## Chandlers Field Primary School <br> Progression in Calculation

This progression document has been designed to support children's learning through the use of concrete, pictorial and abstract representations at each stage of their education. These representations do not need to be used in this order, nor are they necessary in every maths lesson. Teachers will decide on their most effective use at each stage of pupils' learning.

Concrete - 'doing stage': a pupil is first introduced to an idea or skill by using real objects to model a problem. This is a 'hands on' component using real objects and is a foundation for conceptual understanding.
Pictorial - 'seeing stage': a pupil has sufficiently understood the 'hands on' experiences performed and can now relate them to representations, such as a diagram or picture of the problem.
Abstract - 'symbolic stage' : a pupil is now capable of representing problems by using mathematical notation, for example $12 \times 6=72$.

It is important that conceptual understanding, supported by the use of representation, is secure for all procedures and at every stage of primary education. Reinforcement is achieved by going back and forth between these representations.

We follow the Maths No Problem scheme of exploration. This provides clear progression in learning calculation within the Maths No Problem teacher hub for all teachers.

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## Mathematics Mastery

At the centre of the mastery approach to the teaching of mathematics is the belief that all children have the potential to succeed. They should have access to the same curriculum content and, rather than being extended with new learning, they should deepen their conceptual understanding by tackling challenging and varied problems. Pupils are taught through whole-class interactive teaching, enabling all to master the concepts necessary for the next part of the curriculum sequence.

In a typical lesson, the teacher leads back and forth interaction, including questioning, short tasks, explanation, demonstration, and discussion, enabling pupils to think, reason and apply their knowledge to solve problems. Maths No Problem supports the teacher in planning using this approach. Use of precise mathematical language enables all pupils to communicate their reasoning and thinking effectively

Maths mastery is a transformational approach to maths teaching:

- It helps pupils develop a deep, long-term, and adaptable understanding of maths
- It's an inclusive approach where all children achieve
- It goes at a slower pace with deeper learning, which results in greater progress


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## Addition: EYFS

Vocabulary: add, more, and, make, altogether, total, equal to, equals, double, most, count on, part-whole

| Early Learning Goals | Concrete | Pictorial |
| :--- | :--- | :--- |
| - Have a deep | Use toys and general | Two groups of pictures so |
| understanding of | classroom resources for | children are able to count the |
| number to 10, | children to physical |  |
| including the |  |  |
| manipulate, group and re- | total |  |
| composition of each | group. |  |

Bar model using visuals, picture/icons or colours, especially for number composition


Use visual supports such as Ten frames, part-whole models and addition mats with pictures/icons.

Written number formation


Focus on symbols and numbers to form an equation.


No expectation for children to be able to record a written equation.

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contexts, recognising when one quantity is greater than, less than or the same as the other quantity.


Use visual supports such as Ten frames, part-whole models and addition mats with physical objects and resources that can be manipulated.




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| :---: | :---: | :---: | :---: |
|  |  |  |  |
| - Add 1 <br> and 2- <br> digit <br> numbers <br> to 20 | Ten frames (within 20) <br> Bead strings (20) <br> Number shapes <br> Number lines (labelled) <br> Straws | Part-whole model <br> Bar model <br> Ten frames (within 20) Jumps on a number line (counting on) | Written equation from part-whole model $8=7=15$ <br> Make Ten first, then add on the rest $\begin{gathered} 8+7=15 \\ 2) 5 \end{gathered}$ |

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## Addition: Year 2

Vocabulary: add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, Tens, Ones, partition, addition, column, part-whole


|  | Chandlers Field Primary School Progression in Calculation |  |  |
| :---: | :---: | :---: | :---: |
| - Add 1 and 2-digit numbers | Number lines (blank) <br> Straws <br> Hundred square (blank) | Part-whole model <br> Bar model $\square$ <br> 38 <br> Hundred square labelled <br> Number lines labelled | Written equation from pictorial representation $38+5=43$ <br> Count on from the larger number <br> Apply knowledge of number bonds |


