


Multiplication Prior Assessment Question 8

Objective: I am beginning to use the short method for written multiplication.

NC NMD 4: multiply two-digit and three-digit numbers by a one-digit number using formal written layout

Assessment Question 8:

Prior Learning:

	Question 8: I can use written methods for multiplication sums.	I feel
a) $34 \times 6 =$ <input type="text"/> b) $52 \times 3 =$ <input type="text"/>		

Teacher Input Ideas: Short multiplication

Recap with the children ways to work out the sums in the assessment question provided. Ask the children to explain how they have worked these out and what methods they have used. Some of the children should demonstrate understanding of a more formal approach to multiplication, applying their knowledge of partitioning amounts using the expanded column method. Before introducing the short method, the children should be confident in using the expanded method and demonstrate a good understanding of place value. The children should leave year 4 being able to use the expanded column method with confidence and understanding. There may be some children ready to be introduced to using the short method as suggested below.

Short method: When the children are confident and secure with the expanded method model how this can be shortened:

76	model alongside	76	
x 6		x 6	
4 5 6		3 6	(6 x 6 = 36)
3		4 2 0	(6 x 70 = 420)
		4 5 6	

Discuss how the two methods work alongside each other, and that with the short method we are adding the partitioned amounts as we go along. We are carrying any new tens or hundreds that are made and adding these whilst we are working along the sum, rather than adding the two partitioned amounts at the end. Point out parts that are the same, such as 6×6 is 36. I carry the tens I have made into the tens column., I can see the 3 here, just like I can see the three tens in the expanded method. I now know that 70×6 is 420. So I have 2 tens for 420, the 2 tens and the 3 carried tens make 5 tens so I am placing this into the tens column straight away. I have to then carry the 4 hundreds into the hundred column so I have made 456.

Further support:

<table style="margin: auto;"> <tr><td style="text-align: right;">h t o</td></tr> <tr><td style="text-align: right;">1 2 3</td></tr> <tr><td style="text-align: right;">x 6</td></tr> <tr><td style="border-top: 1px solid black; text-align: right;">+ 18</td></tr> <tr><td style="text-align: right;">1 2 0</td></tr> <tr><td style="text-align: right;">6 0 0</td></tr> <tr><td style="border-top: 1px solid black; text-align: right;">7 3 8</td></tr> </table>	h t o	1 2 3	x 6	+ 18	1 2 0	6 0 0	7 3 8	<table style="margin: auto;"> <tr><td style="text-align: right;">h t o</td></tr> <tr><td style="text-align: right;">1 2 3</td></tr> <tr><td style="text-align: right;">x 6</td></tr> <tr><td style="border-top: 1px solid black; text-align: right;">7 3 8</td></tr> <tr><td style="text-align: right;">1 1</td></tr> </table>	h t o	1 2 3	x 6	7 3 8	1 1
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x 6													
7 3 8													
1 1													

Expanded method: ensure that when this is being modelled that vocabulary such as 20×6 and 100×6 is being used so that the children understand the value of the amounts they are multiplying.

When ready, move on to compare with showing the short method alongside to show that we can make this method quicker and more efficient by adding as we go along.

Short multiplication method: Ensure that the children understand why amounts are being carried across and why we add them as we go along.

Practice Activities:

Purple Practice: Most suited for children who will benefit from exploring both the expanded and short method alongside each other for two digit amounts.

This activity models how the expanded multiplication method can be shortened to the short multiplication method. The children are provided with an example so that they can see how the two methods work alongside each other. The children are provided with structured questions so that they can use the expanded method and then the short method. For these questions, the children do not need to carry any amounts in to the tens or hundreds columns. These sums can be worked out mentally, however they are provided to introduce the short method and when the children become more confident, they should be encouraged to explore the most efficient method to use.

Green Practice: Most suited for children who will benefit from exploring the short method with 3 digit amounts that contain no carrying.

This activity models how the expanded multiplication method can be shortened to the short multiplication method. The children are provided with an example so that they can see how the two methods work alongside each other. The children are provided with structured questions so that they can use the short multiplication method for multiplying a 3 digit amount by a 1 digit amount. For these questions, the children do not need to carry any amounts in to the tens or hundreds columns.

