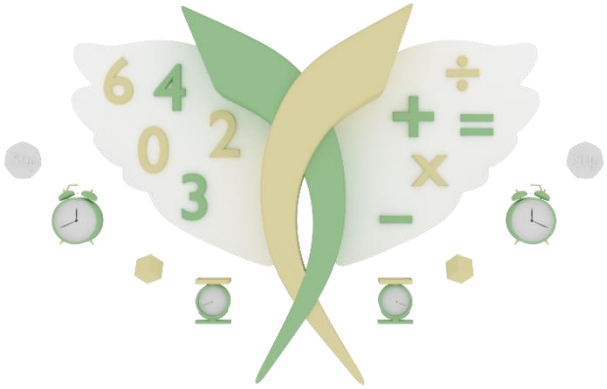
National Curriculum 2014

Planning Materials

Year 2



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 have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems
- **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 non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

The principal focus of mathematics teaching in Key Stage 1

- The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools].
- At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.
- By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.
- Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

Year 2 programme of study (statutory requirements)

Number and place value	Addition and subtraction	Multiplication and division	Fractions
• count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward • recognise the place value of each digit in a two-digit number (tens, ones) • identify, represent and estimate numbers using different representations, including the number line • compare and order numbers from 0 up to 100; use <, > and = signs • read and write numbers to at least 100 in numerals and in words • use place value and number facts to solve problems.	• solve problems with addition and subtraction: – using concrete objects and pictorial representations, including those involving numbers, quantities and measures – applying their increasing knowledge of mental and written methods • recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 • add and subtract numbers using concrete objects, pictorial representations, and mentally, including: – a two-digit number and ones – a two-digit number and tens – two two-digit numbers – adding three one-digit numbers • show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	• recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.	• recognise, find, name and write fractions $^1/_3$, $^1/_4$, $^2/_4$ and $^3/_4$ of a length, shape, set of objects or quantity • write simple fractions e.g. $^1/_2$ of 6 = 3 and recognise the equivalence of $^2/_4$ and $^1/_2$.

Measurement	Geometry: properties of shapes	Geometry: position and direction	Statistics
• choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels • compare and order lengths, mass, volume/capacity and record the results using >, < and = • 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 • solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change • compare and sequence intervals of time • 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. • know the number of minutes in an hour and the number of hours in a day.	• identify and describe the properties of 2-D shapes, including the number of sides and symmetry in a vertical line • identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces • identify 2-D shapes on the surface of 3-D shapes, [e.g. a circle on a cylinder and a triangle on a pyramid] • compare and sort common 2-D and 3-D shapes and everyday objects.	• order and arrange combinations of mathematical objects in patterns and sequences • use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise).	• interpret and construct simple pictograms, tally charts, block diagrams and simple tables • 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 compare categorical data.

AB BC MATHS

Year 2 Notes and Guidance (non-statutory)

Number and place value	Addition and subtraction	Multiplication and division	Fractions
Using materials and a range of representations, pupils practise counting, reading, writing and comparing numbers to at least 100 and solving a variety of related problems to develop fluency. They count in multiples of three to support their later understanding of a third. *As they become more confident with numbers up to 100, pupils are introduced to larger numbers to develop further their recognition of patterns within the number system and represent them in different ways, including spatial representations.* *Pupils should partition numbers in different ways (e.g. 23 = 20 + 3 and 23 = 10 + 13) to support subtraction. They become fluent and apply their knowledge of numbers to reason with, discuss and solve problems that emphasise the value of each digit in two-digit numbers. They begin to understand zero as a place holder.*	*Pupils extend their understanding of the language of addition and subtraction to include sum and difference.* *Pupils practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using 3 + 7 = 10, 10 - 7 = 3 and 7 = 10 - 3 to calculate 30 + 70 = 100, 100 - 70 = 30 and 70 = 100 - 30. They check their calculations, including by adding to check subtraction and adding numbers in a different order to check addition (e.g. 5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5). This establishes commutativity and associativity of addition.* *Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger numbers.*	*Pupils use a variety of language to describe multiplication and division.* *Pupils are introduced to the multiplication tables. They practise to become fluent in the 2, 5 and 10 multiplication tables and connect them to each other. They connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face. They begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations.* *Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, and relating these to fractions and measures (e.g. 40 ÷ 2 = 20, 20 is a half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (e.g. 4 × 5 = 20 and 20 ÷ 5 = 4).*	*Pupils use additional fractions as 'fractions of' discrete and continuous quantities by solving problems using shapes, objects and quantities. They connect unit fractions to equal sharing and grouping, to numbers when they can be calculated, and to measures, finding fractions of lengths, quantity, a set of objects or shapes. They meet $^{3}/_{4}$ as the first example of a non-unit fraction.* *Pupils should count in fractions up to 10, starting from any number and using the $^{1}/_{2}$ and $^{2}/_{4}$ equivalence on the number line (e.g. $1^{1}/_{4}$, $1^{2}/_{4}$, (or $1^{1}/_{2}$), $1^{3}/_{4}$, 2). This reinforces the concept of fractions as numbers and that they can add up to more than one.*

Measurement	Geometry: properties of shapes	Geometry: position and direction	Statistics
Pupils use standard units of measurement with increasing accuracy, using their knowledge of the number system. They use the appropriate language and record using standard abbreviations. *Comparing measures includes simple multiples such as 'half as high'; 'twice as wide'.* *They become fluent in telling the time on analogue clocks and recording it.* *Pupils become fluent in counting and recognising coins. They read and say amounts of money confidently and use the symbols £ and p accurately, recording pounds and pence separately.*	*Pupils handle and name a wider variety of common 2-D and 3-D shapes including: quadrilaterals and polygons, and cuboids, prisms and cones, and identify the properties of each shape (e.g. number of sides, number of faces). Pupils identify, compare and sort shapes on the basis of their properties and use vocabulary precisely, such as sides, edges, vertices and faces.* *Pupils read and write names for shapes that are appropriate for their word reading and spelling.* *Pupils draw lines and shapes using a straight edge.*	*Pupils should work with patterns of shapes, including those in different orientations.* *Pupils use the concept and language of angles to describe 'turn' by applying rotations, including in practical contexts (e.g. pupils themselves moving in turns, giving instructions to other pupils to do so, and programming robots using instructions given in right angles).*	*Pupils record, interpret, collate, organise and compare information (e.g. using many-to-one correspondence with simple ratios 2, 5, 10).*

