

Wycliffe Church of England Primary School

Calculation Policy

24/25



Updated: July 2024

To be reviewed: July 2025

Vision Statement

We nurture an aspirational family of hard-working, respectful individuals who work collaboratively to have a lifelong love of learning.

“Life in all its fullness” (John 10:10)

Our vision is to ensure that our school family are happy and fulfilled in a creative learning environment. This is flexible and caters to individual needs while developing a life-long love for learning through which all members can flourish. We nurture an aspirational family of hard-working, respectful individuals who work collaboratively.

Aims


The aims of Wycliffe Primary School’s Calculation Policy are:

- to develop methods for calculation of the four operations at age-appropriate levels throughout school
- to ensure that children have embedded calculation methods that prepare them with wider opportunities in their education journey and adult life

Objectives

The objectives are:

- to provide clear progressive methods for teaching calculations of the four operations.
- to provide clear examples and examples of visual models and resources to all stakeholders of the methods being taught and learnt in each year group.

	KEY VOCAB.	ADDITION
EYFS Addition	Zero, none One, two, three to twenty and beyond Teens numbers Ones Tens Digit The same as Larger, bigger, greater Most, biggest, largest, greatest After Count all More Order digit And One more Two more Ten more Double	<p>One more than $3 + 1 = 4$</p> 
		<p>Counting all</p> <p>5 + 3 = 8</p>  <p>I count out 5 counters and 3 counters. I put them together and count them all. 1, 2, 3, 4, 5, 6, 7, 8</p>

Numeral Twenty-one, twenty-two ...
 one hundred
 Forwards Equal to
 Equivalent to Most
 Many Above
 Addition Near
 double

Counting on

$$13 + 5 = 18$$

Number bonds
 Pairs
 Missing number

Counting on using efficient jumps to bridge 10.

$$8 + 5 = 13$$

Rods and dots to model

$$12 + 6 = 18$$

Two hundred...
 One, two, three
 digit number Place
 value Stands
 for / represents
 One thousand One
 hundred more
 Number facts Tens
 boundary

Rods and dots to pictorially model base 10 and partitioning

$$14 + 23 = 37$$

Leading to partitioning with less reliance on visual model

$$35 + 47 = 82$$

Partition

$$30 + 40 = 70$$

Add the 'tens'

$$5 + 7 = 12$$

Add the 'ones'

$$70 + 12 = 82$$

Recombine the 'tens' and 'ones'

One hundred more
 Hundreds boundary
 Columns
 Column addition
 Unitise
 Carry over

Expanded columns as a prelude to the compact formal written method

Addition : Partitioning using columns

Question : 74 + 23

STEP 1	Partition your first number and write down the partitioned number.	70 4
STEP 2	Repeat with your second number. Write this partitioned number UNDER the first partitioned number, lined up in place value order.	70 4 20 3
STEP 3	Place the maths symbols	70 4 + 20 3
STEP 4	Add the units first—ALWAYS START ON THE RIGHT. Write the answer under the units.	70 4 + 20 3 7
STEP 5	Add the tens. Write the answer down under the tens.	70 4 + 20 3 90 7
STEP 6	Add the two answer numbers together.	70 4 + 20 3 90 + 7 = 97

Addition : Using Columns (H T U) With Carrying

Question : 369 + 247

STEP 1	Label your headings : H T O	3 6 9
STEP 2	Lay out your calculation, one number below the other.	H T O 3 6 9 2 4 7
STEP 3	Place the maths symbols	H T O 3 6 9 + 2 4 7
STEP 4	Add the digits in the ones column first—ALWAYS START ON THE RIGHT. The answer has 2 digits! Write the ones digit below in the units column. Write the tens digit in the tens column under the = sign.	H T O 3 6 9 + 2 4 7 6
STEP 5	Add the digits in the tens column including the carried digit. The answer has 2 digits. Write the units digit below in the tens column and the tens digit in the hundreds column under the = sign	H T O 3 6 9 + 2 4 7 1 6
STEP 6	Add the digits in the hundreds column including the carried digit. Write the answer in the hundreds column.	H T O 3 6 9 + 2 4 7 6 1 6

YEAR 3 Addition

Ten thousand Ones
boundary Tenth
boundary

Compact column method with including decimal numbers.

$$23.7 + 48.56 = 72.26$$

$$\begin{array}{r} \text{T O . t h} \\ 23.7 \\ + 48.56 \\ \hline 72.26 \\ \hline \end{array}$$

