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| Numeracy for Nursing |
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| Calculation Strategies 3: Multiplication |
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There are several ways to approach multiplication. The method that you have been taught will depend on where (and when!) you were last taught maths at school or college.

The aim of this guide is to reassure you that there are no ‘right’, ‘wrong’ or ‘better’ ways to get to the correct answer – only the way that works best for you! Other students will know and use different methods; this is absolutely fine as long as your own method works! Let’s look at some commonly used strategies:

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| * Repeated Doubling
* Partitioning and Doubling
* Using Near Numbers & Adjusting
* Long Multiplication
 | * Multiplying by 10 and Halving
* Multiplying by 10s, then by Units
* Written Multiplication
 |

1. **Repeated Doubling**

Repeated Doubling is a really useful basic strategy for solving straightforward multiplication problems, particularly those involving tablets or capsules.

**Example 1:**

4 x 25mg = 2 x 25 = 50

 2 x 50 = **100mg**

1. **Partitioning and Doubling**

This method involves breaking the numbers down into easier ‘round number’ and ‘single digit’ calculations. A useful example is that of Digoxin tablets, which often come in 62.5 mcg units

**Example 2:**

2 x 62.5 mcg = 2 x 60 = **120**

 2 x 2.5 = **5**

 120 + 5 = 125 mcg

 Therefore, 2 x 62.5 mcg digoxin tablets would provide a dose of 125 mcg.

1. **Using Near Numbers and Adjusting**

This is a variation on the theme of using numbers that are easier to work with.

**Example 3:**

£2.89 x 4 = £3.00 x 4 = £12.00

*(£3 – £2.89 = 11p)* £12.00 – 44p = **£11.56**

1. **Multiplying by Ten and Halving**

This is a very useful strategy when you need to multiply by 5.

**Example 4:**

 5 x 14lb = 10 x 14 = 140

 140 ÷ 2 = **70lb**

1. **Multiplying by Tens, then by Units**

**Example 4:**

 21m x 13m = 21 x 10 = **210**

This is another example of the **vertical** method of addition.

 21 x 3 = **63**

 210 + 63 = **273m2**

This method involves an element of partitioning and recombining. It can also be approached in a slightly different way, involving multiplying by ten and then doubling:

 21m x 13m = 20 x 13 = **260**  (10 x 13 = 130, then double it)

 1 x 13 = **13**

 260 + 13 = **273m2**

1. **Written Multiplication**

Before trying to learn methods for written multiplication, it is a good idea to review and revise your times tables. A multiplication table is provided on the next page for you to print out and keep.

Good online screencast resources for long multiplication can be found here:

<http://www.qub.ac.uk/elearning/public/NumeracySkillsforDrugCalculations/Year1GenericSkillsTest/Multiplication/>

<https://www.khanacademy.org/math/arithmetic/multiplication-division/multi_digit_multiplication/v/multiplication-6--multiple-digit-numbers>

**Multiplication Table**

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**Multiplying 2 digits by 1 digit**

**Example 6:**

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The Khan Academy Screencast will talk you through this method if you are still uncertain. An alternative approach might have been to break the calculation down into tens and units:

 13 x 7 = 10 x 7 = 70

 3 x 7 = 21

1. + 21 = **91**

**Long Multiplication**

 **Example 7:**

1. Firstly, write the sum correctly. This means placing units over units, tens over tens, etc.

 54

x 72

1. The first part of the calculation is done exactly as per Example 6 above:

 Top Unit x Bottom Unit = 4x2 = 8

 Top Tens x Bottom Unit = 5 x 2 = 10

54

 x 72

 108

1. Then, because we are multiplying by ten, we need to write a 0 under the Units column and repeat the process, but with the Bottom Tens instead of the Bottom Unit.

 Top Unit x Bottom Tens = 4x7 = 28

 Top Tens x Bottom Tens = 5 x7 = 35

 Add any carried over tens to the second stage = 35 + 2 = 37

 2

 54

 x 72

 108

 3780

1. Now use vertical addition to add the two numbers together. This is your final answer!

 **2**

 **54**

**x 72**

 **108**

**3780**

**3888**