

# Primary Mathematics Scheme of Work: Year 1

Unit	Lessons			Key 'Build a Mathematician' (BAM) Indicators	Essential knowledge
	Autumn	Spring	Summer		
Numbers and the number system	15	10	--	<ul style="list-style-type: none"> <li>Read and write numbers from 1 to 20 in numerals and in words</li> <li>Count to and across 100, forwards and backwards from any given number</li> <li>Count from zero in multiples of 2, 5 and 10</li> <li>Add and subtract a two-digit number and a one-digit number up to 20</li> <li>Solve one-step multiplication and division problems by using concrete objects and pictorial representations</li> <li>Write addition and subtraction statements using the symbols '+', '-' and '='</li> <li>Recognise and name the fractions <math>\frac{1}{2}</math> and <math>\frac{1}{4}</math></li> <li>Tell the time to the hour, and half past the hour, using an analogue clock</li> <li>Sequence events in chronological order</li> <li>Use the comparative vocabulary of length, mass, capacity and time</li> <li>Recognise and name rectangles (including squares), circles and triangles</li> <li>Recognise and name cuboids (including cubes), pyramids and spheres</li> <li>Describe position and movement</li> </ul>	<ul style="list-style-type: none"> <li>Know the symbols =, +, -</li> <li>Know doubles and halves up to 10</li> <li>Know number bonds to 10</li> <li>Know the value of different denominations of coins and notes</li> <li>Know the days of the week</li> <li>Know the meaning of 'weeks', 'months' and 'years'</li> </ul>
Visualising and constructing	5	10	--		
Calculating: addition and subtraction I	15	--	--		
Exploring time	10	--	10		
Calculating: addition and subtraction II	--	10	--		
Measuring space	10	--	--		
Exploring fractions	--	10	--		
Mathematical movement	10	--	--		
Exploring money	--	10	10		
Calculating: multiplication and division	--	--	10		
Numbers and the number system: Going deeper	--	--	5		
Calculating: addition and subtraction I: Going deeper	--	--	5		
Calculating: addition and subtraction II: Going deeper	--	--	5		
Preventing the gap / Going deeper					
<b>Total:</b>		160			

Stage 1 BAM Progress Tracker Sheet

SUMMER TERM- TRY TO DEEPEN IN ORDER FOR ACCESS TO YEAR 2 MATERIAL

2/9/2019	Transition	4/11/2019	Measuring space	6/1/2020	Numbers and the number system	24/2/2020	Exploring money	20/4/2020	Calculating: multiplication and division	1/6/2020	Exploring money
9/9/2019	Numbers and the number system	11/11/20	Exploring time	13/1/202	Calculating: addition and subtraction II	2/3/2020	Consolidation	27/4/2020	Exploring time	8/6/2020	NNS: deeper
16/9/201		18/11/20		20/1/202		9/3/2020		4/5/2020		15/6/202	
23/9/2019	Visualising and constructing	25/11/2019	Whole School Assessment Week	27/1/2020	Exploring fractions	16/3/2020	Whole School Assessment Week	11/5/2020	Exploring time	22/6/2020	CAS1: deeper
30/9/2019		2/12/2019		3/2/2020		23/3/2020		18/5/2020		29/6/2020	Whole School Assessment Week
7/10/2019	Calculating: addition and subtraction I	9/12/2019	Mathematical movement	10/2/2020	Visualising and constructing	30/3/2020				6/7/2020	CASII: deeper
14/10/2019		16/12/2019		13/7/2020							
21/10/2019										20/7/2020	Term ends 20/7/2020





<p><b>Key concepts (National Curriculum Statements)</b></p> <ul style="list-style-type: none"> <li>read and write numbers from 1 to 20 in numerals and words.</li> <li>identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least</li> <li>count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens</li> </ul>	<p>The Big Picture: <a href="#">Number and Place Value progression map</a></p>
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<p><b>Notes and guidance (non-statutory)</b></p> <ul style="list-style-type: none"> <li>Pupils practise counting (1, 2, 3...), ordering (for example, first, second, third...), and to indicate a quantity (for example, 3 apples, 2 centimetres), including solving simple concrete problems, until they are fluent.</li> <li>Pupils begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100, supported by objects and pictorial representations.</li> <li>They practise counting as reciting numbers and counting as enumerating objects, and counting in 2s, 5s and 10s from different multiples to develop their recognition of patterns in the number system (for example, odd and even numbers), including varied and frequent practice through increasingly complex questions.</li> <li>They recognise and create repeating patterns with objects and with shapes.</li> <li>Pupils practise counting (1, 2, 3...), ordering (for example, first, second, third...), and to indicate a quantity (for example, 3 apples, 2 centimetres), including solving simple concrete problems, until they are fluent.</li> <li>Pupils begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100, supported by objects and pictorial representations.</li> <li>They practise counting as reciting numbers and counting as enumerating objects, and counting in 2s, 5s and 10s from different multiples to develop their recognition of patterns in the number system (for example, odd and even numbers), including varied and frequent practice through increasingly complex questions.</li> <li>They recognise and create repeating patterns with objects and with shapes.</li> </ul>
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Band 1 (N-WT)	Band 2 (N-AT)	Band 3 (R-WT)	Band 4 (R-WT)	Band 5 (R-AT)
<ul style="list-style-type: none"> <li>Shows an awareness of number activities and counting</li> <li>Is aware of cause and effects in familiar mathematical activities <i>e.g. knows that in a role play shop a coin can be exchanged for an item</i></li> <li>Pupils show awareness of changes in quantity</li> </ul>	<ul style="list-style-type: none"> <li>Indicates one or two</li> <li>Makes sets that have the same small number of objects in each,</li> <li>Solves simple problems practically eg. checking there is a knife for every fork.</li> <li>Responds to and joins in with familiar number rhymes, stories, songs and games</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrates understanding of 'more'</li> <li>Demonstrates understanding of 1:1 correspondence in range of contexts and counts reliably to 3</li> <li>Joins in rote counting to 5</li> <li>Joins in with new number rhymes, songs stories, games</li> </ul>	<ul style="list-style-type: none"> <li>Counts at least 5 objects reliably</li> <li>Recognises numerals from one to five and to understands that each represents a constant number or amount</li> <li>Joins in rote counting to 10</li> </ul>	<ul style="list-style-type: none"> <li>Counts reliably with numbers from one to 20, places them in order</li> <li>Begins to use ordinal numbers (first, second, last) when describing the position of objects</li> <li>Begins to recognise numerals 1-9 and relate them to sets of objects</li> <li>Recognises differences in quantity</li> <li>Estimates a small number and checks by counting</li> <li>Continues counting from a given small number up to 10</li> <li>Joins in with rote counting beyond 10</li> </ul>

<p><b>Possible themes</b></p> <ul style="list-style-type: none"> <li>Explore the value of numbers</li> <li>Explore where numbers live in our number system</li> <li>Solve problems comparing the value of numbers</li> <li>Investigate number patterns</li> </ul>	<p><b>Possible key learning points</b></p> <ul style="list-style-type: none"> <li>Show the value of a number using objects or pictures</li> <li>Read numbers to 20 in numerals and words</li> <li>Write numbers to 20 and beyond in numerals</li> <li>Write numbers to 20 in words</li> <li>Identify and represent numbers on the number line</li> <li>Identify and represent numbers using pictorial representations</li> </ul>	<ul style="list-style-type: none"> <li>Compare the value of numbers explaining if they are more/ less than or equal to another number or numbers</li> <li>Read and write numbers to 100 in numerals</li> <li>Count on to or back from numbers in ones from any given number up to 100</li> <li>Count in multiples of two starting from zero</li> <li>Count in multiples of five starting from zero</li> <li>Count in multiples of ten starting from zero</li> </ul>
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EYFS – development matters (months)	Mathematical language	Pedagogical notes
<p>16 - 26</p> <ul style="list-style-type: none"> <li>Says some counting words randomly</li> </ul>	<p>One, Two, Three, Four, Five, Six, Seven, Eight, Nine, Ten, Eleven, Twelve, Thirteen, Fourteen, Fifteen, Sixteen, Seventeen, Eighteen, Nineteen, Twenty</p> <p>More than, greater, larger, bigger</p> <p>Less than, fewer, smaller</p> <p>Equal to, the same amount as, as many as</p> <p>Greatest/ Most/biggest/largest</p> <p>Least/fewest/smallest</p> <p>Hundreds, Tens, units (ones)</p> <p>Exchange</p> <p>Digit</p> <p><b>Notation</b></p> <p>The equals symbol (=)</p>	<p>Pupils need to understand that there is a 'stable order' to our counting system and that we say the numbers in a set order (i.e. 1,2,3,4,5,6 not 1,4,3,5,2 etc..). They also need to understand that numbers can be used as labels to represent the final (cardinal) value of a set of objects (i.e. 12 cakes).</p> <p>Pupils need to understand that when counting in our number system we count objects into groups of ten and then groups of one hundred.</p> <p>The = symbol should be modelled when exploring numbers that are equal in value. Practical apparatus such as a pan balance can be used to support this comparison. (Where an equal set of the same weight objects can be compared and the = symbol displayed in the centre of the balance).</p> <p>NRICH: <a href="#">How can I support the development of Early Number Sense and Place Value?</a></p> <p>NCETM: <a href="#">Glossary</a></p> <p><b>Common approaches</b></p> <p><i>Numerals to 100 and beyond – It would help to use three different consistent colours to represent the notation of the hundreds, tens and units digits so that the pupils understand that they read the left (or red) digit first etc.</i></p> <p><i>When counting objects pupils should be encouraged to count into groups of ten and then to discuss whether they have enough objects to make another group of ten or whether they have some 'ones/units' left over.</i></p>
<p>22 - 36</p> <ul style="list-style-type: none"> <li>Recites some number names in sequence.</li> <li>Creates and experiments with symbols and marks representing ideas of number</li> </ul>		
<p>30 - 50</p> <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>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>		
<p>40 – 60+</p> <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> <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> </ul> <p><b>Early Learning Goal</b></p> <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>		

<p><b>Reasoning opportunities and probing questions</b></p> <ul style="list-style-type: none"> <li>Show me (find/ write) the number that will label this group of objects. And Another. And Another.</li> <li>Show me (find/write) a number with 2 tens and another... and another. Which of your numbers is the greatest? And Another.</li> <li>Can you change this pot so that it has enough pencils for 8 children?</li> <li>Convince me that 13 is less than 20.</li> <li>Always/Sometimes/Never: A number with 9 in the units is always bigger than one with 6 in the units.</li> </ul>	<p><b>Suggested activities</b></p> <p>KM: <a href="#">Grab a group</a></p> <p>KM: <a href="#">Greater (more) than/ less than</a></p> <p>KM: Practical counting activities where pupils are encouraged to support with everyday problems (i.e. counting out and labelling the correct number the of milk cartons, pencils, aprons, balls for P.E. etc.)</p> <p>NRICH: <a href="#">Count the crayons</a>, <a href="#">Matching numbers</a>, <a href="#">6 beads</a></p> <p><b>Learning review</b></p> <p>KM: <a href="#">1M1 BAM Task</a>, <a href="#">1M3 BAM Task</a></p> <p>NCETM: <a href="#">NC Assessment Materials (Teaching and Assessing Mastery)</a></p>	<p><b>Possible misconceptions</b></p> <ul style="list-style-type: none"> <li>Some pupils may appear to be counting confidently but they may just be mimicking the rhythm of the counting pattern.</li> <li>Some pupils may not be confident in counting over the tens boundaries</li> <li>Some pupils may not understand that a number can be used to show/ label the final (cardinal) value of the set of objects being counted, i.e. the final number that they have said represents the value of the objects in the set.</li> <li>Some pupils may muddle the 'teen' and the 'ty' numbers</li> <li>Some pupils may read the units digit before the tens digit.</li> </ul>
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Concrete	Pictorial	Abstract



PUMA assessment criteria			NCETM - Exemplification
Autumn	Spring	Summer	
<p>Count to 100, forwards and backwards, beginning with 0 or 1, or from any given number e.g. 19, 18, 17, 16, ...</p> <p>Count, read and write numbers to 100 in numerals, count in multiples of twos and tens e.g. 2, 4, 6, 8, 10, 12, ...</p> <p>Given a number, identify one more and one less</p> <p>Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least</p> <p>Read and write numbers from 1 to 20 in numerals</p> <p>Use language of ordering e.g. first, second, third</p>	<p>Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number</p> <p>Count, read and write numbers to 100 in numerals, count in multiples of twos, fives and tens e.g. 22, 24, 26, 28, 30, ... or 90, 80, 70, 60, ...</p> <p>Given a number, identify one more and one less</p> <p>Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least</p> <p>Read and write numbers from 1 to 20 in numerals and words.</p> <p>Use language of ordering e.g. first, second, third</p> <p>Begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100 supported by objects and pictorial representations</p> <p>Begin to order numbers to 100 (different tens) e.g. order 36, 29, 63, 51</p>	<p>Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number e.g. 103, 102, 101, 100, 99, 98, ...</p> <p>Count, read and write numbers to 100 in numerals, count in multiples of twos, fives and tens e.g. 5, 10, 15, 20, 25, ...</p> <p>Given a number, identify one more and one less</p> <p>Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least</p> <p>Read and write numbers from 1 to 20 in numerals and words.</p> <p>Use language of ordering e.g. first, second, third</p> <p>Recognise odd and even numbers</p> <p>Begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100 supported by objects and pictorial representations</p> <p>Begin to order numbers to 100 (different tens)</p>	<p>count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number</p> <ul style="list-style-type: none"> <li>➤ count forwards from 80 to 110</li> <li>➤ count backwards from 105</li> </ul> <p>count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens</p> <ul style="list-style-type: none"> <li>➤ Find p 39 in a book</li> <li>➤ Make a label to show how many things were in your collection</li> <li>➤ Count groups of 10 each of 2p, 5p and 10p coins</li> </ul> <p>identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least</p> <ul style="list-style-type: none"> <li>➤ <i>I'm giving each of you a strip of card with some numbers on [five numbers at random from 0 to 30].</i></li> <li>➤ <i>Point to the number which is worth most. Now point to the number which is worth least.</i></li> <li>➤ <i>Make these numbers using tens and ones apparatus and put them in order.</i></li> <li>➤ <i>Why have you put this number there?</i></li> </ul> <p>read and write numbers from 1 to 20 in numerals and words</p> <ul style="list-style-type: none"> <li>➤ Make some labels for collections using numbers and words.</li> </ul>



**Key concepts (National Curriculum statements)** **The Big Picture:** [Properties of Shape progression map](#)  
 • recognise and name common 2-D and 3-D shapes, including: 2-D shapes [for example, rectangles (including squares), circles and triangles]; 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]

**Notes and guidance (non-statutory)**  
 • Pupils handle common 2-D and 3-D shapes, naming these and related everyday objects fluently. They recognise these shapes in different orientations and sizes, and know that rectangles, triangles, cuboids and pyramids are not always similar to each other.

