

# How to pass Level 2 Numeracy in a nutshell.

Make sure you understand everything in Level 1. Level 2 questions often test the same knowledge as Level 1 but the question gives much more information. You have to read very carefully to work out what calculations are required. Don't be put off by the information that you don't need!

## Number

Practice converting quickly between decimals, fractions and percentages. Learn these frequently used facts.

Fraction	Decimal	Percentage
1/2	0.5	50
1/4	0.25	25
1/8	0.125	12.5
1/5	0.2	20
1/10	0.1	10
1/3	0.3333	33.33
3/4	0.75	75
2/3	0.6667	66.67
3/8	0.375	37.5

If you have to compare fractions, decimals and percentages, change them all to decimals first so that you can order them.

eg which is the largest? 80%, 0.78,  $\frac{3}{4}$ , or  $\frac{5}{8}$ ?

$80\% = 0.8$ ,  $0.78 = 0.78$ ,  $\frac{3}{4} = 0.75$  (calculate  $3 \div 4$ ),  $\frac{5}{8} = 5 \div 8 = 0.625$

0.8 is the largest decimal, so 80% is the largest.

**Ratio** questions often involve interpreting tables and extracting the necessary figures.

This is the nutritional information from a packet of soup.

Typical Values	Per 100g	Per can
Energy	27kcal	108kcal
Protein	0.8g	3.2g
Carbohydrate	5.6g	22.4g
Fat	0.2g	0.8g
Fibre	0.9g	3.6g
Sodium	0.3g	1.2g

A question might ask "What is the ratio of Fat to Fibre in the soup?"

It doesn't matter if you use the per100g column, or the per can column- both should give the same answer.

	Fat	Fibre
Per 100g	0.2	0.9
x by 10 to get rid of decimals	2	9
Per can	0.8	3.6
x by 10 to get rid of decimals	8	36
Cancel down (Divide by 4)	2	9

Both methods give the ratio as 2:9

Be very careful to get the ratio round the right way 9:2 is wrong because it would mean there is more fat than fibre.

A free resource from [www.grahamwroe.org.uk](http://www.grahamwroe.org.uk)

### Using formulas

Questions often give you a formula to use. For instance to convert degrees Fahrenheit into degrees Centigrade use the formula  $C = (F-32) \times 5/9$

All you have to do is to change the F for the Fahrenheit for the temperature and calculate the answer. If the temperature in degrees F is 40  
 $C = (40-32) \times 5/9 = 8 \times 5/9 = 40/9 = 4 \frac{4}{9}$

If F is 10

$$C = (10-32) \times 5/9 = -22 \times 5/9 = -110/9 = -12 \frac{2}{9}$$

Note- when you multiply by 5/9, multiply by 5 and divide by 9.

**Area** calculations at Level 2 often involve circles.

To find the area of a circle use the formula  $A = \pi r^2$  (this means  $\pi \times r \times r$ )  
 $\pi$  is usually rounded to 3 in Level 2 papers.

To find the area inside this shape



Split the shape into a rectangle and two semi circles.

$$\text{The area of the rectangle} = 75 \times 18 = 700 + 560 + 50 + 40 = 1260 + 90 = 1350\text{m}^2$$

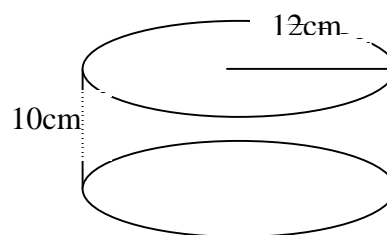
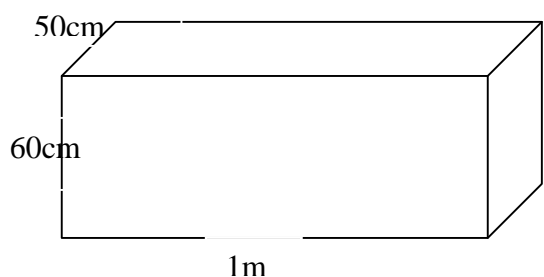
<b>x</b>	<b>70</b>	<b>5</b>
<b>10</b>	<b>700</b>	<b>50</b>
<b>8</b>	<b>560</b>	<b>40</b>

Two semi circles make one circle. Radius is half the diameter =  $18/2 = 9\text{m}$

$$\text{Area of circle} = \pi r^2 = 3 \times 9 \times 9 = 3 \times 81 = 243\text{m}^2$$

$$\text{Total area} = 243 + 1350 = 1593\text{m}^2$$

**Three dimensional questions** often involve working out how many cylinders can fit



in a box.

In this example the radius is 12cm First work out the diameter.  $12 \times 2 = 24\text{cm}$ . Then work out how many 24cm will fit in 1m.  $100/24 = 4$  (no need to worry about the decimal part of the answer).

Then work out how many 24cm will fit in 50cm.  $50/24 = 2$  (again don't worry about the decimal part- we can't put a fraction of a cylinder in the box)

This means that on the bottom layer there will be 2 rows of 4 cylinders, so there will be 8 cylinders on each level.

The height of the box is 60cm and the height of the cylinder is 10cm.