1 1

Compact column method with more than 4 digits

$$27835 + 4683 = 32518$$

$$\begin{array}{r} \text{TTh Th H T O} \\ 27835 \\ + 4683 \\ \hline 32518 \\ \hline \end{array}$$

1 1 1



Hundredths
boundary

Compact column method with multiple digits and decimal places.

$$3.242 + 18.07 = 21.313$$

$$\begin{array}{r} \text{T O. t h th} \\ 3.242 \\ + 18.07 \\ \hline 21.313 \\ \hline \end{array}$$

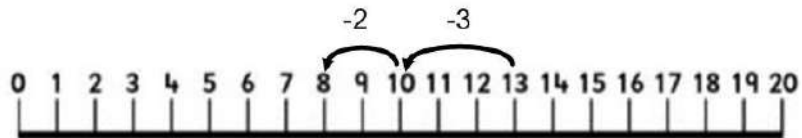
1 1

		SUBTRACTION
EYFS Subtraction	Zero, none One, two, three to twenty and beyond Teens numbers Ones Tens Digit Fewer, smaller, less Fewest, smallest, least Before Count back Take away How many are left over How many have gone One less, two less, ten less ... How many fewer is ___ than_? How much less is ___? Difference between	<p>One less than</p> 
	<p>Taking away</p> <p>$8 - 3 = 5$</p>  <p>I count out 8 counters. I take 3 away. I count how many I have left. I record this as a calculation.</p>	

Numeral Twenty-one, twenty-two ...
 one hundred
 Backwards Equal to
 Equivalent to Least
 Many Below
 Subtract
 Number bonds
 Pairs
 Missing number

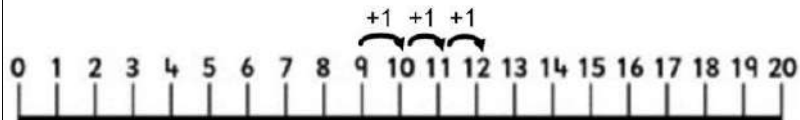
Counting back using efficient jumps to bridge 10

$$13 - 5 = 8$$



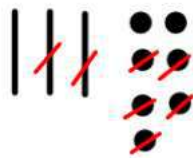
Counting on to find a small difference

$$12 - 9 = 3$$



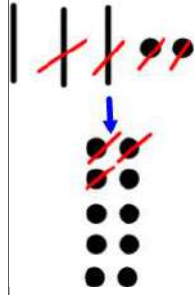
Pictorial model crossing out / taking away tens (rods) and ones (dots).

$$37 - 25 = 12$$



As for Y1 but with exchanging of ten for ten ones

$$32 - 15 = 17$$



Exchange a 10 for 10 ones first then cross out one rod and 7 dots

$$64 - 36 = 28$$

$$64 - 30 - 6$$

$$34 - 6 = 28$$

Partition the number to be subtracted

Subtract the 'tens'.

Subtract the ones.

Progressing to formal written method without decomposition

Subtraction : Column Method

Question : 67 - 24

<u>STEP 1</u>	Label your headings : T O	T O
<hr/>		
<u>STEP 2</u>	Lay out your calculation with the largest number on top	T O 6 7 2 4
<hr/>		
<u>STEP 3</u>	Place the maths symbols	T O 6 7 - 2 4 <hr/>
<hr/>		
<u>STEP 4</u>	STARTING ON THE RIGHT subtract the bottom number from the upper number and write the answer under the ones	T O 6 7 - 2 4 <hr/> 3
<hr/>		
<u>STEP 5</u>	Repeat with the next column.	T O 6 7 - 2 4 <hr/> 4 3

Formal Written method using decomposition

Subtraction : Decomposition Method

Question : 81 - 37

STEP 1	Label your headings : T O	T O
STEP 2	Lay out your calculation with the largest number on top	$\begin{array}{r} \text{T O} \\ 81 \\ 37 \end{array}$
STEP 3	Place the maths symbols	$\begin{array}{r} \text{T O} \\ 81 \\ - 37 \\ \hline \end{array}$
STEP 4	Attempt to subtract the digits in the ones column. The top digit is smaller than the bottom digit.	$\begin{array}{r} \text{T O} \\ 81 \\ - 37 \rightarrow 1-7 \\ \hline \end{array}$
STEP 5	Subtract 1 from the digit in the tens column and write down the new value, increase the value of the ones digit by 10.	$\begin{array}{r} \text{T O} \\ 7 \\ \cancel{8} 11 \\ \hline \end{array}$
STEP 6	Starting on the right, subtract the bottom number from the upper number. Write the answer under the ones.	$\begin{array}{r} \text{T O} \\ 7 \\ \cancel{8} 11 \\ - 37 \\ \hline 4 \end{array}$
STEP 7	Repeat with the next column.	$\begin{array}{r} \text{T O} \\ 7 \\ \cancel{8} 11 \\ - 37 \\ \hline 44 \end{array}$

