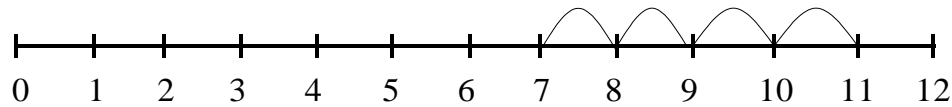
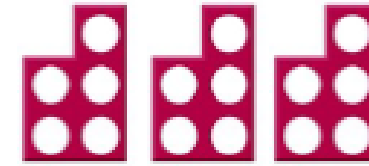


$7 + 4 =$



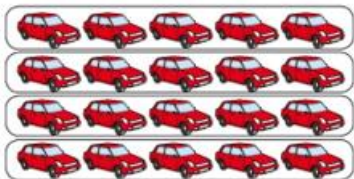
$3 \times 5 =$



# Holly Lodge Primary Academy Calculation Policy

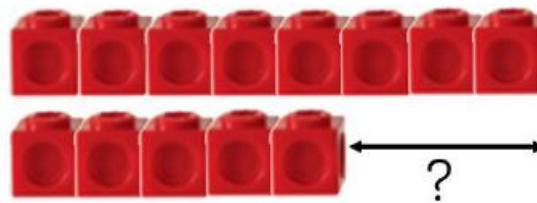


Understand the relationship between multiplication facts and division.

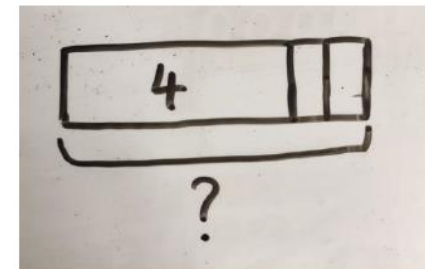


4 groups of 5 cars is 20 cars in total.  
20 divided by 4 is 5.

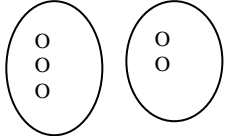




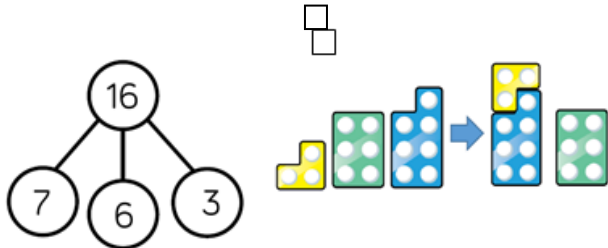
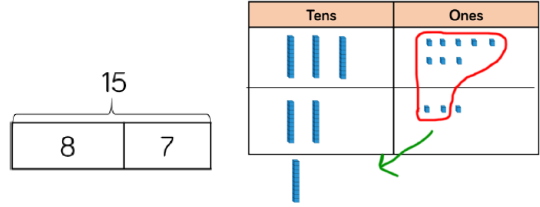
Calculate the difference between 8 and 5.



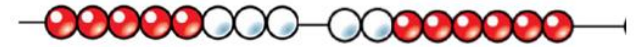
A bar model which encourages the children to count on, rather than count all.



