



This policy has been largely adapted from the White Rose Maths Calculation Policy with further material added. It is a working document and will be revised and amended as necessary.

Written by: Emma Loveland (mathematics coordinator)

Date: October 2018



## THE EARLY YEARS FOUNDATION STAGE

**Mathematics** involves providing children with opportunities to develop and improve their skills in counting, understanding and using numbers, calculating simple addition and subtraction problems; and to describe shapes, spaces, and measures.

Maths for young children should be meaningful. Where possible, concepts should be taught in the context of real life.




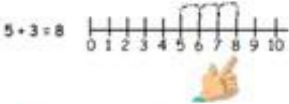
(Statutory Framework for the Early Years Foundation Stage, DfE: 2012)



WESTON VILLAGE PRIMARY SCHOOL







# EYFS Addition



GUIDANCE / MODELS AND IMAGES	KEY VOCABULARY
<p>If available, Numicon shapes are introduced straight away and can be used to:</p> <ul style="list-style-type: none"> <li>• identify 1 more/less</li> <li>• combine pieces to add.</li> <li>• find number bonds.</li> <li>• add without counting.</li> </ul> <p>Children can record this by printing or drawing around Numicon pieces.</p> <p>Children begin to combine groups of objects using concrete apparatus</p>  <p>Construct number sentences verbally or using cards to go with practical activities.</p> <p>Children are encouraged to read number sentences aloud in different ways "Three add two equals 5" "5 is equal to three and two"</p> <p>Children make a record in pictures, words or symbols of addition activities already carried out.</p> <p>Solve simple problems using fingers</p>  $5 + 1 = 6$ <p>Number tracks can be introduced to count up on and to find one more:</p>  <p>What is 1 more than 4? 1 more than 13?</p> <p>Number lines can then be used alongside number tracks and practical apparatus to solve addition calculations and word problems.</p>  <p>Children will need opportunities to look at and talk about different models and images as they move between representations.</p>	<p><b>Games and songs can be a useful way to begin using vocabulary involved in addition e.g. Alice the Camel</b></p> <p>add</p> <p>more</p> <p>and</p> <p>make</p> <p>sum</p> <p>total</p> <p>altogether</p> <p>score</p> <p>double</p> <p>one more, two more, ten more...</p> <p>how many more to make...?</p> <p>how many more is... than...?</p>

# EYFS - Subtraction


GUIDANCE / MODELS AND IMAGES	KEY VOCABULARY
<p>Children begin with mostly pictorial representations</p> <p>X X X      <span style="border: 1px solid black; padding: 2px;">X X</span></p> <p>Concrete apparatus is used to relate subtraction to taking away and counting how many objects are left.</p> <p>Concrete apparatus models the subtraction of 2 objects from a set of 5.</p> <p>Construct number sentences verbally or using cards to go with practical activities.</p> <p>Children are encouraged to read number sentences aloud in different ways "five subtract one leaves four" "four is equal to five subtract one"</p> <p>Children make a record in pictures, words or symbols of subtraction activities already carried out.</p> <p>Solve simple problems using fingers</p> <p>5 - 1 = 4</p> <p>Number tracks can be introduced to count back and to find one less:</p> <p>What is 1 less than 9? 1 less than 20?</p> <p>Number lines can then be used alongside number tracks and practical apparatus to solve subtraction calculations and word problems. Children count back under the number line.</p> <p>Children will need opportunities to look at and talk about different models and images as they move between representations.</p>	<p>Games and songs can be a useful way to begin using vocabulary involved in subtraction e.g.</p> <p>Five little men in a flying saucer</p> <p>take (away)</p> <p>leave</p> <p>how many are left/left over?</p> <p>how many have gone?</p> <p>one less, two less... ten less...</p> <p>how many fewer is... than...?</p> <p>difference between</p> <p>is the same as</p>

# EYFS - Multiplication

GUIDANCE / MODELS AND IMAGES	KEY VOCABULARY
<p>The link between addition and multiplication can be introduced through doubling.</p> <p>If available, Numicon is used to visualise the repeated adding of the same number. These can then be drawn around or printed as a way of recording.</p> <p>Children begin with mostly pictorial representations:</p>  <p>How many groups of 2 are there?</p> <p>Real life contexts and use of practical equipment to <u>count in repeated groups of the same size</u>:</p>  <p>How many wheels are there altogether?</p>  <p>How much money do I have?</p>  <p>Count in twos; fives; tens both aloud and with objects</p> <p>Children are <u>given multiplication problems set in a real life context</u>. Children are encouraged to visualise the problem.</p> <p>How many fingers on two hands? How many sides on three triangles? How many legs on four ducks?</p> <p>Children are encouraged to read number sentences aloud in different ways "five times two makes ten" "ten is equal to five multiplied by two"</p>	<p>lots of</p> <p>groups of</p> <p>times</p> <p>multiply</p> <p>multiplied by</p> <p>multiple of</p> <p>once, twice, three times... ten times...</p> <p>...times as (big, long, wide... and so on)</p> <p>repeated addition</p> <p>double</p>

GUIDANCE / MODELS AND IMAGES	KEY VOCABULARY
<p>The ELG states that children solve problems, including doubling, halving and sharing.</p> <p>Children need to see and hear representations of division as both grouping and sharing.</p> <p>Division can be introduced through halving.</p> <p>Children begin with mostly pictorial representations linked to real life contexts:</p> <div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;">  <p><b>Grouping model</b> Mum has 6 socks. She grouped them into pairs – how many pairs did she make?</p> </div> <div>  <p><b>Sharing model</b> I have 10 sweets. I want to share them with my friend. How many will we have each?</p> </div> </div> <p>Children have a go at recording the calculation that has been carried out.</p>	<p>halve</p> <p>share, share equally</p> <p>one each, two each, three each...</p> <p>group in pairs, threes...</p> <p>tens</p> <p>equal groups of</p> <p>divide</p> <p>divided by</p> <p>divided into</p> <p>left, left over</p>

## FRACTIONS

GUIDANCE / MODELS AND IMAGES	KEY VOCABULARY
<p>Although not explicit in the Development Matters document, the sharing model is a useful way of introducing young children to fractions and calculating with fractions.</p> <p>Setting the problems in real life context and solving them with <u>concrete apparatus</u> will support children's understanding.</p> <p>"I have got 5 bones to share between my two dogs. How many bones will they get each?"</p> <p>Children have a go at recording the calculation that has been carried out.</p> <p><math>2\frac{1}{2} + 2\frac{1}{2} = 5</math></p> <div style="text-align: right;">  </div>	<p>As division vocabulary plus:</p> <p>fraction</p> <p>half</p> <p>halves</p> <p>third</p> <p>thirds</p>



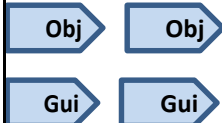



# Development Matters in the Early Years Foundation Stage (EYFS)

This non-statutory guidance material supports practitioners  
in implementing the statutory requirements of the EYFS.

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Links to calculation:





<u>22 – 36 months</u>	<u>30 – 50 months</u>	<u>40 – 60 months</u>	<u>Early Learning Goal for Numbers</u>
<div data-bbox="144 571 347 621">  </div> <p>Creates and experiments with symbols and marks representing ideas of number. Begins to make comparisons between quantities. Uses some language of quantities, such as <i>'more'</i> and <i>'a lot'</i>. Knows that a group of things changes in quantity when something is added or taken away.</p>	<div data-bbox="556 571 772 621">  </div> <p>Beginning to represent numbers using fingers, marks on paper or pictures. Compares two groups of objects, saying when they have the same number. Separates a group of three or four objects in different ways, beginning to recognise that the total is still the same.</p>	<div data-bbox="975 571 1197 692">  </div> <p>Says the number that is one more than a given number. Finds one more or one less from a group of up to five objects, then ten objects. In practical activities and discussion, beginning to use the vocabulary involved in adding and subtracting. Records, using marks that they can interpret and explain.</p>	<div data-bbox="1400 614 1738 728">  </div> <p><b>Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.</b></p>



# Development Matters in the Early Years Foundation Stage (EYFS)

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Mathematics: Numbers			
	A Unique Child: observing what a child is learning	Positive Relationships: what adults could do	Enabling Environments: what adults could provide
 Birth - 11 months	<ul style="list-style-type: none"> <li>Notices changes in number of objects/images or sounds in group of up to 3.</li> </ul>	<ul style="list-style-type: none"> <li>Sing number rhymes as you dress or change babies, e.g. 'One, Two, Buckle My Shoe'.</li> <li>Move with babies to the rhythm patterns in familiar songs and rhymes.</li> <li>Encourage babies to join in tapping and clapping along to simple rhythms.</li> </ul>	<ul style="list-style-type: none"> <li>Display favourite things so that a young baby can see them.</li> <li>Provide a small group of the same objects in treasure baskets, as well as single items, e.g. two fir cones or three shells.</li> <li>Create a mobile, occasionally changing the number of items you hang on it.</li> <li>Collect number rhymes which are repetitive and are related to children's actions and experiences, for example, 'Peter Hammers with One Hammer'.</li> <li>Use song and rhymes during personal routines, e.g. 'Two Little Eyes to Look Around', pointing to their eyes, one by one.</li> <li>Collect number and counting rhymes from a range of cultures and in other languages. This will benefit all children and will give additional support for children learning English as an additional language.</li> </ul>
 8-20 months	<ul style="list-style-type: none"> <li>Develops an awareness of number names through their enjoyment of action rhymes and songs that relate to their experience of numbers.</li> <li>Has some understanding that things exist, even when out of sight.</li> </ul>		
 16-26 months	<ul style="list-style-type: none"> <li>Knows that things exist, even when out of sight.</li> <li>Beginning to organise and categorise objects, e.g. putting all the teddy bears together or teddies and cars in separate piles.</li> <li>Says some counting words randomly.</li> </ul>	<ul style="list-style-type: none"> <li>Use number words in meaningful contexts, e.g. 'Here is your other mitten. Now we have two'.</li> <li>Talk to young children about 'lots' and 'few' as they play.</li> <li>Talk about young children's choices and, where appropriate, demonstrate how counting helps us to find out how many.</li> <li>Talk about the maths in everyday situations, e.g. doing up a coat, one hole for each button.</li> <li>Tell parents about all the ways children learn about numbers in your setting. Have interpreter support or translated materials to support children and families learning English as an additional language.</li> </ul>	<ul style="list-style-type: none"> <li>Provide varied opportunities to explore 'lots' and 'few' in play.</li> <li>Equip the role-play area with things that can be sorted in different ways.</li> <li>Provide collections of objects that can be sorted and matched in various ways.</li> <li>Provide resources that support children in making one-to-one correspondences, e.g. giving each dolly a cup.</li> </ul>
 22-36 months	<ul style="list-style-type: none"> <li>Selects a small number of objects from a group when asked, for example, 'please give me one', 'please give me two'.</li> <li>Recites some number names in sequence.</li> <li>Creates and experiments with symbols and marks representing ideas of number.</li> <li>Begins to make comparisons between quantities.</li> <li>Uses some language of quantities, such as 'more' and 'a lot'.</li> <li>Knows that a group of things changes in quantity when something is added or taken away.</li> </ul>	<ul style="list-style-type: none"> <li>Encourage parents of children learning English as an additional language to talk in their home language about quantities and numbers.</li> <li>Sing counting songs and rhymes which help to develop children's understanding of number, such as 'Two Little Dickie Birds'.</li> <li>Play games which relate to number order, addition and subtraction, such as hopscotch and skittles and target games.</li> </ul>	<ul style="list-style-type: none"> <li>Make a display with the children about their favourite things. Talk about how many like apples, or which of them watches a particular TV programme at home.</li> <li>Provide props for children to act out counting songs and rhymes.</li> <li>Provide games and equipment that offer opportunities for counting, such as skittles.</li> <li>Plan to incorporate a mathematical component in areas such as the sand, water or other play areas.</li> </ul>

