



Danegrove Primary School

Numeracy Policy - 049

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DOCUMENT APPROVAL

Completion of the following signature block indicates that the appropriate parties have reviewed this document and agree with its intent.

Name	Role	Signature	Date
Deborah Metcalf	Headteacher		
Linda Gowling	Chair of Governors		

REFERENCES

The policy for teaching & learning is applicable to the Literacy policy and may be found in

POL-TLC-001 Teaching and Learning Policy

The Literacy procedures can be found in

PRC-TLC-009 Literacy Procedures

Numeracy Policy

Addition

Step 1 – Counting out loud (getting used to hearing the numbers in order out loud)

Start with lots of practice counting aloud in ones forwards from any number:

e.g. 28, 29, 30, 31, 32, 33 etc.

57, 58, 59, 60, 61, 62, 63 etc.

96, 97, 98, 99, 100, 101, 102, 103 etc.

Play a game

One person starts counting from any number out loud and deliberately misses out a number. The other person has to guess which number is missing.

e.g. 13, 14, 15, 17, 18, 19, 20 Which number is missing?

Crossing a tens boundary is often tricky and needs lots of practice

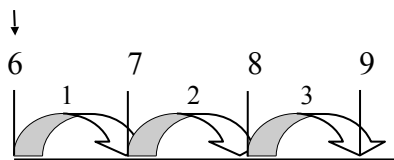
47, 48, 49, **50**, 51, 52, 53 etc

78, 79, **80**, 81, 82, 83 etc

Step 2 – Additional using a number line

e.g. $6 + 3$

Start here

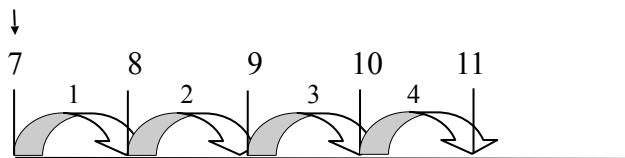


Alternatively
 $6 + 3 =$ start at 6 and count on 3 more in your head using your fingers as support.

Starting at 6 count 3 jumps forward $6 + 3 = 9$

e.g. $7 + 4$

Start here



Starting at 6 count 3 jumps forward $6 + 3 = 9$

Alongside this stage it is very important for children to know their number bonds to 10. (The use of numicon is an excellent resource for this because it provides a visual image for each number and two numbers added and placed together make a larger one exactly).

An example of number bonds for the number 6

$1 + 5$, $2 + 4$, $3 + 3$, $0 + 6$, $4 + 2$, $5 + 1$, $6 + 0$ (all the pairs of numbers when added together make 6).

These can then be placed in order:

0+6
1+5
2+4
3+3
4+2
5+1
6+0

By laying them out this way it helps to see any patterns and makes it easier to check if any have been missed out.

0+8 number bonds for 8

1+7
2+6
3+5
4+4
5+3
6+2
7+1
8+0

This is also a good opportunity to show that adding can be done in any order and the answer will be the same.

$3+5$ and $5+3$ make the same answer.

Big tip

It really helps firstly to know all the number bonds to

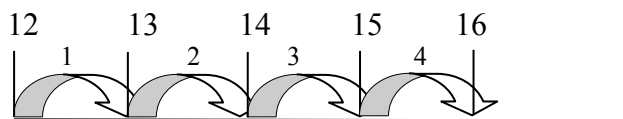
If you know that $6+7 = 13$ and $9+5 = 14$
It helps you make a link to $46+7 = 53$ and $39+5 = 44$

Addition on a number line continued

$$12 + 4$$

e.g. $12 + 4$

Start here



Starting at 12 count on 4 jumps to get to the answer 16.

Number lines help at the early stages of addition because they support children in doing two things at once: counting a number of steps and remembering the numbers involved.

As numbers become bigger understanding of place value is essential.

So that with a number like 48 the value of each digit needs to be understood. The 4 stands for 40 or 4 tens. The 8 stands for 8 ones or units.

65 : the 6 stands for 60 or 6 tens, the 5 stands for 5 ones or units.

Children need to have lots of experience of counting objects and grouping them into sets of ten.

Big tip

Being able to read a number :1439 is one thousand, four hundred and thirty nine.

274 is two hundred and seventy four

Practice doubling

Very useful for mental maths

Double 5? Double 6?

Double 7? Double 8? Etc.

