Calculation Policy

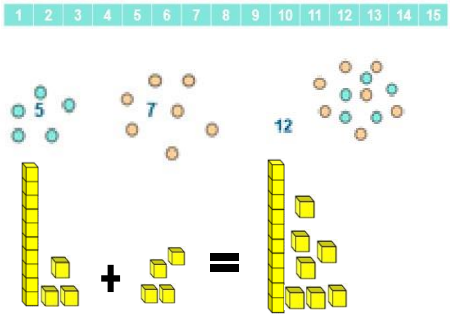
Oatlands Junior School

Approved by:	LGB	**Date:** 1st July 2020
Last reviewed on:	July 2020	
Next review due by:	July 2023	

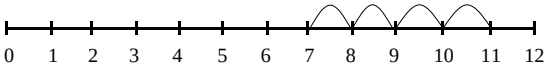
Addition: Year 1

For each of the following progressive stages of addition calculation it is recommended to use concrete – pictorial – abstract to aid understanding.

Combining two sets of objects (aggregation) which will progress onto adding on to a set (augmentation).
Progress ion:
2 + 7 (no bridging)
2 + 9 (bridging)
12 + 6 (no bridging)
Use of bead strings, objects , fingers then number tracks.



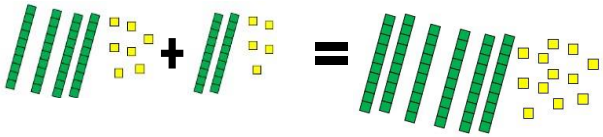
Missing numbers need to be placed in all possible places. (focussing on number bonds)
3 + 7 = □ □ = 3 + 7
3 + □ = 10 10 = □ + 7
Children can progress to a marked number line if comfortable with using concrete objects and a number track.



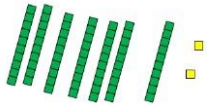
- Identify one more and 1 less of a given number
- Represent and use number bonds and related subtraction facts within 20
- Solve one-step problems that involve addition and subtraction using concrete objects and pictorial representations, and missing number problems such as 7 = 2 + ?

Addition: Year 2

For each of the following progressive stages of addition calculation it is recommended to use concrete – pictorial – abstract to aid understanding.
15 + 8 (bridging)
3 + 7 + 8 three one-digit numbers
22 + 10 – and then multiples of ten (no bridging)
25 + 27 (bridging)
Group tens and ones and exchange 10 units into a ten stick.
Count tens first and then units (like in money)



Then exchanged



Working towards a written method
Partition into tens and units
35 + 24
30 + 20 = 50
5 + 4 = 9
50 + 9 = 59
Extend to partition the smaller number only e.g.
35 + 20 + 4
35 + 20 = 55
55 + 4 = 59

Missing number problems e.g. 14 + 5 = 10 + □ 32 + □ + □ = 100
35 = 1 + □ + 5

- Solve problems with addition and subtraction using concrete objects and pictorial representations, including those involving numbers, quantities and measures.
- Solve problems with addition and subtraction applying their increasing knowledge of mental and written methods
- Show that addition of numbers can be done in any order (commutative) and subtraction can not

Addition: Year 3

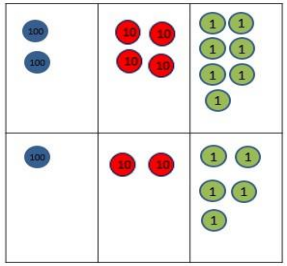
Missing number problems using a range of equations as in Year 1 and 2 but with appropriate, larger numbers.

Partition into tens and ones

Count on by partitioning the second number only e.g.
247 + 125 = 247 + 100 + 20+ 5
= 347 + 20 + 5
= 367 + 5
= 372
Children need to be secure adding multiples of 100 and 10 to any three-digit number including those that are not multiples of 10.

Towards a Written Method

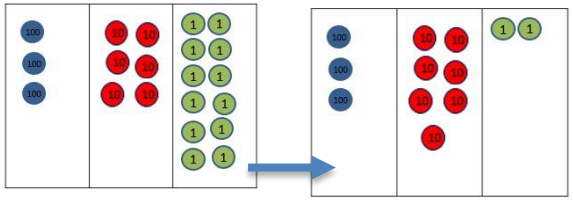
Introduce expanded column addition modelled with place value counters (Dienes could be used for those who need a less abstract representation)



247 + 125 =

200 + 40 + 7
100 + 20 + 5
_____
300 + 60 + 12
372

Leading to children understanding the exchange between tens and ones.

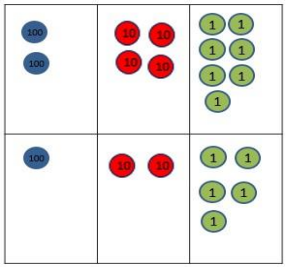


Some children may begin to use a formal columnar algorithm, initially introduced alongside the expanded method. The formal method should be seen as a more streamlined version of the expanded method, not a new method.

Addition: Year 4

Missing number/digit problems:

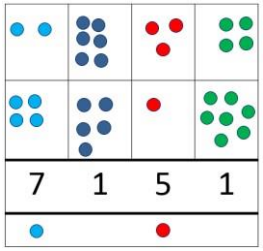
Mental methods should continue to develop, supported by a range of models and images, including the number line. The bar model should continue to be used to help with problem solving. **Written methods (progressing to 4-digits)** Expanded column addition modelled with place value counters, progressing to calculations with 4digit numbers.



200 + 40 + 7
100 + 20 + 5
300 + 60 +12 = 372

Compact written method

Extend to numbers with at least four digits.