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Mathematics: Numbers			
	A Unique Child: observing what a child is learning	Positive Relationships: what adults could do	Enabling Environments: what adults could provide
 30-50 months	<ul style="list-style-type: none"> <li>• Uses some number names and number language spontaneously.</li> <li>• Uses some number names accurately in play.</li> <li>• Recites numbers in order to 10.</li> <li>• Knows that numbers identify how many objects are in a set.</li> <li>• Beginning to represent numbers using fingers, marks on paper or pictures.</li> <li>• Sometimes matches numeral and quantity correctly.</li> <li>• Shows curiosity about numbers by offering comments or asking questions.</li> <li>• Compares two groups of objects, saying when they have the same number.</li> <li>• Shows an interest in number problems.</li> <li>• Separates a group of three or four objects in different ways, beginning to recognise that the total is still the same.</li> <li>• Shows an interest in numerals in the environment.</li> <li>• Shows an interest in representing numbers.</li> <li>• Realises not only objects, but anything can be counted, including steps, claps or jumps.</li> </ul>	<ul style="list-style-type: none"> <li>• Use number language, e.g. 'one', 'two', 'three', 'lots', 'fewer', 'hundreds', 'how many?' and 'count' in a variety of situations.</li> <li>• Support children's developing understanding of abstraction by counting things that are not objects, such as hops, jumps, claps or claps.</li> <li>• Model counting of objects in a random layout, showing the result is always the same as long as each object is only counted once.</li> <li>• Model and encourage use of mathematical language e.g. asking questions such as 'How many saucepans will fit on the shelf?'</li> <li>• Help children to understand that one thing can be shared by number of pieces, e.g. a pizza.</li> <li>• As you read number stories or rhymes, ask e.g. 'When one more frog jumps in, how many will there be in the pool altogether?'</li> <li>• Use pictures and objects to illustrate counting songs, rhymes and number stories.</li> <li>• Encourage children to use mark-making to support their thinking about numbers and simple problems.</li> <li>• Talk with children about the strategies they are using, e.g. to work out a solution to a simple problem by using fingers or counting aloud.</li> </ul>	<ul style="list-style-type: none"> <li>• Give children a reason to count, e.g. by asking them to select enough wrist bands for three friends to play with the puppets.</li> <li>• Enable children to note the 'missing set', e.g. 'There are none left' when sharing things out.</li> <li>• Provide number labels for children to use, e.g. by putting a number label on each bike and a corresponding number on each parking space.</li> <li>• Include counting money and change in role-play games.</li> <li>• Create opportunities for children to separate objects into unequal groups as well as equal groups.</li> <li>• Provide story props that children can use in their play, e.g. varieties of fruit and several baskets like Handa's in the story <i>Handa's Surprise</i> by Eileen Browne.</li> </ul>
 40-60+ months	<ul style="list-style-type: none"> <li>• Recognise some numerals of personal significance.</li> <li>• Recognises numerals 1 to 5.</li> <li>• Counts up to three or four objects by saying one number name for each item.</li> <li>• Counts actions or objects which cannot be moved.</li> <li>• Counts objects to 10, and beginning to count beyond 10.</li> <li>• Counts out up to six objects from a larger group.</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage estimation, e.g. estimate how many sandwiches to make for the picnic.</li> <li>• Encourage use of mathematical language, e.g. number names to ten: 'Have you got enough to give me three?'</li> <li>• Ensure that children are involved in making displays, e.g. making their own pictograms of lunch choices. Develop this as a 3D representation using bricks and discuss the most popular choices.</li> <li>• Add numerals to all areas of learning and development, e.g. to a display of a favourite story, such as 'The Three Billy Goats Gruff'.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide collections of interesting things for children to sort, order, count and label in their play.</li> <li>• Display numerals in purposeful contexts, e.g. a sign showing how many children can play on a number track.</li> <li>• Use tactile numeral cards made from sandpaper, velvet or string.</li> <li>• Create opportunities for children to experiment with a number of objects, the written numeral and the written number word. Develop this through matching activities with a range of numbers, numerals and a selection of objects.</li> </ul>



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Mathematics: Numbers			
	A Unique Child: observing what a child is learning	Positive Relationships: what adults could do	Enabling Environments: what adults could provide
	<ul style="list-style-type: none"> <li>• Selects the correct numeral to represent 1 to 5, then 1 to 10 objects.</li> <li>• Counts an irregular arrangement of up to ten objects.</li> <li>• Estimates how many objects they can see and checks by counting them.</li> <li>• Uses the language of 'more' and 'fewer' to compare two sets of objects.</li> <li>• Finds the total number of items in two groups by counting all of them.</li> <li>• Says the number that is one more than a given number.</li> <li>• Finds one more or one less from a group of up to five objects, then ten objects.</li> <li>• In practical activities and discussion, beginning to use the vocabulary involved in adding and subtracting.</li> <li>• Records, using marks that they can interpret and explain.</li> <li>• Begins to identify own mathematical problems based on own interests and fascinations.</li> </ul> <p><b>Early Learning Goal</b> Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.</p>	<ul style="list-style-type: none"> <li>• Make books about numbers that have meaning for the child such as favourite numbers, birth dates or telephone numbers.</li> <li>• Use rhymes, songs and stories involving counting on and counting back in ones, twos, fives and tens.</li> <li>• Emphasise the empty set and introduce the concept of nothing or zero.</li> <li>• Show interest in how children solve problems and value their different solutions.</li> <li>• Make sure children are secure about the order of numbers before asking what comes after or before each number.</li> <li>• Discuss with children how problems relate to others they have met, and their different solutions.</li> <li>• Talk about the methods children use to answer a problem they have posed, e.g. 'Get one more, and then we will both have two.'</li> <li>• Encourage children to make up their own story problems for other children to solve.</li> <li>• Encourage children to extend problems, e.g. "Suppose there were three people to share the bricks between instead of two".</li> <li>• Use mathematical vocabulary and demonstrate methods of recording, using standard notation where appropriate.</li> <li>• Give children learning English as additional language opportunities to work in their home language to ensure accurate understanding of concepts.</li> </ul>	<ul style="list-style-type: none"> <li>• Use a 100 square to show number patterns.</li> <li>• Encourage children to count the things they see and talk about and use numbers beyond ten</li> <li>• Make number games readily available and teach children how to use them.</li> <li>• Display interesting books about number.</li> <li>• Play games such as hide and seek that involve counting.</li> <li>• Encourage children to record what they have done, e.g. by drawing or tallying.</li> <li>• Use number staircases to show a starting point and how you arrive at another point when something is added or taken away.</li> <li>• Provide a wide range of number resources and encourage children to be creative in identifying and devising problems and solutions in all areas of learning.</li> <li>• Make number lines available for reference and encourage children to use them in their own play.</li> <li>• Big number lines may be more appropriate than counters for children with physical impairments.</li> <li>• Help children to understand that five fingers on each hand make a total of ten fingers altogether, or that two rows of three eggs in the box make six eggs altogether.</li> </ul>

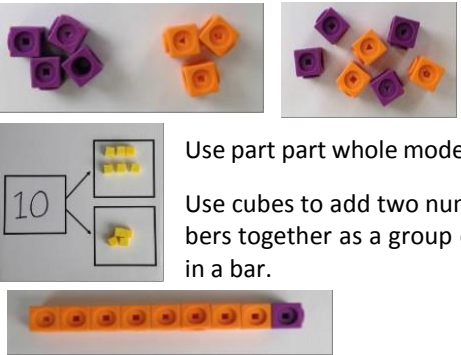
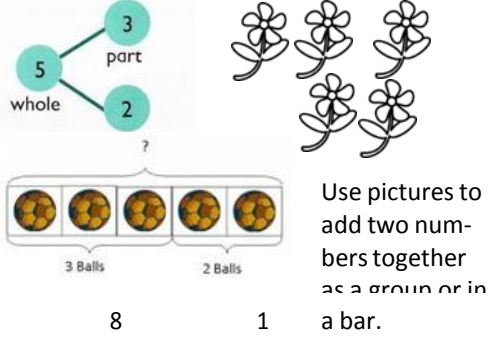
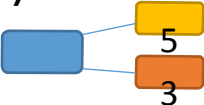

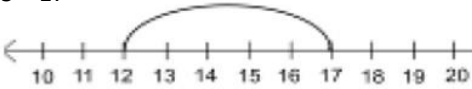
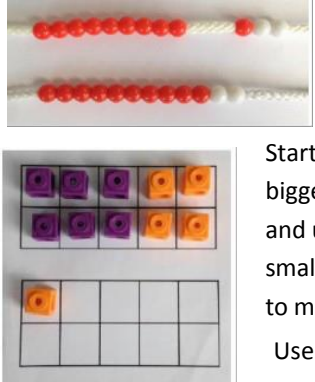
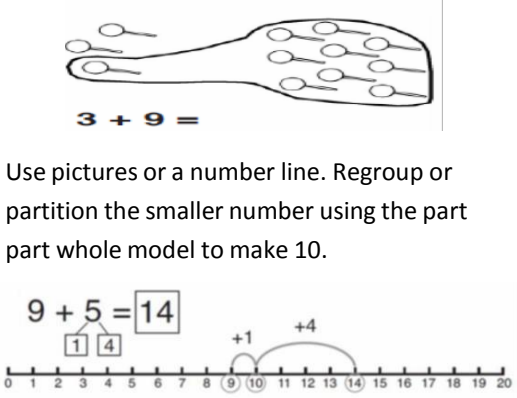

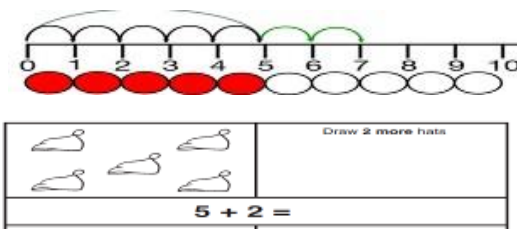
# Additional information for the ‘exceeding’ judgement

Taken from the 2014 Early Years Foundation Stage Handbook

**Numbers:** Children estimate a number of objects and check quantities by counting up to 20. They solve practical problems that involve combining groups of 2, 5, or 10, or sharing into equal groups.


