Westleigh Methodist Primary School
Mathematics Progression of Skills and Knowledge

With God, all things are possible – Matthew 19:26

Love Teamwork Thankfulness Generosity Peace Forgiveness Equality Justice

Early Years Foundation Stage

Educational programme

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding – such as using manipulatives, including small pebbles and tens frames for organising counting – children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

Early Learning Goals:

Number

- Have a deep understanding of number to 10, including the composition of each number.
- Subitise (recognise quantities without counting) up to 5.
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

Numerical Patterns

- Verbally count beyond 20, recognising the pattern of the counting system.
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how

National Curriculum

Purpose of study

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject

Aims

The national curriculum for mathematics aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

	Nursery 1 (birth to 3 years)	Nursery 2 (3-4 years)	Reception
Number and place value	· Combine objects like stacking blocks and cups. · Put objects inside others and take them out again. · Take part in finger rhymes with numbers. · Build with a range of resources.	· Develop fast recognition of up to 3 objects, without · having to count them individually ('subitising'). · Recite numbers past 5. · Say one number for each item in order: 1,2,3,4,5. · Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle'). · Show 'finger numbers' up to 5. · Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...	· Count objects, actions and sounds · Link the number symbol (numeral) with its cardinal number value. · Subitise (recognise quantities without counting) up to 5. · Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity. · Have a deep understanding of number to 10, including the composition of each number. · Count beyond 10. · Verbally count beyond 20, recognising the pattern of the counting system.

Addition and subtraction	· React to changes of amount in a group of up to three items. · Compare amounts, saying 'lots', 'more' or 'same'. · Develop counting-like behaviour, such as making sounds, pointing or saying some numbers in sequence.	· Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5. · Experiment with their own symbols and marks as well as numerals. · Solve real world mathematical problems with · numbers up to 5. · Compare quantities using language: 'more than', 'Fewer than'.	· Understand the 'one more than/one less than' relationship between consecutive numbers. · Explore the composition of numbers to 10. · Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.
Multiplication and division	· Count in everyday contexts, sometimes skipping numbers - '1-2-3-5.'	**N/A**	· Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.
Properties of shape (Geometry)	· Climb and squeeze themselves into different types of spaces. · Complete inset puzzles.	· Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'. · Select shapes appropriately: flat surfaces for building, a triangular prism for a roof etc. · Combine shapes to make new ones – an arch, a bigger triangle etc. · Talk about and identifies the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs' etc. · Extend and create ABAB patterns – stick, leaf, stick, leaf. · Notice and correct an error in a repeating pattern.	· Select, rotate and manipulate shapes to develop spatial reasoning skills. · Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can. · Continue, copy and create repeating patterns.

