
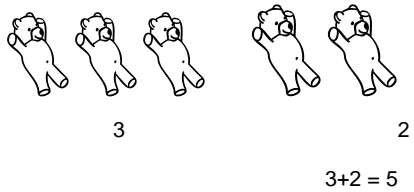
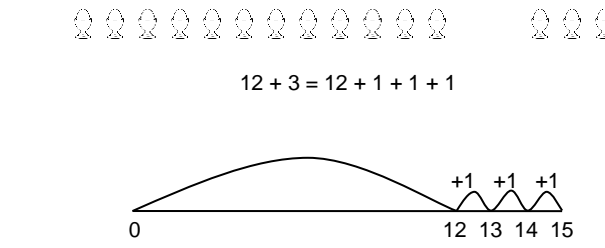

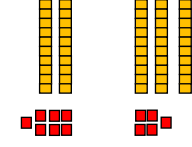
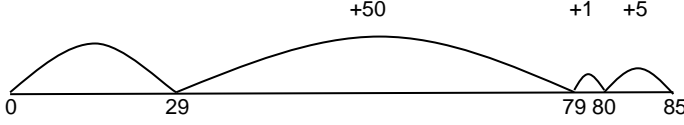
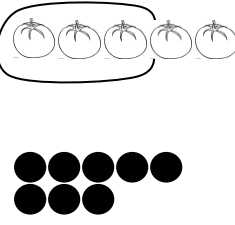
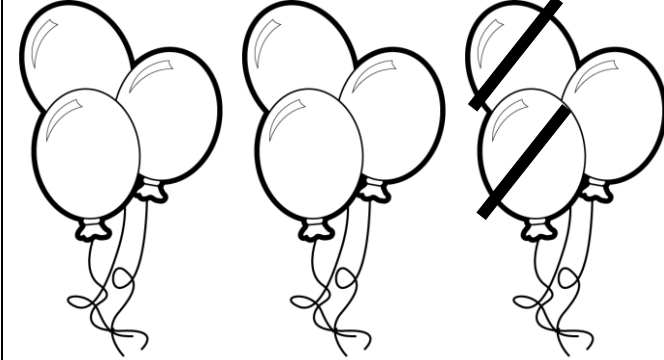
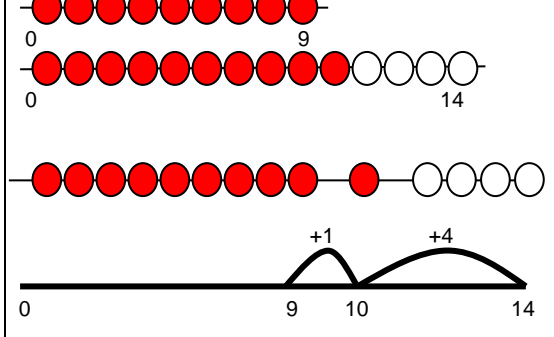
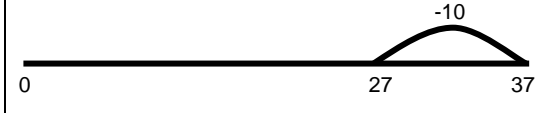
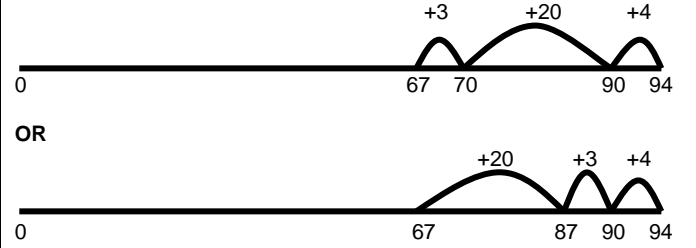
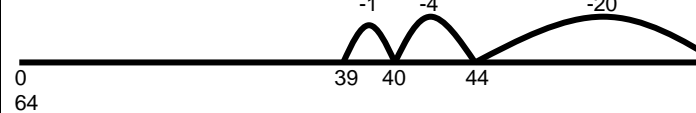



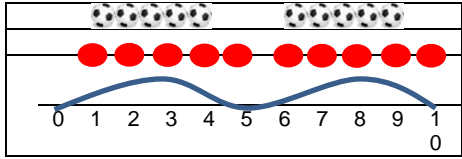
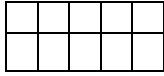

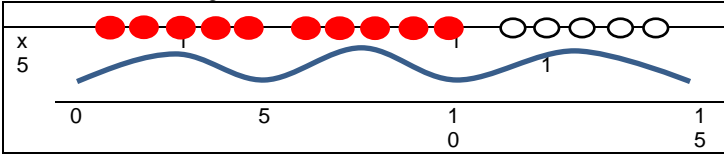

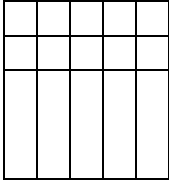
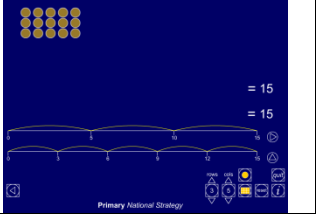


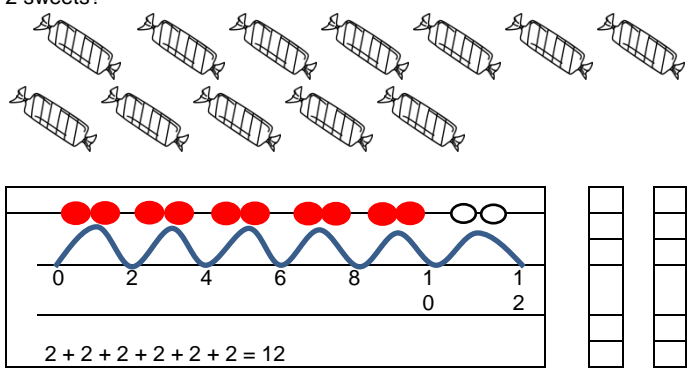
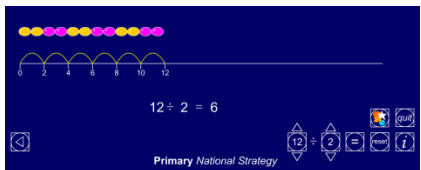
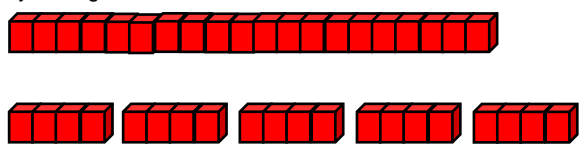
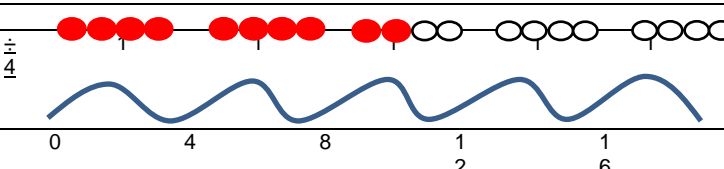
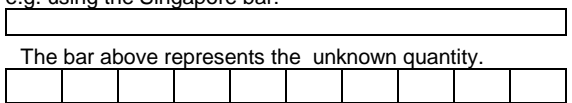
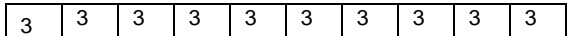
ADDITION			
Nursery	Reception	Y1	Y2
<p>Strategy: combining two groups and counting to establish total (aggregation)</p>	<p>Strategy: combining two or more groups and counting to establish total (aggregation); 'counting on' from one number (augmentation)</p>	<p>Strategy: Mental and written calculation strategies and structures: Augmentation and aggregation structures for addition, 'counting' strategies e.g. 'count on in 10s from any 2-digit number. Reorder numbers when adding e.g. put the larger number first; counts on in 1s, 2s and 10s; using concrete models e.g. a bead bar; demonstrate partitioning of small numbers e.g. $18 + 5 = 18 + 2 + 3$; partition and combine 10s and 1s; partition, double and adjust e.g. $5 + 6 = 5 + 5 + 1$; uses place value knowledge, also multiples of 10. NB: In Y1 mental and written strategies are still largely interchangeable</p>	<p>Strategy: Mental and written calculation strategies and structures: reordering to begin with largest number; partitioning other number(s) e.g. into 10s and 1s; and counting on in 10s and 1s; NB: In Y2 mental and written strategies are still largely interchangeable</p>
<p>Vocabulary: more, and, make, sum, total, altogether</p>	<p>Vocabulary: add, more, and, make, sum, total, altogether</p>	<p>Vocabulary: add, more, sum, total, altogether, plus, equals, put together.</p>	<p>Vocabulary: as for Y1 plus; addition;</p>
<p>Recording: teacher demonstration of pictorial recording where appropriate.</p>	<p>Recording: teacher demonstration of calculation to match pictorial recording using numberlines and use of notation of + and = Children begin using numberlines and standard notation when appropriate.</p>	<p>Recording: Children to continue to develop pictorial recording; using a tally; beginning to record on their own empty number line; use standard notation including the symbols + - and =; include empty box number statements.</p>	<p>Recording: Children to continue to develop recording especially using their own number lines and standard notation (including the symbols + - and =) to show partitioning and recombining.</p>