**Continuum Reference**

Band 1 (N-WT)	Band 2 (N-AT)	Band 3 (R-WT)	Band 4 (R-WT)	Band 5 (R-AT)
<ul style="list-style-type: none"> <li>✓ Searches for objects that have gone out of sight, hearing or touch</li> <li>✓ Demonstrates interest in position and the relationship between objects.</li> </ul>	<ul style="list-style-type: none"> <li>✓ Searches intentionally for objects in their usual place,</li> <li>✓ Explores the position of objects,</li> <li>✓ Sorts or matches objects or pictures by recognising similarities</li> </ul>	<ul style="list-style-type: none"> <li>✓ Searches for objects not found in their usual place demonstrating their understanding of object permanence,</li> <li>✓ Manipulates three-dimensional shapes,</li> <li>✓ Shows understanding of words signs and symbols that describe positions,</li> </ul>	<ul style="list-style-type: none"> <li>✓ Responds to 'forwards' and 'backwards',</li> <li>✓ Picks out described shapes from a collection,</li> <li>✓ Completes classification activities using a given criterion</li> <li>✓ Identifies when an object is different and does not belong to a given familiar category,</li> </ul>	<ul style="list-style-type: none"> <li>✓ Responds to mathematical vocabulary such as 'straight', 'circle', 'larger' to describe the shape and size of solids and flat shapes,</li> <li>✓ Talks about, recognises and copies simple repeating patterns and sequence.</li> </ul>

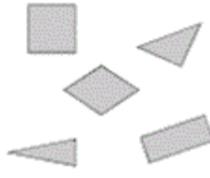
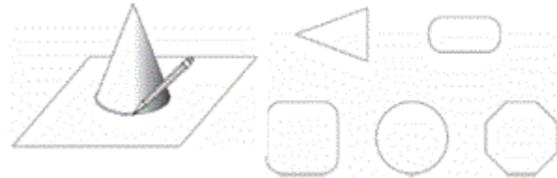
Possible themes	Possible key learning points
<ul style="list-style-type: none"> <li>• Explore 2 –D shapes</li> <li>• Compare 2 –D shapes</li> <li>• Explore 3 –D shapes</li> <li>• Compare 3-D shapes</li> </ul>	<ul style="list-style-type: none"> <li>• Recognise 2-D shapes</li> <li>• Recognise and name rectangles</li> <li>• Recognise and name squares</li> <li>• Recognise and name circles</li> <li>• Recognise and name triangles</li> <li>• Compare 2-D shapes and explain how they are similar or different</li> <li>• Recognise 3-D shapes</li> <li>• Recognise and name cuboids</li> <li>• Recognise and name cubes</li> <li>• Recognise and name pyramids</li> <li>• Recognise and name sphere</li> <li>• Compare 3-D shapes and explain how they are similar or different</li> </ul>

EYFS – development matters (months)	Mathematical language	Pedagogical notes
<p>16 - 26</p> <ul style="list-style-type: none"> <li>✓ Attempts, sometimes successfully, to fit shapes into spaces on inset boards or jigsaw puzzles.</li> <li>✓ Uses blocks to create their own simple structures and arrangements.</li> </ul>	<p>2-D shape (polygon)                      Rectangle, square, circle, triangle and other 2-D shapes if appropriate</p> <p>3-D shape                      Cuboid, cube, cone, cylinder, pyramid, sphere</p> <p>Shape, pattern                      Flat, curved, straight, round, hollow, solid                      Corner, point, pointed                      Face, side, edge, end                      Sort, make, build, draw</p>	<p>Note that a square is a rectangle but a rectangle is not necessarily a square. A rectangle is a 4 sided polygon with opposite sides that are equal in length and 4 right angled corners.</p> <p>Pupils may also know names of other polygons such as pentagon (5 sides), hexagon (6 sides), heptagon (7 sides), octagon (8 sides), nonagon (9 sides), decagon (10 sides) and dodecagon (12 sides). Most sets of shapes that are available to buy represent shapes often in their regular form. Be careful not to only present shapes in a regular form or in a specific orientation as this could lead to possible misconceptions.</p> <p>NCETM: <a href="#">Glossary</a></p> <p><b>Common approaches</b>                      Every classroom displays shapes in different orientations.                      Every classroom displays regular and irregular hexagons, pentagons, octagons and decagons</p>
<p>22 - 36</p> <ul style="list-style-type: none"> <li>✓ Notices simple shapes and patterns in pictures.</li> <li>✓ Beginning to categorise objects according to properties such as shape or size.</li> <li>✓ Begins to use the language of size.</li> </ul>		
<p>30 - 50</p> <ul style="list-style-type: none"> <li>✓ Shows an interest in shape and space by playing with shapes or making arrangements with objects.</li> <li>✓ Shows awareness of similarities of shapes in the environment.</li> <li>✓ Uses positional language.</li> <li>✓ Shows interest in shape by sustained construction activity or by talking about shapes or arrangements.</li> <li>✓ Shows interest in shapes in the environment.</li> <li>✓ Uses shapes appropriately for tasks.</li> <li>✓ Beginning to talk about the shapes of everyday objects, e.g. 'round' and 'tall'.</li> </ul>		
<p>40 – 60+</p> <ul style="list-style-type: none"> <li>✓ Beginning to use mathematical names for 'solid' 3D shapes and 'flat' 2D shapes, and mathematical terms to describe shapes.</li> <li>✓ Selects a particular named shape.</li> <li>✓ Can describe their relative position such as 'behind' or 'next to'.</li> </ul> <p><b>Early Learning Goal</b>                      Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them</p>		

Reasoning opportunities and probing questions	Suggested activities	Possible misconceptions
<ul style="list-style-type: none"> <li>• Look at the shapes in front of you...What can you tell me about the shapes?</li> <li>• Show me a shape with four sides. And Another. And Another.</li> <li>• Convince me that this is a square (rectangle, circle, triangle, cuboid, cube, cone, pyramid, sphere etc.)</li> <li>• Always/ Sometimes/ Never: A shape with 4 straight sides is a square.</li> <li>• Always/ Sometimes/ Never: A shape with 3 sides and 3 corners is a triangle</li> </ul>	<p>KM: Making shapes: Encourage pupils to explore the properties of 2-D and 3-D shapes using practical apparatus such as geoboards, construction apparatus, ICT resources for example the polygon ITP and outdoor equipment (for example garden canes). Encourage the pupils to match cards with names of the shapes written on them (or to attempt to spell the names themselves)</p> <p>KM: Shape challenges: Link challenges involving shapes to other areas of the curriculum. (For example what shapes could they use to create a repeating pattern for some wrapping paper etc.)</p> <p>NRICH: <a href="#">Chain of changes</a>                      NRICH: <a href="#">Playing with 2D shape</a>                      NRICH: <a href="#">Matching Triangles</a>                      NRICH: <a href="#">What Shape for Two</a></p> <p><b>Learning review</b>                      KM: <a href="#">1M11 BAM Task</a>, <a href="#">1M12 BAM Task</a>                      NCETM: <a href="#">NC Assessment Materials (Teaching and Assessing Mastery)</a></p>	<ul style="list-style-type: none"> <li>• Some pupils may think that a rectangle and square are the same shape.</li> <li>• Some pupils may think that a cuboid and cube are the same solid.</li> <li>• Some pupils may be confused over the language used to describe the properties of shapes (for example using edges rather than sides when describing 2-D shapes)</li> <li>• Some pupils may only recognise shapes when they are in a specific (often horizontal orientation)</li> <li>• Some pupils think that all hexagons, pentagons, octagons and decagons are regular</li> </ul>

Concrete	Pictorial	Abstract



PUMA assessment criteria			NCETM - Exemplification
Autumn	Spring	Summer	
<p>Recognise and name common 2-D and 3-D shapes, including:</p> <ul style="list-style-type: none"> <li>o 2-D shapes (e.g. rectangles (including squares), circles and triangles)</li> <li>o 3-D shapes (e.g. cuboids, including cubes, pyramids and spheres)</li> </ul> <p>Describe positions, directions and movements using language such as left and right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far, up and down, forwards and backwards, inside and outside...</p>	<p>Recognise and name common 2-D and 3-D shapes, in different orientations and sizes, including:</p> <ul style="list-style-type: none"> <li>o 2-D shapes (e.g. rectangles (including squares), circles and triangles)</li> <li>o 3-D shapes (e.g. cuboids, including cubes, pyramids and spheres).</li> </ul> <p>Know that rectangles, triangles, cuboids and pyramids can be different shapes</p> <p>Describe positions, directions and movements using language such as left and right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far, up and down, forwards and backwards, inside and outside...</p> <p>Describe position, directions and movements, including half and quarter turns, in a clockwise direction</p>	<p>Recognise and name common 2-D and 3-D shapes, in different orientations and sizes, including:</p> <ul style="list-style-type: none"> <li>o 2-D shapes (e.g. rectangles (including squares), circles and triangles)</li> <li>o 3-D shapes (e.g. cuboids (including cubes), pyramids and spheres).</li> </ul> <p>know that rectangles, triangles, cuboids and pyramids can be different shapes</p> <p>Describe positions, directions and movements using language such as left and right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far, up and down, forwards and backwards, inside and outside...</p> <p>Describe position, directions and movements, including half, quarter and three-quarter turns, in a clockwise direction</p>	<p>Pupils should be taught to recognise and name common 2-D and 3-D shapes, including [for example] rectangles (including squares), circles, triangles, cuboids (including cubes), pyramids and spheres.</p> <ul style="list-style-type: none"> <li>➤ <b>Give each child this shape</b>  <p>Child A Child B Child C Child D</p> <p>Look at the Shape I have given you. Tell me one thing about the shape.</p> </li> <li>➤ <b>Hand each child this shape.</b> <p>Child A: cylinder Child B: triangular prism Child C: cone Child D: cube</p> <p>Look at the shape I have given you. Tell me one thing about the shape.</p> </li> <li>➤ (Give each child two different shapes.) Tell me something that is the same about the two shapes. Now tell me something that is different about the two shapes. One shape has 2 long sides and 2 short sides. Tick (✓) it.</li> </ul>  <ul style="list-style-type: none"> <li>➤ <b>Fred draws round the bottom of a cone.</b>  <p>Tick (✓) the shape that Fred draws.</p> </li> </ul>



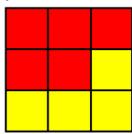
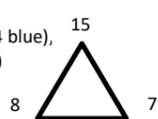
<p><b>Key concepts (National Curriculum statements)</b></p> <ul style="list-style-type: none"> <li>given a number, identify one more and one less</li> <li>count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number</li> <li>represent and use number bonds and related subtraction facts within 20</li> </ul>	<p>The Big Picture: <a href="#">Calculation progression map</a></p>
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<p><b>Non-statutory guidance</b></p> <ul style="list-style-type: none"> <li>Pupils practise counting (1, 2, 3...), ordering (for example, first, second, third...), and to indicate a quantity (for example, 3 apples, 2 centimetres), including solving simple concrete problems, until they are fluent.</li> <li>Pupils begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100, supported by objects and pictorial representations.</li> <li>They practise counting as reciting numbers and counting as enumerating objects, and counting in 2s, 5s and 10s from different multiples to develop their recognition of patterns in the number system (for example, odd and even numbers), including varied and frequent practice through increasingly complex questions.</li> <li>They recognise and create repeating patterns with objects and with shapes.</li> </ul>
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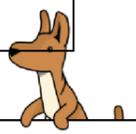
Continuum Reference				
Band 1 (N-WT)	Band 2 (N-AT)	Band 3 (R-WT)	Band 4 (R-WT)	Band 5 (R-AT)
<ul style="list-style-type: none"> <li>Shows an awareness of number activities and counting</li> <li>Is aware of cause and effects in familiar mathematical activities e.g. <i>knows that in a role play shop a coin can be exchanged for an item</i></li> <li>Pupils show awareness of changes in quantity</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrates awareness of contrasting quantities - Makes 'one' and 'lots' by making groups of one or lots of food items on plates</li> <li>Demonstrates awareness of contrasting quantities - difference</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrates understanding of 'more' - Asks for 'more' e.g. cups, food items as required</li> <li>Demonstrates an understanding of 'less' - Indicates which bottle has less water in it</li> </ul>	<ul style="list-style-type: none"> <li>In practical situations responds to 'add one' to a number of objects - Responds to requests such as add one pencil to the pencils in the pot, add one sweet to the dish</li> <li>In practical situations responds to 'add one' to or 'take one away' from a number of objects - Using objects placed on or people standing on a number track, adds or removes object and says, signs or indicates how many</li> </ul>	<ul style="list-style-type: none"> <li>Says which number is one more than a given number</li> <li>Using quantities and objects, adds two single-digit numbers and counts on to find the answer</li> <li>Says which number is one less than a given number</li> <li>Using quantities and objects, subtracts two single-digit numbers and counts back to find the answer</li> </ul>