Position and direction	**N/A**	· Understand position through words alone – for example, “The bag is under the table,” – with no pointing. · Describe a familiar route. · Discuss routes and locations, using words like ‘in front of’ and ‘behind’.	· Use everyday language to describe position and direction.
Measurement	· Compare sizes, weights etc. using gesture and language - ‘bigger/little/smaller’, ‘high/low’, ‘tall’, ‘heavy’. · Notice patterns and arrange things in patterns	· Make comparisons between objects relating to size, length, weight and capacity.	· Compare length, weight and capacity.
Fractions	**N/A**	**N/A**	Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place Value	1. Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number. Count, read and write numbers to 100 in numerals. G 2. Count in multiples of twos, fives and tens. A 3. Given a number, identify one more and one less. G 4. Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least. G 5. Read and write numbers from 1 to 20 in numerals and words. G Use key vocabulary to demonstrate knowledge and understanding in this strand: count, forwards, backwards, smaller, bigger, fewer, most, least, number, ten, more/less, digit, numeral, figure(s), compare, (in) order/a different order, size, value, between, halfway, between, above, below, tens, ones	1. Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward. G 2. Recognise the place value of each digit in a two-digit number (tens, ones). G 3. Identify, represent and estimate numbers using different representations, including the number line. A 4. Compare and order numbers from 0 up to 100; use <, > and = signs. G 5. Read and write numbers to at least 100 in numerals and in words. G Use key vocabulary to demonstrate knowledge and understanding in this strand: Read, write, order, compare, numbers to one hundred, hundreds, partition, recombine, more/less, count, steps, recognise, identify, compare, order, numerals, words, forward, backwards, count	1. Count from 0 in multiples of 4, 8, 50 and 100. Find 10 or 100 more or less than a given number. G 2. Recognise the place value of each digit in a three-digit number (hundreds, tens, ones). G 3. Compare and order numbers up to 1000. Read and write numbers up to 1000 in numerals and in words G 4. Identify, represent and estimate numbers using different representations. A 5. Solve number problems and practical problems involving these ideas. A Use key vocabulary to demonstrate knowledge and understanding in this strand: Ascending, descending, approximate, nearest, numbers to one thousand, multiples, recognise, place value, numerals, words, represent, hundreds, tens, ones, thousand, numerals, estimate, representations, count	1. Count in multiples of 6, 7, 9, 25 and 1000. G 2. Find 1000 more or less than a given number. Round any number to the nearest 10, 100 or 1000. G 3. Count backwards through zero to include negative numbers. G 4. Recognise the place value of each digit in a 4-digit number (thousands, hundreds, tens, and ones). Order and compare numbers beyond 1000. G 5. Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value. R Use key vocabulary to demonstrate knowledge and understanding in this strand: Tenths, hundredths, decimal (places), round (to nearest), thousand, more/less than, negative integers, count through zero, roman numerals I to C, count	1. Read, write, order & compare numbers to at least 1 000 000 and determine the value of each digit G 2. Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000. Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000. G 3. Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero. G 4. Read Roman numerals to 1000 (M) and recognise years written in Roman numerals. R Use key vocabulary to demonstrate knowledge and understanding in this strand: Powers of 10, numbers to 1,000,000, round, nearest, count forwards, backwards, positive, whole, roman numerals I to M	1. Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit. Round any whole number to a required degree of accuracy. G 2. Use negative numbers in context, and calculate intervals across zero. Solve number and practical problems that involve all of the above. G Use key vocabulary to demonstrate knowledge and understanding in this strand: Numbers to 10,000,000, digit, value, negative, whole, positive, intervals, degree, accuracy context

Addition and Subtraction	6. Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs. G 7. Represent and use number bonds and related subtraction facts within 20. G 8. Add and subtract one-digit and two-digit numbers to 20, including zero. G 9. Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = - 9. A Use key vocabulary to demonstrate knowledge and understanding in this strand: Number bonds, number line, add, more, make, sum, total, altogether, double, equals, is the same as, difference between, subtract, take away, number sentence, problem, solve, find	6. Solve problems with addition and subtraction: using concrete objects and pictorial representations; applying their increasing knowledge of mental and written methods. A 7. Recall and use add and subtract facts to 20 fluently, and derive and use related facts up to 100. G 8. Add and sub numbers using concrete objects, pictorial representations, and mentally, including: a 2-digit no and 1s or 10s; two 2-digit numbers; adding three 1-digit numbers. G 9. Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot. G Use key vocabulary to demonstrate knowledge and understanding in this strand: Add, addition, more, plus, make, increase, sum, total, altogether, inverse, double, near double, equals, is the same as, difference between, subtract, subtraction, take away, minus, decrease, more than, less than, inverse, operations, difference, order, 1 digit, 2 digit	6. Add and subtract numbers mentally, including: a 3-digit no and 1s, 10s, 100s. G 7. Add and sub numbers with up to 3 digits, using formal written methods of columnar add and sub. G 8. Estimate the answer to a calculation and use inverse operations to check answers. A 9. Solve problems, including missing no problems, using number facts, place value, and more complex add/sub. A Use key vocabulary to demonstrate knowledge and understanding in this strand: Total, approximation, addition, plus, subtract, minus, subtraction, increase, decrease, mentally, 3 digit numbers, formal written method, column, inverse, operation, fractions, place value	6. Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate. G 7. Estimate and use inverse operations to check answers to a calculation. G 8. Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. A Use key vocabulary to demonstrate knowledge and understanding in this strand: Calculation, method, addition, add, more, make, sum, total, altogether, double, near double, half, subtract, take away, subtraction, 4 digits, estimate, solve, two step, operations, method, inverse, efficient method	5. Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction). G 6. Add and subtract numbers mentally with increasingly large numbers. Use rounding to check answers to calculations and levels of accuracy G 7. Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why G Use key vocabulary to demonstrate knowledge and understanding in this strand: whole, more than 4 digits, formal written methods, efficient written method, mentally, rounding, level of accuracy, multi-step problems, context, selective, efficient	3. Multiply and divide numbers up to 4 digits by a 2-digit whole number using the formal written methods and interpret remainders as whole number remainders, fractions, or by rounding. G 4. Identify common factors, common multiples and prime numbers. G 5. Use their knowledge of the order of operations to carry out calculations involving the four operations. G 6. Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. G Use key vocabulary to demonstrate knowledge and understanding in this strand: Multiply, divide, addition, subtraction, order of operations, BODMAS, formal written strategies, whole, remainder, rounding, common factors, fractions, common multiples, prime factors, multi-step problems

