

# Multiplying Doubles and Digits

## Learning Objective:

To multiply two-digit and three-digit numbers by a one-digit number using formal written layout.

$$38 \times 4$$

I've used expanded multiplication to work out  $38 \times 4$ .

Can you explain what I've done so far? Can you finish it?



$$\begin{array}{r} 38 \\ \times 4 \\ \hline 32 \\ + 120 \\ \hline \hline \hline \end{array}$$

# 38 × 4

First, I multiplied the ONES, then I multiplied the TENS, although when doing expanded multiplication, these could be done in any order.

They need to be added together to find the answer.

Did you get it right?



		<b>3 8</b>
×		<b>4</b>
		3 2
+		1 2 0
		<b>1 5 2</b>

<b>×</b>	<b>30</b>	<b>8</b>	
<b>4</b>	120	32	<b>= 152</b>



Here is the same multiplication, solved using the grid method and the expanded multiplication method.

What similarities and differences do you notice?

			<b>3</b>	<b>8</b>	
<b>×</b>				<b>4</b>	
			3	2	
<b>+</b>			1	2	0
			<b>1</b>	<b>5</b>	<b>2</b>

<b>×</b>	<b>30</b>	<b>8</b>	
<b>4</b>	120	32	= <u><b>152</b></u>

## Similarities and Differences

In both, the number to be multiplied is partitioned.

Each partitioned part can be multiplied in any order.

The multiples of each partitioned amount are added to find the answer.

		<b>3</b>	<b>8</b>
<b>×</b>			<b>4</b>
			<hr/>
		3	2
<b>+</b>		1	2
			<hr/>
		<b>1</b>	<b>5</b>
			<b>2</b>
			<hr/>

# 213 × 6

×	<b>200</b>	<b>10</b>	<b>3</b>
<b>6</b>	1,200	60	18

Here, the same calculation has been done in three different ways.

Can you explain what is happening in each calculation?

$$\begin{array}{r} \phantom{213} \times \phantom{6} \\ \hline \phantom{213} \phantom{6} \\ \phantom{213} 18 \\ \phantom{213} 60 \\ + \phantom{213} 1,200 \\ \hline \phantom{213} 1,278 \end{array}$$

**EXPANDED  
MULTIPLICATION**

**SHORT  
MULTIPLICATION**

$$\begin{array}{r} \phantom{213} \times \phantom{6} \\ \hline \phantom{213} 1,278 \\ \hline \phantom{213} 1,278 \end{array}$$

We can use short multiplication to multiply any number by a one-digit number.

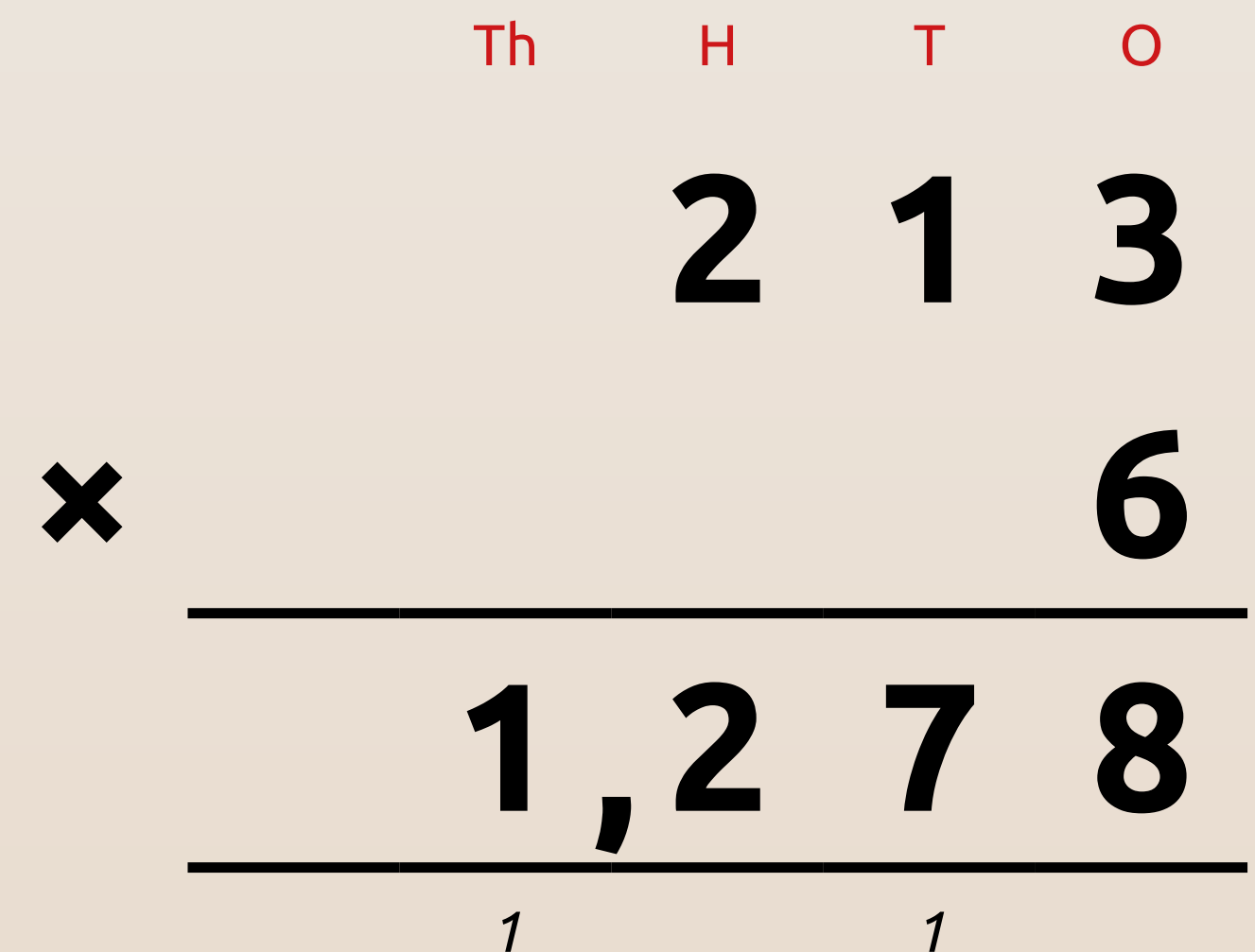
Working from right to left, the ONES, TENS, HUNDREDS and so on are multiplied.

