Padre Pio Primary Calculation Policy Guidance

As a school, we value very highly any support you, as parents, are able to offer your child at home; this document has therefore been written to provide you with the guidance you will need in order to assist your child with the appropriate mental and written calculation strategies they are using in class.

The emphasis, initially, is on mental calculations skills, but progresses to the written strategies that your child is expected to become familiar with. Whilst this document has been organised into the expected outcomes for each year group, it is important to recognise that children develop their mathematical skills at different rates and that you should work with your child, using a combination of practical, mental and written activities, at a level that is suitable to them.

Padre Pio Primary Calculation Policy Guidance

Reception

Developing number skills

Skill – Reciting a range of number rhymes and songs

Pupils are familiar with the following:

"1, 2, 3, 4 , 5, once I caught a fish alive", "One man went to mow …" – Counting forwards

"Un, dau, tri banana" – Counting forwards in Welsh

"5 fat sausages", "10 green bottles", "5 little speckled frogs" – Counting backwards

More are available at: https://www.bbc.co.uk/programmes/p065s47t

Skill - Counting reliably up to 10 objects

Encourage the application of this skill incidentally wherever possible e.g. how many coins are in my hand? How many grapes are in your snack box today? Count the characters on a page in a bedtime story etc.

When your child has counted to a number ask them to identify it on a number line? Count up to it together. What is one more than that number ("spring forward")? What is one less than that number ("shuffle back")?

Skill – Reciting numbers up to 20, forwards and backwards from different starting points

Encourage child to "slow down the beat" (count slower) when they move beyond 10 so mistakes are reduced by children rushing.

Arrange number cards in a line (see resources), point to a number and start counting with your child from there. Put a counter on a number. Can they stop independently at that point and then identify the number.

Take away a number card. Ask the child to identify what number is missing. Count the number line again and "ssh" or hum on that number.

Skill – Read and write numbers to at least 10

Using the rhymes in the resource pack that pupils are familiar with, develop formation gradually through the following:

- Follow the road on the printed numbers with a toy car whilst saying the rhyme
- Form the number with a finger in sand/glitter, on a tablet using *Doodlebuddy* (or another similar) app whilst repeating the rhyme
- Form numbers on a whiteboard for quick correction of mistakes
- Finally with a pencil on paper

Observe how the child holds their pencil and model the dynamic grip (see handout) as a target for them

2 and 3 are numbers that are commonly reversed. Praise effort from child first and then revisit with them e.g. "I can't do it ***yet",*** "We all make mistakes, and we can all learn from them."

Skills – Comparing and ordering numbers to at least 10

Use visual examples with child e.g. build two Lego towers

Which has the **most/least** blocks? Encourage this vocabulary

All pupils are aware that zero means 'none' and is a one-digit number. Pupils refer to one-digit numbers as 'lonely', whereas two-digit numbers are 'nice next-door neighbours'. Show child a number can they tell you how many digits it has.

Skills – Addition and subtraction

Similarly use visual examples e.g. give two characters a pile of sweets each. Discuss who has the **least/most** to consolidate previous skill. Combine the two. How many have they got altogether? If they decided two eat two sweets how many will be left? Encourage child to physically combine the sweets (equivalent objects) and take them away to aid their learning.

Skill – Count in 2s to 10 and 10s to 100

Children are beginning to practise counting in 10s via our Dojo rewards e.g. 10 for a sticker, 20 for Bronze etc. 10, 20, 30, 40. Ask your child do they know what number their next 'Lion Point' target is.

Skill – To use ordinal numbers to 10 in daily activities and play

Talk about who finished 1st, 2nd and 3rd in races they have watched/participated in.

Look at ordinal numbers on birthday cards/badges. What birthday have they celebrated/are preparing to celebrate (5th). How old will they be on their next birthday? Talk about your child's birthday with them. Can they remember the month and the date with support?

Look at the numbers on Advent calendars together. Encourage them to find the next number. Emphasise that Christmas is on **25th December.**

Skill – To begin to read number words

"one" and "eight" will eventually be taught as "danger words" (non-phonetic spellings) within the Read Write Inc. (RWI) scheme. Encourage pupils to use their existing knowledge of RWI set 1 sounds to discern other number words.

Skill – To use 1p, 2p, 5p and 10p coins to pay for items

Managing money will be taught as a Mathematical Development skill during the Spring term. Until then, prepare pupils by showing the aforementioned coins (and more should they show confidence). Encourage your child to read the numbers on the coins. Discuss their size, colour and whether they have pointed or rounded edges to aid with their recognition when amounts and transactions are eventually introduced.