Multiplication and Division	10. Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial reps and arrays with the support of the teacher. A Use key vocabulary to demonstrate knowledge and understanding in this strand: Multiply, multiply by, repeated addition, array, row, double, half, share, share equally, group, equal groups of, divide, divided by, problem, find, solve	11. Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers. G 12. Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs. A 13. Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot. A 14. Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts. R Use key vocabulary to demonstrate knowledge and understanding in this strand: Multiply, multiply by, repeated addition, array, row, column, double, half, share, share equally, group, equal groups of, divide, divided by, left over, remainder, equal, repeated addition, repeated subtraction inverse	10. Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. G 11. Write and calculation math statements for x and ÷ using the tables they know, including 2-digit numbers times 1-digit numbers, using mental and formal written methods. G 12. Solve problems and missing number problems, involving x and ÷, including integer scaling problems and correspondence problems in which n objects are connected to m objects. A Use key vocabulary to demonstrate knowledge and understanding in this strand: Formal written method, missing number, product, multiples of four, grid method, mental, solve, problem inverse, corresponding, multiply, sequence, combination	9. Recall multiplication and division facts for multiplication tables up to 12 × 12. G 10. Recognise and use factor pairs and commutativity in mental calculations. G 11. Multiply two-digit and three-digit numbers by a one-digit number using formal written layout. A 12. Solve problems involving x and +, including. using the distributive law to multiply 2 digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects. A Use key vocabulary to demonstrate knowledge and understanding in this strand: Recall, multiplication, division, dividend, product, divisor, factor, pairs, mental, two digits, three digits, grid method, formal written method, scaling, inverse, corresponding	8. Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. G 9. Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers. Establish whether a number up to 100 is prime and recall prime numbers up to 19. A 10. Multiply numbers up to 4 digits by a 1- or 2-digit number using a formal written method. Divide numbers up to 4 digits by a 1-digit number using the formal written method of short division. A 11. Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. G 12. Recognise and use square numbers and cube numbers, and the notation for squared and cubed. A Use key vocabulary to demonstrate knowledge and understanding in this strand: Dividend, product, quotient, divisor, multiples, factors, factor pairs, common factor, composite numbers, prime number, prime factors, square number, cubed number, formal written method	3. Multiply and divide numbers up to 4 digits by a 2-digit whole number using the formal written methods and interpret remainders as whole number remainders, fractions, or by rounding. G 4. Identify common factors, common multiples and prime numbers. G 5. Use their knowledge of the order of operations to carry out calculations involving the four operations. G 6. Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why. G Use key vocabulary to demonstrate knowledge and understanding in this strand: Dividend, product, quotient, 4 digits, 2 digits, remainders, whole, fractions, rounding, common factors, common multiples, prime numbers, order, operations, BODMAS