Possible themes	Possible key learning points
<ul style="list-style-type: none"> <li>Investigate one more or one less than any number</li> <li>Investigate number patterns</li> <li>Explore addition and subtraction facts</li> </ul>	<ul style="list-style-type: none"> <li>Identify the number that is one more than a given number</li> <li>Identify the number that is one less than a given number</li> <li>Know addition facts to 10</li> <li>Know subtraction facts from 10</li> <li>Know addition facts within 10</li> <li>Know subtraction facts within 10</li> <li>Know addition facts to 20</li> <li>Know subtraction facts from 20</li> <li>Know addition facts within 20</li> <li>Know subtraction facts within 20</li> <li>Count to and across 100 and beyond in ones from any number</li> <li>Count back from 100 and beyond in ones from any number</li> </ul>

EYFS – development matters (months)	Prerequisites	Mathematical language	Pedagogical notes
16 - 26	<ul style="list-style-type: none"> <li>Order numbers to 20 accurately</li> <li>Understand how a number line is organised</li> </ul>	One more, one less Count on, count back One hundred Number bonds/ number facts Addition facts/ subtraction facts Fact family	It is vital that pupils are supported in identifying numbers more/ less than a given number and in counting to from 100 and beyond with visual resources such as the number line or number grid. It is helpful to show the pupils that the number grid is actually just a number track in a different orientation (as some pupils will not have made the connection)  KM: <a href="#">Progression: Addition and Subtraction</a> and <a href="#">Calculation overview</a> NCETM: <a href="#">The Bar Model</a> and <a href="#">Subtraction</a> NCETM: <a href="#">Glossary</a>  <b>Common approaches</b> <i>Numerals to 100 and beyond – It would help to use three different consistent colours to represent the notation of the hundreds, tens and units digits so that the pupils understand that they read the left (or red) digit first etc.</i> <i>When exploring addition and subtraction facts pupils are given the opportunity to explore relationships practically and to understand how subtraction undoes addition. Encourage them to explore the relationships and to notice patterns through linking the practical exploration with the abstract notation as it will support them in internalising related facts.</i>
22 - 36	<ul style="list-style-type: none"> <li>Count accurately from 0 to 21</li> <li>Count up to 20 objects accurately and attribute the correct numeral to label the set</li> <li>Subitise small groups of objects (i.e. can say how many there are without needing to count each individual object.)</li> </ul>		
30 - 50	<ul style="list-style-type: none"> <li>Understand the 'cardinal' value of a set/ array. (Once it has been counted they understand that they don't need to count again.)</li> </ul>		
40 – 60+	<ul style="list-style-type: none"> <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></p> <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>		

Reasoning opportunities and probing questions	Suggested activities	Possible misconceptions
<ul style="list-style-type: none"> <li>I'm thinking of a number. It is 1 more / less than 36. What number am I thinking of?</li> <li>Kenny says that one less than 53 is 43. Is he correct?</li> <li>I will clap where a number is missing: 78, 79, 80 ... clap ... 82, 83, 84. What number did I miss?</li> <li>If I know that <math>3 + 7 = 10</math>, what else do I know?</li> <li>What facts can you tell me from this array?</li> </ul> 	<p>KM: <a href="#">One more/one less; Pause it ; Stand up if you are...</a></p> <p>KM: Fact families: Use practical apparatus (arrays) to explore related number facts. For example fact family puzzles (which pieces combine to reach the target number), coat hanger and pegs, flip flaps, bags with different target amounts (and different combinations of coloured counters; i.e. 2 red and 4 blue), the ITP number facts and triominos (see example)</p>  <p><b>Learning review</b>                      KM: <a href="#">1M2 BAM Task</a>                      NCETM: <a href="#">NC Assessment Materials (Teaching and Assessing Mastery)</a></p>	<ul style="list-style-type: none"> <li>Some pupils might count the number that they are starting from as one of the numbers in the count when adding on or counting back.</li> <li>Some pupils may appear to be counting confidently but they may just be mimicking the rhythm of the counting pattern.</li> <li>When exploring related number facts some pupils may just manipulate the numbers and record incorrectly. For example instead of understanding that they need to subtract from the largest number (for example <math>10 - 6 = 4</math>) they may move the numbers around because they think they are related (for example <math>6 - 4 = 10</math>).</li> </ul>

Concrete	Pictorial	Abstract



PUMA assessment criteria			NCETM - Exemplification
Autumn	Spring	Summer	
<p>Solve simple one-step problems (in familiar practical contexts, including using quantities) that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems e.g. <math>3 + \square = 7</math></p> <p>Problems should include vocabulary such as: put together, add, altogether, total, take away, more than, less than...</p> <p>Represent, memorise and use number bonds and related subtraction facts within 10, in several forms e.g. <math>3 + 4 = 7</math>; <math>4 = 7 - 3</math>;</p>	<p>Solve simple one-step problems (in familiar practical contexts, including using quantities) that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems</p> <p>Problems should include vocabulary such as: put together, add, altogether, total, take away, distance between, more than, less than...</p> <p>Represent, memorise and use number bonds and related subtraction facts within 10, in several forms, and begin to know doubles to 20 e.g. <math>8 + 8 = 16</math></p> <p>complements to 20 e.g. <math>8 + 12 = 20</math></p>	<p>Solve simple one-step problems (in familiar practical contexts, including using quantities) that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems e.g. <math>7 = \square - 9</math></p> <p>Problems should include vocabulary such as: put together, add, altogether, total, take away, distance between, more than, less than...</p> <p>Represent, memorise and use number bonds and related subtraction facts within 20, in several forms e.g. <math>9 + 7 = 16</math>; <math>16 - 7 = 9</math>; <math>7 = 16 - 9</math></p>	<p>count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number</p> <ul style="list-style-type: none"> <li>➤ count forwards from 80 to 110</li> <li>➤ count backwards from 105</li> </ul> <p>given a number, identify one more and one less</p> <ul style="list-style-type: none"> <li>➤ <i>There are twenty nine beads in this pot. I am putting one more bead in the pot. How many are in there now? How did you know? How can you check?</i></li> <li>➤ <i>This time there are forty beads in the pot. I take out one bead. How many beads are left in the pot? How did you know? How can you check?</i></li> <li>➤ <i>Start with a different number of beads in the pot. Ask your partner to put another bead in or take one out and then say how many there are in the pot. How will you know if your partner is right?</i></li> </ul> <p>identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least</p> <ul style="list-style-type: none"> <li>➤ <i>I'm giving each of you a strip of card with some numbers on [five numbers at random from 0 to 30].</i></li> <li>➤ <i>Point to the number which is worth most. Now point to the number which is worth least.</i></li> <li>➤ <i>Make these numbers using tens and ones apparatus and put them in order.</i></li> </ul> <p><i>Why have you put this number there?</i></p>



<p><b>Key concepts (National Curriculum statements)</b></p> <ul style="list-style-type: none"> <li>recognise and use language relating to dates, including days of the week, weeks, months and years</li> <li>sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]</li> <li>tell the time to the hour and half past the hour and draw the hands on a clock face to show these times</li> </ul>	<p>The Big Picture: <a href="#">Measurement and mensuration progression map</a></p>
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<p><b>Notes and guidance (non-statutory)</b></p> <ul style="list-style-type: none"> <li>Pupils use the language of time, including telling the time throughout the day, first using o'clock and then half past.</li> </ul>
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Continuum Reference				
Band 1 (N-WT)	Band 2 (N-AT)	Band 3 (R-WT)	Band 4 (R-WT)	Band 5 (R-AT)
N/A	N/A	N/A	N/A	<ul style="list-style-type: none"> <li>Shows awareness of time, through some familiarity with names of the days of the week and significant times in their day, e.g. bedtime</li> <li>Understands now and next, after</li> </ul>

Possible themes	Possible key learning points
<ul style="list-style-type: none"> <li>Understand the vocabulary of time</li> <li>Organise events</li> <li>Explore telling the time</li> </ul>	<ul style="list-style-type: none"> <li>Know and use the days of the week</li> <li>Know and use the months of the year</li> <li>Know the number of days in each month</li> <li>Recognise and use language relating to dates, including days of the week, weeks, months and years</li> <li>Tell the time to the hour</li> <li>Tell the time to half past the hour</li> <li>Draw hands on a clock face to show time to the hour and half past the hour</li> <li>Draw hands on a clock face to show time to half past the hour</li> <li>Sequence events in chronological order within the same day</li> <li>Sequence events in chronological order within the same week</li> <li>Solve simple problems involving time</li> </ul>

EYFS – development matters (months)	Prerequisites	Pedagogical notes							
<table border="1"> <tr> <td>16 - 26</td> <td> <ul style="list-style-type: none"> <li>Associates a sequence of actions with daily routines</li> <li>Beginning to understand that things might happen 'now'.</li> </ul> </td> <td rowspan="4"> <p>Many people see Monday as the first day of the week as this links to the working week and makes sense as we describe a Saturday and Sunday as the weekend with the children. Notice the content of rhymes and songs as most start with Sunday as the first day of the week.</p> <p>While this unit focuses on pupils' understanding of key concepts and facts related to time, it is important that the ideas are reinforced through the whole year.</p> <p>Notice that months 1, 3, 5, 7 and 8, 10, 12 have 31 days.</p> <p>October was originally the eighth month in the Roman calendar (and so on), but the months of January and February were later inserted. July and August were also renamed in honour of Roman emperors.</p> <p>NCETM: <a href="#">Glossary</a></p> <p><b>Common approaches</b></p> <p><i>Sunday is promoted as the first day of the week (Sunday is linked to history as the first day of the week, as in religion people rested on the Sabbath (Saturday) and celebrated on the Sunday.)</i></p> <p><i>Every classroom has a set of geared mini-clocks and a larger teacher version. The classroom clock has labels for quarter past, half past and quarter to.</i></p> </td> </tr> <tr> <td>22 - 36</td> <td> <ul style="list-style-type: none"> <li>Understands some talk about immediate past and future, e.g. 'before', 'later' or 'soon'.</li> <li>Anticipates specific time-based events such as mealtimes or home time.</li> </ul> </td> </tr> <tr> <td>30 - 50</td> <td> <p><b>Mathematical language</b></p> <p>Day, week, month, season, year, leap year</p> <p>Weekend, fortnight</p> <p>Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday</p> <p>January, February, March, April, May, June, July, August, September, October, November, December</p> <p>Before, after, next, first, today, yesterday, tomorrow, morning, afternoon, evening</p> <p>Clock</p> <p>Hand, hour hand, minute hand</p> <p>Hour, minute</p> <p>o'clock, half past</p> <p><b>Notation</b></p> <p>A colon is used to separate hours and minutes when writing the time</p> </td> </tr> <tr> <td>40 – 60+</td> <td> <ul style="list-style-type: none"> <li>Uses everyday language related to time.</li> <li>Beginning to use everyday language related to money.</li> <li>Orders and sequences familiar events.</li> <li>Measures short periods of time in simple ways.</li> </ul> <p><b>Early Learning Goal</b></p> <ul style="list-style-type: none"> <li>Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. 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Reasoning opportunities and probing questions	Suggested activities	Possible misconceptions
<ul style="list-style-type: none"> <li>Show me a month in the summer. And another, and another.</li> <li>What is the same and what is different: Monday, Wednesday, Thursday, Saturday?</li> <li>Convince me that there are seven days in a week</li> <li>Always / Sometimes / Never:             <ul style="list-style-type: none"> <li>You get dressed before you go to school</li> <li>You have lunch at 12 o'clock</li> </ul> </li> </ul>	<p>KM: <a href="#">Your week in a box</a></p> <p>KM: <a href="#">Build and explore a clock</a></p> <p>KM: Create a visual timetable for each school day and encourage the children to create visual timetables for their weekend. Use these as reference points to model/use/reinforce days of the week.</p> <p>NRICH: <a href="#">Times of Day</a></p> <p>NRICH: <a href="#">Snap</a></p> <p>NCETM: <a href="#">Activity C</a></p> <p>NCETM: <a href="#">Activity D</a></p> <p><b>Learning review</b></p> <p>KM: <a href="#">1M8 BAM Task</a>, <a href="#">1M9 BAM Task</a></p> <p>NCETM: <a href="#">NC Assessment Materials (Teaching and Assessing Mastery)</a></p>	<ul style="list-style-type: none"> <li>Some pupils may think that the hour hand is the long hand as it is more important</li> <li>Some pupils may think that every month is of equal length</li> <li>Some pupils may read a clock face in an anti-clockwise direction</li> <li>Some pupils may think that there are ten months in a year</li> </ul>

