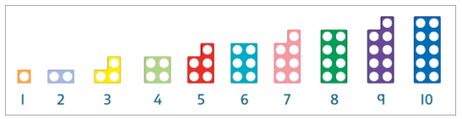
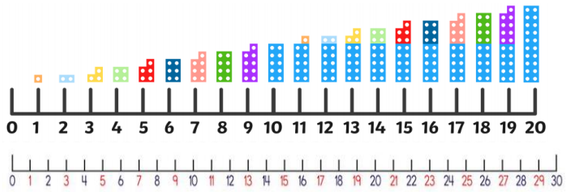
St Francis CE Primary School

Key Models and Calculations Progression Policy – NUMBER AND PLACE VALUE

<table>
<tr><th colspan="4">Number: Number and Place Value</th></tr>
<tr><th>NC Statement</th><th>Year</th><th>Concrete</th><th>Pictorial</th><th>Abstract</th></tr>
<tr><td>Verbally count beyond 20, recognising the pattern of the counting system</td><td>R</td><td>Counting physical objects (including counters and multilink)

Numicon

</td><td>Pictures of known objects

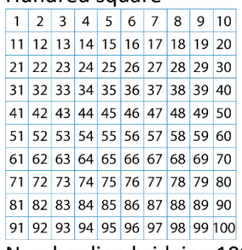
Numicon number lines


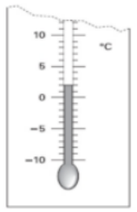
Ten Town
</td><td rowspan="4">Verbal counting without concrete or pictorial resources</td></tr>
<tr><td>Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.</td><td>1</td><td>Counting physical objects (including counters and multilink)

Numicon

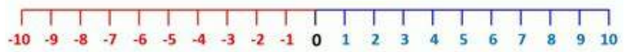
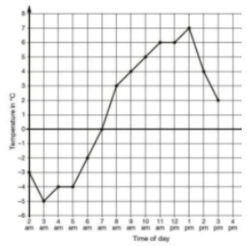
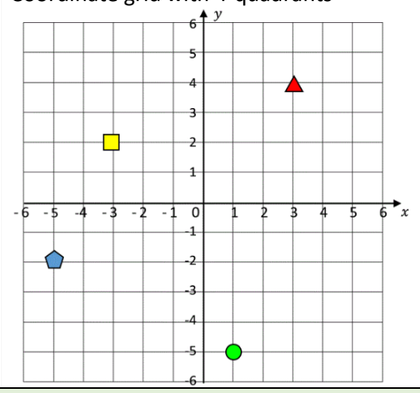
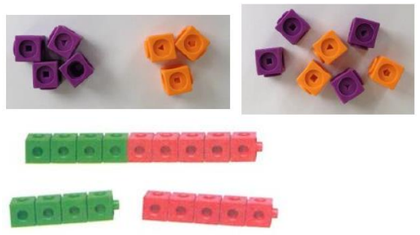
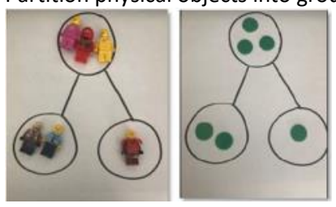
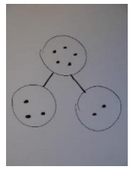
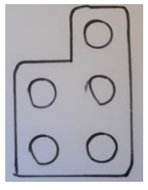

Bead strings

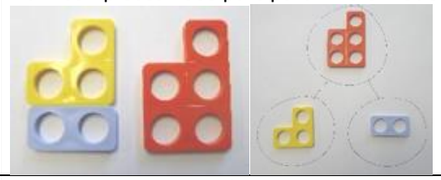
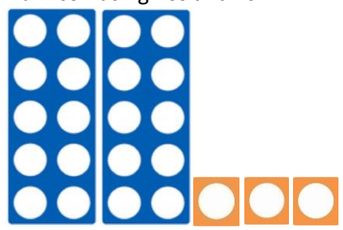
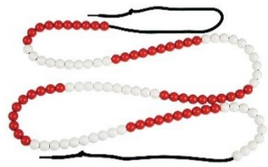
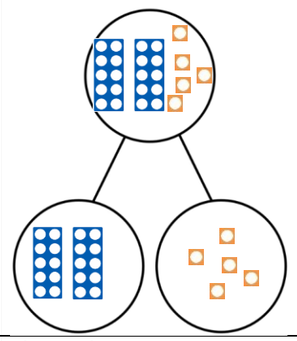
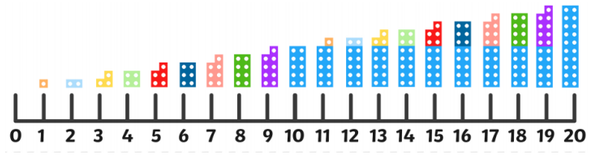
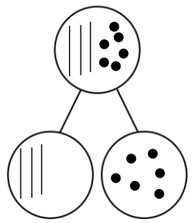
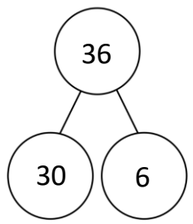
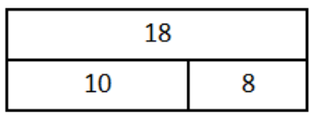
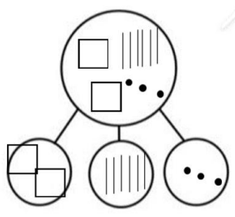
Base ten – ones
</td><td>Unstructured objects to count – teach to cross out as counted