ABC MATHS

Number and Place Value

Yr 2 Statutory requirements

- **count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward**
- **recognise the place value of each digit in a two-digit number (tens, ones)**
- **identify, represent and estimate numbers using different representations, including the number line**
- **compare and order numbers from 0 up to 100; use <, > and = signs**
- **read and write numbers to at least 100 in numerals and in words**
- **use place value and number facts to solve problems.**

Autumn 1

- count on and back from any two-digit number in ones and tens *e.g. Count back six from 78... Count on from 47 to 53. How many did you count?*
- know the number that is 1 and 10 more/less than any two-digit number
- read and write two-digit numbers, recognise the difference between, for example, 'sixty' and 'sixteen' *e.g. Find 63, 34 on a 100 grid; write the number 17*
- know why it is necessary to write 0 in the ones place for two-digit multiples of 10 such as 50, 90, 10…
- know what each digit represents in two-digit numbers *e.g. Which number is 5 tens and no ones*
- practically make any two-digit number *e.g. using place value equipment, arrow cards, bundles of straws*
- use place value to know the total of a one-digit number and a multiple of ten *e.g. 50 + 6 = 56*
- partition two-digit numbers *e.g. 53 = 50 + 3*
- use place value to fill in missing numbers on a blank or partially filled 100 grid or number line
- solve problems e.g. *What different numbers can be made using 20, 40, 3 and 5, recording systematically*

Autumn 2

- count on and back from any two-digit number in tens e.g. *Count on/back 30 in tens from 50, 67*
- count on in steps of 2, 5 and 10 from 0
- compare numbers and say which is more/less *e.g. Which is less: 36 or 63? Which is shorter 18m or 15m? Which is more 31kg or 37kg? Ali has 16 pens. Ben has 28 pens. Who has fewer pens?*
- use the < and > symbols to record comparison *e.g. 34 < 45, 56 > 15*
- order numbers recognising the value of digits and by considering relative positions on a number line *e.g. Put these in order e.g. 27, 16, 85, 72, 52; Write a number so the three numbers are in order 45 ☐ 51, 42 ☐ 37*
- know that when ordering two-digit numbers the tens digit is more significant than the ones digit
- consolidate the reading and writing of numbers to 20 in words

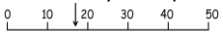
Spring 1

- count on and from back to any number in ones and tens *e.g. count in tens from 33 to 73, 90 to 40. How many tens did you count? Count on in tens from 27. Will 85 be in the count? How do you know?*
- count on and back in multiples of 2 from 0 or 1
- know the number that is 1 and 10 more/less than any number within 100
- extend knowledge of reading and writing numbers in words to include multiples of 10 and 'hundred'
- understand place value when writing two-digit numbers *e.g. sixty five is 65 and not 605*
- know what each digit in two-digit numbers represents
- partition two-digit numbers in different ways using base-ten apparatus, bundles of straws, bead strings to support understanding *e.g. 45 = 40 + 5, 45 = 30 + 15, 45 = 30 + 10 + 5*
- explain what number needs to go in each box *e.g. 64 = ☐ + 4, 25 – ☐ = 20, 53 = 40 + ☐*
- solve problems *e.g. In one step make 5 into 75, change 49 to 9, Billy has saved 10p more than me. I have saved 85p. How much has Paul saved?*

Spring 2

- count on and back from any number in ones and tens crossing 100 *e.g. What is 30 more/less than 56?*
- count on in steps of 2, 3 and 5 from zero
- know which two-digit numbers are multiples of 10
- place multiples of 10 on a number line e.g. *20, 90*

- recognise which two multiples of 10 any two-digit number lies between *e.g. 42 is between 40 and 50*
- begin to round numbers to the nearest 10 by identifying which multiple of 10 it's closer too
- estimate and place two-digit numbers on number lines, where only multiples of 2, 5 or 10 are marked *e.g.*



what number is the arrow pointing to? Where would 42 and 27 be ?

- estimate the number of objects in a set *e.g. Knowing how many are in a full jar, estimate the number of sweets in a jar that is about half full*
- compare and explain how estimates are reached

Summer 1

- count on and back from any number in ones and tens crossing the 100 boundary
- know the number that is 10, 20 or 30 more/less than a two-digit number *e.g. 20 less than 102*
- know the multiple of ten that comes before and after any two-digit number
- count on and back in steps of 2, 3 and 5
- read and write numbers to at least 100 in numerals and words
- compare and order two-digit numbers and explain decisions, *e.g. 52, 25, 5, 22, 2, 55. My cake cost between 95p and £1. What could it have cost?*
- understand and use the < and > symbols *e.g. Write a two-digit number to make 56 > ☐ true. Put the right sign to make this correct 56 ☐ 61*
- describe a sequence and write the next few terms *e.g. 43, 53, 63… 3, 6, 9, 12... 15, 13, 11, 9...*
- fill in the missing number in a sequence *e.g. 5, 9, ☐, 17, 21, ☐... ☐, 18, 23, 28, ☐... ☐, 48, 51, 54, ☐, 60*
- create sequences with a given constraint *e.g. Make a sequence which has the numbers 6 and 12 in it*

