DIVISION Stage 1: division by repeated subtraction using an open number line

Always use correct vocabulary from the start – division/divide rather than sharing. Introduce the remainder early on in the process.	20 ÷ 3 = **ESTIMATE** I know 6 x 3 =18 and 7x 3=21, so the quotient is between 6 and 7 **CALCULATE**
Begin by reminding how to use an open number line to subtract. Division is by **repeated subtraction** NOT "chunking". Demonstrate how you can subtract the divisor until you reach the dividend, subtracting a single divisor each time. Replace "+1" over the jump with "x1" subtracting the divisor itself. Model and rehearse a lot!	**CHECK** by inverse operation – multiplication and/or repeated addition

DIVISION Stage 2: division by repeated subtraction TU ÷ U
expanded method

	37 ÷ 4 = **ESTIMATE** I know 9x 4 =36 and 10x 4 = 40, so the quotient is between 9 and 10
Model and rehearse this expanded method, subtracting a single divisor at a time. There is no rush, we are introducing this earlier to help children become confident user of the repeated subtraction method.	**CALCULATE**
Starting within a range of numbers and number relationships children should readily know and be able to access helps them to focus on the process of repeated subtraction and in time will help all children make a secure move to subtracting multiples of the divisor.	Record "x1" beside each divisor subtracted, talk about why, ask children to explain
	CHECK by inverse operation – multiplication or repeated addition

DIVISION Stage 3: repeated subtraction for HTU ÷ U
expanded method using repeated subtraction

This method is based on subtracting multiples of the divisor from the number to be divided, the dividend.

Once they understand and can apply the method, dedicate plenty of time to this before moving on, it will pay off in the long run, children should be able to move on from TU ÷ U to HTU ÷ U quite quickly.

This method is based on subtracting multiples of the divisor. Initially children subtract single chunks, but by working with the teacher on modelled examples will soon begin to suggest that it might be quicker to subtract larger "chunks" of the divisor to get to the answer more quickly. Some children may be happier and safer continuing to subtract the single divisor or double the divisor until they achieve the quotient. With practice they will begin to look for the biggest multiples of the divisor that they can find to subtract. For most children it is important to recognise that chunking is inefficient if too many subtractions have to be carried out. Encourage them to reduce the number of steps and move them on quickly to finding the largest possible multiples.

The key to the efficiency lies in the original estimate made before starting the calculation. Estimating for HTU ÷ U involves multiplying the divisor by multiples of 10 to find the two multiples that 'trap' the HTU dividend. Estimating has two purposes when doing a division: to help to choose a starting point for the division; to check the answer after the calculation. Children who have a secure knowledge of multiplication facts and place value should be able to move on quickly to the more efficient recording on the right.

It is important that children move on at a rate matched to their understanding if they prefer to take single divisors or "small chunks" let them. Success breeds success.

97 ÷ 9

```
  9)97
 - 90    9 ×10
 ────
    7
Answer:    10 R7
```

First step ESTIMATE:
To find 196 ÷ 6, we start by multiplying 6 by 10, 20,30, ... to find that $6 \times 30 = 180$ and $6 \times 40 = 240$. The multiples of 180 and 240 trap the number 196. This tells us that the answer to 196 ÷ 6 is between 30and 40

Second step: CALCULATE

```
  6)196
 -  60    6 ×10
 ─────
   136
 -  60    6 ×10
 ─────
    76
 -  60    6 ×10
 ─────
    16
 -  12    6 × 2
 ─────
     4      32
Answer:    32 R 4
```

Stage 3(i)
Teachers SHOULD model the subtraction of facts and relationshipsx10, 100 of divisor or x20 or x5 divisor to help children understand how to make their calculations more efficient and how to apply known number facts and relationships

Start the division by first subtracting 180, leaving 16, and then subtracting the largest possible multiple of 6, which is 12, leaving 4.

```
  6)196
 - 180    6 ×30
 ─────
    16
 -  12    6 × 2
 ─────
     4      32
Answer:    32 R 4
```
The quotient 32 (with a remainder of 4) lies between 30 and 40, as predicted.

Third step: CHECK by inverse operation and by reference to estimate

DIVISION Stage 3(ii) : long division by repeated subtraction

The next step is to tackle HTU ÷ TU, which for most children will be in Year 5
The layout on the right, which links to division by repeated subtraction, 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.

$560 \div 24 =$ **First step estimate:**
How many packs of 24 can we make from 560 biscuits? Start by multiplying 24 by multiples of 10 to get an estimate. As $24 \times 20 = 480$ and $24 \times 30 = 720$, we know the answer lies between 20 and 30 packs. We start by subtracting 480 from 560. **Second step: CALCULATE**

```
24 ) 560
20 - 480      24 × 20
      80
 3   72       24 × 3
      8
Answer: 23 R 8
```

Third step: CHECK by inverse operation and by reference to estimate

DIVISION Stage 4 : short divison of HTU ÷ U

'Short' division of HTU ÷ U can be introduced as an alternative, more compact recording. No "chunking" is involved since the links are to partitioning, not repeated subtraction.
The accompanying pattern is 'How many threes in 290?' (the answer must be a multiple of 10). This gives 90threes or 270, with 20 remaining. We now ask: 'How many threes in 21?' which has the answer 7.
Short division of a three-digit number can be introduced to children who are confident with multiplication and division facts and with subtracting multiples of 10 mentally, and whose understanding of partitioning and place value is sound.
For most children this will be at the end of Year 5 or the beginning of Year 6.

First step ESTIMATE:
For $291 \div 3$, because $3 \times 90 = 270$ and $3 \times 100 = 300$, we use 270 and split the dividend of 291 into $270 + 21$. Each part is then divided by 3.
Second step: CALCULATE
The short division method is recorded like this:

```
    9 7
3 ) 2 9²1
```

The carry digit '2' represents the 2 tens that have been exchanged for 20 ones. In the first recording above it is written in front of the 1 to show that a total of 21 ones are to be divided by 3.
The 97 written above the line represents the answer: $90 + 7$,or 9 tens and 7 ones.
Third step: CHECK
Look again at working, talk aloud to check.
And use inverse operation