Inverse Thousands

Column subtraction of numbers up to 4 digits

$$1374 - 768 = 606$$

$$\begin{array}{r}
 \cancel{1}3\cancel{7}4 \\
 - \quad 768 \\
 \hline
 606 \\
 \hline
 \end{array}$$

Ten thousand Ones
boundary Tenth's
boundary

As for year 4 but to include decimal numbers with the same amount of decimal places ...

$$72.5 - 45.7 = 26.8$$

$$\begin{array}{r} 72.5 \\ - 45.7 \\ \hline 26.8 \end{array}$$

... and numbers with more than 4 digits.

$$134672 - 27384 = 107288$$

$$\begin{array}{r} 134672 \\ - 27384 \\ \hline 107288 \end{array}$$

(Note: In the original image, the digits 3, 4, 6, and 7 in the top number are crossed out with red lines, and the numbers 2, 5, and 16 are written above the 3, 4, and 6 respectively, indicating borrowing.)

As for year 5 but including decimals with a different number of decimal places.

$$359.03 - 87.642 = 271.388$$

$$\begin{array}{r}
 \begin{array}{ccccccc}
 & 2 & & 8 & & 9 & 12 \\
 \cancel{3} & 5 & \cancel{9} & . & \cancel{0} & \cancel{3} & 10 \\
 - & & 8 & 7 & . & 6 & 4 & 2 \\
 \hline
 & 2 & 7 & 1 & . & 3 & 8 & 8 \\
 \hline
 \end{array}
 \end{array}$$

MULTIPLICATION

Doubling Number patterns Count in ones, twos, fives, tens

Doubling using pictures.



How many socks are there in 4 pairs?



..... then recorded visually as repeated addition

$$\begin{array}{ccccccc} \parallel & & \parallel & & \parallel & & \parallel \\ 2 & + & 2 & + & 2 & + & 2 & = & 8 \end{array}$$

EYFS Multiplication

YEAR 1 Multiplication

Once, twice, three times, five times.
Multiplication
Multiply Multiplied by Multiple
Multiple of Count in twos, threes, fives, tens
Array
Row column

Repeated addition modelled, for example, using bead strings.

5×3 or 3×5



Progression to simple arrays

5×2 or 2×5



Lots of Groups of
Sets of Times
Once, twice, three
times, five times,
ten times Repeated
addition
Multiplication table
Multiplication fact

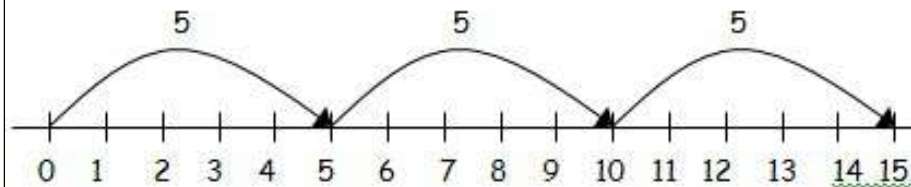
Children will develop their understanding of multiplication and use jottings to support calculation:

Repeated addition

3 times 5 is $5 + 5 + 5 = 15$ or 3 lots of 5 or 5×3

Repeated addition can be shown easily on a number line:

$$5 \times 3 = 5 + 5 + 5$$



Multiplication : Arrays

Question : 8×4

STEP 1

Take the biggest number in your question and represent it as a series of dots.



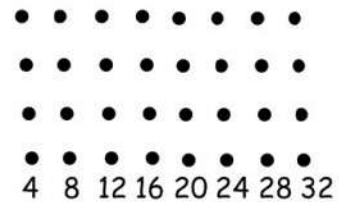
STEP 2

Under the first row of dots add more rows of your dots until you have the same number of rows as your multiplier



STEP 3

Now count all the dots you have made.
Alternately for greater speed count up in the multiple created by the dots in each column until you have reached the final column.



STEP 4

Write your answer.