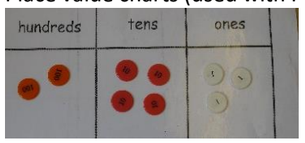
Hundred square

Number line bridging 100

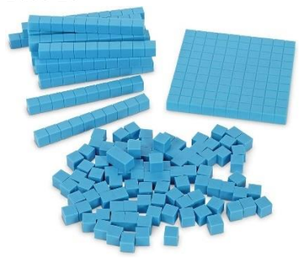
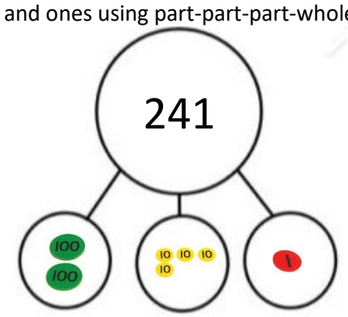
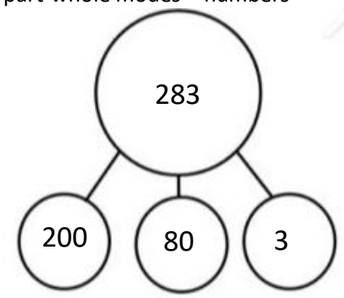
</td></tr>
<tr><td>Count backwards through zero to include negative numbers.</td><td>4</td><td rowspan="2">Thermometers
</td><td rowspan="2">Pictorial thermometers

</td></tr>
<tr><td>Interpret negative numbers in context, count forwards and backwards with positive and negative numbers through zero.</td><td>5</td></tr>
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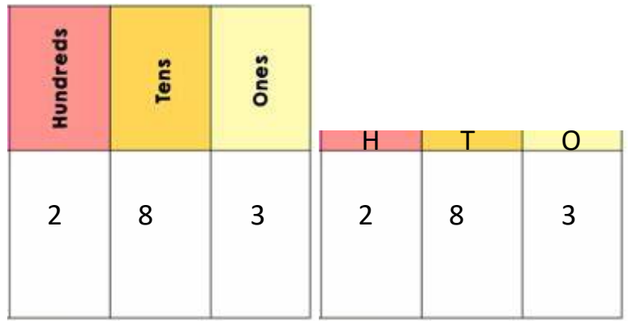
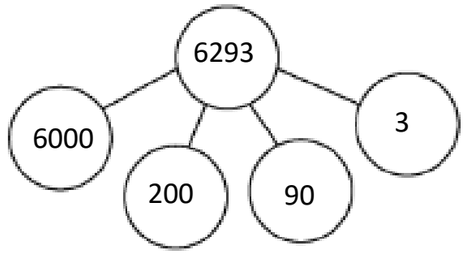
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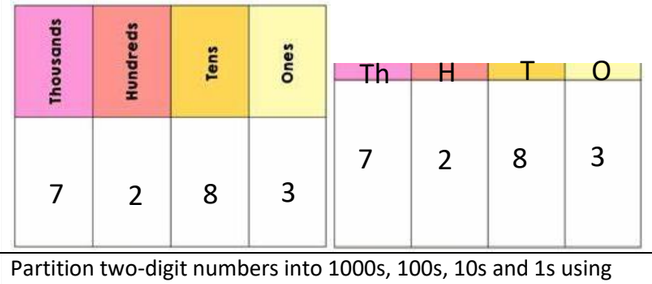
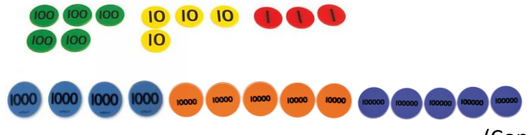
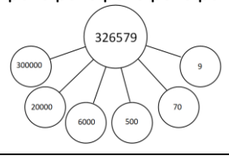
			Number line bridging zero  Graphs showing temperature or amounts of money 	
Use negative numbers in context and calculate intervals across zero.	6	As above.	As above, and: Coordinate grid with 4-quadrants  	
Have a deep understanding of number to 10, including the composition of each number	R	Partition physical objects into groups  Use multilink of two different colours  Partition physical objects into groups using part-part-whole models  (Continued on next page)	Draw representations of objects e.g. three flowers and two flowers  Part-part-whole models, representing the concrete materials with marks  Draw around Numicon then cut out in different ways 	

