



PARK SCHOOL

Numeracy

Progression in
Subtraction
including Written
Calculations



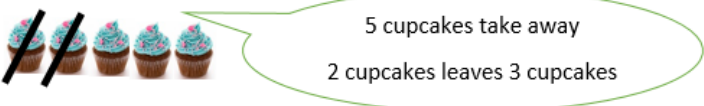
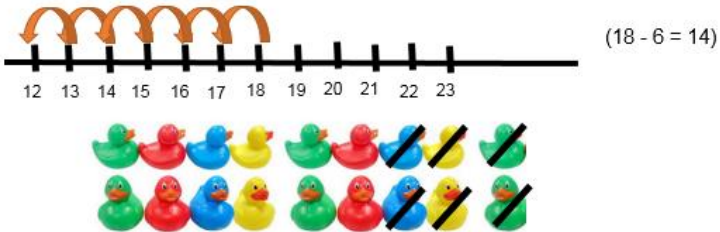
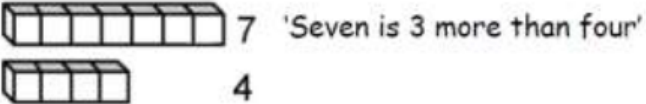
INTRODUCTION

At Park we follow the New National Curriculum (September 2014) and aim to provide a systematic approach to teaching number. This document demonstrates the progression in the mathematical written methods and approaches to calculations across years 1-6. There is a considerable emphasis on teaching mental calculation strategies and up to Year 3 pupils choose an informal written method to record how they work out their answers. The Standard Written Method is introduced when the child begins to work within year 3 and has a secure understanding of place value.

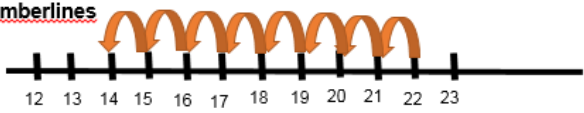
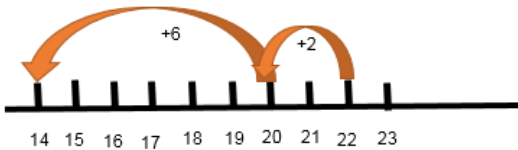



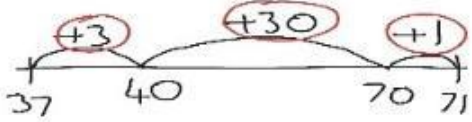

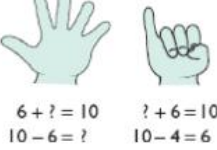


REASONS FOR USING WRITTEN METHODS

- To aid mental calculation by writing down some of the numbers and answers involved
- To make clear a mental procedure for the pupil
- To help communicate methods and solutions
- To provide a record of work
- To aid calculation when the problem is too difficult to be done mentally
- To develop and refine a set of rules for calculation

Year 1

Numeracy Objective	Example Method																														
<p>Read, write and interpret mathematical symbols (- =).</p> <p>Subtract one and two digit numbers to 20 including zero.</p>	<p>$20 - 15 = 5$ $5 = 20 - 15$</p> <p>$18 - 6 = 12$ $12 = 18 - 6$</p> <p>$16 - 9 = 7$ $7 = 16 - 9$</p>																														
<p>Solve one-step problems using concrete objects and pictures and solve missing number problems.</p>	<p>Using pictures:</p>  <p>Using a number line and objects:</p>  <p>Subtracting tens using a hundred square:</p> <table border="1"> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> <tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr> </table> <p>What's the difference between 7 and 4?</p>  <p>'Seven is 3 more than four'</p>	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
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21	22	23	24	25	26	27	28	29	30																						
31	32	33	34	35	36	37	38	39	40																						

Year 2

Numeracy Objective	Example Method
<p>Solve problems using concrete objects and pictures, including: numbers, quantities and measures.</p> <p>Subtract:</p> <ul style="list-style-type: none"> -A 2-digit number and ones -A 2-digit number and tens -Two two digit numbers <p>Use mental and written methods.</p>	<p>Penny has 22 playing cards but gives 8 to her brother. How many does she have left?</p> <p>Numberlines</p>  <p>(22 - 8 = 14)</p> <p>Numberlines with efficient jumps</p>  <p>(22 - 8 = 14)</p> <p>Partition to subtract:</p>  <p>$30 - 4 = ?$</p>  <p>$10 - 4 = 6$</p>  <p>$30 - 4 = 26$</p> <p>Find the difference between two numbers:</p> $71 - 37 = 34$ 
<p>Recall and use subtraction facts to 20 and relate these to addition facts to 100.</p>	  <p>$6 + ? = 10$ $10 - 6 = ?$</p> <p>$? + 6 = 10$ $10 - 4 = 6$</p>  <p>$20 = 12 + 8$ $20 - 8 = 12$</p>  <p>$8 + 12 = 20$ $20 - 12 = 8$</p> <p>Use $7 = 10 - 3$ to calculate $70 = 100 - 30$ Use $20 - 8 = 12$ to calculate $200 - 80 = 120$</p>

