Maths Skills Development

	Place Value	Four operations	FDP & Ratio & proportion	Manipulation & solving	Graphical	Properties of shape	Position & Angles	Measure	Collect, interpret & present	Statistical analysis	Probability
Purpose	Ambitious & capable learners ready to learn throughout their lives Enterprising, creative contributors, ready to play a full part in life and work Healthy, confident individuals, ready to lead fulfilling lives as valued members of society			Enterprising, creative contributors, ready to play a full part in life and work		Ambitious & capable learners ready to learn throughout their lives Enterprising, creative contributors, ready to play a full part in life and work			Ambitious & capable learners ready to learn throughout their lives Ethically informed citizens of Wales and the world		
What Matters Statement:	The number system is used to represent and compare relationships between numbers and quantities.			Algebra uses symbol systems to express the structure of mathematical relationships.		Geometry focuses on relationships involving shape, space and position, and measurement focuses on quantifying phenomena in the physical world.			Statistics represent data, probability models chance, and both support informed inferences and decisions.		
Nursery											
Reception											
Year 1	Count, order and compare – Within 100 Count in 10s	Language – More, less, etc. Bonds to 10 Fact families for addition and subtraction within 20 Count in 2, 10, 5 Grouping and sharing	Recognise and find ½ and ¼			Recognise, sort and name 2D shapes	Describe turns and positions	Compare lengths & heights, mass & volume Measure in cm Recognise coins Time vocab – Before after Days & Months Tell time to the hour/half			
Year 2	Write numbers as words Place value chart Partition to 100	Count in 2, 5, 10 & 3s Multiply & divide by 2, 5, 10 Bonds to 100 Add & subtract two-digit numbers across 10 with exchange using manipulatives.	Recognise and find 1/3, 3/4			Count sides, edges and vertices on 2d & 3D shapes Identify and draw vertical lines of symmetry	Describe position, turns and movement	Count, compare and calculate with money £ & p Measure, order compare & calculate in cm, m, g kg, ml, l Time to 5 mins	Sort data into tables Tally charts Draw & interpret pictograms		
Year 3	Represent, partition and order up to 1000	Add and subtract 2 numbers across 100 using the column method with exchange Subtract 2 digit from a 3 digit (with exchange) Multiply and divide 2, 4 and 8, 5 and 10 and 3 (incl. 2 by 1 digit)	Understand and compare unit & non unit fractions Number line and bar model equivalence Add and subtract simple fractions with same denominator Fractions of amount with bar model (Non unit fractions of a set of objects)			Recognise and describe 2D and 3D shapes Vocab – Horizontal, vertical, Parallel, perpendicular	Recognise and compare turns & angles	Measure and compare in cm & mm, g & kg, ml & l Measure perimeter Add, subtract Money and find change – convert £ and p Tell the time	Collect data Draw and interpret pictograms and bar charts		
Year 4	Represent, order and use place value up to 10,000 Round to nearest whole, 10, 100, 100	Add and subtract numbers up to 4 digits with more than one exchange Multiply and divide by 3, 6, 9 and 11 Multiply by 10 and 100 and know related facts Multiply 3 digits by 1 digit	Understand fractions greater than 1 Convert between mixed and improper fractions Add and subtract mixed numbers and fractions (including from a whole, same denom.) Understand tenths and hundredths halves and quarters as fractions and decimals Partition, order and compare decimals		Plot and use co-ordinates in the 1st quadrant	Properties of types of triangles, quadrilaterals and polygons Draw all lines of symmetry and complete symmetrical shapes	Identify and classify angles Translate shapes on a grid	Find and compare areas by counting Equivalent measures m to km Perimeter of polygons (regular and irregular) Estimate and solve problems involving money Convert between analogue, digital, 12- and 24-hour clocks	Draw and interpret charts and line graphs		