		Use Numicon to see how you can make the Numicon shape using other Numicon pieces. Use part-part-whole models to show this. 		
Recognise the place value of each digit in a two-digit number (tens and ones).	2	Numicon using 10s and 1s  (continued on next page) Multilink – stacks of 10s and 1s  Base 10  Bead strings  Straw bundles  Partition physical objects (for example, those above) into tens and ones using part-part-whole models 	Numicon number line  (continued on next page) Partition two-digit numbers into 10s and 1s using part-part-whole models – concrete materials represented with lines for 10s and dots for 1s  Partition two-digit numbers into 10s and 1s using part-part-whole models – numbers  Bar model 	Write place value number sentences e.g. 35 = 30 + 5 40 + 6 = 46
Recognise the place value of each digit in a three-digit number (hundreds, tens and ones)	3	Place value counters  (Continued on next page)	Partition three-digit numbers into 100s, 10s and 1s using part-part-part-whole models – concrete materials represented with boxes for 100s, lines for 10s and dots for 1s  (Continued on next page)	Write place value number sentences e.g. 536 = 500 + 30 + 6 100 + 80 + 9 = 189 309 = 300 + 9

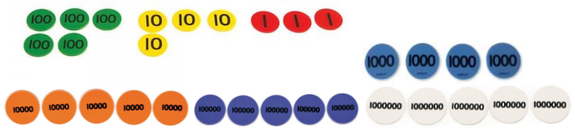
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<tr>
<td></td>
<td></td>
<td>Place value charts (used with PV counters)


Base 10

Partition physical objects (for example, those above) into hundreds, tens and ones using part-part-part-whole models

</td>
<td>Partition two-digit numbers into 100s, 10s and 1s using part-part-part-whole modes – numbers


Place value charts – numbers

</td>
<td></td>
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<tr>
<td>Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones).</td>
<td>4</td>
<td>As above, but extending to include thousands</td>
<td>Partition two-digit numbers into 1000s, 100s, 10s and 1s using part-part-part-part-whole models – numbers


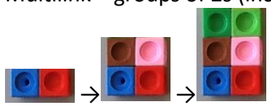
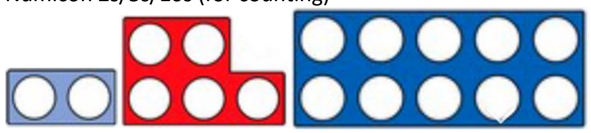
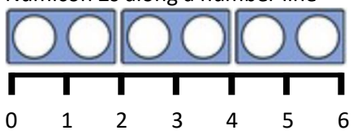
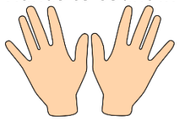
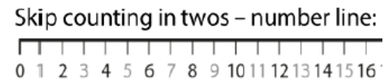
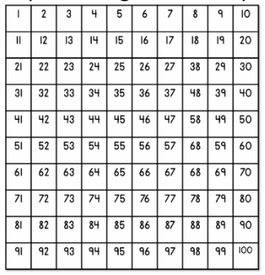
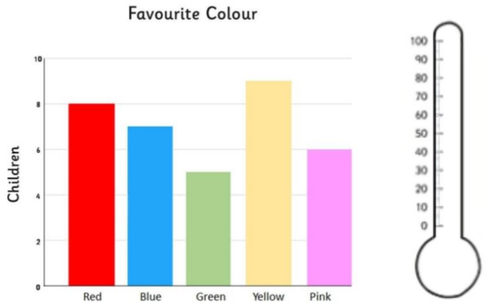
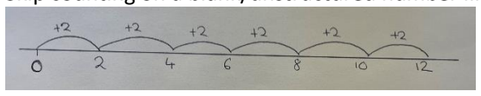
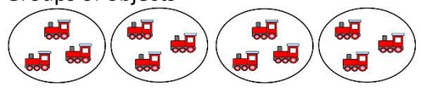
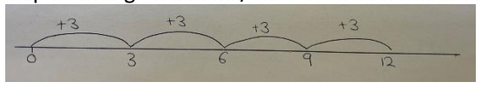
Place value charts – numbers

</td>
<td>Write place value number sentences e.g.
3451 = 3000 + 400 + 50 + 1
4000 + 800 + 30 + 2 = 4832
3002 = 3000 + 2</td>
</tr>
<tr>
<td>Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit.</td>
<td>5</td>
<td>Place value counters

(Continued on next page)</td>
<td>Partition two-digit numbers into 1000s, 100s, 10s and 1s using part-part-part-part-whole models – numbers