<p>Equipment & Resources: every day objects, counters, fingers http://www.childrens-mathematics.net/ http://www.foundationyears.org.uk/wp-content/uploads/2011/10/Numbers_and_Patterns.pdf</p>	<p>Equipment & Resources: number tracks, number lines, counters, fingers, Base 10 equipment ITPs: Number facts; Counting on and back; http://www.childrens-mathematics.net/ http://www.foundationyears.org.uk/wp-content/uploads/2011/10/Numbers_and_Patterns.pdf</p>	<p>Equipment & Resources: number lines, bead strings, bead bars, counters, fingers, straws, Base 10 equipment, ITPs: Number facts Counting on and back; NCETM video examples: Counting in steps of 1 and 10; Number bonds to 10; Partitioning in different ways</p>	<p>Equipment & Resources: number lines, hundred squares, Base 10 equipment, bead strings, bead bars, straws, ITPs: Number facts Counting on and back; Difference NCETM video examples: Counting in steps of 1 and 10; Number bonds to 10; Partitioning in different ways Using resources to develop fluency: conceptual understanding of addition</p>
<p>School Examples of addition: I've got 2 sweets and I am given one more. How many have I got now?</p> 	<p>School Examples of addition: Jane had 3 bears. She was given 2 more. How many does she have now?</p> 	<p>School Examples of addition: Some hens lay 12 eggs and 3 eggs. How many eggs do they lay altogether?</p>  <p>We know that $2 + 3 = 5$ so $12 + 3 = 15$</p> 	<p>School Examples of addition: Partitioning into T and U and recombining $27 + 35 =$ $20 + 30 = 50$ (tens) $7 + 5 = 12$ (units) $50 + 12 = 62$</p>  <p>My cat is 29cm tall. My dog is 56cm taller. How tall is my dog?</p> <p>$29 + 56 =$</p> <p>Augmentation: Partition and count on in 10s and 1s with or without a number line $29 + 50 + 1 + 5 = 85$ cm</p>  <p>OR $29 + 10 + 10 + 10 + 10 + 10 + 1 + 5$ (no illustration)</p>
		<p>Links: Opportunities for links with other mathematics domains: multiplication, fractions, measurement Opportunities for contexts and cross curricular links: Science: for example, in the programmes of study the children are expected to use their local environment throughout the year to explore and answer questions about animals in their habitat. They need to be able to sort and group them. <i>This would give opportunities for children add and subtract to find totals and differences.</i> History: for example, the children are expected to explore where the people and events they study fit within a chronological framework. <i>They could use addition to find, for example the number of years the people they studied lived or the lengths of reign of different Kings and Queens</i></p>	<p>Links: Opportunities for links with other mathematics domains: Number and place value and measurement especially money Opportunities for contexts and cross curricular links: Science: <i>finding totals</i> using their data findings sorted and presented as tables and charts; History: explore events beyond living memory that are significant nationally or globally. For example, <i>plot relevant dates on a number line and compare how long they went on for by counting on or back along it.</i> Also, explore the lives of significant individuals in the past who have contributed to national and international achievements. For example, plot the years in which they were born and died on a number line and work out, <i>by counting on or back, for how many years they lived. Compare the ages of different people and work out how much older one person was than another.</i></p>

SUBTRACTION

Nursery	Reception	Y1	Y2
