Hill View Primary School
Calculation Policy

HVP Calculation Policy

Aims

The national curriculum for mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, through varied and frequent practice with increasingly complex problems over time, So that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- **can Solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

The purpose of the Hill View Calculation Policy is to share with our community how we aim for our children to achieve fluency in the four operations.

HVP Number Facts: 'Learn Its'

Learn Its

By the end of Year 2, your child is expected to recall all 1 digit add 1 digit fact. Our aim is for children to be able to recall these facts as quickly as they can tell you their name. They should also be able to recall their 2, 5 and 10 times tables. If your child knows all of their addition Learn Its they can earn an Amazing Adder Badge.

+	1	2	3	4	5	6	7	8	9
1	2	3	4	5	6	7	8	9	10
2	3	4	5	6	7	8	9	10	11
3	4	5	6	7	8	9	10	11	12
4	5	6	7	8	9	10	11	12	13
5	6	7	8	9	10	11	12	13	14
6	7	8	9	10	11	12	13	14	15
7	8	9	10	11	12	13	14	15	16
8	9	10	11	12	13	14	15	16	17
9	10	11	12	13	14	15	16	17	18

HVP Number Facts: 'Learn Its'

Multiplication Learn Its

By the end of Year 4 your child is expected to know their times tables. These multiplication Learn Its should be hardwired just like the addition facts. Once your child knows their times tables inside out with instant recall, they can earn a Smile Badge.

x	2	3	4	5	6	7	8	9	10	11	12
2	4	6	8	10	12	14	16	18	20	22	24
3	6	9	12	15	18	21	24	27	30	33	36
4	8	12	16	20	24	28	32	36	40	44	48
5	10	15	20	25	30	35	40	54	50	55	60
6	12	18	24	30	36	42	58	54	60	66	72
7	14	21	28	35	42	49	56	63	70	77	84
8	16	24	32	40	48	56	64	72	80	88	96
9	18	27	36	45	54	63	72	81	90	99	108
10	20	30	40	50	60	70	80	90	100	110	120
11	22	33	44	55	66	77	88	99	110	121	132
12	24	36	48	60	72	84	96	108	120	132	144

HVP Learn It Pathway

	End of Autumn Term	End of Spring Term	End of Summer Term
Reception	Step 1 1+1, 2+2	Step 2 3 + 3, 4 + 4, 5 + 5	Step 3 1 + 2, 2 + 3 Count in multiples of 10
Year 1	Step 4 2 + 8, 3 + 7, 4 + 6 Count in multiples of 5	Step 5 4 + 2, 5 + 2, 6 + 2, 7 + 2, 9 + 2, 4 + 3, 5 + 3, 6 + 3	Step 6 6 + 6, 7 + 7, 8 + 8, 9 + 9 Count in multiples of 2
Year 2	Step 7 3 + 8, 3 + 9, 4 + 7, 4 + 8, 4 + 9 X 10 table	Step 8 4 + 5, 5 + 6, 6 + 7, 7 + 8, 8 + 9 X 5 table	Step 9 5 + 9, 6 + 9, 7 + 9, 5 + 7, 5 + 8, 6 + 8 X 2 table
Year 3	Step 10 X 3 table	Step 11 X 4 table	Step 12 X 8 table
Year 4	Step 13 6 Fact Challenge (x6, x 7, x 9)	Step 14 X 11 table	Step 15 X 12 table
Year 5 / 6	COMPLETE	COMPLETE	COMPLETE

HVP Calculations Glossary

Fact families

Jigsaw Numbers

Coin Cards

Smile Multiplication

Multiples. Where's Mully?

