

Mathematics (1 of 18)

Skill mastery and conceptual understanding are at the core of our mathematics programme. We emphasise problem solving skills, higher level thinking, and mental math processes. Children engage in hands-on activities to build understanding, thus increasing their confidence with mathematics in real life situations. When students construct knowledge that has been derived from personal experience, they are much more likely to retain and use what they have learned.

Our Lower School has adopted the high quality and well researched standards developed by National Council for Teachers of Mathematics (NCTM). A variety of resources support our programme, with heavier emphasis in Pre-Kindergarten and Kindergarten on the Math Their Way Program. 1st-4th Grades mainly utilise the Houghton Mifflin Math scheme.

Mathematics Their Way, developed by The Center for Innovation in Education, is used in Pre-Kindergarten and Kindergarten. This programme focuses on children developing understanding and insight into the patterns of mathematics. It establishes an environment where students deal flexibly with mathematical ideas and concepts through the use of manipulatives.

Houghton Mifflin Math is the main resource in 1st through 4th Grades because it contains emphasis on basic skills and the concepts that underlie them. The Houghton Mifflin Math series is based on the premise that the five strands of mathematics proficiency, as defined by the National Research Council (conceptual understanding, procedural fluency, strategic competence, adaptive reasoning, and productive disposition), are all interwoven.

Mathematics may be best viewed through a scope and sequence. The following pages show our Lower School scope and sequence charts. The dots indicate where a skill is introduced.

Mathematics Scope and Sequence – Pre-Kindergarten and Kindergarten		
	• Teach and Apply	^ Practice and Apply
	Pre-Kindergarten	Kindergarten
Numeral Recognition		
1-10	•	^
10-100		•
Counting		
Counting on 1-10	•	^
Counting on 1-100		•
Skip counting by 10s		•
Comparing/ordering 1-20		•
Number Operations		
Addition to 10		•
Subtraction to 10		•

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Mathematics Scope and Sequence – Pre-Kindergarten and Kindergarten		
	• Teach and Apply	^ Practice and Apply
	Pre-Kindergarten	Kindergarten
Fractions		
Recognise and read: 1/2, 1/4		•
Parts of a whole: 1/2, 1/4		•
Measurement		
Language of measurement: long/short, heavy/light, full/empty/half full, hot/cold	•	^
Linear, volume and weight		•
Time: days/weeks	•	^
Time: months/years		•
Time: hour/half hour		•
Organising Information		
Sorting	•	^
Classifying	•	•
Real graphs	•	•
Representative graphs		•
Charts		•
Money		
Coin recognition: British coins		•
Addition to 10 pence		•
Pattern		
Patterns around us	•	•
Patterns with manipulatives	•	•
People patterns		•
A B Patterns		•
Symmetry		•
Geometry		
Positional language	•	•
3D shapes: cube, cone, sphere	•	^

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Mathematics Scope and Sequence – 1 st through 4 th Grade				
	• Teach and Apply		^ Practice and Apply	
	1 st Grade	2 nd Grade	3 rd Grade	4 th Grade
NUMBER AND OPERATIONS (1 of 6)				
Addition				
Adding decimals			•	•
Adding fractions			•	•
Adding integers and rational numbers				•
Adding mixed numbers				•
Adding money	•	•	•	^
Adding multi-digit numbers	•	•	^	^
Adding whole numbers	•	^	^	^
Basic facts	•	^		
Estimating sums	•	•	^	^
Expressions				•
Inverse operations				•
Mental maths	•	•	•	•
Missing addends	•	•	^	^
Number sentences	•	•	^	^
Problem-solving applications	•	•	^	^
Properties of addition	•	•	^	^
Regrouping to add		•	•	^
Strategies for adding	•	•	^	^
Three or more addends	•	^	^	^
Comparing and Ordering Numbers				
Decimals			•	•
Decimals and fractions			•	•
Fractions		•	•	•
Integers				•
Money amounts	•	•	•	^
Using <, > and = symbols	•	•	•	^
Whole numbers	•	•	^	^

