

HOLGATE PRIMARY & NURSERY SCHOOL



A guide for parents on written
calculations in mathematics

Year 6

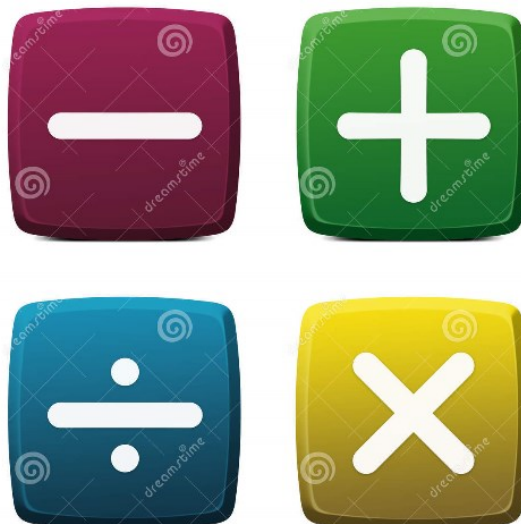
This booklet is designed to support parents understand the strategies/methods used in school when teaching children a formal written method to solve a problem. It shows the progression in calculation strategies for each of the four operations: addition, subtraction, multiplication and division. For each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

These are the calculations that you child will do in year 6. These stages are progressive and will be built upon throughout the academic year. Children will work through these stages at different paces to ensure that they are confident and can apply them independently.

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 relevant to year 6 at the back of this booklet. These should be learnt by the end of year 6 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. The new curriculum states that all children by the end of year 4 should know all of their times tables (up to 12×12).



Addition

Stage 1

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

$$\begin{array}{r} 16.35 \\ 04.30 \\ \hline 20.65 \\ \hline 1 \end{array}$$

Year 6

addition	compact
column	thousands
tens	hundreds
boundary	digits
hundreds	inverse
boundary	decimal
increase	places
vertical	decimal point
bridging	tenths
expanded	hundredths
	thousandths

Subtraction

Stage 1

Use vertical column subtraction with whole and decimal numbers.

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

equal to
take away
less
minus
subtract
distance
between
how many
more
exchange
how much
less is
decrease
value
decimal point
decimal

difference
strategy
minus
inverse
less than
most
least
count back
how many
left
how much
less is
difference
count on
strategy
tenths
hundredths

Multiplication

Stage 1

Introduce Expanded Multiplication for TU x TU e.g. 23 x 18

$$\begin{array}{r}
 23 \\
 \times 18 \\
 \hline
 24 \text{ (8x3)} \\
 160 \text{ (8x20)} \\
 30 \text{ (10x3)} \\
 200 \text{ (10x20)} \\
 \hline
 414 \\
 \text{\textit{A}}
 \end{array}$$

Stage 2

Use long multiplication (compact) for TU x TU. 57 x 24

$$\begin{array}{r}
 57 \\
 \times 24 \\
 \hline
 228 \text{ (57 x 4)} \\
 1140 \text{ (57 x 20)} \\
 \hline
 1368
 \end{array}$$

Year 6

groups of
lots of
times
array
altogether
multiply
count
multiplies by
repeated
addition
partition
inverse
square
factor
tenths
hundredths
decimal

column
row
commutative
sets of
equal groups
times
grid method
multiple
product
tens
units
commutative
integer
decimal
short/long
multiplication
carry

Division

Stage 1

Use short division with remainders.

$$78 \div 5 = 15r3$$

$$\begin{array}{r} 15r3 \\ 5 \overline{) 78} \\ \underline{5} \\ 28 \\ \underline{25} \\ 3 \end{array}$$

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

Stage 2

Long division by chunking with TU.

$$180 \div 12 = 15$$

$$\begin{array}{r} 015 \\ 12 \overline{) 180} \\ \underline{120} \quad (\times 10) \\ 060 \\ \underline{060} \quad (\times 5) \\ 000 \end{array}$$

$$10 + 5 = 15$$

Stage 3

For Level 5 and above, children are expected to be able to convert the remainder into a fraction or decimal. So, if the remainder is 2 they would need to know that it is $\frac{2}{5}$ (two fifths) as they were dividing by 5.

Year 6

one each
two each
group
groups of
equal groups
of
lots of
array
divide
divided by
divided into
division
composite
number (non
prime)

grouping
number line
left
left over
inverse
short division
carry
remainder
multiple
divisible by
factor
prime number
prime
factors
common
factor

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