Cube Numbers

Factors

Prime Numbers

Square Numbers

Doubling

Halving

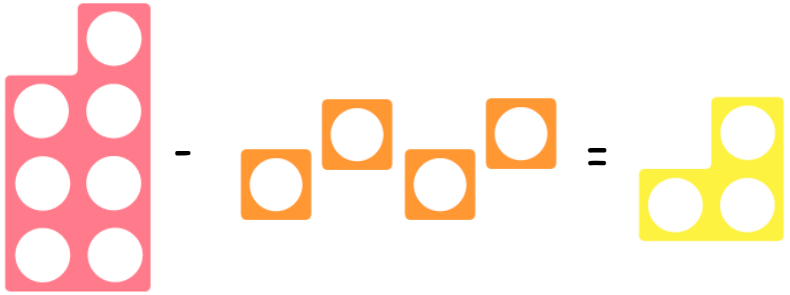
6 + 3 = 9

I count out 6.
I **know** there's 6.

I count on in 3 lots of 1

6... 7, 8, **9**

7 - 4 = 3



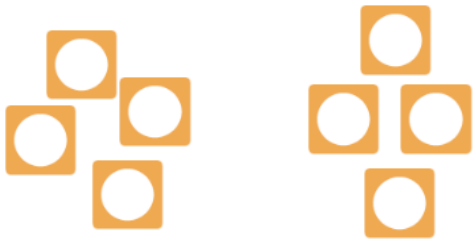
I count out 7.
I **know** there's 7.

I count how many I need to take away.

I count how many are left.

Year R

2 lots of 4

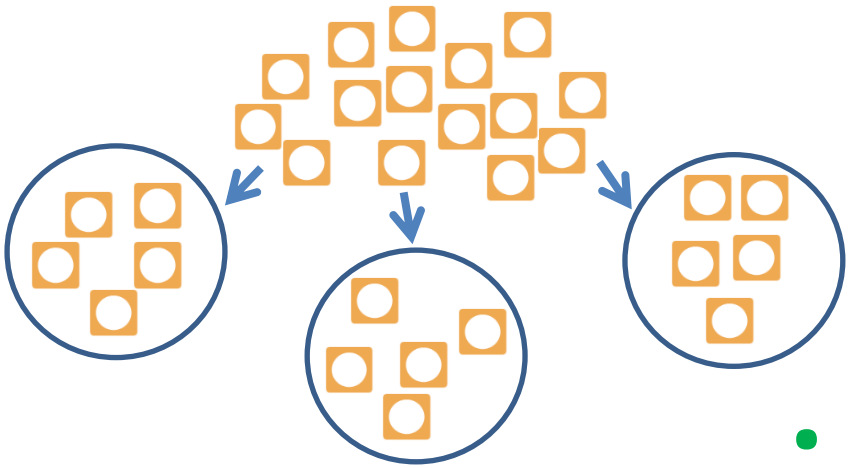


I set out one group of four

I set out another group of four

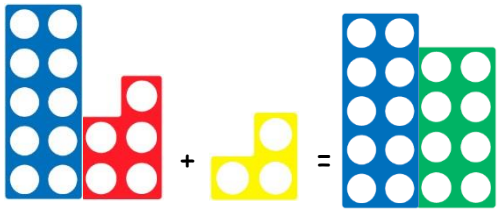
I then count all the objects

Share 15 between 3 (with objects)



I count out 15. I share between 3 (giving one at a time) and check to make sure everyone gets the same.

I can add a 1 digit number to a number to 20.



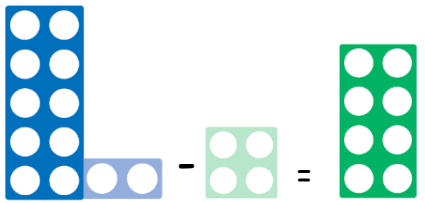
15 + 3 = 18

Fact Families

9	
6	3

3 + 6 = 9
6 + 3 = 9
9 − 3 = 6
9 − 6 = 3

I can take a 1 digit number from a number to 20.



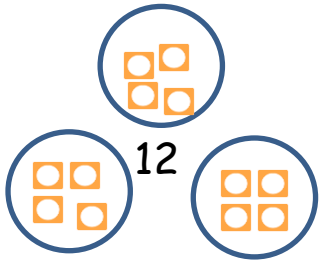
12 − 4 = 8

Can you count on in your head?