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Mathematics Scope and Sequence – 1 st through 4 th Grade				
	• Teach and Apply		^ Practice and Apply	
	1 st Grade	2 nd Grade	3 rd Grade	4 th Grade
NUMBER AND OPERATIONS (2 of 6) Counting, Reading, Writing Numbers				
Decimals			•	•
Fractions	•	•	•	^
Mixed numbers			•	•
Money	•	^	^	^
Ordinal numbers	•	•	^	^
Roman and other numerals			•	•
Square numbers			•	•
Whole numbers	•	•	•	•
Decimals				
Adding decimals			•	•
Comparing decimals			•	•
Decimal notation			•	^
Decimals and fractions			•	•
Decimals and mixed numbers			•	•
Estimating decimals				•
Modelling decimals			•	^
Ordering decimals			•	•
Place value of decimals			•	•
Reading decimals			•	•
Rounding decimals				•
Subtracting decimals			•	•
Writing decimals			•	^

Mathematics (5 of 18)

Mathematics Scope and Sequence – 1 st through 4 th Grade				
	• Teach and Apply		^ Practice and Apply	
	1 st Grade	2 nd Grade	3 rd Grade	4 th Grade
NUMBER AND OPERATIONS (3 of 6)				
Division				
Basic facts			•	^
Checking division with multiplication			•	^
Dividing money			•	•
Dividing whole numbers			•	•
Division as equal groups		•	^	^
Estimating the quotient			•	•
Expressions				•
Fact families			•	^
Missing factors			•	^
Number sentences			•	^
Problem solving applications			•	^
Relating multiplication and division			•	^
Relating subtraction and division			•	^
Remainders			•	•
Strategies for dividing			•	^
Estimating				
Benchmarks	•	•	•	^
Estimated or exact answer?			•	•
Estimating decimals			•	•
Estimating differences		•	•	^
Estimating fractions				•
Estimating measures	•	•	^	^
Estimating money		•	•	^
Estimating products			•	•
Estimating quotients			•	•
Estimating sums	•	•	^	^
For reasonableness of answer		•	•	^
Quantities	^			
Using a referent	•	^	^	^
Using strategies	•	•	•	•

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Mathematics Scope and Sequence – 1 st through 4 th Grade				
	• Teach and Apply		^ Practice and Apply	
	1 st Grade	2 nd Grade	3 rd Grade	4 th Grade
NUMBER AND OPERATIONS (4 of 6)				
Fractions				
Adding fractions			•	•
Comparing fractions		•	•	•
Decimals and fractions			•	•
Equivalent fractions			•	•
Improper fractions			•	•
Meaning of fractions	•	•	•	•
Measurement of fractions			•	^
Mixed numbers			•	^
Modelling fractions	•	•	^	^
Ordering fractions			•	^
Simplifying fractions				•
Subtracting fractions			•	•
Integers and Rational Numbers				
Adding and subtracting integers				•
Graphing on the number line				•
Meaning				•
Negative numbers on a thermometer			•	•
Opposites				•
Mental Mathematics				
Addition	•	•	•	•
Division			•	^
Multiples and powers of 10	•	•	•	^
Multiplication			•	^
Patterns	•	^	^	^
Problem-solving applications		•	^	^
Subtraction	•	•	^	^
Use properties	•	•	•	•
Mixed Numbers				
Adding mixed numbers				•
Decimals and mixed numbers			•	•
Meaning of mixed numbers			•	^
Subtracting mixed numbers				•
Using a number line with mixed numbers			•	^
Writing mixed numbers			•	^