2634
+4517
7151
1 1

Children should be able to make the choice of reverting to expanded methods if experiencing any difficulty.

Extend to up to two places of decimals (same number of decimals places) and adding several numbers (with different numbers of digits).

72.8
+ 54.6
127.4
1 1

Addition: Year 5

Missing number/digit problems:

Mental methods should continue to develop, supported by a range of models and images, including the number line. The bar model should continue to be used to help with problem solving. Children should practise with increasingly large numbers to aid fluency
e.g. 12462 + 2300 = 14762

Written methods (progressing to more than 4-digits)
As year 4, progressing when understanding of the expanded method is secure, children will move on to the formal columnar method for whole numbers and decimal numbers as an efficient written algorithm.

172.83
54.68
+ 227.51
1 1 1

Place value counters can be used alongside the columnar method to develop understanding of addition with decimal numbers.

Addition: Year 6

Missing number/digit problems:

Mental methods should continue to develop, supported by a range of models and images, including the number line. The bar model should continue to be used to help with problem solving.

Written methods
As year 5, progressing to larger numbers, aiming for both conceptual understanding and procedural fluency with columnar method to be secured. Continue calculating with decimals, including those with different numbers of decimal places.

Problem Solving
Teachers should ensure that pupils have the opportunity to apply their knowledge in a variety of contexts and problems (exploring cross curricular links) to deepen their understanding.

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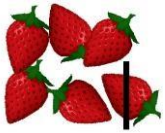
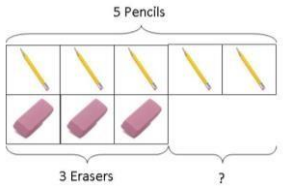
Subtraction: Year 1

Understand subtraction as take-away: Use concrete objects remove and recount.
Progress to pictorial representations and cross out objects: 6- 1=5



Eventually children to make own picture jottings

Counting back in 1s on a number track and then number line (with divisions).



Understand subtraction as finding the difference:

Singapore bar method – first objects then pictures

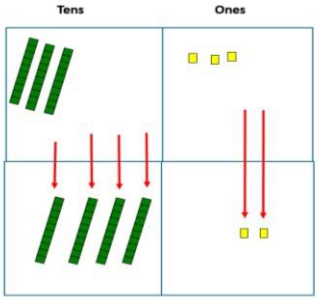
Use number sentences and calculations and give children practise with a range of concrete objects including base 10, bead strings etc.

Progression of difficulty:
7 – 5 = (single digit) 16– 4 = (single digit no bridging) 14 – 5 (single digit bridging) 18 – 12 (two digits)
Missing number problems e.g. 7 = □ - 9; 20 - □ = 9; 15 – 9 = □; □ - □ = 11; 16 – 0 = □ Use concrete objects and pictorial representations.

- Identify one more and one less of a given number
- Represent and use number bonds and related subtraction facts within 20
- Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and using missing number problems such as 7=9-?

Subtraction: Year 2

It is valuable to use a range of representations (also see Y1). Continue to use equipment to model take-away and difference.
Progress to using number lines when understanding is



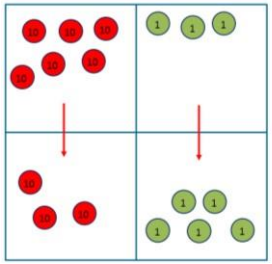
$$\begin{array}{r} 70\ \ 5 \\ -40\ \ 2 \\ \hline 30\ \ 3 \end{array}$$

secure with concrete equipment. E.g. Children should first practise subtracting multiples of ten then numbers with tens and units. When calculations bridge 10s (e.g. 45 – 19) exchange a 10 for 10 units.
Missing number problems e.g. 52 – 8 = □; □ – 20 = 25; 22 = □ – 21; 6 + □ + 3 = 11

- Solve problems with addition and subtraction using concrete objects and pictorial representations including quantities and measures
- Solve problems with addition and subtraction applying their increasing knowledge of mental written methods
- Show that addition of two numbers can be done in any order (commutative) and that subtraction cannot.

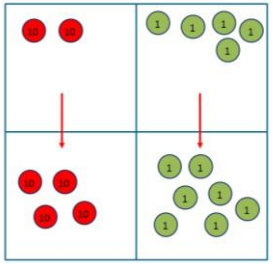
Subtraction: Year 3

Missing number problems e.g. □ = 43 – 27; 145 – □ = 138; 274 – 30 = □; 245 – □ = 195; 532 – 200 = □; 364 – 153 = □
Mental methods should continue to develop, supported by a range of models and images, including the number line. The bar model should continue to be used to help with problem solving (see Y1 and Y2).
Children should make choices about whether to use complementary addition or counting back, depending on the numbers involved.
Written methods (progressing to 3-digits) Introduce expanded column subtraction with no decomposition, modelled with place value counters (Dienes could be used for those who need a less abstract representation)
(Counting on to solve subtraction may also be used)



$$\begin{array}{r} 90\ \ 8 \\ -30\ \ 5 \\ \hline 60\ \ 3 \end{array}$$

For some children this will lead to exchanging, modelled using place value counters (or Dienes).



$$\begin{array}{r} {\scriptstyle 60}\ \ {\scriptstyle 1}\ \ {\scriptstyle 2} \\ \not{70}\ \ 2 \\ -\ 40\ \ 7 \\ \hline 20\ \ 5 \end{array}$$

A number line and expanded column method may be compared next to each other.
Some children may begin to use a formal columnar algorithm, initially introduced alongside the expanded method. The formal method should be seen as a more streamlined version of the expanded method, not a new method.

