meadows school

Curriculum Progress Plan

MATHS   **Key Stage 3**   **Year 2018-19**

	HALF TERM 1	HALF TERM2	HALF TERM3	HALF TERM 4	HALF TERM 5	HALF TERM 6
Topic Titles	Whole numbers and Decimals Measures and Area Expressions and Formulae	Fractions, Decimals and Percentages Angles and 2-D shapes Graphs	Calcuations Statistics	Transformations and Symmetry Equations Powers and Roots	Construction Sequences 3-D shapes	Ratio and Proportion Probability Real Life Maths
Objectives (The things we want the pupils to make progress in)	N1 Understand and use place value for decimals, measures and integers of any size. N13 Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures]. N5 Use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals. N3 Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property. Enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams. N2 Order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥ R1 Change freely between related standard units [for example time, length, area, volume/capacity, mass]. G1 Derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia	N11 Interpret fractions and percentages as operators N4 Use the 4 operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative. N9 Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and 7/2 or 0.375 and 3/8). DF5 Move freely between different numerical, algebraic, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals, and equations and graphs] N10 Define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express 1 quantity as a percentage of another, compare 2 quantities using percentages, and work with percentages greater than 100%. R8 Solve problems involving percentage change, including:	N4 Use the 4 operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative. N14 Use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation a<x≤b N13 Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures]. N15 Use a calculator and other technologies to calculate results accurately and then interpret them appropriately. DF12 Select and use appropriate calculation strategies to solve increasingly complex problems. DF7 Use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D shapes, probability and statistics RM7 Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems S2 Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts	G8 Identify properties of, and describe the results of, translations, rotations and reflections applied to given figures. G9 Identify and construct congruent triangles, and construct similar shapes by enlargement, with and without coordinate grids. R2 Use scale factors, scale diagrams and maps. A3 Understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors. A7 Use algebraic methods to solve linear equations in 1 variable (including all forms that require rearrangement). DF3 Use algebra to generalise the structure of arithmetic, including to formulate mathematical relationships. DF4 Substitute values in expressions, rearrange and simplify expressions, and solve equations. A6 Model situations or procedures by translating them into algebraic expressions or formulae and by using graphs. RM14 Make and test conjectures about patterns and relationships; look for proofs or counter-examples. N7 Use integer powers and associated real roots (square, cube	G3 Draw and measure line segments and angles in geometric figures, including interpreting scale drawings. G9 Identify and construct congruent triangles, and construct similar shapes by enlargement, with and without coordinate grids G5 Describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric G4 Derive and use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line as the shortest distance to the line. A14 Generate terms of a sequence from either a term-to-term or a position to-term rule. A15 Recognise arithmetic sequences and find the nth term G15 Use the properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres to solve problems in 3-D. DF7 Use language and properties	R4 Use ratio notation, including reduction to simplest form. R5 Divide a given quantity into 2 parts in a given part:part or part:whole ratio; express the division of a quantity into 2 parts as a ratio. RM2 Extend and formalise their knowledge of ratio and proportion in working with measures and geometry, and in formulating proportional relations algebraically. N10 Define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express 1 quantity as a percentage of another, compare 2 quantities using percentages, and work with percentages greater than 100% S3 Describe simple mathematical relationships between 2 variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs SP2 Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics. SP4 Select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems P1 Record, describe and analyse the frequency of outcomes of simple

Stage 4 GCSE 5-6						

Column 1:
N1 Understand and use place value for decimals, measures and integers of any size.
N13 Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures].
N5 Use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals.
N3 Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property. Enumerate sets and unions/intersections of sets systematically, using tables, grids and Venn diagrams.
N2 Order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥
R1 Change freely between related standard units [for example time, length, area, volume/capacity, mass].
G1 Derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, trapezia

Column 2:
N11 Interpret fractions and percentages as operators
N4 Use the 4 operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative. N9 Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and 7/2 or 0.375 and 3/8).
DF5 Move freely between different numerical, algebraic, graphical and diagrammatic representations [for example, equivalent fractions, fractions and decimals, and equations and graphs]
N10 Define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express 1 quantity as a percentage of another, compare 2 quantities using percentages, and work with percentages greater than 100%.
R8 Solve problems involving percentage change, including:

