



KOINONIA FEDERATION – ALL THROUGH SUBJECT MAP

SUBJECT: Mathematics

CURRICULUM INTENT: To produce numerate, logical, problem-solving students who can apply their mathematical knowledge both in further study within mathematics and other disciplines, and in real-life situations.

SPIRITUALITY STATEMENT: Following in the footsteps of the school's ethos of 'do unto others as you would have done unto yourself', we view the mathematical education of the pupils as a spiritual mission in enabling them to be the best version of themselves by developing their problem solving and numerical reasoning to open up paths for them to choose and determine their future, so that they may leave us confident and motivated, fully equipped to make a positive contribution to society.

Probability & Statistics

Algebra

Geometry & Measures

Number / Ratio & Proportion



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	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
NURSERY – KEY THEMES / CONCEPTS	More than, fewer, same Explore and build with shapes and objects Explore repeats Hear and say number names	Begin to order number names I see 1, 2, 3 Join in with repeats Explore position and space	Show me 1, 2, 3 Move and label 1, 2, 3 Explore position and routes Explore own first patterns	Take and give 1, 2, 3 Match, talk, push and pull Talk about dots Compare and sort collections	Compare and sort collections Lead on Own Repeats Starts to puzzle Making patterns together Make games and actions	Make games and actions Show me 5 My own pattern Stop at 1, 2, 3, 4, 5 Match, sort, compare
NURSERY – KEY CONTENT / LEARNING	Comparative language Repetitive patterns Explore 2d shapes.	Begin to order number names Join in with repeats Explore position and space	Understand position under, on etc One to one recognition.	Take and give 1, 2, 3 Match, talk, push and pull Talk about dots Compare and sort collections Groups of objects.	Comparative language Lead on Own Repeats Starts to puzzle Making patterns together Make games and actions	Consolidate numbers 0 to 5 and extending it to 10. Use of manipulatives, Subitizing to 5 Show finger numbers to 5, Compositions of 5-part whole
RECEPTION – KEY THEMES / CONCEPTS	Getting to know you period Match, sort and compare Talk about measure and patterns Problem solving It's me 1,2,3	Circles & triangles 1, 2, 3, 4, 5 Problem solving Shapes with 4 sides Alive in 5 Problem solving	Mass & capacity Growing 6, 7, 8 Length, height and time Problem solving Consolidation	Building 9 & 10 Problem solving Explore 3D shapes Problem solving	To 20 and beyond How many now? Manipulate, compose and decompose Sharing and grouping	Visualise, build and map Make connections Deadline for EYFSP Consolidation