|  | Chandlers Field Primary School Progression in Calculation |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| - Add two 2digit numbers (without regrouping) | Number lines (blank) <br> Number lines (labelled) <br> Hundred square <br> Straws <br> Number shapes <br> Place value grid with Base 10 or place value counters | Number I <br> Number l <br> Hundred <br> Part-whol <br> Bar mode <br> 24 <br> Straws <br> Number s | Iled) <br> 15 | Written equation from pictorial representation $24+15=39$ <br> Column recording with partitioning $\begin{aligned} & 20+4 \\ & \frac{10+5}{30+9}=39 \end{aligned}$ |
| - Add two 2 digit | Number lines (blank) Number lines (labelled) | Number li |  | Written equation from pictorial |



|  | Chandlers Field Primary School Progression in Calculation |  |  |
| :---: | :---: | :---: | :---: |
| Addition: Year 3 |  |  |  |
| Vocabulary: addition, add, more, and, make, sum, total, altogether, double, near double, half, halve, Hundreds, Tens, Ones, partition, column |  |  |  |
| Objective | Concrete | Pictorial | Abstract |
| - Add 1 and 2digit numbers | Number lines (blank) <br> Straws <br> Hundred square (blank) | Part-whole model <br> Bar model ? <br> 38 <br> Hundred square labelled <br> Number lines labelled | Written equation from pictorial representation $38+5=43$ <br> Count on from the larger number <br> Apply knowledge of number bonds |


| Chandlers Field Primary School Progression in Calculation |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| - Add two 2digit numbers (without regrouping) | Number lines (blank) <br> Number lines (labelled) <br> Hundred square <br> Straws <br> Number shapes <br> Place value grid with Base 10 or place value counters |  | Number lines (blank) <br> Number lines (labelled) <br> Hundred square <br> Part-whole model <br> Bar model |  | Written equation from pictorial representation $24+15=39$ <br> Column recording with partitioning |
|  |  |  | 38 | 23 |  |
|  | $10 \mathrm{~s}$ | $1 \mathrm{~s}$ | Straws <br> Number sh |  |  |
|  |  |  |  |  |  |
| - Add two 2digit numbers (with regrouping) | Number lines Number lines Hundred squa Straws | (blank) <br> (labelled) <br> re | Number lin <br> Number lin | k) $+21$ <br> lled) | Written equation from pictorial representation $38+23=61$ |


|  | Chandlers Field Primary School Progression in Calculation |  |  |
| :---: | :---: | :---: | :---: |
|  | Base 10 <br> Place value grid with Base 10 or place value counters | Hundred square <br> Part-whole model <br> Bar model <br> Straws <br> Place value grid with Base 10 or place value counters | Column recording with partitioning $\begin{aligned} & 30+8 \\ & \underline{20+3} \\ & 50+11=61 \end{aligned}$ |
| - Add numbers with up to 3 digits | Base 10 <br> Place value counters <br> Place value grids with Base 10 or counters | Part-whole model | Column addition with partitioning $\begin{aligned} & 200+60+5 \\ & 100+60+4 \\ & \hline \end{aligned}$ |

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## Addition: Year 4

Vocabulary: addition, add, more, and, make, sum, total, altogether, double, near double, half, halve, Thousands, Hundreds, Tens, Ones, partition, column, decimal, decimal point




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## Subtraction: EYFS

Vocabulary: take, take away, less, subtract, leaves, how many more, how many fewer/less than, most, least, count back, how many left

| Early Learning Goals |
| :---: |
| - Have a deep <br> understanding of number | to 10 , including the composition of each number.

- Subitise (recognise quantities without counting) up to 5.
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10 , including double facts.
- Compare quantities up to 10 in different contexts, recognising when one


Use specific maths resources such as counters, cubes, number shapes, etc.



$$
3-1=
$$

Use visual supports such as Ten frames,

part-whole models and bar models with pictures/icons

Abstract
Focus on symbols and numbers to form an equation.

| 3 | ? |
| :--- | :--- |
| 7 |  |



Written number formation

No expectation for children to be able to record a written equation.