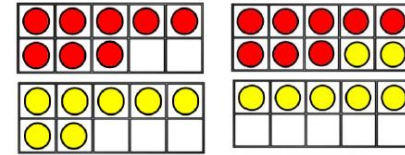
# Addition

Rec	Year 1	Year 2
<p>-To be able to subitise (amounts to 5 then 10)                      -Say the number that is one more than a number from at least 1 to 5.                      -Find the total number of items in two groups by counting all of them.                      -In practical activities and discussion, beginning to use the vocabulary involved in adding when combining two groups.                      - -In practical activities and discussion, beginning to use the vocabulary involved in subtraction when subtracting from a group.                      -Count on and back from a number other than 0.</p>	<p>-Read, write and interpret mathematical statements involving addition (+) and (=) signs.                      -Represent and use number bonds within 20                      -Add and one-digit and two-digit numbers to 20, including zero                      -Solve one-step problems that involve addition using concrete objects and pictorial representations, and missing number problems such as <math>4 + \square = 7</math></p>	<p>-Solve addition problems using concrete objects and pictorial representations, including:</p> <ul style="list-style-type: none"> <li>• a two-digit number and ones</li> <li>• a two-digit number and tens</li> <li>• two two-digit numbers</li> <li>• adding three one-digit numbers</li> </ul> <p>-Recall and use addition facts to 20 fluently, and derive and use related facts up to 100                      -Show that addition of two numbers can be done in any order (commutative)                      -Use the inverse relationship between addition and subtraction to check calculations and solve missing number problems.                      -Start to record addition in columns.</p>
<p>Add, more, make, sum, total, altogether, one more, two more, ten more, how many more to make...?, how many more is...than...?                      Subtract, fewer, less, 1 less, 2 less, How many are left...?                      Oral and practical work                      Songs and rhymes                      Dice and number games                      Use Part Part whole model                      Number stories for combining sets eg 3 pigs in a field, 2 in a sty how many altogether?</p> <p>Teacher models <math>3+2=5</math> using a range of objects</p> <div style="text-align: center;">  </div> <p>Number track</p> <div style="text-align: center;">  </div> <p>Number bonds for numbers up to 10                      Full number lines</p>	<p>Songs and rhymes                      Working with apparatus such as bead strings to 20, cubes, dienes, Numicon:</p> <div style="text-align: center;">  </div> <p>Use + and = signs and associated vocabulary.                      Adding more than 2 numbers                      Putting the larger number first <math>13+3=</math>                      13 in your head or on fingers</p> <div style="text-align: center;">  </div> <p>Counting in 10s from multiples of 10</p> <p>Number bonds of all numbers to 20</p> <div style="text-align: center;">  </div>	<p>Counting in 10s from any number                      Rapid recall of all number bonds for all numbers to 20.                      Use of numicon, dienes, bar model, part whole model to demonstrate.</p> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div>

Structured number lines and bead strings to 100



Use of tens frames



$$\begin{array}{r} 8 + 7 = 15 \\ 2 \quad 5 \end{array}$$

Commutative law

$$12 + 11 = 33$$

$$11 + 12 = 33$$

Start to record addition in columns

71

13 +

84

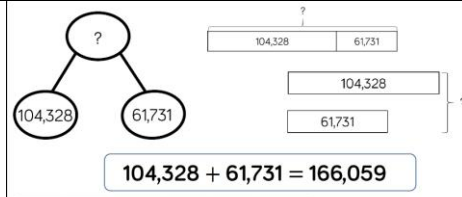
Can check by using inverse operation, use to solve missing box problems

Eg  + 5 = 23

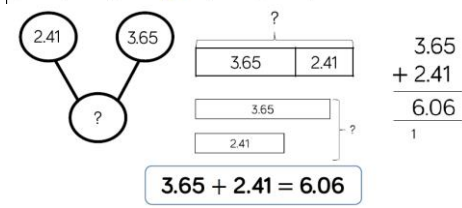
Stem sentences used.

# Addition

Year 3	Year 4	Year 5	Year 6
<p>-Add a range of numbers mentally, including:</p> <ul style="list-style-type: none"> <li>a three-digit number and ones</li> <li>a three-digit number and tens</li> <li>a three-digit number and hundreds</li> </ul> <p>-Add numbers with up to three digits, using formal written methods of columnar addition</p> <p>-Estimate the answer to a calculation and use inverse operations to check answers</p> <p>-Solve problems, including missing number problems, using number facts, place value, and more complex addition.</p> <p>-Add fractions with the same denominator within one whole (for example, <math>\frac{5}{7} + \frac{1}{7} = \frac{6}{7}</math>)</p>	<p>-Add numbers with up to 4 digits using the formal written methods of columnar addition where appropriate</p> <p>-Estimate and use inverse operations to check answers to a calculation</p> <p>-Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.</p> <p>-Add fractions with the same denominator</p> <p>-Solve simple measure and money problems involving fractions and decimals to two decimal places</p>	<p>-Add whole numbers with more than 4 digits, including using formal written methods (columnar addition)</p> <p>-Add numbers mentally with increasingly large numbers (e.g. <math>8\ 462 + 2300 = 10\ 762</math>).</p> <p>-Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy</p> <p>-Solve addition and subtraction multi-step problems in contexts, including to 3 decimal places, deciding which operations and methods to use and why.</p> <p>-Add and subtract fractions with the same denominator and denominators that are multiples of the same number</p>	<p>-Add whole numbers with more than 4 digits, including using formal written methods (columnar addition)</p> <p>-Perform mental calculations, including with mixed operations and large numbers</p> <p>-Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</p> <p>-Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions</p>
<p>Use partitioning to support mental calculations.</p> <p>Using an empty number line to count on.</p> <p><math>274 + 132</math></p> <div style="text-align: center; margin: 10px 0;"> </div> <p>Add a near multiple of 10 to a two-digit number</p> <p>Continue as in Year 2 but with appropriate numbers e.g. <math>350 + 189</math> is the same as <math>350 + 190 - 1</math>.</p> <p>Extend use of columnar addition, developing more compact recording to tackle larger numbers.</p>	<p>Use formal column addition for numbers with 4 digits</p> <div style="text-align: center; margin: 10px 0;"> <math display="block">\begin{array}{r} 1271 \\ 2243 + \\ \hline 3514 \\ 1 \end{array}</math> </div> <p>Extend to decimals, using an empty number line. (pic)</p>	<p>Use formal column addition for numbers with more than 4 digits.</p> <div style="text-align: center; margin: 10px 0;"> <math display="block">\begin{array}{r} 21271 \\ 12243 + \\ 33514 \\ \hline 1 \end{array}</math> </div> <p>Including method where carrying is used.</p> <p>Extend to decimals.</p> <div style="text-align: center; margin: 10px 0;"> <math display="block">\begin{array}{r} 42.432 \\ 12.713 + \\ 55.145 \\ \hline 1 \end{array}</math> </div> <p>Develop reasoning skills by using a range of representations including part whole models, number sentences, place value counter problems and bar models.</p>	<p>Use formal column addition for any numbers which cannot be added mentally (<math>&gt;1</math> million)</p> <div style="text-align: center; margin: 10px 0;"> <math display="block">\begin{array}{r} 2353248 \\ 1254173 + \\ 3607421 \\ \hline 1 \quad 11 \end{array}</math> </div> <div style="text-align: center; margin: 10px 0;"> </div>



