# 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 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.

We develop spirituality in maths by encouraging a sense of wonder, curiosity, and reflection. When pupils explore patterns, symmetry, and the order found in numbers and shapes, they can experience awe at the beauty and structure of the world around them. We create opportunities for quiet reflection, discussion, and appreciation of different problem-solving approaches, helping children value perseverance and the ideas of others. In this way, mathematics becomes not only a subject for logical thinking but also a space where children can reflect on meaning, creativity, and their place in the wider world.

# KOINONIA FEDERATION – ALL THROUGH SUBJECT MAP

| Probability & Statistics | Algebra | Geometry & Measures | Number / Ratio & Proportion |
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| | AUTUMN 1 | AUTUMN 2 | SPRING 1 | SPRING 2 | SUMMER 1 | SUMMER 2 |
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| **NURSERY – KEY THEMES / CONCEPTS** | More than, fewer, same<br>Explore and build with shapes and objects<br>Explore repeats<br>Hear and say number names | Begin to order number names<br>I see 1, 2, 3<br>Join in with repeats<br>Explore position and space | Show me 1, 2, 3<br>Move and label 1, 2, 3<br>Explore position and routes<br>Explore own first patterns | Take and give 1, 2, 3<br>Match, talk, push and pull<br>Talk about dots<br>Compare and sort collections | Compare and sort collections<br>Lead on Own Repeats<br>Starts to puzzle<br>Making patterns together<br>Make games and actions | Make games and actions<br>Show me 5<br>My own pattern<br>Stop at 1, 2, 3, 4, 5<br>Match, sort, compare |
| **NURSERY – KEY CONTENT / LEARNING** | Comparative language<br>Repetitive patterns<br>Explore 2d shapes. | Begin to order number names<br>Join in with repeats<br>Explore position and space | Understand position under, on etc<br>One to one recognition. | ake and give 1, 2, 3<br>Match, talk, push and pull<br>Talk about dots<br>Compare and sort collections<br>Groups of objects. | Comparative language<br>Lead on Own Repeats<br>Starts to puzzle<br>Making patterns together<br>Make games and actions | Consolidate numbers 0 to 5 and extending it t to 10.<br>Use of manipulatives, Subitizing to 5<br>Show finger numbers to 5,<br>Compositions of 5-part whole |
| **RECEPTION - KEY THEMES / CONCEPTS** | **Getting to know you period**<br>Match, sort and compare<br>Talk about measure and patterns<br>Problem solving<br>It's me 1,2,3 | Circles & triangles<br>1, 2, 3, 4, 5<br>Problem solving<br>Shapes with 4 sides<br>Alive in 5<br>Problem solving | Mass & capacity<br>Growing 6, 7, 8<br>Length, height and time<br>Problem solving<br>**Consolidation** | Building 9 & 10<br>Problem solving<br>Explore 3D shapes<br>Problem solving | To 20 and beyond<br>How many now?<br>Manipulate, compose and decompose<br>Sharing and grouping | Visualise, build and map<br>Make connections<br>**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<br><br>Compare amounts -Compare sizes -Compare mass -Compare capacity<br><br>Explore simple – patterns -Copy and continue simple patterns -Create simple patterns<br><br>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<br><br>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<br><br>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<br><br>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<br><br>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)<br><br>-Explore even and odd<br><br>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<br><br>Add more -How many did I add? -Take away -How many did I take away?<br><br>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<br><br>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<br><br>Deepen understanding -Patterns and relationships |