Summer 2

- count on and back from any number in ones and tens crossing the 100 boundary *e.g. Count on in tens from 89, count back in tens from 134*
- use and extend knowledge of place value to numbers beyond 100
- work out what whole number is half way between two given numbers *e.g. What number is half way between 10 and 20, 40 and 50, 9 and 13?*
- identify properties of numbers *e.g. Describing 42 as 'between 40 and 50, 'even' or 'not odd', or 'has a ones digit of 2'*
- use knowledge of properties of numbers to identify a secret number, asking questions which will be answered 'yes' or 'no' *e.g. Is it a multiple of 5? Is it an even number?*
- solve puzzles *e.g. Put 15 buttons in three boxes so that each box has 3 more buttons than the one before.*

Apply knowledge to solve mathematical problems or puzzles

Addition and Subtraction

Yr 2 Statutory requirements

- **solve problems with addition and subtraction:**
  - **using concrete objects and pictorial representations, including those involving numbers, quantities and measures**
  - **applying their increasing knowledge of mental and written methods**
- **recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100**
- **add and subtract numbers using concrete objects, pictorial representations, and mentally, including:**
  - **a two-digit number and ones**
  - **a two-digit number and tens**
  - **two two-digit numbers**
  - **adding three one-digit numbers**
- **show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot**
- **recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.**

Autumn 1

- add and subtract a one-digit number to or from any two-digit number by counting in ones, crossing a tens boundary
- investigate that addition of two numbers can be done in any order and subtraction cannot
- rearrange addition calculations to put the larger number first *e.g. For 8 + 45, start at 45, count on 8*
- reinforce addition and subtraction facts for each number up to 10 and pairs to make 20
- add and subtract a one-digit number to/from a two-digit number not crossing a tens boundary using place value and known facts to 10 *e.g. 50 + 6 = 56, 45 + 3 = 40 + 5 + 3, 7 – 3 = 4 to find 57 – 3*
- understand and use a range of vocabulary associated with addition and subtraction *e.g. sum, total, subtract*
- solve problems *e.g. 23 people on a bus, 6 more get on, how many are there on the bus? A ribbon is 32cm long. I cut off 5cm. How long is the ribbon now? Rob has £47, he spends £5, how much does he have left?*

Autumn 2

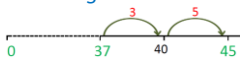
- add and subtract mentally two one-digit numbers
- know pairs to 20 *e.g. 15 + 5, 20 – 4, 3 + □ = 20*
- extend range of known facts to include addition and subtraction facts for numbers between 10 and 20
- add and subtract a one-digit number to and from a two-digit number not crossing a tens boundary, using place value and facts *e.g. 42 + 3, 38 – 4*
- add and subtract a multiple of 10 to or from a two-digit number by **counting on** or back in tens, using a 100-square to support
- know pairs of multiples of 10 that total 100
- add and subtract multiples of 10 using known facts to *e.g. 9 – 2 = 7 so 90 – 20 = 70*
- add and subtract a multiple of ten to and from a two-digit number **using place value and known facts** *e.g. 40 + 20 = 60, so 48 + 20 = 68, using place value equipment to support understanding*
- solve problems involving measures and money *e.g. Pete spent 70p. He spent 40p more than Maggie. How much did Maggie spend? A plant is 48 cm tall. It grows another 30 cm. How tall is it now?*

Spring 1

- add or subtract multiples of 10 using place value or counting in tens *e.g. 84 – 30*
- recall addition and subtraction facts for numbers to 20
- know how much to add to any two-digit number to reach the next ten *e.g. 67 + 3 = 70 because 7 + 3 = 10*
- use place value to know what needs to be subtracted from a two-digit number to reach a multiple of 10 *e.g. 36 – □ = 30*
- extend addition of a one-digit number to a two-digit number using known facts and place value, to include crossing a tens boundary *e.g. 7 + 8 = 15 so 47 + 8 is 40 + 15, using place value equipment to support*
- extend subtraction of a one-digit number from a two-digit number crossing a boundary using known facts and partitioning *e.g. 32 – 6 using 30 – 2 – 4*
- derive and use related facts up to 100 *e.g. I know 5 + 6 = 11, so 15 + 6 = 21, 25 + 6 = 31… 85 + 6 = 91, I know 9 – 3 = 6 so 19 – 3 = 16, 29 – 3 = 23*
- solve problems involving money and measures

Spring 2

- add on to the next multiple of 10 *e.g. 47 + □ = 50, find answers for □3 + □ = □0, record results in a logical way, explain the patterns and relationships*
- know that finding the difference involves comparing two numbers or quantities
- find the difference between two numbers practically, finding how many more than, less than, fewer than… *e.g. How many more cubes there are in a tower of 15 than a tower of 11?*
- find a small difference by counting on/back from one number to another *e.g. Difference between 29 and 34*
- finding a small difference on a blank or partially marked number line *e.g. 45 – 37*



- add mentally three one-digits, using pairs to 10, known facts or largest number first *e.g. 2 + 7 + 5 = □, the sum / total of 3, 6 and 7, 4 + □ + 5 = 17, find sets of 3 numbers that add up to 20*
- check answers to calculations involving three one-digit numbers using knowledge of commutativity, adding in a different order

Summer 1

- recall addition and subtraction facts for each number to 20
- add and subtract a one-digit number or a multiple of 10 to any two-digit number using place value, known facts and counting strategies
- add and subtract near multiples of 10 by rounding and adjusting using equipment as required *e.g. To add 19, add 20 then subtract 1*
- add and subtract two-digit numbers, using place value and known facts, moving to crossing a tens boundary using a range of place value equipment or number lines as required
- use inverse operations to check answers *e.g. Check 78 – 12 = 66 by working out 66 + 12 = 82*
- know the subtraction fact relating to an addition fact, and vice versa *e.g. 17 – 3 = 14. What is 17 – 14, or 3 + 14, or 14 + 3?*
- solve missing number problems *e.g. 29 + □ = 85, 60 – □ = 52*