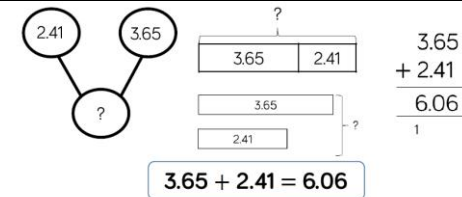
HTh	TTh	Th	H	T	O



Ones	Tenths	Hundredths

Add fractions with the same denominator and multiples of the same number.  
 $\frac{2}{3} + \frac{1}{6} = \frac{4}{6} + \frac{1}{6} = \frac{5}{6}$

Solve problems involving all of the above.


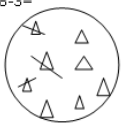

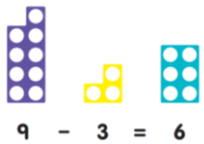

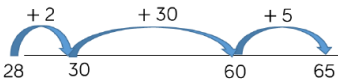
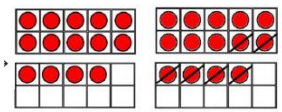
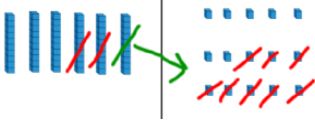


Ones	Tenths	Hundredths

Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions

$\frac{1}{3} + \frac{1}{5} = \frac{5}{15} + \frac{3}{15} = \frac{8}{15}$

# Subtraction

Rec	Year 1	Year 2
<p>-Say the number that is one less than a number from 1 to 20.</p> <p>-In practical activities and discussion, beginning to use the vocabulary involved in subtraction when taking away objects groups.</p>	<p>-Read, write and interpret mathematical statements involving addition (-) and (=) signs.</p> <p>-Represent and use number bonds and related subtraction facts within 20</p> <p>-Subtract one-digit and two-digit numbers to 20, including zero</p> <p>-Solve one-step problems that involve subtraction using concrete objects and pictorial representations, and missing number problems such as <math>8 - \square = 5</math></p>	<p>-Solve subtraction problems using concrete objects and pictorial representations, including:</p> <ul style="list-style-type: none"> <li>a two-digit number and ones</li> <li>a two-digit number and tens</li> <li>two two-digit numbers</li> </ul> <p>-Recall and use subtraction facts to 20 fluently, and derive and use related facts up to 100</p> <p>-Show that subtraction of one number from another cannot be done in any order.</p> <p>-Use the inverse relationship between addition and subtraction to check calculations and solve missing number problems.</p> <p>-Start to record subtraction in columns.</p>
<p>Take (away), leave, how many are left/left over? How many have gone? One less, two less, ten less, is the same as</p> <p>Oral and practical work Songs and rhymes Dice and number games, counting back, taking away. Use of number tracks.</p>  <p>Number stories using objects</p>  <p>8-3=</p> <p>How many are there? How many now? (after some have been removed) Teacher modelling number sentences, 8 take away 3 is 5</p>	<p>Songs and rhymes Working with apparatus Bead strings to 20.  Cubes, dienes, bar model.</p> <p>Subtraction with Numicon.</p>  <p><math>9 - 3 = 6</math></p> <p>Physical and practical work on structured number lines eg jumping backwards Number stories, 15 people on a bus 3 get off, how many are left on? Putting a number in your head and counting back with fingers to help.</p> <p><math>12 - 3 = \square</math>    <math>15 - \square = 4</math>    <math>\square - 11 = 4</math></p> <p>Counting back in 10s from multiples of 10s Giving change to 20p Finding the difference by counting on, comparing quantities</p> 	<p>Counting back in 10s from any number to 100 Jumping back on a structured number line. 76-34</p>    <p>Finding the difference between 2 towers of cubes leading to using the structured number line or fingers for numbers that are close together to calculate difference by counting on eg <math>42 - 39 = 3</math></p> <p>Use addition as the inverse operation to check and in empty box problems e.g.</p> <p><math>\square - 8 = 12</math></p>