Year 1

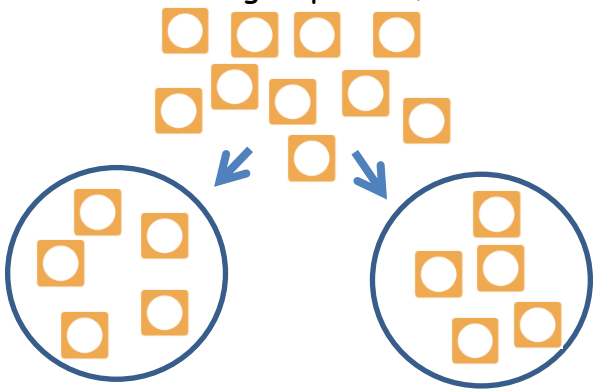
Can you count back in your head?

3 lots of 4



I can count out one lot of four, two more lots of four, check I have 3 groups, check there are four in each group. I can count to find the total. 3 lots of 4 is 12.

I can make groups of 2, 5 or 10



I can count out 1 group of 5, I keep counting out more groups of 5 until there are not enough objects for another whole group

Written Calculation

Mental Strategy

I can add 2 digit numbers to 2 digit numbers without exchanging.

$$\begin{array}{r} 36 \\ +\ 43 \\ \hline 79 \end{array}$$

23 + 46

60 + 9 = 69

I can mentally add 2 digit numbers without exchanging.

Fact Families

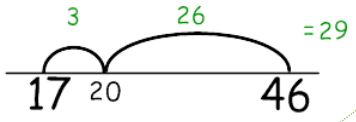
110	
30	80

80 + 30 = 110
30 + 80 = 110
110 - 30 = 80
110 - 80 = 30

Mental Strategy

I can subtract from a 2 digit number using two 'jumps' (the first jump must be to the next 'ten')

46 - 17 = 29



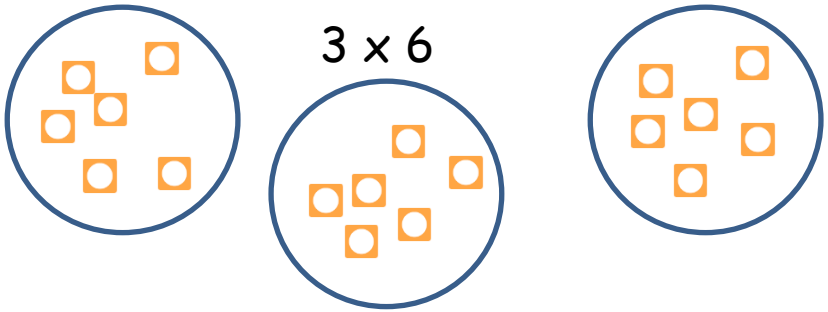
Written Calculation

I can take away 2 digit numbers from 2 digit numbers without exchanging.

$$\begin{array}{r} 79 \\ -\ 36 \\ \hline 43 \end{array}$$

Year 2

I can solve 1 digit by 1 digit multiplications (2, 3, 4 and 5 times tables)



3 lots of 6/3x6/6+6+6 = 18

I can instantly recall the 2, 5 and 10 times table

I can use table facts to find a division fact with remainders.

17 ÷ 5

5, 10, 15... That's three lots of 5.
How many are left?
16, 17...That's 2.
Three lots of 5 and 2 left over.
17 ÷ 5 = 3 r 2

Written Calculation

Written Calculation

Fact Families

100	
37	63

37 + 63 = 100
63 + 37 = 100
100 - 37 = 63
100 - 63 = 37

$$\begin{array}{r} 537 \\ +\ 383 \\ \hline 920 \\ 1\ 1 \end{array}$$

$$\begin{array}{r} {}^{6}\cancel{7}{}^{15}\cancel{6}{}^{1}5 \\ -\ 386 \\ \hline 379 \end{array}$$

Year 3

I can add 3 digit numbers to 3 digit numbers with exchanging.