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quantity is greater than, less than or the same as the other quantity.

Use visual supports such as |  |  |  |  |
| :--- | :--- | :--- | :--- |

Ten frames, part-whole models and addition mats 0000 with physical -000 objects and resources that can be manipulated.


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## Subtraction: Year 1

Vocabulary: equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least, count back, how many left, how much less is...


|  | Chandlers Field Primary School Progression in Calculation |  |  |
| :---: | :---: | :---: | :---: |
|  |  |  |  |
| - Subtract 1 <br> and 2- <br> digit <br> numbers <br> to 20 | Ten frames (within 20) <br> Bead strings (20) <br> Number tracks $\begin{array}{\|l\|l\|l\|l\|l\|l\|l\|l\|l\|l\|l\|l\|l\|l\|l\|l\|l\|l\|} \hline 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 10 & 11 & 12 & 13 & 14 & 15 & 16 & 17 & 18 \\ \hline \end{array}$ <br> Straws <br> Number shapes | Cross out drawn objects to show what has been taken away <br> Part-whole model <br> Bar model $\square$ <br> 6 . <br> 8 <br> Ten frames (within 20) Jumps on a number line (counting back) | Written equation from part-whole model <br> Make Ten first, then subtract the rest $14-6=8$ <br> (4) 2 |



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|  | Chandlers Field Primary School Progression in Calculation |  |  |
| :---: | :---: | :---: | :---: |
|  | Number shapes |  |  |
| - Subtract 1 and 2digit numbers to 100 | Number lines (labelled) <br> Number lines (blank) <br> Straws <br> Hundred square <br> Place value grid with Base 10 or place value counters |  | Written equation from part-whole model <br> Written equation from pictorial representation $\begin{array}{r} 51 \\ -25 \\ -28 \\ \hline 37 \\ \hline \end{array}$ |

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## Subtraction: Year 3

Vocabulary: equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least, count back, how many left, how much less is..., difference, count on, strategy, partition, Hundreds, Tens, Ones, exchange


## Chandlers Field Primary School <br> Progression in Calculation

## Subtraction: Year 4

Vocabulary: equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least, count back, how many left, how much less is..., difference, count on, strategy, partition, Thousands, Hundreds, Tens, Ones, exchange


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Place value grids with
Base 10 or counters

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## Subtraction: Year 5

Vocabulary: equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least, count back, how many left, how much less is..., difference, count on, strategy, partition, Thousands, Hundreds, Tens, Ones, tenths, hundredths, thousandths, exchange



## Chandlers Field Primary School <br> Progression in Calculation

Vocabulary: equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least, count back, how many left, how much less is..., difference, count on, strategy, partition, Thousands, Hundreds, Tens, Ones, tenths, hundredths, thousandths, exchange

| Objective | Concrete | Pictorial | Abstract |
| :---: | :---: | :---: | :---: |
| - Subtract with up to 3 decimal places | Base 10 <br> Place value counters <br> Place value grids with Base 10 or counters (PV or plain) | Part-whole model <br> Bar model <br> 5.43 $\square$ <br> 5.43 <br> 2.7 . $\square$ <br> Place value grids with Base 10 or counters | Column subtraction with exchange notation alongside concrete/ pictorial resources " $0.5-0.8$ ? We need to exchange." Include a variety of decimal places and contexts, e.g. money. $\begin{gathered} 4.1 \\ 5.43 \\ -2.7 \\ \hline 2.73 \\ \hline \end{gathered}$ |



|  | Chandlers Field Primary School Progression in Calculation |  |  |
| :---: | :---: | :---: | :---: |
|  | $-\infty-\infty-\infty-\infty-\infty-\infty-\infty-00-$ <br> Number lines <br> Ten frames |  |  |
| - Recall and use multiplication and division facts for the 5-times table | Number shapes <br> Counters <br> Money <br> Everyday objects <br> Bead strings <br> -00000-00000- | Bar model <br> Number shapes <br> Number lines <br> Ten frames | Written multiplication facts alongside pictorial representations <br> Daily counting in multiples forwards and backwards; support using number line or hundred square. <br> Look for patterns using concrete manipulatives to support; notice the pattern in the Ones and highlight the odd, even, odd, even pattern. |