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Year 5	Read and write numbers to one million. Place them on a number line. Partition, compare and order numbers up to one million, including 1dp Round to the nearest 1000 and 1 dp Understand compare and order negative numbers	Multistep addition and subtraction problems. Understanding the inverse operation. Using rounding to check answers Understanding the meaning of multiples and factors Understanding number types – prime, square and cube numbers Multiply and divide by 1000. Multiply up to 4 by 2 digit Short division by one number including the understanding of remainders	Recognise equivalent fractions Compare and order fractions less than & greater than 1 Add and subtract fractions with the same denominator with answers greater than 1. Subtract from a mixed number including breaking the whole. (Different denominators) Subtract 2 mixed numbers (different denominators) Add and subtract fractions with a different denominator Multiply fractions different types of fractions & understand what it means. Understanding the use of fractions as operators Find whole given fraction Understand percentages Write % as decimals & fractions Solve problems knowing the % and decimal equivalent of ½,¼, 1/5 & denominators with a multiple of 10 or 25		Problem solving with co-ordinates in 1st quadrant	Properties of 2D & 3D shapes Translation and reflection on an axis (touching axis)	Estimate, measure and draw angles up to 180° Angle properties (point, straight line & polygons)	Area & Perimeter of rectilinear shapes (incl. Compound) Estimating area or irregular shapes Convert & estimate metric and imperial Convert units of time Calculations with time and timetables Understand, estimate & compare volume using cubic cm.	Read & interpret two ways and timetables		
Year 6	Represent, order and use place value 1,000,000s and decimals Powers of 10 Round to an integer Compare, represent negative numbers	Understand and use types of number (I.e. primes) Know and use divisibility tests and known facts Multiply and divide integers and decimals Order of operations BIDMAS	Four operations with fractions Use and order fractions decimals and percentage Fractions & percentage of amounts Understand the relationship between ratio and fractions Ratio and proportion problems	Introduction to algebra by exploring 1 & 2 step function machines. Forming algebraic expressions & equations. Substituting numbers into expressions. Solving 1 & 2 step equations using different representations eg.bar models. Recognising the difference between equality and equivalence.	Plot co-ordinates in four quadrants		Measure and classify angles up to 180° Understand angles in polygons Circle vocabulary Recognise nets of 3D shapes Translate and reflect shapes on an axis	Convert and use metric and imperial measures Area of triangles & parallelograms Volume of cuboids	Draw and interpret line graphs, dual bar charts and pie charts	Understand and use the Mean	

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Year 7	Represent and order integers up to one billion Interpreting number lines with unusual intervals Rounding numbers to powers of ten and one significant figures Writing numbers in standard form. Order directed number 4 rules with directed number	Solving addition & subtraction problems in context Solving problems with tables, timetables & frequency trees Solving financial maths problems Add & subtract numbers in standard form Solving problems using knowledge of factors and multiples Exploring powers and roots Using estimation as a method of checking calculations Revisit concepts of square, primes and introduce triangular numbers BIDMAS with negatives	Multiply and divide integers & decimals by powers of ten Convert fluently between fractions, decimals and percentages Find the percentage of an amount using a calculator Use a given fraction to find the whole and/or other fractions Solve problems with fractions greater than 1 and percentage greater than 100% Add and subtract mixed numbers & improper fractions.	Describe & continue linear & non-linear sequences Collecting like terms Solving 1& 2 step equations +/- using the inverse operation. Exploring multiplication & division in algebraic expressions Evaluate algebraic expressions with directed number	Recognise and draw sequences including tables and graphically	Solving problems using the area of rectangles, triangles, parallelogram and trapezia Understand how to label geometric shapes using letters Identify parallel and perpendicular lines Why do some shapes tessellate ?	Measure and classify angles up to 360° Understand and apply the angle facts Investigate angles in parallel lines Find and use the angle rules in any polygon	Converting metric units of length weight and capacity Constructing triangles	Interpret and draw with a protractor simple pie chart. Interpret and create Venn diagrams Understand set notation	Find the range and median of a set of numbers	Know and use the language of probability. Understand the probability scale. Calculate the probability of a single event Generate sample spaces for a single event Know that the sum of probabilities for all possible outcomes equals 1
Year 8	Write numbers less than one in standard form	Writing numbers in index form Multiplying and dividing in standard form	Understand and simplify ratio (up to 1:n) Share into a given ratio Solve problems with direct proportion Explore direct proportion graphs Multiplying and dividing fraction, with basic introduction to algebraic fractions Express a number as a percentage of another Convert fluently between fractions, decimals and percentages greater than 1 Percentage decrease/increase including the use of a multiplier Percentage change	Understand, classify and use formula, identities and equations Expand and simplify single brackets Factorise into a single bracket Expand double brackets Form & solve equations with brackets and inequalities up-to unknowns on both sides Generate sequences given the algebraic expression Find the nth term of a sequence Use and simplify expressions with indices	Understand Gradient as a ratio Recognise and use linear graphs and link to sequences Explore non-linear graphs Find the mid-point of a line segment	Explore similar shapes Draw and interpret scale diagrams Construct triangles and quadrilaterals and know and their properties	Understand and apply rules of angles on parallel lines Understand and use the sum of interior and exterior angles Calculate the area of trapeziums, circles and part circles, and compound shapes involving circles Reflect in y=, x= and y=x	Understand Pi as a ratio Use conversion graphs Problem solving with time and calendars	Draw and interpret scatter graphs Identify and classify types of data Read, present and interpret grouped and ungrouped data Construct two-way tables Compare distributions using charts Identify misleading charts/graphs	Set up a statistical enquiry Design and criticise questionnaires Understand and use mean, median, mode and choose the most appropriate average Interpret the range of data Find the mean from tables Compare distributions using averages and identify outliers.	Find probabilities involving more than one event using sample space, two-way tables and Venn diagrams
Year 9	Use calculator to solve complex calculations		Product of prime factors in index form, including use of venn to find HCF and LCM Fractional increase and decrease Calculate repeated proportional changes including exponential growth, decay, appreciations and depreciation Calculate reverse percentages Solve problems involving currency conversion.	Substitution including negatives, fractions and decimals Factorise non-linear expressions		Use and draw 2D representations of 3D shapes using isometric paper Plans & elevations Construct nets of 3D shapes Construct angle and line bisections and angle (30,60, 90, 45) Understand and complete shapes with Rotational symmetry Understand and use rotation Recognise congruent shapes	Understand tessellation Problem solving using angle facts Calculate missing interior and exterior angles of regular and irregular polygons Write and measure three figure bearings	Understand and use circumference of a circle. Problem solving involving area. Understand and use appropriate estimations with conversions. Convert area of area and volume (metric) Calculate the volume of prisms, including reverse to find lengths Surface area of cubes and cuboids	Draw and interpret any pie chart Construct and interpret frequency polygons Construct and interpret cumulative frequency tables and diagrams including median and quartiles Construct and interpret box plots Compare distributions using cumulative frequency and box plots Construct and use conversion graphs	Calculate the mean and range from frequency tables Estimate the mean of group frequency tables State the modal class and median of grouped frequency distributions Solve problems with reverse averages	