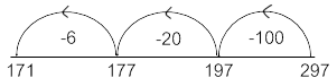
		<p>Fact families to help with the understanding of commutativity in addition but not in subtraction</p> $6 + 4 = 10$ $4 + 6 = 10$ $10 - 6 = 4$ $10 - 4 = 6$ <p>Stem sentences used.</p>
--	--	---

# Subtraction

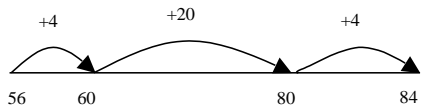
Year 3	Year 4	Year 5	Year 6
<ul style="list-style-type: none"> <li>-Subtract a range of numbers mentally, including:               <ul style="list-style-type: none"> <li>a three-digit number and ones</li> <li>three-digit number and tens</li> <li>a three-digit number and hundreds</li> </ul> </li> <li>-Subtract numbers with up to three digits, using formal written methods of columnar subtraction               <ul style="list-style-type: none"> <li>-Estimate the answer to a calculation and use inverse operations to check answers</li> </ul> </li> <li>-Solve problems, including missing number problems, using number facts, place value, and more complex addition.</li> <li>-Subtract fractions with the same denominator within one whole (for example, <math>\frac{5}{7} - \frac{1}{7} = \frac{4}{7}</math>)</li> </ul>	<ul style="list-style-type: none"> <li>-Subtract numbers with up to 4 digits using the formal written methods of columnar subtraction where appropriate</li> <li>-Estimate and use inverse operations to check answers to a calculation</li> <li>-Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.</li> <li>-Subtract fractions with the same denominator</li> <li>-Solve simple measure and money problems involving fractions and decimals to two decimal places</li> </ul>	<ul style="list-style-type: none"> <li>-Subtract whole numbers with more than 4 digits, including using formal written methods (columnar subtraction)               <ul style="list-style-type: none"> <li>-Subtract numbers mentally with increasingly large numbers (e.g. <math>10\ 462 - 2300 = 8\ 162</math>).</li> </ul> </li> <li>-Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy</li> <li>-Solve addition and subtraction multi-step problems in contexts, including to 3 decimal places, deciding which operations and methods to use and why.</li> <li>-Add and subtract fractions with the same denominator and denominators that are multiples of the same number</li> </ul>	<ul style="list-style-type: none"> <li>-Subtract whole numbers with more than 4 digits, including using formal written methods (columnar subtraction)</li> <li>-Perform mental calculations, including with mixed operations and large numbers</li> <li>-Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</li> <li>-Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions</li> </ul>



Develop confidence in counting back in 100s, 10s and 1s from any number.  
Use an empty number line to count back.  
297-126=



Count on to find the difference using empty number line  
84-56=



Expanded method of decomposition and beginning to record in a more compact method for numbers too large to do mentally.

$$\begin{array}{r} 757-259= \\ \begin{array}{r} 6\ 14\ 17 \\ \cancel{2}\ \cancel{5}\ \cancel{7} \\ \hline 2\ 5\ 9 \\ 4\ 9\ 8 \end{array} \end{array}$$

Using dienes and column subtraction to find the difference between two numbers. (Up to 4 digits)

Extend to decimals to 2 decimal places.