Encourage estimation and checking wherever appropriate throughout all aforementioned activities.

Padre Pio Primary Calculation Policy Guidance

Year 1

Addition

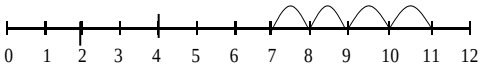
+ = signs and missing numbers

3 + 4 = □ □ = 3 + 4
3 + □ = 7 7 = □ + 4
□ + 4 = 7 7 = 3 + □
□ + ∇ = 7 7 = □ + ∇

Promoting covering up of operations and numbers.

Number lines (numbered)

7 + 4



Recording by - drawing jumps on prepared lines

- constructing own lines

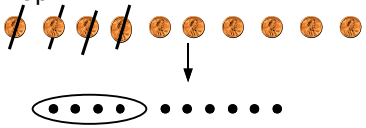
(Teacher model number lines with missing numbers)

(Teachers model jottings appropriate for larger numbers)

Subtraction

Pictures / marks

Sam spent 4p. What was his change from 10p?

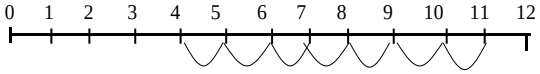


- = signs and missing numbers

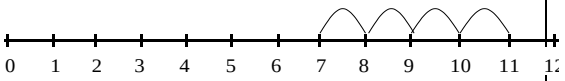
7 - 3 = □ □ = 7 - 3
7 - □ = 4 4 = □ - 3
□ - 3 = 4 4 = 7 - □
□ - ∇ = 4 4 = □ - ∇

Number lines (numbered)

11 – 7
(Counting back)



The difference between 7 and 11
(Counting up)



Recording by - drawing jumps on prepared lines
- constructing own lines

(Teachers model jottings appropriate for larger numbers)

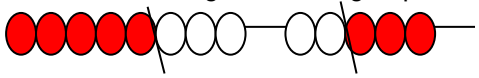
Multiplication

Pictures and symbols

There are 3 sweets in one bag.
How many sweets are there in 5 bags?

(Recording on a number line modelled by the teacher when solving problems)

Use of bead strings to model groups of.



Division

Pictures / marks

12 children get into teams of 4 to play a game. How many teams are there?

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Year 2

Addition

+ = signs and missing numbers

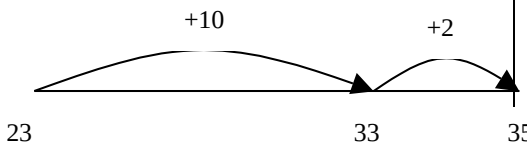
Continue using a range of equations as in Year 1 but with appropriate, larger numbers.
Extend to
14 + 5 = 10 + □
and adding three numbers
32 + □ + □ = 100 35 = 1 + □ + 5

Partition into tens and ones and recombine

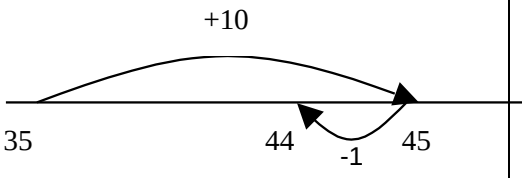
12 + 23 = 10 + 2 + 20 + 3
= 30 + 5
= 35

refine to partitioning the second number only:

23 + 12 = 23 + 10 + 2
= 33 + 2
= 35



Add 9 or 11 by adding 10 and adjusting by 1
35 + 9 = 44



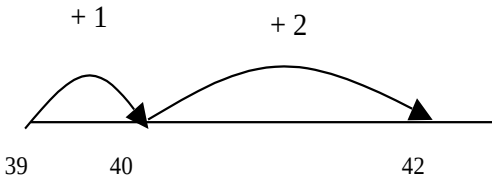
Subtraction

- = signs and missing numbers

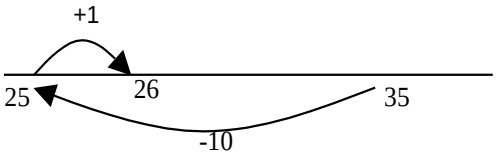
Continue using a range of equations as in Year 1 but with appropriate numbers.
Extend to 14 + 5 = 20 - □

