Topic: 1 Mixed Numbers

Learning Outcomes and Scaffolding		Sparxmaths reference	Edexcel Ref
8.1.1	Express a given number as a fraction of another number	M939	1.2, E(F)
8.1.2	Use common denominators to add and subtract fractions and mixed numbers	M931	1.2, F(F)
	π $1\frac{3}{5}+2\frac{5}{7}$		
	π $3\frac{1}{5}-2\frac{2}{3}$		
8.1.3	Multiply and divide mixed numbers	M197	1.2, I(F)
	π $2\frac{2}{3}\times 4\frac{5}{7}$	M265	
	π $3\frac{1}{5}\div 2\frac{2}{3}$		

Topic: 2 Expressions and Formulae

Learning Outcomes and Scaffolding		Sparxmaths reference	Edexcel Ref
8.2.1	Understand and use algebraic notation to multiply algebraic terms	M813	2.1, A(F)
	π Simplify $a \times a \times a$		
	π Simplify $2 \times a \times b$		
	π Simplify $3a \times 4b$		
8.2.2	Multiply a single term over a bracket	M237	2.2, C(F)
	π Expand: $2(3x-4)$	M792	
	π Expand and simplify: $3-2(x-1)$		
	π Expand and simplify: $3(3x-2y)-2(4x-y)$		
	π Expand ½ $(8x-4)$		
8.2.3	Substitute positive and negative integers, decimals, fractions, mixed numbers and squares for words and letters in expressions and formulae	M417 M327	2.3, C(F)
	π Evaluate $2x-3y^2$ when $x=4$ and $y=-5$		
	π Evaluate $2x-3y^2$ when $x=0.2$ and $y=\frac{3}{5}$		
	Ext: Evaluate $5a+3b$ when $a=2\frac{1}{10}$ and $b=4\frac{1}{2}$		

Topic: 3 Sequences

	Learning Outcomes and Scaffolding	Sparxmaths reference	Edexcel Ref
8.3.1	Generate terms of a sequence using term-to-term, position-to-term definitions of the sequence	M241, M418	3.1, A(F)
	π Find nth term rule for linear sequence	M866, M166	
	π Know the definition of the natural numbers and understand how they relate to the position of the term	M381, M991	
	π Recognise odd, even, squares, multiples and power sequences	M981	
	π Explore Fibonacci sequences and triangular numbers		
8.3.2	Find subsequent terms of an integer sequence and the role for generating it		3.1, B(F)
	π $5, 9, 13, 17$ … (add 4)		
	π 1, 2, 4, 8 … (multiply by 2)		

Topic: 4 Polygons

	Learning Outcomes and Scaffolding	Sparxmaths reference	Edexcel Ref
8.4.1	Understand and use the properties of the parallelogram, rectangle, square, rhombus, trapezium, isosceles trapezium and kite	M276	4.2, C(F)
	π Be able to comment on the following for each shape:		
	○ Lengths		
	○ Angles		
	○ Parallel sides		
	π Know the conventions for notation for lengths, angles (e.g. $A\hat{B}C$) and parallel sides.		

Topic: 5 Ratio and Proportion

	Learning Outcomes and Scaffolding	Sparxmaths reference	Edexcel Ref
8.5.1	Use ratio notation, including reduction to its simplest form and its various links to fraction notation	M885, M801	1.7, A(F)
	π Express in the form $1: n$	M543	
8.5.2	Divide a quantity in a given ratio or ratios	M525	1.7, B(F)
	π Share $\$416$ in the ratio $5 : 3$		
	π Share $\$416$ in the ratio $4 : 3 : 1$		
8.5.3	Use the process of proportionality to evaluate unknown quantities	M681	1.7, C(F)
	π Compare prices by finding the value of 1 item		
8.5.4	Solve word problems about ratio and proportion	M478	1.7, E(F)

Topic: 6 Statistical Measures

Learning Outcomes and Scaffolding	Sparxmaths reference	Edexcel Ref
8.6.1 Understand the concept of average	M841, M940,	6.2, A(F)
π From a list of values	M328, M934	
π From a frequency table (no grouped data)	M127	
8.6.2 Calculate the mean, median, mode and range for a discrete data set	M841, M940,	6.2, B(F)
π Simple examples from a list	M328, M934	
π Find missing values from a data set given two values from the range, median, mode and mean	M127	
8.6.3 Choosing suitable averages and solving problems	M440	

Topic: 7 Constructions

Learning Outcomes and Scaffolding	Sparxmaths reference	Edexcel Ref
8.7.1 Construct triangles and other two-dimensional shapes using a combination of a ruler, a protractor and compasses	M565	4.5, B(F)
π Construct any triangle using a ruler and a compass		
π Construct a rhombus		
π Construct a parallelogram		
8.7.2 Use straight edge and compasses to:	M239	4.5, D(F)
π (i) construct the perpendicular bisector of a line segment	M232	
(ii) construct the bisector of an angle		

Topic: 8 Linear Equations

Learning Outcomes and Scaffolding	Sparxmaths reference	Edexcel Ref
8.8.1 Solve linear equations, with integer coefficients, in one unknown in which the unknown appears on either side or both sides of the equation	M554	2.4, A(F)
π $5x - 2 = 2x + 7$		
π $3(2x + 1) = 8$		
π $2(7x - 1) = 4(1 - x)$		
π $\frac{(7x-1)}{2} = x - 1$		
8.8.2 Set up simple linear equations from given data	M957	2.4, B(F)

- Ann took a taxi home from the airport. The taxi fare was \$2.10 per mile, and she gave the driver a tip of \$5. Ann paid a total of \$49.10. Write an equation to determine the distance in miles, $\{x\}$, between the airport and Ann's home.