Factor Product
Remainder Scale up

Multiplication : Partitioning

Question : 25×3

STEP 1 Partition the large number into tens and units. Place the tens number above the units number. 20
 5

STEP 2 Write the multiplier to the right of each of the partitioned numbers and add in the mathematical symbols. $20 \times 3 =$
 $5 \times 3 =$

STEP 3 Starting with the tens multiply this number by the multiplier. Write the answer. $20 \times 3 = 60$
 $5 \times 3 =$

STEP 4 Repeat with the units number. $20 \times 3 = 60$
 $5 \times 3 = 15$

STEP 4 Add the two answers together. Use column addition if necessary. $20 \times 3 = 60$
 $5 \times 3 = 15$
 $60 + 15 = 75$

Progressing to the principles of short multiplication (once column addition is secure and children understand 'carrying')

$$36 \times 4 = 144$$

$$\begin{array}{r} 36 \\ \times 4 \\ \hline 144 \\ \hline \end{array}$$

Inverse Square
 Squared Cube
 Cubed
 Formal written
 method
 Short multiplication
 Carry over Derive

Multiplication : Formal Method With Carrying

Question : 426 x 5

STEP 1	Label your headings : H T O	H T O
STEP 2	Lay out your calculation, big number first and multiplier underneath in the furthest right column.	$\begin{array}{r} \text{H T O} \\ 426 \\ \times \quad 5 \end{array}$
STEP 3	Place the maths symbols	$\begin{array}{r} \text{H T O} \\ 426 \\ \times \quad 5 \\ \hline \hline \end{array}$
STEP 4	Starting on the right multiply the ones digit by the multiplier. The answer is a 2 digit number. Write the ones number of the answer in the ones column between the equals sign. Write the tens digit in the tens column under the large equals sign.	$\begin{array}{r} \text{H T O} \\ 426 \\ \times \quad 5 \\ \hline \quad 0 \\ \hline \end{array}$ <p style="text-align: right; margin-right: 20px;"> $6 \times 5 = 30$ </p>
STEP 5	Multiply the tens digit by the multiplier. Add on the carried number. The answer is a 2 digit number. Write the ones number in the answer in the tens column between the equals sign. Write the other digit in the hundreds column under the large equals sign.	$\begin{array}{r} \text{H T O} \\ 426 \\ \times \quad 5 \\ \hline \quad 30 \\ \hline \end{array}$ <p style="text-align: right; margin-right: 20px;"> $2 \times 5 = 10$ $10 + 3 = 13$ </p>
STEP 6	Multiply the hundreds digit by the multiplier. Add on the carried digit. Write the answer between the equals sign.	$\begin{array}{r} \text{H T O} \\ 426 \\ \times \quad 5 \\ \hline 2130 \\ \hline \end{array}$ <p style="text-align: right; margin-right: 20px;"> 13 </p>

Factor pairs
 Composite numbers
 Prime number
 Prime factors

As for year 4 but with 4 digits

$$\begin{array}{r}
 2741 \\
 \times \quad 6 \\
 \hline
 16446 \\
 \hline
 4 \quad 2
 \end{array}$$

Long multiplication

$$\begin{array}{r}
 24 \\
 \times 16 \\
 \hline
 144 \\
 240 \\
 \hline
 384
 \end{array}$$

Longer multiplication

$$\begin{array}{r}
 124 \\
 \times 28 \\
 \hline
 992 \\
 2480 \\
 \hline
 3472 \\
 \hline
 1 \quad 1
 \end{array}$$

Order of operations
 BODMAS
 Common factors
 Common multiples
 Long multiplication



Short multiplication for decimals

$$\begin{array}{r}
 4.7 \\
 \times 8 \\
 \hline
 37.6 \\
 \hline
 5
 \end{array}$$

$7 \times 8 = 56$
 $(8 \times 4) + 5 = 37$

Long multiplication for 4 digit numbers.

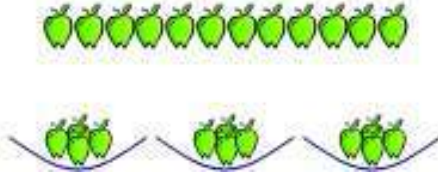
$$\begin{array}{r}
 1234 \\
 \times 56 \\
 \hline
 7404 \\
 104 \\
 1700 \\
 \hline
 69104 \\
 \hline
 1
 \end{array}$$

		DIVISION
EYFS Division	Sharing Halving Number patterns Count in ones, twos, fives, tens	Halving using concrete resources 
		Sharing using concrete resources 

Grouping Division
Dividing
How many times?
Multiple of

Sharing using pictorial model

How many apples in each bowl if
I share 12 apples between 3 bowls?