Fractions	11. Recognise, find and name a half as one of two equal parts of an object, shape or quantity. A 12. Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity. R Use key vocabulary to demonstrate knowledge and understanding in this strand: Recognise, find, whole, equal parts, four equal parts, one half, two halves, a quarter, two quarters, shape, quantity	15. Recognise/find/name/write fractions ⅓, ¼, 2/4, ¾ of a length, shape, set of objects or quantity. A 16. Write simple fractions e.g. ½ of 6 = 3 and recognise the equivalence of 2/4 and ½. R Use key vocabulary to demonstrate knowledge and understanding in this strand: Name, identify, write, whole, three quarters, one third, a third, quarter, two quarters, equivalence, equivalent, numerator, denominator, recognise	13. Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10. G 14. Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. G 15. Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators. A 16. Recognise and show, using diagrams, equivalent fractions with small denominators. R 17. Add and sub fractions with the same denominator within one whole (e.g. $^5/_7 + ^1/_7 = ^6/_7$). R 18. Compare and order unit fractions, and fractions with the same denominators. R Use key vocabulary to demonstrate knowledge and understanding in this strand: Identify, tenths, dividing, equal, parts, find, write, equivalent, add, addition, whole, numerator, denominator, unit fraction, non-unit fraction, compare and order	13. Recognise and show, using diagrams, families of common equivalent fractions. G 14. Count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten. A 15. Add and subtract fractions with the same denominator. R 16. Recognise and write decimal equivalents of any number of tenths or hundredths; and the decimal equivalents to ¼, ½ and three quarters. R 17. Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths. A 18. Round decimals with one decimal place to the nearest whole number. Solve simple measure and money problems involving fractions and decimals to 2 decimal places. R Use key vocabulary to demonstrate knowledge and understanding in this strand: Categorise, show, diagrams, common, equivalent, hundredths, divide, addition, plus, subtraction, minus, denominator, numerator, decimals, one quarter, half, three quarters, digits, tenths, round, nearest, whole, measure, money, 2 decimal places	13. Compare and order fractions whose denominators are all multiples of the same number. Add and subtract fractions with the same denominator and multiples of the same number. G 14. Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths. A 15. Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number. R 16. Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. R 17. Round decimals with two decimal places to the nearest whole number and to one decimal place. Read and write decimal numbers as fractions (e.g. 0.72 = $^{72}/_{100}$). A 18. Read, write, order and compare numbers with up to three decimal places. Solve problems involving number up to three decimal places. A 19. Write percentages as a fraction. Solve problems which require knowing percentage and decimal equivalents of ½, ¼, ⅕, ⅖, ⅘ and those with a denominator of a multiple of 10 or 25. R Use key vocabulary to demonstrate knowledge and understanding in this strand: Compare, order, multiple, plus, minus, subtract, equivalent, tenths, hundreds, proper fractions, improper fractions, mixed numbers, convert, multiply, whole, decimals, round, 3 decimal places, percentage, half, quarter, fifth, two fifths, four fifths	7. Use common factors to simplify fractions; use common multiples to express fractions in the same denomination G 8. Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions. G 9. Multiply simple proper fractions and simplify the answer (e.g. ¼ x ½ = ⅛). Divide proper fractions by whole numbers (e.g. ⅓ ÷ 2 = ⅙). R 10. Identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places. G 11. Multiply one-digit numbers with up to two decimal places by whole numbers. Use written division methods in cases where the answer has up to two decimal places. A 12. Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. A Use key vocabulary to demonstrate knowledge and understanding in this strand: Common factors, simplify, common multiples, mixed numbers, proper, improper, divide, multiply, 3 decimal places, equivalent, percentage, degree of accuracy

Ratio and Proportion						13. Solve problems involving the calculation of percentages (e.g. of measures) such as 15% of 360 and the use of percentages for comparison. **A** 14. Solve problems involving similar shapes where the scale factor is known or can be found. Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples. **A** Use key vocabulary to demonstrate knowledge and understanding in this strand: Calculation, equivalent, percentage, comparison, similar, scale, scale factor, fractions, multiples, unequal, division, dividend, product, sum, ratio, proportion, degree of accuracy

Algebra						15. Express missing number problems algebraically. Use simple formulae expressed in words. **R** 16. Generate and describe linear number sequences. **R** 17. Find pairs of numbers that satisfy number sentences involving two unknowns. Enumerate all possibilities of combinations of two variables. A Use key vocabulary to demonstrate knowledge and understanding in this strand: Algebra, algebraic, formula, formulae, linear, sequence, unknowns, enumerate, function, variables, BODMAS, BIDMAS **Links to Computing – Computer Science** To design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. Use sequence, selection, and repetition in programs; work with variables and various forms of input and output