Double 6 Double 7

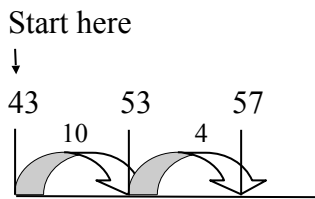
$$6 = 5 + 1 \quad 7 = 5 + 2$$

$$5 + 5 = 10 \quad 5 + 5 = 10$$

$$1 + 1 = 2 \quad 2 + 2 = 4$$

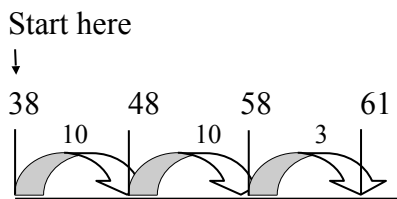
Progressing on to larger steps on a number line

43 + 14
 10 4 (split 14 into 10 and 4)

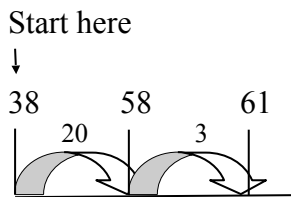


Big tip
 To practice counting in tens from any number out loud. Being able to spot the pattern going on.
 23, 33, 43, 53, 63 etc.

38 + 23
 20 3 (split 23 into 20 or 3) or (10 + 10 and 3)



Or



Step 2 Partitioning (the importance of understanding place value is really evident here)

24 + 13	
20 4 10 3	Step 1 split each number into tens and units
20 + 10 = 30	Step 2 add the tens together
4 + 3 = 7	Step 3 add the units together
30 + 7 = 37	Step 4 add the two answers above together

56 + 35	48 + 46
50 6 30 5	40 8 40 6
50 + 30 = 80	40 + 40 = 80
6 + 5 = 11	8 + 6 = 14
80 + 11 = 91	80 + 14 = 94
10 1	10 4

Practice doubles

Double 12	Double 14
12 = 10 + 2	14 = 10 + 4
10 + 10 = 20	10 + 10 = 20
2 + 2 = 4	4 + 4 = 8
20 + 4 = 24	20 + 8 = 28
Double 26	Double 37
26 = 20 + 6	37 = 30 + 7
20 + 20 = 40	30 + 30 = 60
6 + 6 = 12	7 + 7 = 14
40 + 12 = 52	60 + 14 = 74

When children are confident with this method they can do it all mentally.

Step 3 Column Addition

Step 2 works well until the numbers start getting too big to partition easily and at this stage we move on to columns addition

	2	3	+	1	4
	t	u			
	2	3			
+	<u>1</u>	<u>4</u>			
	3	7			

	4	8	+	3	5
	4	8			
+	<u>3</u>	<u>5</u>			
	8 ₁	3			

When the 8 and 5 are added together they make 13. Note that 1 representing 10 is moved into the next available empty box in the bottom right hand corner. It is then in the right place to be added to the 4 and the 3 to make 8. We put a little curved line around it (we call it a house) to show that it has been moved

	2	4	8	+	3	7	5
	2	4	8				
+	3	7	5				
	6 ₁	2 ₁	3				

Big tip
Getting children to estimate their answer by rounding each number up and down and adding it up quickly. This helps them to roughly know what the answer will be and spot a possible mistake.

Estimating an answer first-then doing it

3	2	+	5	9			

3	2	+	5	9			
3	2	Is roughly			3	0	
5	9	Is roughly			6	0	
3	0	+	6	0	is		90

	3	2	+	5	9		
	3	2					
+	5	9					
	9	1					

Useful addition vocabulary

Add, plus, more than, total, sum of, and, together make, count on, double

Try asking some questions with these words

What is the total of 6 & 3?

What number is 4 more than 19?

What is 17 plus 8?

What is the sum of 6 and 3 and 8?

What is double 17?

(To know and understand these words really helps in mental maths tests).

Subtraction

Many of the steps followed in addition are repeated here but for subtraction.

Step 1. Counting

Start with lots of practice counting backwards out loud in ones from any number

10, 9, 8, 7, 6, 5, etc.

62, 61, 60, 59, 58, 57 etc

104, 103, 102, 101, 100, 99, 98, 97 etc.

tip

Children find crossing over tens and hundreds difficult and need lots of practice