Summer 2

- add or subtract mentally a one-digit number or a multiple of 10 to or from any two-digit number
- add and subtract **mentally** two-digit numbers, not crossing a tens boundary *e.g. 34 + 42, 86 - 34*
- add and subtract two-digit numbers, crossing a tens boundary, using place value equipment or number lines as required *e.g. 38 + 47, 82 - 56*
- solve problems in a range of contexts *e.g. Sheldon rolled a toy car 47 cm. He pushed it another 39 cm. How far did the car travel? Rob has 36p. Someone gave him another 56p. How much money does he have altogether?*
- continue to develop conceptual understanding of a range of addition and subtraction calculation strategies including counting on and back, partitioning, using known facts and finding the difference
- solve non-routine problems *e.g. Three birds laid some eggs. Each bird laid an odd number of eggs. Altogether they laid 19 eggs. How many eggs did each bird lay? Find different ways to do it.*

Multiplication and Division

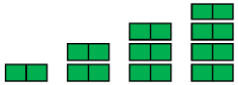
Yr 2 Statutory requirements

- **recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers**
- **calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs**
- **show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot**
- **solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.**

Autumn

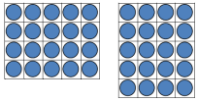
- count from zero in steps of 2, 5 and 10
- recognise odd and even numbers in counting patterns
- recognise multiples of 5 realising they end in 0 and 5, and multiples of 10 end in 0
- use fingers to follow a count when counting in steps of 2, 5, and 10 and answer questions e.g. *What are six twos? How many fives make 15?*

- use counting to support the building of times-tables with practical equipment, diagrams or a number line; emphasising the pattern of repeated addition

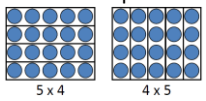


- understand multiplication as repeated addition – 'speedy counting' e.g. *Understand that 'multiplied by 5' means 'add the number five times' which is the same as four lots of five*
- record multiplication statements using the multiplication sign (x)
- represent a multiplication statement by constructing an array using knowledge of repeated addition
- describe a multiplication statement in a variety of ways *e.g.*

  5 + 5 + 5 + 5 = 20
  5 × 4 = 20
  5 multiplied by 4 = 20
  4 groups of 5 equal 20



- use arrays to investigate and establish the commutative nature of multiplication



- start to derive the 2 and 10 times-tables
- develop understanding of division as grouping using practical equipment *e.g. bead strings, counters*
- solve division problems practically by grouping *e.g. 18 marbles put into groups of three, how many groups? How many groups of two can I make from twelve?*
- record division statements using the ÷ sign *e.g. 15 cakes, 5 cakes in a box, how many boxes? 15 ÷ 5*

Spring

- count from zero in steps of 2, 3, 5 and 10 e.g. *Count on six fives, where do you finish? What are six tens? What is the next multiple of 5 after 35?*
- say times tables using fingers to track e.g. *One ten is 10, two tens are 20, three tens are 30 etc. linking to how many tens make 50?*
- use a range of representations to support the understanding and learning of multiplication facts *e.g. Write and match times tables facts to given pictorial representations using the correct signs*
- tell multiplication stories to illustrate calculations *e.g. 6 x 3, there are 6 apples in a bag, I have 3 bags*
- relate division to multiplication e.g. *Recognise that 'how many 5s make 30' can be written as 30 ÷ 5 ?*
- know the tables facts for the 2 and 10 times-tables and corresponding division facts
- begin to derive the 5 times-tables and division facts for the 2 and 10 time-tables
- know that multiples of 2 are even numbers and that numbers which are not even are odd
- know numbers in the 5 times-table end in 0 or 5 and those in the 10 times table end in 0
- link doubling to the 2 times-table
- use knowledge of multiplication facts to solve simple word problems *e.g. Eleven pairs of socks go in the wash. How many socks is this? I roll double 6 what's my score?*
- develop understanding of division as equal sharing, including halving, using practical equipment
- solve division problems practically by sharing, in a range of contexts *e.g. 18 marbles shared equally between three children, how many will they get each? What's half of 22?*
- record division statements using the ÷ sign *e.g. 18 cake put equally on to 3 plates, how many will be on each plate? 18 ÷ 3*

Summer

- know the multiplication facts for the 2, 5 and 10 times tables and corresponding division facts
- know doubles of all numbers to 20 and corresponding halves *e.g. Half of a number is 8. What is the number?*
- reinforce doubling and halving using money *e.g. Double 35p, using 10p and 5p coins, match each coin with an identical coin. Halve amounts by replacing two coins of the same kind by one coin. If there is only one coin of a particular type, replace it with smaller coins of equivalent value e.g. replacing a 20p coin with two 10p coins*
- use knowledge of fact families to show related number facts e.g. *If 5 x 4 = 20 then 4 x 5 = 20 and 20 ÷ 5 = 4 and 20 ÷ 4 = 5*
- solve missing number problems using multiplication and division facts *e.g. □ × 2 = 18, 3 × □ = 15, 20 ÷ □ = 10*
- reinforce multiplication (x) as repeated addition using practical materials and arrays
- reinforce division (÷) as both grouping and sharing using real life contexts
- solve a range of problems involving multiplication and division (grouping and sharing), using apparatus, diagrams and known facts *e.g. I have 16 socks. How many pairs is that? How many wheels are there on 3 cars? Jo's box is 5 cm wide. Mary's box is twice as wide as Jo's box. How wide is Mary's box? There are 10 lollies in a bag. Harry needs 40 lollies for his party. How many bags does he need to buy?*
- identify the operation needed to solve the problem and explain thinking
- begin to understand the idea of remainders *e.g. Three friends share 16 marbles equally. How many marbles does each friend get? How many marbles are left over? Ella has 14 litres of water. A bucket holds 5 litres. How many buckets are needed to hold all the water?*