Measure	13. Compare, describe & solve practical problems for: lengths/heights (short/tall, half/ double); mass/weight (heavier/lighter); capacity/volume (full/empty, more/less); time (quicker/slower/later). **R** 14. Measure and begin to record the following: lengths/heights; mass/weight; capacity/volume; time (hours, minutes, seconds). **R** 15. Recognise and know the value of different denominations of coins and notes. **R** 16. Sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening. **A** 17. Recognise and use language relating to dates, including days of the week, weeks, months and years. **A** 18. Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. **R** Use key vocabulary to demonstrate knowledge and understanding in this strand: Short, tall, half, double full, empty, more, less, heavier, lighter, quicker, slower, later, length, height, mass, weight, capacity, volume, time, clock, hour, second, minute, o'clock, half past, before, after, next, today, yesterday, tomorrow, morning, afternoon, evening, days of the week, moths of the year, year **Links to Science - Working Scientifically** • Questioning • Pattern Seeking and Observation Over Time • Comparative and Fair Testing	17. Choose/use appropriate stand units to estimate/measure length/height (m/cm); mass (kg/g); temp (°C); cap (litres/ml) to nearest unit, using rulers, scales, thermometers and measuring vessels. **R** 18. Compare and order lengths, mass, volume/capacity and record the results using >, < and = . **A** 19. Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value. Find different combinations of coins that equal the same amounts of money. **A** 20. Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change. **R** 21. Compare and sequence intervals of time. Know the number of minutes in an hour and the number of hours in a day. **A** 22. Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times. **R** Use key vocabulary to demonstrate knowledge and understanding in this strand: Estimate, measure, length, height, metre, centimetre, mass, kilogram, temperature, degrees, capacity, litres, millilitres, compare order, more than, less than, pound, pence, amounts, total, coins, money, different, same, change, compare, time, minutes, hours, o'clock, half past, quarter past/ to, minute intervals **Links to Science - Working Scientifically** • Questioning • Pattern Seeking and Observation Over Time • Comparative and Fair Testing	19. Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml). **A** 20. Measure the perimeter of simple 2-D shapes. **G** 21. Add and subtract amounts of money to give change, using both £ and p in practical contexts. **R** 22. Tell/write the time from an analogue clock, including Roman numerals from I to XII, and 12-hr/24-hr clocks. **R** 23. Estimate and read time with increasing accuracy to nearest min; record/compare time in seconds, minutes, hours. Use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight. **R** 24. Know the no of seconds in a minute and the number of days in each month, year and leap year. **A** Use key vocabulary to demonstrate knowledge and understanding in this strand: Compare, perimeter, pounds, pence, change, time, analogue, Leap year, twelve-hour/twenty-four-hour clock, Roman numerals I to XIII, seconds, minutes, hours, days, months, year, leap year **Links to Science - Working Scientifically** • Questioning • Pattern Seeking and Observation Over Time • Comparative and Fair Testing	19. Convert between different units of measure (e.g. kilometre to metre). Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days). **G** 20. Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres. Find the area of rectilinear shapes by counting squares. **A** 21. Estimate, compare and calculate different measures, including money in pounds and pence. **A** 22. Read, write and convert time between analogue and digital 12 and 24-hour clocks. **R** Use key vocabulary to demonstrate knowledge and understanding in this strand: Convert, kilometre, metre, hours, minutes, seconds, years, months, weeks, days, grams, kilograms, metre, centimetre, millimetre, measure, perimeter, rectilinear, centimetres, money, analogue, digital, 12 and 24 hour clocks, area **Links to Science - Working Scientifically** • Questioning • Pattern Seeking and Observation Over Time • Comparative and Fair Testing	20. Convert between different units of metric measure (e.g. km & m; cm & m; cm & mm; g & kg; l & ml). Use approx. equivalences between metric and imperial units (e.g. inches, pounds & pints). **A** 21. Measure & calculate the perimeter of composite rectilinear shapes in cm/m. Calculate the area of squares/rectangles using standard units, square cm/m and estimate the area of irregular shapes. **A** 22. Estimate volume (e.g. using 1 cm blocks to build cubes/cuboids) and capacity (e.g. using water). **R** 23. Solve problems involving converting between units of time. Use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling. **R** Use key vocabulary to demonstrate knowledge and understanding in this strand: Metric measure, equivalent, imperial, inches, pounds, pints, measure, calculate, perimeter, area, estimate, volume, length, mass, cubed, squared, rectilinear, perpendicular, degree, convert **Links to Science - Working Scientifically** • Questioning • Pattern Seeking and Observation Over Time • Comparative and Fair Testing	18. Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate. Convert between miles and km. **G** 19. Use, read, write & convert between standard units of measure, converting length, mass, volume & time from smaller to larger units, and vice versa, using decimal notation to up to 3 decimal places. **A** 20. Recognise that shapes with the same areas can have different perimeters and vice versa. **R** 21. Calculate the area of parallelograms and triangles. Recognise when it is possible to use formulae for area and volume of shapes. **A** 22. Calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^2) and cubic metres (m^3), and extending to other units. **R** Use key vocabulary to demonstrate knowledge and understanding in this strand: Calculation, conversion, units, measure, decimal, places, miles, kilometres, read, write, convert, standard units, length, mass, volume, time, area, perimeter, parallelograms, triangles, formulae, calculate, estimate, compare, cubes, cuboids, centimetre cubed (cm^2), cubic metres (m^3) **Links to Science - Working Scientifically** • Questioning • Pattern Seeking and Observation Over Time • Comparative and Fair Testing