Subtraction: Year 4

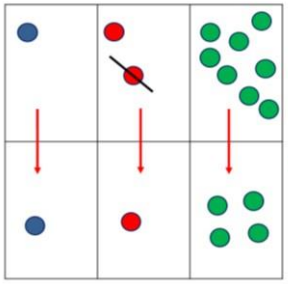
Missing number/digit problems: 456 + □ = 710; 1□7 + 6□ = 200; 60 + 99 + □ = 340; 200 – 90 – 80 = □; 225 - □ = 150; □ – 25 = 67; 3450 – 1000 = □; □ - 2000 = 900

Mental methods should continue to develop, supported by a range of models and images, including the number line. The bar model should continue to be used to help with problem solving.

Written methods (progressing to 4-digits)

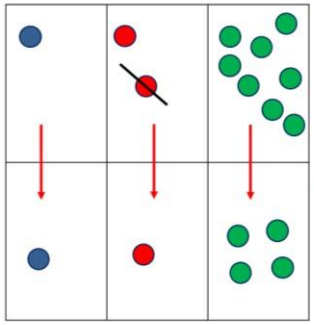
Expanded column subtraction with decomposition, modelled with place value counters/dienes, progressing to calculations with 4-digit numbers.

Use of squared paper to aid lining up of numbers.



$$\begin{array}{r} 200\ \overset{20}{\cancel{30}}\ \overset{1}{2} \\ -\ 100\ \ 10\ \ 4 \\ \hline 100\ \ 10\ \ 8 \end{array}$$

If understanding of the expanded method is secure, children will move on to the formal method of decomposition, which again can be initially modelled with place value counters.



$$\begin{array}{r} \overset{2}{\cancel{2}}\overset{1}{3}2 \\ -\ 114 \\ \hline 118 \end{array}$$

Subtraction: Year 5

Missing number/digit problems: 6.45 = 6 + 0.4 + □; 119 □ = 86; 1 000 000 - □ = 999 000; 600 000 + □ + 1000 = 671 000; 12 462 – 2 300 = □

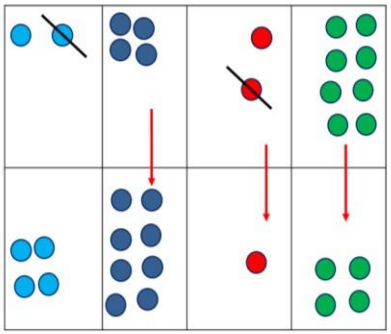
Mental methods should continue to develop, supported by a range of models and images, including the number line. The bar model should continue to be used to help with problem solving.

Written methods (progressing to more than 4-digits)

When understanding of the expanded method is secure, children will move on to the formal method of decomposition, which can be initially modelled with place value counters.

Expanded subtraction method

$$\begin{array}{rrrr} & 600 & 120 & \\ & \cancel{700} & \cancel{30} & 14 \\ - & 200 & 60 & 7 \\ \hline & 400 & 60 & 7 \ = 467 \end{array}$$



$$\begin{array}{r} \overset{5}{\cancel{6}}\overset{1}{2}\overset{2}{\cancel{3}}\overset{1}{2} \\ -\ 4814 \\ \hline 1418 \end{array}$$

Progress to calculating with decimals, including those with different numbers of decimal places.

Subtraction: Year 6

Missing number/digit problems: □ and # each stand for a different number. # = 34. # + # = □ + □ + #. What is the value of □? What if # = 28? What if # = 21

10 000 000 = 9 000 100 + □

7 – 2 x 3 = □; (7 – 2) x 3 = □; (□ - 2) x 3 = 15

Mental methods should continue to develop, supported by a range of models and images, including the number line. The bar model should continue to be used to help with problem solving.

Written methods

As year 5, progressing to larger numbers, aiming for both conceptual understanding and procedural fluency with decomposition to be secured.

Teachers may also choose to introduce children to other efficient written layouts which help develop conceptual understanding. For example use of expanded subtraction:

326
-148
2(150)
150 (300)
26
178 (326)

Continue calculating with decimals, including those with different numbers of decimal places.

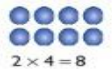
Multiplication: Year 1 & 2

Counting in 2s, 10s and 5s using concrete objects and real life contexts progressing to pictures of equipment.

$2+2+2+2+2=10$
$2\times5=10$
2 multiplied by 5
5 pairs

$5+5+5+5+5+5=30$
$5\times6=30$
5 multiplied by 6

Use practical and then pictorial arrays to represent multiplication and to show the commutative law.
Use language '5 lots of 2' and '2 - 5 times'



$4\times2=8$
$2\times4=8$

$2\times4=8$
$4\times2=8$

Start to represent using calculations along side practical and pictorial representations.

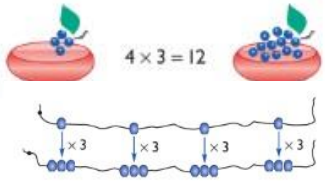
Continue to solve problems in practical and real life contexts and develop the language of early multiplication

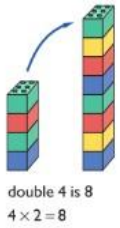
How many eyes altogether?

- count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens
- solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher

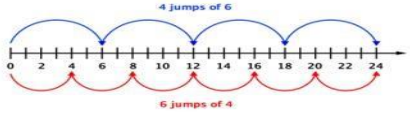
Multiplication: Year 2

Continue to use concrete objects, arrays and repeated addition now include numbers not in the 2,5 or 10 times





Develop understanding of multiplication using number lines
Include multiplications not in the 2, 5 or 10 times tables and recognise odd and even numbers.