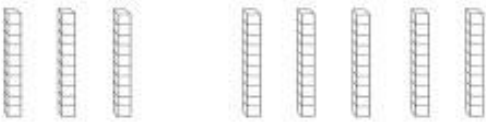
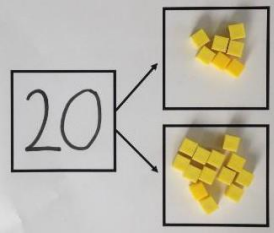
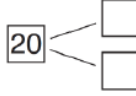
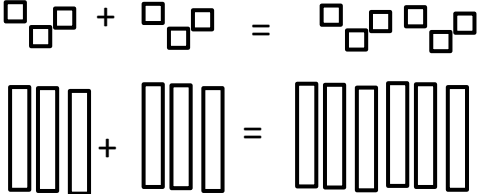
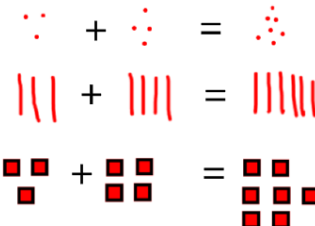


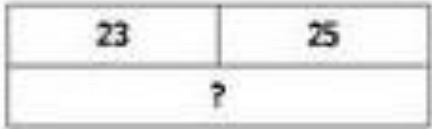
(This descriptor has been amended to reflect the increased level of challenge applied to the expected descriptor following the Tickell review.)

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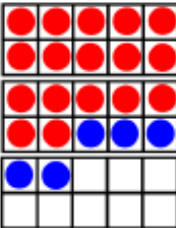
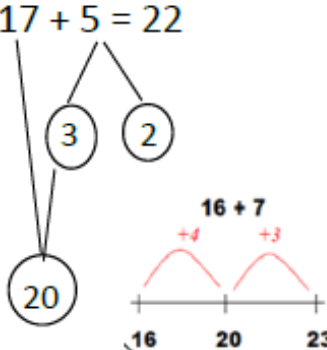

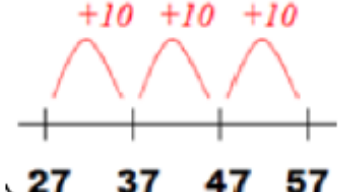


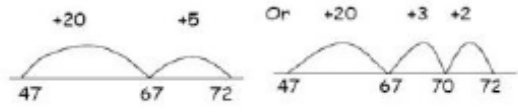


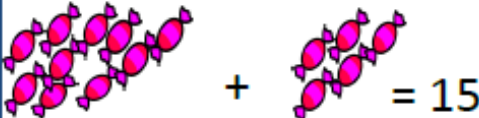
Objective & Strategy	Concrete	Pictorial	Abstract
Combining two parts to make a whole: part- whole model	 <p>Use part part whole model.</p> <p>Use cubes to add two numbers together as a group or in a bar.</p>	 <p>Use pictures to add two numbers together as a group or in a bar.</p>	$4 + 3 = 7$  <p>Use the part-part whole diagram as shown above to move into the abstract.</p> $10 = 6 + 4$
Starting at the bigger number and counting on	 <p>Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.</p>	$12 + 5 = 17$  <p>Start at the larger number on the number line and count on in ones or in one jump to find the answer.</p>	$5 + 12 = 17$ <p>Place the larger number in your head and count on the smaller number to find your answer.</p>
Regrouping to make 10. <i>This is an essential skill for column addition later.</i>	 <p>Start with the bigger number and use the smaller number to make 10.</p> <p>Use ten frames.</p>	 <p>Use pictures or a number line. Regroup or partition the smaller number using the part part whole model to make 10.</p>	$7 + 4 = 11$ <p>If I am at seven, how many more do I need to make 10. How many more do I add on now?</p>
Represent & use number bonds and related subtraction facts within 20	 <p>2 more than 5.</p>	 <p>5 + 2 =</p>	<p>Emphasis should be on the language</p> <p>'1 more than 5 is equal to 6.'</p> <p>'2 more than 5 is 7.'</p> <p>'8 is 3 more than 5.'</p>

# Y1

# ADDITION +

Objective & Strategy	Concrete	Pictorial	Abstract
Adding multiples of ten	$50 = 30 + 20$  Model using dienes and bead strings	 $3 \text{ tens} + 5 \text{ tens} = \underline{\hspace{2cm}} \text{ tens}$ $30 + 50 = \underline{\hspace{2cm}}$ Use representations for base ten.	$20 + 30 = 50$ $70 = 50 + 20$ $40 + \square = 60$
Use known number facts	 Children explore ways of making numbers within 20	 $\square + \square = 20$ $20 - \square = \square$ $\square + \square = 20$ $20 - \square = \square$	$\square + 1 = 16$ $16 - 1 = \square$ $1 + \square = 16$ $16 - \square = 1$
Using known facts	 $\square\square + \square\square = \square\square\square\square$ $\square\square\square + \square\square\square = \square\square\square\square\square\square$	 $\dots + \dots = \dots$ $    +      =      $ $\square\square + \square\square = \square\square\square$ Children draw representations of H, T and O	$3 + 4 = 7$ <i>leads to</i> $30 + 40 = 70$ <i>leads to</i> $300 + 400 = 700$
Bar model	 $3 + 4 = 7$	 $7 + 3 = 10$	 $23 + 25 = 48$

# Y2 ADDITION +

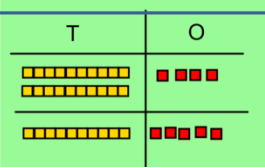
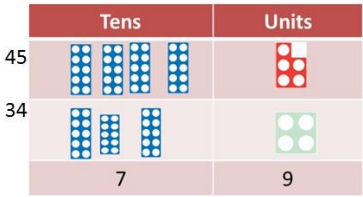
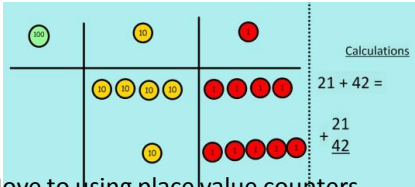
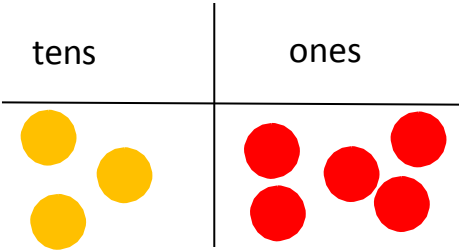
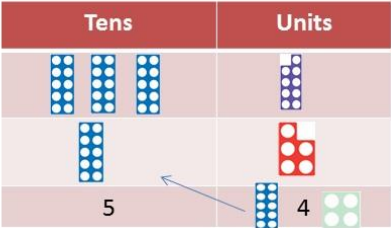
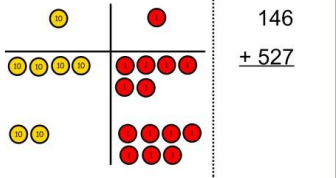
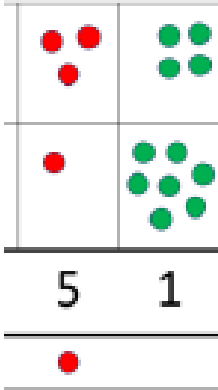
Objective & Strategy	Concrete	Pictorial	Abstract				
Add a two digit number and ones	<div></div> <div><math>17 + 5 = 22</math></div> <div>Use ten frame to make 'magic ten'</div> <div>Children explore the pattern.</div> <div><math>17 + 5 = 22</math></div> <div><math>27 + 5 = 32</math></div>	<div>Use part part whole and number line to model.</div> <div><math>17 + 5 = 22</math></div> <div></div>	<div><math>17 + 5 = 22</math></div> <div>Explore related facts</div> <div><math>17 + 5 = 22</math></div> <div><math>5 + 17 = 22</math></div> <div><math>22 - 17 = 5</math></div> <div><math>22 - 5 = 17</math></div> <div><table border="1" data-bbox="1635 438 1888 529"><tr><td colspan="2">22</td></tr><tr><td>17</td><td>5</td></tr></table></div>	22		17	5
22							
17	5						
Add a 2 digit number and tens	<div></div> <div><math>25 + 10 = 35</math></div> <div>Explore that the ones digit does not change</div>	<div><math>27 + 30</math></div> <div></div>	<div><math>27 + 10 = 37</math></div> <div><math>27 + 20 = 47</math></div> <div><math>27 + \square = 57</math></div>				
Add two 2-digit numbers	<div></div> <div></div> <div>Model using dienes, place value counters and numicon</div>	<div></div> <div>Use number line and bridge ten using part whole if necessary.</div>	<div><math>25 + 47</math></div> <div><math>20 + 5</math>   <math>40 + 7</math></div> <div><math>20 + 40 = 60</math></div> <div><math>5 + 7 = 12</math></div> <div><math>60 + 12 = 72</math></div>				
Add three 1-digit numbers	<div></div> <div>Combine to make 10 first if possible, or bridge 10 then add third digit</div>	<div></div> <div>Regroup and draw representation.</div> <div></div> <div><math>4 + 7 + 6 = 15</math></div>	<div><math>4 + 7 + 6 = 10 + 7</math></div> <div><math>= 17</math></div> <div>Combine the two numbers that make/ bridge ten then add on the third.</div>				