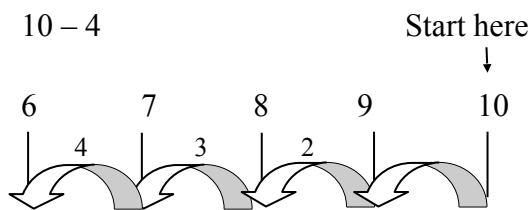
302, 301, **300**, 299, 298, 297

Play a game

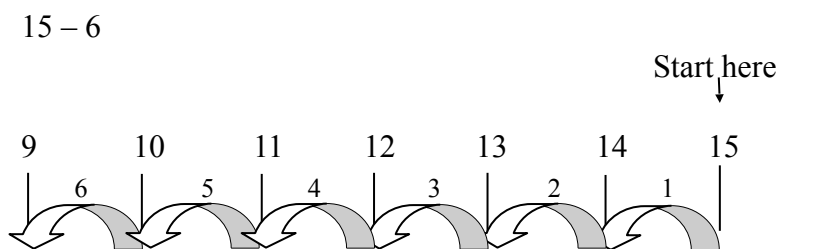
Write some numbers down each on a separate card and place them in order from largest to smallest. One person closes their eyes while the other swaps two cards around. Once done the first person opens their eyes and tries to spot the change and correct it.

37	36	32	34	33	35
----	----	----	----	----	----

Step 2 – counting backwards on a numberline -counting in ones.



I started on 10 and counted back 4. $10 - 4 = 6$.
(Counting the jumps helps the children to remember not to count the number they are on).



$15 - 6 = 9$ I started on 15 and counted back 6

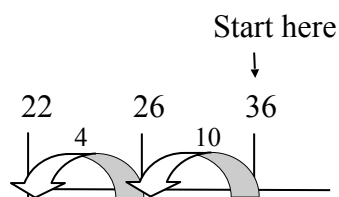
Before progressing on to larger steps practise counting back in tens from any number.
54, 44, 34, 24, 14, 4 etc

75, 65, 55, 45, 35, 25 etc.

133, 122, 112, 102, 92, 82 etc

(remember to talk about patterns)

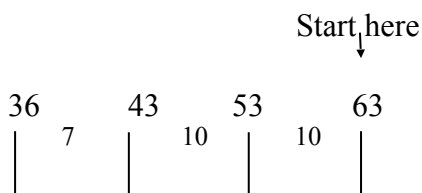
36 – 14
10 4 (split 14 into 10 and 4)

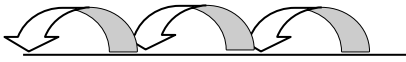


Step 1 – split (smaller number) 14 into 10 and 4
Step 2 – start at 36 and count back 10 = 26
Start 3 – start at 26 count back 4 = 22

63 – 27
20 7
Or
10, 10 7

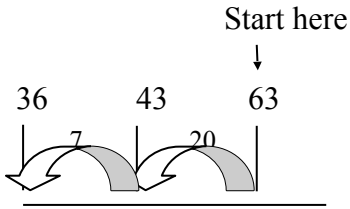
Step 1 – split 27 into 20 and 7 (or 10, 10 and 7)
Step 2 – count back 20 from 63 (or in 10's – 10, 10) = 43
Start 3 – land on 43 and count back 7 = 36





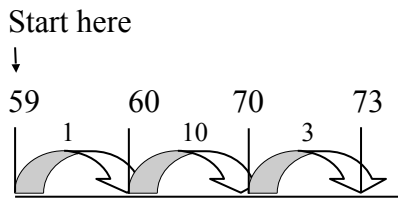
(you can take away 7 or 3 and then 4)

Or



Counting back works really well when numbers are far apart but if they are close together it is easier to count on from the smallest number to the larger one.

$$73 - 59$$



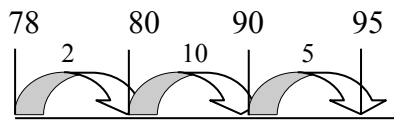
$59 \text{ to } 60 = 1$ $60 \text{ to } 70 = 10$ $70 \text{ to } 73 = 3$
--

$$10 + 1 + 3 = 14 \text{ (when adding together start with the biggest number)}$$

$95 - 78$

Start here

↓



$78 \text{ to } 80 = 2$
$80 \text{ to } 90 = 10$
$90 \text{ to } 95 = 5$

$10 + 5 + 2 = 17$

$95 - 78 = 17$

Spot the patterns and make the links.

Remember to go over numbers that can be subtracted from each other to make another number

e.g. for 6 7-1, 8-2, 9-3, 10-4, 11-5

It is really helpful to be able to do it for all the numbers up to twenty.