<p>Strategy: begin to recognise subtraction as 'taking away' and 'counting back'. Also compare two numbers to find 'difference'.</p>	<p>Strategy: recognise subtraction as 'taking away' and 'counting back' on a numberline; compare two numbers to find difference e.g. as 'towers'</p>	<p>Strategy: Mental and written calculation strategies and structures: 'Counting' strategies e.g. 'count back in 10s from any 2-digit number. Counts back in 1s, 2s and 10s; using concrete models e.g. a bead bar; uses place value knowledge – 10 e.g. $37 - 10$; also multiples of 10 e.g. $37 - 20$ Recognise subtraction as 'taking away' and 'counting back'; or 'counting on' as the most efficient way of finding 'difference' e.g. <i>make up some difference questions with the answer 5</i>. Decide on most efficient strategy. NB: In Y1 mental and written strategies are still largely interchangeable</p>	<p>Strategy: Mental and written calculation strategies and structures: recognise subtraction as 'taking away' and 'counting back'; recognise 'counting on' as the most efficient way of finding 'difference' NB: In Y2 mental and written strategies are still largely interchangeable</p>
<p>Vocabulary: take away, leave,</p>	<p>Vocabulary: take away, leave, how many are left, how many fewer than, difference between,</p>	<p>Vocabulary: <i>more than</i> take away, leave, how many are left, how many difference between, how much more is...., <i>subtract, minus, equals, is the same value as, less than, fewer than</i> Non statutory - take away, distance between, difference between, less than</p>	<p>Vocabulary: <i>as for Y1 plus:</i> <i>difference;</i> how many fewer than, difference between, <i>subtraction, less</i></p>
<p>Recording: teacher demonstration of pictorial recording where appropriate.</p>	<p>Recording: teacher demonstration of calculation to match pictorial recording using numberlines and use of notation of - and = Children begin using numberlines and standard notation when appropriate.</p>	<p>Recording: Children to continue to develop pictorial recording; beginning to record on their own empty number line; use standard notation including the symbols - and =; include empty box number statements</p>	<p>Recording: to continue to develop recording especially using their own number lines and standard notation (including the symbols - and =) to show partitioning and recombining of one number.</p>
<p>Equipment & Resources: every day objects, counters, fingers http://www.childrens-mathematics.net/ http://www.foundationyears.org.uk/wp-content/uploads/2011/10/Numbers_and_Patterns.pdf</p>	<p>Equipment & Resources: number tracks, number lines, counters, fingers, Base 10 equipment e.g. Dienes or straws ITPs: Number facts; Counting on and back; http://www.foundationyears.org.uk/wp-content/uploads/2011/10/Numbers_and_Patterns.pdf</p>	<p>Equipment & Resources: number lines, counters, fingers, straws, Base 10 equipment, ITPs: Number facts; Counting on and back; Difference NCETM video examples: Counting in steps of 1 and 10; Number bonds to 10; Partitioning in different ways</p>	<p>Equipment & Resources: number lines, hundred squares, bead strings, bead bars Base 10 material ITPs: Number facts; Counting on and back; Difference NCETM video examples: Counting in steps of 1 and 10; Number bonds to 10; Partitioning in different ways</p>
<p>School Examples of subtraction:</p> <p>There were 5 tomatoes but I ate 2. How many are left? There were 5 tomatoes but I hid some. You can see there are 3 left. How many did I hide? I've got 3 tomatoes. You've got 5 tomatoes. How many more tomatoes have you got?</p> 	<p>School Examples of subtraction:</p> <p>There were 9 balloons. Two popped. How many left? I've got 9 balloons. You've got 2 balloons. How many more balloons have I got?