For this calculation, two exchanges have been done:

Firstly,  $3 \times 6 = 18$ . The ONES column can show a maximum of 9 ones, so 18 ONES have been exchanged for 8 ONES and 1 TEN, which is written below.

Describe the second exchange to a partner.

## SHORT MULTIPLICATION



A short multiplication diagram on a light-colored background. The title 'SHORT MULTIPLICATION' is at the top. Below it, the number 213 is written with columns labeled 'Th', 'H', 'T', and 'O' above the digits. A multiplication sign 'x' is to the left of the number. Below 213 is a horizontal line, followed by the number 6. Another horizontal line is below 6. Below the second line, the result 1,278 is written. The '1' is under the 'T' column and the '2' is under the 'H' column. Small '1's are written below the '1' and '2' in the result, indicating the carry-over from the previous step.

	Th	H	T	O
		2	1	3
x				6
<hr/>				
		1,2	7	8
<hr/>				
		1	1	

# Practise:

Use short multiplication to solve this:

	TTh	Th	H	T	O
				9	5
×					6
	<hr/>				
	<hr/>				



# Practise:

Use short multiplication to solve this:

	TTh	Th	H	T	O
				9	5
×					6
<hr/>					
			5	7	0
<hr/>					
				3	

Did you get it right? Let's try another...



# Practise:

Use short multiplication to solve this:

$$\begin{array}{r} \text{TTh} \quad \text{Th} \quad \text{H} \quad \text{T} \quad \text{O} \\ \quad \quad \quad 5 \quad 8 \quad 2 \\ \times \quad \quad \quad \quad \quad 8 \\ \hline \\ \hline \end{array}$$

## Practise:

Use short multiplication to solve this:

$$\begin{array}{rcccccc} & & \text{TTh} & \text{Th} & \text{H} & \text{T} & \text{O} \\ & & & & 5 & 8 & 2 \\ \times & & & & & & 8 \\ \hline & & & 4 & , & 6 & 5 & 6 \\ \hline & & & & 6 & & 1 & \end{array}$$

Did you get it right? Let's try one more REALLY tricky one...



## Practise:

Use short multiplication to solve this:

$$\begin{array}{r} \text{TTh} \quad \text{Th} \quad \text{H} \quad \text{T} \quad \text{O} \\ 2,332 \\ \times \quad \quad \quad 7 \\ \hline \\ \hline \end{array}$$

# Practise:

Use short multiplication to solve this:

$$\begin{array}{r} \text{TTh} \quad \text{Th} \quad \text{H} \quad \text{T} \quad \text{O} \\ 2,332 \\ \times \quad \quad \quad 7 \\ \hline 16,324 \\ \hline \quad \quad \quad 2 \quad 2 \quad 1 \end{array}$$

That was tough! Did anyone manage to work it out?

