Curriculum Sequencing - Year 8

UNIT 8.1: ARITHMETICAL OPERATIONS WITH DECIMALS AND NEGATIVES

STRAND: NUMBER

WHAT WE ARE STUDYING

Using formal written methods for arithmetic (including decimals and negatives)

LINKS TO EARLIER TOPICS

- Solving addition and subtraction problems
- Rounding numbers to the nearest power of ten
- Dividing decimals by a power of ten
- Dividing by a two-digit number
- Dividing fractions by a whole number
- Using times tables
- The inverse relationship between multiplication and division
- Placing negative numbers on a number line
- Adding, subtracting, multiplying and dividing decimals

WHAT IT WILL HELP US LEARN

- Finding the nth term of an arithmetic sequence
- Currency exchange
- Multiplying and dividing proper and improper fractions
- Converting mixed numbers to improper fractions
- Number machines
- Rounding and estimating
- Scale factors
- Standard index form
- Solving linear equations

KEY SKILLS:

KEY SKILLS:	R	A	G
- Add and subtract integers without a calculator			
- Multiply and divide by a power of ten			
- Multiply integers up to 3-digit numbers			
- Divide integers up to 2-digit numbers			
- Add and subtract decimals			
- Multiply and divide decimals			
- All four operations with directed numbers			

WHY WE STUDY THIS

Decimal and negative number calculations are used in everyday life, in a variety of contexts.

YOU WILL USE THIS IF…

You are working out how much change you should get at the shop; calculating interest rates on a credit card, mortgage or loan; understanding bank statements and the concept of debt and overdraft.

KEY WORDS

Subtract, place value, whole numbers, addition, integer, operation, thousands, hundreds, tens, multiply, divide, multiple, subtraction, addition, decimal, number line, directed number, decimal places

SPARX CODES

Fundamentals
Q566, Q652, Q777

Key Stage 3
M527, M106, M288, M429
M152, M911
M803, M262

UNIT 8.2: LINEAR EQUATIONS WITH UNKNOWNS ON BOTH SIDES		STRAND: ALGEBRA
	WHAT WE ARE STUDYING Solving linear equations in one variable (unknown on both sides)	

LINKS TO EARLIER TOPICS

- Solving linear equations with brackets
- Single digit directed numbers
- Expanding brackets by multiplying an expression by a value
- Multiplying mixed numbers by whole numbers
- Substituting into a formula

WHAT IT WILL HELP US LEARN

- Subject of formulae including brackets and indices
- Solving equations with the unknown on both sides (including brackets and fractional)
- Use equations to solve problems described in words
- Tables of values from linear functions
- The subject of linear formulae

KEY SKILLS:	R	A	G
• To solve equations in one variable with unknowns on both sides			
• To solve equations in one variable with unknowns on both sides with brackets			
• To solve equations with unknowns on both sides with brackets preceded by a term			
• To solve equations with unknowns on both sides and fractional coefficients			
• Use equations to solve problems escribed in words			

WHY WE STUDY THIS
To be able to find unknown values that appear twice in an equation.

YOU WILL USE THIS IF…
You want to solve more complex equations in algebra. Used to be able to compare two things using the same variable.

KEY WORDS
Distributive, sign, equals, equation, brackets, substitute, operation, inverse, algebra, solve, integer, coefficient, commutative, balance, directed number, negative, multiply, multiplicative, fraction, denominator, numerator, relation(ship), evaluate, constant, symbol, interpret, notation

SPARX CODES
M509, M554

UNIT 8.3: ALL SORTS OF FRACTIONS | **STRAND: NUMBER**

WHAT WE ARE STUDYING

Simplifying fractions
Comparing and ordering fractions with different denominators
Adding and subtracting fractions with different denominators
Converting between mixed numbers and improper fractions
Adding and subtracting improper fractions and mixed numbers
Recognising equivalent fractions, decimals and percentages