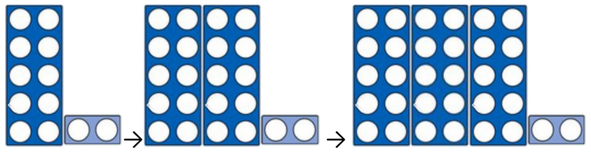
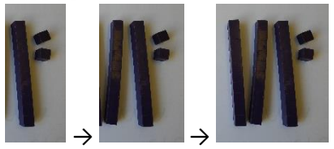
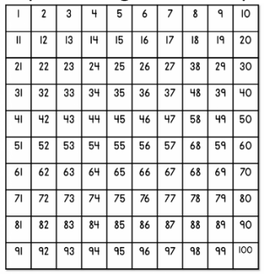
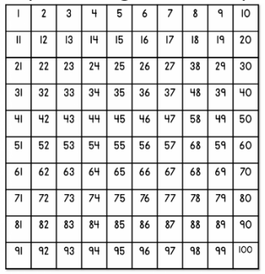
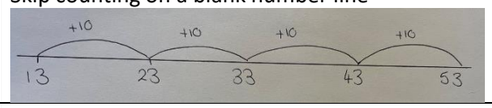
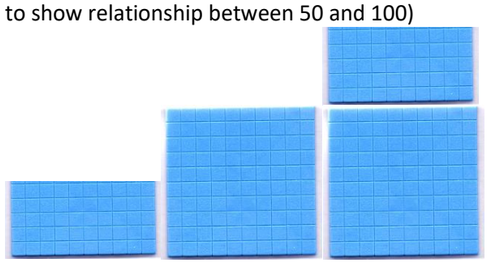
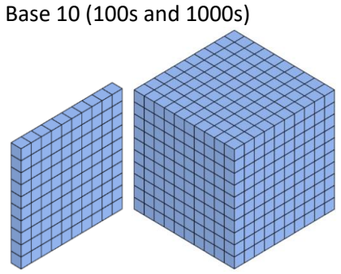
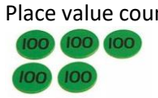
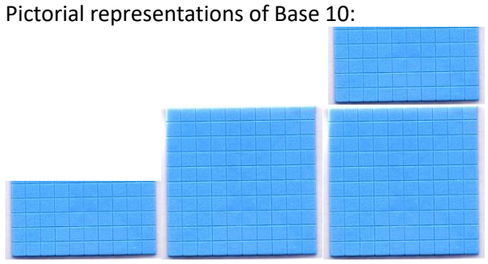
(Continued on next page)</td>
<td>Write place value number sentences e.g.
483729 = 400000 + 80000 + 3000 + 700 + 20 + 9
600000 + 20000 + 9000 + 200 + 30 + 1 = 629231
403901 = 400000 + 3000 + 900 + 1</td>
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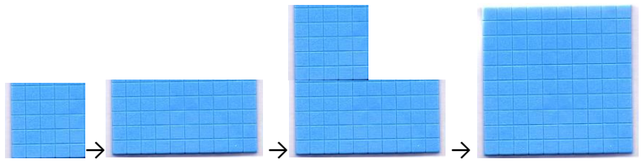
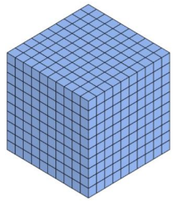
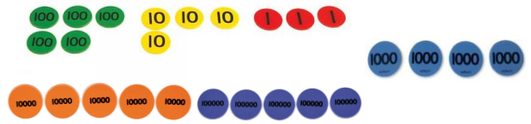
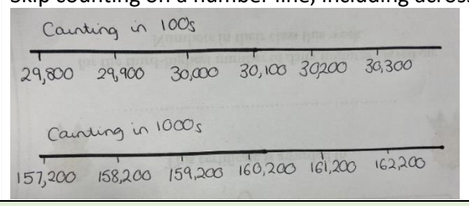
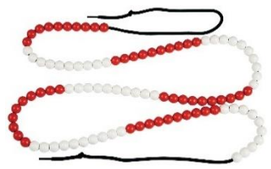
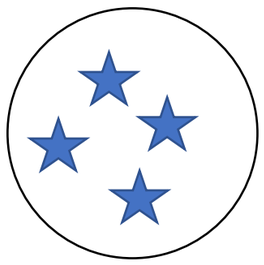
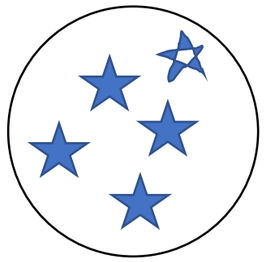
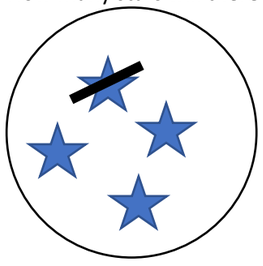
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<tr><td>HTh</td><td>TTh</td><td>Th</td><td>H</td><td>T</td><td>O</td></tr>
<tr><td>100,000</td><td>10,000</td><td>1,000</td><td>100</td><td>10</td><td>1</td></tr>
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Gattengo chart
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<tr><td>1,000</td><td>2,000</td><td>3,000</td><td>4,000</td><td>5,000</td><td>6,000</td><td>7,000</td><td>8,000</td><td>9,000</td></tr>
<tr><td>100</td><td>200</td><td>300</td><td>400</td><td>500</td><td>600</td><td>700</td><td>800</td><td>900</td></tr>
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<table>
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<td></td>
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<tr>
<td>Read, write, order and compare numbers to at least 10,000,000 and determine the value of each digit.</td>
<td>6</td>
<td>Place value counters

Place value charts (used with PV counters)
<table>
<tr><th>Millions</th><th>Hundred Thousands</th><th>Ten Thousands</th><th>Thousands</th><th>Hundreds</th><th>Tens</th><th>Ones</th></tr>
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<td>Place value charts – numbers
<table>
<tr><th>Millions</th><th>Hundred Thousands</th><th>Ten Thousands</th><th>Thousands</th><th>Hundreds</th><th>Tens</th><th>Ones</th></tr>
<tr><td>M</td><td>HTh</td><td>TTh</td><td>Th</td><td>H</td><td>T</td><td>O</td></tr>
<tr><td>1,000,000</td><td>100,000</td><td>10,000</td><td>1,000</td><td>100</td><td>10</td><td>1</td></tr>
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<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table></td>
<td>Write place value number sentences e.g.
6483729 = 6000000 + 400000 + 80000 + 3000 + 700 + 20 + 9
7000000 + 600000 + 20000 + 9000 + 200 + 30 + 1 = 7629231
9403901 = 9000000 + 400000 + 3000 + 900 + 1</td>
</tr>
<tr><td colspan="5"></td></tr>
<tr>
<td>Count in multiples of twos, fives and tens</td>
<td>1</td>
<td>Pairs of objects e.g. socks, shoes

