

Multiplication – Multiplying Multiples of Ten

Key NC Statement

Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods

Related NC Statements

- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables

Key Concepts

This sequence builds the conceptual place value understanding that will be needed for pupils to fully understand formal written calculation in the next sequence.

Pupils learn about the effect of multiplication by ten practically and the multiplicative impact upon the digits. They build on this to multiply multiples of ten using place value language and known base facts.

The examples provided are all taken from times tables facts learnt previously in Year 3. This means the emphasis is on multiplicative understanding rather than trying to compute unknown facts.







Steps within the Learning Sequence

Step 1: Explore the effect of scaling by ten

Step 2: Explore the effect of scaling by ten on place value

Step 3: Multiplying multiples of ten by one-digit where the product is less than 100

Step 4: Multiplying multiples of ten by one-digit where the product is greater than 100

Destination Questions 		
<p>1 </p> <p>What is the same and what is different about:</p> <p>7 x 10 and 17 x 10?</p>	<p>2 </p> <p>Why do 60×10 and 6×100 have the same answer?</p> <p>Use base-10 equipment to prove it.</p>	<p>3 </p> <p>Prove it</p> <p>2 groups of 3 tens is equal to 3 groups of 2 tens.</p>
<p>4 </p> <p>Circle two numbers that multiply to make 120.</p> <div style="display: flex; flex-wrap: wrap; justify-content: center; gap: 10px;"> <div style="border: 2px solid blue; border-radius: 15px; padding: 10px; margin: 5px;">100</div> <div style="border: 2px solid blue; border-radius: 15px; padding: 10px; margin: 5px;">20</div> <div style="border: 2px solid blue; border-radius: 15px; padding: 10px; margin: 5px;">40</div> <div style="border: 2px solid blue; border-radius: 15px; padding: 10px; margin: 5px;">3</div> <div style="border: 2px solid blue; border-radius: 15px; padding: 10px; margin: 5px;">6</div> </div>	<p>5 </p> <p>Write two calculations that are ten times greater than:</p> <p>$4 \times 6 = 24$</p>	

Step one

Explore the effect of scaling by ten

Tell pupils that giants are ten times bigger than humans. Show pupils a range of items from the human world. Handout_3LS25_step1_human_place_mat can be covered by six base-10 equipment hundred pieces. Demonstrate this to pupils.

Show a knife that is approximately 20cm and fork that is about 18 or 19cm and use a piece of border roll to show a human stride of 55cm (measurements rounded to the nearest cm). Provide a mug full of water (25cl) and a bucket or large bowl that will hold ten times the amount of liquid in the mug.

Pupils work in groups to scale up the items. They use border roll to support the scaling by 10 for any length measurements.

18	18	18	18	18	18	18	18	18	18	18
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18

Bring pupils together and compare the human measures and the giant measures directly. For example, the measures for the fork might look like the representation to the left.

Begin to build up a table of human and giant measures. Pupils could build numbers with base-10 and compare.

Item	Measures
Length of knife (cm)	20 200
Length of fork (cm)	18 180
Base - 10 hundreds covering a place mat	6 60
Centilitres in a mug	25 250
Length of stride (cm)	55 550

What do you notice about the human numbers and the giant numbers?
What patterns do you notice?

There is one more digit in the giant measures than the human measures.

The ten times bigger giant measures all have zero in the ones place.

A human pencil is 15cm long. How long will a giant's pencil be if it is ten times longer?
How do you know?

Step two

Explore the effect of scaling by ten on place value

This step builds on the learning and pattern spotting that has been explored in the previous step.

Model the calculation: $5 \times 10 = 50$

H	T	O	•	t	h
		5			
5	0				

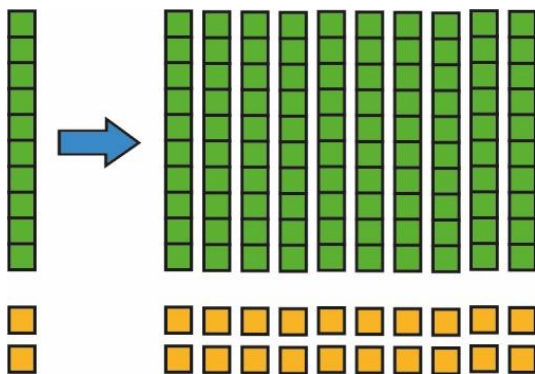
5×10

Use place value sliders to demonstrate that when numbers get ten times greater they move one place to the left.

Also model with five, base-10 equipment ones and increasing to five, base-10 equipment tens.

Repeat for ten times greater than 12. $12 \times 10 = 120$.

Pupils represent ten times greater than 12 and use place value sliders and / or place value grids to show that 1 ten becomes 1 hundred and 2 ones become 2 tens.



Where are the 10 tens?
Where are the 10 ones?
Can we regroup this number?