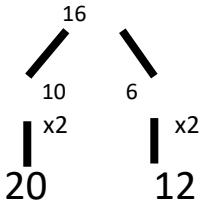


Expressing multiplication as a number sentence using x.

Using understanding of the inverse and practical resources to solve missing number problems.

□ x 2 = 14 14 = 2 x □
□ x ◯ = 14 14 = □ x ◯

Use partitioning and jottings to develop an understanding of doubling two digit .



- Recall and use multiplication and division facts for the 2, 5 and 10 times tables, including recognising odd and even numbers
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

Multiplication: Year 3

Missing number problems
Continue with a range of equations as in Year 2 but with appropriate numbers.

Mental methods

Doubling 2 digit numbers using partitioning

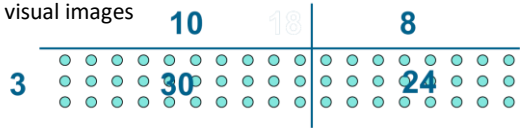
Demonstrating multiplication on a blank number line – jumping in larger groups of amounts

Start with repeated addition
13 x 4 = 10 groups 4 = 3 groups of 4

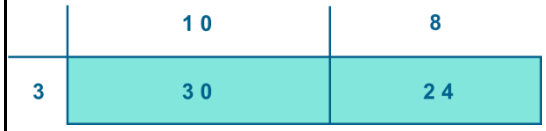
Use of a number line to physically group (SEN) eg 10 x 4 on number line then 3x4

Written methods (progressing to 2d x 1d)

Developing written methods using understanding of visual images



Develop onto the grid method



Give children opportunities for children to explore this and deepen understanding using Dienes apparatus and place value counters

Multiplication: Year 4

Continue with a range of equations as in Year 2 but with appropriate numbers. Also include equations with missing digits □2 x 5 = 160

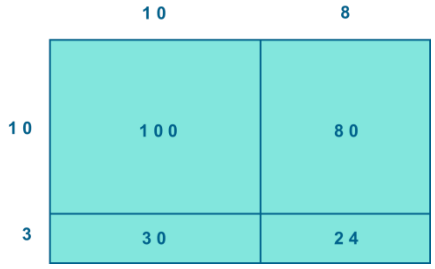
Mental methods

Counting in multiples of 6, 7, 9, 25 and 1000, and steps of 1/100.

Solving practical problems where children need to scale up. Relate to known number facts. (e.g. how tall would a 25cm sunflower be if it grew 6 times taller?)

Written methods (progressing to 3d x 2d)

Children to embed and deepen their understanding of the grid method to multiply up 2d x 2d. Ensure this is still linked back to their understanding of arrays and place value counters.



Year 4 More Able

18
x 13
180 (10 x 18)
30 (10 x 3)
24
234 (8 x 3)

Multiplication: Year 5

Continue with a range of equations as in Year 2 but with appropriate numbers. Also include equations with missing digits

Mental methods

X by 10, 100, 1000 using moving digits ITP

Use practical resources and jottings to explore equivalent statements (e.g. 4 x 35 = 2 x 2 x 35)

Recall of prime numbers up 19 and identify prime numbers up to 100 (with reasoning)

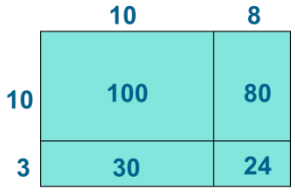
Solving practical problems where children need to scale up. Relate to known number facts.

Identify factor pairs for numbers

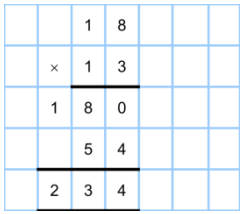
Written methods (progressing to 4d x 2d)

Long multiplication using place value counters

Children to explore how the grid method supports an understanding of long multiplication (for 2d x 2d)



Secure grid multiplication needed before long multiplication method used.



Multiplication: Year 6

Continue with a range of equations as in Year 2 but with appropriate numbers. Also include equations with missing digits

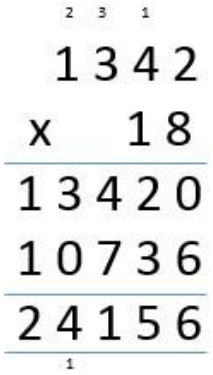
Mental methods

Identifying common factors and multiples of given numbers
Solving practical problems where children need to scale up. Relate to known number facts.

Written methods

Continue to refine and deepen understanding of written methods including fluency for using long multiplication.

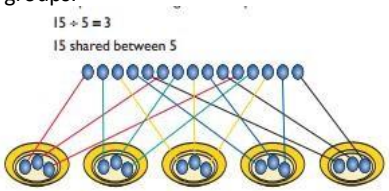
X	1000	300	40	2
10	10000	3000	400	20
8	8000	2400	320	16



Division: Year 1

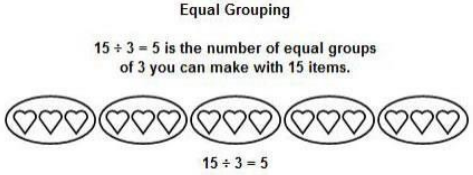
Sharing

Practically share a variety of small quantities of objects into two equal groups progressing to different numbers of groups.



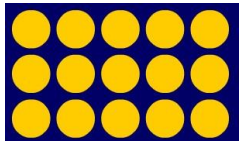
Grouping

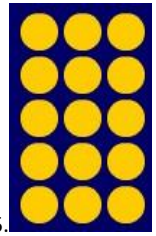
Children will move from sharing towards grouping in practical ways. Initially with groups of 2, 5 and 10.