I can take away 3 digit numbers from 3 digit numbers with or without exchanging.

I can solve 1 digit by 2 digit multiplications (2, 3, 4 and 5 times tables)

$$\begin{array}{r} 35 \\ \times\ \ 5 \\ \hline 175 \\ 2 \end{array}$$

I can solve a 2d ÷ 1d (using x2, 3, 4, 5) with no remainders inside the question

$$3\overline{)69} = 23$$

69÷3=23

Fact Families

210						
30	30	30	30	30	30	30

7 x 30 = 210
30 x 7 = 210
120 ÷ 7 = 30
120 ÷ 30 = 7

Written Calculation

Written Calculation

Mental Strategy

+

623 + 146

700 + 60 + 9 = 769

I can mentally add 3 digit numbers without exchanging.

I can solve any 1 digit by 2 digit multiplications

x	20	3
4	80	12

4 x 23 = 80 + 12

80 + 12 = 92

×

Mental Strategy

Fact Families

100	
37	63

37 + 63 = 100
63 + 37 = 100
100 - 37 = 63
100 - 63 = 37

Year 3

Fact Families

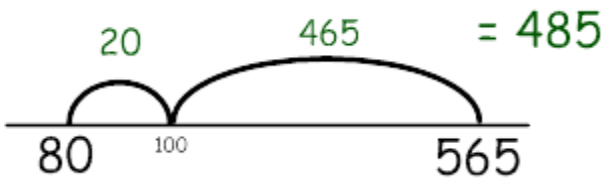
210						
30	30	30	30	30	30	30

7 x 30 = 210
30 x 7 = 210
120 ÷ 7 = 30
120 ÷ 30 = 7

Mental Strategy

-

565 - 80 = 485



I can subtract from 3 digit numbers in 'jumps' (the first jump must be to the next 'hundred')

I can use table facts to find a division fact with or without remainders

68÷5

÷

Mental Strategy

Written Calculation

+

$$\begin{array}{r} 7452 \\ +\ 1464 \\ \hline 8916 \\ \scriptstyle 1 \end{array}$$

I can add 4 digit numbers to 4 digit numbers with exchanging.

Written Calculation

−

$$\begin{array}{r} \overset{6}{\cancel{7}},\overset{13}{\cancel{4}}\,\overset{14}{\cancel{5}}\,\overset{1}{3} \\ -\ 3,464 \\ \hline 3,989 \end{array}$$

I can subtract from 4 digit numbers without exchanging.

Fact Families

100	
37	63

37 + 63 = 100
63 + 37 = 100
100 − 37 = 63
100 − 63 = 37

Year 4

I can solve any 3 digit by 1 digit multiplication

$$\begin{array}{r} 374 \\ \times\ \ \ 6 \\ \hline 2,244 \\ \scriptstyle 2\ \ 4\ \ 2 \end{array}$$

I can solve any 4d ÷ 1d with remainders within the question but not the answer

$$7\overline{)2,247} = 321$$

Fact Families

210						
30	30	30	30	30	30	30

7 x 30 = 210
30 x 7 = 210
120 ÷ 7 = 30
120 ÷ 30 = 7

×

Written Calculation

÷

Written Calculation

Mental Strategy

+

688 + 345

900 + 120 + 13 = 1,033

Also as money... eg. £6.88 + £3.45 = £10.33

I can mentally add 3 digit numbers with exchanging.

Fact Families

100	
37	63

37 + 63 = 100
63 + 37 = 100
100 - 37 = 63
100 - 63 = 37

Mental Strategy

−

753 - 45 =

653 + 55 = 708

753 - 45 = 708

I can subtract **any** 2 digit number from 3 digit numbers in 2 'jumps' (the first jump must be to the next 'hundred')

Year 4

I can solve 1 digit by 2 digit multiplications (2, 3, 4 and 5 times tables)

x	80	6
7	560	42

7 x 86 = 560 + 42
560 + 42 = 602

I can combine 2 or more Tables Facts **from any time table** to solve division with remainders

68÷5

Fact Families

210						
30	30	30	30	30	30	30

7 x 30 = 210
30 x 7 = 210
120 ÷ 7 = 30
120 ÷ 30 = 7

×

Mental Strategy

÷

Mental Strategy

Written Calculation

$$\begin{array}{r} 12,583 \\ +\ 45,621 \\ \hline 58,204 \\ \ \ 1\ \ 1 \end{array}$$

I can add 5 digit numbers to 5 digit numbers with exchanging.

