# Lesson 9

# Place Value: Tens Hundreds & Thousands

*This is the quick guide to the video. For more complete details watch video 9.*

**Goals:**

To show the role of "bringing down"

To show how "place value" comes into long division

## Bringing Down

Here is a long division, modelled by currency:

The "263" shows the 2 as 2 hundred dollar bills, the 6 as 6 ten dollar bills and the 3 as 3 one dollar coins.

So it models place value.

We begin our division by saying "8's into 2" won't go.

This is demonstrated below:

$$\begin{array}{r} 0 \\ 8\overline{)263} \end{array}$$

Putting aside the $63 (to the right)

there is no way 8 people can divide up 2 one-hundred-dollar bills

So the answer is 0

At this point the importance of place value becomes apparent.

Each $100 bill is worth **TEN** $10 bills.

Exchanging each of them for **TEN** $10 bills that makes

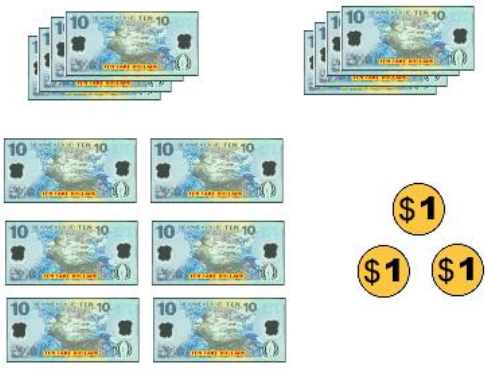
a total of **TWENTY** $10 bills.

But wait...

There are another **SIX** $10 bills on the right

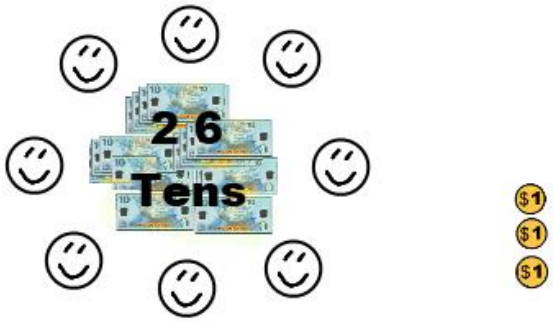
So that's a total of **TWENTY-SIX** $10 bills

That amount can be shared!



Two piles of 10 and another 6 makes 26 ten-dollar-bills in total

$$\begin{array}{r} 0 \\ 8\overline{)263} \end{array}$$




26 can be divided up between 8 people.

Divide by subtracting:

Each person grabs one $10 bill

That leaves 26 - 8 = 18  ten dollar bills:

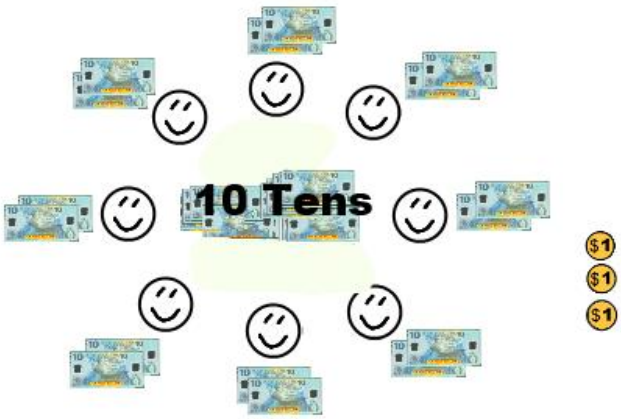
$$\begin{array}{r} 0 \\ 8\overline{)263} \\ \underline{\phantom{0}} \\ 18 \end{array}$$

Each person grabs another $10 bill each.

Another 8 bills are taken off the pile.

That leaves 18 - 8 = 10 ten dollar bills:

$$\begin{array}{r} 0 \\ 8\overline{)263} \\ 18 \\ 10 \end{array}$$



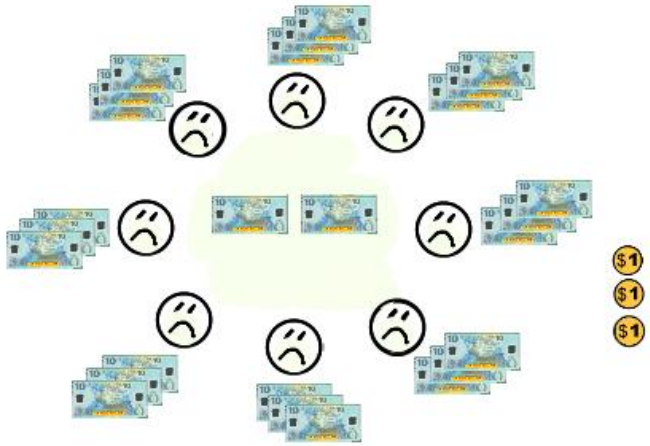

One more time...