Fractions

Yr 2 Statutory requirements

- **recognise, find, name and write fractions $^1/_3$, $^1/_4$, $^2/_4$ and $^3/_4$ of a length, shape, set of objects or quantity**
- **write simple fractions e.g. $^1/_2$ of 6 = 3 and recognise the equivalence of $^2/_4$ and $^1/_2$.**

Autumn

- count forwards in halves to 10, using a number line to support *e.g. $^1/_2$, 1, $1^1/_2$, 2, $2^1/_2$, 3*
- know that two halves make one whole and that each halve must be the same size
- know that folding/cutting in half gives two equal pieces
- know that four quarters make one whole and that each quarter must be the same size
- know that folding/cutting in half and then half again makes quarters
- know that folding/cutting in to three equal pieces makes thirds
- know that three thirds make one whole
- link fraction notation for one half to it being one of two equal parts written as $^1/_2$, one quarter to one of four equal parts written as $^1/_4$ and one third to one of three equal parts written as $^1/_3$
- find halves and quarters of various shapes by folding *e.g. Folding squares in half or quarters in as many different ways as possible, labelling each part using fraction notation*
  Which shapes can be folded into halves / quarters?

- begin to recognise that $^1/_2$ and $^2/_4$ are equivalent *e.g. By folding shapes, using a fraction wall*
- recognise that three lots of one quarter or three quarters is written as $^3/_4$
- recognise what fraction of a shape is shaded and record using fraction notation
- recognise what is not $^1/_2$, $^1/_3$, $^1/_4$ and explain why *e.g.*

- investigate which numbers to 30 can be halved (whole number answers) and find that these are even numbers
- make half and quarter turns in P.E
- solve problems involving fractions *e.g. How could you find one quarter of a piece of string?*

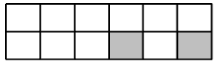
Spring

- count forwards in halves and quarters to 10, using a number line to support as required *e.g. $^1/_4$, $^2/_4$, $^3/_4$, 1, $1^1/_4$, $1^2/_4$, $1^3/_4$, 2*
- find $^1/_2$, $^1/_4$ and $^1/_3$ of amounts practically by sharing equally *e.g. Find $^1/_3$ of 12 sweets by sharing onto a fraction board*

$^1/_3$	$^1/_3$	$^1/_3$

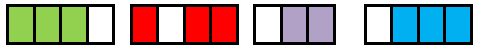
- find halves of amounts using knowledge of number facts
- begin to find $^1/_4$ of amounts using number facts, halving and halving again
- read and write the fraction notation for $^1/_2$, $^1/_4$ and $^1/_3$ *e.g. Tell me why we write one half as $^1/_2$*
- solve simple problems involving fractions *e.g. Explain how we could find one quarter of this set of 12 pencils.*
  Harry has a pack of 22 pencils. How many is in half of the pack?
  Use cubes to make a shape that is $^1/_2$ red and $^1/_2$ blue, make a shape that is $^1/_4$ green
  Shade one quarter of this shape

Shade more squares so that exactly half of the shape is shaded

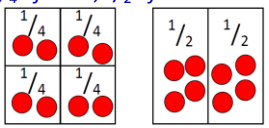


Summer

- count forwards in halves, quarters and thirds to 10, using a number line to support as required *e.g. $^1/_3$, $^2/_3$, 1, $1^1/_3$, $1^2/_3$, 2 and $^1/_4$, $^1/_2$, $^3/_4$, 1, $1^1/_4$, $1^1/_2$, $1^3/_4$, 2*
- begin to position halves on a number line *e.g. place $3^1/_2$ on a number line, and recognise that it lies mid-way between 3 and 4*
- find halves, quarters and thirds of groups of objects using practical apparatus or diagrams and record in simple sentences *e.g. $^1/_2$ of 12 = 6, $^1/_4$ of 20 = 5, $^1/_3$ of 6 = 2.*
- explain how to find $^1/_2$, $^1/_3$ or $^1/_4$ of a set of objects *e.g. Sharing objects using a fraction board or known facts*
- recognise and record the fraction notation $^2/_4$, $^3/_4$
- know that $^2/_4$ is two lots of $^1/_4$, $^3/_4$ is three lots of $^1/_4$ *e.g. Shade two quarters and three quarters of shapes. Which is the odd-one-out and why?*



- find one quarter of a set of objects and use this to find the number of objects in two quarters or three quarters
- reinforce the equivalence between $^1/_2$ and $^2/_4$ by finding fractions of *amounts* *e.g. $^1/_4$ of 8 = 2, $^2/_4$ of 8 = 4, $^1/_2$ of 8 = 4*



- solve problems involving simple fractions *e.g. Would a chocolate lover rather have $^1/_2$ or $^1/_3$ of a bar of chocolate? Explain why.*
  Say what fraction of a cake each person will get when it is divided equally between two, three or four people.
  Zach has 15 marbles, he loses one third, how many does he lose?
  Harry has 16 grapes, he eats half, how many does he have left?