I can solve 1 digit by 4 digit multiplications

$$\begin{array}{r} 8,324 \\ \times\ \ \ \ 6 \\ \hline 49,944 \\ \ 1\ \ 1\ \ 2 \end{array}$$

Written Calculation

Written Calculation

$$\begin{array}{r} {}^{3}\cancel{4}\ {}^{1}2,{}^{7}\cancel{8}\ {}^{1}45 \\ -\ 13,674 \\ \hline 29,171 \end{array}$$

I can subtract from 5 digit numbers with and without exchanging.

I can solve any 4d ÷ 1d with remainders

$$\begin{array}{r} 1,201\ r3 \\ 6\overline{)\,7,{}^{1}209} \end{array}$$

7,209 ÷ 6 = 1,201 r3

Written Calculation

Year 5

Fact Families

1.1	
0.4	0.7

0.4 + 0.7 = 1.1
0.7+ 0.4 = 1.1
1.1 - 0.4 = 0.7
1.1 - 0.7 = 0.4

Fact Families

1.2			
0.3	0.3	0.3	0.3

4 x 0.3 = 1.2
0.3 x 4 = 1.2
1.2 ÷ 4 = 0.3
1.2 ÷ 0.3 = 4

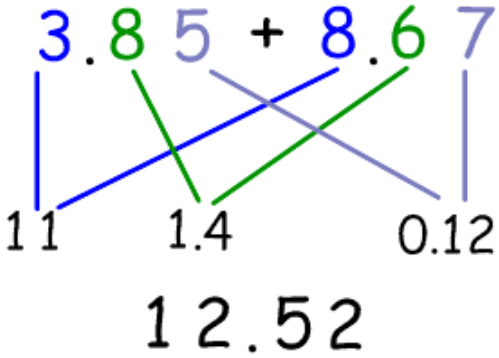
Mental Strategy

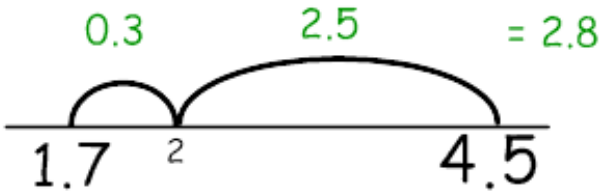
Mental Strategy

Fact Families

1.1	
0.4	0.7

0.4 + 0.7 = 1.1
0.7+ 0.4 = 1.1
1.1 - 0.4 = 0.7
1.1 - 0.7 = 0.4





I can solve any addition with larger numbers and with numbers with 2 decimal places

Year 5

I can subtract larger numbers and numbers with 1 decimal place using two sensible 'jumps'

I can use jottings to solve 2 digit by 2 digit multiplications

x	60	9
30	1,800	270
8	480	72

I can use table facts to find a division fact with or without remainders

x	14
1	14
2	28
5	70
10	140
20	280

156 ÷ 14
Where does 152 come in?
After '10x14'
Enough left for any more 14s?
Yes, 1 more lot of 14 with 2 left over.
10 lots add 1 lot with 2 remaining.
156 ÷ 14 = 11r2