Yellow Practice: Most suited for children who are ready to explore carrying when using the short multiplication method.

The yellow activity encourages children to use the short multiplication method to multiply 2 and 3 digit numbers by a 1 digit number. The questions provided, encourage the children to use the short method and the sums require the children to carry over any tens or ones that have been created. Encourage the children to explain what they are doing and why this method works. Children should be able to explain how a tens or hundreds have been created and why they are carried into the next column.

Answers

Purple:

1) 99

2) 84

3) 93

4) 88

5) 60

6) 86

Green :

1) 369

2) 484

3) 248

4) 848

5) 699

6) 96

Yellow:

1) 96

2) 96

3) 74

4) 156

5) 140

6) 141

7) 896

8) 560

9) 955

Here is an example of how the expanded multiplication method can be shortened:

$$\begin{array}{r}
 \text{T O} \\
 43 \\
 \times \quad 2 \\
 \hline
 6 \text{ (3} \times 2\text{)} \\
 80 \text{ (40} \times 2\text{)} \\
 \hline
 86
 \end{array}$$

$$\begin{array}{r}
 \text{T O} \\
 43 \\
 \times \quad 2 \\
 \hline
 86 \leftarrow \text{(3} \times 2\text{)} \\
 \leftarrow \text{(40} \times 2\text{)}
 \end{array}$$

Now try using the expanded method and then the short method for each multiplication sum.

$$\begin{array}{r}
 \text{T O} \\
 33 \\
 \times \quad 3 \\
 \hline
 \text{(3} \times 3\text{)} \\
 \text{(30} \times 3\text{)} \\
 \hline
 \\
 \\
 \hline
 \\

 \end{array}$$

$$\begin{array}{r}
 \text{T O} \\
 33 \\
 \times \quad 3 \\
 \hline
 \\
 \\
 \hline
 \\

 \end{array}$$

$$\begin{array}{r}
 \text{T O} \\
 21 \\
 \times \quad 4 \\
 \hline
 \text{(1} \times 4\text{)} \\
 \text{(20} \times 4\text{)} \\
 \hline
 \\
 \\
 \hline
 \\

 \end{array}$$

$$\begin{array}{r}
 \text{T O} \\
 21 \\
 \times \quad 4 \\
 \hline
 \\
 \\
 \hline
 \\

 \end{array}$$

$$\begin{array}{r}
 \text{T O} \\
 31 \\
 \times \quad 3 \\
 \hline
 \text{(1} \times 3\text{)} \\
 \text{(30} \times 3\text{)} \\
 \hline
 \\
 \\
 \hline
 \\

 \end{array}$$

$$\begin{array}{r}
 \text{T O} \\
 31 \\
 \times \quad 3 \\
 \hline
 \\
 \\
 \hline
 \\

 \end{array}$$

$$\begin{array}{r}
 \text{T O} \\
 22 \\
 \times \quad 4 \\
 \hline
 \text{(2} \times 4\text{)} \\
 \text{(20} \times 4\text{)} \\
 \hline
 \\
 \\
 \hline
 \\

 \end{array}$$

$$\begin{array}{r}
 \text{T O} \\
 22 \\
 \times \quad 4 \\
 \hline
 \\
 \\
 \hline
 \\

 \end{array}$$

$$\begin{array}{r}
 \text{T O} \\
 20 \\
 \times \quad 3 \\
 \hline
 \text{(0} \times 3\text{)} \\
 \text{(20} \times 3\text{)} \\
 \hline
 \\
 \\
 \hline
 \\

 \end{array}$$

$$\begin{array}{r}
 \text{T O} \\
 20 \\
 \times \quad 3 \\
 \hline
 \\
 \\
 \hline
 \\

 \end{array}$$

$$\begin{array}{r}
 \text{T O} \\
 43 \\
 \times \quad 2 \\
 \hline
 \text{(3} \times 2\text{)} \\
 \text{(40} \times 2\text{)} \\
 \hline
 \\
 \\
 \hline
 \\