</p> 	<p>School Examples of subtraction:</p> <p>'Counting on' to find the difference Holly has 9 grapes. Her friend has 14 grapes. How many fewer grapes does Holly have? $14 - 9 = 5$. Initial modelling of both quantities</p>  <p>'Taking away' There are 37 bean bags. Kim takes 10. How many bean bags are left?</p> $37 - 10$  <p>What would 37 subtract 20 be?</p>	<p>School Examples of subtraction:</p> <p>'Counting on' to find the difference Where there is a small difference and initially modelling both amounts separately, use 'counting on' on bead bars/ strings or a number line and record informally.</p> <p>There are 94 bean bags in the red bucket and 67 bean bags in the blue bucket. How many more bean bags are there in the red bucket?</p>  <p>'Taking away' There are 64 bean bags. Kim takes 25. How many bean bags are left?</p> <p>Partition smaller numbers and 'count back' either on a number line or record informally. $64 - 4 - 20 - 1 = 39$ OR $64 - 20 - 4 - 1 = 39$</p> 
		<p>Opportunities for links with other mathematics domains: multiplication, fractions, measurement</p> <p>Opportunities for contexts and cross curricular links: Science: for example, in the programmes of study the children are expected to use their local environment throughout the year to explore and answer questions about animals in their habitat. They need to be able to sort and group them. <i>This would give opportunities for children add and subtract to find totals and differences.</i> Geography: for example, the children are expected to identify seasonal and daily weather patterns in the United Kingdom and the location of hot and cold areas of the world in relation to the Equator and the North and South Poles. <i>When they do this they could use subtraction to find differences in the temperatures of the different areas.</i></p>	<p>Opportunities for links with other mathematics domains: Number and place value and measurement especially money</p> <p>Opportunities for contexts and cross curricular links: Science: <i>finding totals and differences</i> using their data findings sorted and presented as tables and charts; Geography: identify seasonal and daily weather patterns in the UK and the location of hot and cold areas of the world in relation to the Equator and the North and South Poles, <i>and find numerical differences in the seasonal average temperatures.</i> History: explore events beyond living memory that are significant nationally or globally. For example, <i>plot relevant dates on a number line and compare how long they went on for by counting on or back along it.</i> Also, explore the lives of significant individuals in the past who have contributed to national</p>

		History: for example, the children are expected to explore where the people and events they study fit within a chronological framework. This could involve using subtraction or counting on to find time differences between these events.	and international achievements. For example, plot the years in which they were born and died on a number line and work out, by counting on or back, for how many years they lived. Compare the ages of different people and work out how much older one person was than another.
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MULTIPLICATION			
Nursery	Reception	Y1	Y2
Strategy: begin to recognise repetitive addition of groups of the same size	Strategy: begin to recognise repetitive addition of groups of the same size; counting in steps of 10 or 2.	Strategy: <i>repeated aggregation</i> (addition) of groups of the same size and recorded as an array	Strategy: to recognise repetitive addition of groups of the same size; as an array; counting in steps of 2, 5 & 10