# Y2

# ADDITION

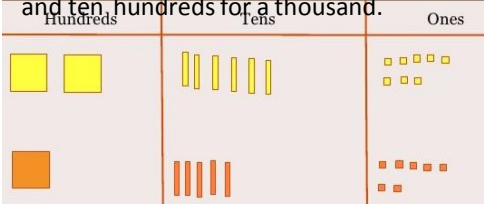
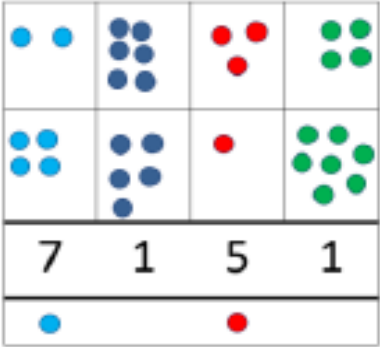
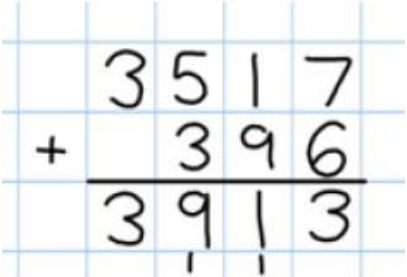
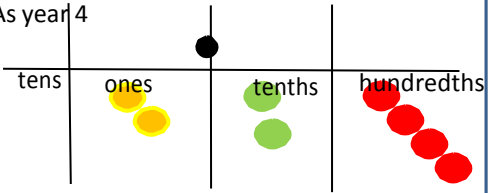
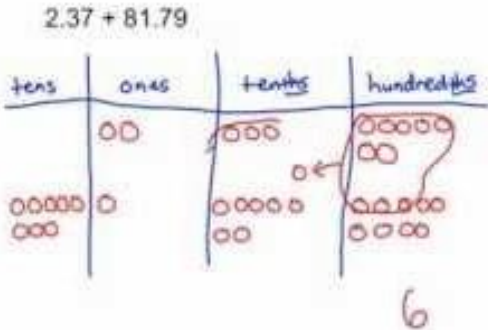
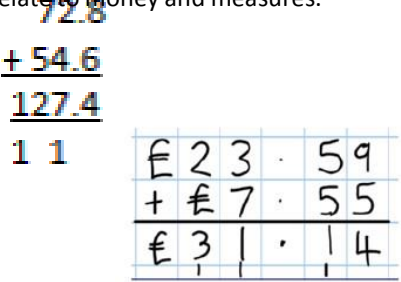
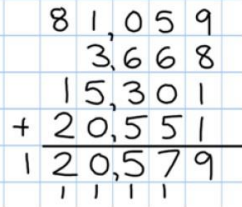

# +



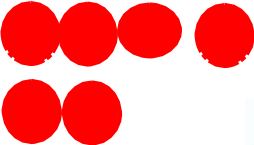

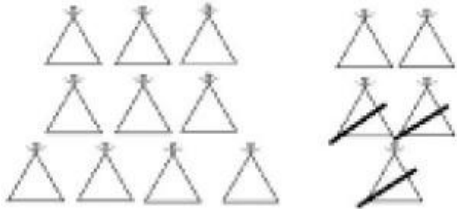


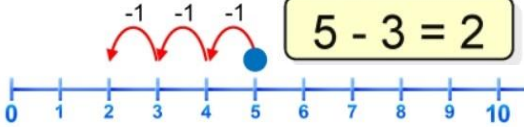
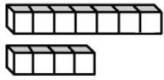
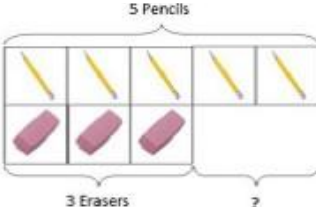
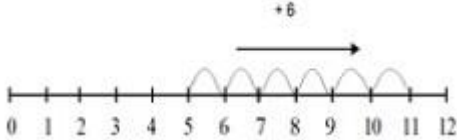
Objective & Strategy	Concrete	Pictorial	Abstract
<p>Column Addition—no regrouping (friendly numbers)</p> <p>Add two or three 2 or 3-digit numbers.</p>	<p>Model using Dienes or numicon</p>  <p>Add together the ones first, then the tens.</p>   <p>Move to using place value counters</p>	<p>Children move to drawing the counters using a tens and one frame.</p> 	$\begin{array}{r} 223 \\ + 114 \\ \hline 337 \end{array}$ <p>Add the ones first, then the tens, then the hundreds.</p>
<p>Column Addition with regrouping.</p>	 <p>Exchange ten ones for a ten. Model using numicon and pv counters.</p> 	 <p>Children can draw a representation of the grid to further support their understanding, carrying the ten <u>underneath</u> the line</p>	$\begin{array}{r} 20 + 5 \\ 40 + 8 \\ 60 + 13 = 73 \end{array}$ <p>Start by partitioning the numbers before formal column to show the exchange.</p> $\begin{array}{r} 536 \\ + 85 \\ \hline 621 \\ 11 \end{array}$

# Y3 ADDITION

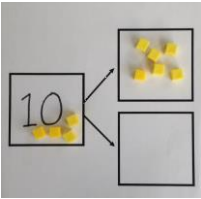
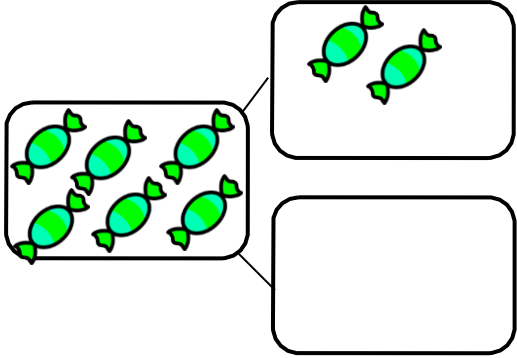
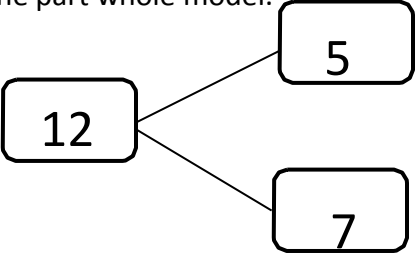
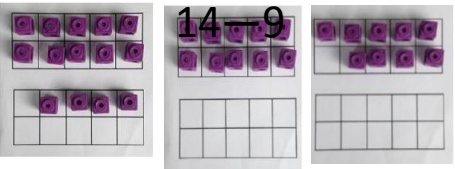
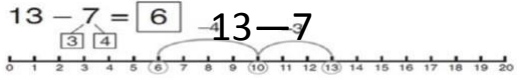


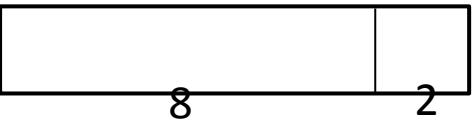


Objective & Strategy	Concrete	Pictorial	Abstract
Y4—add numbers with up to 4 digits	<p>Children continue to use dienes or place value counters to add, exchanging ten ones for a ten and ten tens for a hundred and ten hundreds for a thousand.</p> 	 <p>Draw representations using pv grid.</p>	 <p>Continue from previous work to carry hundreds as well as tens.</p>
<p>Y5—add numbers with more than 4 digits.</p> <p>Add decimals with 2 decimal places, including money.</p>	<p>As year 4</p>  <p>Introduce decimal place value counters and model exchange for addition.</p>		<p>Relate to money and measures.</p> 
<p>Y6—add several numbers of increasing complexity</p> <p>Including adding money, measure and decimals with different numbers of decimal points.</p>	As Y5	As Y5	 <p>Insert zeros for place holders.</p> 

# Y4-6 ADDITION +

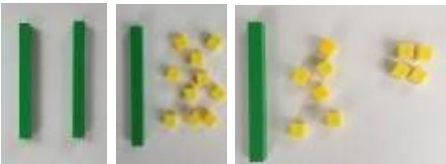
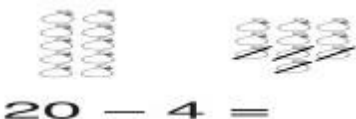

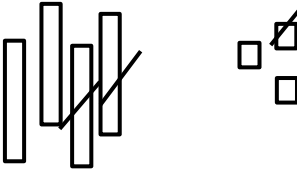
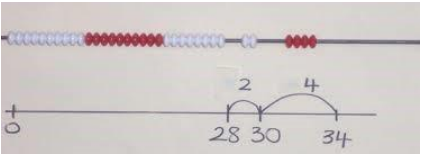
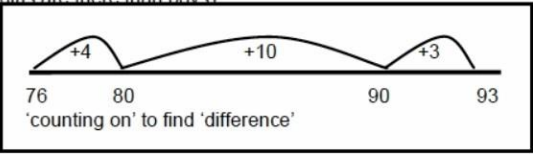
Objective & Strategy	Concrete	Pictorial	Abstract
Taking away ones.	<p>Use physical objects, counters, cubes etc. to show how objects can be taken away.</p>  $6 - 4 = 2$  $4 - 2 = 2$	 $15 - 3 = 12$ <p>Cross out drawn objects to show what has been taken away.</p>	$7 - 4 = 3$  $16 - 9 = 7$
Counting back	 <p>Move objects away from the group, counting backwards.</p>  <p>Move the beads along the bead string as you count backwards.</p>	 $5 - 3 = 2$ <p>Count back in ones using a number line.</p>	<p>Real life worded problems e.g. Put 13 in your head, count back 4. What number are you at?</p>
Find the Difference	<p>Compare objects and amounts</p>  <p>'Seven is 3 more than four'</p> <p>'I am 2 years older than my sister'</p>  <p>Lay objects to represent bar model.</p>	<p>Count on using a number line to find the difference.</p> 	<p>Real life worded problems e.g. Hannah has 12 sweets and her sister has 5. How many more does Hannah have than her sister?</p>

