UNIT 7.1: WORKING WITH PLACE VALUE

STRAND: NUMBER

WHAT WE ARE STUDYING

Understanding place value
Ordering numbers using correct symbolism
Working with terminating decimals and corresponding fractions
Expressing one quantity as a fraction of another

LINKS TO EARLIER TOPICS

- Number problems
- Converting between units of length
- Real-life problems
- Fraction problems
- Problems involving HCF and LCM

WHAT IT WILL HELP US LEARN

- Using different metric units of measure
- Standard index form
- Significant figures and decimal places
- Finding the nth term of an arithmetic sequence
- Converting between FDP
- Converting between mixed numbers and improper fractions
- Expressing quantities as fractions
- Using ratio
- The probability of an exhaustive set of outcomes
- Multiplicative relationships as ratios and fractions
- Calculate with multiples of pi

KEY SKILLS:

KEY SKILLS:	R	A	G
- Placing numbers correctly on a place value table			
- Know the name of each column			
- Use different metric units of length, weight and volume			
- Place positive and negative decimal numbers on a number line			
- Place positive and negative fractions on a number line			
- Ordering positive and negative decimal numbers			
- Ordering positive and negative fractions			
- Converting between fractions and decimals			
- Express a quantity as a fraction of a whole			
- Express one fraction as a quantity of another, including when the fraction is greater than one			

WHY WE STUDY THIS

Being able to understand the order and value of numbers underpins all work on numeracy.

YOU WILL USE THIS IF…

In all aspects of life where basic numeracy skills are essential.

KEY WORDS

Place value, fraction, decimal, kilogram, weight, millimetre, kilometre, centimetre, lire, centilitre, metre, gram, negative number, positive number, number line, negative integer, common fraction, cancel, equivalent fraction, multiplicative, denominator, proportion, multiply, numerator

SPARX CODES

Place value: U922, U600, U435
Metric units: U388
Fractions: U746, U679, U888

UNIT 7.2: INTRODUCING ALGEBRA		STRAND: ALGEBRA
	WHAT WE ARE STUDYING Knowing key terminology for algebra Using algebraic notation Simplifying expressions by collecting like terms and multiplying over a bracket	

LINKS TO EARLIER TOPICS	WHAT IT WILL HELP US LEARN
• Using formulae • Describing sequences	• Formulae with indices • Lowest common multiple (LCM) and highest common factor (HCF) • Expressing a mathematical relationship as a formula, • Use vectors in two dimensions • Solving linear equations with brackets • Solving linear equations with brackets and unknowns on both sides of the equals sign • Introduction to factorising an expression

KEY SKILLS:	R	A	G
• Understand definitions of keywords in algebra • Read and write expressions with addition and subtraction • Read, write and use expressions where variables are multiplied together • Form algebraic expressions with one or more variables • Collecting like terms (simplifying) in linear expressions • Collecting like terms (simplifying) in linear expressions with multiple variables • Multiply an expression in brackets by a number (expanding) • Multiply an expression in brackets by a variable (expanding)			

WHY WE STUDY THIS	KEY WORDS	SPARX CODES
Being able to understand the basics of algebraic notation and key skills underpins all work on algebra.	Formula, expression, equation, variable, identity, term, unknown, factor, algebra, inequality, coefficient, quotient, index notation, product, expanding brackets	Algebra keywords: M830 Expressions: M795, M531, M949, Brackets: M273, M792
YOU WILL USE THIS IF… You are problem-solving in real-life. Almost all professions use some form of algebra on a regular basis (without you really realising it!)		

UNIT 7.3: LINES AND ANGLES		STRAND: GEOMETRY
	WHAT WE ARE STUDYING Using correct conventions for drawing (including points, lines, parallel lines and right angles) Using the properties of angles at a point, on a straight line and vertically opposite	

LINKS TO EARLIER TOPICS	WHAT IT WILL HELP US LEARN
• Classifying lines • Drawing shapes from given angles • Vertically opposite angles • Quadrilaterals and their angles	• Standard conventions for labelling and identifying side lengths • Illustrating triangles and their properties • Illustrating quadrilaterals and their properties • Parallel lines and transversals

KEY SKILLS:	R	A	G
• Recognise, describe and compare parallel and perpendicular lines			
• Accurately construct parallel and perpendicular lines			
• Using the properties of angles at a point (360°)			
• Using the properties of angles on a straight line (180°)			
• Using the properties of vertically opposite angles (are equal)			
• To know the angle sum of a triangle (180°)			