Concrete	Pictorial	Abstract



PUMA assessment criteria			NCETM - Exemplification
Autumn	Spring	Summer	
Sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening	Sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening	Recognise and use language relating to dates, including days of the week, weeks, months and years	sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening
Recognise and use language relating to dates, including days of the week, weeks, months and years	Recognise and use language relating to dates, including days of the week, weeks, months and years	Sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening	<ul style="list-style-type: none"> <li>➤ Continue to develop the concept of time in terms of time passing and sequencing events in familiar story or day-to-day routines.</li> <li>➤ They use terms such as morning, afternoon and evening, yesterday and tomorrow.</li> <li>➤ They learn to order the days of the week and learn that weekend days are Saturday and Sunday.</li> <li>➤ They listen to stories and rhymes about time, such as The Very Hungry Caterpillar or The Bad-Tempered Ladybird by Eric Carle, Monster Monday by Susanna Gretz or Hard Boiled Legs by Michael Rosen and Quentin Blake.</li> </ul>
Tell the time to the hour and draw the hands on a clock face to show these times.	Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.	Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times	<p>recognise and use language relating to dates, including days of the week, weeks, months and years</p> <ul style="list-style-type: none"> <li>➤ order the months of the year and make a 12-page classroom calendar with pictures of each month, writing significant events underneath, such as Divali, Pancake Day or Midsummer's Day, or the dates of their birthdays.</li> </ul> <p>tell the time to the hour and half past the hour and draw the hands on a clock face to show these times</p> <ul style="list-style-type: none"> <li>➤ Read time to the hour and half hour on a clock with hands and recognise half past the hour in day-to-day routines. They use time lines or clocks to help them to respond to questions such as:</li> <li>➤ It's half past seven. What time will it be in four hours' time? What time was it two hours ago?</li> <li>➤ John went to the park at 9 o'clock. He left at half past eleven. How long was he at the park?</li> </ul>



**Key concepts (National Curriculum statements)**

The Big Picture: [Calculation progression map](#)

- read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs
- add and subtract one-digit and two-digit numbers to 20, including zero
- solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as  $7 = \square - 9$

**Non-Statutory guidance**

- Pupils memorise and reason with number bonds to 10 and 20 in several forms (for example,  $9 + 7 = 16$ ;  $16 - 7 = 9$ ;  $7 = 16 - 9$ ). They should realise the effect of adding or subtracting 0. This establishes addition and subtraction as related operations.
- Pupils combine and increase numbers, counting forwards and backwards.
- They discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly.

**Continuum Reference**

Band 1 (N-WT)	Band 2 (N-AT)	Band 3 (R-WT)	Band 4 (R-WT)	Band 5 (R-AT)
<ul style="list-style-type: none"> <li>✓ Shows an awareness of number activities and counting</li> <li>✓ Is aware of cause and effects in familiar mathematical activities e.g. <i>knows that in a role play shop a coin can be exchanged for an item</i></li> <li>✓ Pupils show awareness of changes in quantity</li> </ul>	<ul style="list-style-type: none"> <li>✓ Demonstrates awareness of contrasting quantities - Makes 'one' and 'lots' by making groups of one or lots of food items on plates</li> <li>✓ Demonstrates awareness of contrasting quantities</li> </ul>	<ul style="list-style-type: none"> <li>✓ Demonstrates understanding of 'more' - Asks for 'more' e.g. cups, food items as required</li> <li>✓ Demonstrates an understanding of 'less' - Indicates which bottle has less water in it</li> </ul>	<ul style="list-style-type: none"> <li>✓ In practical situations responds to 'add one' to a number of objects - Responds to requests such as add one pencil to the pencils in the pot, add one sweet to the dish</li> <li>✓ In practical situations responds to 'add one' to or 'take one away' from a number of objects - Using objects placed on or people standing on a number track, adds or removes object and says, signs or indicates how many</li> </ul>	<ul style="list-style-type: none"> <li>✓ Says which number is one more than a given number</li> <li>✓ Using quantities and objects, adds two single-digit numbers and counts on to find the answer</li> <li>✓ Says which number is one less than a given number</li> <li>✓ Using quantities and objects, subtracts two single-digit numbers and counts back to find the answer</li> </ul>

**Possible themes**

- Explore ways of writing mathematical statements
- Solve addition and subtraction problems

**Possible key learning points**

- Add two one-digit numbers to 20, including zero
- Add a one-digit and two-digit numbers to 20, including zero
- Read and interpret statements involving the symbols '+' and '=' involving numbers up to 20
- Write statements involving the symbols '+' and '=' involving numbers up to 20
- Subtract one-digit number (a) from another one-digit number (b, a<b) within 20, including zero
- Subtract a one-digit number from a two-digit numbers within 20, including zero
- Read and interpret statements involving the symbols '-' and '=' involving numbers up to 20
- Write statements involving the symbols '-' and '=' involving numbers up to 20
- Solve one-step problems calculations involving numbers up to 20 using concrete objects and pictorial representations
- Solve missing number problems involving adding numbers to 20
- Solve missing number problems involving subtracting numbers within 20

**EYFS – development matters (months)**

16 - 26	✓
22 - 36	<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> </ul>
30 - 50	<ul style="list-style-type: none"> <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>
40 - 60+	<ul style="list-style-type: none"> <li>✓ Counts out up to six objects from a larger group.</li> <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></p> <ul style="list-style-type: none"> <li>✓ 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.</li> </ul>

**Prerequisites**

- Identify the number that is one more than a number
- Identify the number that is one less than a number
- Know addition and subtraction facts to and from 10
- Know addition and subtraction facts within 10
- Know addition and subtraction facts to and from 20
- Know addition and subtraction facts within 20
- Pupils need to be able to count on and back in ones from any given number to 20.
- Pupils need to be able to read, write and order numbers to at least 20

**Pedagogical notes**

The equals symbol means 'the left side is equal in value to the right side'. It is sometimes seen as meaning 'the answer is' and as a result pupils may think that  $7 = 3 + 4$  is not a correct statement, or they may think that  $2 + 5 = 3 + 4$  is an incomplete statement.

The equals symbol (=) was introduced in 1557 by a Welsh mathematician named Robert Recorde. He also introduced the addition symbol (+) to the English-speaking world.

To help develop conceptual understanding concrete apparatus (base-10 equipment, Numicon, etc.) needs to be used alongside pictorial representations (an empty number line, partitioning, etc.)

KM: [Progression: Addition and Subtraction](#) and [Calculation overview](#)  
 NCETM: [Designing a calculation policy](#), [The Bar Model](#) and [Subtraction](#)  
 NCETM: [Glossary](#)  
 NRICH: [Developing Number Fluency - What, Why and How](#)

**Mathematical language**

Add, subtract  
 Count on, count back  
 More, less  
 Plus, minus, total, sum  
 Difference between  
 Equal, equal to

**Notation**

The symbols '+', '−' and '='

**Common approaches**

To avoid confusion with language, all teachers use 'sum' to refer only to the result of an addition. Teachers say 'complete these calculations' instead of 'complete these sums'  
 Teachers avoid saying '2 take away 7' is not possible.

**Reasoning opportunities and probing questions**

- Always / Sometimes / Never: The equals sign always comes at the end of the mathematical statement
- Convince me that  $5 = 9 - 4$
- Convince me that  $12 + 7 = 19$
- Show me a calculation which is equal to 7. And another, and another...

**Suggested activities**

KM: [Balance statements](#)  
 KM: Using a large number track or number tiles encourage the children to step along the number line to count on / back to aid addition / subtraction. Discuss whether pupils could step in different step sizes and use their knowledge of number bonds to 10 to help them.  
 NRICH: [I'm Eight](#)  
 NRICH: [2, 4, 6, 8](#)  
 NCETM: [Activity A](#), [Activity C](#)

**Learning review**

KM: [1M4 BAM Task](#), [1M6 BAM Task](#)  
 NCETM: [NC Assessment Materials \(Teaching and Assessing Mastery\)](#)

**Possible misconceptions**

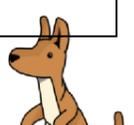
- Some pupils may first include the number that they count from, add to or subtract from (therefore they may be out by 1 each time)
- Some pupils may think that the equals sign means 'makes', or 'is equal to'
- Some pupils may think that there always 'has to be an answer' when writing statements using the equals symbol

**Concrete**

**Pictorial**

**Abstract**

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PUMA assessment criteria			NCETM - Exemplification
Autumn	Spring	Summer	
<p>Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</p> <p>Add and subtract one-digit and two-digit numbers to 20 (<math>9 + 9</math>, <math>18 - 9</math>), including zero</p> <p>Solve simple one-step problems (in familiar practical contexts, including using quantities) that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems e.g. <math>3 + \square = 7</math></p> <p>Problems should include vocabulary such as: put together, add, altogether, total, take away, more than, less than...</p> <p>Represent, memorise and use number bonds and related subtraction facts within 10, in several forms e.g. <math>3 + 4 = 7</math>; <math>4 = 7 - 3</math>;</p>	<p>Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</p> <p>Add and subtract one-digit and two-digit numbers to 20 (<math>9 + 9</math>, <math>18 - 9</math>), including zero</p> <p>Solve simple one-step problems (in familiar practical contexts, including using quantities) that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems</p> <p>Problems should include vocabulary such as: put together, add, altogether, total, take away, distance between, more than, less than...</p> <p>Represent, memorise and use number bonds and related subtraction facts within 10, in several forms, and begin to know doubles to 20 e.g. <math>8 + 8 = 16</math> complements to 20 e.g. <math>8 + 12 = 20</math></p>	<p>Add and subtract one-digit and two-digit numbers to 20 (<math>9 + 9</math>, <math>18 - 9</math>), including zero</p> <p>Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</p> <p>Solve simple one-step problems (in familiar practical contexts, including using quantities) that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems e.g. <math>7 = \square - 9</math></p> <p>Problems should include vocabulary such as: put together, add, altogether, total, take away, distance between, more than, less than...</p> <p>Represent, memorise and use number bonds and related subtraction facts within 20, in several forms e.g. <math>9 + 7 = 16</math>; <math>16 - 7 = 9</math>; <math>7 = 16 - 9</math></p>	<p>read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</p> <ul style="list-style-type: none"> <li>➤ Use the vocabulary add, subtract, minus, equals, is the same value as, total, more than, fewer/less than.</li> <li>➤ Explain that things on both sides of the equals sign have the same value</li> <li>➤ Know that the 'total' can be presented on either side of the equals sign</li> <li>➤ Complete 'empty box' number sentences</li> </ul> <p>represent and use number bonds and related subtraction facts within 20</p> <ul style="list-style-type: none"> <li>➤ I'm thinking of a number. I've subtracted 6 and the answer is 8. What number was I thinking of? Explain how you know.</li> <li>➤ I'm thinking of a number. I've added 7 and the answer is 18. What number was I thinking of? Explain how you know.</li> <li>➤ I know that 6 and 4 is 10. How can I find <math>7 + 4</math>? How could you work it out?</li> </ul> <p>add and subtract one-digit and two-digit numbers to 20, including zero</p> <ul style="list-style-type: none"> <li>➤ What is 37 subtract 10? How did you work that out? How could you show that using cubes/a number line/a 100-square? What would 37 subtract 20 be?</li> <li>➤ Make up some difference questions with the answer 5. Can you show how to solve them using counters? Can you show how to find the answer on a number line?</li> </ul> <p>solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as <math>7 = ? - 9</math>.</p> <ul style="list-style-type: none"> <li>➤ Make up some additions with the answer 15. Try to put them in different ways, like this: <math>10 + 5 = 15</math>. The total of 10 and 5 is 15. 10 and 5 more makes 15.</li> <li>➤ How many ways can you show me that 9 subtract 3 is 6?</li> <li>➤ Make up some subtractions with the answer 5. Try to put them in different ways, like this: <math>11 - 6 = 5</math>. The difference between 6 and 11 is 5.</li> </ul>



**Key concepts (National Curriculum statements)**

The Big Picture: [Measurement and mensuration progression map](#)

- measure and begin to record the following: lengths and heights; mass/weight; capacity and volume; time (hours, minutes, seconds)
- compare, describe and solve practical problems for: lengths and heights [for example, long/short, longer/shorter, tall/short, double/half]; mass/weight [for example, heavy/light, heavier than, lighter than]; capacity and volume [for example, full/empty, more than, less than, half, half full, quarter]; time [for example, quicker, slower, earlier, later]

**Non statutory guidance**

(The pairs of terms: mass and weight, volume and capacity, are used interchangeably at this stage)

- Pupils move from using and comparing different types of quantities and measures using non-standard units, including discrete (for example, counting) and continuous (for example, liquid) measurement, to using manageable common standard units.
- In order to become familiar with standard measures, pupils begin to use measuring tools such as a ruler, weighing scales and containers.
- Pupils use the language of time, including telling the time throughout the day, first using o'clock and then half past.

