

HOLGATE PRIMARY & NURSERY SCHOOL



Primary and Nursery School

A guide for parents on written
calculations in mathematics

Year 5

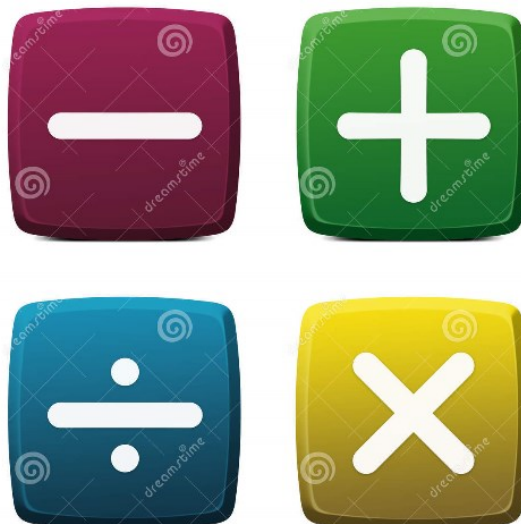
This booklet is designed to support parents understand the strategies/methods used in school when teaching children a formal written method to solve a problem. It shows the progression in calculation strategies for each of the four operations: addition, subtraction, multiplication and division. For each operation there are stages that children need to work through and build upon their basic skills.

This is an outline of our calculation policy — it does not cover everything but provides examples of the main stages for your information. A full version of the Calculation Policy is available on the our website.

For children to develop a good sense of number, it is important to lay firm foundations in mathematics and to build on these in a systematic way.

At Holgate Primary we have taken into account the way children develop in their learning and understanding, beginning with a firm grounding in mental calculations, and using these skills to develop effective written methods for calculations.

We have provided a copy of the multiplication facts at the back of this booklet. These should be learnt (up to 12×12) by the end of year 4 and children need to become fluent and able to recall these quickly. Times tables are one of the basic skills needed to develop understanding of mathematics.



Addition

Step 1

Column addition by partitioning with the brackets

$135 + 143$

135
143
<hr/>
8
70
200
<hr/>
278

Step 2

Compact column addition involving carrying.

$165 + 143$

165
143
<hr/>
308
<hr/>
1

Step 3

Column addition involving decimals. When adding decimals, it is vital that place value is used and place holders are put in empty columns.

16.35
04.30
<hr/>
20.65
<hr/>
1

Year 5

addition
column
tens
boundary
hundreds
boundary
increase
vertical
carry
expanded

compact
thousands
hundreds
digits
inverse
decimal
places
decimal point
tenths
hundredths
thousandths

Subtraction

Step 1

Introduce the compact method, comparing to the previous one discussing what is the same and different.

$$327 - 136 = 191$$

$$\begin{array}{r} \overset{2}{\cancel{3}}\overset{1}{2}7 \\ 136 \\ \hline 191 \end{array}$$

Step 2

Use vertical column subtraction with whole and decimal numbers.

$$\begin{array}{r} \overset{2}{\cancel{3}}\overset{1}{7}\overset{7}{\cancel{8}}\overset{1}{2}9 \\ 28342 \\ \hline 09487 \end{array} \quad \begin{array}{r} \overset{2}{\cancel{3}}\overset{1}{6}\overset{4}{\cancel{5}}\overset{1}{.}45 \\ 173.50 \\ \hline 191.95 \end{array}$$

Year 5

exchange
how much
less is
decrease
value

difference
strategy
minus
inverse

Multiplication

Step 1

Use the grid method to multiply HTU
 \times U

$$357 \times 7$$

X	300	50	7
7	2100	350	49

$$2100 + 350 + 49 = 2499$$

Step 2

When confident with grid method,
introduce long multiplication (with
partitioning).

$$57 \times 7$$

$$\begin{array}{r} 57 \\ \times 7 \\ \hline 49 \text{ (Units } 7 \times 7) \\ + 350 \text{ (Tens } 50 \times 7) \\ \hline 399 \end{array}$$

Step 3

Introduce long multiplication
(compact).

$$57 \times 7$$

$$\begin{array}{r} 57 \\ \times 7 \\ \hline 399 \\ \hline 4 \end{array}$$

Step 4

Introduce Expanded Multiplication
for TU \times TU e.g. 23×18

$$\begin{array}{r} 23 \\ \times 18 \\ \hline 24 \text{ (} 8 \times 3) \\ 160 \text{ (} 8 \times 20) \\ 30 \text{ (} 10 \times 3) \\ 200 \text{ (} 10 \times 20) \\ \hline 414 \\ \text{✓} \end{array}$$

Year 5

inverse
square
factor

integer
decimal
short/long
multiplication
carry

Division

Step 1

Long division by chunking with U.
 $72 \div 4 = 18$

$$\begin{array}{r} 18 \\ 4 \overline{) 72} \\ \underline{40} \quad (\times 10) \\ 32 \\ \underline{32} \quad (\times 8) \\ 00 \end{array}$$

Step 2

Introduce short division without remainders.
 $72 \div 4 = 18$

$$\begin{array}{r} 18 \\ 4 \overline{) 7^3 2} \end{array}$$

How many 4s in 7? 1 remainder 3 and then how many 4s in 32? 8

Step 3

Short division
 $205 \div 5$

$$\begin{array}{r} 041 \\ 5 \overline{) 2^2 05} \end{array}$$

We always need to check the answer using the inverse.

$$5 \times 41 = 205$$

Step 4

Use short division with remainders.
 $78 \div 5 = 15r3$

$$\begin{array}{r} 15r3 \\ 5 \overline{) 7^2 8} \end{array}$$

How many 5s in 7? 1 remainder 2 and then how many 5s in 28? 5 with 3 left over.

