Division	
Year 5	**Year 6**
Basic to subject specific (Beck's Tiers): see year 4 common factors, prime number, prime factors, composite numbers, short division, dividend, quotient, divisor square number, cube number, inverse, power of  **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 **Sometimes, always, never true questions about multiples and divisibility.** E.g.: • 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)	**Basic to subject specific (Beck's Tiers):** see years 4 and 5  **Generalisations** Order of operations: brackets first, then multiplication and division (left to right) before addition and subtraction (left to right). 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) Using what you know about rules of divisibility, do you think 7919 is a prime number? Explain your answer. **Some Key Questions for Year 4 to 6** **What do you notice?** **What's the same? What's different?** **Can you convince me?** **How do you know?**
NC 2104: Multiply and divide numbers mentally drawing upon known facts. Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context. Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.	**NC 2014:** Divide numbers up to 4 digits by a two-digit number and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context. Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.

Mental Strategies

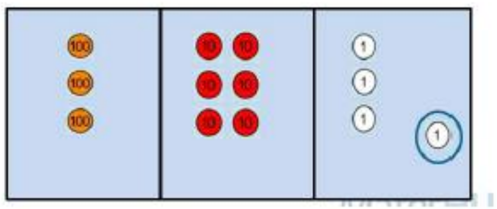
Children should count regularly using a range of multiples, and powers of 10, 100 and 1000, building fluency.
Children should practice and apply the multiplication facts to 12 x 12.

Short division with 'bus stop' notation
Recap division without remainders and without carrying
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?'

  1 1 2
3 | 3 3 6

364 ÷ 3 =

  1 2 1 rem 1
3 | 3 6 4



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?)

Quickly progress onto 'carrying' their remainder across to the next digit.
Short division to be modelled for understanding using place value counters as shown below. Calculations with 2 and 3-digit dividends. Language of grouping to be used.

Use place value equipment to model.

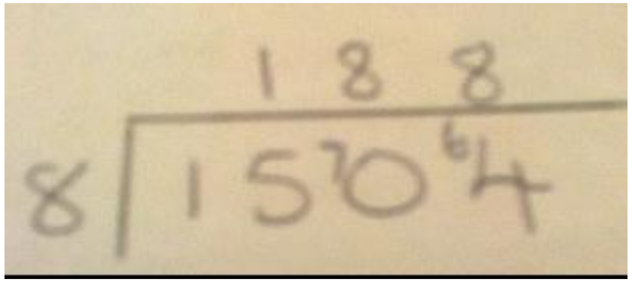
Mental Strategies

Children should count regularly, building on previous work in previous years.
Children should practice and apply the multiplication facts to 12 x 12.

Explain the effect of dividing by1000.

Extend methods to include Th HTU by TU.
Quotients should be expressed as decimals and fractions

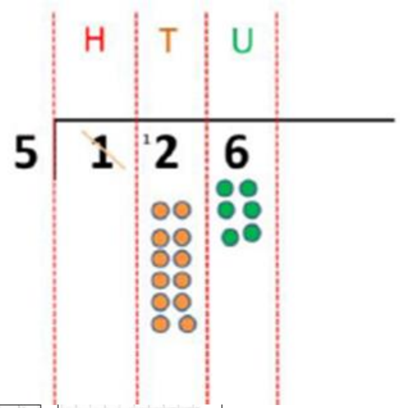
Formal Written Methods –short division
E.g. 1504 ÷ 8

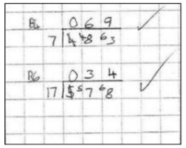


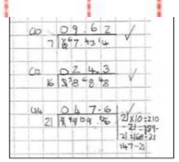
Continue to use the short division method when the two digit divisor is up to 12 or is a easily recognisable multiple eg 20, 25 or 50.

Use a calculator appropriately, approximating first.
Use of calculator for interpreting the quotient by entering a fraction to find the decimal equivalent.

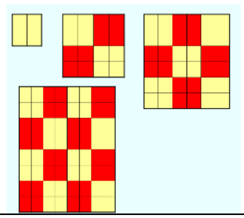
Use long division only with pupils who are secure with number sense and place value.