LINKS TO EARLIER TOPICS

- HCFs and LCMs
- Recognising equivalent FDP
- Comparing fractions

WHAT IT WILL HELP US LEARN

- Ordering fractions
- Probability
- Improper fractions
- Dividing and multiplying fractions
- Adding and subtracting improper fractions

KEY SKILLS:

- Place fractions on a number line in size order
- Place a mixture of decimals, fractions and percentages in size order
- Adding and subtracting fractions including mixed numbers
- Simplify fractions
- Compare and order fractions with different denominators
- Adding and subtracting fractions with different denominators
- Converting from a mixed number to an improper fraction
- Converting from an improper fraction to a mixed number
- Adding and subtracting improper fractions and mixed numbers
- Recognize equivalent fractions, decimals and percentages

R	A	G

WHY WE STUDY THIS

To help us understand division.
To work out proportion of ingredients when cooking or amount of something.

YOU WILL USE THIS IF…

You work in medicine working out doses; hairdresser or barber; mechanics; in retail.

KEY WORDS

Fraction, decimal, factor, divisible, denominator, numerator, simplify, multiple, percentage

SPARX CODES

Fundamentals:
Q310 Q954 Q912 Q129 Q200 Q128
Q490 Q709 Q503 Q347 Q621

KS3
M671 M335
M835 M601
M931 M264

UNIT 8.4: PARALLEL, ALTERNATE AND CORRESPONDING				STRAND: GEOMETRY
	WHAT WE ARE STUDYING Understanding alternate and corresponding angles			
LINKS TO EARLIER TOPICS • Reason using properties of angles • Line segments and angles		**WHAT IT WILL HELP US LEARN** • The angle sum of a triangle • Constructing the perpendicular bisector of a line segment • An introduction to bearings		

KEY SKILLS:	R	A	G
• Understand parallel lines and recognise the angles created when a pair of parallel lines is bisected by a transversal			
• Identify alternate angles and use the rule to find missing angles			
• Identify corresponding angles and use the rule to find missing angles			
• Identify supplementary/co-interior angles and use the rule to find missing angles			
• Identify which are interior and which are exterior alternate angles			

WHY WE STUDY THIS	KEY WORDS	SPARX CODES
To be able to find missing angles in a variety of different problems. **YOU WILL USE THIS IF…** Especially important in any kind of design work.	Acute, line, equidistant, transversal. supplementary (co-interior), adjacent, parallel, bisect/bisector, obtuse, angle, alternate, congruent, corresponding, intersect, exterior, right angle, reflex, interior	M163, M351, M679, M606

<table>
<tr><td colspan="2">UNIT 8.5: SETS AND UNIONS</td><td colspan="4">STRAND: PROBABILITY</td></tr>
<tr><td></td><td colspan="2">WHAT WE ARE STUDYING
Using tables, grids, Venn and Carroll diagrams for sets and unions</td><td colspan="3"></td></tr>
<tr><td colspan="2">LINKS TO EARLIER TOPICS
• Venn diagrams
• Probability of events not occurring</td><td colspan="4">WHAT IT WILL HELP US LEARN
• Mutually exclusive events
• Venn diagrams and probability</td></tr>
<tr><td colspan="2">KEY SKILLS:
• Be able to put numerical and survey data accurately into a Carroll diagram
• To enumerate a Venn diagram
• To find the number of elements in the various regions on a Venn diagram
• Enumerating Venn diagrams containing two or three sets which are intersecting
• Creating and populating a Venn Diagram given a set of data</td><td>R</td><td>A</td><td>G</td></tr>
<tr><td colspan="2">WHY WE STUDY THIS
To highlight the similarities and differences and to compare the characteristics of different data. To organise information visually.</td><td rowspan="2">KEY WORDS
Data, Venn diagram, intersection, Carroll diagram, set, union, symbol, element</td><td colspan="3" rowspan="2">SPARX CODES
<u>KS3</u>
M829, M941, M755, M206, M718, M829, M419, M834