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RECEPTION - KEY CONTENT/ LEARNING	-Match objects -Match pictures and objects - Identify a set -Sort objects to a type - Explore sorting techniques -Create sorting rules Compare amounts - Compare sizes - Compare mass - Compare capacity Explore simple – patterns -Copy and continue simple patterns -Create simple patterns Find 1, 2 and 3 -Subitise 1, 2 and 3 -Represent 1, 2 and 3 -1 more -1 less - Composition of 1, 2 and 3	Identify and name circles and triangles - Compare circles and triangles -Shapes in the environment -Describe position Find 4 and 5 -Subitise 4 and 5 -Represent 4 and 5 -1 more -1 less - Composition of 4 and 5 - Composition of 1 –5 Identify and name shapes with 4 sides - Combine shapes with 4 sides -Shapes in the environment -My day and night	Compare mass -Find a balance -Explore capacity -Compare capacity Find 6, 7 and 8 - Represent 6, 7 and 8 - 1 more -1 less - Composition of 6, 7 and 8 -Make pairs-odd and even -Double to 8 (find a double) - Double to 8 (make a double) -Combine 2 groups -Conceptual subitising Explore length - Compare length - Explore height - Compare height -Talk about time -Order and sequence	Find 9 and 10 -Compare numbers to 10 - Represent 9 and 10 - Conceptual subitising to 10 -1 more -1 less - Composition to 10 - Bonds to 10 (2 parts) - Make arrangements of 10 -Bonds to 10 (3 parts) -Doubles to 10 (find a double) -Doubles to 10 (make a double) -Explore even and odd Recognise and name 3-D shapes -Find 2-D shapes within 3-D shapes -Use 3-D shapes for tasks -3-D shapes in the environment - Identify more complex patterns -Copy and continue patterns - Patterns in the environment	Build numbers beyond 10 (10 -13) -Continue patterns beyond 10 (10-13) -Build numbers beyond 10 (14-20) - Continue patterns beyond 10 (14-20) - Verbal counting beyond 20 -Verbal counting patterns Add more -How many did I add? -Take away - How many did I take away? Select shapes for a purpose -Rotate shapes -Manipulate shapes - Explain shape arrangements - Compose shapes - Decompose shapes - Copy 2-D shape pictures -Find 2-D shapes within 3-D shapes Explore sharing –Sharing -Explore grouping – Grouping -Even and odd	Identify units of repeating patterns - Create own pattern rules -Explore own pattern rules - Replicate and build scenes and constructions - Visualise from different positions - Describe positions Give instructions to build -Explore mapping -Represent maps with models - Create own maps from familiar places - Create own maps and plans from story situations Deepen understanding - Patterns and relationships
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					sharing -Play with and build doubles	
YEAR 1 - KEY THEMES / CONCEPTS	Place value within 10 Addition & subtraction within 10	Addition & subtraction within 10 Shape	Place value within 20 Addition & subtraction within 20	Place value within 50 Length & height Mass, capacity and temperature	Multiplication and division Fractions	Position and direction PV within 100 Money Time
YEAR 1 - KEY CONTENT/ LEARNING	Place value: one more, one less; number line to 20; compare and order numbers to 20; Addition & Subtraction: counting on; bonds to 20; doubles; near doubles; counting back; finding the difference; related facts; missing number problems.	Addition and Subtraction (within 10) Shape	Place value (within 20) Addition and subtraction (within 20)	Place value (to 50) Measurement (length and height) Measurement (mass, capacity and temperature)	Make equal groups number fractions	Geometry: position and direction Place Value to 100 Money Measurement time
YEAR 2 - KEY THEMES / CONCEPTS	Place value Addition & Subtraction	Addition & Subtraction Shape	Multiplication and division Fractions	Fractions Money	Length & height Mass, capacity & temperature Statistics	Consolidation (measurement, geometry & statistics)



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					Time Position & direction	
YEAR 2 - KEY CONTENT/ LEARNING	Place Value, (to 100), Partitioning numbers to 100, comparing and ordering numbers, Counting in 2s,5s,10s and 3s. Number bonds (recap 10 then to 100), adding ones Adding and subtracting across 10s	Adding and subtracting 2-digit numbers Comparing number sentences. 2-D and 3D shapes Lines of symmetry	Equal groups Sharing and grouping 2,5 and 10 times tables Doubling and halving Half, quarter, third	Unit fractions Non-unit fractions Equivalence Pounds and pence Comparing amounts Finding change	Length Height Mass Capacity Temperature Tally, pictogram O'clock, half past, quarter past and to. To 5 minutes. Hours and days Duration of time	Describing position, movement and turns Making patterns.
YEAR 3 - KEY THEMES / CONCEPTS	Place value Addition Subtraction	Addition Subtracting Multiplication Division	Multiplication Division Length Perimeter	Fractions Mass Capacity	Mass Capacity Fractions Money Time	Time Shape Statistics
YEAR 3 - KEY CONTENT/ LEARNING	Partition numbers to 1000 Number line to 1000 Estimate Compare numbers to 1000 Count in 50s Addition and subtraction with and without regrouping	3 digit +/- 1 and 2 digit numbers Multiplication and Division Arrays, 2,5,10, 3, 4, 8 times tables Multiples of 10	Multiplication and Division 2 digit by 1 digit division and multiplication with and without exchange and remainders	Measurement, Length and Perimeter, Fractions, Consolidation	Fractions, Time	Geometry, Properties of Shape, Measurement, Mass and Capacity