Apply knowledge to solve mathematical problems or puzzles

Measures

Yr 2 Statutory requirements

- **choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels**
- **compare and order lengths, mass, volume/capacity and record the results using >, < and =**

Autumn 1 or Autumn 2 or Spring 1

Length/height

- recognise that metres and centimetres are units of measurement for length/height
- become familiar with the approximate size of 1m and 1cm *e.g. Which is longer 20cm or 20m?*
- begin to know 100cm is 1m
- compare lengths/heights to a metre stick *e.g. The table's height is less than 1m*
- suggest lengths/heights that could be measured using cm or m
- read a measurement to the nearest cm on a metre stick or a ruler *e.g. Find out which of two or more things is longest / shortest by measuring in cm*
- compare lengths/heights measured in cm
- record the comparisons using the >, < and = sign *e.g. 45cm > 23cm*
- order lengths/height measured in m or cm
- solve problems involving measures e.g. *A plant is 48cm tall. It grows another 5cm. How tall is it now?*

Autumn 1 or Autumn 2 or Spring 1

Capacity/volume

- recognise that litres and millilitres are units of measurement for capacity
- become more familiar with how a litre can look *e.g. Pouring 1 litre of water into various containers*
- compare capacities to one litre
- establish practically that 1 litre is 1000ml
- use measuring vessels *e.g. Find out which of two or more things holds most/least using a measuring cylinder. Measure 30ml of milk for the cake mixture*
- read the scale on the measuring vessel to the nearest appropriate unit *e.g. How much is in this jug?*
- compare capacities and record using the >, < *e.g. Looking at capacities on containers and bottles*
- order capacities measured in ml or litre *e.g. 30ml, 48ml, 84ml, 3ml, 83ml*
- solve problems involving measures *e.g. Harry makes a potion using 55ml of beetle juice and 35ml of Gillyweed. How many ml of potion does Harry make?*

Summer 1

Temperature

- know that temperature is measured using a thermometer
- know that temperature is measured in °C
- read the temperature on a thermometer to the nearest appropriate degree
- compare positive temperatures *e.g. Is this statement true, 25°C > 22°C?*
- order positive temperatures *e.g. Those recorded throughout the day/week, those in different countries*
- solve problems involving temperature *e.g. Water boils at 100°C and it is now 60°C, how much does the temperature need to increase until the water boils. It is 27°C at the moment, if the temperate has increased by 8°C since breakfast, what temperature was it?*

↓↓↓ ↓↓↓

Autumn 1 or Autumn 2 or Spring 1

Mass

- recognise that kilograms and grams are units of measurement for mass
- become more familiar with the approximate mass of 1kg and 1g (100g) *e.g. By comparing objects to 1kg*
- suggest objects that could be measured using kg or g
- establish practically that 1 kg is 1000g *e.g. Investigate how many 100g weights balance 1kg*
- use balance scales in practical activities *e.g. Find how many pens weigh the same as a 100g weight*
- use scales in practical activities *e.g. Find the mass of an apple. Weigh out 100g of flour for the cake*
- read the scale to the nearest appropriate unit
- compare masses *e.g. Look at packets and see which has the greater mass*
- record the comparisons using the >, < and = sign
- order masses measured in kg or g *e.g. Order chocolate bars by the mass written on the wrappers*
- solve problems involving measures e.g. *If an apple has a mass of 56g and an orange has a mass of 40g, what would be the total mass of an apple and an orange?*

Spring 2

Length

- draw lines and measure to the nearest cm using a ruler *e.g. Draw a line 6cm long. Which line is 7cm long? Draw a line 2cm longer than mine*
- estimate length in cm *e.g. Estimate how far you can step in one stride, then measure. Find something in the classroom that you think is about 10cm long. How long do you think this line is?*
- measure longer distances in metres, using metre sticks, tape measures and trundle wheels *e.g. Measure the distance jumped….*
- begin to estimate in metres *e.g. Estimate and then measure the distance from the classroom to the hall, decide how close the estimate was*
- solve problems involving measures including finding the difference in practical situations *e.g. How much longer/shorter than the red ribbon is the blue ribbon? Cut a strip of paper to show the difference. Sam's shoe is 25 cm long. His father's shoe is 31 cm long. How much longer is his father's shoe?*

Summer 2

- suggest suitable units and instruments to measure practically *e.g. The capacity of a watering can or the height of the door, the mass of a cup*
- distinguish between the units used for length/height, mass, capacity/volume and temperature *e.g. Sort these quantities: 2cm, 5g, 7m, 13kg, 12ml, 3l, 20grams, 6 metres, 21℃, 10 litres*
- develop estimation and measuring skills of mass in kg and g, using practical activities *e.g. If this book is 200g, how heavy do you think this book is? Use scales to measure the actual mass and compare estimates*
- develop estimation and measuring of capacity in litres and ml, using practical activities *e.g. If this bottle hold 100 ml when full, how much do you think is in there now? Check estimate using a measuring cylinder or jug*
- solve problems involving measures and simple scaling in a range of contexts *e.g. If this pencil weights 17g and this one is twice has heavy, how much does it weigh? If this bottle holds 100ml. the cup holds half as much, how much does it hold?*