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| | | | | | sharing -Play with and build doubles | |
| **YEAR 1 - KEY THEMES / CONCEPTS** | Place value within 10<br>Addition & subtraction within 10 | Addition & subtraction within 10<br>Shape | Place value within 20<br>Addition & subtraction within 20 | Place value within 50<br>Length & height<br>Mass, capacity and temperature | Multiplication and division<br>Fractions | Position and direction<br>PV within 100<br>Money<br>Time |
| **YEAR 1 - KEY CONTENT/ LEARNING** | Place value: one more, one less; number line to 20; compare and order numbers to 20;<br>Addition & Subtraction: counting on; bonds to 20; doubles; near doubles; counting back; finding the difference; relqted facts; missing number problems. | Addition and Subtraction (within 10)<br>Shape | Place value (within 20)<br>Addition and subtraction (within 20) | Place value (to 50)<br>Measurement (length and height)<br>Measurement (mass, capacity and temperature) | Make equal groups<br>number fractions | Geometry: position and direction<br>Place Value to 100<br>Money<br>Measurement time |
| **YEAR 2 - KEY THEMES / CONCEPTS** | Place value<br>Addition & Subtraction | Addition & Subtraction<br>Shape | Multiplication and division<br>Fractions | Fractions<br>Money | Length & height<br>Mass, capacity & temperature<br>Statistics | Consolidation (measurement, geometry & statistics) |

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

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| **YEAR 4 - KEY THEMES / CONCEPTS** | Place value<br>Addition<br>Subtraction | Area<br>Multiplication<br>Division | Multiplication<br>Division<br>Length<br>Perimeter<br>Fractions | Fractions<br>Decimals | Decimals<br>Money<br>Time | Shapes<br>Statistics<br>Position and Direction |
| **YEAR 4 - KEY CONTENT/ LEARNING** | Number and Place Value,<br>Addition and Subtractions: 4 digit numbers<br>with up to one exchange | Measurement, equivalent lengths cm and mm<br>Length and Perimeter,<br>Measure perimeter<br>Multiplication and Division<br>Multiply and divide by 3,6,9, 11,12,1,0<br>Multiply 3 digit numbers | Multiplication and Division,<br>Multiply and divide by 10,100<br>Multiply by 2 and 3 digit numbers by 1 digit.<br>Divide 2 digit and 3 digit numbers by 1 digit number<br><br>Length,<br>Fractions | Decimals and Place Value, Fractions | Decimals, Measurement, Money, Time | Properties of Shapes, Consolidation |
| **YEAR 5 - KEY THEMES / CONCEPTS** | Place Value<br><br>Addition<br><br>Subtraction | Multiplication<br><br>Division<br><br>Fractions | Multiplication<br><br>Division<br><br>Fractions | Decimals<br><br>Percentages<br><br>Perimeter and Area<br><br>Statistics | Shape<br><br>Position and Direction<br><br>Decimals | Negative numbers<br><br>Converting units<br><br>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<br>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<br>Addition<br>Subtraction<br>Multiplication<br>Division | Fractions<br>Decimals<br>Percentages | Shape<br>Converting Units<br>Ratio | Algebra<br>Area, Perimeter and Volume<br>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 | | | | | | |
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| 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 signigicant 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 prims 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<br>H: Number; Algebra basics | F: Fractions, decimals, and percentages; Equations<br>H: Number, Ratio and proportion; Data basics | F: Angles, Perimeter Area and Volume<br>H: Geometry, Accuracy and bounds | F: Data – Graphs, Charts and Averages<br>H: Real-life graphs; Graphs and coordinate geometry | F: Real life graphs; Algebraic graphs; Ratio; Proportion<br>H: Algebra, Multiplicative reasoning | F: Transformations; Probability<br>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<br>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<br>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<br>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<br>H: Real-life graphs; Linear graphs and coordinate geometry; Quadratic, cubic, and other graphs | F: Real life graphs; Straight line graphs; Ratio; Proportion<br>H: Solving quadratic and simultaneous equations; Inequalities; Multiplicative reasoning | F: Transformations; Probability<br>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<br>H: More Trigonometry; Further Statistics | F: Quadratic Equations and Graphs; Perimeter Area and Volume, Fractions and Indices and Standard Form<br>H: Equations and Graphs; Circle theorems; Surds; | F: Congruence, Similarity and Vectors; More Algebra<br>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<br>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<br>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<br>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 |