Expanded method of decomposition, leading to more compact recording.

$$\begin{array}{r} 2757-1259= \\ \begin{array}{r} 6\ 14\ 17 \\ \cancel{2}\ \cancel{7}\ \cancel{5}\ \cancel{7} \\ \hline 1\ 2\ 5\ 9 \\ 1\ 4\ 9\ 8 \end{array} \end{array}$$

Extend to decimals.

Formal method used for both calculations with and without borrowing

874 - 523 becomes

$$\begin{array}{r} 8\ 7\ 4 \\ -\ 5\ 2\ 3 \\ \hline 3\ 5\ 1 \end{array}$$

Answer: 351

932 - 457 becomes

$$\begin{array}{r} 8\ 12\ 1 \\ \begin{array}{r} 9\ 3\ 2 \\ -\ 4\ 5\ 7 \\ \hline 4\ 7\ 5 \end{array} \end{array}$$

Answer: 475

Move towards compact decomposition, including decimals.

$$\begin{array}{r} 2\ 1 \\ \cancel{36.57} \\ \hline 17.46 \\ \hline 19.11 \end{array}$$

Subtract fractions with the same denominator and multiples of the same number.

$$\frac{2}{3} - \frac{1}{6} = \frac{4}{6} - \frac{1}{6} = \frac{3}{6}$$

Use formal method of compact decomposition.

$$\begin{array}{r} 2\ 1 \\ \cancel{36.573} \\ \hline 18.462 \\ \hline 18.111 \end{array}$$



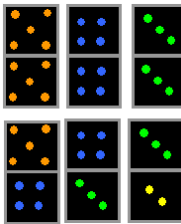
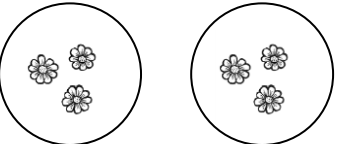

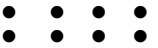


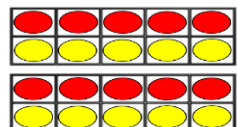
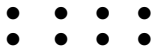
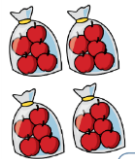
Apply to problem solving contexts e.g. money and measures

Subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions

$$\frac{1}{3} - \frac{1}{5} = \frac{5}{15} - \frac{3}{15} = \frac{2}{15}$$

Revert to expanded methods if the children experience any difficulty.

# Multiplication

Rec	Year 1	Year 2
<p>-Start to solve problems involving doubling.</p>	<p>-Solve one-step problems involving multiplication by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.</p> <p>-Make connections between arrays, number patterns, and counting in twos, fives and tens.</p>	<p>-Recall and use multiplication facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers</p> <p>-Calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication (×) and equals (=) signs</p> <p>-Show that multiplication of two numbers can be done in any order (commutative)</p> <p>-Solve problems involving multiplication using materials, arrays, repeated addition, mental methods and multiplication and including problems in contexts.</p>
<p>Counting in ones, twos, tens Odd and even numbers Matching pairs e.g. socks Noah's Ark</p>    <p>Songs and rhymes</p> <p>Finding doubles in dominoes</p> <p>Doubles in practical contexts. Groups of objects with the same number, counting how many in each group, and finding how many altogether</p> 	<p>Counting in twos, fives and tens (using fingers to help count in multiples) Knowing doubles of numbers to 10 Dice and domino games with doubles</p> <p>Finding patterns of numbers using a 100 square and make connections with arrays.</p>   <p>Repeated addition of sets of objects, teacher modelling <math>2+2+2 = 6</math></p> <p>Use coins for repeated addition</p>  <p>and model using Numicon.</p>  <p><math>5 + 5 + 5 = 15</math></p> <p>Stem sentences are introduced.</p>	<p>Counting in 3s Doubles of all numbers up to 10 and doubles of multiples of 10 to 100 Recognise odd and even numbers, supported by Tens frames.</p>  <p>Arrays and repeated addition this links to commutative law below. Use visual and concrete methods below as long with fingers for counting. Additional language introduced including "lots of" for problem solving.</p>  <p><math>4 \times 2</math> or <math>4 + 4</math></p> <p><math>2 \times 4</math> or <math>2 + 2 + 2 + 2</math></p>  <p>Commutative law</p> <p><math>4 \times 3 = 12</math> <math>3 \times 4 = 12</math></p> <p>Stem sentences used.</p>