Use of practical arrays for division. 15 ÷ 3 = 5 There are 5 groups of 3.

15 ÷ 5 = 3 There are 3 groups of 5.





Develop pictorial representations for sharing, grouping and arrays and apply these to one-step problems.

Present children with calculations and solve using equipment for support.

- solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher

Division: Year 2

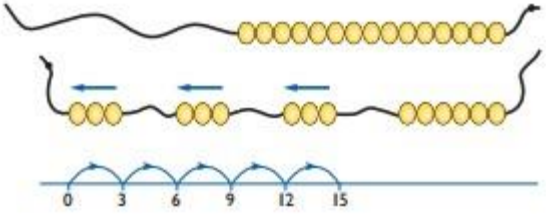
Know and understand sharing and grouping- further familiarise children to the ÷ sign and it's meaning in calculations.

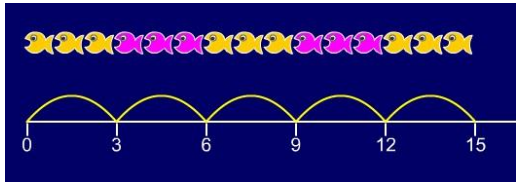
Children should continue to use grouping and sharing for division using practical apparatus, arrays and pictorial representations.

Grouping using a number line

Group from zero in jumps of the divisor to find our 'how many groups of 3 are there in 15?'. Use beads practically and pictorial representations of beads

15 ÷ 3 = 5





Continue work on arrays. Support children to understand how multiplication and division are inverse.

÷ = signs and missing numbers

6 ÷ 2 = □ □ = 6 ÷ 2

6 ÷ □ = 3 3 = 6 ÷ □

□ ÷ 2 = 3 3 = □ ÷ 2

□ ÷ □ = 3 3 = □ ÷ □

- Recall and use multiplication and division facts for the 2, 5 and 10 times tables, including recognising odd and even numbers
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

Division: Year 3

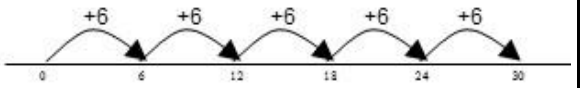
÷ = signs and missing numbers

Continue using a range of equations as in year 2 but with appropriate numbers.

Grouping

How many 6's are in 30?

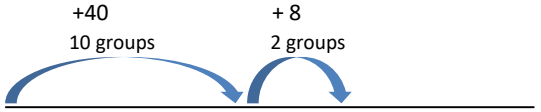
30 ÷ 6 can be modelled as:



Becoming more efficient using a number line

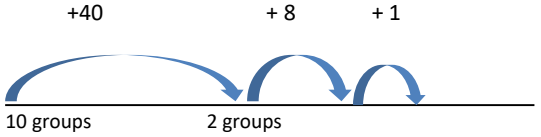
Children need to be able to partition the dividend in different ways.

48 ÷ **4 = 12**



Remainders

49 ÷ **4 = 12 r1**



Sharing – 49 shared between 4. How many left over?

Grouping – How many 4s make 49. How many are left over?

Place value counters can be used to support children apply their knowledge of grouping.

For example:

60 ÷ 10 = How many groups of 10 in 60?

600 ÷ 100 = How many groups of 100 in 600?

Division: Year 4

÷ = signs and missing numbers

Continue using a range of equations as in year 3 but with a

Sharing, Grouping and using a number line

Children will continue to explore division as sharing and gr have a secure understanding. Children should progress in

- Using tables facts with which they are fluent
- Experiencing a logical progression in the numbers they

1. Dividend just over 10x the divisor, e.g. 84 ÷ 7
2. Dividend just over 10x the divisor when the divisor is calculations such as 102 ÷ 17)
3. Dividend over 100x the divisor, e.g. 840 ÷ 7
4. Dividend over 20x the divisor, e.g. 168 ÷ 7 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)

Division: Year 5

Appropriate numbers.

Grouping and to represent calculations on a number line until their use of written division calculations:

Use, for example:

A teen number, e.g. 173 ÷ 15 (learning sensible strategies for

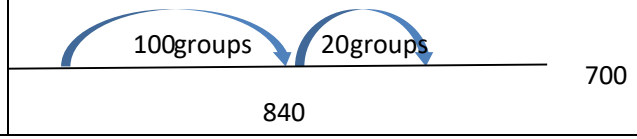
e.g. 840 ÷ 7 = 120

Jottings

7 x 100 = 700

7 x 10 = 70

7 x 20 = 140



Division: Year 6

÷ = signs and missing numbers

Continue using a range of equations but with appropriate numbers

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.

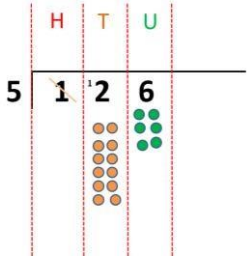
Quotients should be expressed as decimals and fractions

Formal Written Methods – long and short division

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)

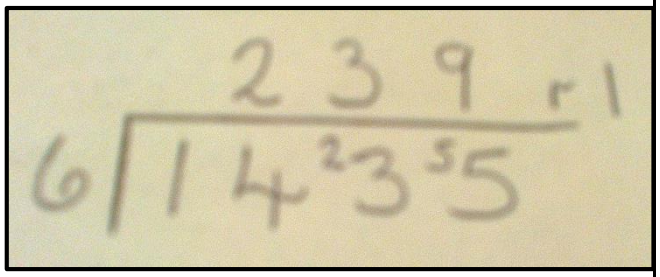
Short division to be modelled for understanding using place value counters as shown below. Calculations with 2 and 3-digit dividends. E.g. fig 1