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			Proportional reasoning –calculate and find best buys and value money Sweet – Being financially aware								
Year 10		Understand, use and apply the rules on indices to evaluate and simplify expressions Addition and subtraction in standard form	Multiply and divide improper fraction and mixed number Real life finances – bills, tax	Nth term of a quadratic Change the subject of a formula Solve quadratic expressions by factorising Use trial and improvement to find an estimated value Form and solve simultaneous equations	Understand the gradient of parallel lines Recognise and interpret graphs that illustrate direct and inverse proportion Draw and interpret quadratic graphs	Enlargement of shapes using whole scale factors	Understand and apply Pythagoras theorem Understand and apply right angle trigonometry including problem solving Recognise, describe and complete combined transformations Construct Loci Understand and apply circle theorems	Understand and use bounds including addition and subtraction Dimensional analysis Draw and interpret travel graphs Calculate and use compound measures including speed and density			Calculate the probability of an even not happening Understand mutually exclusive and independent events And and or rule for independent events Understand and use tree diagrams to calculate probabilities Calculate expected frequencies Calculate, represent and use Relative frequency
Year 11	Apply bounds to calculate problems involving multiplication and division	Use and apply fractional indices Manipulating and simplifying surds	Convert recurring decimals to fractional form Understand rational and irrational numbers Understanding annual rates and calculate AER and APR Constants of proportionality	Change the subject of a formula using factorising Solve quadratic expressions by factorising when the coefficient of x squared is greater than one and using the quadratic formula and graphically Understand the difference of two squares Simplify algebraic fractions Understanding identities	Apply and use equations of parallel and perpendicular lines Draw and interpret complex graphs e.g. cubic, exponential and reciprocal and trig functions Transformation of functions Estimating rates of change for non-linear functions using tangents to curves Interpret and calculate the meaning of area under a curve Understand and apply the trapezium rule. Plot inequalities to state regions	Understand and use the four rules of congruency for triangles Use negative and fractional scale factors to enlarge shapes	Understand and use sine and cosine rule including area of a triangle Understand and apply 3D trigonometry and Pythagoras Circle theorems – Alternate segment theorem	Surface area and volume of cylinders, cones, spheres and hemispheres and pyramids Draw and interpret velocity time graphs Calculate and use area and volume scale factor Calculate and use length of arcs and area of segments and sectors	Construct and interpret histograms Calculate frequency density	Apply stratified sampling techniques and define a random sample	Understand when and how to estimate conditional probabilities Multiplication rule for dependant events Sampling without replacement
Years 12 and 13	Pure Mathematics					Applied Mathematics					
	Year 12 • Indices and Surds • Quadratics – including completing the square, quadratic graphs and the discriminant • Equations and Inequalities • Graphs and Transformations • Coordinate Geometry including straight lines and circles • Algebraic Methods including proof and polynomial division • Binomial Expansion • Further Trigonometry including trig identities and solving trig equations • Vector • Calculus including differentiation and integration • Exponentials and Logarithms Year 13 • Algebraic Methods including partial fractions and further proof • Functions and Graphs including composite and inverse functions • Sequences and Series • Further Binomial Expansion • Radians • Further Trig Identities and Solving Trig Equations • Parametric Equations • Further Calculus with differentiation and Integration • Numerical Methods • Further Vector					Year 12 • Data Collection Methods • Measures of Location and Spread • Representations of Data • Correlation • Probability • Statistical Distributions including Binomial and Poisson • Hypothesis Testing • Constant Acceleration Problems • Variable Acceleration Problems • Forces and Motion Year 13 • Regression, Correlation and Hypothesis Testing • Conditional Probability • Normal Distribution • Moments • Forces and Friction • Projectiles • Application of Forces in Statics and Dynamics • Further Kinematics				

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