Find a small difference by counting up

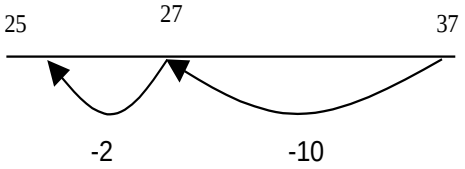
42 – 39 = 3



Subtract 9 or 11. Begin to add/subtract 19 or 21
35 – 9 = 26



Use known number facts and place value to subtract (partition second number only)
37 – 12 = 37 – 10 – 2
= 27 – 2
= 25



Multiplication

x = signs and missing numbers

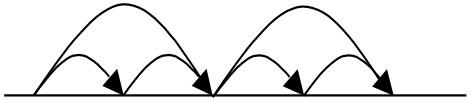
7 x 2 = □ □ = 2 x 7
7 x □ = 14 14 = □ x 7
□ x 2 = 14 14 = 2 x □
□ x ∇ = 14 14 = □ x ∇

Arrays and repeated addition


4 x 2 or 4 + 4

2 x 4
or repeated addition

2 + 2 + 2 + 2

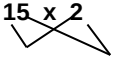


Doubling multiples of 5 up to 50

15 x 2 = 30

Partition

15 x 2


20 + 10 = 30

OR

x	10	5
2	20	10

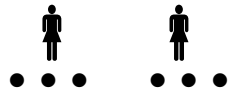
Division

÷ = signs and missing numbers

6 ÷ 2 = □ □ = 6 ÷ 2
6 ÷ □ = 3 3 = 6 ÷ □
□ ÷ 2 = 3 3 = □ ÷ 2
□ ÷ ∇ = 3 3 = □ ÷ ∇

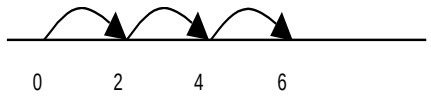
Understand division as sharing and grouping

Sharing – 6 sweets are shared between 2 people. How many do they have each?



6 ÷ 2 can be modelled as:

Grouping – There are 6 sweets. How many people can have 2 each? (How many 2's make 6?)



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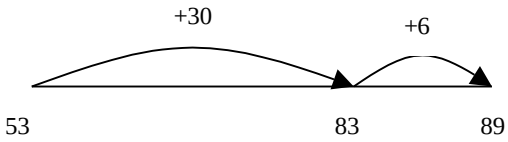
Year 3

Addition

+ = signs and missing numbers
Continue using a range of equations as in Year 1 and 2 but with appropriate, larger numbers.

Partition into tens and ones and recombine
Partition both numbers and recombine. Refine to partitioning the second number only e.g.
36 + 53 = 53 + 30 + 6
= 83 + 6
= 89



Add a near multiple of 10 to a two-digit number
Continue as in Year 2 but with appropriate numbers
e.g. 35 + 19 is the same as 35 + 20 – 1.

pencil and paper procedures
83 + 42 = 125

80 + 3	83	83
+40 + 2	+ 42	+ 42
120 + 5 =125	120	5
	5	120
	125	125

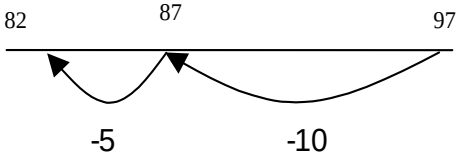
Subtraction

- = signs and missing numbers
Continue using a range of equations as in Year and 2 but with appropriate numbers.

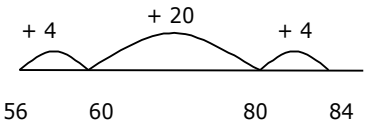
Find a small difference by counting up
Continue as in Year 2 but with appropriate numbers e.g. 102 – 97 = 5

Subtract mentally a 'near multiple of 10' to or from a two-digit number
Continue as in Year 2 but with appropriate numbers e.g. 78 – 49 is the same as 78 – 50 + 1

Use known number facts and place value to subtract
Continue as in Year 2 but with appropriate numbers e.g.
97 – 15 = 72



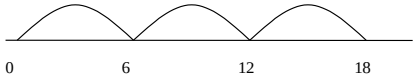
Pencil and paper procedures
Complementary addition
84 – 56 = 28



Multiplication

x = signs and missing numbers
Continue using a range of equations as in Year 2 but with appropriate numbers.

Number lines
6 x 3



Arrays and repeated addition
Continue to understand multiplication as repeated addition and continue to use arrays (as in Year 2).