Formal Written Methods

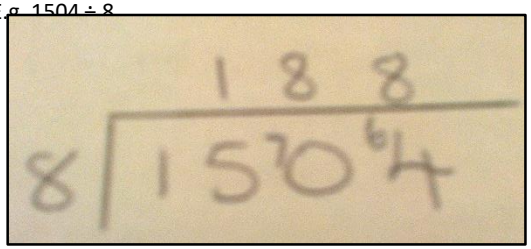
Continued as shown in Year 4, leading to the efficient use of a formal method. The language of grouping to be used (see link from fig. 1 in Year 4)

E.g. 1435 ÷ 6

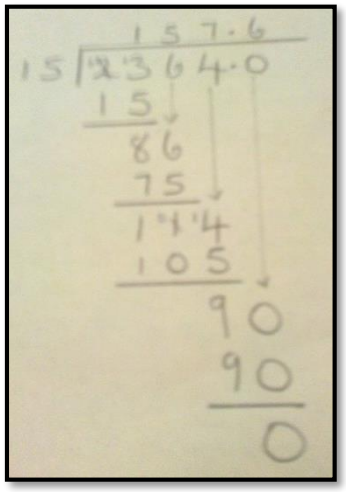


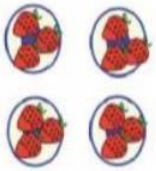
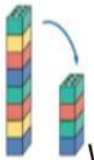
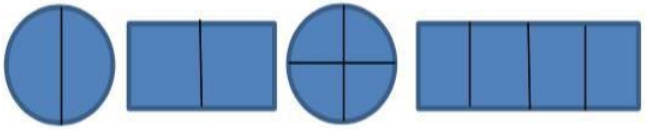
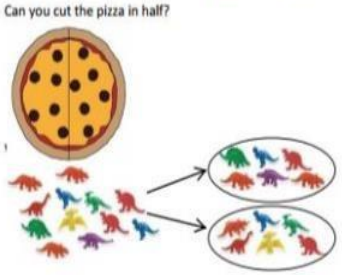
Children begin to practically develop their understanding of how express the remainder as a decimal or a fraction. Ensure practical understanding allows children to work through this (e.g. what could I do with this remaining 1? How could I share this between 6 as well?)

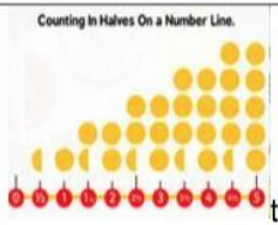
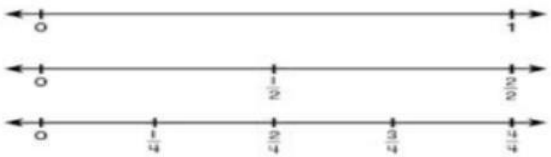
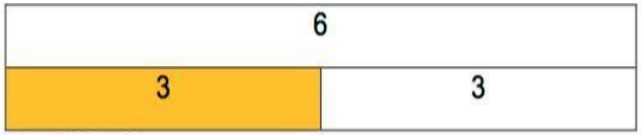
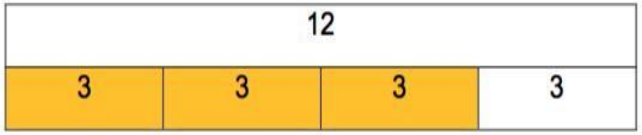
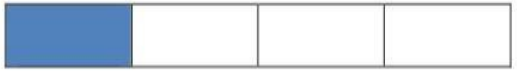
E.g. 1504 ÷ 8

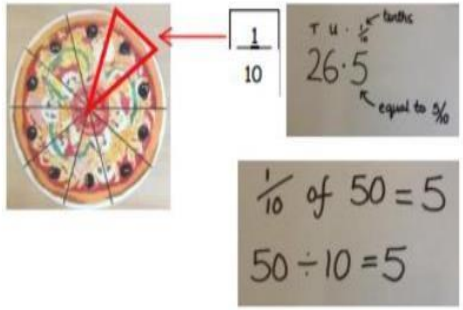
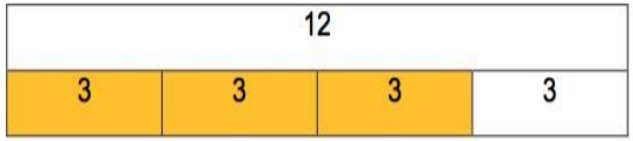


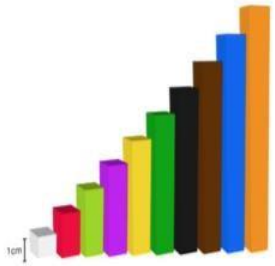
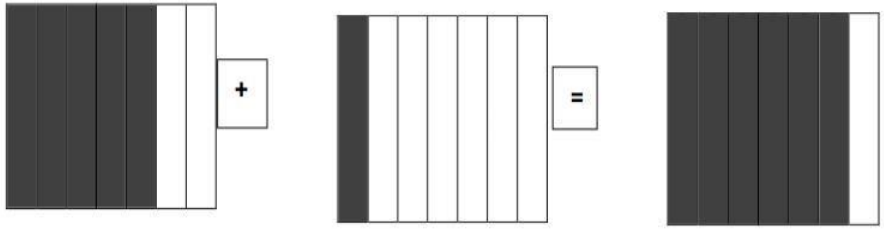
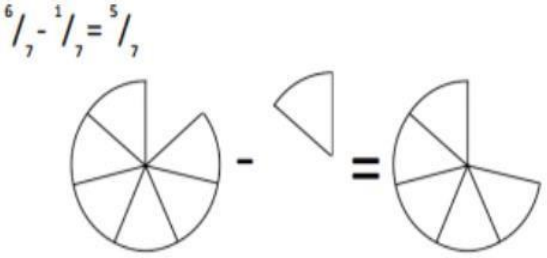
E.g. 2364 ÷ 15