# Multiplication

Year 3	Year 4	Year 5	Year 6
<ul style="list-style-type: none"> <li>-Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables</li> <li>-Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods of short multiplication</li> <li>-Solve problems, including missing number problems, involving multiplication, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.</li> </ul>	<ul style="list-style-type: none"> <li>-Recall multiplication and division facts for multiplication tables up to <math>12 \times 12</math></li> <li>-Use place value, known and derived facts to multiply mentally, including: multiplying by 0 and 1 and multiplying together three numbers</li> <li>-Recognise and use factor pairs and commutativity in mental calculations</li> <li>-Multiply two-digit and three-digit numbers by a one-digit number using formal written layout</li> <li>-Solve problems involving multiplying including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.</li> </ul>	<ul style="list-style-type: none"> <li>-Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers</li> <li>-Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers               <ul style="list-style-type: none"> <li>-Multiply numbers mentally drawing upon known facts, including multiplying whole numbers and those involving decimals by 10, 100 and 1000</li> </ul> </li> <li>-Recognise and use square numbers and cube numbers, write the notation for both [<math>(^2)</math> and <math>(^3)</math>] and solve problems involving multiplication using knowledge of factors and multiples, squares and cubes</li> <li>-Solve problems involving scaling by simple fractions.</li> <li>-Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams</li> </ul>	<ul style="list-style-type: none"> <li>-Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication</li> <li>-Multiply one-digit numbers with up to two decimal places by whole numbers</li> <li>-Perform mental calculations, including with mixed operations and large numbers</li> <li>-Multiply simple pairs of proper fractions</li> <li>-Identify common factors, common multiples and prime numbers</li> </ul>

Doubling multiples of 5 up to 50 by partitioning

$$15 \times 2 = 30$$

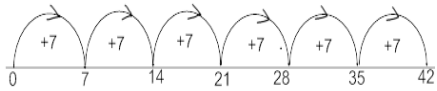
$$\begin{array}{r} 10 + 5 \\ \downarrow \quad \downarrow \end{array}$$

$$20 + 10 = 30$$

Know that division is inverse of multiplication and multiplication is inverse of division

Understand multiplication as repeated addition

Use a number line to solve  $6 \times 7$



Continue to use arrays

Progress towards formal short multiplication

$24 \times 6$  becomes

$$\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ 2 \end{array}$$

multiplication

Multiplication by using known facts.

E.g. to multiply by 60, multiply by 6 then by 10

Doubling all numbers to 50, multiples of 10 to 500

Multiply decimals and integers by 10, 100 and 1000.

Use the grid method  $234 \times 7 =$

Extend use of formal short multiplication

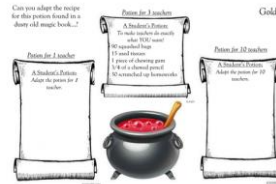
$342 \times 7$  becomes

$$\begin{array}{r} 342 \\ \times 7 \\ \hline 2394 \\ 21 \end{array}$$

Missing number type problems

e.g.  $.12 \times ? = 9 \times 8$ ,

Use methods within problem solving contexts such as money and measures. Eg apply scaling to problems such as recipes and ingredients.



Use short multiplication when multiplying by 1 digit.

$342 \times 7$  becomes

$$\begin{array}{r} 342 \\ \times 7 \\ \hline 2394 \\ 21 \end{array}$$

Answer: 2394

Use formal long multiplication for up to 4 digit  $\times$  2 digit

$124 \times 26$  becomes

$$\begin{array}{r} 124 \\ \times 26 \\ \hline 744 \\ 2480 \\ \hline 3224 \\ 11 \end{array}$$

Answer: 3224

Multiply fractions by whole numbers e.g.  $\frac{1}{2} \times 7$

Missing number problems

$$\begin{array}{r} \phantom{0}6\phantom{0} \\ \times \phantom{0}3 \\ \hline 195 \\ 3250 \\ \hline 3445 \end{array}$$

Use formal long multiplication for up to 4 digits  $\times$  2 digits. E.g.  $1354 \times 24$

$$\begin{array}{r} 1354 \\ \times 24 \\ \hline 5416 \\ 27080 \\ \hline 32496 \\ 1 \end{array}$$

Extend to decimals.

