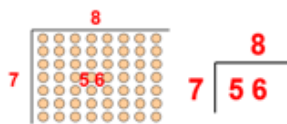
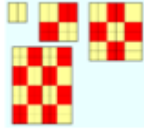



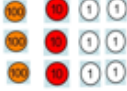
Preston Primary School Adacemy – Calculation methods

Division

Obj	Gui	Year 4	Vid	Ex	Obj	Gui	Year 5	Vid	Ex	Obj	Gui	Year 6	Vid	Ex
<p>÷ = signs and missing numbers Continue using a range of equations as in year 3 but with appropriate numbers.</p> <p>Sharing, Grouping and using a number line Children will continue to explore division as sharing and grouping, and to represent calculations on a number line until they have a secure understanding. Children should progress in their use of written division calculations:</p> <ul style="list-style-type: none"> Using tables facts with which they are fluent Experiencing a logical progression in the numbers they use, for example: <ol style="list-style-type: none"> Dividend just over 10x the divisor, e.g. $84 \div 7$ Dividend just over 10x the divisor when the divisor is a teen number, e.g. $173 \div 15$ (learning sensible strategies for calculations such as $102 \div 17$) Dividend over 100x the divisor, e.g. $840 \div 7$ Dividend over 20x the divisor, e.g. $168 \div 7$ <p>All of the above stages should include calculations with remainders as well as without. Remainders should be interpreted according to the context. (i.e. rounded up or down to relate to the answer to the problem)</p> <p style="text-align: center;">e.g. $840 \div 7 = 120$</p> <div style="text-align: center;"> </div>					<p>÷ = signs and missing numbers Continue using a range of equations but with appropriate numbers</p> <p>Sharing and Grouping and using a number line Children will continue to explore division as sharing and grouping, and to represent calculations on a number line as appropriate.</p> <p>Quotients should be expressed as decimals and fractions</p> <ul style="list-style-type: none"> Divide numbers up to 4 digits by a two-digit number using short division <p>Formal Written Methods – long and short division E.g. $1504 \div 8$</p> <div style="text-align: center;"> </div>									
<p>Formal Written Methods Formal short division should only be introduced once children have a good understanding of division, its links with multiplication and the idea of 'chunking up' to find a target number (see use of number lines above)</p> <p>Short division to be modelled for understanding using place value counters as shown below. Calculations with 2 and 3-digit dividends. E.g. fig 1 uses the grouping method.</p> <p>How many groups of three in the hundreds? How many groups of three in the tens? How many groups of three in the ones?</p> <p>$336 \div 3 = 112$ $349 \div 3 = 116 \text{ r } 1$</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;"> $\begin{array}{r} 112 \\ 3 \overline{)336} \end{array}$ </div> <div style="text-align: center;"> $\begin{array}{r} 116 \text{ r } 1 \\ 3 \overline{)349} \end{array}$ </div> </div>					<ul style="list-style-type: none"> Divide numbers up to 4 digits by a one digit number using short division and interpret remainders appropriately for the context. <p>Formal Written Methods Continued as shown in Year 4, leading to the efficient use of a formal method. The language of grouping to be used (see link from fig. 1 in Year 4) E.g. $1435 \div 6$</p> <div style="text-align: center;"> </div> <p>Children begin to practically develop their understanding of how express the remainder as a decimal or a fraction. Ensure practical understanding allows children to work through this (e.g. what could I do with this remaining 1? How could I share this between 6 as well?)</p>									
<p>E.g. $2364 \div 15$ (chunking- Using known facts)</p> <div style="text-align: center;"> $\begin{array}{r} 157 \text{ r } 9 \\ 15 \overline{)2364} \\ \underline{-1500} \quad (15 \times 100) \\ 864 \\ \underline{-750} \quad (15 \times 50) \\ 114 \\ \underline{-90} \quad (15 \times 7) \\ 24 \\ \underline{-21} \quad (15 \times 1) \\ 39 \\ \underline{-30} \quad (15 \times 2) \\ 9 \end{array}$ </div> <p>Short Division</p> <div style="text-align: center;"> </div>														