Doubling multiples of 5 up to 50
35 x 2 = 70

Partition

x	30	5
2	60	10

Use known facts and place value to carry

out simple multiplications

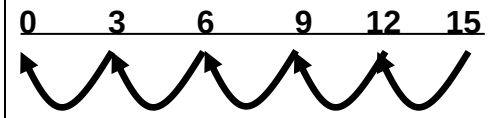
Use partitioning, e.g. 32 x 3 = 96

32 x 3 = (30 x3) + (2 x 3)
= 90 + 6
= 96

Division

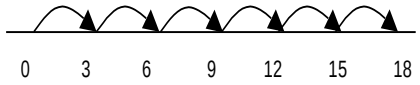
÷ = signs and missing numbers
Continue using a range of equations as in Year 2 but with appropriate numbers.

Understand division as sharing and grouping
15 ÷ 3 can be modelled as:
Sharing – 15 shared between 3 (see Year 2 diagram)
OR



Or
18 ÷ 3 can be modelled as:
Sharing – 18 shared between 3 (see Year 2 diagram)

Grouping - How many 3's make 18?



Remainders
16 ÷ 3 = 5 r1
Sharing - 16 shared between 3, how many left over?
Grouping – How many 3's make 16, how many left over?
e.g.

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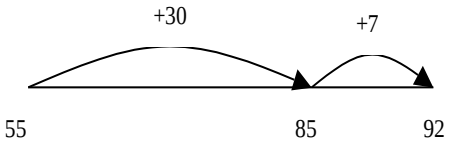
Year 4

Addition

+ = signs and missing numbers
Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.

Partition into tens and ones and recombine
Either partition both numbers and recombine or partition the second number only e.g.
55 + 37 = 55 + 30 + 7
= 85 + 7
= 92



Add the nearest multiple of 10, then adjust
Continue as in Year 2 and 3 but with appropriate numbers e.g. 63 + 29 is the same as 63 + 30 - 1

Pencil and paper procedures
358 + 73 = 431
either **or**

300+50+8
\+ 70+3
300+120+11 = 431

358
73
11
120
300
431

Extend to decimals in the context of money (vertically)
£ 2.50 + £ 1.75 = £ 4.25

£ 2.50
+ £ 1.75
£ 4.25
1

(Revert to expanded methods if the children experience any difficulty.)

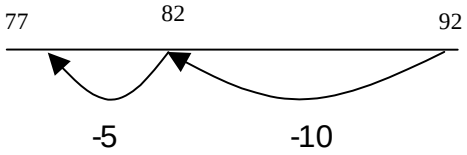
Subtraction

- = signs and missing numbers
Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.

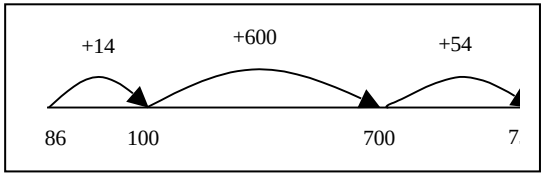
Find a small difference by counting up
e.g. 5003 – 4996 = 7
This can be modelled on an empty number line (see complementary addition below).

Subtract the nearest multiple of 10, then adjust.
Continue as in Year 2 and 3 but with appropriate numbers.

Use known number facts and place value to subtract
92 – 15 = 77



Pencil and paper procedures
Complementary addition
754 – 86 = 668



Column Subtraction

754
86 –
———

Multiplication

x = signs and missing numbers
Continue using a range of equations as in Year 2 but with appropriate numbers

Partition
23 x 4 = 92

23 x 4 = (20 x 4) + (3 x 4)
= (80) + (12)
= 92

OR

Use the grid method of multiplication (as below)

Pencil and paper procedures
Grid method
23 x 7 is approximately 20 x 10 = 200

x	20	3
7	140	21

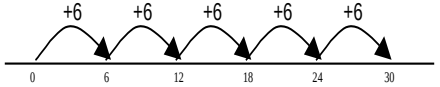
x	70	2
30	2100	60
8	560	16

38
x6
48 6 x 8
180 6 x 30
228

Division

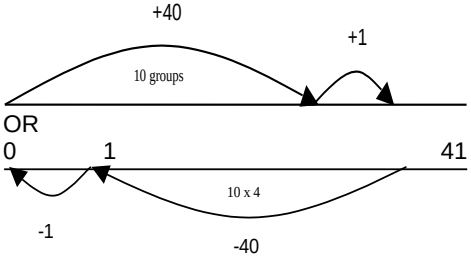
÷ = signs and missing numbers
Continue using a range of equations as in Year 2 but with appropriate numbers.