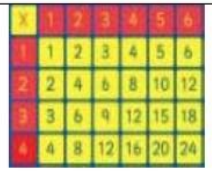
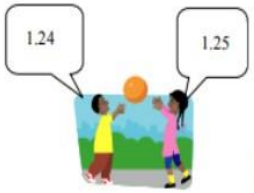


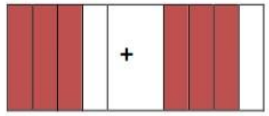
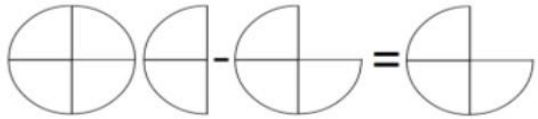
DEVELOPING UNDERSTANDING OF FRACTIONS, DECIMALS AND PERCENTAGES			
Year	**NC Objectives**	**Examples**	**Models and Images**
EYFS	• Share objects, shapes and count how many are in each group (early division) • Solve problems involving halving and sharing	Adults to use fraction vocabulary of halves, quarters, thirds etc when describing the number of groups).	  What is half of 8? Half of 8 is 4.
Year 1	• Recognise, find and name a half as one of two equal parts of an object, shape or quantity • Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity • Begin to learn sharing and grouping into equal parts. • Begin to recognise that the larger the denominator the smaller the fraction (unit fractions or same numerator).	Children use their knowledge of fractions of shape to find fractions of quantities. Children should be give practical apparatus to find halves and quarters of quantities within 20. Record work pictorially.	  **An array can be used to demonstrate sharing.** Sharing – sharing the counters among 4 people, each person gets 3. Grouping- 3 groups/ lots of 4. 

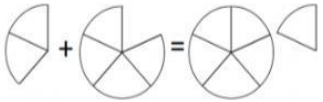
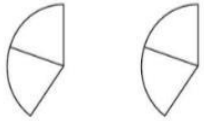
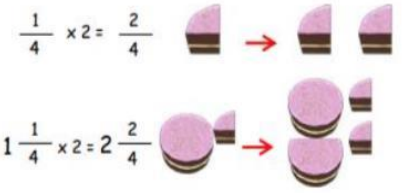
Year 2	• Count in fractions up to 10 starting from any number and using the ½ and 2/4 equivalence. (*(Non Statutory Guidance)*	Use a number line or fraction pieces to count in fraction starting from any number up to 10.	 twinkl.  Bar model ½ of 6 = 3  ¾ of 12 = 9 
	• Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity • Write simple fractions for example, $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.	Children use their knowledge of unit and non-unit fractions of shapes to find fractions of quantities. Use bar model, fraction wall, fraction pieces, Numicon. Vary the shape of objects used e.g. not always 'pizzas' and 'chocolate bars'. They relate this to find fractions of a length e.g. 2/4 of 1m = Children need to relate finding a quarter to halving and halving again.	If I can see ¼ how many quarters can you see?  If I can see 2/3 how many thirds can you see? 

Year	NC Objectives	Examples	Models and Images
Year 3	• count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one digit numbers or quantities by 10 • recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators • recognise and use fractions as numbers: unit fractions and non- unit fractions with small denominators	Encourage children to count up and down in tenths. 1 ÷ 10 = 1/10 2 ÷ 10 = 2/10 3 ÷ 10 = 3/10 Continue the pattern. What do you notice? What's the same? What's different? Children can use fractions as an operator E.g. 1/4 of 12 = 12 ÷ 4 = 3 Children can relate fractions to the division of integers 1 ÷ 4 = ¼ 4 x ¼ = 1 3 ÷ 4 = ¾	1÷ 10 = 1/10 1/10 1/10 1/10 1/10 1/10 1/10 1/10 1/10 1/10 1/10 0 1 2 ÷ 10 = 2/10 2/10 2/10 2/10 2/10 2/10 2/10 2/10 2/10 2/10 2/10 0 2  ¾ of 12 = 9 

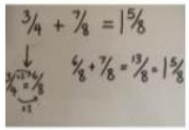
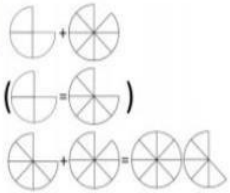
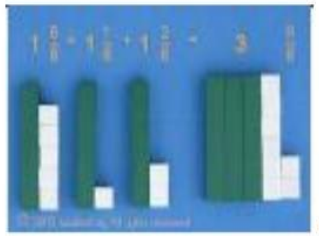
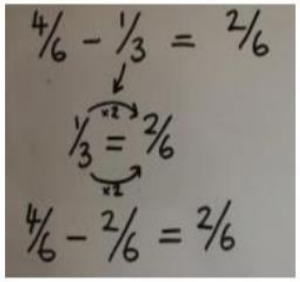
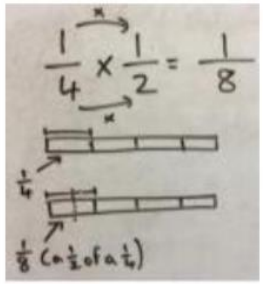
	• recognise and show, using diagrams, equivalent fractions with small denominators • add and subtract fractions with the same denominator within one whole • recognise and write mixed number fractions- link to the addition of fractions with the same denominator *(Leighton School guidance).* • compare and order unit	¾ x 4 = 3 (12/4 or ¾ + ¾ + ¾ + ¾) Children need to relate and reason about why their diagrams are equivalent to a half – make connections between the numerator and the denominator E.g. ½ = 4/ 8 The numerator will be half of the denominator. Children should be encouraged to make the connection between their multiplication tables and equivalents E.g. 1/3 = 3/9 because 3 x 3 = 9. $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$ Children need to use practical resources/visual representations to support the comparison of fractions E.g. 1/3 > ¼ Children should also be taught how to order fractions on a number line.	Use Cuisenaire rods to develop vocabulary of equivalence.    