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YEAR 4 - KEY THEMES / CONCEPTS	Place value Addition Subtraction	Area Multiplication Division	Multiplication Division Length Perimeter Fractions	Fractions Decimals	Decimals Money Time	Shapes Statistics Position and Direction
YEAR 4 - KEY CONTENT/ LEARNING	Number and Place Value, Addition and Subtractions: 4 digit numbers with up to one exchange	Measurement, equivalent lengths cm and mm Length and Perimeter, Measure perimeter Multiplication and Division Multiply and divide by 3,6,9, 11,12,1,0 Multiply 3 digit numbers	Multiplication and Division, Multiply and divide by 10,100 Multiply by 2 and 3 digit numbers by 1 digit. Divide 2 digit and 3 digit numbers by 1 digit number Length, Fractions	Decimals and Place Value, Fractions	Decimals, Measurement, Money, Time	Properties of Shapes, Consolidation
YEAR 5 - KEY THEMES / CONCEPTS	Place Value Addition Subtraction	Multiplication Division Fractions	Multiplication Division Fractions	Decimals Percentages Perimeter and Area Statistics	Shape Position and Direction Decimals	Negative numbers Converting units Volume
YEAR 5 - KEY CONTENT/ LEARNING	Number and Place Value, Addition and Subtraction: 4-digit numbers with up to one exchange	Multiplication and Division: prime and square numbers, prime factors, common factors, cube numbers,	Multiply 4-digit numbers by 1-digit numbers; multiply 3-digit numbers by 2-digit numbers;	Add and subtract fractions; multiply fractions; percentages as fractions and decimals	Angles, protractors, drawing lines and angles; co-ordinates, translation and reflection; converting	co-ordinates, translation & reflection converting units of measure



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		multiplying and dividing by 10, 100 and 1,000, multiples of 10, 100 and 1,000	improper fractions and mixed numbers; compare and order fractions		units of measure; decimals as fractions, including thousandths add and subtract decimals; multiply and divide decimals	
YEAR 6 - KEY THEMES / CONCEPTS	Place value Addition Subtraction Multiplication Division	Fractions Decimals Percentages	Shape Converting Units Ratio	Algebra Area, Perimeter and Volume Position and Direction	Consolidation Problem solving	Consolidation Problem solving
YEAR 6 - KEY CONTENT/ LEARNING	Place value: numbers up to 10,000,000; four operations: multiply 4-digit numbers by 2-digit numbers; long division	Four operations; fractions on a number line; four operations using fractions; multiply and divide decimals by integers; equivalent fractions, decimals and percentages; percentages of amounts	Geometry: position and direction, quadrants, translations, reflections; measures: converting units, metric measures, miles to kilometres; Ratio: addition and multiplication; ratio and fractions; recipes	Algebra: formulae and substitution; area of a triangle; volume of a cuboid; ratio and scale factor; plot points in four quadrants; coordinates; translations; reflection	Statistics: line graphs, pie charts, mean; properties of shapes, angles, nets	Consolidation and themed projects; budgets and bills; profit and loss
YEAR 7 - KEY	Place value and Operations.	Algebra basics	2D shapes and Decimals	Properties of 2D shapes	Fractions and percentages	Ratio and data