	$13 - 4 = 9$	$14 - 5 = 9$	$15 - 7 = 8$
helps later with	$53 - 4 = 49$	$74 - 5 = 69$	$35 - 7 = 28$

Step 3 Partitioning with Smaller number

$34 - 13$	Step 1 Partition the smaller number only
10 3	
$34 - 10 = 24$	Step 2 take 10 away from 34
$24 - 3 = 21$	Step 3 take 3 away from 24

$78 - 25$	$63 - 37$
20 5	30 7
$78 - 20 = 58$	$63 - 30 = 33$
$58 - 5 = 53$	$33 - 7 = 26$

Halving

Half of 14
 $14 = 10 \text{ and } 4$
 Half of 10 = 5
 Half of 8 = 4
 $5 + 4 = 9$

Half of 50
 $50 = 40 + 10$
 Half of 40 = 20
 Half of 10 = 5
 $20 + 5 = 25$

Half of 26
 $26 = 20 \text{ and } 6$
 Half of 20 = 10
 Half of 6 = 3
 $10 + 3 = 13$

Half of 74
 $74 = 70 + 4$
 $70 = 60 + 10$
 half of 60 = 30
 half of 10 = 5
 Half of 4 = 2
 $30 + 5 + 2 = 37$

Half of 48
 $40 = 40 \text{ and } 8$
 half of 40 = 20
 half of 8 = 4
 $20 + 4 = 24$

Step 4 Vertical subtraction

	5	4	-	1	3
	t	u			
	5	4			
-	1	3			
	4	1			

Step 1 start with the units $4 - 3 = 1$
 Step 2 move on to the tens column
 It is $50 - 10$ but we can do it as $5 - 1 = 4$
 Giving an answer of 41

	6	2	-	2	8
	₅ 6	₁ 2			
-	2	8			
	3	4			

Step 1 start with the units you cannot do $2 - 8$
 Step 2 move to the tens column and exchange a ten and move it across (exchange not borrow because borrow suggests giving it back) cross out the 6 and write 5
 Step 3 Place the ten in the top left hand corner of the units square with a 2 in it to make 12 $12 - 8 = 4$
 Step 4 Say that in $50 - 20$ but we can say $5 - 2 = 3$. Answer = 30.

1	4	5	-	6	8
01	₁ 34	₁ 5			
-	6	8			
	7	7			

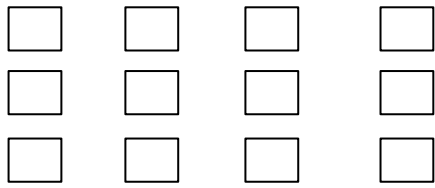
	3	1	6	-	1	4	9
	₂ 3	₁₀ 1	₁ 6				
-	1	4	9				
	1	6	7				

Vocabulary tip
 There are many different words for subtractions
 Subtract, minus, difference, fewer, less than, reduce, count back, take away
 Ask a variety of questions using different vocabulary.
 What is 11 minus 6? Which number is 8 less than 20?
 What is the difference between 37 and 45? Count back 4 from 15?
 Which number is 4 fewer than 32?

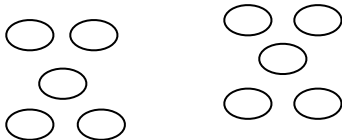
Multiplication

Multiplication is repeated addition (adding the same number)

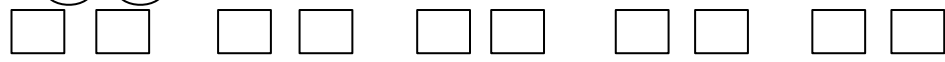
Step 1 Visual – to use objects to visually represent the numbers being added
 - To know that the groups of objects have the same number in each one (arrays)



This is 4 groups of 3
 4×3
 X = groups of



This is 2 groups of 5
 2×5



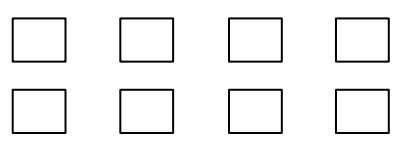
5 groups of 4
 5×4

Children with lots of experience should be encouraged to count objects before going on to more formal written methods like learning times tables.

Lots of experience of counting out loud in twos
 2,4,6,8,10,12,14 etc.
 And tens
 10,20,30,40,50,60 etc.
 And fives
 5,10,15,20,25,30,35,40 etc.

Once children are familiar with counting in a certain way try counting out loud and missing one out. Can you spot it?

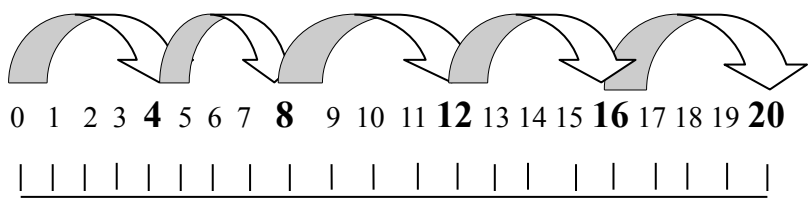
5,10,15, 20, 25, 30, 35,40, 50, 55 (notice how the pattern is broken?)