Geometry	19. Recognise and name common 2-D shapes (e.g. rectangles, circles and triangles) and 3-D shapes (e.g. cuboids (including cubes), pyramids and spheres). A 20. Describe position, directions and movements, including whole, half, quarter and three-quarter turns. R Use key vocabulary to demonstrate knowledge and understanding in this strand: Before, after, beside, next to, opposite, apart, between, middle, edge, centre, corner, direction, journey, left, right, up, down, forwards, backwards, sideways, across, close, far, near, along, through, to, from, towards, away from, movement, slide, roll, turn, whole turn, half turn, stretch, bend 2dimenional, 3 dimensional, vertices, face, side, edge, make, build, draw, square, triangle, circle, rectangle, pentagon, octagon, hexagon, cube, cuboid, sphere, cone, pyramid, cylinder **Links to Geography – Place Knowledge** Use simple compass directions (North, South, East and West) and locational and directional language [for example, near and far; left and right], to describe the location of features and routes on a map. **Links to Computing – Computer Science** Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.	23. Identify and describe the properties of 2D shapes, including the number of sides and symmetry in a vertical line. A 24. Identify and describe the properties of 3D shapes, including the no. of edges, vertices and faces. R 25. Identify 2D shapes on the surface of 3D shapes, e.g. circle on a cylinder; a triangle on a pyramid. G 26. Compare and sort common 2D and 3D shapes and everyday objects. 1 27. Order and arrange combinations of mathematical objects in patterns and sequences. R 28. Use maths vocabulary to describe position, direction & movement including movement in a straight line and distinguishing rotation as a turn & in terms of right angles for ¼, ½, & ¾ turns (clock/anti-clockwise). R Use key vocabulary to demonstrate knowledge and understanding in this strand: Rotation, clockwise, anticlockwise, straight line, ninety degree turn, right angle 2 dimensional, 3 dimensional, size, bigger, larger, smaller, symmetrical, line of symmetry, fold, match, mirror line, reflection, pattern, repeating pattern, square-based/ triangle based pyramid, cylinder, triangular prism **Links to Geography – Place Knowledge** Use simple compass directions (North, South, East and West) and locational and directional language [for example, near and far; left and right], to describe the location of features and routes on a map. **Links to Computing – Computer Science** Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.	25. Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them. A 26. Recognise that angles are a property of shape or a description of a turn. R 27. Identify right angles, recognise that 2 right angles make a half-turn, 3 make three quarters of a turn and 4 a complete turn. Identify whether angles are greater than or less than a right angle. R 28. Identify horizontal and vertical lines and pairs of perpendicular and parallel lines. R Use key vocabulary to demonstrate knowledge and understanding in this strand: Greater/less than ninety degrees, orientation (same orientation, different orientation) Horizontal, vertical, perpendicular and parallel lines, pairs, right angle, half turn, whole turn **Links to Geography – Place Knowledge** Use the eight points of a compass, four and six-figure grid references, symbols and key (including the use of Ordnance Survey maps). **Links to Computing – Computer Science** Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.	23. Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. A 24. Identify acute and obtuse angles and compare and order angles up to two right angles by size. A 25. Identify lines of symmetry in 2-D shapes presented in different orientations. R 26. Complete a simple symmetric figure with respect to a specific line of symmetry. R 27. Describe positions on a 2-D grid as coordinates in the first quadrant. Describe movements between positions as translations of a given unit to the left/right and up/down. R 28. Plot specified points and draw sides to complete a given polygon. R Use key vocabulary to demonstrate knowledge and understanding in this strand: Compare, classify, co-ordinate, translate, quadrant, X-axis, Y-axis, perimeter, area Quadrilaterals, triangles, right, acute and obtuse angles, symmetry, mirror line, polygon, regular, irregular **Links to Geography – Place Knowledge** Use the eight points of a compass, four and six-figure grid references, symbols and key (including the use of Ordnance Survey maps). **Links to Computing – Computer Science** Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.	24. Identify 3D shapes, including cubes and other cuboids, from 2D representations. G 25. Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles. Draw given angles, and measure them in degrees. A 26. Identify: angles at a point and one whole turn (total 360^0); angles at a point on a straight line and ½ a turn (total 180^0); other multiples of 90^0. R 27. Use the properties of rectangles to deduce related facts and find missing lengths and angles. A 28. Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed. R Use key vocabulary to demonstrate knowledge and understanding in this strand: 2D, 3D, representations, reflex/obtuse angle, degrees, dimensions, translation, reflection, straight line, half turn, multiples, lengths, regular and irregular polygons, lengths, angles **Links to Geography – Place Knowledge** Use the eight points of a compass, four and six-figure grid references, symbols and key (including the use of Ordnance Survey maps). **Links to Computing – Computer Science** To design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.	23. Draw 2-D shapes using given dimensions and angles. Recognise, describe and build simple 3-D shapes, including making nets. R 24. Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons. A 25. Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius. R 26. Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. R 27. Describe positions on the full coordinate grid (all four quadrants). A 28. Draw and translate simple shapes on the coordinate plane, and reflect them in the axes. R Use key vocabulary to demonstrate knowledge and understanding in this strand: Four quadrants, translate, co-ordinates, reflect, axe, axes, corresponding angles, alternate angles, interior and exterior angles, alternate angles, parallel lines, perpendicular. 3D, net, describe, build, angles, vertical lines, vertically opposite, circumference, radius, diameter **Links to Geography – Place Knowledge** Use the eight points of a compass, four and six-figure grid references, symbols and key (including the use of Ordnance Survey maps). **Links to Computing – Computer Science** To design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. Use sequence, selection, and repetition in programs; work with variables and various forms of input and output