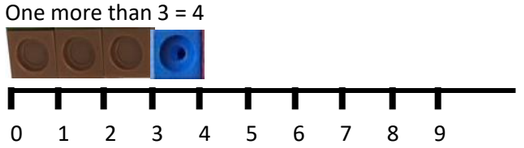
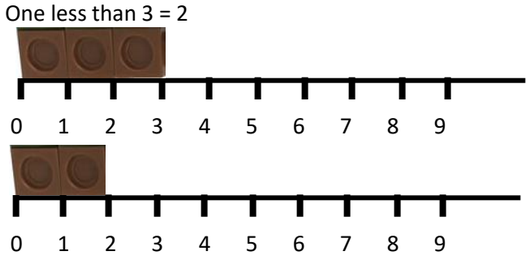
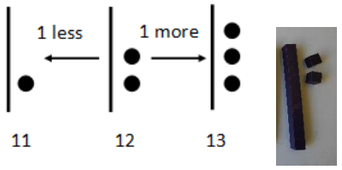
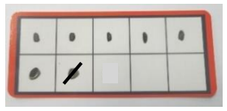
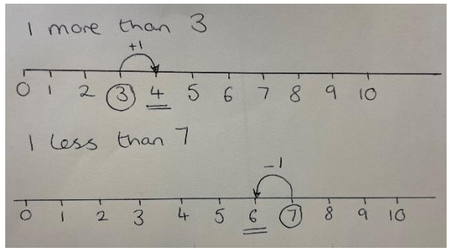
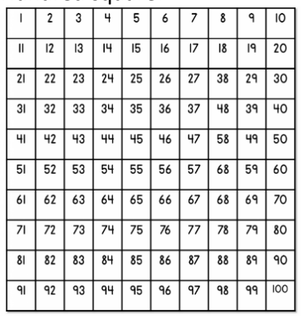
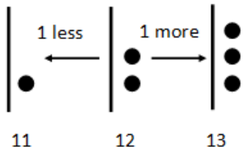
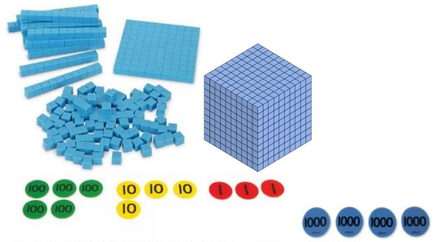
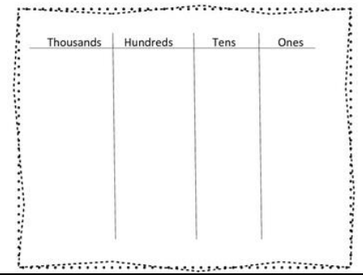
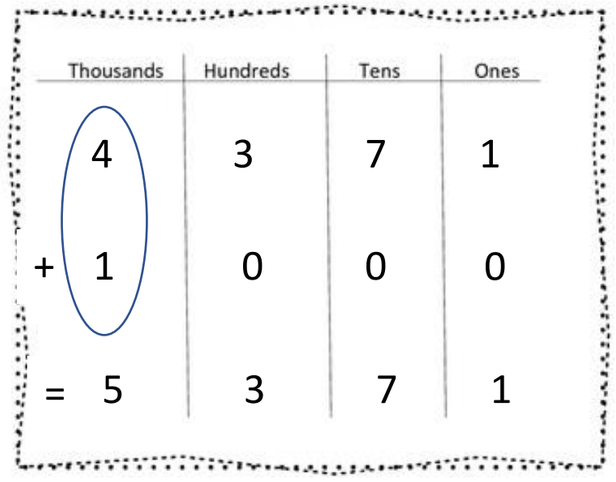
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<td>Groups of objects (2s, 5s, 10s)