Vocabulary: groups, sets	Vocabulary: double, groups of, sets of, lots of	Vocabulary: double, groups of, sets of, lots of; groups, left over,	Vocabulary: lots of, groups of; times, multiply, multiplied by; multiple of; once, twice, three times... ten times...; times as (big, long, wide... and so on); repeated addition; array; row, column; double,
Recording: teacher demonstration of pictorial recording. Children begin using pictorial recording	Recording: teacher demonstration of calculation to match pictorial recording using numberlines Children begin using pictorial recording and numberlines	Recording: Following teacher demonstration, children continue to develop pictorial recording including an array	Recording: Following teacher demonstration of calculation to match pictorial recording i.e. array children to continue to develop recording especially using pictures and their own number lines. They begin to use standard notation including the symbols \div and $=$
Equipment & Resources: every day objects, counters, fingers http://www.childrens-mathematics.net/ http://www.foundationyears.org.uk/wp-content/uploads/2011/10/Numbers_and_Patterns.pdf	Equipment & Resources: every day resources but also 'maths' resources such as number tracks, number lines, counters, fingers, straws organised into groups of 10 http://www.childrens-mathematics.net/ http://www.foundationyears.org.uk/wp-content/uploads/2011/10/Numbers_and_Patterns.pdf	Equipment & Resources: number lines, counters, fingers, straws, Base 10 equipment, every day objects, counters, fingers, ITPs: Multiplication Array ; Grouping ; NCETM video examples: Multiple Representations and Reinforcing tables facts The commutative law of multiplication at KS1 Sharing and grouping	Equipment & Resources: number lines, hundred squares, counters, array, pegboards, straws, squared paper, cubes etc. & everyday objects e.g. bars of chocolate, egg boxes, ITPs: Multiplication Array ; Multiplication facts ; Number dials ; Grouping NCETM video examples: Multiple Representations and Reinforcing tables facts and The commutative law of multiplication at KS1 Sharing and grouping BBC Learning Zone Class Clips
School Examples of Multiplication: How many feet have these 3 teddy bears got altogether?  $2 + 2 + 2 = 6$	School Examples of Multiplication: How many gloves do we need for three people?  $2 + 2 + 2 = 6$ How many wheels do we need for 3 cars?  $4 + 4 + 4 = 12$	School Examples of Multiplication: Multiplication: example from exemplification (NCETM) <ul style="list-style-type: none"> Ben had 5 football stickers on each page. He has two pages of stickers. How many does he have altogether? ARRAY and  Show two groups of 5 football stickers. Model this on a bead bar/string. Demonstrate recording of two groups of 5 stickers on a number line. Also show as a rectangular 'array' i.e. two groups of 5 or $5 + 5 = 10$ 	School Examples of Multiplication: Example from exemplification: Anna has 3 boxes of cakes. Each box contains 5 cakes. How many cakes does she have altogether? Show how you worked this out.  For example, 'practically' and counting in 5s. Model on a bead bar/string as ' repeated ' addition i.e. $5 + 5 + 5 = 15$ AND '5 three times equals 15' so $5 \times 3 = 15$ or 'five multiplied or times by three equals 15'. Demonstrate recording on a number line.    Model/demonstrate as a rectangular 'array' using the cakes or beads (fold bead string) or counters (left). Also show as a rectangular 'array' (right) as 'three rows of 5' i.e. $5 \times 3 = 15$ <div style="border: 1px solid black; padding: 5px; width: fit-content;"> Use the ITP Multiplication Facts to demonstrate these processes and also commutativity. </div> 