Groups of Lots of
Sets of Divide
Divided by
Divided into Share
Share equally Left,
left over One each,
two
each, three each...
ten each
Group in pairs,
threes Tens
Equal groups of
Array
Row column
Division fact

Division : Repeated subtraction on a number

Question : $35 \div 5$

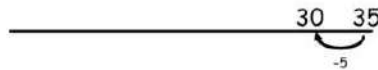
STEP 1

Draw the number line. Write the dividend on the right of your number line.



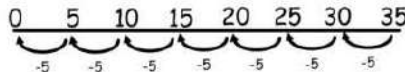
Subtract the divisor. Record the answer on the number line to the left of the starting number.

STEP 2



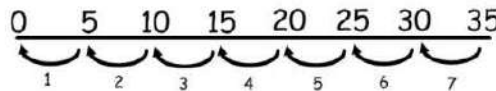
STEP 3

Repeat the process in step 2 until you reach zero.



STEP 4

To find your answer count up the number of jumps.



$35 \div 5 = 7$

Division : Arrays

Question : $24 \div 6$

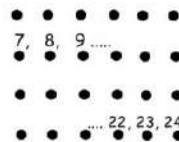
STEP 1

Take the divisor and represent as a series of dots.



STEP 2

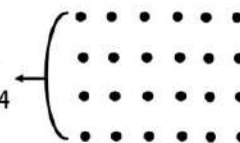
Under the first row of dots continue to add further rows of dots of the divisor whilst counting on up to the number that is the dividend.



STEP 3

Now count the number of rows made up of your dividend. Record this number as your answer.

4 rows so
 $24 \div 6 = 4$



Factor Product
Remainder

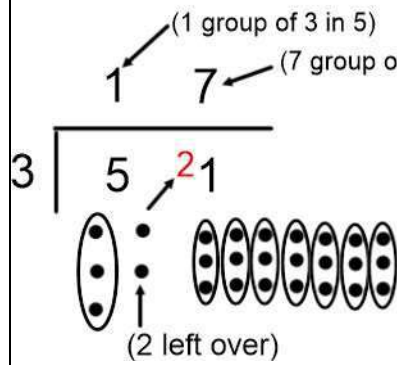
Repeated subtraction of chunks of multiples using column subtraction.

$$51 \div 3 = 17$$

$$\begin{array}{r} 51 \\ 30 \text{ (3 x 10)} \\ \hline 21 \\ 21 \text{ (3 x 7)} \\ \hline 0 \end{array}$$

Beginnings of short division using arrays and key questions to scaffold.

$$51 \div 3 = 17$$



Key questions :

How many groups of 3 are in ___ ?

How many are left over?

Inverse Derive Bus stop
Short division

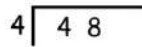
Division : Bus Stop TU ÷ U

Question : $48 \div 4$

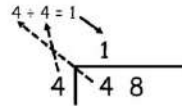
STEP 1 Draw a bus stop.



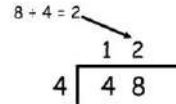
STEP 2 Write the dividend under the bus stop and the divisor to the left of the bus stop.



STEP 3 Divide the first digit in the dividend by the divisor (ask the questions, 'how many of the divisor go into the dividend'). Place the answer above the first digit of the dividend.



STEP 4 Divide the second number by the divisor. Place the answer above the second digit in the dividend.



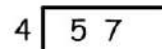
Division : Bus Stop TU ÷ U with carrying and remainders.

Question : $57 \div 4$

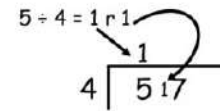
STEP 1 Draw a bus stop.



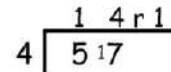
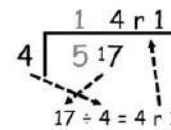
STEP 2 Write the dividend under the bus stop and the divisor to the left of the bus stop.



STEP 3 Divide the first digit in the dividend by the divisor (ask the questions, 'how many of the divisor go into the dividend and how many are left over'). Place the answer above the first digit of the dividend and carry the remainder onto the next digit.

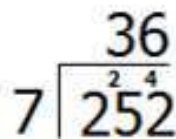


STEP 4 Divide the second (2 digit) number by the divisor. Place the answer above the second digit in the dividend and write any remainder next to the answer after the letter 'r'.



Progressing to formal short division of 3 digit numbers.

