Curriculum Sequencing - Year 9

UNIT 9.1: ARITHMETIC WITH FRACTIONS	STRAND: NUMBER

WHAT WE ARE STUDYING

Arithmetic with mixed numbers (including negatives)

LINKS TO EARLIER TOPICS

- All 4 operations on proper fractions
- Ordering and simplifying fractions
- Equivalent fractions
- Comparing fractions
- Using LCM and HCF
- Converting FDP
- Negative numbers

WHAT IT WILL HELP US LEARN

- Understand and use composite and inverse functions and their graphs

KEY SKILLS:	R	A	G
- Multiplying proper and improper fractions			
- Dividing proper and improper fractions			
- Adding proper and improper fractions			
- Subtracting proper and improper fractions			
- Converting improper fractions to mixed numbers			
- Converting mixed numbers to improper fractions			
- Multiplying and dividing mixed numbers			
- Adding and subtracting mixed numbers			

WHY WE STUDY THIS

To be able to accurately deal with values which are not integers, and problems which do not give an integer answer.

YOU WILL USE THIS IF…

Fractions are part of everyday life, whatever you do.

KEY WORDS

Fraction, proper, improper, denominator, numerator, add, subtract, multiply, divide, reciprocal, inverse, reduce, simplify, equivalent, mixed number, convert

SPARX CODES

M410, M671, M335, M835, M601, M931, M157, M197, M110, M265

UNIT 9.2: EXPRESSIONS AND FORMULAE		STRAND: ALGEBRA
	WHAT WE ARE STUDYING Squaring and cubing binomials Changing the subject of a formula	

LINKS TO EARLIER TOPICS	WHAT IT WILL HELP US LEARN
• Difference of two squares • Expanding and simplifying binomials • Formulae with indices • Solving linear equations with unknown on both sides • Multiplying fractions	• Calculating with surds • Manipulating expressions • Connecting ratio, fractions and functions • Finding the equation of a line • Applying and arranging formulae to solve problems • Surface area

KEY SKILLS:	R	A	G
• Expanding and simplifying binomial expressions			
• Squaring a binomial expression			
• Expand and simplify three binomial expressions			
• Use a variety of mathematical formulae			
• Identifying and changing the subject of linear formulae			
• Change the subject of formulae involving brackets, indices or roots			
• Rearrange formulae involving fractions			

WHY WE STUDY THIS	KEY WORDS	SPARX CODES
To be able to deal confidently with more complex algebraic problems.	Expression, brackets, identity, algebra, coefficient, factorise, generalise, product, square, cube, relation(ship), formula, constant, exponent, Pythagoras' Theorem, subject, substitute, index notation	M960, M908, M184, M208, M979 U178, U963, U556
YOU WILL USE THIS IF… Especially important in any kind of design or engineering work.		

UNIT 9.3: ANGLES AND POLYGONS		STRAND: GEOMETRY
	WHAT WE ARE STUDYING Deriving angle sum of triangles and regular polygons	

LINKS TO EARLIER TOPICS	WHAT IT WILL HELP US LEARN
• Alternate, interior and exterior angles • Finding angles in regular polygons • Illustrating quadrilaterals and their properties • Properties of regular polygons	• Investigating the angles and sides of a quadrilateral

KEY SKILLS:	R	A	G
• The angle sum of a triangle is 180 ° • The angle sum of a quadrilateral is 360 ° • The interior angle sum of a polygon is 180(n-2)° • Calculate the size of the interior angle of a regular polygon • Understand the relationship between the number of sides of a regular polygon and its interior angle sum • Properties of regular polygons • Calculate the size of interior angles in polygons • Tessellation problems • Be able to explain why a polygon will / will not tessellate			

WHY WE STUDY THIS	KEY WORDS	SPARX CODES
Understand how and why shapes tessellate and patterns created. **YOU WILL USE THIS IN…** Lines and angles are used a lot in everyday life such as in design, architecture, measuring and animation.	Isosceles, proof, scalene, regular, equilateral, parallel, alternate angles, triangle, quadrilateral, rhombus, angle sum, trapezium, kite, angle, parallelogram, concave, convex, exterior angle, irregular, polygon, diagonal, interior angle, pentagon, hexagon, octagon, heptagon, generalise, nonagon, decagon, tessellate, simple polygon, complex polygon, factor, pattern	M351, M679, M319, U628, U732, U655, U329, U427

UNIT 9.4: SAMPLE SPACES TO CALCULATE THEORETICAL PROBABILITY		STRAND: PROBABILITY
	WHAT WE ARE STUDYING Using sample spaces for single and combined events (equally likely, mutually exclusive events)	

LINKS TO EARLIER TOPICS	**WHAT IT WILL HELP US LEARN**
• Probability of events not occurring	• The multiplication rule • The probability of combined events • Understand and use sampling techniques

KEY SKILLS:	**R**	**A**	**G**
• Understanding of how a sample space diagram can be used to identify all possible outcomes of two events • Use a sample space diagram to calculate the theoretical probabilities of given events • To construct and interpret a sample space diagram • Understand how to use the diagram to calculate probabilities when additional conditions are applied			

WHY WE STUDY THIS	**KEY WORDS**	**SPARX CODES**
To understand the likelihood of something happening. To be able to predict the likelihood of future events happening.	Probability, random, fair, outcome, sample space, probability scale, mutually exclusive, fraction, independent events	M755, M206, M718, U863, U166, U104
YOU WILL USE THIS IN… You want to work in meteorology (weather) and epidemiology (risks in health).		

UNIT 9.5: RATIO AND PERCENTAGE CHANGE		STRAND: RATIO
	WHAT WE ARE STUDYING Understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction Solving percentage change problems Relating ratios to fractions and functions	

LINKS TO EARLIER TOPICS

- Introducing formulae
- Expressing quantities as fractions
- Ratio problems
- Converting a numerical change into a percentage change
- Dealing with percentages greater than 100%
- Find a percentage of a quantity
- Find one quantity as a percentage of another
- Fractions and percentages as operators
- The subject of linear formulae

WHAT IT WILL HELP US LEARN

- Ratios as fractions
- Simple and compound interest for personal finance
- Connecting ratios, fractions and functions
- Direct proportion
- Solve problems using the unitary method

KEY SKILLS:	R	A	G
• To describe a multiplicative relationships as a ratio or a fraction			
• Increase a quantity by a given percentage			
• To find the appropriate multiplier by adding the percentage increase to 100% then converting this to a decimal			
• Decrease a quantity by a given percentage			
• To find the appropriate multiplier by subtracting the percentage decrease from 100% then converting this to a decimal			
• To deal with repeated percentage changes where the magnitudes of the percentages alter			
• To find the inverse of percentage change or changes.			
• Use simple interest to find the increase in a quantity			
• To increase or decrease a quantity by a repeated change			
• To convert between the ratio between two quantities and the respective fractional amounts			

WHY WE STUDY THIS

The relation between ratio, fractions and percentages in real life context.

YOU WILL USE THIS IN…

Here are some examples of where people use fractions, percentages and ratio in everyday life such as pharmacy and nursing, architecture and design, baking and recipes, banking, finance, building and DIY.

KEY WORDS

Relation(ship), multiplication, fraction, multiplicative, equivalent, ratio, multiply, percentage, denominator, quantity, multiplier, convert, decimal, inverse operation, reciprocal, per cent, simple interest, compound interest, powers, function, constant, direct proportion, variable, interpret, proportion

SPARX CODES

M267, M533, M476, U533