**Continuum References**

Band 1 (N-WT)	Band 2 (N-AT)	Band 3 (R-WT)	Band 4 (R-WT)	Band 5 (R-AT)
<ul style="list-style-type: none"> <li>✓ Matches big objects and small objects,</li> <li>✓ Anticipates, follow and joins in familiar activities when given a contextual clue,</li> </ul>	<ul style="list-style-type: none"> <li>✓ Finds big and small objects on request,</li> <li>✓ Compares the overall size of one object with that of another where there is a marked difference,</li> </ul>	<ul style="list-style-type: none"> <li>✓ Compares the overall size of one object with that of another where the difference is not great</li> </ul>	<ul style="list-style-type: none"> <li>✓ Uses familiar words in practical situations when they compare sizes and quantities</li> </ul>	<ul style="list-style-type: none"> <li>✓ Compares objects directly, focusing on one dimension such as length or height and can indicate 'the long one' or 'the tall one'</li> <li>✓ Shows awareness of time, through some familiarity with names of the days of the week and significant times in their day, e.g. bedtime</li> <li>✓ Understands now and next, after</li> </ul>

**Possible themes**

- Explore the measurement of distance
- Explore the measurement of mass
- Explore the measurement of capacity
- Measure time

**Possible key learning points**

- Measure length using appropriate equipment
- Measure mass using appropriate equipment
- Measure capacity using appropriate equipment
- Measure time using hours, minutes and seconds using appropriate equipment
- Record measurements using a system of non-standard or standard units
- Compare and order lengths using long/short, longer/shorter, tall/short, double/half
- Compare and order masses using heavy/light, heavier than, lighter than
- Compare and order capacities using full/empty, more than, less than, half, half full, quarter
- Compare and order times using quicker, slower, earlier, later
- Select appropriate language when making comparisons
- Solve practical problems involving length, height, mass, volume
- Solve practical problems involving time

**EYFS – development matters (months)**

16 - 26	<ul style="list-style-type: none"> <li>✓ Enjoys filling and emptying containers</li> </ul>
22 - 36	<ul style="list-style-type: none"> <li>✓ Beginning to categorise objects according to properties such as shape or size.</li> <li>✓ Begins to use the language of size.</li> </ul>
30 - 50	<ul style="list-style-type: none"> <li>✓ Beginning to talk about the shapes of everyday objects,</li> <li>✓ e.g. 'round' and 'tall'.</li> </ul>
40 - 60+	<ul style="list-style-type: none"> <li>✓ Can describe their relative position such as 'behind' or 'next to'.</li> <li>✓ Orders two or three items by length or height.</li> <li>✓ Orders two items by weight or capacity.</li> </ul>

**Mathematical language**

Measure  
 Length, height, distance  
 Mass, weight  
 Time  
 Capacity, volume  
 Long, short, longer, shorter, tall, taller  
 Heavy, light, heavier, lighter  
 Full, empty, half full  
 Quicker, slower, earlier, later  
 More than, greater than, less than  
 Double, half, quarter  
 Hour, minutes, second  
 Ruler  
 Container  
 Order, Compare

**Pedagogical notes**

When introducing any work on measurement (especially considering non-standard versus standard units) it is important that pupils understand the importance of measuring accurately. Accuracy will need modeling at every opportunity and any misuse of measuring apparatus needs to be picked up quickly.  
 Many pupils may not be at the stage to work with numbers beyond 20 confidently (therefore reading a ruler or metre stick may prove too difficult) However they could be encouraged to compare objects in relation to a benchmark object such as the length of a ruler saying whether they are longer/ shorter.  
 During this unit pupils should be encouraged to develop their own non-standard units for measuring. They then need opportunities to explore why a standard unit of measure is more useful as this allows them to make consistent comparison with other measurements (even if they have not been made that measurement)  
 NCETM: [Glossary](#)  
**Common approaches**  
 Every classroom has a range of measuring equipment and scales immediately available  
 Every classroom has a sack of sand (25 kg), a bag of sugar (1 kg), a cheque book (1 cheque is 1 gram), a bottle of water (1 litre, and also 1 kg of water) and a teaspoon (5 ml)

**Reasoning opportunities and probing questions**

- Convince me that you can use metre sticks to measure the mass of a bag of apples
- Show me a minute (in silence!)
- Show me an item longer than this ruler. And another, and another ...
- Show me an item heavier than this book. And another, and another

**Suggested activities**

[KM: Mind the gap](#)  
[NRICH: Little Man](#)  
[NRICH: Sizing Them Up](#)  
[NCETM: Activity A](#)  
**Learning review**  
 KM: [1M10 BAM Task](#)  
[NCETM: NC Assessment Materials \(Teaching and Assessing Mastery\)](#)

**Possible misconceptions**

- Some pupils may think that cm (for example) is a unit for measuring anything
- Some pupils may think that all times have to be measured in minutes
- Some pupils may think that the straight line is longer than the wiggly line

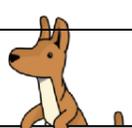


**Concrete**

**Pictorial**

**Abstract**

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PUMA assessment criteria			NCETM - Exemplification
Autumn	Spring	Summer	
<p>Compare, describe and solve practical problems for:</p> <ul style="list-style-type: none"> <li>lengths and heights (e.g. long/short, longer/shorter, tall/short, double/half)</li> <li>mass or weight (e.g. heavy/light, heavier than, lighter than)</li> <li>capacity/volume (full/empty, more than, less than)</li> <li>time (quicker, slower, earlier, later)</li> </ul> <p>Use non standard measures to measure and begin to record the following:</p> <ul style="list-style-type: none"> <li>lengths and heights</li> <li>mass/weight</li> <li>capacity and volume</li> </ul>	<p>Compare, describe and solve practical problems for:</p> <ul style="list-style-type: none"> <li>lengths and heights (e.g. long/short, longer/shorter, tall/short, double/half)</li> <li>mass or weight (e.g. heavy/light, heavier than, lighter than)</li> <li>capacity/volume (full/empty, more than, less than, quarter)</li> <li>time (quicker, slower, earlier, later)</li> </ul> <p>Begin to use measuring tools (ruler, weighing scales, containers) to measure and begin to record the following:</p> <ul style="list-style-type: none"> <li>lengths and heights</li> <li>mass/weight</li> <li>capacity and volume</li> </ul>	<p>Compare, describe and solve practical problems for:</p> <ul style="list-style-type: none"> <li>lengths and heights (e.g. long/short, longer/shorter, tall/short, double/half)</li> <li>mass or weight (e.g. heavy/light, heavier than, lighter than)</li> <li>capacity/volume (full/empty, more than, less than, quarter)</li> <li>time (quicker, slower, earlier, later)</li> </ul> <p>Begin to use standard measures (metres, cms, grams/kg, litres) to measure and begin to record the following:</p> <ul style="list-style-type: none"> <li>lengths and heights</li> <li>mass/weight</li> <li>capacity and volume</li> </ul>	<ul style="list-style-type: none"> <li>• Use their experience of standard units to make realistic estimates, answering questions such as: <ul style="list-style-type: none"> <li>○ Is the table taller or shorter than a metre?</li> <li>○ Is this doll taller or shorter than one of the class rulers?</li> <li>○ Does this bottle hold more or less than the litre jug?</li> <li>○ Which of these things do you think will weigh less than a kilogram?</li> </ul> </li> <li>• Use standard units to measure and compare objects. For example, they place metre sticks end-to-end to find out how much wider the hall is than the classroom. They use a litre jug to measure how much more the washing-up bowl holds than the cola bottle.</li> </ul>



**Key concepts (National Curriculum statements)**

The Big Picture: [Fractions, decimals and percentages progression map](#)

- recognise, find and name a half as one of two equal parts of an object, shape or quantity
- recognise, find and name a quarter as one of four equal parts of an object, shape or quantity

**Notes and guidance (non-statutory)**

- Pupils are taught half and quarter as ‘fractions of’ discrete and continuous quantities by solving problems using shapes, objects and quantities. For example, they could recognise and find half a length, quantity, set of objects or shape.
- Pupils connect halves and quarters to the equal sharing and grouping of sets of objects and to measures, as well as recognising and combining halves and quarters as parts of a whole.

**Continuum Reference**

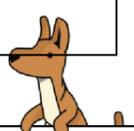
Band 1 (N-WT)	Band 2 (N-AT)	Band 3 (R-WT)	Band 4 (R-WT)	Band 5 (R-AT)
N/A	N/A	N/A	N/A	✓ Solves practical problems, involving the vocabulary and concepts of doubling, halving and sharing

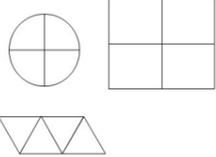
Possible themes	Possible key learning points
<ul style="list-style-type: none"> <li>• Explore fractions</li> </ul>	<ul style="list-style-type: none"> <li>• Recognise a half as one of two equal parts of an object or shape</li> <li>• Recognise a half as one of two equal parts of a quantity</li> <li>• Recognise a quarter as one of four equal parts of an object or shape</li> <li>• Recognise a quarter as one of four equal parts of a quantity</li> <li>• Use fraction notation to write one half</li> <li>• Use fraction notation to write one quarter</li> <li>• Identify half of a set of objects</li> <li>• Identify quarter of a set of objects</li> </ul>

EYFS – development matters (months)	Prerequisites	Mathematical language	Pedagogical notes
16 - 26	<ul style="list-style-type: none"> <li>• Know the language of double and half</li> <li>• Know the meaning of the word ‘equal’</li> </ul>	Part Equal Whole Half, halves Quarter Fraction Numerator Denominator  <b>Notation</b> Horizontal bar for fractions; $\frac{1}{2}$ , $\frac{1}{4}$ Diagonal bar for fractions; $\frac{1}{2}$ , $\frac{1}{4}$	It would help if the children had experience of splitting objects/ shapes/ quantities equally (and comparing whether they are exactly equal) before introducing them to the concept of fractions. Pupils need opportunities to explore how to find fractions of objects and shapes and then represent what they have found. For example, once they have identified that they have split a shape into two equal parts and have taken out one of the parts, then the fractional notation can be introduced and will make more sense. It is also beneficial to discuss possible early misconceptions such as ‘Please may I have the bigger half’ when discussing a slice of cake/ pizza etc. as this is a great opportunity to discuss the need for fractions to be equal amounts.  NCETM: <a href="#">Teaching fractions</a> NCETM: <a href="#">Glossary</a>  <b>Common approaches</b> <i>Pupils are expected to use horizontal bar notation for fractions</i>
22 - 36			
30 - 50			
40 – 60+			

Reasoning opportunities and probing questions	Suggested activities	Possible misconceptions
<ul style="list-style-type: none"> <li>• (Given a 2 by 2 grid) Show me <math>\frac{1}{2}</math> of this shape. And another, and another ...</li> <li>• (Given a 4 by 3 grid) Show me <math>\frac{1}{4}</math> of this shape. And another, and another ...</li> <li>• Convince me that you can split a group of 9 objects in half</li> <li>• Kenny says that he would like the bigger half. Is this possible? Explain your answer.</li> </ul>	KM: <a href="#">To quarter or not to quarter</a> (part 1) NRICH: <a href="#">Halving</a> NRICH: <a href="#">Happy Halving</a> NRICH: <a href="#">Making longer, making shorter</a>  <b>Learning review</b> KM: <a href="#">1M7 BAM Task</a> NCETM: <a href="#">NC Assessment Materials (Teaching and Assessing Mastery)</a>	<ul style="list-style-type: none"> <li>• Some pupils may not understand that when splitting one whole into a fractional amount, each part must be equal</li> <li>• Some pupils may think that a quarter is a larger piece than a half since 4 is greater 2</li> <li>• Some pupils may not appreciate that when shading a fraction of a shape, the position of the shaded section can vary</li> </ul>

Concrete	Pictorial	Abstract



PUMA assessment criteria			NCETM - Exemplification
Autumn	Spring	Summer	<p>recognise, find and name a half as one of two equal parts of an object, shape or quantity</p> <ul style="list-style-type: none"> <li>➤ Here is a set of 12 pencils How many is half the set?</li> </ul>  <ul style="list-style-type: none"> <li>➤ Shade one quarter of each shape</li> </ul>  <p>recognise, find and name a quarter as one of four equal parts of an object, shape or quantity</p> <ul style="list-style-type: none"> <li>➤ Four Children share 12 strawberries into equal parts. How many strawberries will each child have?</li> </ul> 
Recognise, find and name a half as one of two equal parts of an object, shape, length or quantity e.g. Find half of a length of string, by folding;	Recognise, find and name a half as one of two equal parts of an object, shape, length or quantity e.g. What is half of 12 counters? Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity e.g. find a quarter of a shape, by folding in half and half again	Recognise, find and name a half as one of two equal parts of an object, shape, length or quantity Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity e.g. find $\frac{1}{4}$ of 12 beads, practically	



**Key concepts (National Curriculum statements)** The Big Picture: [Position and direction progression map](#)  
 • describe position, direction and movement, including whole, half, quarter and three-quarter turns

**Notes and guidance (non-statutory)**  
 • Pupils use the language of position, direction and motion, including: left and right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far, up and down, forwards and backwards, inside and outside.  
 • Pupils make whole, half, quarter and three-quarter turns in both directions and connect turning clockwise with movement on a clock face.