Topic: 9 Mensuration of 2D Shapes

Learning Outcomes and Scaffolding	Sparxmaths reference	Edexcel Ref
8.9.1 Find the area of parallelograms and trapezia	M291, M705 M303, M269	4.9, D(F)
- Memorise the formulae $A = hl, A = \frac{1}{2}(a+b)h$		
- Select and apply the correct formula for single shapes		
- Solve problems involving compound shapes (also include rectangles and triangles)		
8.9.2 Find circumferences and areas of circles using relevant formulae; find perimeters and areas of semicircles	M619	4.9, E(F)
- Memorise the formulae: $C = \pi d, C = 2\pi r$ & $A = \pi r^2$	M231	
Note: whilst exact value will be given in an exam, allow calculator use in some lessons.		
EXT: using $22/7$ as an approximation for π		
- Select and apply the correct formula for a single shape		
- Solve problem involving composite shapes made from trapeziums, triangles, rectangles, circles and parallelograms		

Topic: 10 Powers and Roots

Learning Outcomes and Scaffolding	Sparxmaths reference	Edexcel Ref
8.10.1 Use index notation and index laws for multiplication and division of positive and negative integer powers including zero and 1	M608	1.4, C(F)
- Memorise the index laws:		
• $a^m \times a^n = a^{m+n}$		
• $a^m \div a^n = a^{m-n}$		
• $a^1 = a$		
• $a^o = 1$		
- Convert common powers of 2 – 5 into index form and use index laws to simplify		
• $4^2 \times 2^8 = 2^?$		
- Solve index problems with multiple rules in index form and written as fractions		
8.10.2 Express integers as the product of powers of prime factors	M823	1.4, D(F)
- Identify factors using divisibility rules	M108	
- Use a prime factor tree to identify the prime factors		
8.10.3 Find highest common factors (HCF) and lowest common multiples (LCM)	M227	1.4, E(F)
- Express the prime factors of two values in a Venn diagram	M698	

- π Use the Venn diagram to identify the HCF and LCM

Topic: 11 Map scales and Bearings

Learning Outcomes and Scaffolding	Sparxmaths reference	Edexcel Ref
8.11.1 Use length scale factors, scale diagrams and maps	M112	4.5, C(F)
π Calculate real distances from maps		
π Solve ratio problems using map scales		
Ext: Solve worded problems involving areas on maps		
8.11.2 Solve problems including bearings	M260	4.5,C(F)
π Construct triangles using bearings.	M416	
π Solve simple bearing problems utilising properties of angles in parallel lines		

Topic: 12 Pythagoras' Theorem

Learning Outcomes and Scaffolding	Sparxmaths reference	Edexcel Ref
8.12.1 Know, understand and use Pythagoras' Theorem in two dimensions	M677	4.8, A(F)
π Find both the hypotenuse and smaller sides of a triangle	M480	
π Find the distance between two points		
π Solve problems with Pythagoras' in context		
Note: Whilst assessment will use exact values, expose student to calculator questions also.		

Topic: 13 Applying Number

Learning Outcomes and Scaffolding	Sparxmaths reference	Edexcel Ref
8.13.1 Understand and carry out calculations using time and carry out calculations using money, including converting between currencies		1.1, C(F)
π Convert between currencies both with and without a calculator	X448	3.3,F(F)
π Solve problems using currency conversion graphs		

Topic: 14 Transformations

Learning Outcomes and Scaffolding	Sparxmaths reference	Edexcel Ref

8.14.1	Understand that rotations are specified by a centre and an angle	M910	5.2, A(F)
8.14.2	Rotate a shape about a point through a given angle	M910	5.2, B(F)
8.14.3	Recognise that an anti-clockwise rotation is a positive angle of rotation and a clockwise rotation is a negative angle of rotation	M910	5.2, C(F)
8.14.4	Understand that reflections are specified by a mirror line	M290	5.2, D(F)
8.14.5	Construct a mirror line given an object and reflect a shape given a mirror line	M290	5.2, E(F)
8.14.6	Understand that translations are specified by a distance and direction	M139	5.2, F(F)
8.14.7	Translate a shape	M139	5.2, G(F)
8.14.8	Understand and use column vectors in translations	M139	5.2, H(F)
8.14.9	Understand that rotations, reflections and translations preserve length and angle so that a transformed shape under any of these transformations remains congruent to the original shape Describe reflections using horizontal and vertical.	M881	5.2, I(F)

Topic: 16 Probability

Learning Outcomes and Scaffolding		Sparxmaths reference	Edexcel Ref
8.15.1	Understand the language of probability	M655, M941,	6.3, A(F)
8.15.2	Understand and use the probability scale	M938	6.3, B(F)
8.15.3	Understand and use estimates or measures of probability from theoretical models		6.3, C(F)
8.15.4	Understand and use two-way tables	M899	
	π Complete two-way tables using information from word problems		
	π Calculate probabilities from two-way table		
8.15.5	Understand the concepts of a sample space and an event, and how the probability of an event happening can be determined from the sample space	M718	6.3, E(F)
8.15.6	Calculate the probability of the complement of an event happening	M755	6.3, H(F)

Topic: 16 3D Shapes and Volume

Learning Outcomes and Scaffolding		Sparxmaths reference	Edexcel Ref
8.16.1	Find the surface area of simple shapes using the area formulae for triangles and rectangles	M518	4.10,C(F)
	π Draw the net of a 3D shape and use to calculate the surface area	M884, M534 M661	
8.16.2	Find the surface area of a cylinder	M936	4.10, D(F)
8.16.3	Find the volume of prisms, including cuboids and cylinders, using an appropriate formula	M765, M722, M697	4.10, E(F)