonometric functions		U450
Translating trigonometric graphs		U598
Reflecting trigonometric graphs		U487
<b>13b Further Trigonometry</b>		
Area of a triangle		U592
Sine rule		U952
Cosine rule		U591
Trigonometry in 3D		U170
Pythagoras in 3D		U541



## Unit 14: Further Statistics



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### 14a Collecting Data

Types of data	U322
Collecting and recording data using tables	U120
Selecting sampling techniques	U162
Designing and using questionnaires	U911
Capture Recapture	-

### 14b Cumulative Frequency, Box Plots and Histograms

Drawing cumulative frequency graphs	U182
Interpreting cumulative frequency graphs	U642
Drawing box plots	U879
Interpreting box plots	U837
Comparing populations using box plots and cumulative frequency graphs	U507
Drawing histograms with equal class widths	U185
Drawing histograms with unequal class widths	U814
Interpreting histograms	U983
Calculating averages from histograms	U267



Unit 15: Equations and Graphs		✓	SPARX
<b>15 Quadratics, Expanding Triple Brackets, Sketching Graphs, Graphs of Circles, Cubes and Quadratics</b>			
Expand triple brackets			U606
Interpreting graphs of quadratic functions			U667
Solving quadratic equations graphically			U601
Finding the turning point of a quadratic graph by completing the square			U769
Graphs of cubic functions			U980
Solving simultaneous equations graphically			U875
Solve quadratic inequalities			U133
Graphs of inequalities			U747
Substituting into iterative formulae			U434
Finding approximate solutions to equations using iteration			U168



<b>Unit 16: Circle Theorems and Circle Geometry</b>		✓	SPARX
<b>16a Circle Theorems</b>			
Identifying parts of circles			U767
Angles subtended at the centre or circumference of a circle			U459
Angles in segments and cyclic quadrilaterals			U251
Circle theorems for chords and tangents			U489
Alternate segment theorem			U130
Mixed problems: circle theorems			U808
Proving circle theorems			U807
<b>16b Circle Geometry</b>			
Equations of circles			U567
Equations of tangents to a circle			U567



## Unit 17: More Algebra and Rationalising Denominators



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### 17 Changing the Subject of Formulae (More Complex), Algebraic Fractions, Solving Equation Arising from Algebraic Fractions, Rationalising Surds, Proof

Rationalising denominators containing a single term		U707
Rationalising denominators containing two terms		U281
Simplifying algebraic fractions by cancelling common factors		U103
Simplify algebraic fractions by factorising into one bracket		U437
Simplifying algebraic fractions by factorising into two brackets		U294
Multiplying algebraic fractions		U457
Dividing algebraic fractions		U824
Adding and subtracting algebraic fractions		U685
Solve equations with the variable in the denominator		U505
Changing the subject of a formula		U556
Writing algebraic proofs		U582
Substituting into functions		U637
Substituting into composite functions		U895
Finding composite functions		U448
Finding inverse functions		U996



Unit 18: Vectors and Geometric Proof		✓	SPARX
<b>18 Vectors and Geometric Proof</b>			
Understanding column vectors			U632
Adding and subtracting column vectors			U903
Multiplying column vectors by a scalar			U564
Solving geometric problems using vectors			U781
Geometric proof with vectors			U560
Identifying parallel vectors			U660



Unit 19: Proportion and Graphs		✓	SPARX
<b>19a Reciprocal and Exponential Graphs; Gradient and Area Under a Curve</b>			
Graphs of reciprocal functions			U593
Graphs of exponential functions			U229
Growth and decay			U988
Transforming graphs			U455
Estimating areas under non-linear graphs			U882
Estimating gradients of non-linear graphs			U800
<b>19b Direct and Inverse Proportion</b>			
Graphs of direct and inverse proportion			U238
Constructing direct proportion equations			U407
Constructing inverse proportion equations			U138