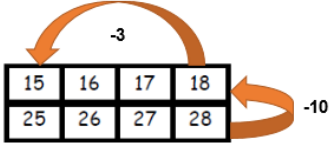
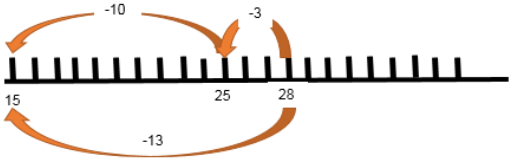
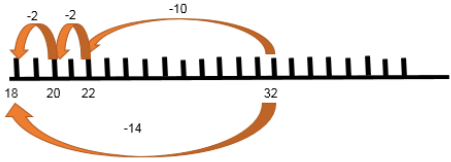
Key Vocabulary

Key Vocabulary

subtract
take away
minus
count back
less
fewer
difference between

count back take away
fewer subtract
minus less
difference between

Year 3

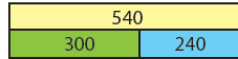
Numeracy Objective	Example Method																																																				
<p>Subtract numbers mentally, including:</p> <ul style="list-style-type: none"> -A three-digit number and ones -A three-digit number and tens -A three-digit number and hundreds 	<p>679 – 5 679 – 60 679 - 400</p> <p>Subtracting two two-digit numbers (without bridging), counting back in Tens (10's) and Units (1's), using Partitioning and Recombining.</p> <p>(28 - 13 = 28 - 10 - 3 = <u>18</u> - 3 = 15)</p>   <p>Subtract any 2 two-digit numbers (bridging over Tens boundary)</p> <table border="1"> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> <tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr> </table>  <p>32 - 14 = 32 - 10 - 4 = <u>32</u> - 10 - 2 - 2 = 18</p>	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40																						
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<p>Subtract numbers with up to three digits, using formal written methods of columnar addition.</p>	<p>The Expanded Method. It is important that pupils have a good understanding of place value and partitioning using resources such as Number lines and Number Squares. The Expanded Method enables pupils to see what happens to the numbers in the Standard Written Method.</p> <div style="display: flex; justify-content: space-around;"> <div> <p>258 - 132 = 126</p> <table border="0"> <tr><td></td><td>H</td><td>T</td><td>U</td></tr> <tr><td></td><td>200</td><td>50</td><td>8</td></tr> <tr><td>-</td><td>100</td><td>30</td><td>2</td></tr> <tr><td colspan="4"><hr/></td></tr> <tr><td></td><td>100</td><td>20</td><td>6</td></tr> </table> </div> <div> <p><small>Standard Written Method with exchanging</small></p> <p>262 - 138 = 124</p> <table border="0"> <tr><td></td><td>H</td><td>T</td><td>U</td></tr> <tr><td></td><td>200</td><td>60</td><td>2</td></tr> <tr><td>-</td><td>100</td><td>30</td><td>8</td></tr> <tr><td colspan="4"><hr/></td></tr> <tr><td></td><td>200</td><td><u>50</u></td><td>12</td></tr> <tr><td></td><td>100</td><td>30</td><td>8</td></tr> <tr><td colspan="4"><hr/></td></tr> <tr><td></td><td>100</td><td>20</td><td>4</td></tr> </table> </div> </div>		H	T	U		200	50	8	-	100	30	2	<hr/>					100	20	6		H	T	U		200	60	2	-	100	30	8	<hr/>					200	<u>50</u>	12		100	30	8	<hr/>					100	20	4
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The standard written method:

$$\begin{array}{r} 6712 \\ 56- \\ \hline 16 \end{array}$$

Solve problems involving missing numbers, place value and number facts.

Write the four number facts that this bar model shows.



$$\square + \square = \square$$

$$\square + \square = \square$$

$$\square - \square = \square$$

$$\square - \square = \square$$

Flo and Jim are answering a problem:

Danny has read 62 pages of the class book, Jack has read 43. How many more pages has Danny read than Jack?