Multiply simple pairs of proper fractions.

$$\frac{2}{3} \times \frac{2}{5} = \frac{4}{15}$$

Missing number problems

E.g. using the given digit cards once, complete the calculation

$$\begin{array}{r} 3 \ 9 \ 2 \ 5 \ 3 \\ \times \phantom{0} \phantom{0} \phantom{0} \phantom{0} \\ \hline 2 \ 9 \ 2 \ 5 \\ 9 \ 7 \ 5 \ 0 \\ \hline 1 \ 2 \ 6 \ 7 \ 5 \end{array}$$

# Division

## Rec

## Year 1

## Year 2

-Start to solve problems involving halving and sharing

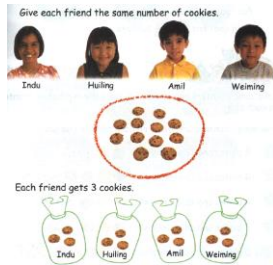
-Solve one-step problems involving division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

-Recall and use division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers  
 -Calculate mathematical statements for division within the multiplication tables and write them using the division ( $\div$ ) and equals (=) signs  
 -Show that division of one number by another cannot be done in any order  
 -Solve problems involving division, using materials, arrays, repeated subtraction, mental methods, and multiplication and division facts, including problems in contexts.

Practical activities, songs and rhymes.  
 10 fat sausages.



Sharing during snack time by giving 1 each  
 Is there an easier way of sharing a larger amount? E.g. 2 at a time



Making groups/piles of 2, finding partners  
 E.g. in PE grouping in 2s, how many pairs are there?  
 1 ball for each pair, how many balls do I need to get out?

Practical activities, songs, and games.

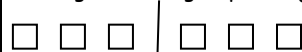
**Sharing** - 6 sweets are shared between 2 people. How many do they have each?



**Grouping** - There are 6 sweets. How many people can have 2 each? (How many 2s make 6?)



Cutting cakes/ pizza in half, sharing related to fractions  
 Finding half of a group of objects



Knowing halves of even numbers to 20

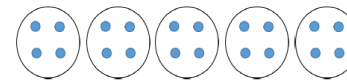


Use Numicon and bar model as a representation



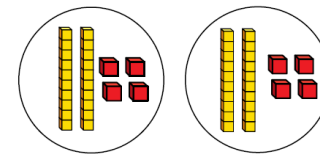
Relate division to fractions  $\frac{1}{2}$  or  $\frac{1}{4}$  of 12, 20.  
 Half of 12 is  $12 \div 2 =$   
 Introduction of fact families and making equal groups  
 Understand division as sharing and grouping and link to multiplication facts

$12 \div 3 = 4$      $12 \div 4 = 3$   
 $3 \times 4 = 12$      $4 \times 3 = 12$

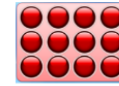
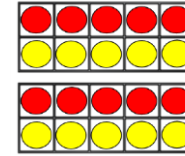
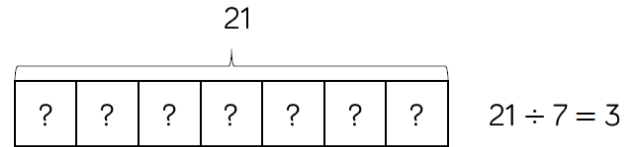


$20 \div 5 = 4$

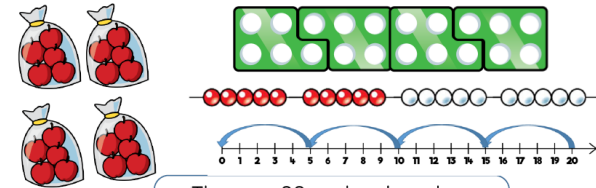
$48 \div 2 = 24$



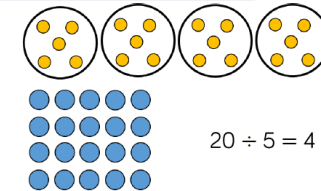
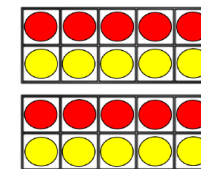
Bar model used for representation of groups in a whole



Counting on and back in 2s, 5s, 10s  
How many 2s in 10?



There are 20 apples altogether.  
They are put in bags of 5.  
How many bags are there?



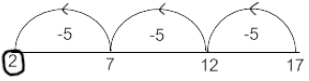
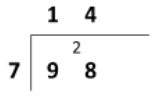
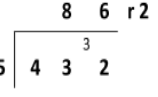
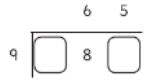
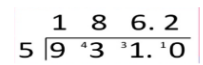
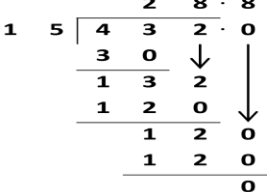
$20 \div 5 = 4$

Counting on fingers also used at this stage.

