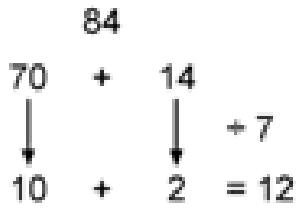
Written methods for Division

Stage 1: Mental division using partitioning

One way to work out TU ÷ U mentally is to partition TU into smaller multiples of the divisor, then divide each part separately.

Informal recording in Year 4 for 84 ÷ 7 might be:



In this example, using knowledge of multiples, the 84 is partitioned into 70 (most children will be secure with a multiple of 10) plus 14

Written methods for Division

Stage 1: Mental division using partitioning

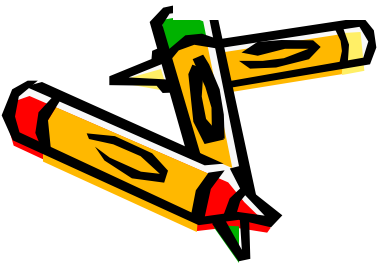
or……

$64 \div 4 = (40 + 24) \div 4$
$= (40 \div 4) + (24 \div 4)$
$= 10 + 6 = 16$

$87 \div 3 = (60 + 27) \div 3$
$= (60 \div 3) + (27 \div 3)$
$= 20 + 9 = 29$

$96 \div 7 = (70 + 26) \div 7$
$= (70 \div 7) + (26 \div 7)$
$= 10 + 3 \text{ R } 5 = 13 \text{ R } 5$

and with a remainder

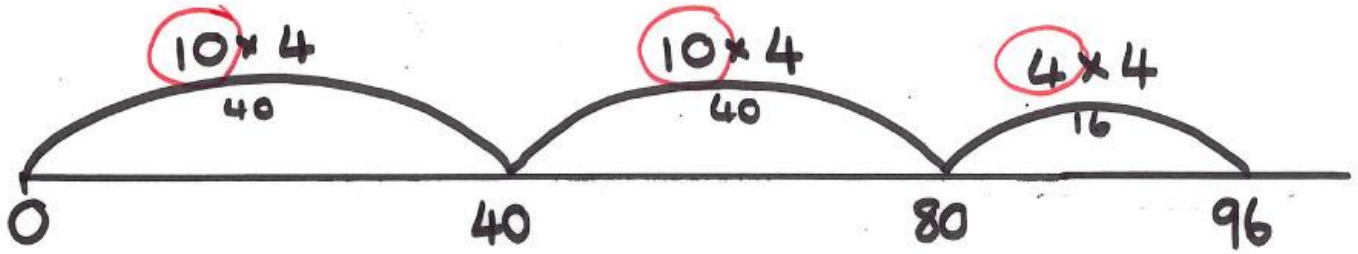


division by chunking on a numberline

$96 \div 4 = 24$

make sure that the number you have multiplied by go in the same position each time

WDIK
10 x 4
20 x 4
30 x 4
etc



How many lots of 4 altogether?

$10 + 10 + 4 = 24$

Written methods for Division

Stage 2: Short division of TU ÷ U

'Short' division of TU ÷ U can be introduced as a more compact recording of the mental method of partitioning, to children who are confident with multiplication and division facts and whose understanding of partitioning and place value is sound. For most children this will be during Year 5.

Written methods for Division

Stage 2: 'Expanded' method for TU ÷ U and HTU ÷ U

This method, often referred to as 'chunking', is based on subtracting multiples of the divisor, or 'chunks'. It is useful for reminding children of the link between division and repeated subtraction. However, children need to recognise that chunking is inefficient if too many subtractions have to be carried out.

$9\overline{)97}$

$-\ 90$ $\quad 9 \times 10$

7

Answer: 10 R 7

$6\overline{)196}$

$-\ 60$ $\quad 6 \times 10$

136

$-\ 60$ $\quad 6 \times 10$

76

$-\ 60$ $\quad 6 \times 10$

16

$-\ 12$ $\quad 6 \times 2$

4 $\quad 32$

Answer: 32 R 4

Written methods for Division

Stage 3: Refining the 'Expanded' method for HTU ÷ U

Initially children subtract several chunks, but with practice they should look for the biggest multiples that they can find to subtract, to reduce the number of steps.

Once they understand and can apply the expanded method, children should try the standard method for short division.

$$
\begin{array}{rll}
6\overline{)196} & & \\
-\ 180 & 6 \times 30 & \\
\hline
16 & & \\
-\ 12 & 6 \times 2 & \\
\hline
4 & 32 & \\
\text{Answer:} & & 32\ \text{R}\ 4
\end{array}
$$

$$
\begin{array}{r}
\phantom{3\overline{)}}97 \\
3\overline{)29^{2}1}
\end{array}
$$

Written methods for Division

Stage 4: Long division for HTU ÷ TU

The next step is to tackle HTU ÷ TU, which for most children will be in Year 6. The layout on the right, which links to chunking, is in essence the 'long division' method. Conventionally the 20, or 2 tens, and the 3 ones forming the answer are recorded above the line, as in the second recording.

$$
\begin{array}{rrl}
24 \overline{)\ 560} & & \\
20 - & 480 & 24 \times 20 \\
 & 80 & \\
3 & 72 & 24 \times 3 \\
 & 8 &
\end{array}
$$

Answer: 23 R 8

$$
\begin{array}{r}
23 \\
24 \overline{)\ 560} \\
-480 \\
\hline
80 \\
-72 \\
\hline
8
\end{array}
$$

Answer: 23 R 8