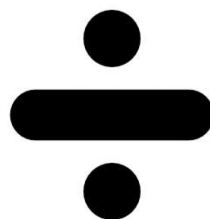




PARK SCHOOL

Numeracy

Progression in
Division
including Written
Calculations







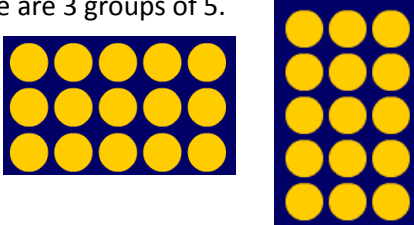
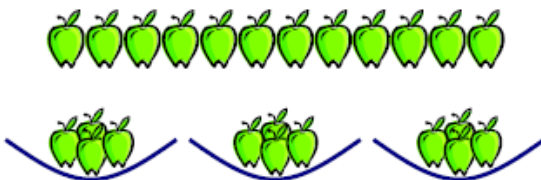
INTRODUCTION

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.


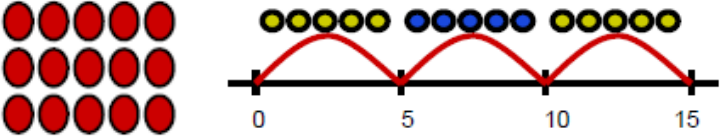

REASONS FOR USING WRITTEN METHODS

- 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

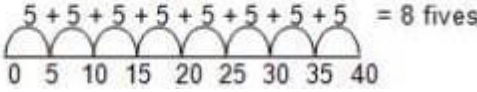
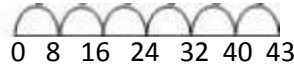
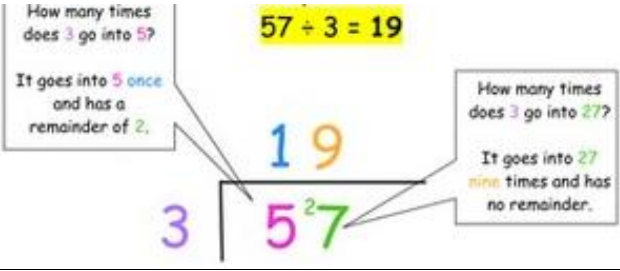
Year 1

Numeracy Objective	Example Method
Solve a one-step problem involving division using objects, pictures and arrays.	<p>Share objects into equal groups and count how many are in each group:</p>  <p>15 cubes shared into 3 groups leaves 5 cubes in each group.</p> <p>Use pictures and drawings to help share into equal groups:</p> <p>6 cakes to share </p> <p>6 cakes shared onto 2 plates </p> <p>6 cakes shared into groups of 2 </p> <p>Use of arrays as a pictorial representation for division:</p> <p>15 shared into 3 groups. There are 5 groups of 3. 15 shared into 5 groups. There are 3 groups of 5.</p>  <p>Solve practical problems: How many apples in each bowl if I share 12 apples into 3 bowls?</p> 

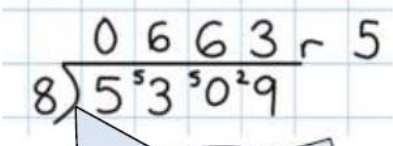
Year 2

Numeracy Objective	Example Method
<p>Recall division facts for the 2, 5 and 10 multiplication tables.</p> <p>Calculate mathematical statements within the multiplication tables using the division (\div) and equals (=) symbol.</p>	<p>$10 \div 2 = 5$ or $10 \div 5 = 2$</p> <p>$20 \div 5 = 4$ or $20 \div 4 = 5$</p> <p>$12 \div 6 = 2$ or $12 \div 2 = 6$</p> <p>$25 \div 5 = 5$</p>
<p>Solve problems using materials, mental methods and division facts, including some in context.</p>	<p>Grouping using a number line: Group from zero in jumps of the divisor to find out how many groups of 3 are there in 15. $15 \div 3 = 5$</p>  <p>$15 \div 5 = 3$</p>  <p>A division problem in context:</p> <p>Four eggs fit in a box. How many boxes will be needed for 20 eggs?</p> 