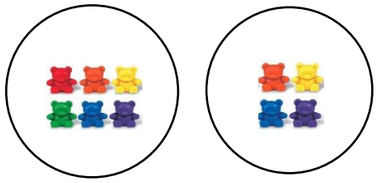
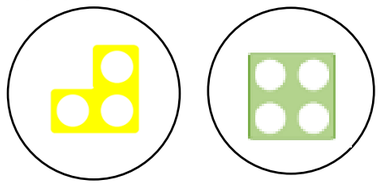
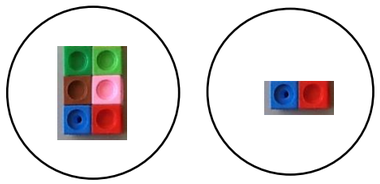
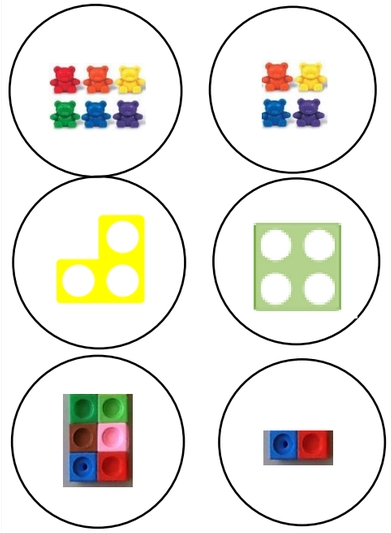
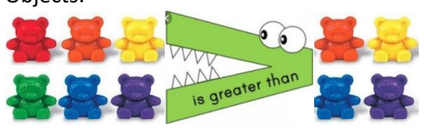
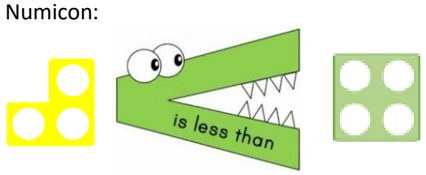
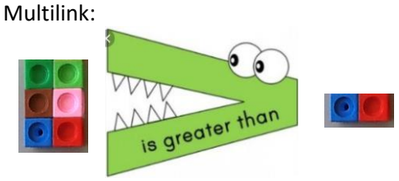
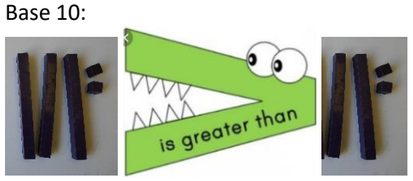
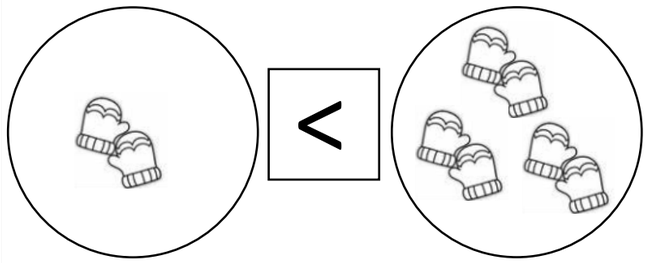
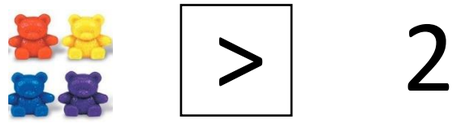
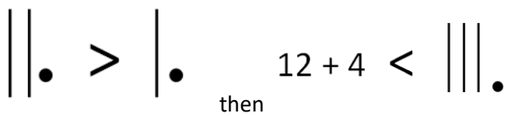
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<td>Verbal counting without concrete or pictorial resources</td>
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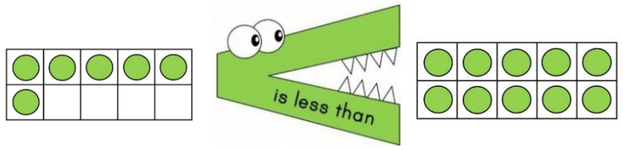
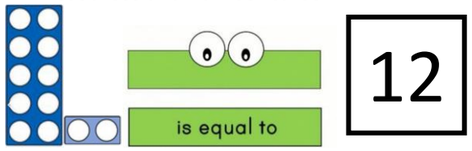
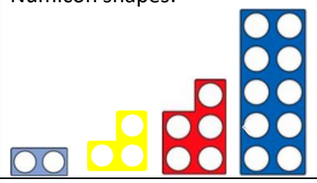
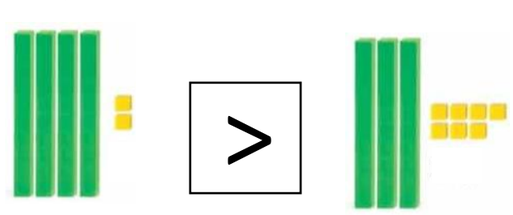
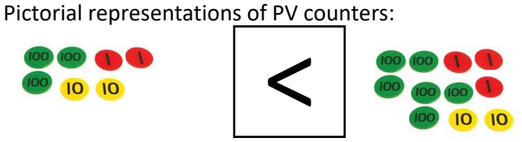
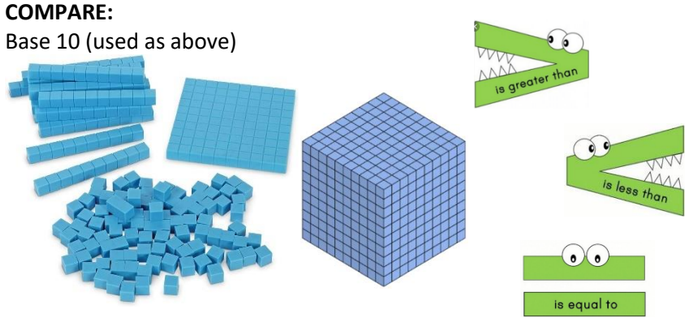
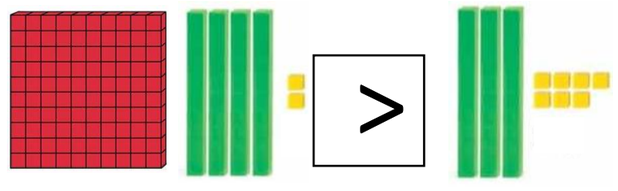
		Multilink – groups of 2s (including forming an array shape)  Numicon 2s/5s/10s (for counting)  Numicon 2s along a number line  0 1 2 3 4 5 6 Hands to count in 5s  Numicon 2s to form an array  (Continued on next page) Money 	Skip counting on a number line (2s/5s):  Skip counting on a 100 square (2, 5s and 10s)  Scales/graphs in 2s/5s/10s  	
Count in steps of 2, 3 and 5 from 0, and in tens from any given number, forward or backward.	2	As above for 2s, 5s and 10s from 0, including in reverse. Counting in 3s (including reverse): Numicon Multilink – groups of 3s (including forming an array shape)  Multilink 3s along a number line  0 1 2 3 4 5 6 7 8 9 (Continued on next page)	As above for 2s, 5s and 10s from 0, including in reverse. And: Skip counting on a blank/unstructured number line  Counting in 3s (including reverse): Groups of objects  Skip counting in 3s on a number line  Skip counting on a blank/unstructured number line  (Continued on next page)	