Apply knowledge to solve mathematical problems or puzzles

Measures: Time

Yr 2 Statutory requirements	Autumn	Spring	Summer
compare and sequence intervals of time **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.** **know the number of minutes in an hour and the number of hours in a day.**	know that hours, minutes and seconds are units of time develop a sense of how long a minute lasts *e.g. Use sand timers to time activities. Put your hand up after you think a minute has passed. Watch the second hand as it travels around the clock and know that it takes one minute* consolidate reading the time to the hour and half hour on an analogue clock know that as the minute hand of a clock turns through a quarter turn it represents a quarter of an hour tell the time to the quarter hour record times to the quarter hour by drawing hands on a clock face recognise and explain the difference between quarter past and quarter to know that one hour is 60 minutes, that half an hour is 30 minutes, that a quarter of 60 (found by halving and halving again) is 15 *e.g. that a quarter past 3 is also said as 'three fifteen'* solve simple time problems in a range of contexts *e.g. Sue got on the bus at 9 o'clock. The journey took half an hour. What time did she get off the bus? Mary went into a shop at half past 10. She came out at quarter to 11. How long was she in the shop?*	consolidate reading the time to the hour, half hour and quarter hour on an analogue clock read the time on an analogue clock to the nearest 5 minutes record times to the nearest 5 minutes by drawing hands on a clock face *e.g. Draw clocks to go on a visual timetable* know that there are different ways to express a time *e.g. That the time is eight thirty-five is 35 minutes past 8 or 25 minutes to 9* order clock faces showing times to the 5 minute identify key times of the day using times or clock faces on visual timetables *e.g. Know when it's time for P.E* know that there are 24 hours in a day know that there are 60 minutes in an hour, that half an hour is 30 minutes and that 15 minutes is a quarter of an hour *e.g. Which is longer 20 minutes or a quarter of an hour?*	consolidate reading the time to the hour, half hour, quarter hour and to the nearest 5 minutes on an analogue clock solve time problems in a range of context *e.g. Emma went into a shop at half past 10. She came out at quarter past 11. How long was she in the shop? Lunch takes 50 minutes. It ends at 1 o'clock. What time does it start?* explain how to work out time intervals, using appropriate divisions on a clock face to support explanation *e.g. Count round in 5 minute intervals to add 20 minutes* know and use the equivalence between hours and minutes, hours and days and other time units *e.g.* $^{1}/_{2}$ *hour and 30 minutes,* $^{3}/_{4}$ *hour is 45 minutes* compare and sequence intervals of time *e.g. 1 hour, 20 minutes,* $^{1}/_{2}$ *hour*

Telling the time needs to be incorporated daily routines

Use everyday activities and opportunities, throughout the year, to practice telling the time. Solve simple everyday problems e.g. How long is it until playtime?

Measures: Money

Yr 2 Statutory requirements	Autumn	Spring	Summer
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** **solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change**	recognise and know the value of all coins and notes recognise and use the symbols pounds (£), pence (p) use the vocabulary associated with money *e.g. price, cost, pay, costs more/less, change, total, how much* know that £1 is equal to 100p find the total of a small set of mixed coins *e.g. 20p, 5p, 2p, 2p 10p, 10p, 10p, 5p, 5p* combine coins to make amounts *e.g. Mary buys a notepad for 37p. What coins could she use to pay exactly for it? If there is only one type of coin in my purse and I have 20p. What could be in my purse?* investigate combinations of coins *e.g. Ben has two coins of the same value. How much might he have altogether?* exchange coins for the equivalent value using smaller coins *e.g. 50p for five 10p coins, 20p for four 5p coins* solve a range of money problems *e.g. I have £44. I earn another £7. How much do I have? Rosie spent 70p. She spent 30p more than Poppy. How much did Poppy spend? A pear costs 5p less than an apple. An apple costs 37p. What does a pear cost? I have 36p, how much more do I need to make 40p*	know the equivalence between coins and notes *e.g. £1 is equal to ten 10p, equal to two 50p, equal to five 20p. £2 is 200p. £5 is five £1s and 500p* find the total of a set of mixed coins *e.g. In my purse I have a 20p, 20p, 10p, 5p, 2p, 2p, 2p. Choose 5 coins from my purse what's the total?* combine coins to make a given amount *e.g. If I pay exactly for a 54p cereal bar, what coins could I use? Get me 71p from the money pot. How many different ways can 20p be made using less than 7 coins? Investigate ways of using silver coins to make 20p, 50p.* solve problems involving coins *e.g. You have three 10p and three 5p coins in a purse. You use two of the coins to buy a lolly. What might the lolly cost? What if you used three/four coins?* solve a range of money problems *e.g. How many 5p coins are needed to make 45p? I want to buy an iPad costing £100. I have saved £70 so far. How much more do I need? A slice of pizza costs 54p and a bottle of water costs 40p, how much is that altogether?*	find the total of a set of mixed coins *e.g. 50p, 5p, 20p, 10p, 2p, 2p, 5p* combine coins to make a given amount *e.g. What is the least number of coins that you need to make 18p, 35p, 62p, 97p? Make 66p using six coins.* compare totals of combinations of coins *e.g. Which group of coins has the greatest value: 20p and 5p, two 10p coins and two 2p coins or four 5p coins and one 1p coin?* solve addition and subtraction problems and explain thinking *e.g. Rick has 46p. Simon gave him 25p. How much money does he have now? Brian has £1, he buys crisps for 35p and a drink for 30p. Does he have enough for a 40p comic? Jo has three 20p and two 15p stamps. What values can he make using two or more of the stamps?* solve problems that involve giving change *e.g. Daniel bought a banana for 12p. How much change did he get from 50p? Becky bought a train ticket for £34, how much change did she get from £40? Phil bought three choc bars at 10p each. How much change from 50p did he get? Toby pays for a pencil with a £1 coin. He gets a 50p, 10p as his change. How much is the pencil?*

Use activities and opportunities, throughout the year, calculate and solve problems involving money.

Geometry: properties of shapes

Yr 2 Statutory requirements

- **identify and describe the properties of 2-D shapes, including the number of sides and symmetry in a vertical line**
- **identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces**
- **identify 2-D shapes on the surface of 3-D shapes, [e.g. a circle on a cylinder and a triangle on a pyramid]**
- **compare and sort common 2-D and 3-D shapes and everyday objects.**

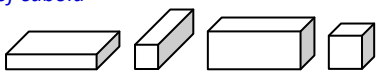
Autumn

- name and identify a range of 2-D shapes including pentagons, hexagons and octagons
- know that rectangles, triangles, pentagons, hexagon and octagons can look different to each other *e.g. These are all different hexagons*