Year 3

Numeracy Objective	Example Method																
<p>Recall division facts for the 3, 4 and 8 multiplication tables.</p>	<p>Continue to practise mental recall of multiplication tables. Connect the 2, 4 and 8 multiplication tables through doubling:</p> $\begin{array}{c} 12 \div 4 = 3 \\ \curvearrowright \quad \quad \quad \curvearrowleft \\ 24 \div 4 = 6 \end{array}$ <p>Use and relate multiplication and division facts: and $2 = 6 \div 3$</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">If</td> <td style="width: 30%;">$4 \times 5 = 20$</td> <td style="width: 30%;">If</td> <td style="width: 10%;">$3 \times 2 = 6$</td> </tr> <tr> <td>Then</td> <td>$20 \div 4 = 5$</td> <td>Then</td> <td>$6 \div 3 = 2$</td> </tr> <tr> <td>And</td> <td>$20 \div 5 = 4$</td> <td>And</td> <td>$6 \div 2 = 3$</td> </tr> <tr> <td>Also</td> <td>$5 = 20 \div 4$</td> <td>Also</td> <td>$2 = 6 \div 3$</td> </tr> </table> <p>Derive related facts: $30 \times 2 = 60$, so $60 \div 3 = 20$ and $20 = 60 \div 3$.</p>	If	$4 \times 5 = 20$	If	$3 \times 2 = 6$	Then	$20 \div 4 = 5$	Then	$6 \div 3 = 2$	And	$20 \div 5 = 4$	And	$6 \div 2 = 3$	Also	$5 = 20 \div 4$	Also	$2 = 6 \div 3$
If	$4 \times 5 = 20$	If	$3 \times 2 = 6$														
Then	$20 \div 4 = 5$	Then	$6 \div 3 = 2$														
And	$20 \div 5 = 4$	And	$6 \div 2 = 3$														
Also	$5 = 20 \div 4$	Also	$2 = 6 \div 3$														
<p>Write and calculate mathematical statements for division using the multiplication tables they know, including dividing a two-digit number by a one-digit number (TU÷U)</p>	<p>Example without a remainder: $40 \div 5$ How many 5s are in 40?</p>  <p>$40 \div 5 = 8$</p> <p>Example with a remainder: $43 \div 8$ How many 8s are in 43?</p> <p>$8 + 8 + 8 + 8 + 8 + 3 = 5 \text{ 8s with a remainder of } 3$</p>  <p>$43 \div 8 = 5 \text{ r } 3$</p> <p>Bus Stop Method:</p> 																
<p>Solve problems including missing number problems.</p>	<p>12 sweets are shared equally between 4 children. How many sweets do they get?</p> $\underline{\quad} \div 4 = 12$ $56 \div \underline{\quad} = 7$																

Year 5

Numeracy Objective	Example Method
Divide numbers up to 4-digits by a one-digit number using the formal written method	 <p>The answer could be expressed as 663 remainder 5 or 663 and $\frac{5}{8}$ or as a decimal.</p> <p>Short division involving decimals example:</p> $43.4 \div 7$ <p>(estimate: $42 \div 7 = 6$)</p> $\begin{array}{r} 6.2 \\ 7 \overline{) 43.4} \end{array}$

Year 6

Numeracy Objective	Example Method
Divide numbers up to 4 digits by a 2-digit number using the formal written method of long division and short division.	<p>Long division with remainders example:</p> $560 \div 24 \text{ (estimate: } 550 \div 25 = 22)$ $ \begin{array}{r} \text{H T U} \\ 23 \\ 24 \overline{) 560} \\ \underline{- 480} \\ 80 \\ \underline{- 72} \\ 8 \end{array} $ <p>Answer = 23 R 8</p> <hr/> <p>432 ÷ 15 becomes</p> $ \begin{array}{r} 2 8 \text{ r } 12 \\ 1 5 \overline{) 4 3 2} \\ \underline{3 0 } \\ 1 3 2 \\ \underline{1 2 } \\ 1 2 \end{array} $ <p>Ensure children are able to express remainders either as remainder, fraction or decimal. For example remainder 12 or 12/15 (4/5) or 0.8)</p>