Flo does the calculation $62 + 43$. Jim does the calculation $62 - 43$.


Who is correct?

Explain how you know.

Year 4

Numeracy Objective	Example Method																																							
<p>Add numbers with up to 4 digits using the formal written method.</p>	<p>Standard Written Method for subtraction in contracted format for exchanging.</p> <table style="border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="padding-right: 10px;"> <table style="border-collapse: collapse;"> <tr><td style="padding: 0 5px;">H</td><td style="padding: 0 5px;">T</td><td style="padding: 0 5px;">U</td></tr> <tr><td style="padding: 0 5px;">3</td><td style="padding: 0 5px;">7⁶</td><td style="padding: 0 5px;">14</td></tr> <tr><td style="padding: 0 5px;">2</td><td style="padding: 0 5px;">6</td><td style="padding: 0 5px;">5</td></tr> <tr style="border-top: 1px solid black;"><td style="padding: 0 5px;">1</td><td style="padding: 0 5px;">0</td><td style="padding: 0 5px;">9</td></tr> </table> </td> <td style="padding: 0 10px;">-</td> <td style="padding: 0 5px;"> <table style="border-collapse: collapse;"> <tr><td style="padding: 0 5px;">3</td><td style="padding: 0 5px;">8¹⁴</td><td style="padding: 0 5px;">5</td><td style="padding: 0 5px;">12</td></tr> <tr><td style="padding: 0 5px;">1</td><td style="padding: 0 5px;">4</td><td style="padding: 0 5px;">7</td><td style="padding: 0 5px;">5</td></tr> <tr style="border-top: 1px solid black;"><td style="padding: 0 5px;">2</td><td style="padding: 0 5px;">4</td><td style="padding: 0 5px;">7</td><td style="padding: 0 5px;">7</td></tr> </table> </td> </tr> </table> <p>Standard Written Method for subtraction up to 2 decimal places for money using the contracted format for exchanging.</p> <table style="border-collapse: collapse; margin-bottom: 10px;"> <tr><td style="padding: 0 5px;">£</td><td style="padding: 0 5px;">.</td><td style="padding: 0 5px;">p</td></tr> <tr><td style="padding: 0 5px;">3</td><td style="padding: 0 5px;">7⁶</td><td style="padding: 0 5px;">14</td></tr> <tr><td style="padding: 0 5px;">2</td><td style="padding: 0 5px;">6</td><td style="padding: 0 5px;">5</td></tr> <tr style="border-top: 1px solid black;"><td style="padding: 0 5px;">1</td><td style="padding: 0 5px;">0</td><td style="padding: 0 5px;">9</td></tr> </table>	<table style="border-collapse: collapse;"> <tr><td style="padding: 0 5px;">H</td><td style="padding: 0 5px;">T</td><td style="padding: 0 5px;">U</td></tr> <tr><td style="padding: 0 5px;">3</td><td style="padding: 0 5px;">7⁶</td><td style="padding: 0 5px;">14</td></tr> <tr><td style="padding: 0 5px;">2</td><td style="padding: 0 5px;">6</td><td style="padding: 0 5px;">5</td></tr> <tr style="border-top: 1px solid black;"><td style="padding: 0 5px;">1</td><td style="padding: 0 5px;">0</td><td style="padding: 0 5px;">9</td></tr> </table>	H	T	U	3	7 ⁶	14	2	6	5	1	0	9	-	<table style="border-collapse: collapse;"> <tr><td style="padding: 0 5px;">3</td><td style="padding: 0 5px;">8¹⁴</td><td style="padding: 0 5px;">5</td><td style="padding: 0 5px;">12</td></tr> <tr><td style="padding: 0 5px;">1</td><td style="padding: 0 5px;">4</td><td style="padding: 0 5px;">7</td><td style="padding: 0 5px;">5</td></tr> <tr style="border-top: 1px solid black;"><td style="padding: 0 5px;">2</td><td style="padding: 0 5px;">4</td><td style="padding: 0 5px;">7</td><td style="padding: 0 5px;">7</td></tr> </table>	3	8 ¹⁴	5	12	1	4	7	5	2	4	7	7	£	.	p	3	7 ⁶	14	2	6	5	1	0	9
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<p>Estimate calculations and use the inverse to check your final answers.</p>	<p>Question: 2754 – 1562</p> <p>Estimate: 2800 – 1600 = 1200</p> <p>Calculation:</p> <table style="border-collapse: collapse; margin-bottom: 10px;"> <tr><td style="padding: 0 5px;">2</td><td style="padding: 0 5px;">7⁶</td><td style="padding: 0 5px;">5</td><td style="padding: 0 5px;">4</td></tr> <tr><td style="padding: 0 5px;">-</td><td style="padding: 0 5px;">1</td><td style="padding: 0 5px;">5</td><td style="padding: 0 5px;">6</td><td style="padding: 0 5px;">2</td></tr> <tr style="border-top: 1px solid black;"><td style="padding: 0 5px;">1</td><td style="padding: 0 5px;">1</td><td style="padding: 0 5px;">9</td><td style="padding: 0 5px;">2</td></tr> </table> <p>Inverse: 1192</p> <table style="border-collapse: collapse; margin-bottom: 10px;"> <tr><td style="padding: 0 5px;">+1562</td></tr> <tr style="border-top: 1px solid black;"><td style="padding: 0 5px;">2754</td></tr> <tr><td style="padding: 0 5px;">1</td></tr> </table>	2	7 ⁶	5	4	-	1	5	6	2	1	1	9	2	+1562	2754	1																							
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<p>Solve subtraction two-step problems in contexts, deciding which operations to use and why.</p>	<p>Identify the missing numbers in these bar models. They are not drawn to scale.</p> <table style="border-collapse: collapse; margin-bottom: 10px;"> <tr><td style="padding: 5px; text-align: center;">1000</td></tr> <tr style="border-top: 1px solid black;"><td style="width: 30%;"></td><td style="width: 40%; text-align: center;">353</td><td style="width: 30%; text-align: center;">354</td></tr> </table> <table style="border-collapse: collapse; margin-bottom: 10px;"> <tr><td style="padding: 5px; text-align: center;">2000</td></tr> <tr style="border-top: 1px solid black;"><td style="width: 30%; text-align: center;">493</td><td style="width: 40%;"></td><td style="width: 30%; text-align: center;">754</td></tr> </table> <p>Select your own numbers to make this bar model correct.</p> <table style="border-collapse: collapse; margin-bottom: 10px;"> <tr><td style="padding: 5px; text-align: center;">5000</td></tr> <tr style="border-top: 1px solid black;"><td style="width: 30%;"></td><td style="width: 40%;"></td><td style="width: 30%;"></td></tr> </table> <p>1232 – 232 ○ 1355 – 252</p> <p>1237 – 68 + 32 ○ 1242 – 69 + 31</p> <p>A pizza shop makes 176 pizza bases before opening. Over the evening, they sell 247 pizzas. During the evening, they make another 80 pizza bases. How many pizza bases will be left at the end of the evening?</p>	1000		353	354	2000	493		754	5000																														
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Year 5