|  | Chandlers Field Primary School Progression in Calculation |  |  |
| :---: | :---: | :---: | :---: |
|  | Number lines <br> Ten frames |  | $\underset{20}{\stackrel{P}{\rightarrow}}$ |
| - Recall and use multiplication and division facts for the 10-times table | Hundred square <br> Number shapes <br> Counters <br> Money <br> Everyday objects <br> Bead strings <br> Number lines <br> Ten frames <br> Base 10 | Bar model Number shapes Number lines Ten frames Base 10 | Written multiplication facts alongside pictorial representations <br> Daily counting in multiples forwards and backwards; support using number line or hundred square. <br> Look for patterns using concrete manipulatives to support; notice the pattern in the digits the Ones are always 0 , |

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## Times Tables: Year 3

Vocabulary: multiply, multiplication, times, lots of, groups of, divide, division, shared between, how many... are in...

| Objective | Concrete | Abstract |
| :---: | :---: | :---: |
| - Recall and use multiplication and division facts for the 3times table | Hundred square Bar model <br> Number shapes Number shapes <br> Counters Number lines <br> Bead strings  <br> Number lines  <br> Everyday objects  | Written multiplication facts <br> Daily counting in multiples forwards and backwards; support using number line or hundred square. <br> Look for patterns using concrete manipulatives to support; notice the odd, even, odd, even pattern using number shapes to support; highlight the pattern in the Ones using a hundred square. |
|  |  |  |





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## Times Tables: Year 4

Vocabulary: multiply, multiplication, times, lots of, groups of, divide, division, shared between, how many... are in...







|  | Chandlers Field Primary School Progression in Calculation |  |  |
| :---: | :---: | :---: | :---: |
|  | Blocks/cubes <br> Everyday objects (esp. pairs) <br> Making arrays |  |  |
| - Solve 1-step problems using multiplication | Number shapes <br> Counters <br> Ten frames Bead strings -00000-00000-00000-00000Number lines Blocks/cubes Everyday objects (esp. | Bar model <br> Ten frames Number lines <br> Arrays | One bag hold five apples. How many apples do 5 bags hold? <br> Written repeated addition $5+5+5+5=20$ <br> Written multiplication alongside repeated addition can be modelled |

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No expectation for children
to record multiplication
formally.

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## Multiplication: Year 2

Vocabulary: groups of, lots of, times, array, altogether, multiply, multiply by, repeated addition, sets of, equal groups, times as big as, commutative


Ten frames
Bead strings
-00000-00000-00000-00000Number lines


Blocks/cubes

| Pictorial |  |  |  |
| :--- | :---: | :---: | :---: |
| Bar model |  |  |  |
| 3 3 3 3 <br>     |  |  |  |

Ten frames


Number lines


Abstract
Written multiplication: introduction to the multiplication symbol.

$$
\begin{aligned}
& 4 \times 5=20 \\
& 2 \times 6=12
\end{aligned}
$$

Write sequences with multiples of numbers.

2,4,6,8,10... 3,6,9,12,15...


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| :---: | :---: | :---: | :---: |
|  |  | methods. |  |
| - Solve problems involving scaling | Cubes or counters <br> Number shapes |  | Written methods as above |
| Multiplication: Year 4 |  |  |  |
| Vocabulary: groups of, lots of, times, array, altogether, multiply, multiply by, repeated addition, sets of, equal groups, |  |  |  |