Obj	Gui	Year 4	Vid	Ex	Obj	Gui	Year 5	Vid	Ex	Obj	Gui	Year 6	Vid	Ex
<p>Use the Singapore Bar method to help solve division problems.</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>whole whole = number of parts \times one part whole = one part \times number of parts</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p>larger quantity</p> <p>larger quantity = smaller quantity \times multiple larger quantity \div multiples = larger quantity</p> </div>					<p>Continue to use the Singapore Bar method to solve division problems.</p>					<p>Continue to use the Singapore Bar method to solve division problems.</p>				

Division		
Year 4	Year 5	Year 6
<p>Mental Strategies Children should experience regular counting on and back from different numbers in multiples of 6, 7, 9, 25 and 1000. Children should learn the multiplication facts to 12 x 12.</p> <p>Vocabulary see years 1-3 divide, divided by, divisible by, divided into share between, groups of factor, factor pair, multiple times as (big, long, wide ...etc) equals, remainder, quotient, divisor, dividend inverse</p> <p>Towards a formal written method Alongside pictorial representations and the use of models and images, children should progress onto short division using a bus stop method.</p>  <p>Place value counters can be used to support children apply their knowledge of grouping. Reference should be made to the value of each digit in the dividend.</p> <p>Each digit as a multiple of the divisor 'How many groups of 3 are there in the hundreds column?' 'How many groups of 3 are there in the tens column?' 'How many groups of 3 are there in the units/ones column?'</p>	<p>Mental Strategies Children should count regularly using a range of multiples, and powers of 10, 100 and 1000, building fluency. Children should practice and apply the multiplication facts to 12 x 12.</p> <p>Vocabulary see year 4 common factors prime number, prime factors composite numbers short division square number cube number inverse power of</p> <p>Generalisations The = sign means equality. Take it in turn to change one side of this equation, using multiplication and division, e.g. Start: 24 = 24 Player 1: 4 x 6 = 24 Player 2: 4 x 6 = 12 x 2 Player 1: 48 ÷ 2 = 12 x 2</p> <p>Sometimes, always, never true questions about multiples and divisibility. E.g.:</p> <ul style="list-style-type: none"> If the last two digits of a number are divisible by 4, the number will be divisible by 4. If the digital root of a number is 9, the number will be divisible by 9. When you square an even number the result will be divisible by 4 (one example of 'proof' shown left) 	<p>Mental Strategies Children should count regularly, building on previous work in previous years. Children should practice and apply the multiplication facts to 12 x 12.</p> <p>Vocabulary see years 4 and 5</p> <p>Generalisations Order of operations: brackets first, then multiplication and division (left to right) before addition and subtraction (left to right). Children could learn an acronym such as PEMDAS, or could be encouraged to design their own ways of remembering.</p> <p>Sometimes, always, never true questions about multiples and divisibility. E.g.: If a number is divisible by 3 and 4, it will also be divisible by 12. (also see year 4 and 5, and the hyperlink from the Y5 column)</p> <p>Using what you know about rules of divisibility, do you think 7919 is a prime number? Explain your answer.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Some Key Questions for Year 4 to 6</p> <p>What do you notice?</p> <p>What's the same? What's different?</p> <p>Can you convince me?</p> <p>How do you know?</p> </div>

  <p>When children have conceptual understanding and fluency using the bus stop method without remainders, they can then progress onto 'carrying' and 'regrouping' their remainder across to the next digit.</p> <p>Generalisations True or false? Dividing by 10 is the same as dividing by 2 and then dividing by 5. Can you find any more rules like this? Is it sometimes, always or never true that $a \div \Delta = \Delta \div a$?</p> <p>Inverses and deriving facts. 'Copy one, get lots free!' e.g.: $2 \times 3 = 6$, so $3 \times 2 = 6$, $6 \div 2 = 3$, $60 \div 20 = 3$, $600 \div 3 = 200$ etc.</p> <p>Sometimes, always, never true questions about multiples and divisibility. (When looking at the examples on this page, remember that they may not be 'always true!') E.g.:</p> <ul style="list-style-type: none"> Multiples of 5 end in 0 or 5. The digital root of a multiple of 3 will be 3, 6 or 9. The sum of 4 even numbers is divisible by 4. 		
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