<u>GCSE</u>
U476, U296</td></tr>
<tr><td colspan="2">YOU WILL USE THIS IF…
You are working with data.</td></tr>
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UNIT 8.6: PERCENTAGES		STRAND: RATIO
	WHAT WE ARE STUDYING Considering fractions and percentages as operators Working with percentages and percentage changes using fractions and decimals	

LINKS TO EARLIER TOPICS	WHAT IT WILL HELP US LEARN
• Percentages, fractions and decimals • Converting simple fractions to decimals • Solving problems with HCFs and LCMs • Recognising equivalent FDP • Fractions of a turn • Using all 4 operations • Using a calculator	• Growth and decay • Compound interest • Statistical hypothesis testing • Savings and investments • Percentage increase/decrease • Taxation and inflation • Repeated percentage change

KEY SKILLS:	R	A	G
• Convert between decimals, fractions and percentages			
• Order decimals, fractions and percentages			
• Calculating or estimating the percentage shown on grids, pie charts and similar diagrams			
• To find one quantity as a percentage of another quantity			
• To find simple percentages of a quantity without a calculator			
• To calculate a percentage of a quantity using a calculator			
• Convert a numerical change in quantities into a percentage change			
• Using percentages greater than 100%			
• Use percentages to make comparisons between events			

WHY WE STUDY THIS	KEY WORDS	SPARX CODES
Making connections between FDP.	Per cent, percentage, fraction, division, numerator, denominator, decimal, tenths, convert, equivalent, compare, quarter, half, decimal, fifths, pie chart, equal, circle, total, notation, composite, quantity, divide, evaluate, multiplication, difference, percentage change, mixed number, data	M437, M905, M476, M533, M528
YOU WILL USE THIS IF… Weather forecasting; probability; statistics; road signs; traffic lights on food labels; banks; business.		

UNIT 8.7: SEQUENCES & RELATIONSHIPS		STRAND: ALGEBRA
	WHAT WE ARE STUDYING Finding the nth term of an arithmetic sequence Interpreting linear relationships algebraically and graphically	

LINKS TO EARLIER TOPICS

- Substituting into a formula
- Predicting numbers in a sequence
- Ordering fractions
- Multiplying integers
- Directed numbers
- Converting from miles to kilometres
- Interpretation of line graphs and conversion graphs
- Conversions in length, area, mass and capacity
- Bar and line graphs
- Points in four quadrants
- Writing expressions

WHAT IT WILL HELP US LEARN

- Geometric relationships
- Calculating the area of circles
- Model situations using graphs
- Graphs in financial context
- Currency exchange
- Nth term rule for geometric sequences
- RPI/CPI

KEY SKILLS:	R	A	G
• Recognise that linear/arithmetic sequences can be written using a general term of the form an + b			
• To generate linear/arithmetic sequences from an nth term			
• Find the *n*th term of an arithmetic sequence			
• Find the value of terms later in the sequence			
• To interpret conversion graphs			
• To read information from a given conversion graph			
• Be able to plot a conversion graph			
• To write formulae to model mathematical relationships			
• To identify variables and write formulae in context			
• To write formulae and substitute values in order to solve problems			
• To recognise a sequence where the difference between terms is constant			

WHY WE STUDY THIS

Sequences occur often in the real world. Recognising when something is a sequence is a useful skill when understanding real world situation and being able to represent it is even better. Conversion graphs are also particularly useful for currency exchange, which almost everyone will do at some point in their life.

YOU WILL USE THIS IF…

Sequences are used a lot in construction, design and manufacturing. You will also use sequences for any job that requires you to form patterns of things, even if you don't explicitly use the nth term rule.

KEY WORDS

Sequence, arithmetic sequence, term, ascending, Nth term, common difference, nth term rule, term-to-term rule, conversion graph, x-axis, y-axis, axis, formula

SPARX CODES

Sequences
M241, M866, M991, M381, M166

Conversion Graphs
M771, M205, M483, U610

Constructing Equations
M957, M509, M707, M554