**Continuum Reference**

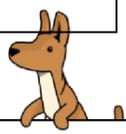
Band 1 (N-WT)	Band 2 (N-AT)	Band 3 (R-WT)	Band 4 (R-WT)	Band 5 (R-AT)
Demonstrates interest in position and the relationship between objects.	Searches intentionally for objects in their usual place, Explores the position of objects,	Searches for objects not found in their usual place demonstrating their understanding of object permanence, Shows understanding of words signs and symbols that describe positions,	Responds to 'forwards' and backwards',	

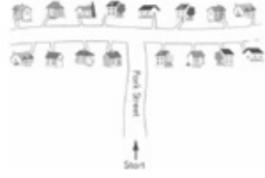
Possible themes	Possible key learning points
<ul style="list-style-type: none"> <li>Investigate mathematical language to describe movement</li> </ul>	<ul style="list-style-type: none"> <li>Use mathematical language to describe position</li> <li>Use mathematical language to describe movement along a straight line</li> <li>Use mathematical language to describe a turn, including whole and half turns</li> <li>Use mathematical language to describe a turn, including quarter turns</li> <li>Use mathematical language to describe a turn, including three-quarter turns</li> </ul>

EYFS – development matters (months)	Prerequisites	Pedagogical notes
16 - 26 ✓ Attempts, sometimes successfully, to fit shapes into spaces on inset boards or jigsaw puzzles.	<ul style="list-style-type: none"> <li>Describe position using language such as 'behind' or 'next to'</li> <li>Know the language of half and quarter</li> </ul>	Pupils follow clues, such as 'on top of', 'between', 'inside', etc., to find missing objects. Pupils experience following instructions, devising and stating instructions for other pupils/robots to follow. Note: - Turning 'anticlockwise' is introduced in Stage 2 - Recognising three quarters as three of four equal parts of an object, shape or quantity is explored in detail in Stage 2 - Understanding degrees as a way of measuring angles is not introduced until Stage 5 - NCETM: <a href="#">Glossary</a>  <b>Common approaches</b> <i>All pupils practically experience the 'feel' of a whole, half, quarter and three-quarters turn. Pupils are shown how to remember left and right by identifying the 'L' shape formed by extending the thumb and forefinger on their left hand.</i>
22 - 36 ✓ Notices simple shapes and patterns in pictures. ✓ Beginning to categorise objects according to properties such as shape or size. ✓ Begins to use the language of size. ✓ Understands some talk about immediate past and future, e.g. 'before', 'later' or 'soon'. ✓ Anticipates specific time-based events such as mealtimes or home time.	<b>Mathematical language</b> Position Direction Top, middle, bottom On top of In front of Above Between Around, Near, Close, Far Up, Down Inside, Outside Forwards, Backwards Left, Right Half turn, Quarter turn, Three-quarters turn Straight Line Clockwise	
30 - 50 ✓ Uses positional language. ✓ Shows interest in shape by sustained construction activity or by talking about shapes or arrangements. ✓ Shows interest in shapes in the environment.		
40 - 60+ ✓ Can describe their relative position such as 'behind' or 'next to'  <b>Early Learning Goal</b> Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them		

Reasoning opportunities and probing questions	Suggested activities	Possible misconceptions
<ul style="list-style-type: none"> <li>Show me a quarter turn. An another, and another ...</li> <li>Convince me this is a quarter turn: </li> <li>Jenny walks four steps forward, turns a quarter turn clockwise and walks 2 steps forward. Lenny says 'if Jenny now walks 2 steps backwards, turns a quarter turn clockwise and walks four steps backwards, she will return to the start.' Do you agree with Lenny? Explain your answer.</li> <li>Kenny says, 'A turn of four quarters turns is the same as doing nothing at all'. Do you agree with Kenny? Explain why.</li> </ul> NCETM: <a href="#">Geometry: Position Direction and Movement Reasoning</a>	KM: <a href="#">Stick on the Maths SSM2: Everyday language: Positions of Shapes</a> KM: <a href="#">Stick on the Maths SSM3: Positions of Objects</a> NRICH: <a href="#">Tangram Tangle</a> NRICH: <a href="#">Olympic Rings</a> NRICH: <a href="#">2 Rings</a> NRICH: <a href="#">Turning</a> NCETM: <a href="#">Activity A, B, C, D and E</a>  <b>Learning review</b> KM: <a href="#">1M13 BAM Task</a> NCETM: <a href="#">NC Assessment Materials (Teaching and Assessing Mastery)</a>	<ul style="list-style-type: none"> <li>Some pupils may think that quarter turns have to look like this: </li> <li>Some pupils may have difficulty remembering left and right</li> <li>Some pupils may get confused with 'clockwise'</li> </ul>

Concrete	Pictorial	Abstract



PUMA assessment criteria			NCETM - Exemplification
Autumn	Spring	Summer	Pupils should be taught to describe position, direction and movement, including whole, half, quarter and three-quarter turns.
Describe positions, directions and movements using language such as left and right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far, up and down, forwards and backwards, inside and outside...	Describe positions, directions and movements using language such as left and right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far, up and down, forwards and backwards, inside and outside...  Describe position, directions and movements, including half and quarter turns, in a clockwise direction	Describe positions, directions and movements using language such as left and right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far, up and down, forwards and backwards, inside and outside...  Describe position, directions and movements, including half, quarter and three-quarter turns, in a clockwise direction	<p>➤ Look at the map. Go to start. Follow this route from there. Go to the fourth house on the right. Draw a ring around it.</p>  <p>➤ Look at this map</p>  <p>Desi's house is the 2nd on the left. Tick (✓) it.</p>



**Key concepts (National Curriculum statements)** **The Big Picture:** [Measurement and mensuration progression map](#)  
 • recognise and know the value of different denominations of coins and notes

**Notes and guidance (non-statutory)**  
 •

**Continuum Reference**

| Band 1 (N-WT) |
|---------------|---------------|---------------|---------------|---------------|
| N/A           | N/A           | N/A           | N/A           | N/A           |

Possible themes	Possible key learning points
<ul style="list-style-type: none"> <li>Explore money</li> </ul>	<ul style="list-style-type: none"> <li>Recognise the coins: 1p, 2p, 5p, 10p, 20p, 50p, £1 and £2</li> <li>Read and say amounts of money using the coins 1p, 2p, 5p, 10p, 20p, 50p</li> <li>Recognise the coins: £1 and £2</li> <li>Read and say amounts of money using the coins £1 and £2</li> <li>Count, say and record amounts of money using the coins 1p, 2p, 5p, 10p, 20p, 50p, £1 and £2</li> <li>Recognise the notes: £5 and £10</li> <li>Read and say amounts of money using the notes £5 and £10</li> <li>Solve simple problems involving money</li> </ul>

EYFS – development matters (months)	Prerequisites	Mathematical language	Pedagogical notes
16 - 26	<ul style="list-style-type: none"> <li>Beginning to use everyday language related to money.</li> </ul>	Money Coin Note	This is the first time that pupils explore money in the classroom. This unit should be very practical and focused on recognising and knowing the value of coins and notes. Note: - Pupils are expected to be able to recognise and record money using £ or p notation in Stage 2 - Decimal notation for money is not introduced formally until Stage 4.  NCETM: <a href="#">Glossary</a>  <b>Common approaches</b> <i>All classrooms have a collection of real money</i>
22 - 36			
30 - 50			
40 – 60+			

Reasoning opportunities and probing questions	Suggested activities	Possible misconceptions
<ul style="list-style-type: none"> <li>Kenny thinks that 'the larger the size of the coin, the greater the value of the coin'. Do you agree with Kenny?</li> <li>What is the same and what is different: 2p coin, 5p coin, 10p coin, 20p coin?</li> <li>Always/Sometimes/Never: Coins are circular.</li> </ul>	NRICH: <a href="#">Money Bags</a> NCETM: <a href="#">Activity B</a>  <b>Learning review</b> NCETM: <a href="#">NC Assessment Materials (Teaching and Assessing Mastery)</a>	<ul style="list-style-type: none"> <li>Some pupils may think that the larger the size of the coin, the greater the value of the coin, for example, a 2p coin is greater in value than a 5p coin.</li> <li>Some pupils may think that all coins are circular.</li> <li>Some pupils may think that there all £1 and £2 are notes not coins.</li> </ul>

Concrete	Pictorial	Abstract



PUMA assessment criteria			NCETM - Exemplification
Autumn	Spring	Summer	
Recognise and know the value of different denominations of coins	Recognise and know the value of different denominations of coins and notes	Recognise and know the value of different denominations of coins and notes	<p>recognise and know the value of different denominations of coins and notes</p> <ul style="list-style-type: none"> <li>➤ Distinguish coins by sorting them and start to understand their value. They begin to recognise that some coins have a greater value than others, and will buy more: for example, 2p is worth more than 1p; 5p is worth more than 2p; £2 is worth more than £1. They play money games and collect 1p or 2p coins to the value of 10p and begin to count up 'how much this is altogether'. They extend their activities in the classroom shop, paying for items that cost 1p, 3p, 5p, 7p or 9p using only 2p coins, and receiving the appropriate amount of change in 1p coins. They use coins to help them to respond to questions such as: <ul style="list-style-type: none"> <li>○ Michael had £5. He spent £3. How much did he have left?</li> <li>○ Rosie had a 10p coin. She spent 3p. How much change did she get?</li> <li>○ How much altogether is 1p and 2p and 5p?</li> <li>○ Sunita spent 5p and 6p on toffees. What did she pay altogether?</li> <li>○ Chews cost 2p each. How much do three chews cost?</li> <li>○ An apple costs 12p. Which two coins would pay for it? What combinations of 3 coins would pay for it?</li> </ul> </li> </ul>



**Key concepts (National Curriculum statements)**

The Big Picture: [Calculation progression map](#)

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

**Notes and guidance (non-statutory)**

- Through grouping and sharing small quantities, pupils begin to understand: multiplication and division; doubling numbers and quantities; and finding simple fractions of objects, numbers and quantities.
- They make connections between arrays, number patterns, and counting in 2s, 5s and 10s.

**Continuum Reference**

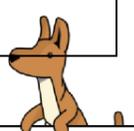
Band 1 (N-WT)	Band 2 (N-AT)	Band 3 (R-WT)	Band 4 (R-WT)	Band 5 (R-AT)
N/A	N/A	N/A	N/A	N/A

Possible themes	Possible key learning points
<ul style="list-style-type: none"> <li>• Develop arithmetic skills</li> <li>• Explore properties of numbers</li> <li>• Explore ways of writing calculations</li> <li>• Solve problems involving multiplication and division</li> </ul>	<ul style="list-style-type: none"> <li>• Double numbers up to at least 10</li> <li>• Halve numbers up to (at least) 20</li> <li>• Count (from zero) in equal steps of 2s</li> <li>• Count (from zero) in equal steps of 5s</li> <li>• Count (from zero) in equal steps of 10s</li> <li>• Use concrete objects to solve one-step problems involving multiplication</li> <li>• Use concrete objects to solve one-step problems involving division (grouping)</li> <li>• Use concrete objects to solve one-step problems involving division (sharing equally)</li> <li>• Use pictorial representations to solve one-step problems involving multiplication</li> <li>• Use pictorial objects to solve one-step problems involving division (grouping)</li> <li>• Use pictorial objects to solve one-step problems involving division (sharing equally)</li> <li>• Use arrays to solve one-step problems involving multiplication</li> </ul>

EYFS – development matters (months)	Prerequisites	Mathematical language	Pedagogical notes
16 - 26	<ul style="list-style-type: none"> <li>• Pupils need to be able to read, write and order numbers to at least 20</li> <li>• Subitise small groups of objects (i.e. can say how many there are without needing to count each individual object.)</li> </ul>	Calculation, Calculate Odd, Even Multiply, Multiplication, Times, Product Repeated addition Array Divide, Division Groups Grouping Sharing	This is the first pupils explore multiplication and division. Through grouping and sharing, pupils make connections between arrays, number patterns, and counting in twos, fives and tens. Pupils need to work with small quantities and experience: doubling and halving numbers and quantities; and finding simple fractions of objects, numbers and quantities. Note: <ul style="list-style-type: none"> <li>• Calculating mathematical statements for multiplication and division within the multiplication tables and writing them using the multiplication (<math>\times</math>), division (<math>\div</math>) and equals (=) signs is in Stage 2</li> <li>• Showing that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot is explored in Stage 2</li> </ul> KM: <a href="#">Progression: Multiplication and Division</a> and <a href="#">Calculation overview</a> NCETM: <a href="#">The Bar Model</a> NCETM: <a href="#">Multiplication, Division, Multiplicative reasoning</a> NCETM: <a href="#">Glossary</a>  <b>Common approaches</b> <i>A variety of concrete apparatus – Numicon, Cuisenaire, 10 Frame, Counters -, are used to help pupils visualise odd/even numbers, doubling/halving and solve multiplication and division problems. Teachers say 'share equally' and not just 'share' when solving problems involving division.</i>
22 - 36			
30 - 50			
40 – 60+			