Each person grabs another $10 bill apiece.

That leaves 10 - 8 = 2 ten dollar bills left.

And you can't divide 2 items by 8 people!

$$\begin{array}{r} 0 \\ 8\overline{)263} \\ 18 \\ 10 \\ 02 \end{array}$$



We have TWO $10 bills and THREE $1 coins left undivided at this stage.

But let's see what has been divided successfully so far:

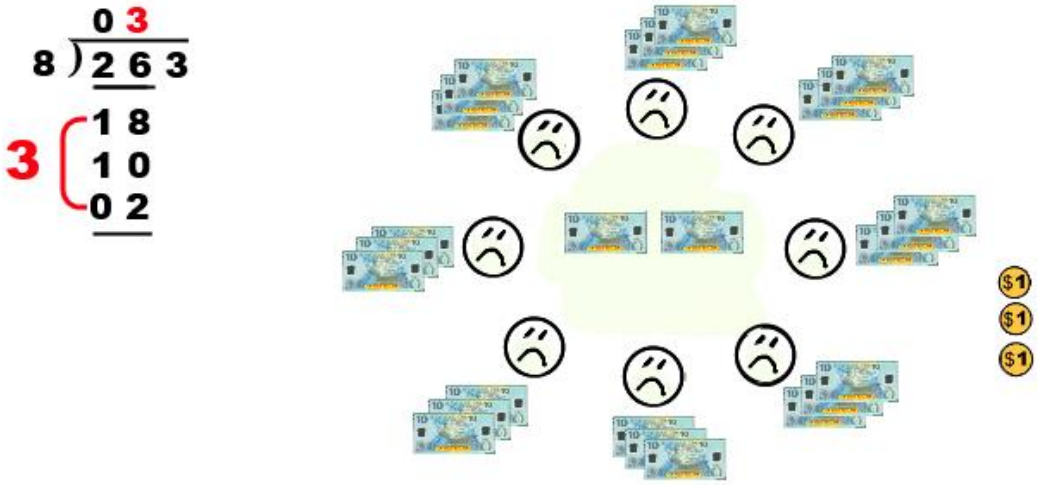
Each subtraction the pile went down by 8

Each person got one more $10 bill

There were 3 subtractions

The partial answer is 3

meaning 3 TENS

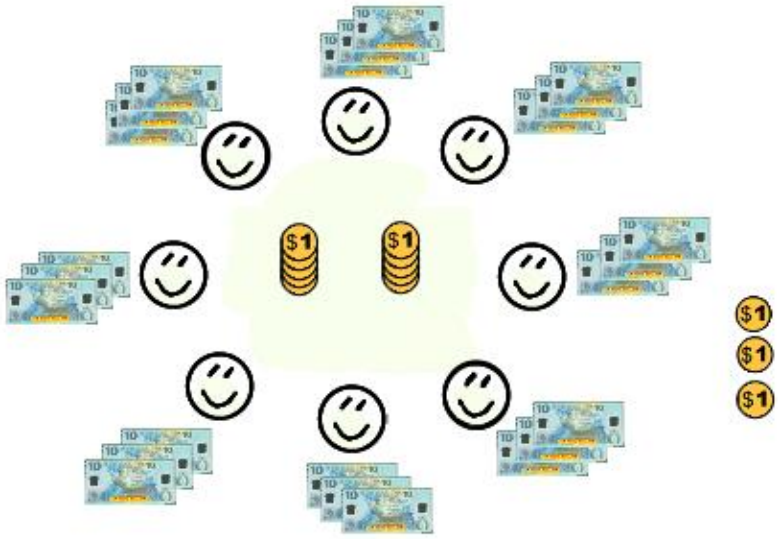



Place value jumps in again.

Each $10 bill can be exchanged for TEN $1 gold coins

We have two of them

so we have 20 one-dollar-coins



If we include the THREE $1 gold coins we haven't touched yet

that's a total of 23 gold coins.