 \end{array}$$

$$\begin{array}{r}
 \text{T O} \\
 43 \\
 \times \quad 2 \\
 \hline
 \\
 \\
 \hline
 \\

 \end{array}$$

Here is an example of how the expanded multiplication method can be shortened:

$$\begin{array}{r}
 \text{H T O} \\
 1 \ 1 \ 2 \\
 \times \quad \quad 4 \\
 \hline
 \quad \quad 8 \\
 \quad 4 \ 0 \ + \\
 4 \ 0 \ 0 \\
 \hline
 4 \ 4 \ 8
 \end{array}$$

$$\begin{array}{r}
 \text{H T O} \\
 1 \ 1 \ 2 \\
 \times \quad \quad 4 \\
 \hline
 4 \ 4 \ 8
 \end{array}$$

Now try using the short multiplication method for each sum.

1)

$$\begin{array}{r}
 \text{H T O} \\
 1 \ 2 \ 3 \\
 \times \quad \quad 3 \\
 \hline
 \\
 \hline
 \end{array}$$

2)

$$\begin{array}{r}
 \text{H T O} \\
 1 \ 2 \ 1 \\
 \times \quad \quad 4 \\
 \hline
 \\
 \hline
 \end{array}$$

3)

$$\begin{array}{r}
 \text{H T O} \\
 1 \ 2 \ 4 \\
 \times \quad \quad 2 \\
 \hline
 \\
 \hline
 \end{array}$$

4)

$$\begin{array}{r}
 \text{H T O} \\
 2 \ 1 \ 2 \\
 \times \quad \quad 4 \\
 \hline
 \\
 \hline
 \end{array}$$

5)

$$\begin{array}{r}
 \text{H T O} \\
 2 \ 3 \ 3 \\
 \times \quad \quad 3 \\
 \hline
 \\
 \hline
 \end{array}$$

6)

$$\begin{array}{r}
 \text{H T O} \\
 2 \ 3 \ 2 \\
 \times \quad \quad 3 \\
 \hline
 \\
 \hline
 \end{array}$$

Look at the example of how the expanded method can be shortened. Explore using the short multiplication method to answer each sum.

$$\begin{array}{r}
 \text{T O} \\
 24 \\
 \times \quad 3 \\
 \hline
 12 \text{ + (4 \times 3)} \\
 60 \text{ (20 \times 3)} \\
 \hline
 72
 \end{array}$$

$$\begin{array}{r}
 \text{T O} \\
 24 \\
 \times \quad 3 \\
 \hline
 72 \\
 1
 \end{array}$$

1)

$$\begin{array}{r}
 \text{T O} \\
 16 \\
 \times \quad 6 \\
 \hline
 \\
 \hline
 \end{array}$$

2)

$$\begin{array}{r}
 \text{T O} \\
 24 \\
 \times \quad 4 \\
 \hline
 \\
 \hline
 \end{array}$$

3)

$$\begin{array}{r}
 \text{H T O} \\
 37 \\
 \times \quad 2 \\
 \hline
 \\
 \hline
 \end{array}$$

4)

$$\begin{array}{r}
 \text{H T O} \\
 26 \\
 \times \quad 6 \\
 \hline
 \\
 \hline
 \end{array}$$

5)

$$\begin{array}{r}
 \text{H T O} \\
 35 \\
 \times \quad 4 \\
 \hline
 \\
 \hline
 \end{array}$$

6)

$$\begin{array}{r}
 \text{H T O} \\
 47 \\
 \times \quad 3 \\
 \hline
 \\
 \hline
 \end{array}$$

7)

$$\begin{array}{r}
 \text{H T O} \\
 112 \\
 \times \quad 8 \\
 \hline
 \\
 \hline
 \end{array}$$

8)

$$\begin{array}{r}
 \text{H T O} \\
 140 \\
 \times \quad 4 \\
 \hline
 \\
 \hline
 \end{array}$$

9)

$$\begin{array}{r}
 \text{H T O} \\
 191 \\
 \times \quad 5 \\
 \hline
 \\
 \hline
 \end{array}$$