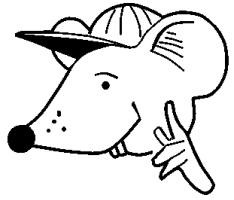


# MATHEMATICS



**N.S. Yr. 4 P.66**

**Develop and refine written methods  
for multiplication.**

## Equipment

Pencil, paper.

# MathSphere

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Concepts

Children should understand that approximating an answer is important in many contexts and may be used to see if the answer to a problem looks reasonable.

In many cases, an approximate answer is all that is needed. Eg. If it is calculated that a house needs 32.6 litres of paint for redecoration, one would probably buy 35 or even 40 litres as paint in 5 litre cans.

In this module, we are looking at estimating an answer and then using ideas that lead to a formal, written method of multiplication.

**Method 1.**

**Eg.  $26 \times 7$**

First an approximate answer.

The answer is approximately  $30 \times 6 = 180$

Split the first number into tens and units and put on the top of a table.

Put the second number by the side and multiply each part in the first number by the second number.

	20	6
7	140	42

Answer is  $140 + 42 = 182$

**Method 2.**

**Eg.  $32 \times 9$**

First an approximate answer.

The answer to  $32 \times 9$  is approximately  $30 \times 10 = 300$

Now perform the sum by using the fact that 32 is  $30 + 2$ .

$$\begin{aligned}
 32 \times 9 &= (30 + 2) \times 9 = (30 \times 9) + (2 \times 9) \\
 &= 270 + 18 \\
 &= \underline{288}
 \end{aligned}$$

**Method 3.**

Use this to lead to a more formal way of presenting multiplication:

$$\begin{array}{r} 32 \\ \times 9 \\ \hline 270 \\ 18 \\ \hline 288 \end{array} \quad \begin{array}{l} (30 \times 9) \\ (2 \times 9) \end{array}$$

Leading to:

$$\begin{array}{r} 32 \\ \times 9 \\ \hline 288 \\ \hline \end{array}$$

Children should know that when laying out calculations formally, units should be placed under units, tens under tens etc.



Now that you can do some multiplication sums in your head, we are going to see how you can write down more difficult ones.

Always begin with an estimate of the answer.

Let's say we want to multiply **27** by **5**.

First, we estimate the answer:  $27 \times 5$  is approximately  $30 \times 5 = 150$

Now, let's do the sum. First we split the first number into tens and units and then we multiply each part by **5**. We can do this in a table:

	20	7
5	<b>100</b>	<b>35</b>

Answer is  $100 + 35 = 135$

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Let's try another one. Multiply  $48 \times 6$

Estimate:  $48 \times 6$  is approximately  $50 \times 6 = 300$

**Put the numbers in a table and work out the answer.**

	40	8
6	<b>240</b>	<b>48</b>

Answer is  $240 + 48 = 288$

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Now try these. Don't forget the estimate.

**a.**  $42 \times 4$       **b.**  $35 \times 2$       **c.**  $23 \times 7$       **d.**  $46 \times 5$

**e.**  $28 \times 4$       **f.**  $62 \times 8$       **g.**  $59 \times 9$       **h.**  $66 \times 6$

Here is another method:

Let's say we want to multiply **34** by **6**.

First, we estimate the answer:  **$34 \times 6$**  is approximately  **$30 \times 6 = 180$**

Now, let's do the sum. First we split the first number into tens and units and then we multiply each part by **6**.

$$34 \times 6 = (30 + 4) \times 6$$

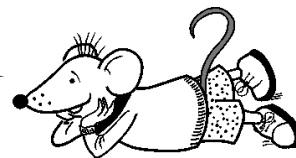
Then we multiply the **30** by **6** and the **4** by **6** :

$$\text{So: } 34 \times 6 = (30 + 4) \times 6 = 180 + 24$$

$$\text{So: } 34 \times 6 = \underline{204}$$

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Let's try another one!



**Multiply 42 by 7.     Estimate:  $40 \times 7 = 280$**

$$42 \times 7 = (40 + 2) \times 7 = 280 + 14$$

$$\text{So: } 42 \times 7 = 294$$

Quite easy, really!!!

Let's try one together.

You fill in the boxes.