Which CAN be divided by 8:

Adding on the 3 extra unused gold coins

is the meaning of

"Bringing Down"

$$
\begin{array}{r}
03 \\
8\overline{)263} \\
18 \\
10 \\
023
\end{array}
$$

Notice how in the sum on the left

the "02" remainder

(which meant 02 TENS)

becomes worth 20 dollar coins

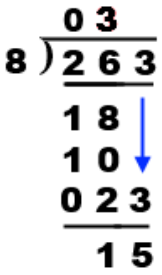
when the 3 is added onto it to make a total of 23

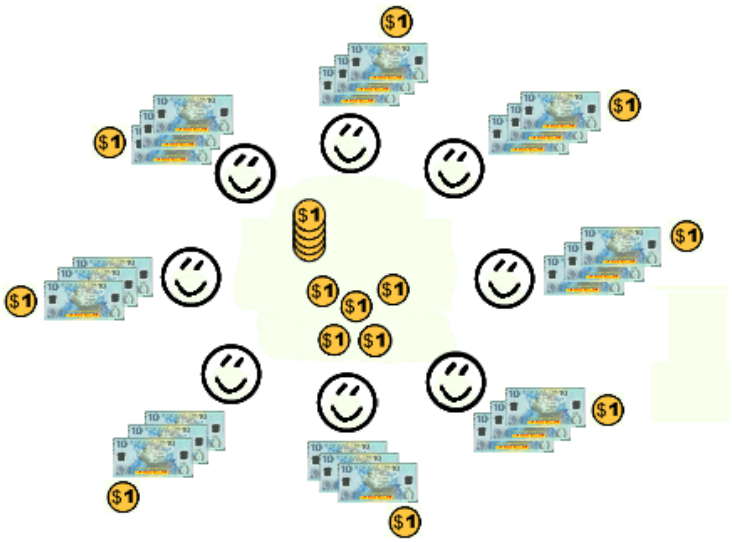
The 23 can be divided by subtracting:

Each person takes one gold coin

That's a total of 8 gold coins less from the pile,

leaving 23 - 8 = 15



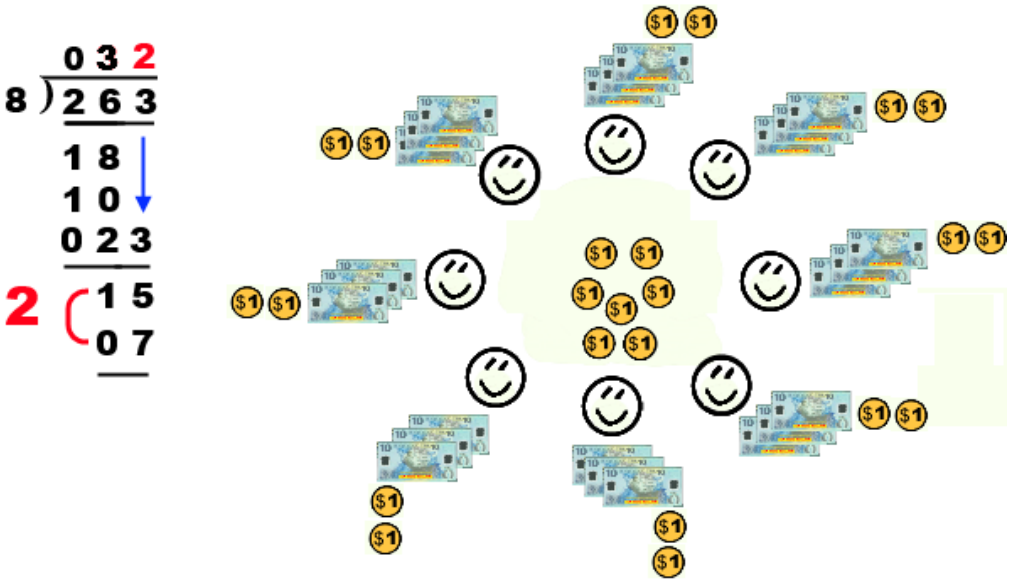




They can do it one more time.

Each person takes a final gold coin from the pile.