# Y1 SUBTRACTION -

Objective & Strategy	Concrete	Pictorial	Abstract
<b>Represent and use</b>  <b>number bonds and related subtraction facts within 20</b>  <b>Part Whole model</b>	 <p>Link to addition. Use PPW model to model the inverse.</p> <p>If 10 is the whole and 6 is one of the parts, what's the other part?</p> $10 - 6 = 4$	 <p>Use pictorial representations to show the part.</p>	<p>Move to using numbers within the part whole model.</p> 
<b>Make 10</b>	 <p>Make 14 on the ten frame. Take 4 away to make ten, then take one more away so that you have taken 5.</p>	 <p>Jump back 3 first, then another 4. Use ten as the stopping point.</p>	$16 - 8$ <p>How many do we take off first to get to 10? How many left to take off?</p>
<b>Bar model</b>	 $5 - 2 = 3$		 $10 = 8 + 2$ $10 = 2 + 8$ $10 - 2 = 8$ $10 - 8 = 2$

# Y1 SUBTRACTION

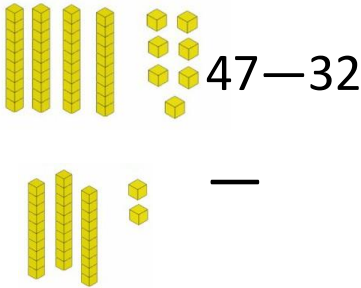
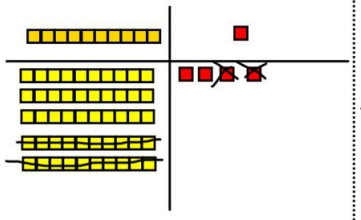
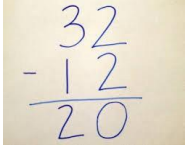
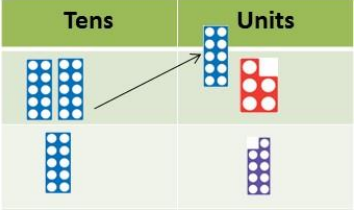
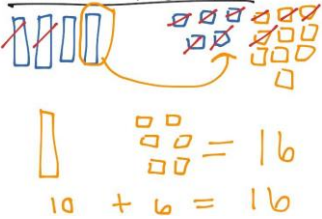
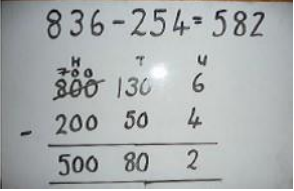
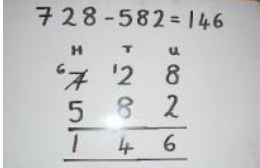


Objective & Strategy	Concrete	Pictorial	Abstract
Regroup a ten into ten ones	 <p>Use a PV chart to show how to change a ten into ten ones, use the term 'take and make'</p>	 $20 - 4 =$	$20 - 4 = 16$
Partitioning to subtract without regrouping. <i>'Friendly numbers'</i>	$34 - 13 = 21$  <p>Use Dienes to show how to partition the number when subtracting without regrouping.</p>	<p>Children draw representations of Dienes and cross off.</p>  $43 - 21 = 22$	$43 - 21 = 22$
Make ten strategy <i>Progression should be crossing one ten, crossing more than one ten, crossing the hundreds.</i>	 $34 - 28$ <p>Use a bead bar or bead strings to model counting to next ten and the rest.</p>	 <p>76 80 90 93 'counting on' to find 'difference'</p> <p>Use a number line to count on to next ten and then the rest.</p>	$93 - 76 = 17$

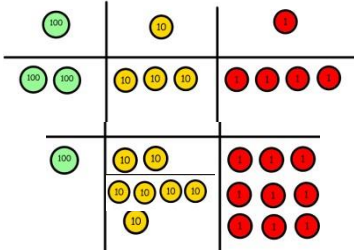
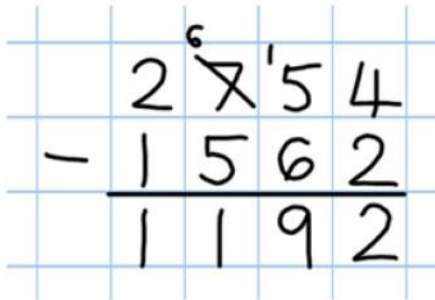
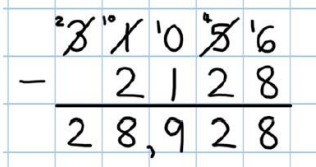
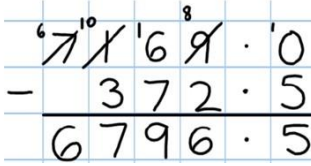
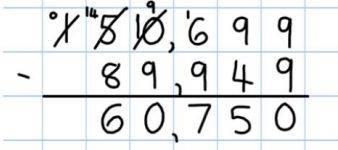
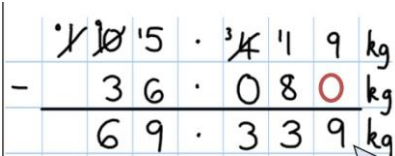
# Y2 SUBTRACTION



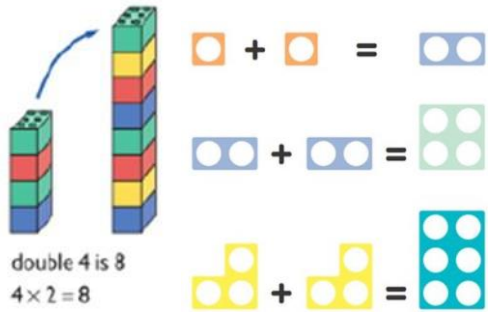

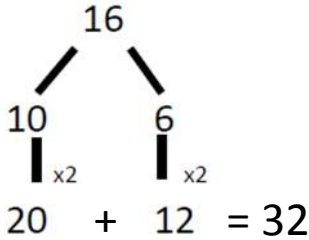
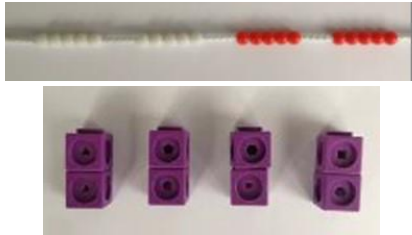
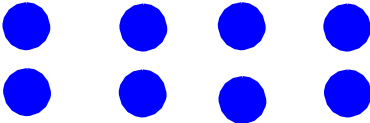
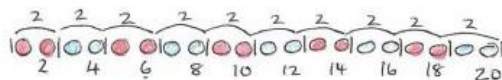

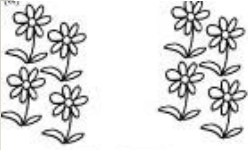



Objective & Strategy	Concrete	Pictorial	Abstract
Column subtraction without regrouping (friendly numbers)	 <p>47—32</p> <p>Use base 10 or Numicon to model</p>	 <p>Calculations</p> $\begin{array}{r} 54 \\ - 22 \\ \hline 32 \end{array}$ <p>Draw representations to support understanding</p>	$47 - 24 = 23$ $\begin{array}{r} 40 + 7 \\ - 20 + 4 \\ \hline 20 + 3 \end{array}$ <p>Intermediate step may be needed to lead to clear subtraction understanding.</p> 
Column subtraction with regrouping	 <p>Begin with base 10 or Numicon. Move to pv counters, modelling the exchange of a ten into ten ones. Use the phrase 'take and make' for exchange.</p>	$\begin{array}{r} 45 \\ - 29 \\ \hline 16 \end{array}$ <p>Tens   Ones</p>  <p>Children may draw base ten or PV counters and cross off.</p>	$836 - 254 = 582$  <p>Begin by partitioning into pv columns</p> $728 - 582 = 146$  <p>Then move to formal method.</p>

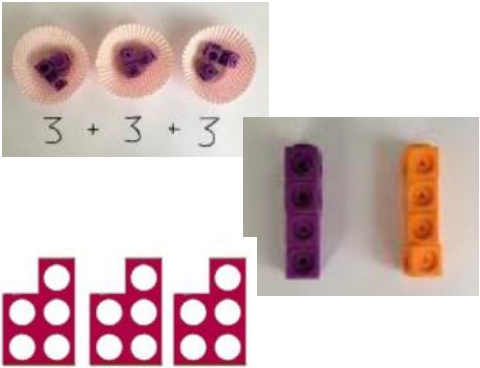
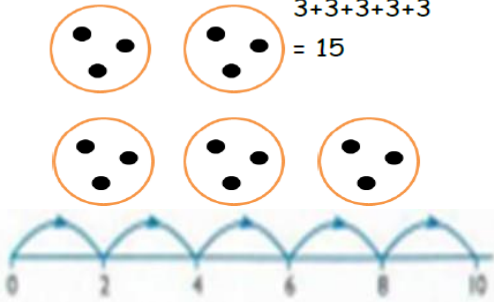

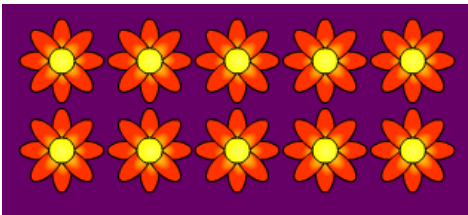
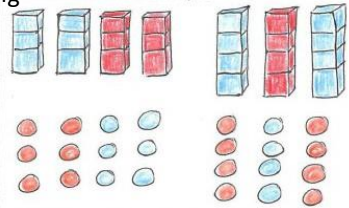
# Y3 SUBTRACTION -

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Subtracting tens and ones</p> <p>Year 4 subtract with up to 4 digits.</p> <p><i>Introduce decimal subtraction through context of money</i></p>	<p>234 - 179</p>  <p>Model process of exchange using base ten and then move to PV counters.</p>	<p>Children to draw pv counters and show their exchange—see Y3</p>	 <p>Use the phrase 'take and make' for exchange</p>
<p>Year 5- Subtract with at least 4 digits, including money and measures.</p> <p><i>Subtract with decimal values, including mixtures of integers and decimals and aligning the decimal</i></p>	<p>As Year 4</p>	<p>Children to draw place value counters and show their exchange—see Y3</p>	 <p>Use zeros for place-holders.</p> 
<p>Year 6—Subtract with increasingly large and more complex numbers and decimal values.</p>			 