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THEMES / CONCEPTS						
YEAR 7 - KEY CONTENT/ LEARNING	Place value (inc conversion of units), operations with integers, order of operations, rounding, powers and roots, time	Forming expressions, manipulating expressions, expanding and factorising single brackets, forming and solving simple equations, Substitution	Area and perimeter of 2D shapes, ordering and operations with decimals and money	Symmetry, angles, using a compass, plans and elevations	Calculating Fractions and Percentages, comparing, of amounts, finding the original, multiplying and dividing)	Ratio, sharing, simplifying, writing, working with data-types of data, bar chart, line graphs, pie charts
YEAR 8 - KEY THEMES / CONCEPTS	Directed numbers, factors, multiples and primes, rounding and estimating (decimal place and sig fig, truncation?)	Substitution, sequences, graphs (plotting and recognising gradient, horizontal/vertical), and solving linear equations, rearranging formulae	Circles, volume, surface area of prisms and cylinders	Angles on parallel lines, constructions, transformations	Calculations with fractions, FDP conversions, probability	Ratio & Statistics - averages from lists and tables, stem and leaf diagrams.
YEAR 8 - KEY CONTENT/ LEARNING	Directed Number. Including factors multiples and primes. Rounding and estimating to both decimal place and significant figures.	Algebra, including equations and rearranging formulae. Substitution. Graphing, including recognising gradient and y intercept. Sequences, recognising nth term.	Review of decimals. Geometry study, including circles, volume and surface area of prisms and cylinders.	Geometry review. angles in straight lines and parallel lines. Constructions and transformations of shape	Working with Fractions, decimals and percents and being able to convert between each. Operation with fractions. Probability	Ratio and proportion. Finding mean, median, mode and range of a data set, including working backwards. Representing data on diagrams.
YEAR 9 - KEY THEMES / CONCEPTS	Prime factorisation and index laws	Algebra including quadratics and graphs	Volume and surface area	Angles, congruence and similarity	Fractions and percentages	Ratio and statistics
YEAR 9 - KEY CONTENT/ LEARNING	Calculations review, Prime Factors, Index Laws, Standard Form	Algebraic manipulation, quadratics, forming and solving equations, linear graphs	Decimals and area reviews, volume and surface area	Angles in parallel lines and in polygons, bearings, congruence and similarity, loci	Operations with fractions, Percentages, Percentage Change, Compound Interest,	Ratio, averages, statistics (pie charts, scatter graphs, stem-and-leaf diagrams)



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					reverse percentages and fractions	and probability (combined events)
YEAR 10 - KEY THEMES / CONCEPTS	F: Number; Algebra basics H: Number; Algebra basics	F: Fractions, decimals, and percentages; Equations H: Number, Ratio and proportion; Data basics	F: Angles, Perimeter Area and Volume H: Geometry, Accuracy and bounds	F: Data – Graphs, Charts and Averages H: Real-life graphs; Graphs and coordinate geometry	F: Real life graphs; Algebraic graphs; Ratio; Proportion H: Algebra, Multiplicative reasoning	F: Transformations; Probability H: Geometry and Probability
YEAR 10 - KEY CONTENT/ LEARNING	F: Integers and place value; Decimals; Indices, powers, and roots; Factors, multiples, and primes; Algebra basics; Expressions and substitution into formulae H: Calculations, checking and rounding; Indices, roots, and reciprocals; Factors, multiples, standard form, and surds; Algebra basics; sequences	F: Fractions, decimals, and percentages; Percentages; Equations and inequalities; Sequences H: Fractions and percentages; Ratio and proportion; Averages and range; Representing and interpreting data	F: Properties of shapes, parallel lines, and angle facts; Interior and exterior angles of polygons; Perimeter, area, and volume H: Polygons, angles, and parallel lines; Pythagoras' theorem and trigonometry; Perimeter, area, and circles; 3D forms and volume; Accuracy and bounds	F: Tables, graphs, and charts; Pie charts; Scatter graphs, Averages and range H: Real-life graphs; Linear graphs and coordinate geometry; Quadratic, cubic, and other graphs	F: Real life graphs; Straight line graphs; Ratio; Proportion H: Solving quadratic and simultaneous equations; Inequalities; Multiplicative reasoning	F: Transformations; Probability H: Transformations; Constructions, loci, and bearings; Probability; Similarity and congruence
YEAR 11 - KEY THEMES / CONCEPTS	F: Right-angled Triangles; Multiplicative reasoning; Constructions, loci, and bearings H: More Trigonometry; Further Statistics	F: Quadratic Equations and Graphs; Perimeter Area and Volume, Fractions and Indices and Standard Form H: Equations and Graphs; Circle theorems; Surds;	F: Congruence, Similarity and Vectors; More Algebra H: Vectors and Geometric Proof; Graphs and Proportion	Revision	Exams	N/A