Statistics		29. Interpret and construct simple pictograms, tally charts, block diagrams and simple tables. **R** 30. Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity; ask and answer questions about totalling and comparing categorical data. **R** Use key vocabulary to demonstrate knowledge and understanding in this strand: Count, tally, sort, vote, graph, block graph, pictogram, represent, group, set, list, table, label, title, most popular, most common, least popular, least common **Links to Science - Working Scientifically** • Questioning • Pattern Seeking and Observation Over Time • Comparative and Fair Testing • Identifying, grouping and classifying	29. Interpret and present data using bar charts, pictograms and tables. **R** 30. Solve one-step and two-step questions such as 'How many more?' and 'How many fewer?' using information presented in scaled bar charts and pictograms and tables. **A** Use key vocabulary to demonstrate knowledge and understanding in this strand: Chart, bar, pictogram, table, more, fewer, presented, scaled, bar chart, frequency table, Carroll diagram, Venn diagram, axis, axe, data **Links to Science - Working Scientifically** • Questioning • Pattern Seeking and Observation Over Time • Comparative and Fair Testing • Identifying, grouping and classifying	29. Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. **R** 30. Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. **A** Use key vocabulary to demonstrate knowledge and understanding in this strand: Interpret, present, Continuous data, line graph, bar chart, time graph, compare, comparison, sum, difference **Links to Science - Working Scientifically** • Questioning • Pattern Seeking and Observation Over Time • Comparative and Fair Testing • Identifying, grouping and classifying	29. Solve comparison, sum and difference problems using information presented in a line graph. **R** 30. Complete, read and interpret information in tables, including timetables. **R** Use key vocabulary to demonstrate knowledge and understanding in this strand: Compare, comparison, sum, difference, line, graph, table, timetables, read, interpret, complete, analyse **Links to Science - Working Scientifically** • Questioning • Pattern Seeking and Observation Over Time • Comparative and Fair Testing • Identifying, grouping and classifying	29. Interpret and construct pie charts and line graphs and use these to solve problems. **A** 30. Calculate and interpret the mean as an average. **R** Use key vocabulary to demonstrate knowledge and understanding in this strand: Interpret, construct, pie chart, line graph, calculate, linear number sequence, substitute, variables, symbol, known values, mean, average, construct **Links to Science - Working Scientifically** • Questioning • Pattern Seeking and Observation Over Time • Comparative and Fair Testing • Identifying, grouping and classifying