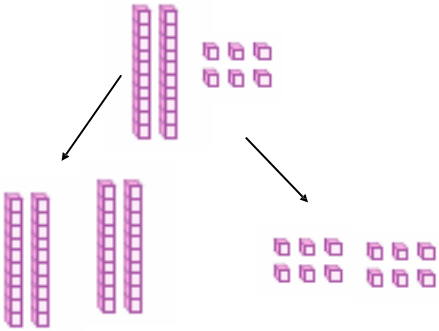
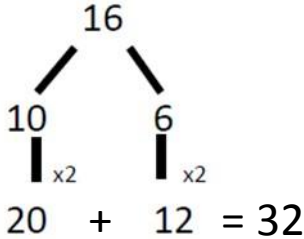
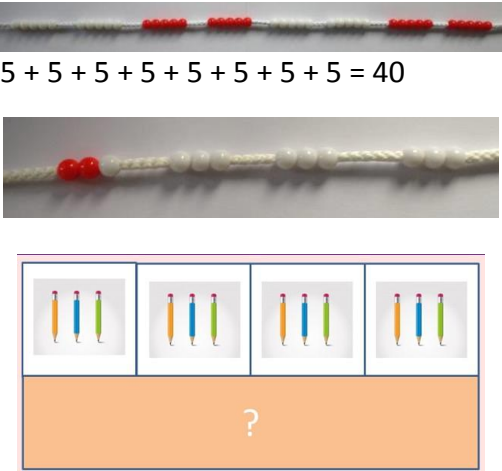
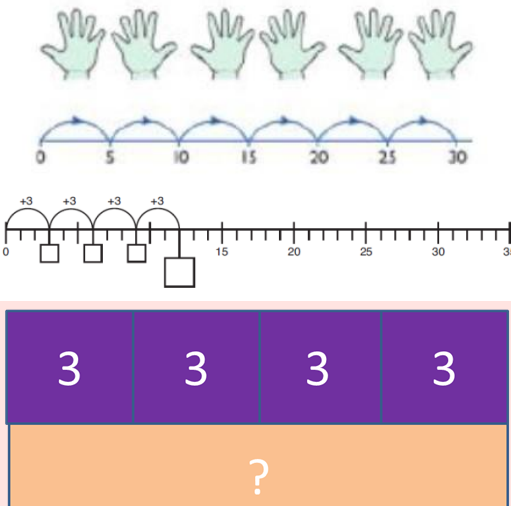
# Y4-6 SUBTRACTION

Objective & Strategy	Concrete	Pictorial	Abstract
Doubling	<p>Use practical activities using manipulatives including cubes and Numicon to demonstrate doubling</p>  <p>double 4 is 8 <math>4 \times 2 = 8</math></p>	<p>Draw pictures to show how to double numbers</p> <p>Double 4 is 8</p> 	<p>Partition a number and then double each part before recombining it back together.</p>  <p>16 10      6          x2    x2 20    +    12    =    32</p>
Counting in multiples	<p>Count the groups as children are skip counting, children may use their fingers as they are skip counting.</p> 	 <p>Children make representations to show counting in multiples.</p> 	<p>Count in multiples of a number aloud.</p> <p>Write sequences with multiples of numbers.</p> <p>2, 4, 6, 8, 10</p> <p>5, 10, 15, 20, 25, 30</p>
Making equal groups and counting the total	  <p><math>\square \times \square = 8</math></p> <p>Use manipulatives to create equal groups.</p>	<p>Draw  to show <math>2 \times 3 = 6</math></p> <p>Draw and make representations</p>	<p><math>2 \times 4 = 8</math></p>





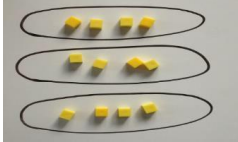
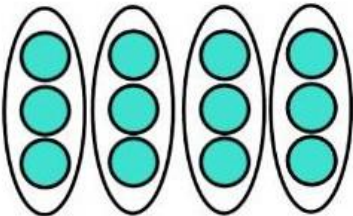
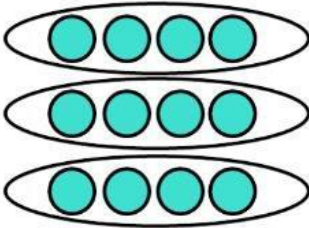


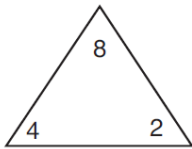
# Y1 MULTIPLICATION X

Objective & Strategy	Concrete	Pictorial	Abstract
Repeated addition	 <p>Use different objects to add equal groups</p>	<p>Use pictorials including number lines to solve problems e.g.</p> <p>There are 3 sweets in one bag. How many sweets are in 5 bags altogether?</p> <p><math>3 + 3 + 3 + 3 + 3 = 15</math></p> 	<p>Write addition sentences to describe objects and pictures.</p>  <p><math>2 + 2 + 2 + 2 + 2 = 10</math></p>
Understanding arrays	<p>Use objects laid out in arrays to find the answers to 2 lots 5, 3 lots of 2 etc.</p> 	<p>Draw representations of arrays to show understanding</p> 	<p><math>3 \times 2 = 6</math></p> <p><math>2 \times 5 = 10</math></p>

# Y1 MULTIPLICATION X

Objective & Strategy	Concrete	Pictorial	Abstract
Doubling	<p>Model doubling using dienes and PV counters.</p>  $40 + 12 = 52$	<p>Draw pictures and representations to show how to double numbers</p>	<p>Partition a number and then double each part before recombining it back together.</p>  $20 + 12 = 32$
Counting in multiples of 2, 3, 4, 5, 10 from 0 (repeated addition)	<p>Count the groups as children are skip counting, children may use their fingers as they are skip counting. Use bar models.</p>  $5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 40$	<p>Number lines, counting sticks and bar models should be used to show representation of counting in multiples.</p> 	<p>Count in multiples of a number aloud.</p> <p>Write sequences with multiples of numbers.</p> <p>0, 2, 4, 6, 8, 10</p> <p>0, 3, 6, 9, 12, 15</p> <p>0, 5, 10, 15, 20, 25, 30</p> $4 \times 3 = \square$

# Y2 MULTIPLICATION X

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Multiplication is commutative</p>	<p>Create arrays using counters and cubes and Numicon.</p>    <p>Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer.</p>  	<p>Use representations of arrays to show different calculations and explore commutativity.</p>  	<p><math>12 = 3 \times 4</math></p> <p><math>12 = 4 \times 3</math></p> <p>Use an array to write multiplication sentences and reinforce repeated addition.</p>  <p><math>5 + 5 + 5 = 15</math></p> <p><math>3 + 3 + 3 + 3 + 3 = 15</math></p> <p><math>5 \times 3 = 15</math></p> <p><math>3 \times 5 = 15</math></p>
<p>Using the Inverse</p> <p><i>This should be taught alongside division, so pupils learn how they work alongside each other.</i></p>		 <p> <math>\square \times \square = \square</math>  <math>\square \times \square = \square</math>  <math>\square \div \square = \square</math>  <math>\square \div \square = \square</math> </p>	<p><math>2 \times 4 = 8</math></p> <p><math>4 \times 2 = 8</math></p> <p><math>8 \div 2 = 4</math></p> <p><math>8 \div 4 = 2</math></p> <p><math>8 = 2 \times 4</math></p> <p><math>8 = 4 \times 2</math></p> <p><math>2 = 8 \div 4</math></p> <p><math>4 = 8 \div 2</math></p> <p>Show all 8 related fact family sentences.</p>

# Y2 MULTIPLICATION X



Objective & Strategy	Concrete	Pictorial	Abstract
Grid method	<p>Show the links with arrays to first introduce the grid method.</p> <div><div><div><div></div><div>10</div><div>3</div></div><div><div>4</div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div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# Y3 MULTIPLICATION X

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Grid method recap from year 3 for 2 digits x 1 digit</p> <p>Move to multiplying 3 digit numbers by 1 digit. (year 4 expectation)</p>	<p>Use place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows</p> <div><div><div><div>100</div><div>20</div><div>6</div></div><div><div>100</div><div>20</div><div>6</div></div><div><div>100</div><div>20</div><div>6</div></div><div><div>100</div><div>20</div><div>6</div></div></div><div>Calculations 4 x 126</div><p>Fill each row with 126</p><div><div><div>100</div><div>20</div><div>6</div></div><div><div>100</div><div>20</div><div>6</div></div><div><div>100</div><div>20</div><div>6</div></div><div><div>100</div><div>20</div><div>6</div></div></div><p>Add up each column making any exchanges needed</p></div> <td><p>Children can represent their work with place value counters in a way that they understand.</p><p>They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below.</p><div><div>24 x 3 = 72</div><div><div><div>X</div><div>20</div><div>4</div></div><div><div>3</div><div>00</div><div>00</div><div>00</div><div>60</div></div><div><div>0000</div><div>0000</div><div>0000</div><div>12</div><div>60</div><div>+ 12</div><div>72</div></div></div></div><td><p>Start with multiplying by one digit numbers and showing the clear addition alongside the grid.</p><div><div><div>x</div><div>30</div><div>5</div></div><div><div>7</div><div>210</div><div>35</div></div></div><p>210 + 35 = 245</p></td></td>	<p>Children can represent their work with place value counters in a way that they understand.</p> <p>They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below.</p> <div><div>24 x 3 = 72</div><div><div><div>X</div><div>20</div><div>4</div></div><div><div>3</div><div>00</div><div>00</div><div>00</div><div>60</div></div><div><div>0000</div><div>0000</div><div>0000</div><div>12</div><div>60</div><div>+ 12</div><div>72</div></div></div></div> <td><p>Start with multiplying by one digit numbers and showing the clear addition alongside the grid.</p><div><div><div>x</div><div>30</div><div>5</div></div><div><div>7</div><div>210</div><div>35</div></div></div><p>210 + 35 = 245</p></td>	<p>Start with multiplying by one digit numbers and showing the clear addition alongside the grid.</p> <div><div><div>x</div><div>30</div><div>5</div></div><div><div>7</div><div>210</div><div>35</div></div></div> <p>210 + 35 = 245</p>
<p>Column multiplication</p>	<p>Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. 321 x 2 = 642</p> <div><div><div>Hundreds</div><div>Tens</div><div>Ones</div></div><div><div><div>3</div><div>2</div><div>1</div></div><div><div>2</div><div>2</div><div>2</div></div><div><div>6</div><div>4</div><div>2</div></div></div></div> <p>It is important at this stage that they always multiply the ones first.</p> <p>The corresponding long multiplication is mod-</p>	<div><div><div>x</div><div>300</div><div>20</div><div>1</div></div><div><div>4</div><div>1200</div><div>80</div><div>28</div></div></div> <div><div>59</div><div>59</div><div>59</div><div>59</div><div>59</div><div>59</div><div>59</div><div>59</div></div> <div><div>8 x 59</div><div>= 8 x 60 - 8</div><div>8 x 6 = 48</div><div>8 x 60 = 480</div><div>480 - 8 = 472</div></div>	<p>The grid method may be used to show how this relates to a formal written method.</p> <div><div><div>327</div><div>x</div><div>4</div></div><div><div>1308</div><div>1</div><div>2</div></div></div> <p>Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written</p>