Column 3:
N4 Use the 4 operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative.
N14 Use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation a<x≤b
N13 Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places or significant figures].
N15 Use a calculator and other technologies to calculate results accurately and then interpret them appropriately.
DF12 Select and use appropriate calculation strategies to solve increasingly complex problems.
DF7 Use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D shapes, probability and statistics
RM7 Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems
S2 Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts

Column 4:
G8 Identify properties of, and describe the results of, translations, rotations and reflections applied to given figures.
G9 Identify and construct congruent triangles, and construct similar shapes by enlargement, with and without coordinate grids.
R2 Use scale factors, scale diagrams and maps.
A3 Understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors.
A7 Use algebraic methods to solve linear equations in 1 variable (including all forms that require rearrangement).
DF3 Use algebra to generalise the structure of arithmetic, including to formulate mathematical relationships.
DF4 Substitute values in expressions, rearrange and simplify expressions, and solve equations.
A6 Model situations or procedures by translating them into algebraic expressions or formulae and by using graphs.
RM14 Make and test conjectures about patterns and relationships; look for proofs or counter-examples.
N7 Use integer powers and associated real roots (square, cube

Column 5:
G3 Draw and measure line segments and angles in geometric figures, including interpreting scale drawings.
G9 Identify and construct congruent triangles, and construct similar shapes by enlargement, with and without coordinate grids
G5 Describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric
G4 Derive and use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line as the shortest distance to the line.
A14 Generate terms of a sequence from either a term-to-term or a position-to-term rule.
A15 Recognise arithmetic sequences and find the nth term
G15 Use the properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms, cylinders, pyramids, cones and spheres to solve problems in 3-D.
DF7 Use language and properties

Column 6:
R4 Use ratio notation, including reduction to simplest form.
R5 Divide a given quantity into 2 parts in a given part:part or part:whole ratio; express the division of a quantity into 2 parts as a ratio.
RM2 Extend and formalise their knowledge of ratio and proportion in working with measures and geometry, and in formulating proportional relations algebraically.
N10 Define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express 1 quantity as a percentage of another, compare 2 quantities using percentages, and work with percentages greater than 100%
S3 Describe simple mathematical relationships between 2 variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs
SP2 Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics.
SP4 Select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems
P1 Record, describe and analyse the frequency of outcomes of simple

Stage 3 GCSE 3-4						
	N1 Understand and use place value for decimals, measures and integers of any size. N13 Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places]. N5 Use conventional notation for the priority of operations, including brackets, powers, roots. N3 Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisatio. N2 Order positive and negative integers, decimals and fractions; use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥ R1 Change freely between related standard units [for example time, length, area, volume/capacity, mass]. G1 Derive and apply formulae to calculate and solve problems involving: perimeter and area of triangles, parallelograms, volume of cuboids (including cubes) and other prisms G2 Calculate and solve problems involving: perimeters of 2-D shapes (including circles), areas of circles and composite shapes	N11 Interpret fractions and percentages as operators N4 Use the 4 operations, including formal written methods, applied to integers, decimals, proper and improper fractions all both positive and negative. N9 Convert terminating decimals to their corresponding fractions (such as 3.5 and 7/2 or 0.375 and 3/8). DF5 Move freely between different numerical representations [for example, equivalent fractions, fractions and decimals] N10 Define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express 1 quantity as a percentage of another, compare 2 quantities using percentages, and work with percentages greater than 100%. R8 Solve problems involving percentage change, including: percentage increase, decrease G10 Apply the properties of angles at a point, angles at a point on a	N4 Use the 4 operations, including formal written methods, applied to integers, decimals, proper fractions all both positive and negative. N14 Use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation a<x≤b N13 Round numbers and measures to an appropriate degree of accuracy [for example, to a number of decimal places]. N15 Use a calculator and other technologies to calculate results accurately and then interpret them appropriately. DF12 Select and use appropriate calculation strategies to solve problems. DF7 Use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D shapes, probability and statistics RM7 Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes S2 Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts, pie charts, and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and	G8 Identify properties of, and describe the results of, translations, rotations and reflections applied to given figures. G9 Identify and construct congruent triangles, and construct similar shapes by enlargement, with and without coordinate grids. R2 Use scale factors, scale diagrams and maps. A3 Understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors. A7 Use algebraic methods to solve linear equations in 1 variable DF3 Use algebra to generalise the structure of arithmetic, including to formulate mathematical relationships. DF4 Substitute values in expressions, rearrange and simplify expressions, and solve equations. A6 Model situations or procedures by translating them into algebraic expressions or formulae and by using graphs. N7 Use integer powers and associated real roots (square, cube), recognise powers of 2, 3 DF3 Use algebra to generalise the structure of arithmetic, including to formulate mathematical relationships	G3 Draw and measure line segments and angles in geometric figures, including interpreting scale drawings. G9 Identify and construct congruent triangles, and construct similar shapes by enlargement, G5 Describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles, regular polygons, and other polygons that are reflectively and rotationally symmetric G4 Derive and use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line as the shortest distance to the line. A14 Generate terms of a sequence from either a term-to-term or a position to-term rule. A15 Recognise arithmetic sequences and find the nth term G15 Use the properties of faces, surfaces, edges and vertices of cubes, cuboids, prisms to solve problems in 3-D. DF7 Use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D	R4 Use ratio notation, including reduction to simplest form. R5 Divide a given quantity into 2 parts in a given part:part or part:whole ratio; express the division of a quantity into 2 parts as a ratio. N10 Define percentage as 'number of parts per hundred', interpret percentages and percentage changes as a fraction or a decimal, interpret these multiplicatively, express 1 quantity as a percentage of another, compare 2 quantities using percentages, and work with percentages greater than 100% S3 Describe simple mathematical relationships between 2 variables (bivariate data) in observational and experimental contexts and illustrate using scatter graphs SP2 Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics. P1 Record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale. P2 Understand that the probabilities of all possible outcomes sum to 1. P4 Generate theoretical sample