Numeracy Objective	Example Method
<p>Subtract numbers mentally with increasingly large numbers.</p> <p>Subtract whole numbers with more than four digits, including using formal written methods.</p> <p>Use rounding to check the accuracy of a calculation.</p>	<p>$12\,462 - 2300 = 10\,162$</p> <p>$13486 - 5000$ $13486 - 3000 = 10486$ $10486 - 2000 = 8486$</p> $\begin{array}{r} \overset{2}{3} \overset{1}{8} 7 \overset{5}{8} 15 \\ - 19248 \\ \hline 19517 \end{array}$
<p>Solve subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</p>	<p>Alisha has £18.35 in her purse. Her father gives her £5 pocket money. She buys a book for £7.99 and a bag for £13.49. How much will she have left?</p> <p>Captain Conjecture says, 'If you keep subtracting 3 from 397 you will eventually reach 0.'</p> <p>Do you agree? Explain your reasoning.</p> 

Year 6

Numeracy Objective	Example Method
<p>Solve subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</p> <p>Use estimation to check the accuracy of a calculation.</p>	<p>What is 2 minus 0.005?</p> <p>Two numbers have a difference of 2·38 . The smaller number is 3·12 . What is the bigger number?</p> <p>Two numbers have a difference of 2·3 . They are both less than 10. What could the numbers be?</p> <p>5748 – 893</p> <p>Kamal says, '893 is 7 less than 900, and 900 is 100 less than 1000, so I can work out the subtraction by taking away 1000 and then taking away 100 and then taking away 7!'</p> <p>What answer does Kamal get, and is he correct?</p> <p>If you disagree with either Jasmine or Kamal, can you correct their reasoning?</p> <p>14 781 – 6 <input type="text"/> 53 = 8528</p>