# Y4 MULTIPLICATION

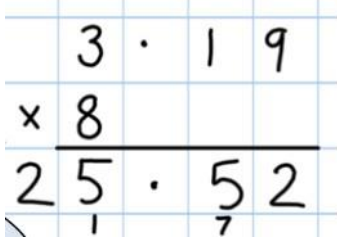
methods.

$$\begin{array}{r}
 327 \\
 \times 4 \\
 \hline
 28 \\
 80 \\
 \hline
 1200 \\
 1308
 \end{array}$$

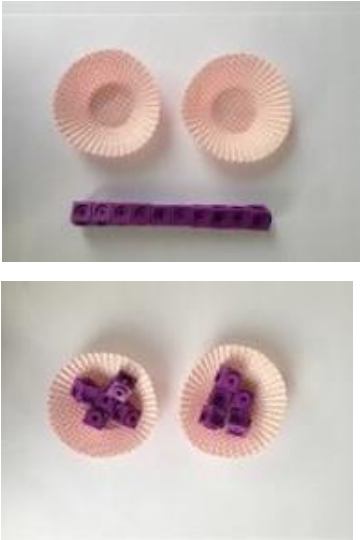
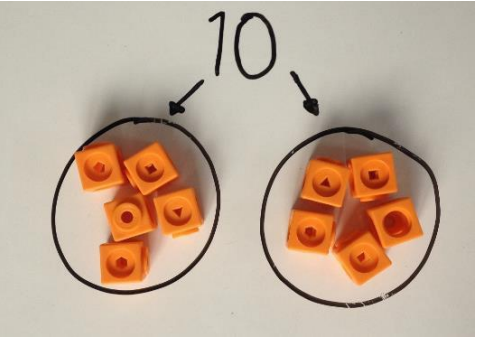

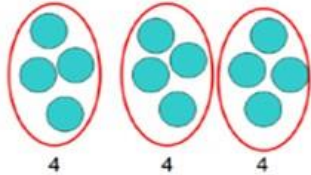
This may lead  
to a compact  
method.

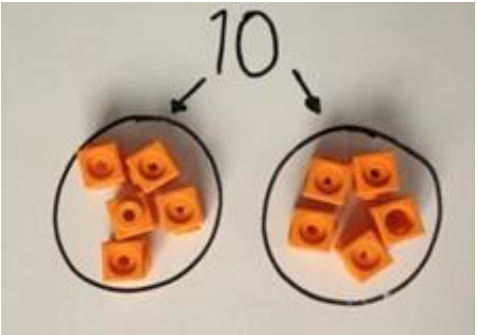
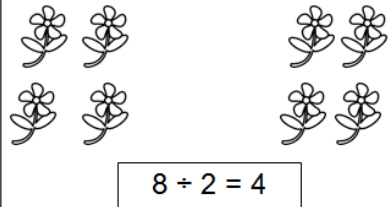
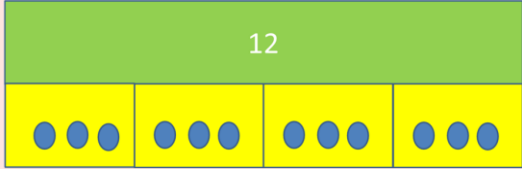

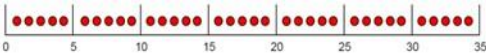
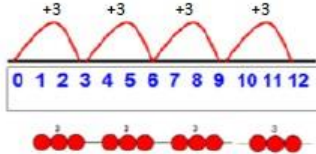
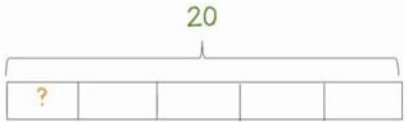
Objective & Strategy	Concrete	Pictorial	Abstract																																																						
Column Multiplication for 3 and 4 digits x 1 digit.	<div><table><tr><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table><p>It is important at this stage that they always multiply the ones first.</p><p>Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. <math>321 \times 2 = 642</math></p></div>	Hundreds	Tens	Ones													<div><table><tr><td>x</td><td>300</td><td>20</td><td>7</td></tr><tr><td>4</td><td>1200</td><td>80</td><td>28</td></tr></table></div>	x	300	20	7	4	1200	80	28	<div><math display="block">\begin{array}{r} 327 \\ \times 4 \\ \hline 28 \\ 80 \\ 1200 \\ \hline 1308 \end{array}</math><div><table><tr><td></td><td>3</td><td>2</td><td>7</td></tr><tr><td>x</td><td></td><td></td><td>4</td></tr><tr><td></td><td>1</td><td>3</td><td>0</td><td>8</td></tr><tr><td></td><td></td><td>1</td><td>2</td><td></td></tr></table></div><p>This will lead to a compact method.</p></div>		3	2	7	x			4		1	3	0	8			1	2														
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	1	3	0	8																																																					
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Column multiplication	Manipulatives may still be used with corresponding long multiplication modelled alongside.	<div><table><tr><td></td><td>10</td><td>8</td></tr><tr><td>10</td><td>100</td><td>80</td></tr><tr><td>3</td><td>30</td><td>24</td></tr></table></div> <p>Continue to use bar modelling to support problem solving</p>		10	8	10	100	80	3	30	24	<div><table><tr><td></td><td>1</td><td>8</td></tr><tr><td>x</td><td>1</td><td>3</td></tr><tr><td></td><td>5</td><td>4</td></tr><tr><td></td><td>2</td><td></td></tr><tr><td>1</td><td>8</td><td>0</td></tr><tr><td>2</td><td>3</td><td>4</td></tr></table><p>18 x 3 on the first row (8 x 3 = 24, carrying the 2 for 20, then 1 x 3) 18 x 10 on the 2nd row. Show multiplying by 10 by putting zero in units first</p><div><table><tr><td></td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>x</td><td></td><td></td><td>1</td><td>6</td></tr><tr><td></td><td>7</td><td>4</td><td>0</td><td>4</td></tr><tr><td></td><td>1</td><td>2</td><td>3</td><td>4</td><td>0</td></tr><tr><td></td><td>1</td><td>9</td><td>7</td><td>4</td><td>4</td></tr></table><p>(1234 x 6) (1234 x 10)</p></div></div>		1	8	x	1	3		5	4		2		1	8	0	2	3	4		1	2	3	4	x			1	6		7	4	0	4		1	2	3	4	0		1	9	7	4	4
	10	8																																																							
10	100	80																																																							
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	7	4	0	4																																																					
	1	2	3	4	0																																																				
	1	9	7	4	4																																																				

# Y5-6 MULTIPLICATION X



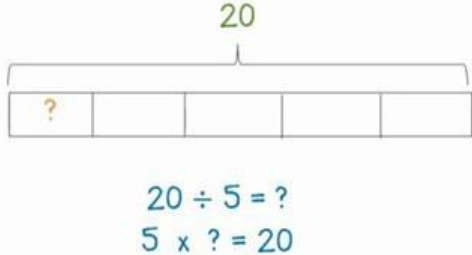
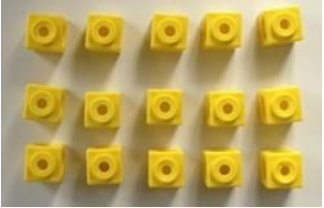
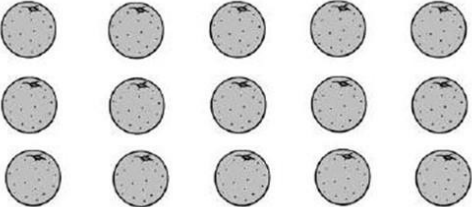
Objective & Strategy	Concrete	Pictorial	Abstract
<p>Multiplying decimals up to 2 decimal places by a single digit.</p>			<p>Remind children that the single digit belongs in the units column. Line up the decimal points in the question and the answer.</p> 

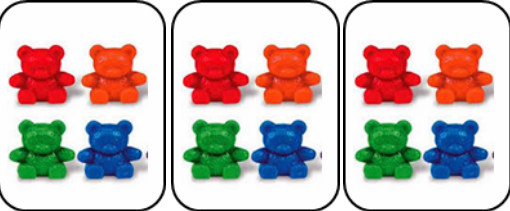

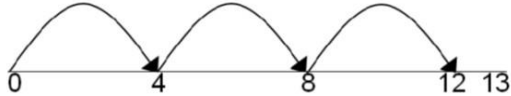

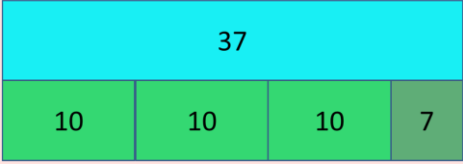
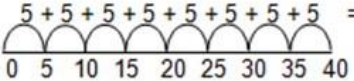
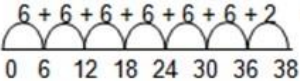
# Y6 MULTIPLICATION X

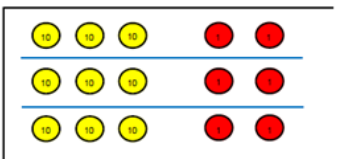
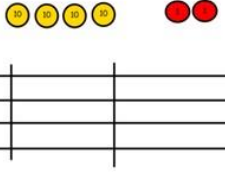
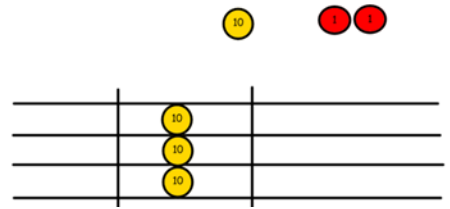
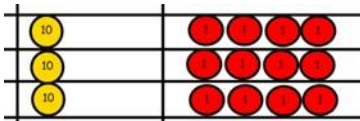
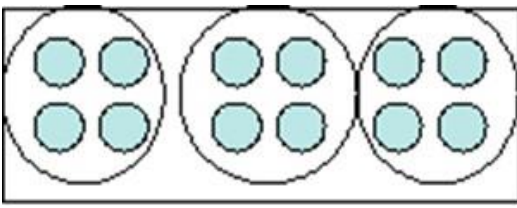
Objective & Strategy	Concrete	Pictorial	Abstract
Division as sharing	  <p>I have 10 cubes, can you share them equally in 2 groups?</p>	<p>Children use pictures or shapes to share quantities.</p>  <p>8 shared between 2 is 4</p> <p>Sharing:</p>  <p>12 shared between 3 is 4</p>	<p>12 shared between 3 is</p> <p>4</p>