Fact Families

1.2			
0.3	0.3	0.3	0.3

4 x 0.3 = 1.2
0.3 x 4 = 1.2
1.2 ÷ 4 = 0.3
1.2 ÷ 0.3 = 4

72÷8=9
Know the inverse of all multiplication facts

Mental Strategy

Mental Strategy

Written Calculation

Written Calculation

Fact Families

5.4	
2.5	2.9

2.5 + 2.9 = 5.4
2.9 + 2.5 = 5.4
5.4 - 2.5 = 2.9
5.4 - 2.9 = 2.5

$$\begin{array}{r} 7.341 \\ +\ 13.02 \\ \hline 20.361 \\ {\scriptstyle 1} \end{array}$$

$$\begin{array}{r} {\scriptstyle 1}\cancel{1}{\scriptstyle 1}2.764 \\ -\ \ 3.22 \\ \hline 9.544 \end{array}$$

Year 6

I can add numbers with mixed decimal places

I can subtract from numbers with 3 decimal places with and without exchanging.

I can solve 2 digit by 4 digit multiplications

I can solve any 4d ÷ 1d with remainders

$$\begin{array}{r} 6,124 \\ \times\ \ \ \ 16 \\ \hline 36,744 \\ {\scriptstyle 1}\ \ {\scriptstyle 2} \\ +\ 61,240 \\ \hline 97,984 \end{array}$$

×	14
1	14
2	28
5	70
10	140
20	280

$$\begin{array}{r} 052\text{r}1 \\ 14\overline{)729} \\ -\ 70\downarrow\ \ \\ \hline 029 \\ -\ 28 \\ \hline 01 \end{array}$$

$$\begin{array}{r} 1,201.5 \\ 6\overline{)7,{\scriptstyle 1}2\,0\,9{\scriptstyle 3}.0} \end{array}$$

7,209 ÷ 6 = 1,201.5

Fact Families

1.2			
0.3	0.3	0.3	0.3

4 x 0.3 = 1.2
0.3 x 4 = 1.2
1.2 ÷ 4 = 0.3
1.2 ÷ 0.3 = 4

Written Calculation

Written Calculation

Mental Strategy

+

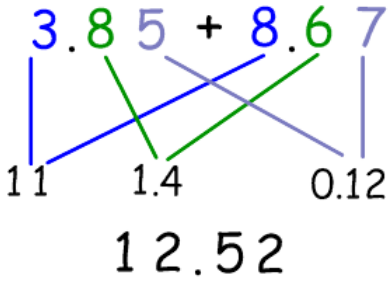
Mental Strategy

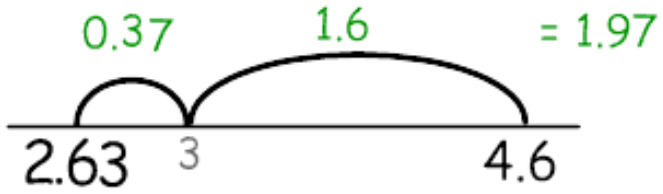
−

Fact Families

5.4	
2.5	2.9

2.5 + 2.9 = 5.4
2.9 + 2.5 = 5.4
5.4 − 2.5 = 2.9
5.4 − 2.9 = 2.5





I can solve any addition with larger numbers and with numbers with 2 decimal places

Year 6

I can subtract larger numbers and numbers with 1 decimal place using two sensible 'jumps'

I can use jottings to solve multiplications with decimal places

x	7	0.6	0.03
4	28	2.4	0.12

4 x 7.63 = 30.52

```
  26.52
x    14
------
 106.08
+265.20
------
 371.28
  2 2
   1
```

I can apply table facts to find a division fact
2.4 ÷ 8 = 0.3

x	14
1	14
2	28
5	70
10	140
20	280

156 ÷ 14

Where does 152 come in?

After '10x14'

Enough left for any more 14s?

Yes, 1 more lot of 14 with 2 left over.

10 lots add 1 lot with 2 remaining.

156 ÷ 14 = 11r2

Fact Families

1.2			
0.3	0.3	0.3	0.3

4 x 0.3 = 1.2
0.3 x 4 = 1.2
1.2 ÷ 4 = 0.3
1.2 ÷ 0.3 = 4

72÷8=9
Know the inverse of all multiplication facts

×

Mental Strategy

÷

Mental Strategy