This array can be viewed as 4×2
 and 2×4
 This is the beginning of understanding that multiplication can be done in any order.

Step 2 Number lines and number squares

Number lines and number squares can also be used to show multiplication as repeated addition or counting in even steps. The number line shows the pattern of counting every 4 numbers and that 3 are missed out each time.



5 groups of 4 or 4 5 times

A hundred square helps children to spot patterns

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Counting in fours.

What to spot? (Looking for patterns)

- They are all even numbers
- They all end in 4,8,2,6,or 0
- They are in the 2 times table

Can the pattern help us predict the next 12 numbers?

The woodlands website has a hundred square that is excellent to use.

It is at this stage that is important for children to learn their times tables having had plenty of experience of visual representations of multiplications (arrays).

Recommended order for learning times tables.

1. 1, 2 and 10 times tables
2. 5 times table (links nicely to 10's) **(2,5,10 to be learnt by the end of year 2)**
3. 4 times table (links to 2 times table)
4. 3 times table
5. 6, 8 times tables (6 links to 3) and (8 links to 4)
6. 7, 9 **(all tables to be learnt by the end of year 4)**

Tip

Chanting your times tables repeatedly is still a great method to use.

Important

Children need to have learnt all of their times tables ideally by the end of year 4 and be able to recall any fact quickly.

Warning

**Not knowing your times tables makes all the next few steps more difficult.
Many of them rely on knowing your times tables.**

Step 4 Partitioning

13 x 4
10 3 Step 1 split 13 into 10 and 3
10 x 4 = 40 Step 2 10 x 4 = 40
3 x 4 = 12 Step 3 3 x 4 = 12
40 + 12 = 52 Step 4 add the two answers together

27 x 5
20 7
20 x 5 = 100
(or 10 x 5 and 10 x 5)
7 x 5 = 35
100 + 35 = 135

Both of these methods (partitioning and grid) give you a very visual record of exactly what you are doing. When children do not know their tables well they find these methods difficult. For children who do understand them this is like a map with a clear route being given to their answer.

Step 5 Grid method

34 x 4 Step 1 draw grid

x	30	4
3		

x	30	4
3	90	12

Step 2 3 x 30 = 90
Step 3 3 x 4 = 12
Step 4 90 + 12 = 102

32 x 15

x	30	2	
10	300	20	320
5	150	10	160
			480

Step 6 Column Multiplication

2	7	x	5
---	---	---	---

	2	7	
	x	5	
1	₃ 3	5	

- Step 1 Place numbers in correct columns
Step 2 Multiply $5 \times 7 = 35$
Write in 5 in square below
Step 3 Place 3 in next blank box to the left (the one that will be used next)
Step 4 $5 \times 2 = 10$ and then add $3 = 13$
1 is placed in next column because you have finished

	2	5	4	x	7
	2	5	4		
		x	7		
1	7 ₃	7 ₂	8		

- Step 1 Place in current column
Step 2 $7 \times 4 = 28$
Write 8 in column below. Place 2 in next column to left that is empty.
Step 3 $7 \times 5 = 35$. Remember to add the 2 to make 37. Write 7 below and place the 3 in the next box to the left.
Step 4 $7 \times 2 = 14$ remember to add the 3 to make 17. This can be written straight in because there are no more digits to multiply by 7. The answer is 1778.

Important Tip

Keep placing a digit being moved into the next box to the left. The reason why becomes clear when we move on to the next step.

Tip

A digit in a house that is transferred to the next square to the left (see example below with the ₄ and ₂) is always used in the very next step. When it comes to adding the two rows at the end the ₄ and ₂ are ignored.

	2	7	1
	x	3	6
1	6 ₄	2	6
8 ₂	1	3	0
9	7	5	6

271 x 36

- Step 1 Check layout of each number so that digits are in the correct column.
Step 2 Start with units column on left – the 6
 $6 \times 1 = 6$
Step 3 $6 \times 7 = 42$ write down 2 in tens columns and transfer 4 in house to hundreds column.
Step 4 $6 \times 2 = 12$ and add the 4 = $16 = 1626$.
Step 5 Place a zero in the units column because although we are going to times the next row by 3 it is really 30.
Step 6 $3 \times 1 = 3$ Place 3 in tens column
Step 7 $3 \times 7 = 21$ – place one in hundreds column and put 2 in house and place in thousands column.
Step 8 $3 \times 2 = 6$ and add 2 = $8 = 8130$.
Step 9 Now add the two numbers together and ignore any numbers in houses because They have already been used.