Stage 2 GCSE 1-2					

Column 1:

for integers.
N13 Round numbers and measures to nearest 10, 100, 1000 and whole number.
N5 Use conventional notation for the priority of operations
N3 Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples
N2 Order positive and negative integers, decimals; use the number line as a model for ordering of the real numbers; use the symbols =, ≠, <, >, ≤, ≥
R1 Change freely between related standard units [for example time, length, area, volume/capacity, mass].
G1 Derive and apply formulae to calculate and solve problems involving: perimeter and area of rectangles and triangles, volume of cuboids (including cubes)
G2 Calculate and solve problems involving: perimeters of rectangles
A4 Simplify and manipulate algebraic expressions to maintain equivalence by:
• collecting like terms
A2 Substitute numerical values into formulae and expressions.
A5 Understand and use standard mathematical formulae
N6 Recognise and use relationships

Column 2:

N4 Use the 4 operations, including formal written methods, applied to integers, decimals.
N9 Convert terminating decimals to their corresponding fractions (such as 3.5 and 7/2 or 0.375 and 3/8).
N10 Define percentage as 'number of parts per hundred', interpret percentages as a fractionl, express 1 quantity as a percentage of another.
G10 Apply the properties of angles at a point, angles at a point on a straight line
G7 Derive and illustrate properties of triangles, quadrilaterals, [for example, equal lengths and angles] using appropriate language and technologies.
G12 Derive and use the sum of angles in a triangle
G3 Draw and measure line segments and angles in geometric figures
RM1 Extend their understanding of the number system;
A8 Work with coordinates in the first quadrant.
S2 Construct and interpret appropriate tables, charts, and diagrams, including frequency tables,

Column 3:

integers and decimals all both positive and negative.
N14 Use approximation through rounding to estimate answers
N13 Round numbers and measures to an appropriate degree of accuracy [for exampe nearest 10, 100, 1000 or whole number].
N15 Use a calculator and other technologies to calculate results accurately and then interpret them appropriately.
DF12 Select and use appropriate calculation strategies to solve problems.
RM7 Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes
S2 Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts and pictograms for categorical data, and vertical line (or bar) charts for numerical data
S1 Describe observed distributions of a single variable through: appropriate graphical representation involving discrete data; and appropriate measures of central tendency (mean, mode, median) and spread (range,)

Column 4:

G8 Identify properties of, and describe the results of rotations and reflections applied to given figures.
R2 Use scale factors, scale diagrams.
A3 Understand and use the concepts and vocabulary of equations and terms.
A7 Use algebraic methods to solve linear equations in 1 variable
DF4 Substitute values in expressions, and solve equations.
N7 Use integer powers and associated real roots (square, cube), recognise powers of 2, 3

Column 5:

and angles in geometric figures, including interpreting scale drawings.
G9 Identify congruent triangles, and construct similar shapes
G5 Describe, sketch and draw using conventional terms and notations: points, lines, parallel lines, perpendicular lines, right angles
G4 Derive and use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line as the shortest distance to the line.
A14 Generate terms of a sequence from a term-to-term rule.
A15 Recognise arithmetic sequences and continue
G15 Use the properties of faces, surfaces, edges and vertices of cubes, cuboids.
Plans and Elevations
G1 Derive and apply formulae to calculate and solve problems involving: perimeter and area of rectangles and triangles, volume of cuboids (including cubes) .
G2 Calculate and solve problems involving: perimeters and areas of rectilinear shapes.

Column 6:

R4 Use ratio notation, including reduction to simplest form.
R5 Divide a given quantity into 2 parts in a given part:part ratio.
N10 Define percentage as 'number of parts per hundred', express 1 quantity as a percentage of another, compare 2 quantities using percentages
SP2 Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics.
P1 Record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale.
P2 Understand that the probabilities of all possible outcomes sum to 1.

Stage 1
Entry Level

N1 Understand and use place value for integers.
N13 Round numbers and measures to nearest 10, 100, 1000.
N3 Use the concepts and vocabulary of factors (or divisors), multiples
N2 Order positive integers.
R1 Change freely between related standard units [for example time, lengths].
G1 Derive and apply formulae to calculate and solve problems involving: perimeter and area of rectangles
A4 Simplify and manipulate algebraic expressions to maintain equivalence by:
• collecting like terms
A2 Substitute numerical values into formulae and expressions.
N6 Recognise and use relationships between operations.
A1 Use and interpret algebraic notation, including:
 • ab in place of a × b
 • 3y in place of y + y + y and 3 × y
 • a² in place of a × a, a³ in place of a × a × a; a²b in place of a × a × b
 • a/b in place of a ÷ b

N4 Use the 4 operations, including formal written methods, applied to integers and decimals.
N10 Define percentage as 'number of parts per hundred'
G10 Apply the properties of angles at a point, angles at a point on a straight line
G3 Draw and measure line segments and angles
RM1 Extend their understanding of the number system;
A8 Work with coordinates in the first quadrant.
S2 Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts and pictograms for categorical data,

N4 Use the 4 operations, including formal written methods, applied to positive integers.
N14 Use approximation through rounding to estimate answers
N13 Round numbers and measures to an appropriate degree of accuracy [for exampe nearest 10, 100, 1000].
N15 Use a calculator and other technologies to calculate results accurately and then interpret them appropriately.
DF12 Select and use appropriate calculation strategies to solve problems.
S2 Construct and interpret appropriate tables, charts, and diagrams, including frequency tables, bar charts and pictograms for categorical data
S1 Find mean, median, mode and range for given sets of data

G8 Recognise Reflection and Rotational symmetry.
R2 Use scale factors, scale diagrams.
A3 Understand and use the concepts and vocabulary of equations and terms.
A7 Use algebraic methods to solve linear equations in 1 variable
DF4 Substitute values in formulae (eg Area rectangle)
N7 Use integer powers and associated real roots (square)

G3 Draw and measure line segments and angles in geometric figures, including interpreting scale drawings.
G9 Identify congruent triangles, and construct similar shapes
G4 Use ruler, protractor and compass to draw and measure accurately .
A15 Recognise arithmetic sequences and continue
G15 Count faces, surfaces, edges and vertices of cubes, cuboids and other solids, knowing some are hidden
Plans and Elevations
G1 Derive and apply formulae to calculate and solve problems involving: perimeter and area of rectangles .

R4 Use ratio notation, including reduction to simplest form.
R5 Divide a given quantity into 2 parts in a given part:part ratio.
N10 Define percentage as 'number of parts per hundred', express 1 quantity as a percentage of another, .
P1 Record, describe and analyse the frequency of outcomes of simple probability experiments involving randomness, fairness, equally and unequally likely outcomes, using appropriate language and the 0-1 probability scale.