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Mathematics Scope and Sequence – 1 st through 4 th Grade				
	• Teach and Apply		^ Practice and Apply	
	1 st Grade	2 nd Grade	3 rd Grade	4 th Grade
NUMBER AND OPERATIONS (5 of 6)				
Multiplication				
Arrays		•	^	
Basic facts			•	^
Concrete/pictorial representation		•	^	
Drawing a picture to multiply		•	^	^
Estimating products			•	•
Expressions				•
Horizontal and vertical forms			•	^
Mental mathematics			•	^
Missing factors				•
Multiplication as equal groups		•	^	
Multiplying money			•	•
Multiplying three factors			•	^
Multiplying whole numbers		•	^	^
Number sentences		•	^	^
Problem-solving applications		•	^	^
Properties of multiplication			•	^
Related facts			•	^
Related to other operations		•	•	^
Skip-counting to multiply		•	•	^
Square numbers			•	^
Strategies			•	^
Number Theory				
Even and odd numbers	•	•	^	^
Factor trees				•
Factors			•	^
Figurate numbers				•
Multiples			•	•
Prime and composite numbers				•

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Mathematics Scope and Sequence – 1 st through 4 th Grade				
	• Teach and Apply		^ Practice and Apply	
	1 st Grade	2 nd Grade	3 rd Grade	4 th Grade
NUMBER AND OPERATIONS (6 of 6)				
Place Value				
Decimals			•	•
Expanded form		•	^	^
Millions and billions				•
Money			•	•
Standard form	•	•	^	^
Using a place-value chart	•	•	•	^
Whole numbers	•	•	^	^
Ratio, Proportion and Percent				
Meaning of percents			•	•
Percents related to fractions and/or decimals			•	•
Rates			•	•
Subtraction				
Basic facts	•	•	^	
Checking subtraction	•	•	•	^
Estimating differences		•	•	^
Mental mathematics	•	•	^	^
Number sentences	•	•	^	^
Problem-solving applications	•	^	^	^
Properties of subtraction		•	^	^
Regrouping to subtract		•	^	^
Strategies for subtracting	•	•	^	^
Subtracting decimals			•	•
Subtracting fractions			•	•
Subtracting integers				•
Subtracting mixed numbers				•
Subtracting money		•	•	^
Subtracting whole numbers	•	^	^	^
Subtracting with zeros		•	•	•

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Mathematics Scope and Sequence – 1 st through 4 th Grade				
	• Teach and Apply		^ Practice and Apply	
	1 st Grade	2 nd Grade	3 rd Grade	4 th Grade
ALGEBRA (1 of 2)				
Readiness and Application				
Addition and subtraction number sentences	•	•	^	^
Analyse change	•	•	^	^
Fact families	•	•	•	^
Inverse operations	•	•	•	^
Meaning of equality			•	•
Missing addends	•	•	^	^
Missing digits		•	^	^
Missing factors			•	^
Missing measurements and units		•	•	•
Missing operations	•	•	•	^
Multiplication and division sentences			•	^
Proportional reasoning		•	•	^
Symbols showing relations	•	•	^	^
Variables		•	•	^
Venn diagrams	•	•	•	•
Writing and solving number sentences or equations	•	•	•	•
Coordinate Graphs				
Graphing ordered pairs		•	•	^
Ordered pairs		•	•	^
Equations and Inequalities				
Modelling equations	•	•	•	^
Formulas				•
Writing an equation or number sentence			•	•
Expressions				
Evaluate by substitution				•
Evaluate by using order of operations				•
Exploring expressions	•	•	•	^
Inverse relationship of addition and subtraction	•	•	^	^
Inverse relationship of multiplication and division				•
Order of operations			•	^
Writing expressions				•

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Mathematics Scope and Sequence – 1 st through 4 th Grade				
	• Teach and Apply		^ Practice and Apply	
	1 st Grade	2 nd Grade	3 rd Grade	4 th Grade
ALGEBRA (2 of 2)				
Patterns and Function				
Continuing pattern	•	•	•	^
Describing pattern	•	•	•	^
Input/output tables	•	•	^	^
Measurement patterns		•	•	^
Numerical patterns	•	•	^	^
Special patterns and sequences	•	•	^	^
Tessellations			•	•
Using patterns to solve problems	•	•	^	^
Visual patterns	•	•	^	^
Properties				
Associative properties	•	•	•	^
Commutative properties	•	•	^	^
Distributive property				•
Identity properties			•	^
Zero properties		•	•	^