÷ = signs and missing numbers  
 $6 \div 2 = \square$        $\square = 6 \div 2$   
 $6 \div \square = 3$        $3 = 6 \div \square$   
 $\square \div 2 = 3$        $3 = \square \div 2$

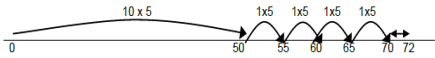
Stem sentences used.

# Division

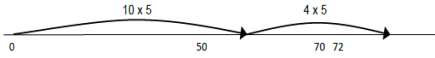
Year 3	Year 4	Year 5	Year 6
<p>-Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables</p> <p>-Write and calculate mathematical statements for division using the multiplication tables that they know, including for two-digit numbers divided by one-digit numbers, using mental and progressing to formal written methods</p> <p>-Solve problems, including missing number problems, involving multiplication and division</p> <p>-Calculate simple remainders after division</p>	<p>-Recall multiplication and division facts for multiplication tables up to <math>12 \times 12</math></p> <p>-Recognise and use factor pairs in mental calculations</p> <p>-Divide two-digit and three-digit numbers by a one-digit number using formal written layout</p> <p>-Divide a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths</p>	<p>-Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context</p> <p>-Divide whole numbers and those involving decimals by 10, 100 and 1000</p> <p>-Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers</p> <p>-Establish whether a number up to 100 is prime and recall prime numbers up to 19</p>	<p>-Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context</p> <p>-Identify common factors, common multiples and prime numbers</p> <p>-Divide proper fractions by whole numbers (for example, <math>\frac{1}{3} \div 2 = \frac{1}{6}</math>)</p> <p>-Associate a fraction with division and calculate decimal fraction equivalents (for example, 0.375) for a simple fraction (for example, <math>\frac{3}{8}</math>)</p>
<p><math>\frac{1}{4}</math> or <math>\frac{1}{2}</math> of 24, 40 etc</p> <p>Understand division as grouping and as sharing. e.g. If there are 14 sweets in a bag, how many people can have 2 each? Practically demonstrate repeated subtraction to find how many groups.</p> <p>Remainders <math>17 \div 5 = 3 \text{ r } 2</math></p>  <p>Make clear links between <math>\times</math> and <math>\div</math></p> <p><math>\div</math> signs and missing numbers</p> <p>Divide by 10 and 100</p> <p>Extend to pencil and paper procedures which reflect mental methods.</p>	<p>Sharing and grouping</p> <p>Continue to understand division as both sharing and grouping.</p> <p>Use informal or pictorial methods relating to the child's mental methods moving onto short formal method when ready.</p> <p><math>98 \div 7</math> becomes</p>  <p>Remainders <math>17 \div 5 = 3 \text{ r } 2</math></p>	<p>Consolidate formal short division</p> <p><math>432 \div 5</math> becomes</p>  <p>Complete missing number calculations</p>  <p>Quotients can be expressed as fractions or decimal fractions</p> <p><math>61 \div 4 = 15 \frac{1}{4}</math> or 15.25</p>	<p>Formal short division for 4 digit <math>\div</math> 1 digit (remainders shown as a decimal)</p>  <p>This method can also be used for decimals.</p> <p>Introduce formal long division</p> <p><math>432 \div 15</math> becomes</p>  <p style="text-align: right;">Answer: 28.8</p> <p>Division of fractions using <b>keep, change, flip</b>.</p> <p><math>\frac{3}{5} \div \frac{2}{8} = \frac{3}{5} \times \frac{8}{2} = \frac{24}{10} = 2 \frac{4}{10}</math></p> <p><math>\frac{3}{5} \div 2 = \frac{3}{5} \div \frac{2}{1} = \frac{3}{5} \times \frac{1}{2} = \frac{3}{10}</math></p>

The number line is also an excellent way of introducing the 'chunking' approach.

$$72 \div 5 = 14 \text{ r } 2$$



Into a more efficient



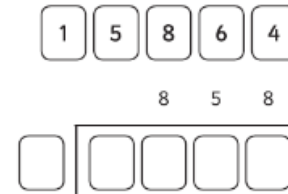
$$\begin{array}{r} 23 \div 1 = 11 \div 1 = 11 \times 4 = 44 = 11 \\ 4 \quad 4 \quad 4 \quad 4 \quad 4 \quad 1 \quad 4 \end{array}$$

Continued...

Y6 division cont.

Missing number questions e.g.

Using the digit cards given, complete the calculation



Leading to long division with missing numbers:

