Rounding Numbers

Rounding is used to get an approximate answer to a more complex calculation or to ensure that your answer has the correct level of accuracy.

How to round numbers

To round a number to a specified place value, investigate the digit to the **immediate right** of that place. If this digit is

a. the number 0, 1, 2, 3 or 4 , the specified place value remains unchanged.
b. the number 5, 6, 7, 8 or 9, **round up** the specified place value by 1.

For example, 734 rounded to the nearest ten is 730, because 734 is closer to 730 than to 740.

Consider the **whole** number 44 745		Consider the **decimal** number 24.564 47	
Round this to	Answer	Round this to	Answer
The nearest 10	44 750	The nearest 10^{th} (1 decimal place)	24.6
The nearest 100	44 700	The nearest 100^{th} (2 decimal places)	24.56
The nearest 1 000	45 000	The nearest 1000^{th} (3 decimal places)	24.564
The nearest 10 000	40 000		

Note that you do not have to place fill with trailing zeros when rounding off decimal numbers

When rounding to approximate a calculation

It is good practice when doing any calculations to have in your head what the approximate answer should be. Rounding is an effective way to get that approximate answer. Round each number before calculating, then calculate. For example, to multiple 234 by 726, round to 200 × 700 to get an approximate answer of 14 000. Then you will know that the answer your calculator produces is close.

When rounding to ensure accuracy

A calculated number can result in a degree of accuracy that is greater than the original numbers used in the calculation. For example, the heights of a group of people are measured in centimetres:

172.5 177.8 169.2 180.0 162.5 173.7

The average height as shown on the calculator is 172.616 666 7 centimetres. This should be rounded off to 1 decimal place, giving 172.6 centimetres. This matches the accuracy of the original measurements.

Adding or subtracting numbers can result in an answer with more decimal places than the original numbers. For example, a mother's weight is given as 58.2 kg (1 decimal place) and her baby's as 3.56 kg (2 decimal places). Their combined calculated weight would be 61.76. This should be rounded to 61.8 kg (1 decimal place).

When working through a problem that requires several calculations before reaching the final answer, do not round off until the whole calculation is complete.

RESOURCES

- Other Quick Tips for Students http://www.usq.edu.au/learningcentre/tips.htm
- Online resources on ALSonline http://www.usq.edu.au/learningcentre/alsonline/mathsci/mathsscitopic/arith.htm
- Talk with a tutor at The Learning Centre (tlc@usq.edu.au)