- know that polygons are closed flat shapes with straight sides *e.g. Rectangles and triangles are polygons, what other shapes are polygons?*
- know that quadrilateral is another name for all 2-D shapes with 4 straight sides
- recognise and name 2-D shapes in different positions and orientations, including in pictures and the environment
- describe features of 2-D shapes using mathematical vocabulary *e.g. The number of sides or vertices, straight or curved sides*
- sort a range of 2-D shapes using given or own criteria *e.g. These all have 8 vertices, these have 4 straight side, these are polygons and quadrilaterals*
- compare 2-D shapes *e.g. What's the same and what's different? They both have 4 straight sides but the sides are of different lengths. Identify which shape is the odd-one-out and explain why.*
- draw simple 2-D shapes using a ruler
- begin to read and write names for 2-D shapes

Spring

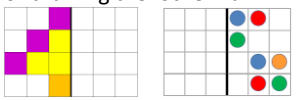
- name and identify a range of 3-D shapes including cuboids, cubes, cones, prisms and pyramids
- identify 2-D shapes on the surface of 3-D shapes
- know that a prism has the same cross-section along its length, and that its two end-faces are identical
- know that prisms, pyramids and cuboids can look different to each other *e.g. These are all different types of cuboid*



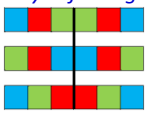
- describe features of 3-D shapes using mathematical vocabulary e.g. Edges, vertices and faces
- sort a range of 3-D shapes using criteria (Venn Diagrams could be used) *e.g. These all have 8 vertices, these have 4 straight edges*
- compare 3-D shapes *e.g. What's the same and what's different? They both have triangular faces but this one's not a prism*
- explore properties of shapes *e .g. Sort a set of 3-D shapes according to whether or not each shape has a rectangular face. Use Venn diagrams using criteria 'triangular face' and 'square face'*
- begin to read and write names for 3-D shapes

Summer

- understand and begin to recognise a vertical line of symmetry in objects and pictures
- complete a symmetrical picture or pattern by making or drawing the 'other half'

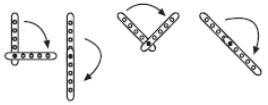
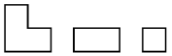


- identify 2-D shapes that have a vertical line of symmetry and check with a mirror or by folding
- sort and classify a range of shapes using vertical symmetry as a criteria *e.g. Using a Carroll diagram*
- read and write names for 2-D and 3-D shapes
- solve puzzles involving vertical symmetry e.g. *Place two red squares, two green squares and two blue squares in a line so that the squares make a symmetrical pattern, explore the number of different ways of doing it*



Apply knowledge to solve mathematical problems or puzzles

Geometry: direction and movement

Yr 2 Statutory requirements	Autumn	Spring	Summer
order and arrange combinations of mathematical objects in patterns and sequences **use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise).**	describe a rotation as a turn *e.g. Use two geo-strips to make and draw half and quarter, three quarter turns from the same starting position*  distinguish between clockwise and anticlockwise movements recognise whole, half, quarter and three quarter turns *e.g. In PE, move clockwise, anti-clockwise, face inwards, face outwards and turn through whole, half or quarter turns* know that a quarter turn is called a right angle follow and give instructions involving right angles *e.g. Instructing a floor robot to navigate a floor plan or maze in which all the paths are at right angles to each other; program a floor robot to travel in a square* evaluate the accuracy of instructions and adjust accordingly	describe position using appropriate mathematical vocabulary *e.g. Higher than, lower than, next to, below, further away from, on the edge of, at the corner of* describe the position of an object in different ways *e.g. A feature on a simple treasure map* describe direction using appropriate mathematical vocabulary *e.g. Second on the left, first right* follow and give instructions involving movement along a straight line *e.g. Use squared paper and a counter to move from a square near the centre of the paper to a square near the edge, describing the route as three squares along and two squares down, or three squares to the left and two squares up…*	talk about and make repeating patterns, describe what is happening, predict what will come next in a range of context *e.g. What will the next 3 shapes be?*  *What colour will the next few bunting flags be?*  *Draw the shape that will come next*  order and describe objects in a sequence *e.g. What will the next shape in my pattern look like?*  arrange shapes to make patterns *e.g. Tessellating patterns, what shapes can you make using these shapes* 

Statistics

Yr 2 Statutory requirements	Autumn	Spring	Summer
interpret and construct simple pictograms, tally charts, block diagrams and simple tables **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 compare categorical data.**	construct simple tables to organise information *e.g. Table showing children's birthdays, shape properties* construct a simple block diagrams where the axis is labelled and marked in ones ask and answer simple questions *e.g. Which is the most/least? How many?* ask and answer questions in relation to *totalling e.g. How many liked yellow or green?* ask and answer questions in relation to comparison *e.g. How many liked blue more than green, liked green less than yellow?* use Venn Diagrams to sort numbers and shapes according to their properties *e.g. Using criteria > 50 and even numbers sort 48, 56, 31, 85, 32, 99* add numbers or shapes to a partially completed Venn diagram	collect information quickly using a tally construct a block diagrams where the vertical axis is labelled and marked in twos read the scale, interpreting numbers between those marked ask and answer simple questions *e.g. Which is the most/least? How many?* ask and answer questions in relation to *totalling e.g. How many altogether, how many liked … or …* ask and answer questions in relation to comparison *e.g. How many more than, how many less than* complete information in a partially constructed tally chart, table or graph use Carroll Diagrams to sort numbers and shapes according to their properties *e.g. Using criteria odd and not odd, less than 40 and not less than 40*	collect information quickly *e.g. Using hands up, votes* construct a simple pictogram, where the symbol represents one unit extend knowledge of simple pictogram, to those where the symbol represents two, five or ten units link reading pictograms to the 2, 5 and 10 times tables ask and answer simple questions *e.g. Which is the most/least favourite? How many choose ___?* ask and answer questions in relation to *totalling e.g. How many altogether, how many choose ___ or ___?* ask and answer questions in relation to comparison *e.g. How many fewer choose ___ than ___?*

Where possible use meaningful data and experiences from across the curriculum