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YEAR 11 - KEY CONTENT/ LEARNING	F: Right-angled triangles, Pythagoras, and trigonometry; Multiplicative reasoning; Plans and elevations; Constructions, loci, and bearings H: Graphs of trigonometric functions; Further trigonometry; Collecting data; Cumulative frequency, box plots, and histograms	F: Expanding and factorising quadratic equations; Quadratic graphs; Circles, cylinders, cones, and spheres; Fractions and reciprocals; Indices and standard form H: Quadratics, expanding more than two brackets, sketching graphs, graphs of circles, cubes, and quadratics; Circle theorems; Circle geometry; Changing the subject of formulae; Solving equations from algebraic fractions; Rationalising surds; Proof	F: Similarity and congruence; Vectors; Rearranging equations, graphs of cubic and reciprocal functions, and simultaneous equations H: Vectors and geometric proof; Reciprocal and exponential graphs; Gradient and area under graphs; Direct and inverse proportion	Revision	Exams	N/A
YEAR 12 - KEY THEMES / CONCEPTS	Algebraic expressions, quadratics, equations and inequalities, graphs and transformations. Data Collection. Measures of location and spread. Representations of data	Straight line graphs, circles, algebraic methods, binomial expansion Modelling in Mechanics. Constant Acceleration.	Trigonometric ratios, Vectors trigonometric identities and equations, Correlation and probability	Differentiation, Integration, Hypothesis Testing	Exponentials and logarithms. Forces and motion. Variable acceleration.	Pure, Statistics and Mechanics revision.
YEAR 12 - KEY CONTENT/ LEARNING	Indices and surds, quadratics, simultaneous equations, graphing. Variance and	Equations of lines, parallel and perpendicular, equations of circles and	Sine/cosine rule. Triangle problems. Trigonometric ratios and identities.	Gradients of curves and derivatives. Increasing and decreasing functions. Integrals,	Exponential functions, Exponential modelling, Logs, non linear data.	



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	standard deviation. Graphing	tangent and chords. Algebraic fractions, polynomials. Vectors, modelling velocity-time graphs.	Representing vectors. Magnitude and direction, solving geometric problems. Venn diagrams, mutually exclusive/independent events.	areas under curves. Areas between curves and lines. Critical values. One and two tailed tests	Functions of time. Maxima and minima problems.	
YEAR 13 - KEY THEMES / CONCEPTS	Algebraic methods, functions and graphs, sequences and series, binomial expansion, regression, correlation, and hypothesis testing, conditional probability	Radians, trigonometric functions, trigonometry and modelling, moments, forces and friction	Parametric equations, differentiation, numerical methods, projectiles	Integration, the normal distribution	Vectors, applications of forces, applications of forces, further kinematics	N/A
YEAR 13 - KEY CONTENT/ LEARNING	Proof by contradiction, algebraic fractions, partial fractions, the modulus function, composite and inverse functions, graph transformations, arithmetic and geometric sequences and series, binomial expansions, exponential models, measuring correlation, hypothesis testing for zero correlation	Radians, arc lengths and sector areas, solving trigonometric equations, reciprocal trigonometric functions and their graphs, trigonometric identities, addition and double- angle formulae, resolving forces, inclined planes and friction	Parametric equations, curve sketching, modelling with parametric equations, differentiating trigonometric functions, chain rule, product rule, quotient rule, parametric differentiation, implicit differentiation, locating roots, iteration, horizontal projection, components	Using trigonometric identities, reverse chain rule, integration by substitution, integration by parts, partial fractions, finding areas, trapezium rule, solving and modelling with differential equations, the normal distribution, finding probabilities, inverse and standard normal distribution, finding mu and sigma, approximating binomial distributions	3D coordinates, vectors in 3D, solving geometric problems, application to mechanics, modelling with static particles, friction, rigid bodies, dynamics and inclined planes, connected particular, vectors in kinematics, vector methods with projectiles, differentiating and integrating vectors	N/A