$252 \div 7 = 36$



Factor pairs
 Composite numbers
 Prime number
 Prime factors
 Chunking Divisor
 Dividend

$$8520 \div 6 = 1420$$

$$\begin{array}{r} 1420 \\ 6 \overline{) 8520} \end{array}$$

'Chunking' with 2 digit numbers between 11 and 19. Repeated subtraction of 'coin' facts (multiples of the divisor in monetary denominations – 1 2 5 10 20 50 100)

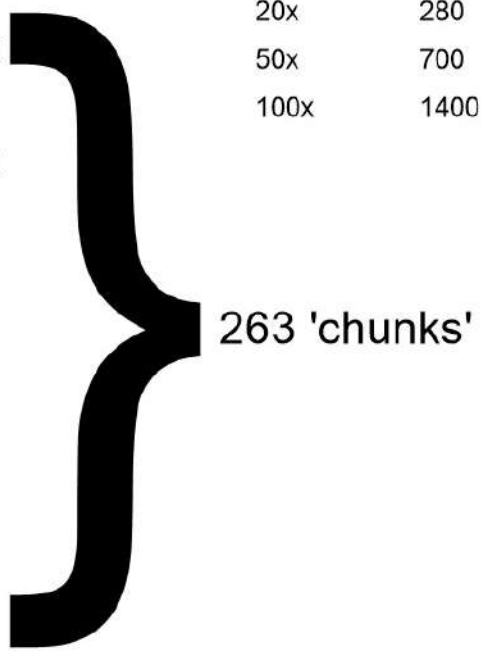
$$3682 \div 14 = 263$$

$$\begin{array}{r} 14 \overline{) 3682} \\ - 1400 \\ \hline 2282 \\ - 1400 \\ \hline 882 \\ - 700 \\ \hline 182 \\ - 140 \\ \hline 42 \\ - 28 \\ \hline 14 \\ - 14 \\ \hline 0 \end{array}$$

100 x
 100 x
 50 x
 10 x
 2 x
 1 x

'Coin' facts (chunks)

1x	14
2x	28
5x	70
10x	140
20x	280
50x	700
100x	1400




Order of operations
BODMAS
Common factors
Common multiples
Long division
Chunking Quotient

Chunking - Subtraction of multiples of the divisor of any 2 digit number.

Division : Chunking

Question : $356 \div 24$

STEP 1 Draw a bus stop. 

STEP 2 Write the dividend under the bus stop and the divisor to the left of the bus stop. $24 \overline{) 386}$

STEP 3 Create a bank of 'known facts' by multiplying the divisor by the money value amounts (1p, 2p, 5p, 10p, 20p etc.)

$24 \times 1 = 24$
$24 \times 2 = 48$
$24 \times 5 = 120$
$24 \times 10 = 240$
$24 \times 20 = 480$

STEP 4 Identify the largest multiple of the divisor which can be subtracted from the dividend and write under the dividend using place value. Record the 'money value' from the known fact. Use column subtraction to subtract this multiple from the dividend.

$24 \overline{) 386}$	$\times 10$
$\underline{-240}$	
146	

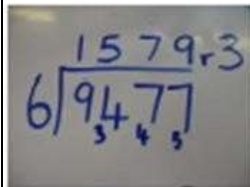
STEP 5 Identify the next largest multiple of the divisor which can be subtracted from the remaining amount and write underneath using place value. Record the 'money value' from the known fact. Use column subtraction to subtract this multiple from the dividend.

$24 \overline{) 386}$	$\times 10$
$\underline{-240}$	
146	
$\underline{-120}$	$\times 5$
26	

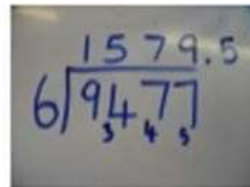
STEP 6 Repeat step 5 until the remaining amount is smaller than the divisor. This amount is the remainder in the answer. Add up the 'money values' down the side and record as the answer above the bus stop along with the remainder.

	$16r2$
$24 \overline{) 386}$	$\times 10$
$\underline{-240}$	
146	
$\underline{-120}$	$\times 5$
26	
$\underline{-24}$	$\times 1$
2	

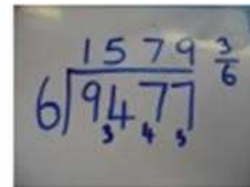
Remainders



Decimals



Fractions



Remainders

Quotients expressed as fractions or decimal fractions
 $61 \div 4 = 15 \frac{1}{4}$ or 15.25