Sharing and grouping
30 ÷ 6 can be modelled as:
grouping – groups of 6 taken away and the number of groups counted e.g.



sharing – sharing among 6, the number given to each person

Remainders
41 ÷ 4 = 10 r1



OR 41 = (10 x 4) + 1

Pencil and paper procedures
72 ÷ 5 lies between 50 ÷ 5 = 10 and 100 ÷ 5 = 20

72
\- 50 (10 groups) or (10 x 5)
22
\- 20 (4 groups) or (4 x 5)
2

Answer : 14 remainder 2

Bus stop
120 ÷ 5

$5\overline{)120}$

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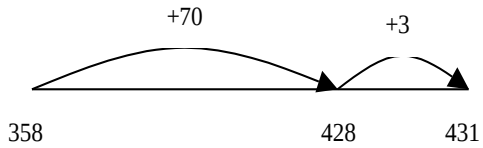
Year 5

Addition

+ = signs and missing numbers
Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.

Partition into hundreds, tens and ones and recombine
Either partition both numbers and recombine or partition the second number only e.g.
358 + 73 = 358 + 70 + 3
= 428 + 3
= 431



Add or subtract the nearest multiple of 10 or 100, then adjust
Continue as in Year 2, 3 and 4 but with appropriate numbers e.g. 458 + 79 = is the same as 458 + 80 - 1

Pencil and paper procedures
Leading to formal method, showing numbers carried underneath for G&T children.

```
  358
+  73
  431
   11
```

Extend to numbers with at least four digits
3587 + 675 = 4262

```
 3587
+ 675
 4262
  111
```

Revert to expanded methods if the children experience any difficulty.
Extend to decimals (same number of decimals places) and adding several numbers (with different numbers of digits).
Model negative numbers using a number line.

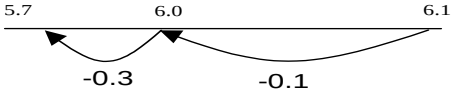
Subtraction

- = signs and missing numbers
Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.

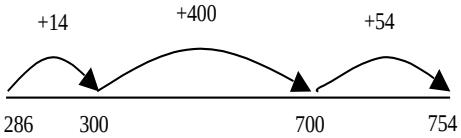
Find a difference by counting up
e.g. 8006 – 2993 = 5013
This can be modelled on an empty number line (see complementary addition below).

Subtract the nearest multiple of 10 or 100, then adjust.
Continue as in Year 2, 3 and 4 but with appropriate numbers.

Use known number facts and place value to subtract
6.1 – 0.4 = 5.7



Pencil and paper procedures
Complementary addition
754 – 286 = 468



OR ***754 - 286 = 468***

```
  14 (300)        can be refined to      14  (300)
 400 (700)                               454 (754)
  54 (754)                               468
 468
```

Multiplication

x = signs and missing numbers
Continue using a range of equations as in Year 2 but with appropriate numbers

Partition
47 x 6 = 92

47 x 6 = (40 x 6) + (7 x 6)
= (240) + (42)
= 282

OR

Use the grid method of multiplication (as below)

Pencil and paper procedures
Grid method
72 x 38 is approximately 70 x 40 = 2800

x	70	2
30	2100	60
8	560	16

Extend to simple decimals with one decimal place.

```
12.5
x  2
 1.0   (2.0 x 0.5 )
 4.0   (2.0 x 2.0 )
20.0   (2.0 x 10.0 )
25.0
```

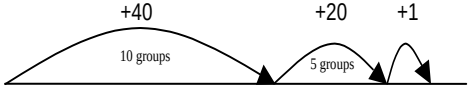
Moving to formal methods of multiplication for decimals. Carrying numbers underneath.

Division

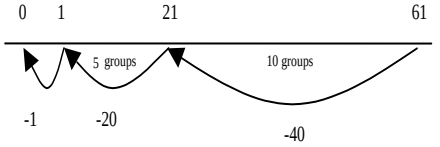
÷ = signs and missing numbers
Continue using a range of equations as in Year 2 but with appropriate numbers.

Sharing and grouping
Continue to understand division as both sharing and grouping (repeated subtraction).