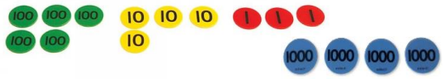
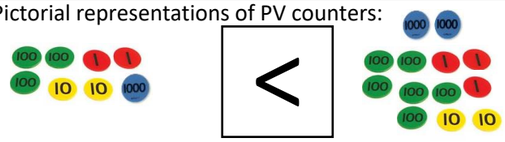
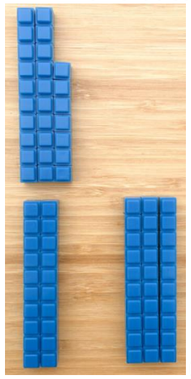
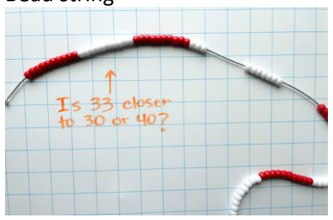
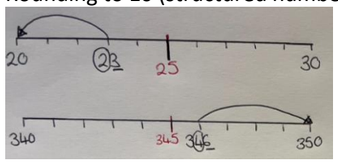
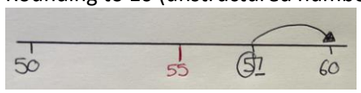
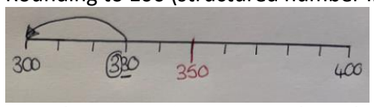
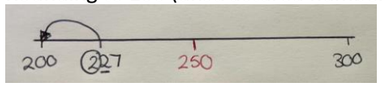
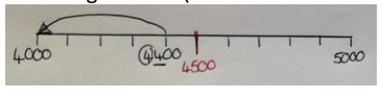
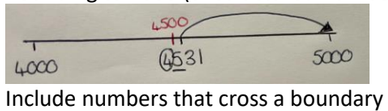
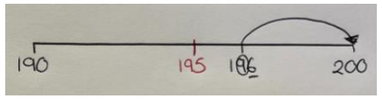
		Multiples of 10 from any number (including reverse): Numicon  Base 10 	Skip counting on a 100 square  Multiples of 10 from any number (including reverse): Skip counting on a 100 square  Skip counting on a blank number line 	
Count from zero in multiples of 4, 8, 50 and 100.	3	From zero in multiples of 4 and 8 – As above for 3 (Numicon, multilink groups and multilink on a number line) From zero in multiples of 50 – Base 10 (100 square cut in half to form 50s to show relationship between 50 and 100)  From zero in multiples of 100: Base 10 (100s and 1000s)  Place value counters 	From zero in multiples of 4 and 8 – as above for 2/3/5/10 (grouped objects, skip counting on a number line/hundred square, skip counting on an unstructured number line) From zero in multiples of 50 and 100: Skip counting on structured and unstructured number lines Pictorial representations of Base 10: 	

Count in multiples of 6, 7, 9, 25 and 1000 from zero.	4	From zero in multiples of 6, 7 and 9 – As above for 3, 4 and 8 (Numicon, multilink groups and multilink on a number line) From zero in multiples of 25: Base 10 (100 square cut into quarters to form 25s and halves to show 50s to show relationship between 25, 50 and 100)  From zero in multiples of 1000: Base 10 (1000s)  Place value counters 	From zero in multiples of 6, 7 and 9 – as above for 2/3/4/5/8/10 (grouped objects, skip counting on a number line/hundred square, skip counting on an unstructured number line) From zero in multiples of 25 – as above for 50 and 100 (skip counting on structured and unstructured number lines Pictorial representations of Base 10)	
Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000	5	Place value counters 	Skip counting on a number line, including across boundaries 	Verbal counting without concrete or pictorial resources Practice of written calculations of adding and subtracting powers of 10 across boundaries e.g. 200,000 – 10 = 40,100 – 1000 = 502,400 – 10,000
Given a number, identify one more and one less.	1	Physical objects – give one more (how many do I have now?), take away one (how many do I have left?)  Bead strings  Numicon – one more e.g.  3 and one more equals 4  (Continued on next page)	Pictorial images of a group of objects:   How many stars will there be if I have one more (child draws and adds up) How many stars will there be if I have one less?  (Continued on next page)	Write the number sentence: 3 + 1 = 4 4 – 1 = 3