		Links: Opportunities for links with other mathematics domains: Cross-curricular and real life connections Learners will encounter multiplication in: Money - when shopping and recognising prices of items, ordering items by price, finding quantities in multiple purchases, sales prices, Measurement - calculating area and perimeter, finding journey distances, reading and calculating scales, adjusting recipe quantities. Data - interpreting and evaluating data, calculating amounts from pie charts and pictograms.	Links: Opportunities for links with other mathematics domains: Cross-curricular and real life connections Learners will encounter multiplication in: Money – shopping: finding quantities in multiple purchases, sales prices, Measurement - calculating area and perimeter, finding journey distances, reading and calculating scales, adjusting recipe quantities. Data – interpreting and evaluating data, calculating amounts from pie charts and pictograms

DIVISION			
Nursery	Reception	Y1	Y2
<p>Strategy: multiplication & division synonymous at this stage combining two or more groups of the same size and counting to establish total (repeated addition or repeated aggregation); Also division as equal sharing and also as grouping</p>	<p>Strategy: multiplication & division synonymous at this stage combining two or more groups of the same size and counting to establish total (repeated addition or repeated aggregation); Also division as equal sharing and also as grouping</p>	<p>Strategy: begin to recognise grouping; also repeated addition of groups of the same size i.e. divided into groups of</p>	<p>Strategy: repeated addition of groups of the same size</p>
<p>Vocabulary: more, and, make, sum, total, altogether, take away, leave,</p>	<p>Vocabulary: double; half, halve; pair; group; divide into groups of; count out, share out; left, left over</p>	<p>Vocabulary: groups of, sets of, lots of; groups, left over, <i>half, each</i></p>	<p>Vocabulary: lots of, groups of; multiple of, repeated addition; halve; share, group in pairs, threes... tens; equal groups of; divide, divided by, divided into; left, left over</p>
<p>Recording: teacher demonstration of calculation of pictorial recording. Children begin using pictorial recording</p>	<p>Recording: teacher demonstration of calculation to match pictorial recording using numberlines Children begin using pictorial recording and numberlines</p>	<p>Recording: Following teacher demonstration, children beginning to record on their own empty number line.</p>	<p>Recording: Following teacher demonstration of calculation to match pictorial recording i.e. number line children to continue to develop recording especially using pictures and their own number lines. They begin to use standard notation including the symbols \div and $=$</p>
