<u>How to use 'chunking' to help with short division</u>

<u>(*dividing by a single digit*)</u>

- **'The Chunking Method'** is helpful when we want to divide a number by a single digit number but we don't know that number's times table.

Example 1: <u>Dividing a 2-digit number by a one-digit number</u>

- Read the number sentence:

27÷9=

Twenty-seven divided by nine equals

- The **divisor** is **9** and, when we don't know the **9** times table, the question seems tricky.

- However **division** is **repeated subtraction**. When we read this number sentence:

27÷9=

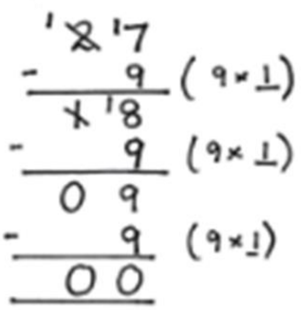
Twenty-seven divided by nine equals

... the sentence is asking, **"How many times does 9 go into 27?"**

or

"How many times can you subtract 9 from 27?"

- The answer can be found by **repeatedly subtracting 9 from 27**, as shown below:



- Notice that every time **9** is **subtracted**, a note is added in brackets to the right-hand side of the calculation (**9×1**). Now it is easy to count how many times **9** was **subtracted from 27** to reach zero (**0**).

- So, **9** was **subtracted** from **27** <u>**three times**</u> and this is our answer:

27÷9=3

Example 2: Dividing a 2-digit number by a one-digit number
(using a 'Ready Reckoner' of multiplication facts)

- Read the number sentence:

96÷4=

Ninety-six divided by four equals

- The **divisor** is **4** and, when we don't know the **4** times table, the question seems tricky.

- However **division** is **repeated subtraction**. When we read this number sentence:

96÷4=

Ninety-six divided by four equals

... the sentence is asking, **"How many times does the number 4 go into 96?"**

or

"How many times can you subtract 4 from 96?"

- The answer can be found by **repeatedly subtracting 4 from 96** but this will take a long time, with lots of subtractions. Instead, we can create a **'Ready Reckoner'** to the right of the page by starting at **4×1** = and adding on **4** each time, until we arrive at **4×10=40**. (All our answers are **multiples of 4**).
As we are subtracting **4s** from **96**, it is clear that **40** is a long way short of **96**.
By doubling **4×10 = 40** to **4×20=80**, we are a closer to 96. This has now been added to the **'Ready Reckoner'**.

'Ready Reckoner'

4	×1	=	4
	×2	=	8
	×3	=	12
	×4	=	16
	×5	=	20
	×6	=	24
	×7	=	28
	×8	=	32
	×9	=	36
	×10	=	40
	×20	=	80

- We are then well-prepared to subtract **groups** (or **multiples**) of **4** from **96**, which will be much quicker. These **groups** or **'chunks'** of a number give **'The Chunking Method'** its name.

- Starting at **96**, first the number **80** is subtracted. This is **20 groups of 4** and a note of this **(4×<u>20</u>)** is added to the right-hand side of the calculation, to use later.

$$\begin{array}{r l} 96 & \\ -\ 80 & (4\times\underline{20}) \\ \hline 16 & \end{array}$$

'Ready Reckoner'

4	× 1	=	4
	× 2	=	8
	× 3	=	12
	× 4	=	16
	× 5	=	20
	× 6	=	24
	× 7	=	28
	× 8	=	32
	× 9	=	36
	× 10	=	40
	× 20	=	80

- The number remaining is **16.** Looking at our **'Ready Reckoner',** we see that **4 groups of 4** make **16.** So now we can **subtract 16,** making sure that a note of this **(4×<u>4</u>)** is added to the right-hand side of the calculation, to use later.

$$\begin{array}{r l} 96 & \\ -\ 80 & (4\times\underline{20}) \\ \hline 16 & \\ -\ 16 & (4\times\underline{4}) \\ \hline 00 & \\ \hline \end{array}$$

'Ready Reckoner'

4	× 1	=	4
	× 2	=	8
	× 3	=	12
	× 4	=	16
	× 5	=	20
	× 6	=	24
	× 7	=	28
	× 8	=	32
	× 9	=	36
	× 10	=	40
	× 20	=	80

- Now that we have reached zero (**0**), use the notes in brackets to work out how many times the number **4** was **subtracted from 96.**

- **4** was **subtracted <u>24 times</u>** and that is our answer:

96÷4=24