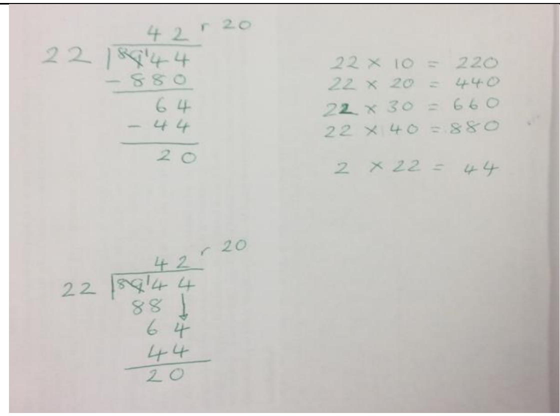






Vocabulary



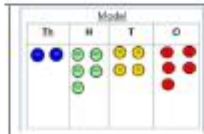


944 ÷ 22

"What do I know about the divisor?"

Record partial tables.

Formal method of long division: as below.

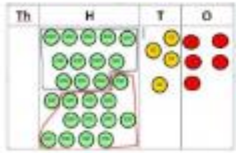


2544 ÷ 12
How many groups of 12 thousands do we have? None

Exchange 2 thousand for 20 hundreds.

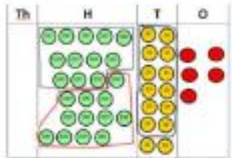
$$\begin{array}{r} 0 \\ 12\overline{)2544} \end{array}$$

How many groups of 12 are in 25 hundreds? 2 groups. Circle them.
We have grouped 24 hundreds so can take them off and we are left with one.



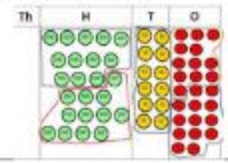
$$\begin{array}{r} 02 \\ 12\overline{)2544} \\ \underline{24} \\ 1 \end{array}$$

Exchange the one hundred for ten tens so now we have 14 tens. How many groups of 12 are in 14? 1 remainder 2



$$\begin{array}{r} 021 \\ 12\overline{)2544} \\ \underline{24} \\ 14 \\ \underline{12} \\ 2 \end{array}$$

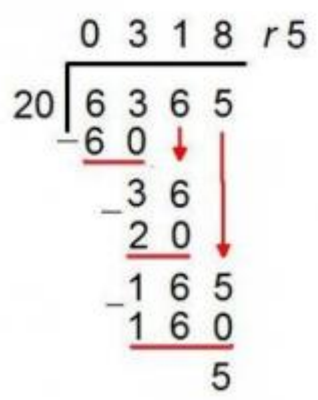
Exchange the two tens for twenty ones so now we have 24 ones. How many groups of 12 are in 24? 2



$$\begin{array}{r} 0212 \\ 12\overline{)2544} \\ \underline{24} \\ 14 \\ \underline{12} \\ 24 \\ \underline{24} \\ 0 \end{array}$$

<table>
<tr><td></td><td>Instead of using physical counters, students can draw the counters and circle the groups on a whiteboard or in their books.

Use this method to explain what is happening and as soon as they have understood what move on to the abstract method as this can be a time consuming process.

</td></tr>
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<table>
<tr><td>Known facts</td><td colspan="2">Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
Recall prime numbers up to 19
Recognise and use square and cube numbers and the notation for squared (^{2}) and cubed (^{3})</td><td colspan="2">Identify common factors, common multiples and prime numbers</td></tr>
<tr><td rowspan="3">Essential knowledge</td><td>4x and 8x tables</td><td>100, 1000 times bigger</td><td>Multiplication facts up to 12 x 12</td><td>Partition to multiply mentally</td></tr>
<tr><td>3x, 6x and 12x tables; 3x and 9x tables</td><td>10, 100, 1000 times smaller</td><td rowspan="2">Apply place value to derive multiplication facts, e.g. 3 x 4 = 12 so 3 x 0.4 = 1.2</td><td>Double larger numbers and decimals</td></tr>
<tr><td>11x and 7x tables</td><td>Double larger numbers and decimals</td><td></td></tr>
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