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Mathematics Scope and Sequence – 1 st through 4 th Grade				
	• Teach and Apply		^ Practice and Apply	
	1 st Grade	2 nd Grade	3 rd Grade	4 th Grade
GEOMETRY (1 of 3)				
Basic Figures				
Attributes of plane figures	•	•	•	^
Basic figures: squares, rectangles, triangles and circles	•	•	^	^
Classifying and sorting figures and shapes	•	•	•	^
Geometric patterns	•	•	^	^
Pattern blocks: triangles, squares, rhombus, trapezoid, hexagon	•	•	•	^
Real-life objects	•	^	^	
Sides, corners, square corners	•	•	^	

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Mathematics Scope and Sequence – 1 st through 4 th Grade				
	• Teach and Apply		^ Practice and Apply	
	1 st Grade	2 nd Grade	3 rd Grade	4 th Grade
GEOMETRY (2 of 3) Plane Figures and Spatial Sense				
Angles		•	•	^
Circles	•	•	•	^
Comparing angles			•	•
Complex figures	•	•	^	^
Classifying polygons			•	•
Congruent figures	•	•	•	^
Intersecting lines			•	•
Line of symmetry	•	•	^	^
Line segments			•	^
Lines			•	^
Making and drawing polygons		•	^	^
Making and drawing quadrilaterals		•	^	^
Measuring angle using a protractor				•
Parallel lines			•	^
Perpendicular lines			•	^
Polygons			•	^
Points			•	^
Quadrilaterals			•	^
Radius, diameter and chord				•
Rays			•	^
Relating solid and plane figures	•	•	^	^
Right angles			•	^
Sides, angles and diagonals of polygons			•	•
Similar figures			•	^
Symmetry	•	•	^	^
Subdividing and combining			•	^
Tangrams		•	•	^
Vertex		•	^	^
Visual thinking	•	•	^	^

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Mathematics Scope and Sequence – 1 st through 4 th Grade				
	• Teach and Apply		^ Practice and Apply	
	1 st Grade	2 nd Grade	3 rd Grade	4 th Grade
GEOMETRY (3 of 3) Solid Figures (3-dimensional objects)				
Complex figures			•	•
Cones	•	•	^	^
Cubes	•	•	^	^
Cylinders	•	•	^	^
Faces, edges, vertexes	•	•	^	^
Identifying, classifying and describing solid figures	•	•	^	^
Nets			•	•
Prisms	•	•	^	^
Pyramids	•	•	^	^
Spheres	•	•	^	^
Transformations				
Flips (Reflections)	•	•	•	•
Slides (Translations)	•	•	•	•
Turns (Rotation)	•	•	•	•

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Mathematics Scope and Sequence – 1 st through 4 th Grade				
	• Teach and Apply		^ Practice and Apply	
	1 st Grade	2 nd Grade	3 rd Grade	4 th Grade
MEASUREMENT (1 of 3)				
Area and Perimeter				
Complex Figures				•
Estimating area, using square units		•	^	^
Finding area, using a formula				•
Finding area, using square units		•	^	^
Finding perimeter		•	•	^
Finding perimeter, using a formula				•
Meaning of area		•	^	^
Meaning of perimeter		•	^	^
Problem-solving applications		•	•	^
Relating area and perimeter			•	•
Surface area, using a formula				•
Capacity				
Conversion tables			•	^
Customary system			•	^
Equivalent units	•	•	•	^
Estimating capacity	•	•	^	^
Measuring capacity	•	•	^	^
Metric system	•	•	•	^
Problem-solving applications	•	•	^	^
Length				
Centimetre	•	•	^	^
Choosing appropriate unit	•	•	•	^
Conversion table			•	^
Customary measurement	•	•	^	^
Equivalent unit		•	•	^
Estimating length	•	•	^	^
Fractions and measurement		•	^	^
Foot, yard		•	^	^
Inch		•	^	^
Indirect measurement				•
Kilometre			•	^
Measuring instruments	•	•	^	^
Measuring length	•	•	^	^
Metre	•	•	•	^
Metric measurement	•	•	•	^
Mile			•	^
Problem-solving applications	•	•	•	^

