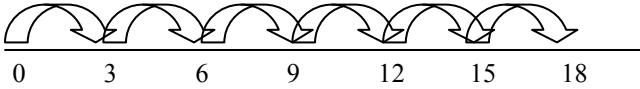


DIVISION

Informal methods including sharing and grouping, repeated addition or subtraction using a number line.

$$18 \div 3 = 6$$



Stage 1: Short division i.e. TU ÷ U, HTU ÷ U
Known as the 'chunking' method.

$$84 \div 6$$

$$\begin{array}{r} 6 \) \ 8 \ 4 \\ - \ 6 \ 0 = 10 \times 6 \\ \hline 2 \ 4 \\ - \ 1 \ 2 = 2 \times 6 \\ \hline 1 \ 2 \\ - \ 1 \ 2 = 2 \times 6 \\ \hline 0 \end{array}$$

Answer = 14

$$123 \div 9$$

$$\begin{array}{r} 9 \) \ 1 \ 2 \ 3 \\ - \ 9 \ 0 = 10 \times 9 \\ \hline 3 \ 3 \\ - \ 1 \ 8 = 2 \times 9 \\ \hline 1 \ 5 \\ - \ 9 \ 0 = 1 \times 9 \\ \hline 6 \end{array}$$

Answer = 13 r 6

Stage 2: Apply to larger numbers and begin to take larger 'Chunks'.

$$1 \ 9 \ 6 \div 6$$

$$\begin{array}{r} 6 \) \ 1 \ 9 \ 6 \\ - \ 6 \ 0 = 10 \times 6 \\ \hline 1 \ 3 \ 6 \\ - \ 6 \ 0 = 10 \times 6 \\ \hline 7 \ 6 \\ - \ 6 \ 0 = 10 \times 6 \\ \hline 1 \ 6 \\ - \ 1 \ 2 = 2 \times 6 \\ \hline 4 \end{array}$$

Answer = 32 r 4

Moving onto

$$\begin{array}{r} 6 \) \ 1 \ 9 \ 6 \\ - \ 1 \ 8 \ 0 = 30 \times 6 \\ \hline 1 \ 6 \\ - \ 1 \ 2 = 2 \times 6 \\ \hline 4 \end{array}$$

Extend to larger and decimal numbers (still dividing by a single digit number).

Stage 3: Long division (HTU ÷ TU)

$$4 \ 3 \ 2 \div 1 \ 5$$

$$\begin{array}{r} 1 \ 5 \) \ 4 \ 3 \ 2 \\ - \ 1 \ 5 \ 0 = 10 \times 15 \\ \hline 2 \ 8 \ 2 \\ - \ 1 \ 5 \ 0 = 10 \times 15 \\ \hline 1 \ 3 \ 2 \\ - \ 6 \ 0 = 4 \times 15 \\ \hline 7 \ 2 \\ - \ 6 \ 0 = 4 \times 15 \\ \hline 1 \ 2 \end{array}$$

Answer = 28 r 12

$$\begin{array}{r} 1 \ 5 \) \ 4 \ 3 \ 2 \\ - \ 3 \ 0 \ 0 = 20 \times 15 \\ \hline 1 \ 3 \ 2 \\ - \ 1 \ 2 \ 0 = 8 \times 15 \\ \hline 1 \ 2 \end{array}$$

MATHEMATICS

St. Gabriel's C.E.
Primary School

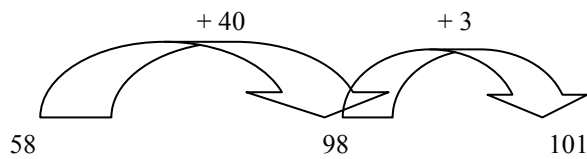
Progression in Methods of Written Calculations



ADDITION

Informal methods include:

Counting on using a number line, $58 + 43$



Stage 1: Mental method using partitioning:

$$47 + 76 = (40 + 70) + (7 + 6) = 110 + 13 = 123$$

Stage 2: Expanded layout—explaining how we add the most significant digit first, (following on from the mental method) then the least significant digit

H	T	U	
	7	6	
	4	7	+
	1	3	
	1	1	0
	1	2	3

Stage 3: Extend to 3 digit numbers

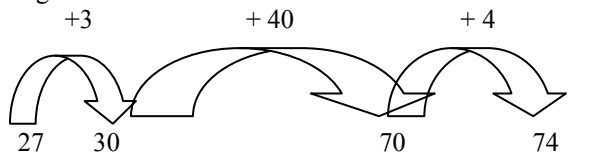
Stage 4: 'One Carry' to 'Two Carries'

T	U		T	U
4	7		7	6
2	6	+	4	7
7	3		1	2
7			1	2

SUBTRACTION

Informal methods include

Counting on or back in repeated steps on a number line, e.g. $74 - 27$



Stage 1: Mental method using partitioning (first without crossing T or H then crossing T and H boundary.)

$$76 - 32 = (76 - 30) - 2 = 44$$

$$72 - 38 = (72 - 30) - 8 = 34$$

Stage 2: Expanded vertical layout

89	—	57		becomes
T	U			
8	9		80	and
5	7	-	50	and
			30	+
			2	=
			32	

Stage 3: Efficient standard method using EXCHANGING

T	U
7	1
5	7
2	4

Stage 4: Use the methods taught with larger numbers, more than two numbers, numbers with different numbers of digits and decimals, including money.

MULTIPLICATION

Stage 1: Mental method using partitioning. Continuous addition. Short multiplication (TU x U)

KNOWLEDGE OF TABLES IS VERY IMPORTANT

$$23 \times 8 = (20 \times 8) + (3 \times 8) = 160 + 24 = 184$$

Stage 2: Introduce the grid method

Short multiplication (TU x U), e.g. 46×9

x	40	6
9	360	54
	54	
	414	

Stage 3: Some children may move to developing a standard written method.

Th	H	T	U
	3	4	6
x			9
3	1	1	4
3	1	1	4

Stage 4: Long multiplication using the grid method some may move to an efficient standard written method.

x	70	2	Th	H	T	U
						7 2
30	2100	60				3 8 x
8	560	16				7 6 = 2 x 38
+	76					2 6 6 0 = 70 x 38
=	2736					2 7 3 6

Stage 5: Use the methods taught with larger numbers, more than two numbers, numbers with different numbers of digits and decimals, including money.