WHY WE STUDY THIS	KEY WORDS	SPARX CODES
To improve spatial understanding and the relationship between numbers and measurement. **YOU WILL USE THIS IF…** You want to be an architect; study the solar system; work in engineering; play sports.	Line, vertical, perpendicular, equidistant, horizontal, angle, parallel, point, right angle, property, sum, acute angle, reflex angle, obtuse angle, degree	<u>Fundamentals:</u> Q498, Q420, Q788, Q572, Q743 <u>KS3:</u> M351, M818, M163, M319

UNIT 7.4: THE PROBABILITY SCALE

STRAND: PROBABILITY

WHAT WE ARE STUDYING

Understanding the probability scale
Understanding that the probabilities of all possible outcomes sum to 1

LINKS TO EARLIER TOPICS

- Fraction bonds to 1
- Counting in steps of powers of ten
- Equivalent fractions
- Simplifying fractions
- Using all operations
- Ordering and comparing simple equivalent fractions
- Looking at possible outcomes

WHAT IT WILL HELP US LEARN

- Using Venn diagrams and Carroll diagrams
- Sample spaces
- Understanding probability
- Making estimations with probability

KEY SKILLS:

R	A	G

- Use the language of probability
- Order events and recognize the probability of events happening
- Use the probability scale to order events
- Understand probability can be given as fractions, decimals or percentages
- Find the probability from experiments
- List outcome of events from an experiment (use a sample space diagram)
- The sum of all possible mutually exclusive outcomes of an event is 1
- Understand what mutually exclusive events are
- Calculate the probability of an event not occurring

WHY WE STUDY THIS

To understand the likelihood of something happening.
To be able to predict the likelihood of future events happening.

YOU WILL USE THIS IF…

You want to work in meteorology (weather) and epidemiology (risks in health).

KEY WORDS

Probability, impossible, certain, fair, likely, unlikely, even chance, frequency, random, probability scale, outcome, percentage, fraction, decimal, sample space, table, sum, rule, addition, independent events, mutually exclusive events, exhaustive, subtraction, complementary events

SPARX CODES

M655, M941, M718

UNIT 7.5: POWERS, ROOTS AND ROUNDING		STRAND: NUMBER
	WHAT WE ARE STUDYING Using powers and roots Rounding to an appropriate degree of accuracy (including significant figures)	

LINKS TO EARLIER TOPICS

- Multiply by two digits, using long multiplication
- Square and cube numbers
- Large numbers in context
- Multiplying and dividing by powers of ten
- Substitution
- Ordering fractions
- Rounding decimals
- Using estimation
- Ordering decimals

WHAT IT WILL HELP US LEARN

- Rounding and estimating in real life problems
- Identify and round to given degrees of accuracy
- Using BIDMAS
- Classify types of numbers
- Calculations using index laws
- Formulae with indices
- Inverse operations
- Simplify surds
- Expressing numbers in standard index form
- Geometric sequences
- Evaluating expressions with brackets and indices

KEY SKILLS:	R	A	G
• Recognise integer powers			
• Recognise powers of 2 and 3 as the square and cube numbers			
• Using the rules of indices or index laws			
• Understanding of real roots			
• Recognise the square and cube root symbol			
• Estimate the roots of non perfect square and cube numbers			
• Recall the first ten square and cube numbers and their roots			
• Recognise and understand that fractions can be used as powers and that they represent roots			
• Accurately round to a given number of significant figures			
• Round a number to the same amount of decimal places or significant figures			
• Use rounding to approximate answers to calculations			
• Round to significant figures to make estimations and complete calculations			

WHY WE STUDY THIS
You will be able to convert from a fractional power to a root and vice versa.

YOU WILL USE THIS IF…
You seek a career in engineering, architecture, carpentry, construction, graphics or music.

KEY WORDS
Multiplication, exponent, square number, cube number, base number, powers, index notation, integer, index laws, multiply, subtract, divide, addition, irrational number, radical, cube root, approximation, square root, decimal, surd, reciprocal, fraction, half, radicand, square root, significant figures, round, decimal places, whole numbers, zero, estimate, pound, measure, pence

SPARX CODES
M135, M521, M608, M150, M111, M341, M994, M730