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Mathematics Scope and Sequence – 1 st through 4 th Grade				
	• Teach and Apply		^ Practice and Apply	
	1 st Grade	2 nd Grade	3 rd Grade	4 th Grade
MEASUREMENT (2 of 3)				
Money				
Adding and subtracting money	•	•	•	^
Comparing amounts		•	•	^
Consumer applications	•	•	^	^
Counting coins and bills	•	^	^	^
Counting on with money	•	^	^	^
Decimals, fractions and money			•	^
Equivalent amounts	•	•	^	^
Estimating money		•	•	^
Identifying coins and bills	•	^	^	^
Making change		•	^	^
Multiplying and dividing money			•	•
Place value				•
Problem-solving applications	•	•	•	^
Rounding money			•	^
Symbolic notation	•	•	^	^
Temperature				
Celsius scale		•	^	^
Estimating temperature			•	^
Fahrenheit scale			•	^
Interpreting a thermometer		•	^	^
Negative numbers				•
Writing temperature		•	•	^

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Mathematics Scope and Sequence – 1 st through 4 th Grade				
	• Teach and Apply		^ Practice and Apply	
	1 st Grade	2 nd Grade	3 rd Grade	4 th Grade
MEASUREMENT (3 of 3)				
Time				
A.M. and P.M.		•	•	^
Analog clock	•	•	^	
Calendar concepts	•	^	^	^
Digital clock	•	•	^	
Elapsed time	•	•	^	^
Estimating time	•	^	^	
Ordinal numbers	•	^	^	
Problem-solving applications	•	•	^	^
Schedules	•	•	^	^
Sequencing events	•	^	^	
Telling time	•	•	^	^
Time line			•	•
Time zone				•
Volume				
Estimating volume		•	•	^
Finding volume, counting cubic units			•	^
Finding volume, using a formula				•
Meaning of volume			•	•
Problem-solving applications			•	•
Weight and Mass				
Conversion table			•	•
Equivalent units			•	•
Estimating weight and mass	•	•	•	^
Finding weight and mass		•	•	^
Gram and kilogram	•	•	•	^
Ounce			•	•
Pound			^	^
Problem-solving applications	•	•	•	^
Ton				•

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Mathematics Scope and Sequence – 1 st through 4 th Grade				
	• Teach and Apply		^ Practice and Apply	
	1 st Grade	2 nd Grade	3 rd Grade	4 th Grade
DATA ANALYSIS AND PROBABILITY (1 of 2)				
Addition				
Analysing and interpreting data	•	•	•	^
Average			•	^
Bar graphs	•	•	^	^
Choosing an appropriate display			•	•
Circle graph		•	•	•
Collecting, organising and displaying data	•	•	•	^
Double bar graph				•
Frequency tables/tally charts	•	•	•	•
Histogram				•
Line graphs	•			•
Line plots			•	^
Making tables and charts	•	•	^	^
Mean			•	^
Measures of central tendency			•	•
Median			•	^
Mode			•	^
Organised lists		•	•	•
Outliers				•
Pictographs	•	•	^	^
Problem-solving applications	•	•	^	^
Range		•	•	^
Reading tables and charts	•	•	^	^
Stem-and-leaf plots				•
Surveys	•	•	•	^

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Mathematics Scope and Sequence – 1 st through 4 th Grade				
	• Teach and Apply		^ Practice and Apply	
	1 st Grade	2 nd Grade	3 rd Grade	4 th Grade
DATA ANALYSIS AND PROBABILITY (2 of 2)				
Probability				
Calculating probability of simple event			•	•
Compound events				•
Developing and analysing predictions and inferences	•	•	•	^
Fair or unfair		•	^	
Likelihood of an event	•	•	^	^
Possible outcomes			•	•
Probability experiments	•	•	•	^
Problem-solving applications	•	•	^	^
Recording outcomes	•	•	•	^
Representing likelihood as a number from 0 to 1				•
Using a tree diagram or grid				•
Using coins, cubes or spinners	•	•	^	^