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times as big as, commutative, product, multiples of, scale up, inverse, derive, multiplication facts, Ones, Tens, Hundreds

| Objective | Concrete | Pictorial | Abstract |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| - Multiply 3-digit numbers by 1 -digit numbers | Place value counters Base 10 | Place value counters on place value chart | Column multiplication expanded |  |  |
|  |  |  |  |  |  |
|  |  | -8 000 00000 <br> -0 000 00000 <br> -0 0000 00000 |  |  |  |
|  |  |  | $\frac{\times 3}{3}$ |  |  |
|  |  | $\begin{array}{\|c\|cc\|c\|} \hline-0 & 0000 & 00000 \\ \hline-0 & 000000000 \\ \hline \end{array}$ | $120$ |  |  |
|  |  | $\bigcirc \bigcirc \bigcirc$ | $600$ |  |  |
|  |  | Base 10 on place value chart | 721 |  |  |
|  |  | Hements Tres | Column multiplication with exchange notation |  |  |
|  |  | = |  |  |  |
|  |  | ミ | H | T | 0 |
|  |  | = |  |  |  |
|  |  |  | 2 | 4 | 5 |
|  |  | \# min |  |  |  |
|  |  |  | X 1 | 2 | 4 |
|  |  |  | 9 | 8 | 0 |
|  |  | Bar modelling and number lines can support learners when solving problems |  |  |  |



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## Multiplication: Year 5

Vocabulary: groups of, lots of, times, array, altogether, multiply, multiply by, repeated addition, sets of, equal groups, times as big as, commutative, product, multiples of, scale up, inverse, derive, factor pairs, composite numbers, prime numbers, factors, squared, cubed, Ones, Tens, Hundreds, Thousands

| Objective | Concrete |  |  |  |  |  |  |  |  |  |  | Pictorial | Abstract |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| - Multiply 4-digit numbers by 1-digit numbers | Place value counters Multiplication grids (to support times table facts) |  |  |  |  |  |  |  |  |  | Place value counters on place value chart <br> Bar modelling and number lines can support learners when solving problems with multiplication, alongside the written methods. |  | Column multiplication expanded if needed <br> Column multiplication with exchange notation |  |  |  |  |
|  |  |  | 22 32 23 23 | 2324 | 24 34 34 35 | 3526 | (27 | 28 | 29 |  |  |  |  | Th | H | T | 0 |
|  |  |  | 424 | 434 | 44 (4) | 5) 46 | 47 | 48 | 49 | 50 |  |  |  |  |  |  |  |
|  |  |  | 5253 | 53 | (4) 55 | 556 | 57 | 58 | 59 | 60 |  |  |  | 1 | 8 | 2 | 6 |
|  |  |  | 5 6 | 3) 64 | 5465 | 556 | 67 | 68 | 69 | 70 |  |  |  |  |  |  |  |
|  |  |  | (2) 73 | 374 | 2475 | 576 | $\pi$ | 78 | 79 |  |  |  | X |  |  |  | 3 |
|  |  |  | 3283 | 3384 | 3485 | 586 | 87 | 88 |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  | 5 | 4 | 7 | 8 |
|  |  |  |  |  |  |  |  |  |  |  | Always multiply the Ones first. $1,826 \times 3=5,478$ <br> Limit number of exchanges needed in questions and |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |


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| :---: | :---: | :---: | :---: | :---: |
|  |  |  | move children away from resources when multiplying larger numbers. |  |
| - Multiply 2-digit numbers by 2-digit numbers | Base 10 on area model Place value counters on area model | Base 10 on area model <br> Place value counters on area model | Grid method to match area model |  |
|  |  |  | $\times$ 20 | 2 |
|  | (-) $1+1$ |  |  |  |
|  | $\cdots$ - © |  | 30600 | 60 |
|  |  |  | 120 | 2 |
|  | (1) (-) 1 |  | Column multipli exchange notati | ion with |
|  |  |  | H T O |  |
|  |  |  | 26 |  |
|  |  |  | X 1113 |  |
|  |  |  |  7 8 <br> 21 6 0 |  |
|  |  |  | $\begin{array}{lll}3 & 3 & 8\end{array}$ |  |