We can regroup the 10 tens for 1 hundred and the 20 ones for 2 tens.

Pupils rehearse multiplying 2-digit numbers by ten building to missing number examples such as $\square \times 10 = 230$.

1 

2 

Activities for exploring ideas at greater depth

Explain how base facts can help when solving the calculations rehearsed.

Use the example below to help.

20 is ten times bigger than 2 so 20×4 is ten times bigger than 2×4 .

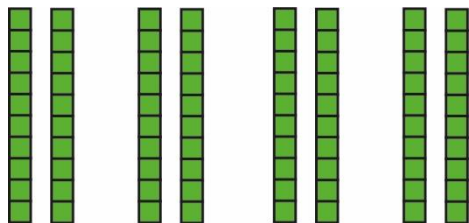
The product will be ten times greater too.

Step three

Multiplying multiples of ten by one-digit where the product is less than 100

Show pupils the calculation: $20 \times 4 =$

Explain that we can also think of this as 4 groups of 2 tens. Model building 4 groups of 2 tens.



$$20 \times 4 = \square$$

How many tens are equal to 4 groups of 2 tens?

There are 8 tens.
8 tens is 80.

Model an effective explanation using handout_3LS25_step3_and_4_speaking_frame.

Speaking Frame

\square is \square tens.

\square groups of \square tens is \square tens.

\square tens is equal to \square .

20 is 2 tens. 4 groups of 2 tens is 8 tens. 8 tens is equal to 80.

Can you see a useful base fact that will help us check?

$$2 \times 4 = 8$$

Show the related calculations and compare place value.

- $2 \times 4 = 8$
- $20 \times 4 = 80$

20 is ten times bigger than 2 so 20×4 is ten times bigger than 2×4 . The product will be ten times greater too.

Pupils work on the calculation 40×2 using base-10 equipment, the speaking frame and identify a useful base fact. Check pupils understand that 40×2 is 2 groups of 4 tens and that the answer is ten times bigger than 4×2 .

What is the same and what is different? 20×4 and 40×2 . Why?

They practise with 30×2 , 20×3 , and 30×3 recording with drawings, on the speaking frame and with symbols. They relate calculations to a known base fact and place value.

3 

5 

Activities for exploring ideas at greater depth

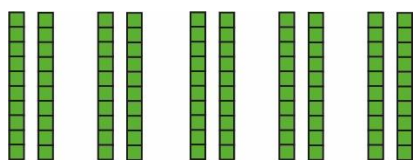
Explain how base facts can help when solving the calculations rehearsed. Use the example below to help.

*20 is ten times bigger than 2 so 20×4 is ten times bigger than 2×4 .
The product will be ten times greater too.*

Step four


Multiplying multiples of ten by one-digit where the product is greater than 100

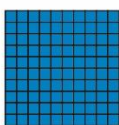
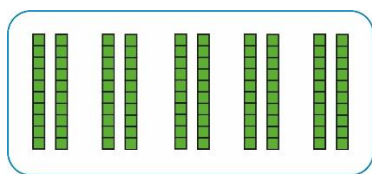
Show pupils the calculation: 20×5



How many tens are equal to 5 groups of 2 tens?

There are 10 tens. 10 tens is 100.

Model an effective explanation using handout_3LS25_step3_and_4_speaking_frame.



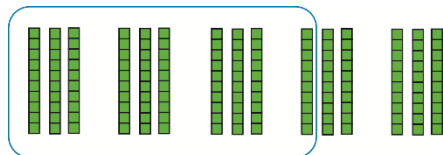
We can regroup the 10 tens for 1 hundred. Where are the 5 groups of 20 now?

Show pupils the calculation: 30×5

What does 30×5 mean?

It means 5 groups of 3 tens.

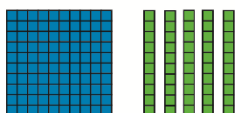
Model building 5 groups of 3 tens



How many tens do I have?

150 is 15 tens.

There are more than 10 tens which is 1 hundred. I can regroup my tens into 1 hundred and 5 tens.



Can you see a useful base fact that will help us check?

$3 \times 5 = 15$

Show the related calculations and compare place value.

- $3 \times 5 = 15$
- $30 \times 5 = 150$

30 is ten times bigger than 3 so 30×5 is ten times bigger than 3×5 . The product will be ten times greater too.

Pupils rehearse with calculations such as 50×3 , 40×3 , 30×4 and 40×5 using base-10 equipment and record to show the regrouping of 10 tens for 1 hundred. Clarify that for 40×5 , 20 tens will be regrouped for 2 hundreds.

They continue to rehearse calculations without resources for calculations such as: 60×5 , 80×3 , 5×70 , 9×40 . Examples should be within pupils' known current times tables base facts.


Activities for exploring ideas at greater depth

Pupils find as many ways of making the statement true as they can. They explain what they notice.

$$20 \times 6 = \square 0 \times \square$$

BUFFER ZONE