<p>Equipment & Resources: every day objects, counters, fingers http://www.childrens-mathematics.net/ http://www.foundationyears.org.uk/wp-content/uploads/2011/10/Numbers_and_Patterns.pdf</p>	<p>Equipment & Resources: every day resources but also 'maths' resources such as number tracks, number lines, counters, fingers, straws organised into groups of 10 http://www.childrens-mathematics.net/ http://www.foundationyears.org.uk/wp-content/uploads/2011/10/Numbers_and_Patterns.pdf</p>	<p>Equipment & Resources: number lines, counters, fingers, straws, Base 10 equipment, every day objects, counters, fingers, ITPs: Multiplication Array ; Grouping; NCETM video examples: 'Multiple Representations' Reinforcing tables facts The commutative law of multiplication at KS1 Sharing and grouping</p>	<p>Equipment & Resources: number lines, hundred squares, counters, pegboards, straws, squared paper, cubes etc. & everyday objects e.g. bars of chocolate, egg boxes, ITPs: Multiplication facts; Number dials; Grouping NCETM video examples: Reinforcing tables facts Sharing and grouping BBC Learning Zone Class Clips</p>
<p>School Examples of:</p>	<p>School Examples of:</p>	<p>School Examples of Division: Example from division exemplification (NCETM) We have 12 sweets. If each child has 2 sweets, how many children will have 2 sweets?  Or 'sharing' model to create an array, as above. EQUAL SHARING Show 12 sweets. Share the sweets equally between two i.e. one for you and one for me – we've used 2 of the sweets. Model this on a bead bar/string and demonstrate recording of one group of 2 sweets on a number line..... Another one for you and one for me – we've used 2 more of the sweets. Model this on a bead bar/string and demonstrate recording of the second group of 2 sweets on a number line..... etc. ALSO: use as above with GROUPING e.g. We have 12 sweets. If each child has 2 sweets, how many children will have 2 sweets? i.e. two for you – that's one group of two – that's one person - model on bead bar and record on a number line as above.  Grouping ITP</p>	<p>School Examples of Division: Other example: How many sticks of 4 cubes can you make from 20 cubes? OR If 20 cubes are shared equally between 4 people, how many cubes do they each get?  GROUPING Show 20 cubes. Divide the cubes into groups of 4 i.e. one group of 4, two groups of 4 and so on..... Model this on a bead bar/string and demonstrate recording of one group of 4 cubes on a number line..... And another group of 4 cubes etc. So, 4 + 4 + 4 + 4 + 4 = 4 x 5 = 20 so 20 ÷ 4 = 5 i.e. 20 divided into groups of 4 equals 5.  Find missing numbers or symbols in a calculation: $\square \div 10 = 3$ Represent e.g. using the Singapore bar:  The bar above represents the unknown quantity. If we divide the bar into 10 equal sections and we know that each section has a value of 3.  So, 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 = 30 OR 3 x 10 = 30 So the value of the empty box here $\square \div 10 = 3$ must be 30 because 30 ÷ 10 = 3 OR as above but divided into GROUPS of 10.</p>
		<p>Opportunities for links with other mathematics domains: Cross-curricular and real life connections Learners will encounter division in: Money - when shopping and recognising prices of items, ordering items by price, sales prices, sharing costs. Measurement - finding journey distances, reading and calculating scales, adjusting recipe quantities.</p>	<p>Opportunities for links with other mathematics domains: Cross-curricular and real life connections Learners will encounter division in: Money – shopping: sales prices, sharing costs. Measurement - finding journey distances, reading and calculating scales, adjusting recipe quantities.</p>

Data - interpreting and evaluating data, calculating amounts from pie charts and pictograms.

Data – interpreting and evaluating data, calculating amounts from pie charts and pictograms