Objective & Strategy	Concrete	Pictorial	Abstract
Division as sharing	 <p>I have 10 cubes, can you share them equally in 2 groups?</p>	<p>Children use pictures or shapes to share quantities.</p>  $8 \div 2 = 4$ <p>Children use bar modelling to show and support understanding.</p>  <p>12 ÷ 4 = 3</p>	$12 \div 3 = 4$
Division as grouping	<p>Divide quantities into equal groups.</p> <p>Use cubes, counters, objects or place value counters to aid understanding.</p>  	<p>Use number lines for grouping</p>  <p>12 ÷ 3 = 4</p> <p>Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group.</p>  $20 \div 5 = ?$ $5 \times ? = 20$	$28 \div 7 = 4$ <p>Divide 28 into 7 groups. How many are in each group?</p>



Objective & Strategy	Concrete	Pictorial	Abstract
Division as grouping	<p>Use cubes, counters, objects or place value counters to aid understanding.</p>  <p>24 divided into groups of 6 = 4</p> $96 \div 3 = 32$ 	<p>Continue to use bar modelling to aid solving division problems.</p>  $20 \div 5 = ?$ $5 \times ? = 20$	<p>How many groups of 6 in 24?</p> $24 \div 6 = 4$
Division with arrays	 <p>Link division to multiplication by creating an array and thinking about the number sentences that can be created.</p> <p>Eg <math>15 \div 3 = 5</math>    <math>5 \times 3 = 15</math></p> <p><math>15 \div 5 = 3</math>    <math>3 \times 5 = 15</math></p>	<p>Draw an array and use lines to split the array into groups to make multiplication and division sentences</p> 	<p>Find the inverse of multiplication and division sentences by creating eight linking number sentences.</p> $7 \times 4 = 28$ $4 \times 7 = 28$ $28 \div 7 = 4$ $28 \div 4 = 7$ $28 = 7 \times 4$ $28 = 4 \times 7$ $4 = 28 \div 7$ $7 = 28 \div 4$

Objective & Strategy	Concrete	Pictorial	Abstract
Division with remainders.	<p><math>14 \div 3 =</math></p> <p>Divide objects between groups and see how much is left over</p>  	<p>Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder.</p>  <p>Draw dots and group them to divide an amount and clearly show a remainder.</p>  <p>Use bar models to show division with remainders.</p>  <p><b>Example without remainder:</b>  <math>40 \div 5</math>          Ask "How many 5s in 40?"   <math>5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 8 \text{ fives}</math></p> <p><b>Example with remainder:</b>  <math>38 \div 6</math>   <math>6 + 6 + 6 + 6 + 6 + 6 + 2 = 6 \text{ sixes with a remainder of 2}</math></p> <p>For larger numbers, when it becomes inefficient to count in single multiples, bigger jumps can be recorded using known facts.</p>	<p>Complete written divisions and show the remainder using r.</p> <p><math>29 \div 8 = 3 \text{ REMAINDER } 5</math></p> <p>↑   ↑   ↑   ↑          dividend   divisor   quotient   remainder</p>

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Divide at least 3 digit numbers by 1 digit.</p> <p>Short Division</p>	<p><math>96 \div 3</math></p> <p>Tens      Units</p> <p>3            2</p>  <p>Use place value counters to divide using the bus stop method alongside</p>  <p>42 <math>\div</math> 3 =</p> <p>Start with the biggest place value, we are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over.</p>  <p>We exchange this ten for ten ones and then share the ones equally among the groups.</p>  <p>We look how much in 1 group so the answer is 14.</p>	<p>Students can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.</p>  <p>Encourage them to move towards counting in multiples to divide more efficiently.</p>	<p>Begin with divisions that divide equally with no remainder.</p> $\begin{array}{r} 218 \\ 3 \overline{) 654} \end{array}$ <p>Move onto divisions with a remainder.</p> $\begin{array}{r} 86 \text{ r } 2 \\ 3 \overline{) 258} \end{array}$ <p>Finally move into decimal places to divide the total accurately.</p> $\begin{array}{r} 14.6 \\ 35 \overline{) 511.0} \end{array}$ $\begin{array}{r} 0663 \text{ r } 5 \\ 8 \overline{) 5309} \end{array}$

## Long Division

Step 1—a remainder in the ones

$$\begin{array}{r} \text{h t o} \\ 041 \text{ R}1 \\ \hline 4 \overline{) 165} \end{array}$$

4 does not go into 1 (hundred). So combine the 1 hundred with the 6 tens (160).

4 goes into 16 four times.

4 goes into 5 once, leaving a remainder of 1.

$$\begin{array}{r} \text{th h t o} \\ 0400 \text{ R}7 \\ \hline 8 \overline{) 3207} \end{array}$$

8 does not go into 3 of the thousands. So combine the 3 thousands with the 2 hundreds (3,200).

8 goes into 32 four times ( $3,200 \div 8 = 400$ )

8 goes into 0 zero times (tens).

8 goes into 7 zero times, and leaves a remainder of 7.

## Long Division

Step 1 continued...

$$\begin{array}{r}
 \text{h t o} \\
 061 \\
 4 \overline{) 247} \\
 \underline{-4} \\
 3
 \end{array}$$

When dividing the ones, 4 goes into 7 one time. Multiply  $1 \times 4 = 4$ , write that four under the 7, and subtract. This finds us the remainder of 3.

Check:  $4 \times 61 + 3 = 247$

$$\begin{array}{r}
 \text{th h t o} \\
 0402 \\
 4 \overline{) 1609} \\
 \underline{-8} \\
 1
 \end{array}$$

When dividing the ones, 4 goes into 9 two times. Multiply  $2 \times 4 = 8$ , write that eight under the 9, and subtract. This finds us the remainder of 1.

Check:  $4 \times 402 + 1 = 1,609$

## Long Division

Step 2—a remainder in the tens

1. Divide.	2. Multiply & subtract.	3. Drop down the next digit.
$\begin{array}{r} \text{t o} \\ 2 \overline{) 58} \end{array}$ <p>Two goes into 5 two times, or 5 tens <math>\div 2 = 2</math> whole tens -- but there is a remainder!</p>	$\begin{array}{r} \text{t o} \\ 2 \overline{) 58} \\ -4 \phantom{0} \\ \hline 1 \phantom{0} \end{array}$ <p>To find it, multiply <math>2 \times 2 = 4</math>, write that 4 under the five, and subtract to find the remainder of 1 ten.</p>	$\begin{array}{r} \text{t o} \\ 2 \overline{) 58} \\ -4 \downarrow \\ \hline 18 \end{array}$ <p>Next, drop down the 8 of the ones next to the leftover 1 ten. You combine the remainder ten with 8 ones, and get 18.</p>

1. Divide.	2. Multiply & subtract.	3. Drop down the next digit.
$\begin{array}{r} \text{t o} \\ 2 \overline{) 58} \\ -4 \phantom{0} \\ \hline 18 \end{array}$ <p>Divide 2 into 18. Place 9 into the quotient.</p>	$\begin{array}{r} \text{t o} \\ 2 \overline{) 58} \\ -4 \phantom{0} \\ \hline 18 \\ -18 \\ \hline 0 \end{array}$ <p>Multiply <math>9 \times 2 = 18</math>, write that 18 under the 18, and subtract.</p>	$\begin{array}{r} \text{t o} \\ 2 \overline{) 58} \\ -4 \phantom{0} \\ \hline 18 \\ -18 \\ \hline 0 \end{array}$ <p>The division is over since there are no more digits in the dividend. The quotient is 29.</p>



## Long Division

Step 2—a remainder in any of the place values

1. Divide.	2. Multiply & subtract.	3. Drop down the next digit.
$\begin{array}{r} \text{h t o} \\ 1 \\ 2 \overline{) 278} \end{array}$ <p>Two goes into 2 one time, or 2 hundreds <math>\div 2 = 1</math> hundred.</p>	$\begin{array}{r} \text{h t o} \\ 1 \\ 2 \overline{) 278} \\ -2 \\ \hline 0 \end{array}$ <p>Multiply <math>1 \times 2 = 2</math>, write that 2 under the two, and subtract to find the remainder of zero.</p>	$\begin{array}{r} \text{h t o} \\ 18 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \end{array}$ <p>Next, drop down the 7 of the tens next to the zero.</p>
Divide.	Multiply & subtract.	Drop down the next digit.
$\begin{array}{r} \text{h t o} \\ 13 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \end{array}$ <p>Divide 2 into 7. Place 3 into the quotient.</p>	$\begin{array}{r} \text{h t o} \\ 13 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \\ -6 \\ \hline 1 \end{array}$ <p>Multiply <math>3 \times 2 = 6</math>, write that 6 under the 7, and subtract to find the remainder of 1 ten.</p>	$\begin{array}{r} \text{h t o} \\ 13 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \\ -6 \\ \hline 18 \end{array}$ <p>Next, drop down the 8 of the ones next to the 1 leftover ten.</p>
1. Divide.	2. Multiply & subtract.	3. Drop down the next digit.
$\begin{array}{r} \text{h t o} \\ 139 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \\ -6 \\ \hline 18 \end{array}$ <p>Divide 2 into 18. Place 9 into the quotient.</p>	$\begin{array}{r} \text{h t o} \\ 139 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \\ -6 \\ \hline 18 \\ -18 \\ \hline 0 \end{array}$ <p>Multiply <math>9 \times 2 = 18</math>, write that 18 under the 18, and subtract to find the remainder of zero.</p>	$\begin{array}{r} \text{h t o} \\ 139 \\ 2 \overline{) 278} \\ -2 \\ \hline 07 \\ -6 \\ \hline 18 \\ -18 \\ \hline 0 \end{array}$ <p>There are no more digits to drop down. The quotient is 139.</p>

Y6  
DIVISION