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| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| - Multiply 3-digit numbers by 2-digit numbers | Place value counters on area model | Place value counters on area model | Grid method to match area model if needed |  |  |  |
|  | - © - - - - |  | $\times$ | 200 | 30 | $4$ |
|  | $00 \theta 0000000$ |  | 30 | 6,000 | 900 | 120 |
|  |  |  | 2 | 400 | 60 | 8 |
|  |  |  | Column exchang | multip <br> ge nota | icatio tion | with |
|  |  |  | T | T H | T | O |
|  |  |  |  | 2 | 3 | 4 |
|  |  |  | X | X ${ }_{1}$ | ${ }_{1} 3$ | 2 |
|  |  |  | $7$ | 4 <br> 7 | 6 2 | $\begin{aligned} & \hline 8 \\ & 0 \end{aligned}$ |
|  |  |  | 7 | 74 | 8 | 8 |

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## Multiplication: Year 6

Vocabulary: groups of, lots of, times, array, altogether, multiply, multiply by, repeated addition, sets of, equal groups, times as big as, commutative, product, multiples of, scale up, inverse, derive, factor pairs, composite numbers, prime numbers, factors, squared, cubed, Ones, Tens, Hundreds, Thousands, Ten Thousands

| Objective | Concrete |  |  |  |  |  |  |  | Pictorial |  |  | Abst | ract |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| - Multiply 4-digit numbers by 2-digit numbers | Children should be confident in the written method. |  |  |  |  |  |  |  | Children should be confident in the written method. <br> Bar modelling can support learners when solving problems with multiplication, alongside the written methods. | Column multiplication with exchange notation |  |  |  |  |
|  |  |  |  |  |  |  |  |  | TTh | Th | H | T | 0 |
|  |  |  |  | 45 | 56 |  |  |  |  |  |  |  |  |  |
|  | 11 | 1213 | 1314 | 14.15 | 516 |  | (18) | 1920 |  |  | 2 | 7 | 3 | 9 |
|  | 21 | 222 | 2324 | 2425 | 226 | (2) | 28 |  |  |  |  |  |  |  |
|  | 31 | 323 | 3334 | 3435 | 35 (3) | 37 | 38 | 3940 |  |  |  |  | 2 |  |
|  | 41 | 424 | 4344 | 44 (45) | 5) 46 | 47 | 48 | 4950 |  | 2 | 1 | 9 | 1 | 2 |
|  | 515 | 52 | 53 (6) | (4) 55 | 556 | 57 | 58 | 5960 |  |  |  |  |  |  |
|  | 61 |  | (3) 64 | 6465 | 566 | 67 | 68 | 6970 |  | 5 | 4 | 7 | 8 | 0 |
|  | 713 | (2) 7 | 7374 | 7475 | 576 | $\pi$ | 78 | 7980 |  |  |  |  |  |  |
|  | (8) | 82 | 8384 | 8485 | 586 | 87 | 88 | 89 (3) |  | 7 | 6 | 6 | 9 | 2 |
|  | 91 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| - Multiply decimals up to 2 decimal places by integers | Place value counters on <br> area model <br> $3.2 \times 3$ Place value counters on <br> area model <br>  Bar modelling can support <br> learners when solving <br> problems with |  |  |  |  |  |  |  |  | Column multiplication with exchange notation |  |  |  |  |

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multiplication, alongside the written methods.

|  | $3 \cdot 7$ | 2 |
| :---: | :---: | :---: |
| x |  | 3 |
|  | $0 \cdot 0$ | 6 |
|  | $2 \cdot 1$ | 0 |
|  | $9 \cdot 0$ | 0 |
| 1 | $1 \cdot 1$ | 6 |

## Division: EYFS

Vocabulary: even, odd, share, share equally, one each, two each, group, groups of, lots of, half, halving

| Early Learning Goals | Concrete | Pictorial | Abstract |
| :--- | :--- | :--- | :--- |
| - Explore and represent | Children have the | Pictures and icons that | Not applicable at this |
| patterns in numbers up |  |  |  |
| to 10, including evens |  |  |  |
| and odds, double facts |  |  |  |
| and how quantities can |  |  |  |
| be distributed equally. | objects, food or shapes in | half. | encourage children to see <br> the concept of halving in <br> relation to subitising; <br> addition and subtracting <br> resources for children to maths <br> share into two equal groups. | | knowledge, i.e. knowing that |
| :--- |
| 4 is made of 2 groups of 2 so |
| half of 4 is 2. |$\quad$.