Remainders
Quotients expressed as fractions or decimal fractions
61 ÷ 4 = 15 ¼ or 15.25



OR



Pencil and paper procedures
256 ÷ 7 lies between 210 ÷ 7 = 30 and 280 ÷ 7 = 40

```
  256
-  70   (10 groups)   or (10 x 7)
 186
- 140   (20 groups)   or (20 x 7)
  46
-  42    (6 groups)   or  (6 x 7)
   4     (36 groups) or (36)
```

Answer: 36 remainder 4

Padre Pio Primary Calculation Policy Guidance

Year 6

Addition

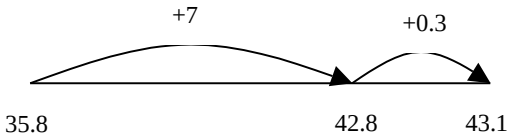
+ = signs and missing numbers

Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.

Partition into hundreds, tens, ones and decimal fractions and recombine

Either partition both numbers and recombine or partition the second number only e.g.

35.8 + 7.3 = 35.8 + 7 + 0.3
= 42.8 + 0.3
= 43.1



Add the nearest multiple of 10, 100 or 1000, then adjust

Continue as in Year 2, 3, 4 and 5 but with appropriate numbers including extending to adding 0.9, 1.9, 2.9 etc

Pencil and paper procedures

Extend to numbers with any number of digits and decimals with 1 and 2 decimal places.

124.9 + 117.25 = 242.15

```
  124.9
+ 117.25
  242.15
   11
```

Revert to expanded methods if the children experience any difficulty.

Extend to decimals (either one or two decimal places).

Subtraction

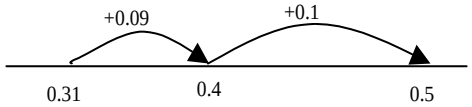
- = signs and missing numbers

Continue using a range of equations as in Year 1 and 2 but with appropriate numbers.

Find a difference by counting up

e.g. 0.5 – 0.31 = 0.19

This can be modelled on an empty number line (see complementary addition below).



Subtract the nearest multiple of 10, 100 or 1000, then adjust

Continue as in Year 2, 3, 4 and 5 but with appropriate numbers.

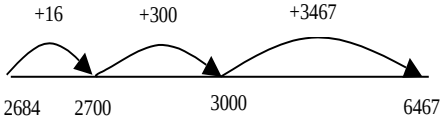
Use known number facts and place value to subtract

Continue as year 5

Pencil and paper procedures

Complementary addition

6467 – 2684 = 3783



OR ***6467 – 2684 = 3783***

16 (2700) can be refined to
316 (3000)
300 (3000)
3467 (6467)
3467 (6467)
3783
3783

OR

6467
2684 –

Multiplication

x = signs and missing numbers

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

Partition

87 x 6 = 522

87 x 6 = (80 x 6) + (7 x 6)
= (480) + (42)
= 522

OR

87
X6
42 (6 x 7)
480 (6 x 80)
522 (units, then tens, hundreds etc)

OR

Use the grid method of multiplication (as below)

Pencil and paper procedures

Grid method

372 x 24 is approximately 400 x 20 = 8000

x	300	70	2
20	6000	1400	40
4	1200	280	8

```
  2 3  1
  1342
x   18
-------
13420   X8
10736   X10
-------
24156
-------
  1
```

Division

÷ = signs and missing numbers

Continue using a range of equations as in Year 5 but with appropriate numbers.

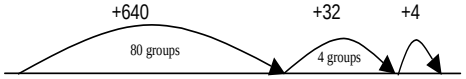
Sharing and grouping

Continue to understand division as both sharing and grouping (repeated subtraction).

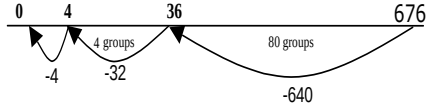
Remainders

Quotients expressed as fractions or decimal fractions

676 ÷ 8 = 84.5

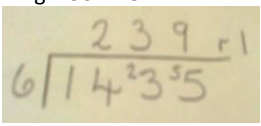


OR

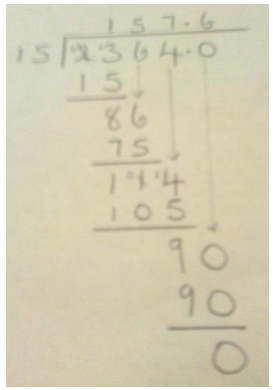


Formal Written Methods – long and short division

E.g. 1504 ÷ 8



2364÷15



Padre Pio Primary Calculation Policy Guidance