Useful words for multiplication

	3	4	5	x	4	2
			3	4	5	
			x	4	2	
			6	19	0	
	1	3 ₁	8 ₂	0	0	
	1	4 ₁	4	9	0	
=	1	4	4	9	0	

		3	2	7
--	--	---	---	---

		X	6	8
	2	6 ₂	1 ₅	6
1	9 ₁	6 ₄	2	0
2 ₁	2 ₁	2	3	6

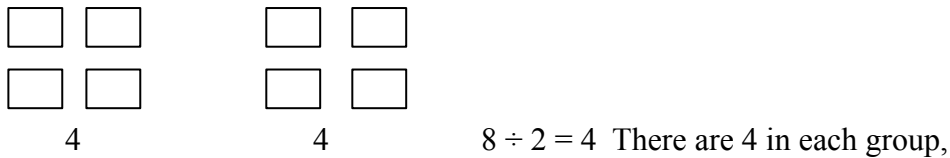
Division

- Division can be taught alongside multiplication
-

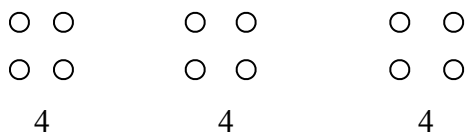
Step 1 Sharing

Sharing a number into groups of the same size through objects (arrays).

$8 \div 2$ take 8 objects and share them into two groups

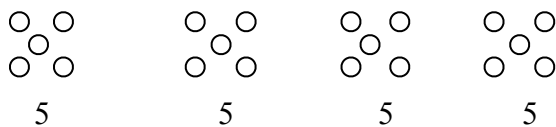


$12 \div 3 = 12$ counters shared into 3 groups = 4



There are 4 in each group

$20 \div 4$ twenty counters divided into 4 groups = 5



There are 5 in each group. Each group is the same size.

$10 \div 2 = 5$



This is a good point to link $\div 2$ to halving
Half of 8 = $8 \div 2$
Or in this case half of 10 = $10 \div 2 = 5$

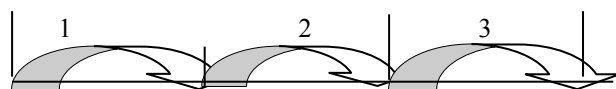
Step 2 Linking division to multiplication

$15 \div 5$ can be read as how many fives are there in 15?

5, 10, 15,

Counting in 5's there are 3

A numberline can be used to support this



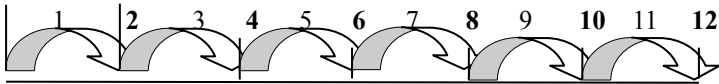
0 1 2 3 4 **5** 6 7 8 9 **10** 11 12 13 14 **15**

3 jumps

$12 \div 2$ can be read as: how many twos are there in 12?

Count in 2's to 12 : 2, 4, 6, 8, 10, 12 = 6

Or to relate it to multiplication $6 \times 2 = 12$



A multiplication square is also very helpful.

$48 \div 6$ How many 6's in 48?

$6 \times 8 = 48$ (Use of multiplication to do division) = 8

$72 \div 8$ How many 8's in 72?

$9 \times 8 = 72 = 9$

Step 3 Chunking

Using what I know to solve the division of bigger numbers

$$\begin{array}{r} 52 \div 4 \\ - 40 \quad (10 \times 4) \\ 12 \quad (3 \times 4) \\ - 12 \\ 0 \\ 10 + 3 = 13 \end{array}$$

The explanation is below
(x 4 under each other very important)

How many 4's in 52?

Step 1 What do I know?

$10 \times 4 = 40$ I write down what I know in brackets.

Step 2 Take $52 - 40 = 12$ left

Step 3 How many 4's in 12? = 3 (3×4)

Step 4 Add $10 + 3$ together 13

Because 10×4

$+ 3 \times 4 =$

13

There are 13 4's in 52.

This method really works if you know your tables!

$$\begin{array}{r} 45 \div 3 = \\ - 30 \quad (10 \times 3) \\ 15 \quad (5 \times 3) \\ 15 \quad (x3 \text{ under each} \\ 0 \text{ other is very} \\ \text{important}) \end{array}$$

Step 1 What do I know already?
Step 2 I know $10 \times 3 = 30$ write down in brackets to side
Step 3 Take 30 away from 45 to leave 15
Step 4 I know there are 5 3's in 15? Write 5×3 in brackets
Step 5 Add the numbers in the brackets $10 + 5 = 15$.
There are 15 3's in 45.

$$\begin{array}{r}
 86 \div 7 \\
 \underline{-70} \text{ (10 x 7)} \\
 16 \text{ (2 x 7)} \\
 \underline{-14} \\
 2
 \end{array}$$