Reasoning opportunities and probing questions	Suggested activities	Possible misconceptions
<ul style="list-style-type: none"> <li>• Show me a number that you can half. And another. And another.</li> <li>• Convince me double 6 is 12.</li> <li>• Convince me 3 multiplied by 4 is 12 (using concrete apparatus such as Numicon, Cuisenaire, etc.).</li> <li>• Convince me if 12 sweets are shared equally between 3 friend, each friend will receive 4 sweets (using concrete apparatus such as Numicon, Cuisenaire, etc.).</li> <li>• Benny thinks you can double any number but only halve even numbers. Do you agree with Benny? Explain your answer.</li> </ul>	KM: <a href="#">Stick on the Maths ALG1: Odd and Even</a> NRICH: <a href="#">Lots of Biscuits!</a> NRICH: <a href="#">Share Bears</a> NCETM: <a href="#">Activity A, B and C</a>  <b>Learning review</b> KM: <a href="#">1M5 BAM Task</a> NCETM: <a href="#">NC Assessment Materials (Teaching and Assessing Mastery)</a>	<ul style="list-style-type: none"> <li>• Some pupils may interpret '3 multiplied by 4' as '4 groups/lots of 3' rather than '3 groups/lots of 4'</li> <li>• Some pupils may try to give whole number answers for the half of an odd number – e.g. Half of 9 is 4 (or 5)</li> <li>• Some pupils may not share equally when solving division problems – e.g. Divide 10 by 2: Answer 6 and 4</li> </ul>

Concrete	Pictorial	Abstract



PUMA assessment criteria			NCETM - Exemplification
Autumn	Spring	Summer	<p>solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of a teacher</p> <p>Children should be able to:</p> <ul style="list-style-type: none"> <li>➤ Use practical apparatus, arrays and images to help solve multiplication and division problems such as:</li> <li>➤ Ben had 5 football stickers. His friend Tom gave him 5 more, how many does he have altogether?</li> <li>➤ Share 12 sweets between two children. How many do they each have?</li> <li>➤ Find half of and double a number or quantity:</li> <li>➤ 16 children went to the park at the weekend. Half that number went swimming. How many children went swimming?</li> <li>➤ I think of a number and halve it. I end up with 9, what was my original number?</li> </ul>
Double and halve numbers to 20 e.g. double 6 is 12, half of 10 is 5	Double and halve numbers to 20 e.g. double 8 is 16, half of 20 is 10	<p>Double and halve numbers to 20</p> <p>Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher e.g. share 8 sweets between 2 children</p>	



**Key concepts (National Curriculum statements)**

- read and write numbers from 1 to 20 in numerals and words.
- identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least
- count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens

The Big Picture: [Number and Place Value progression map](#)

**Notes and guidance (non-statutory)**

- Pupils practise counting (1, 2, 3...), ordering (for example, first, second, third...), and to indicate a quantity (for example, 3 apples, 2 centimetres), including solving simple concrete problems, until they are fluent.
- Pupils begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100, supported by objects and pictorial representations.
- They practise counting as reciting numbers and counting as enumerating objects, and counting in 2s, 5s and 10s from different multiples to develop their recognition of patterns in the number system (for example, odd and even numbers), including varied and frequent practice through increasingly complex questions.
- They recognise and create repeating patterns with objects and with shapes.
- Pupils practise counting (1, 2, 3...), ordering (for example, first, second, third...), and to indicate a quantity (for example, 3 apples, 2 centimetres), including solving simple concrete problems, until they are fluent.
- Pupils begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100, supported by objects and pictorial representations.
- They practise counting as reciting numbers and counting as enumerating objects, and counting in 2s, 5s and 10s from different multiples to develop their recognition of patterns in the number system (for example, odd and even numbers), including varied and frequent practice through increasingly complex questions.
- They recognise and create repeating patterns with objects and with shapes.

Continuum Reference				
Band 1 (N-WT)	Band 2 (N-AT)	Band 3 (R-WT)	Band 4 (R-WT)	Band 5 (R-AT)
Shows an awareness of number activities and counting Is aware of cause and effects in familiar mathematical activities <i>e.g. knows that in a role play shop a coin can be exchanged for an item</i> <i>Pupils show awareness of changes in quantity</i>	Indicates one or two Makes sets that have the same small number of objects in each, Solves simple problems practically <i>eg. checking there is a knife for every fork.</i> Responds to and joins in with familiar number rhymes, stories, songs and games	Demonstrates understanding of 'more' Demonstrates understanding of 1:1 correspondence in range of contexts and counts reliably to 3 Joins in rote counting to 5 Joins in with new number rhymes, songs stories, games	Counts at least 5 objects reliably Recognises numerals from one to five and to understands that each represents a constant number or amount Joins in rote counting to 10	Counts reliably with numbers from one to 20, places them in order Begins to use ordinal numbers (first, second, last) when describing the position of objects Begins to recognise numerals 1-9 and relate them to sets of objects Recognises differences in quantity Estimates a small number and checks by counting Continues counting from a given small number up to 10 Joins in with rote counting beyond 10

Possible themes	Possible key learning points
<ul style="list-style-type: none"> <li>• Explore the value of numbers</li> <li>• Explore where numbers live in our number system</li> <li>• Solve problems comparing the value of numbers</li> <li>• Investigate number patterns</li> </ul>	<ul style="list-style-type: none"> <li>• Solve problems involving:                             <ul style="list-style-type: none"> <li>- reading and writing numbers from 1 to 20 in numerals and words.</li> <li>- identifying and representing numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least</li> <li>- counting, reading and writing numbers to 100 in numerals; count in multiples of twos, fives and tens</li> </ul> </li> </ul>

Prerequisites	Mathematical language	Pedagogical notes
<ul style="list-style-type: none"> <li>• Show the value of a number using objects or pictures</li> <li>• Read numbers to 20 and beyond in numerals and words</li> <li>• Write numbers to 20 and beyond in numerals and words</li> <li>• Show where a number lives on the number line</li> <li>• Compare the value of numbers explaining if they are more/ less than or equal to another number or numbers</li> <li>• Count on to or back from 100 and beyond in ones from any given number</li> <li>• Count on to or back from 100 and beyond in multiples of two starting from zero</li> <li>• Count on to or back from 100 and beyond in multiples of five starting from zero</li> <li>• Count on to or back from 100 and beyond in multiples of ten starting from zero</li> </ul>	One, Two, Three, Four, Five, Six, Seven, Eight, Nine, Ten, Eleven, Twelve, Thirteen, Fourteen, Fifteen, Sixteen, Seventeen, Eighteen, Nineteen, Twenty More than, greater, larger, bigger Less than, fewer, smaller Equal to, the same amount as, as many as Greatest/ Most/biggest/largest Least/fewest/smallest Hundreds, Tens, units (ones) Exchange Digit  <b>Notation</b> The equals symbol (=)	Note: Curriculum time has been prioritised to ensure all pupils secure a deep understanding of the age related expectations for the Number strands of the Year 1 Programme of Study. The key concepts for this unit are the same as the other Stage 1 'Numbers and the number system' unit but this unit should be taught with an increased emphasis on developing pupils' reasoning skills, solving more complex problems and using explicit misconceptions and mistakes to deepen and challenge pupils' understanding.  Further guidance on teaching for mastery can be found in the 'Introduction' of the NCETM: <a href="#">NC Assessment Materials (Teaching and Assessing Mastery)</a> resources.

Reasoning opportunities and probing questions	Suggested activities	Possible misconceptions
<ul style="list-style-type: none"> <li>• Show me (find/ write) the number that will label this group of objects. And Another. And Another.</li> <li>• Show me (find/write) a number with 2 tens and another... and another. Which of your numbers is the greatest? And Another.</li> <li>• Can you change this pot so that it has enough pencils for 8 children?</li> <li>• Convince me that 13 is less than 20.</li> <li>• Always/Sometimes/Never: A number with 9 in the units is always bigger than one with 6 in the units.</li> </ul>	KM: <a href="#">Grab a group</a> KM: <a href="#">Greater (more) than/ less than</a> KM: Practical counting activities where pupils are encouraged to support with everyday problems (i.e. counting out and labelling the correct number the of milk cartons, pencils, aprons, balls for P.E. etc.) NRICH: <a href="#">Count the crayons</a> NRICH: <a href="#">Matching numbers</a> NRICH: <a href="#">6 beads</a>  <b>Learning review</b> NCETM: <a href="#">NC Assessment Materials (Teaching and Assessing Mastery)</a>	<ul style="list-style-type: none"> <li>• Some pupils may appear to be counting confidently but they may just be mimicking the rhythm of the counting pattern.</li> <li>• Some pupils may not be confident in counting over the tens boundaries</li> <li>• Some pupils may not understand that a number can be used to show/ label the final (cardinal) value of the set of objects being counted. If a pupil is asked to count a group of objects and then asked how many there are in the set, if they have to count again, then they do not have an understanding that the final number that they have said represents the value of the objects in the set.</li> <li>• Some pupils may muddle the 'teen' and the 'ty' numbers</li> <li>• Some pupils may read the units digit before the tens digit.</li> </ul>

Concrete	Pictorial	Abstract



PUMA assessment criteria			NCETM - Exemplification
Autumn	Spring	Summer	
<p>Count to 100, forwards and backwards, beginning with 0 or 1, or from any given number e.g. 19, 18, 17, 16, ...</p> <p>Count, read and write numbers to 100 in numerals, count in multiples of twos and tens e.g. 2, 4, 6, 8, 10, 12, ...</p> <p>Given a number, identify one more and one less</p> <p>Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least</p> <p>Read and write numbers from 1 to 20 in numerals</p> <p>Use language of ordering e.g. first, second, third</p>	<p>Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number</p> <p>Count, read and write numbers to 100 in numerals, count in multiples of twos, fives and tens e.g. 22, 24, 26, 28, 30, ... or 90, 80, 70, 60, ...</p> <p>Given a number, identify one more and one less</p> <p>Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least</p> <p>Read and write numbers from 1 to 20 in numerals and words.</p> <p>Use language of ordering e.g. first, second, third</p> <p>Begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100 supported by objects and pictorial representations</p> <p>Begin to order numbers to 100 (different tens) e.g. order 36, 29, 63, 51</p>	<p>Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number e.g. 103, 102, 101, 100, 99, 98, ...</p> <p>Count, read and write numbers to 100 in numerals, count in multiples of twos, fives and tens e.g. 5, 10, 15, 20, 25, ...</p> <p>Given a number, identify one more and one less</p> <p>Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least</p> <p>Read and write numbers from 1 to 20 in numerals and words.</p> <p>Use language of ordering e.g. first, second, third</p> <p>Recognise odd and even numbers</p> <p>Begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100 supported by objects and pictorial representations</p> <p>Begin to order numbers to 100 (different tens)</p>	<p>count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number</p> <ul style="list-style-type: none"> <li>➤ count forwards from 80 to 110</li> <li>➤ count backwards from 105</li> </ul> <p>count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens</p> <ul style="list-style-type: none"> <li>➤ Find p 39 in a book</li> <li>➤ Make a label to show how many things were in your collection</li> <li>➤ Count groups of 10 each of 2p, 5p and 10p coins</li> </ul> <p>identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least</p> <ul style="list-style-type: none"> <li>➤ <i>I'm giving each of you a strip of card with some numbers on [five numbers at random from 0 to 30].</i></li> <li>➤ <i>Point to the number which is worth most. Now point to the number which is worth least.</i></li> <li>➤ <i>Make these numbers using tens and ones apparatus and put them in order.</i></li> <li>➤ <i>Why have you put this number there?</i></li> </ul> <p>read and write numbers from 1 to 20 in numerals and words</p> <p>Make some labels for collections using numbers and words.</p>



**Key concepts (National Curriculum statements)**

The Big Picture: [Calculation progression map](#)

- given a number, identify one more and one less
- count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
- represent and use number bonds and related subtraction facts within 20

**Non-statutory guidance**

- Pupils practise counting (1, 2, 3...), ordering (for example, first, second, third...), and to indicate a quantity (for example, 3 apples, 2 centimetres), including solving simple concrete problems, until they are fluent.
- Pupils begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100, supported by objects and pictorial representations.
- They practise counting as reciting numbers and counting as enumerating objects, and counting in 2s, 5s and 10s from different multiples to develop their recognition of patterns in the number system (for example, odd and even numbers), including varied and frequent practice through increasingly complex questions.
- They recognise and create repeating patterns with objects and with shapes.

**Continuum Reference**

Band 1 (N-WT)	Band 2 (N-AT)	Band 3 (R-WT)	Band 4 (R-WT)	Band 5 (R-AT)
Shows an awareness of number activities and counting Is aware of cause and effects in familiar mathematical activities e.g. <i>knows that in a role play shop a coin can be exchanged for an item</i> <i>Pupils show awareness of changes in quantity</i>	Demonstrates awareness of contrasting quantities - Makes 'one' and 'lots' by making groups of one or lots of food items on plates Demonstrates awareness of contrasting quantities - difference	Demonstrates understanding of 'more' - Asks for 'more' e.g. cups, food items as required Demonstrates an understanding of 'less' - Indicates which bottle has less water in it	In practical situations responds to 'add one' to a number of objects - Responds to requests such as add one pencil to the pencils in the pot, add one sweet to the dish In practical situations responds to 'add one' to or 'take one away' from a number of objects - Using objects placed on or people standing on a number track, adds or removes object and says, signs or indicates how many	Says which number is one more than a given number Using quantities and objects, adds two single-digit numbers and counts on to find the answer Says which number is one less than a given number Using quantities and objects, subtracts two single-digit numbers and counts back to find the answer

**Possible themes**

- Investigate one more or one less than any number
- Investigate number patterns
- Explore addition and subtraction facts

**Possible key learning points**

- Solve problems involving:
  - given a number, identify one more and one less
  - counting to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
  - representing and using number bonds and related subtraction facts within 20

**Prerequisites**

- Identify the number that is one more than a number
- Identify the number that is one less than a number
- Count on to 100 and beyond in ones from any number
- Count back from 100 and beyond in ones from any number
- Know addition and subtraction facts to and from 10.
- Know addition and subtraction facts within 10
- Know addition and subtraction facts to and from 20
- Know addition and subtraction facts within 20.