		Numicon – one less  1 less than 4 equals 3 Tens frame and counters:  Multilink on a number line One more than 3 = 4  One less than 3 = 2  Physical Dienes for: 	Draw counters on a tens frame:  One more than 7 = 8   One less than 7 = 6 Structured number line:  Hundred square:  Pictorial Dienes (10s/1s) 	
Find 1000 more or less than any given number	4	Base 10 and place value counters – Make the number on a place value chart and then add or subtract 1000  	Place value charts – numbers  (and for subtraction)	Write the number sentence: 4371 + 1000 = 5371 4371 – 1000 = 3371

Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity;	R	Hoops/circles with concrete objects: Which has more/is greater? Which has less? Are they the same?  Numicon:  Multilink: 	Pictorial representations of objects: Children verbalise which has more/less/the same. 	NA
Compare and order numbers from 0 up to 100, use < , > and = signs.	2	**COMPARE:** Objects:  Numicon:  Multilink:  Base 10:  (Continued on next page)	**COMPARE:** Pictorial representations of numbers:  Pictorial and numbers:  2 Base 10:  then 12 + 4 < (Continued on next page)	**COMPARE:** Number sentences: 23 < 84 38 > 19 72 = 72 4 + 8 > 7 + 3 **ORDER:** Order numbers: Smallest to largest (ascending) 34, 85, 18, 29, 49 → 18, 29, 34, 49, 85 Largest to smallest (descending) 54, 29, 48, 11, 30 → 54, 48, 30, 29, 11

		Tens frame:  Mix resources and number cards:  **ORDER:** All of the above e.g. Multilink:  Numicon shapes: 	**ORDER:** Pictorial representations of numbers: 	
Compare and order numbers up to 1000.	3	**COMPARE:** Base 10 (used as above)  Place value counters  Mix resources (Base 10/PV counters) and number cards (as above) **ORDER:** Order groups of Base 10 and PV counters	**COMPARE:** Pictorial representations of Base 10:  Pictorial representations of PV counters:  **ORDER:** Order pictorial representations of Base 10 and PV counters	**COMPARE:** Number sentences: 243 < 845 328 > 109 472 = 472 **ORDER:** Order numbers: Smallest to largest 354, 875, 218, 259, 459 → 218, 259, 354, 459, 875 Largest to smallest 546, 229, 468, 171, 302 → 546, 468, 302, 229, 171
Order and compare number beyond 1000.	4	**COMPARE:** Base 10 (used as above)  (Continued on next page)	**COMPARE:** Pictorial representations of Base 10:  (Continued on next page)	**COMPARE:** Number sentences: 1429 < 1592 3283 > 3109 2483 = 2483 Begin to introduce balance equations: 1342 + 238 > 1230 + 142 3920 - 2300 < 3920 - 1000 4291 + 1000 = 3291 + 2000 **ORDER:**

		Place value counters  Mix resources (Base 10/PV counters) and number cards (as above) **ORDER:** Order groups of Base 10 and PV counters	Pictorial representations of PV counters:  **ORDER:** Order pictorial representations of Base 10 and PV counters	Order numbers: Smallest to largest 354, 875, 218, 259, 459 → 218, 259, 354, 459, 875 Largest to smallest 546, 229, 468, 171, 302 → 546, 468, 302, 229, 171
Round any number to the nearest 10, 100 or 1000.	4	Base 10 27 – which is it closer to, 20 or 30?  (continued on next page) Bead string 	Number line: Circle the number you're rounding to, write the 10s/100s/100s number above/below, underline the number to the right. Where is the centre point? Which number it closest to? Underlined number 1-4 = circled number stays the same, underlined number 5-9 = circled number rounds up. Rounding to 10 (structured number line)  (continued on next page) Rounding to 10 (unstructured number line)  Rounding to 100 (structured number line)  Rounding to 100 (unstructured number line)  Rounding to 1000 (structured number line)  Rounding to 1000 (unstructured number line)  Include numbers that cross a boundary e.g. Round 196 to the nearest 10 	Circle the number you're rounding to, underline the number to the right. Decide – does the circled number round up or stay the same? Which is it closest to? Everything to the right of the circled number turns to zero. E.g. Round 47 to the nearest 10. (4)7 → 50 Round 176 to the nearest 10. 1(7)3 → 170 (continued on next page) Round 298 to the nearest 10. 2(9)8 → 300 Round 345 to the nearest 100. (3)4 5 → 300 Round 4658 to the nearest 1000. (4)6 5 8 → 5000 Include rounding numbers in the thousands to 10 and 100.
Round any number up to 1,000,000 to the nearest 10,100,1000, 10,000 and 100,000	5		As above, extending to 1,000,000. Include rounding numbers in the 100,000s to 10, 100, 1000 etc.	As above, extending to 1,000,000. Include rounding numbers in the 100,000s to 10, 100, 1000 etc.
Round any whole number to a required degree of accuracy	6		As above	As above