|  | Chandlers Field Primary School Progression in Calculation |  |  |
| :---: | :---: | :---: | :---: |
|  | Counting and other maths resources for children to explore sharing between three or more. <br> Use visual supports such as halving mats and part-part-whole models with physical objects and resources that can be manipulated. | Bar model with pictures or icons to support understanding of finding 2 equal parts of a number, to further understand how two halves make a whole. <br> Pictures for children to create and visualize 3 or more equal groups. |  |



Chandlers Field Primary School
Progression in Calculation


## Chandlers Field Primary School <br> Progression in Calculation

## Division: Year 2

Vocabulary: share, share equally, one each, two each, group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, partition


|  | Chandlers Field Primary School Progression in Calculation |  |  |
| :---: | :---: | :---: | :---: |
|  | Bead strings -00000-00000-00000-00000Ten frames <br> Cubes/counters |  | Written multiplication alongside worded equation Repeated subtraction alongside number line <br> Introduction to the division symbol and written equations. $20 \div 5=4$ |
| - Divide 2-digits by 1-digit (sharing with no exchange) |  | Place value counters on place value chart <br> Base 10 on place value chart <br> Part-whole model | Worded equation, e.g. Share 48 stickers between 2 people <br> Written multiplication alongside worded equation Repeated subtraction alongside number line <br> Part-whole partition model |

## Chandlers Field Primary School

Progression in Calculation
Introduction to the division
symbol and written
equations.
$48 \div 2=24$

## Chandlers Field Primary School <br> Progression in Calculation

## Division: Year 3

Vocabulary: share, share equally, one each, two each, group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, remainder, partition, product

| Objective | Concrete | Pictorial | Abstract |
| :---: | :---: | :---: | :---: |
| - Solve one-step problems with division (grouping) | Real life objects <br> Number shapes <br> Bead strings -00000-00000-00000-00000Ten frames <br> Cubes/counters | Number line (repeated subtraction) | Worded equation, e.g. There are 20 apples altogether. They are put in bags of 5 . How many bags are there? <br> Written multiplication alongside worded equation Repeated subtraction alongside number line <br> Introduction to the division symbol and written equations. $20 \div 5=4$ |


| Chandlers Field Primary School Progression in Calculation |  |  |  |
| :---: | :---: | :---: | :---: |
| - Solve one-step problems with division (arrays) | Real life objects <br> Number shapes <br> Bead strings <br> -00000-00000-00000-00000- <br> Ten frames | Arrays <br> Drawn arrays with lines to split the array into groups to make multiplication and division sentences | Written division $\begin{aligned} & 28 \div 4=7 \\ & 28 \div 7=4 \end{aligned}$ |
| - Divide 2-digits by 1-digit (sharing with no exchange) | Straws | Place value counters on place value chart | Worded equation, e.g. <br> Share 48 sweets between 2 people <br> Written multiplication |


| Chandlers Field Primary School Progression in Calculation |  |  |  |
| :---: | :---: | :---: | :---: |
|  | Base 10 <br> Place value counters |  <br> Base 10 on place value chart <br> Part-whole model | alongside worded equation <br> Repeated subtraction alongside number line <br> Part-whole partition model <br> Written equations $48 \div 2=24$ |
| - Divide 2-digits by 1-digit (sharing with exchange and no remainder) | Base 10 | Place value counters on place value chart Base 10 on place value chart Part-whole model | Worded equation Written multiplication alongside worded equation Repeated subtraction alongside number line |


| Chandlers Field Primary School Progression in Calculation |  |  |  |
| :---: | :---: | :---: | :---: |
|  |  <br> Place value counters |  | Part-whole partition model <br> Introduction to the division symbol and written equations. $52 \div 4=13$ |
| - Divide 2-digits by 1-digit (sharing with exchange and remainder) |  | Place value counters on place value chart <br> Base 10 on place value chart Part-whole model | Worded equation Written multiplication alongside worded equation Repeated subtraction alongside number line <br> Part-whole partition model |