That's another 8 off the total,

leaving 15 - 8 = 07 coins




There were two subtractions

Each time removing a total of 8 coins

And now each person has exactly 2 gold coins

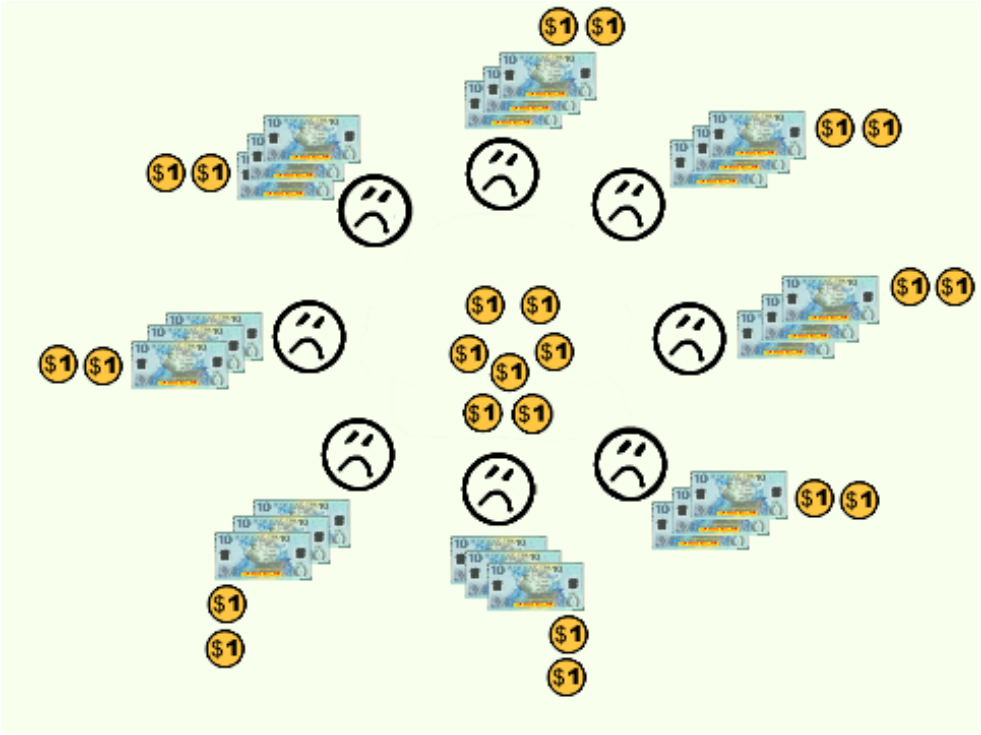
So the 2

is the next digit of the answer

It stands for 2 units (one-dollar-coins).

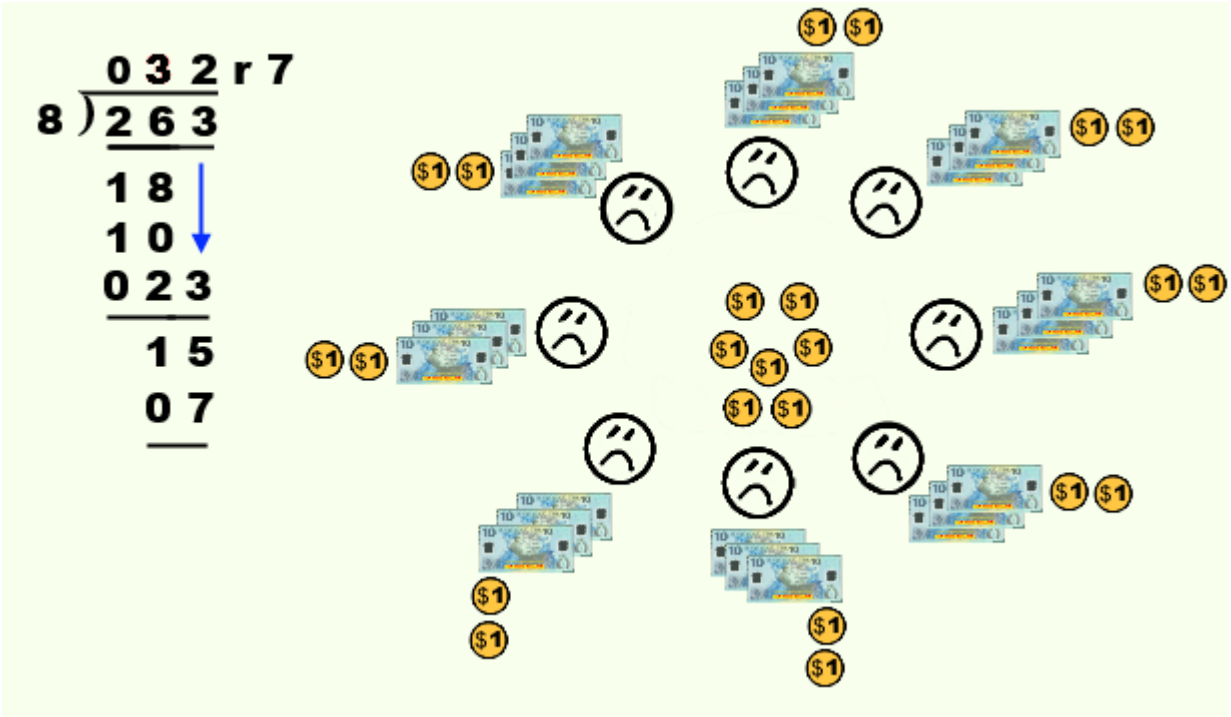
It is impossible to subtract further

as we can't take 8 off 7



So the division stops.

And we say we have 7 remainder.

(We could go further, breaking the 7 remaining dollars into cents

but that's another story).