Well done, everyone!

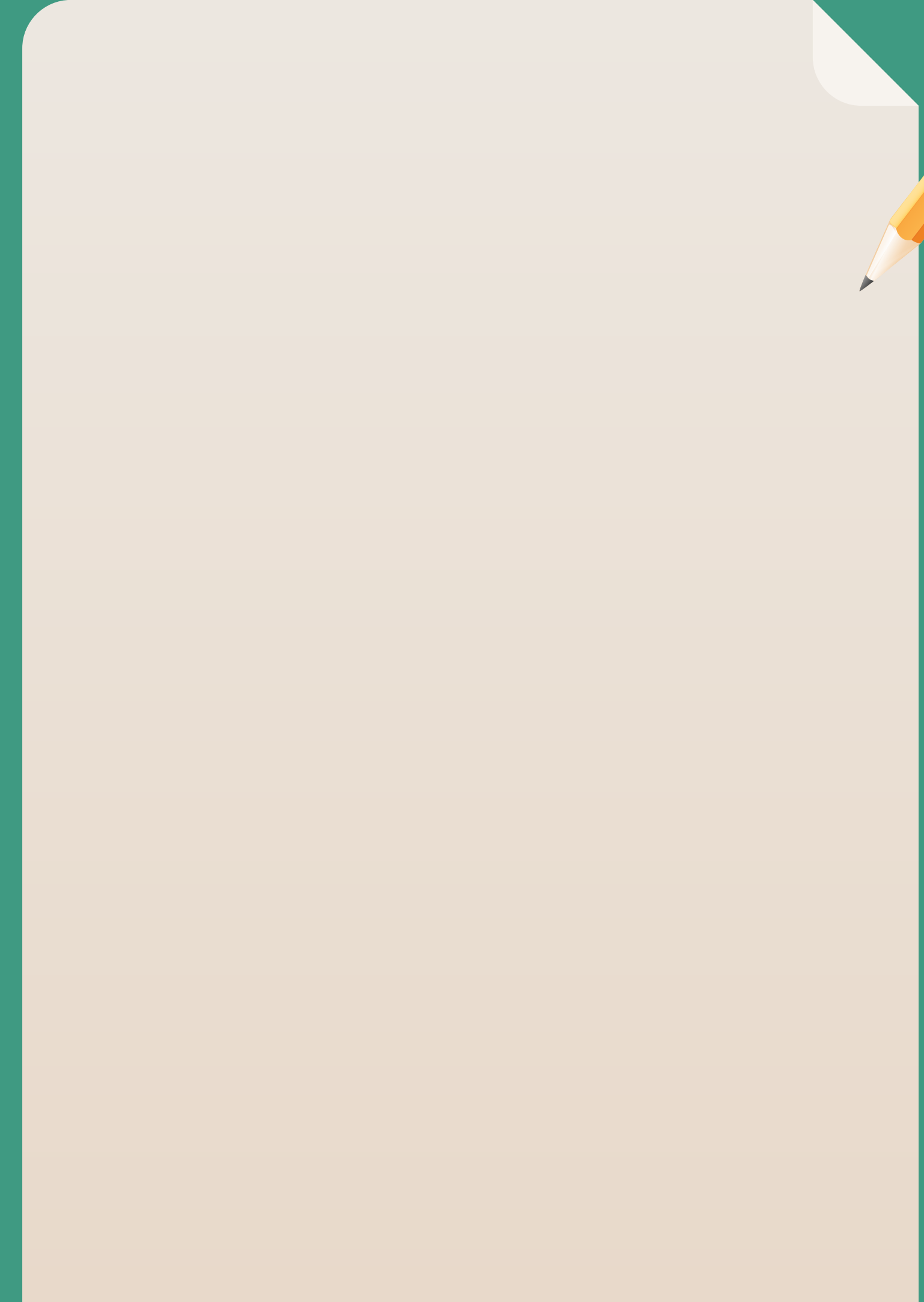




# PLENARY



I'm paying for each of my children to attend a gymnastics club. It costs £215 per child. I have six children. What will it cost me, altogether?





# PLENARY



Did you get it right?  
Did you use short  
multiplication or another  
method to work it out?



$$\begin{array}{r} 215 \\ \times \quad 6 \\ \hline 1,290 \\ \hline \end{array}$$

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