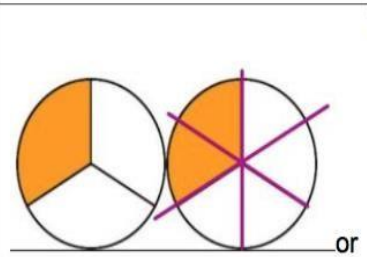
	fractions, and fractions with the same denominators • Securely understand that the larger the denominator the smaller the fraction (if a unit fraction). *(Leighton School guidance).*		
Year 4	• recognise and show using diagrams, families of common equivalent fractions • count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by tenths • solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number • add and subtract fractions with the same denominator • find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths	1 ÷ 100 = 1/100 2 ÷ 100 = 2/100 3/7 of 56 = 24 3/10 of 120 = 36 ¼ = 12 ¾ = __ 3/10 + 4/10 = 7/10 9/100 – 7/100 = 2/100 Children can record on a number line equivalents between 1/10 and 0.1 Count on and back in tenths as decimals and relate to counting on/back in 10ths (fractions).	 Use the rows of a multiplication square to show equivalence e.g: ½, 2/4, 3/6, 4/8 2/3, 4/6. 6/9, 8/12.  What should I cut my pizza into if I have 100 people to serve?   Count back in 1 and 1/10 from 101.

		25 ÷ 10 = 2.5 2 ones and 5 tenths 25 ÷ 100 = 0.25 0 ones, 2 tenths and 5 hundredths or 25 hundredths	¾ + ¾ = $^{6}/_{4}$   = 1 ½ $^{6}/_{4}$ - $^{3}/_{4}$ = $^{3}/_{4}$ 
Y5	• recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • compare and order fractions whose denominators are all multiples of the same number • read, write, order and compare numbers with up to three decimal places • round decimals with two decimal places to the nearest whole number and to one decimal place	e.g. 8/10 = 4/5= 16/20= 24/30	

	• identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • read and write decimal numbers as fractions *(remember to link this to the teaching of percentages so they can see the relationship)* • recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • recognise the per cent symbol (%) and understand that per cent relates to "number of parts per hundred", and write percentages as a fraction with denominator 100 as a decimal fraction • add and subtract fractions with the same denominator and denominators that are multiples of the same number • recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number • multiply proper fractions and mixed numbers by whole	= 80/100 = 0.8 (e.g. 0.71 = $^{71}/_{100}$). E.g. 6/20 + 3/10. Find common denominator and then add together. Encourage chdn to simplify answer where possible. (e.g. $^{2}/_{5} + ^{4}/_{5} = ^{6}/_{5} = 1\,^{1}/_{5}$)  Initially 2/5 x 2 4/5 x 6 = (6 x 4) ÷ 5 = 24/5. Then convert to a mixed number.	 I eat 1 more piece of this cake. What fraction would be left? $^{6}/_{4} - ^{3}/_{4} = ^{3}/_{4}$  2/5 x 2 =  or 

	numbers, supported by materials and diagrams • solve problems involving numbers up to three decimal places • solve problems which require knowing percentage and decimal equivalents of $^{1}/_{2}$, $^{1}/_{4}$, $^{1}/_{5}$, $^{2}/_{5}$, $^{4}/_{5}$ and those with a denominator of a multiple of 10 or 25.		
Y6	• compare and order fractions, including fractions >1 • identify the value of each digit in numbers given to three decimal places • solve problems which require answers to be rounded to specified degrees of accuracy • use common factors to simplify fractions; use common multiples to express fractions in the same denomination • associate a fraction with division and calculate decimal fraction equivalents • recall and use equivalences between simple fractions,	(e.g. 0.375) for a simple fraction (e.g. $^{3}/_{8}$) 3÷8 using bus stop method.	

	decimals and percentages, including in different contexts. • add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions • multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, ¼ x ½ = $^1/_8$] • multiply one-digit numbers with up to two decimal places by whole numbers • divide proper fractions by whole numbers [for example, $^1/_3$ ÷ 2 = $^1/_6$] • multiply one-digit numbers with up to two decimal places by whole numbers • x and ÷numbers by 10, 100 and 1000 up to three decimal places • identify the value of each digit to three decimal places • associate a fraction with division and calculate decimal fraction equivalents (e.g.	Turn them into equivalent fractions with common denominators. Then add and subtract as applicable. Find simplest form where possible. (e.g. $^1/_4 \times {}^1/_2 = {}^1/_8$) ¾ x 8/9 = 24/36. Then simplify to 2/3 by finding a common denominator. 3.25 x 4 Use short multiplication to solve this.	   or  

	0.375) for a simple fraction (e.g. $^{3}/_{8}$) • use written division methods where the answer has up to two decimal places.		 or