- Step 1 What do I already know?
 Step 2 I know $10 \times 7 = 70$ write 10×7 in brackets
 Step 3 $86 - 70 = 16$
 Step 4 How many 7's in 16?
 I know $2 \times 7 = 14$ write 2×7 in brackets
 Step 5 2 left over Finally add $7 + 2 = 9$ remainder 2

Tip
 Checking my answer by using multiplication

$$86 \div 7 = 12 \text{ remainder } 2 \text{ (r = remainder)}$$

				1	2	
				X	7	
R=	+2			8	4	
				+	2	
				8	6	

$$\begin{array}{r}
 49 \div 3 \\
 \underline{-30} \text{ (10 x 3)} \\
 19 \text{ (6 x 3)} \\
 \underline{-18} \\
 \text{r1}
 \end{array}$$

$$10 + 6 = 16 \text{ r1}$$

				1	6	
				x	3	
				4	8	
R=	+1			+	1	
				4	9	

Step 4

$$42 \div 3$$

	1	4	
3	4	12	

- Step 1 The layout 3 4 2
 Step 2 How many 3's in 4? 1 remainder 1.
 Write one above the 4. Put the remainder 1
 In the next column to the left,

Step 3 How many 3's in 12? 4. Put in column above.

7	2	÷	3
	2	4	
3	7	₁ 2	

Step 1 Layout 3 4 2

Step 2 How many 3's in 7? 2 remainder 1

Write 2 above the 7 and carry the one into the Next column.

$$\begin{array}{r} 2 \\ 3 \ 7 \ \underset{1}{2} \end{array}$$

The answer is 24

Step 3 How many 3's in 12? 4 so the answer is 24.

9	6	÷	4
	2	4	
4	9	₁ 6	

Step 1 Layout 4 9 6

Step 2 How many 4's in 9? 2 remainder 1

Step 3 Write 2 above the 9 and place the remainder 1 in the next column by the 6

$$\begin{array}{r} 2 \\ 4 \ 6 \ \underset{1}{6} \end{array}$$

The answer is 24

Step 4 How many 4's in 16? 4

	0	5	5
5	2	₂ 7	₂ 5

Step 1 Layout

Step 2 5's into 2? 0. Put 0 above the 2 and then carry 2
0

5 2 7 5

The answer is 55

Step 3 5's into 27? 5 remainder 2. Put 5 above the 7 and
Carry the 2 over into the next column.

Step 4 How many 5's in 25? 5. Write 5 above the 25.

Step 5 Cross out the 0 at the beginning.

The answer is 55.

Write happens with remainders (part 1)

8	2	÷	5	
	1	6	r	2
5	8	₃ 2		

Step 1 Layout 5 8 2

Step 2 How many 5's in 8? 1 remainder 3.

Step 3 Place remainder 3 in next column by the 2.
Write 1 above the 8.

Step 4 How many 5's in 32? 6 r2

Write 6 above the 2 and r2 after. Answer 16 r 2.

6	3	÷	2	
	3	1	r	1
2	6	3		

Step 1 Layout 2 6 3

Step 2 How many 2's in 6? 3. Write 3 above the 6.

Step 3 How many 2's in 3? 1 r 1. Write 1 r 1 above the 3.

The answer is 31 r 1

8	1	÷	4	

	2	0	r	1
4	8	1		

Step 1 How many 4's in 8? 2. Write 2 above the 8

$$\begin{array}{r} 2 \\ 4 \ 8 \ 1 \end{array}$$

Stage 2 How many 4's in 1? 0 Write 0 above 1 and then r 1. The answer is 20 r 1.

Checking an answer with multiplication

$$\begin{array}{r} 20 \\ \times 4 \\ \hline 80 \\ +1 \quad \underline{+ 1} \\ \hline 81 \end{array}$$

What happens with remainders? Part 2 – the adding of a decimal point

8	2	÷	5	
	1	6	4	
5	8	₃ 2	2	0

Step 1 Layout 5 8 2 (r = remainder)

Step 1 How many 5's in 8? 1 r 3. Write 1 above the 8.

Step 3 Carry the 3 into the next column.

$$\begin{array}{r} 1 \\ 5 \ 8 \ 2 \end{array}$$

Step 4 How many 5's in 32? = 6 r 2

Write down 6 above the 2 and then put a decimal point after the 6 and the 2.

$$\begin{array}{r} 1 \ 6 \\ 5 \ 8 \ \underline{3}2 \end{array}$$

Step 5 Put the remainder 2 to the right of 82 and bring Down a zero.