Year 5

divide
 divided by
 divided into
 division
 grouping
 number line
 left
 left over
 inverse
 short division

carry
 remainder
 multiple
 divisible by
 factor
 quotient
 prime number
 prime
 factors
 composite
 number (non
prime)

Multiplication Facts

1x	2x	3x	4x	5x	6x
$0 \times 1 = 0$	$0 \times 2 = 0$	$0 \times 3 = 0$	$0 \times 4 = 0$	$0 \times 5 = 0$	$0 \times 6 = 0$
$1 \times 1 = 1$	$1 \times 2 = 2$	$1 \times 3 = 3$	$1 \times 4 = 4$	$1 \times 5 = 5$	$1 \times 6 = 6$
$2 \times 1 = 2$	$2 \times 2 = 4$	$2 \times 3 = 6$	$2 \times 4 = 8$	$2 \times 5 = 10$	$2 \times 6 = 12$
$3 \times 1 = 3$	$3 \times 2 = 6$	$3 \times 3 = 9$	$3 \times 4 = 12$	$3 \times 5 = 15$	$3 \times 6 = 18$
$4 \times 1 = 4$	$4 \times 2 = 8$	$4 \times 3 = 12$	$4 \times 4 = 16$	$4 \times 5 = 20$	$4 \times 6 = 24$
$5 \times 1 = 5$	$5 \times 2 = 10$	$5 \times 3 = 15$	$5 \times 4 = 20$	$5 \times 5 = 25$	$5 \times 6 = 30$
$6 \times 1 = 6$	$6 \times 2 = 12$	$6 \times 3 = 18$	$6 \times 4 = 24$	$6 \times 5 = 30$	$6 \times 6 = 36$
$7 \times 1 = 7$	$7 \times 2 = 14$	$7 \times 3 = 21$	$7 \times 4 = 28$	$7 \times 5 = 35$	$7 \times 6 = 42$
$8 \times 1 = 8$	$8 \times 2 = 16$	$8 \times 3 = 24$	$8 \times 4 = 32$	$8 \times 5 = 40$	$8 \times 6 = 48$
$9 \times 1 = 9$	$9 \times 2 = 18$	$9 \times 3 = 27$	$9 \times 4 = 36$	$9 \times 5 = 45$	$9 \times 6 = 54$
$10 \times 1 = 10$	$10 \times 2 = 20$	$10 \times 3 = 30$	$10 \times 4 = 40$	$10 \times 5 = 50$	$10 \times 6 = 60$
$11 \times 1 = 11$	$11 \times 2 = 22$	$11 \times 3 = 33$	$11 \times 4 = 44$	$11 \times 5 = 55$	$11 \times 6 = 66$
$12 \times 1 = 12$	$12 \times 2 = 24$	$12 \times 3 = 36$	$12 \times 4 = 48$	$12 \times 5 = 60$	$12 \times 6 = 72$
7x	8x	9x	10x	11x	12x
$0 \times 7 = 0$	$0 \times 8 = 0$	$0 \times 9 = 0$	$0 \times 10 = 0$	$0 \times 11 = 0$	$0 \times 12 = 0$
$1 \times 7 = 7$	$1 \times 8 = 8$	$1 \times 9 = 9$	$1 \times 10 = 10$	$1 \times 11 = 11$	$1 \times 12 = 12$
$2 \times 7 = 14$	$2 \times 8 = 16$	$2 \times 9 = 18$	$2 \times 10 = 20$	$2 \times 11 = 22$	$2 \times 12 = 24$
$3 \times 7 = 21$	$3 \times 8 = 24$	$3 \times 9 = 27$	$3 \times 10 = 30$	$3 \times 11 = 33$	$3 \times 12 = 36$
$4 \times 7 = 28$	$4 \times 8 = 32$	$4 \times 9 = 36$	$4 \times 10 = 40$	$4 \times 11 = 44$	$4 \times 12 = 48$
$5 \times 7 = 35$	$5 \times 8 = 40$	$5 \times 9 = 45$	$5 \times 10 = 50$	$5 \times 11 = 55$	$5 \times 12 = 60$
$6 \times 7 = 42$	$6 \times 8 = 48$	$6 \times 9 = 54$	$6 \times 10 = 60$	$6 \times 11 = 66$	$6 \times 12 = 72$
$7 \times 7 = 49$	$7 \times 8 = 56$	$7 \times 9 = 63$	$7 \times 10 = 70$	$7 \times 11 = 77$	$7 \times 12 = 84$
$8 \times 7 = 56$	$8 \times 8 = 64$	$8 \times 9 = 72$	$8 \times 10 = 80$	$8 \times 11 = 88$	$8 \times 12 = 96$
$9 \times 7 = 63$	$9 \times 8 = 72$	$9 \times 9 = 81$	$9 \times 10 = 90$	$9 \times 11 = 99$	$9 \times 12 = 108$
$10 \times 7 = 70$	$10 \times 8 = 80$	$10 \times 9 = 90$	$10 \times 10 = 100$	$10 \times 11 = 110$	$10 \times 12 = 120$
$11 \times 7 = 77$	$11 \times 8 = 88$	$11 \times 9 = 99$	$11 \times 10 = 110$	$11 \times 11 = 121$	$11 \times 12 = 132$
$12 \times 7 = 84$	$12 \times 8 = 96$	$12 \times 9 = 108$	$12 \times 10 = 120$	$12 \times 11 = 132$	$12 \times 12 = 144$