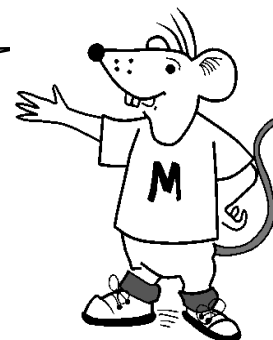
**Multiply 26 by 5.     Estimate:  $30 \times 5 = 150$**

$$26 \times 5 = (\square + 6) \times 5 = \square + 30$$

**So:  $26 \times 5 = \square$**

Ready for another.

You fill in all the boxes this time.



**Multiply 38 by 5.     Estimate:  $40 \times 5 = 200$**

$$38 \times 5 = (\square + \square) \times \square = \square + \square$$

**So:  $38 \times 5 = \square$**

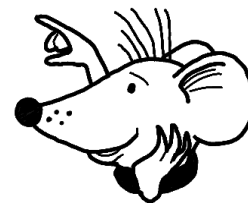
Now try these on your own. Don't forget to do an estimate first.



**a.  $25 \times 5$      b.  $41 \times 6$      c.  $36 \times 4$      d.  $53 \times 3$**

**e.  $64 \times 2$      f.  $57 \times 3$      g.  $22 \times 8$      h.  $45 \times 9$**

We can also set these sums out vertically, like this:



Let's multiply **32** by **6**.      Estimate:  $30 \times 6 = 180$

$$\begin{array}{r} 32 \\ \times \underline{6} \\ 180 \\ \underline{12} \\ 192 \end{array} \quad \begin{array}{l} (30 \times 6) \\ (2 \times 6) \end{array}$$

**So the answer is 192**

Let's try another one.



Let's multiply **53** by **4**.      Estimate:  $50 \times 4 = 200$

$$\begin{array}{r} 53 \\ \times \underline{4} \\ 200 \\ \underline{12} \\ 212 \end{array} \quad \begin{array}{l} (50 \times 4) \\ (3 \times 4) \end{array}$$

**So the answer is 212**

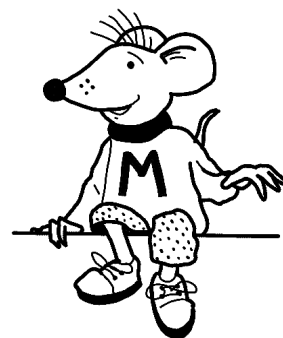
Now try these on your own. Don't forget to do an estimate.

**a.**  $25 \times 6$       **b.**  $34 \times 7$       **c.**  $18 \times 5$       **d.**  $44 \times 7$

**e.**  $62 \times 4$       **f.**  $74 \times 2$       **g.**  $39 \times 5$       **h.**  $26 \times 5$

Here is a slightly different method.

Lay the sum out vertically again and carry any tens into the tens column, like this:



Let's multiply 35 by 5.      Estimate:  $40 \times 5 = 200$

$$\begin{array}{r} 35 \\ \times 5 \\ \hline 175 \\ 2 \end{array}$$

$5 \times 5$  is 25, so we put the 5 in the units column and carry the 2 tens into the tens column.

**So the answer is 175**

Here is another example.

Let's multiply 24 by 7.      Estimate:  $20 \times 7 = 140$

$$\begin{array}{r} 24 \\ \times 7 \\ \hline 168 \\ 2 \end{array}$$

$4 \times 7$  is 28, so we put the 8 in the units column and carry the 2 tens into the tens column.

**So the answer is 168**

Ouch!



a.  $16 \times 4$       b.  $24 \times 7$       c.  $33 \times 7$       d.  $61 \times 4$

e.  $55 \times 7$       f.  $39 \times 4$       g.  $75 \times 4$       h.  $87 \times 3$



**Answers****Page 4**

- a.** 168    **b.** 70    **c.** 161    **d.** 230  
**e.** 112    **f.** 496    **g.** 531    **h.** 396

**Page 6**

$$26 \times 5 = (20 + 6) \times 5 = 100 + 30$$

$$\text{So: } 26 \times 5 = 130$$

$$38 \times 5 = (30 + 8) \times 5 = 150 + 40$$

$$\text{So: } 38 \times 5 = 190$$

- a.** 125    **b.** 246    **c.** 144    **d.** 159  
**e.** 128    **f.** 171    **g.** 176    **h.** 405

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- a.** 150    **b.** 238    **c.** 90    **d.** 308  
**e.** 248    **f.** 148    **g.** 195    **h.** 130

**Page 8**

- a.** 64    **b.** 168    **c.** 231    **d.** 244  
**e.** 385    **f.** 156    **g.** 300    **h.** 261