## Chandlers Field Primary School

Progression in Calculation


| Chandlers Field Primary School Progression in Calculation |  |  |  |
| :---: | :---: | :---: | :---: |
| Division: Year 4 |  |  |  |
| Vocabulary: share, share equally, one each, two each, group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, remainder, partition, product, division facts, inverse, derive |  |  |  |
| Objective | Concrete | Pictorial | Abstract |
| - Divide 2-digits by 1-digit (sharing with exchange and no remainder) | Base 10 <br> Place value counters | Place value counters on place value chart <br> Base 10 on place value chart Part-whole model $10+3=13$ <br> Bar model | Worded equation Written multiplication alongside worded equation Repeated subtraction alongside number line <br> Part-whole partition model <br> Use of the division symbol and written equations. $52 \div 4=13$ |



|  | Chandlers Field Primary School Progression in Calculation |  |  |
| :---: | :---: | :---: | :---: |
|  |  |      <br> 13 13 13 13 1 |  |
| - Divide up to 3 digit numbers by 1 digit (sharing) | Place value counters to share 3digit numbers into equal groups. <br> Children should start with the equipment outside the place value grid before sharing the hundreds, tens and ones equally between the rows. | Flexible partitioning in a partwhole model supports this method. <br> Bar models: | Begin with divisions that divide equally with no remainder. $844 \div 4=211$ <br> Children should be aware that a 0 is used to keep place value, if the number is not divisible. <br> Move onto divisions with a remainder. <br> No formal method |

Chandlers Field Primary School
Progression in Calculation


## Chandlers Field Primary School <br> Progression in Calculation

## Division: Year 5

Vocabulary: share, share equally, one each, two each, group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, remainder, partition, product, division facts, inverse, derive, formal written method.


## Chandlers Field Primary School

Progression in Calculation


|  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  | 4 | 2 | 6 | 6 |
| 2 | 8 | 5 | $1_{3}$ | 12 |

## Chandlers Field Primary School <br> Progression in Calculation

## Division: Year 6

Vocabulary: share, share equally, one each, two each, group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, remainder, partition, product, division facts, inverse, derive, formal written method, quotient, divisor, dividend, vinculum.


## Chandlers Field Primary School

Progression in Calculation


Chandlers Field Primary School
Progression in Calculation

- Divide multi digits by 2-digits (long division)

| $372 \div 15=24 \mathrm{r} 12$ |  |  |  |  |  |  |  | $1 \times 15=15$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | 2 | 4 | r | 1 | 2 | $2 \times 15=30$ |
| 1 | 5 | 3 | 7 | 2 |  |  |  | $3 \times 15=45$ |
|  | - | 3 | 0 | 0 |  |  |  | $4 \times 15=60$ |
|  |  |  | 7 | 2 |  |  |  | $5 \times 15=75$ |
|  | - |  | 6 | 0 |  |  |  | $10 \times 15=150$ |
|  |  |  |  | 2 |  |  |  | $10 \times 15=150$ |

When a remainder is left at the end of a calculation, children can either leave it as a remainder or convert it to a fraction.
This will depend on the context of the question.
Children can also answer questions where the quotient needs to be rounded according to context.

## Chandlers Field Primary School

Progression in Calculation

- Divide multi digits by 2-digits (long division)

$372 \div 15=24 \mathrm{r} 12$

$372 \div 15=24 \frac{4}{5}$

$$
\begin{aligned}
& 1 \times 15=15 \\
& 2 \times 15=30 \\
& 3 \times 15=45 \\
& 4 \times 15=60 \\
& 5 \times 15=75 \\
& 10 \times 15=150
\end{aligned}
$$

When a remainder is left at the end of a calculation, children can either leave it as a remainder or convert it to a fraction.
This will depend on the context of the question.

Children can also answer questions where the quotient needs to be rounded according to context.