Step 6 How many 5's in 20? = 4

$$\begin{array}{r} 1 \ 6 \ . \ 4 \\ 5 \ 8 \ \underline{3}2 \ . \ 2 \ 0 \end{array}$$

6	1	÷	2	

	3	0	5	
2	6	1	1	0

Step 1 Layout 2 6 1

Step 2 How many 2's in 6? 3 Write 3 above the 6.

Step 3 How many 2's in 1? 0. Write 0 above the 1 and put
A decimal point after the 0 and the 1.

3 0.
2 6 1.

Step 4 Carry the 1 across the decimal point and add a zero.
How many 2's in 10? = 5. Put 5 after decimal point.

3 0.5
2 6 1. 1

Answer is 30.5.

2	7	3	÷	4	
	0	6	8	2	5
4	2	27	33	10	20

Step 1 Layout 4 2 7 3

Step 2 How many 4's in 2? 0 Write 0 above the 2 and
then carry the 2 across to make 27.

Step 3 How many 4's in 27? 6 remainder 3. Carry the
3 across to make 33. Write 6 above the 7.

Step 4 How many 4's in 33? 8 remainder 1.

6 8.
4 2 7 3 0

Step 5 Put in a decimal point after the 8 and carry
The 1 below into the next box and add a 0.

Step 6 How many 4's in 10? 2 remainder 2.

Step 7 Carry the 2 into the next column add a 0.
How many 4's in 20? 5

Step 8 The answer is 68.25 and you need to cross
out the 0 at the beginning.

Checking our answers with multiplication using decimals.

6	1	÷	2
	3	0	5
2	6	1	0

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Step 1 The layout – remove the decimal point

$$\begin{array}{r} 30.5 \\ \times 2 \\ \hline \end{array} \quad \begin{array}{r} 305 \\ \times 2 \\ \hline \end{array}$$

Step 2 Multiply 305 by 2

The answer to the multiplication 610 should be the number you divided at the start

	3	0	5
	x		2
	6	1	0

Step 3 We put the decimal point back. The rule being: Count the number of digits to the right of the decimal point at the beginning = 1. (30.5 there is one = .5). Count from the right one and put back the decimal point 61.0 = 61.

If there are two digits to the left of the decimal point then re-place the decimal point two places from the right at the end. See below.

2	7	3	÷	4	
	0	6	8	2	5
4	2	₂ 7	₃ 3	₁ 0	₂ 0

To check any answer

Step 1 Layout of multiplication removing the decimal point. (Note there are two digits to the right of the decimal point).

	6	8	2	5
	x			4
2	7 ₃	3 ₁	0 ₁	0

--	--	--	--	--

Step 2 Do column multiplication to get the answer
Of 27400.

Step 3 Starting from the right of 27400 count in
2 places and put in the decimal point.

Step 4 If the number you end up with is the number
you started with you are correct. If they are
different you are wrong and need to check it
again to see if you can spot your mistake.

Long Division

	4	3	2	÷	1	2
		0	3	6		
1	2	4	3	2		
	-	3	6			
			7	2		

Step 1 Layout of division

1 2 4 3 2

Step 2 How many 12's in 4? 0 Write 0 above 4

How many 12's in 43? 3

Step 3 Write 3 above the 3 or 43 and write 36
Below 43.

		0	3	6
1	2	4	3	2
	-	3	6	
			7	2

Step 4 $43 - 36 = 7$

Bring the 2 from 432 down next to the 7.

Step 5 How many 12's in 72? = 6

Put the 6 next to the 3 at the top of the
sum = 36

Step 6 Cross out the 0 at the beginning

Answer = 36

Will 36×12 give me 432 Check my answer with multiplication

		3	6	
	x	1	2	
		7	1	2
	3	6	0	
	4	1	3	2

7	2	0	÷	1	5
			0	4	8
	1	5	7	2	0
		-	6	0	
			1	2	0

Step 1 Layout of sum

Step 2 How many 15's in 72? 0 Write 0 above.

Step 3 How many 15's in 72? 4

Use knowledge of multiplication to help

$$(4 \times 15 = 60)$$

Write 4 above the 2 of 720

Write 60 under 72

$$\text{Step 4 } 72 - 60 = 12$$

Step 5 Drop 0 down next to 12

How many 15's in 120? = 8

Write 8 by 4 = 48

Cross out 0 at beginning to get answer of 48.

4	6	5	÷	1	3			
			0	3	5	r	1	0
	1	3	4	6	5			
		-	3	9				
				7	5			
				6	5			
				1	0			

Vocab for division

Share, groups of

Factors

divide lots of

half quarter

third etc.

Divide 24 by 6?

How many lots of 6 are there in 42?

What is 16 shared by 4?

What are the factors of 24?