**Mathematical language**

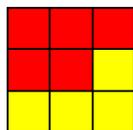
One more, one less  
Count on, count back  
One hundred  
Number bonds/ number facts  
Addition facts/ subtraction facts  
Fact family

**Pedagogical notes**

Note: Curriculum time has been prioritised to ensure all pupils secure a deep understanding of the age related expectations for the Number strands of the Year 1 Programme of Study. The key concepts for this unit are the same as the other Stage 1 'Calculating: addition and subtraction 1' unit but this unit should be taught with an increased emphasis on developing pupils' reasoning skills, solving more complex problems and using explicit misconceptions and mistakes to deepen and challenge pupils' understanding.  
  
Further guidance on teaching for mastery can be found in the 'Introduction' of the NCETM: [NC Assessment Materials \(Teaching and Assessing Mastery\)](#) resources.

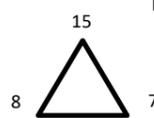
**Reasoning opportunities and probing questions**

- I'm thinking of a number. It is 1 more / less than 36. What number am I thinking of?
- Convince me that 1 more / less than 24 is 25/23.
- Kenny says that one less than 55 is 52. Is he correct?
- I will clap where a number is missing: 78, 79, 80 ... clap ... 82, 83, 84. What number did I miss?
- If I know that  $3 + 7 = 10$ , what else do I know?
- What facts can you tell me from this array?



**Suggested activities**

KM: [One more/one less](#)  
KM: [Pause it](#)  
KM: [Stand up if you are...](#)  
KM: Fact families: Use practical apparatus (arrays) to explore related number facts. For example fact family puzzles (which pieces combine to reach the target number), coat hanger and pegs, flip flaps, with different target amounts (and different combinations of coloured counters; i.e. 2 red and 4 blue), the ITP number facts and triominos (see example)



**Learning review**

NCETM: [NC Assessment Materials \(Teaching and Assessing Mastery\)](#)

**Possible misconceptions**

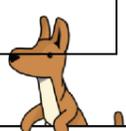
- Some pupils might count the number that they are starting from as one of the numbers in the count when adding on or counting back.
- Some pupils may appear to be counting confidently but they may just be mimicking the rhythm of the counting pattern. Ensure they are confident also in counting over the tens boundaries and over the one hundred boundary (as some pupils may say 99 and then refer back to 20)
- When exploring related number facts some pupils may just manipulate the numbers and record incorrectly. For example instead of understanding that they need to subtract from the largest number (for example  $10 - 6 = 4$ ) they may move the numbers around because they think they are related (for example  $6 - 4 = 10$ ).

**Concrete**

**Pictorial**

**Abstract**

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PUMA assessment criteria			NCETM - Exemplification
Autumn	Spring	Summer	
<p>Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</p> <p>Add and subtract one-digit and two-digit numbers to 20 (9 + 9, 18 - 9), including zero</p> <p>Solve simple one-step problems (in familiar practical contexts, including using quantities) that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems e.g. <math>3 + \square = 7</math></p> <p>Problems should include vocabulary such as: put together, add, altogether, total, take away, more than, less than...</p>	<p>Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</p> <p>Add and subtract one-digit and two-digit numbers to 20 (9 + 9, 18 - 9), including zero</p> <p>Solve simple one-step problems (in familiar practical contexts, including using quantities) that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems</p> <p>Problems should include vocabulary such as: put together, add, altogether, total, take away, distance between, more than, less than...</p>	<p>Add and subtract one-digit and two-digit numbers to 20 (9 + 9, 18 - 9), including zero</p> <p>Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</p> <p>Solve simple one-step problems (in familiar practical contexts, including using quantities) that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems e.g. <math>7 = \square - 9</math></p> <p>Problems should include vocabulary such as: put together, add, altogether, total, take away, distance between, more than, less than...</p>	<p>count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number</p> <ul style="list-style-type: none"> <li>➤ count forwards from 80 to 110</li> <li>➤ count backwards from 105</li> </ul> <p>given a number, identify one more and one less</p> <ul style="list-style-type: none"> <li>➤ <i>There are twenty nine beads in this pot. I am putting one more bead in the pot. How many are in there now? How did you know? How can you check?</i></li> <li>➤ <i>This time there are forty beads in the pot. I take out one bead. How many beads are left in the pot? How did you know? How can you check?</i></li> <li>➤ <i>Start with a different number of beads in the pot. Ask your partner to put another bead in or take one out and then say how many there are in the pot. How will you know if your partner is right?</i></li> </ul> <p>identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least</p> <ul style="list-style-type: none"> <li>➤ <i>I'm giving each of you a strip of card with some numbers on [five numbers at random from 0 to 30].</i></li> <li>➤ <i>Point to the number which is worth most. Now point to the number which is worth least.</i></li> <li>➤ <i>Make these numbers using tens and ones apparatus and put them in order.</i></li> </ul> <p><i>Why have you put this number there?</i></p>



**Key concepts (National Curriculum statements)**

The Big Picture: [Calculation progression map](#)

- read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs
- add and subtract one-digit and two-digit numbers to 20, including zero
- solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as  $7 = \square - 9$

**Non-Statutory guidance**

- Pupils memorise and reason with number bonds to 10 and 20 in several forms (for example,  $9 + 7 = 16$ ;  $16 - 7 = 9$ ;  $7 = 16 - 9$ ). They should realise the effect of adding or subtracting 0. This establishes addition and subtraction as related operations.
- Pupils combine and increase numbers, counting forwards and backwards.
- They discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly.

**Continuum Reference**

Band 1 (N-WT)	Band 1 (N-WT)	Band 1 (N-WT)	Band 1 (N-WT)	Band 1 (N-WT)
Shows an awareness of number activities and counting Is aware of cause and effects in familiar mathematical activities e.g. <i>knows that in a role play shop a coin can be exchanged for an item</i> <i>Pupils show awareness of changes in quantity</i>	Demonstrates awareness of contrasting quantities - Makes 'one' and 'lots' by making groups of one or lots of food items on plates Demonstrates awareness of contrasting quantities	Demonstrates understanding of 'more' - Asks for 'more' e.g. cups, food items as required Demonstrates an understanding of 'less' - Indicates which bottle has less water in it	In practical situations responds to 'add one' to a number of objects - Responds to requests such as add one pencil to the pencils in the pot, add one sweet to the dish In practical situations responds to 'add one' to or 'take one away' from a number of objects - Using objects placed on or people standing on a number track, adds or removes object and says, signs or indicates how many	Says which number is one more than a given number Using quantities and objects, adds two single-digit numbers and counts on to find the answer Says which number is one less than a given number Using quantities and objects, subtracts two single-digit numbers and counts back to find the answer

Possible themes	Possible key learning points
<ul style="list-style-type: none"> <li>• Explore ways of writing mathematical statements</li> <li>• Solve addition and subtraction problems</li> </ul>	<ul style="list-style-type: none"> <li>• Solve problems involving:                             <ul style="list-style-type: none"> <li>- reading, writing and interpreting mathematical statements involving addition (+), subtraction (−) and equals (=) signs</li> <li>- adding and subtracting one-digit and two-digit numbers to 20, including zero</li> <li>- one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as <math>7 = \square - 9</math></li> </ul> </li> </ul>

Prerequisites	Mathematical language	Pedagogical notes
<ul style="list-style-type: none"> <li>• Know the symbols '+', '−' and '='</li> <li>• Know the language of addition</li> <li>• Know the language of subtraction</li> <li>• Read statements involving the symbols '+', '−' and '=' involving numbers up to 20</li> <li>• Interpret statements involving the symbols '+', '−' and '=' involving numbers up to 20</li> <li>• Write statements involving the symbols '+', '−' and '=' involving numbers up to 20</li> <li>• Solve calculations involving numbers up to 20 given statements using the symbols '+', '−' and '='</li> <li>• Solve missing number problems involving numbers to 20 given statements using the symbols '+', '−' and '='</li> </ul> Add and subtract one- and two-digit numbers to 20, including zero	Add, subtract Count on, count back More, less Plus, minus, total, sum Difference between Equal, equal to  <b>Notation</b> The symbols '+', '−' and '='	Note: Curriculum time has been prioritised to ensure all pupils secure a deep understanding of the age related expectations for the Number strands of the Year 1 Programme of Study. The key concepts for this unit are the same as the other Stage 1 'Calculating: addition and subtraction II' unit but this unit should be taught with an increased emphasis on developing pupils' reasoning skills, solving more complex problems and using explicit misconceptions and mistakes to deepen and challenge pupils' understanding.  Further guidance on teaching for mastery can be found in the 'Introduction' of the NCETM: <a href="#">NC Assessment Materials (Teaching and Assessing Mastery)</a> resources.

Reasoning opportunities and probing questions	Suggested activities	Possible misconceptions
<ul style="list-style-type: none"> <li>• Always / Sometimes / Never: The equals sign always comes at the end of the mathematical statement</li> <li>• Convince me that <math>5 = 9 - 4</math></li> <li>• Convince me that <math>12 + 7 = 19</math></li> <li>• Show me a calculation which is equal to 7. And another, and another...</li> </ul>	KM: <a href="#">Balance statements</a> KM: Using a large number track or number tiles encourage the children to step along the number line to count on / back to aid addition / subtraction. Discuss whether pupils could step in different step sizes and use their knowledge of number bonds to 10 to help them. NRICH: <a href="#">I'm Eight</a> NRICH: <a href="#">2, 4, 6, 8</a> NCETM: <a href="#">Activity A</a> NCETM: <a href="#">Activity C</a>  <b>Learning review</b> NCETM: <a href="#">NC Assessment Materials (Teaching and Assessing Mastery)</a>	<ul style="list-style-type: none"> <li>• Some pupils may first include the number that they count from, add to or subtract from (therefore they may be out by 1 each time)</li> <li>• Some pupils may think that the equals sign means 'makes', or 'is equal to'</li> <li>• Some pupils may think that there always 'has to be an answer' when writing statements using the equals symbol</li> </ul>

Concrete	Pictorial	Abstract



PUMA assessment criteria			NCETM - Exemplification
Autumn	Spring	Summer	
<p>Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</p> <p>Add and subtract one-digit and two-digit numbers to 20 (9 + 9, 18 - 9), including zero</p> <p>Solve simple one-step problems (in familiar practical contexts, including using quantities) that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems e.g. <math>3 + \square = 7</math></p> <p>Problems should include vocabulary such as: put together, add, altogether, total, take away, more than, less than...</p>	<p>Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</p> <p>Add and subtract one-digit and two-digit numbers to 20 (9 + 9, 18 - 9), including zero</p> <p>Solve simple one-step problems (in familiar practical contexts, including using quantities) that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems</p> <p>Problems should include vocabulary such as: put together, add, altogether, total, take away, distance between, more than, less than...</p>	<p>Add and subtract one-digit and two-digit numbers to 20 (9 + 9, 18 - 9), including zero</p> <p>Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</p> <p>Solve simple one-step problems (in familiar practical contexts, including using quantities) that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems e.g. <math>7 = \square - 9</math></p> <p>Problems should include vocabulary such as: put together, add, altogether, total, take away, distance between, more than, less than...</p>	<p>read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</p> <ul style="list-style-type: none"> <li>➤ Use the vocabulary add, subtract, minus, equals, is the same value as, total, more than, fewer/less than.</li> <li>➤ Explain that things on both sides of the equals sign have the same value</li> <li>➤ Know that the 'total' can be presented on either side of the equals sign</li> <li>➤ Complete 'empty box' number sentences</li> </ul> <p>represent and use number bonds and related subtraction facts within 20</p> <ul style="list-style-type: none"> <li>➤ I'm thinking of a number. I've subtracted 6 and the answer is 8. What number was I thinking of? Explain how you know.</li> <li>➤ I'm thinking of a number. I've added 7 and the answer is 18. What number was I thinking of? Explain how you know.</li> <li>➤ I know that 6 and 4 is 10. How can I find 7 + 4? How could you work it out?</li> </ul> <p>add and subtract one-digit and two-digit numbers to 20, including zero</p> <ul style="list-style-type: none"> <li>➤ What is 37 subtract 10? How did you work that out? How could you show that using cubes/a number line/a 100-square? What would 37 subtract 20 be?</li> <li>➤ Make up some difference questions with the answer 5. Can you show how to solve them using counters? Can you show how to find the answer on a number line?</li> </ul> <p>solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as <math>7 = ? - 9</math>.</p> <ul style="list-style-type: none"> <li>➤ Make up some additions with the answer 15. Try to put them in different ways, like this: <math>10 + 5 = 15</math>. The total of 10 and 5 is 15. 10 and 5 more makes 15.</li> <li>➤ How many ways can you show me that 9 subtract 3 is 6?</li> <li>➤ Make up some subtractions with the answer 5. Try to put them in different ways, like this: <math>11 - 6 = 5</math>. The difference between 6 and 11 is 5.</li> </ul>