$60/10 = 6$  layers

Total number of cylinders =  $8 \times 6 = 48$  cylinders.

**Currency Conversion** is another common question. Always think carefully – do you need to multiply or divide?

If  $\text{£}1 = \text{€}1.62$  and we are changing  $\text{£}$  to  $\text{€}$  then our answer should be bigger- we need to multiply by 1.62. If we are changing  $\text{€}$  to  $\text{£}$ , our answer should get smaller, so we need to divide by 1.62.

So to change  $\text{£}50$  to Euros  $50 \times 1.62 = \text{€}81$

Or to change  $\text{€}50$  to pounds  $50/1.62 = \text{£}30.86$

### **Data Handling**

Questions about the mean at Level 2 often expect you to work backwards. For instance if you know the **mean** time taken to run a race was 2 hours, and 50 people ran the race, you can work out the total time taken by everybody to run the race.  $50 \times 2 = 100$  hours.

The **mode** is the most frequent data item in a list. On a bar chart the mode will be easy to find- it is the bar with the most data.

The **median** is the middle data item when all the data is arranged in order.

To find the median of 3, 6, 2, 9, 5, first arrange the numbers in order

2, 3, 5, 6, 9

Then choose the middle one- in this case 5.

If there is an even number of numbers, two numbers will be in the middle. The median is half way between them.

Find the median of 3, 2, 5, 6, 10, 9

Arrange them in order first 2, 3, 5, 6, 9, 10

The middle numbers are 5 and 6, so the median is 5.5

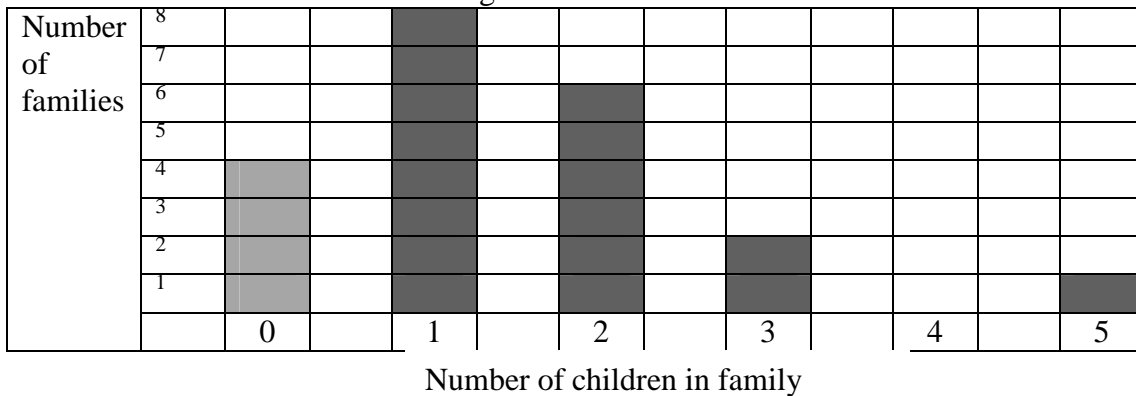
Sometimes you need to find the median from a bar chart or frequency table.

Shoe size	Frequency
3	5
4	7
5	9
6	7
7	6
8	5
Total	39

As there are 39 numbers, the middle number will be the 20<sup>th</sup> number. Add up the frequencies until you reach this number.  $5+7=12$   $12+9=21$  We have gone past the middle number so the median must be in this section. The median = 5

The mode is also 5 as this has the biggest frequency.

The same can be done if the data is given in a bar chart.



To find the median number of children in a family, add up the number of families first.

$$4+8+6+2+0+1 = 21$$

The middle family will be the 10<sup>th</sup> family.

$$4+8 = 12 \text{ which is already more than } 10, \text{ so the median} = 1$$

Level 2 questions on the range are often combined with negative numbers.

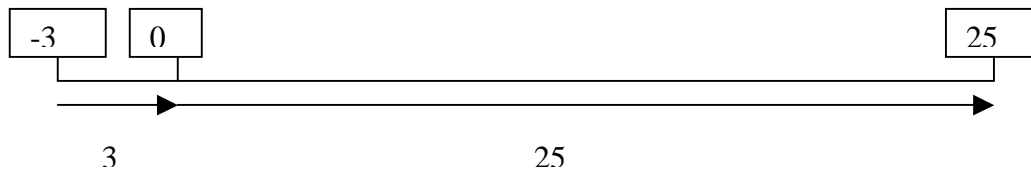
Example

The temperatures in different cities on a certain day were

City	Temperature $^{\circ}\text{C}$	City	Temperature $^{\circ}\text{C}$
Edinburgh	15	New York	12
Moscow	18	Hong Kong	18
London	17	Brisbane	21
Paris	19	Nairobi	23
Helsinki	-3	Tokyo	25

To find **the range** of this data we must subtract the smallest temperature from the largest. What is  $25 - -3$ ? Lots of people make the mistake of saying 22.

To avoid this mistake, think of it as a number line.



Now we can see that the difference between 25 and -3 is  $3 + 25 = 28$ .

A free resource from [www.grahamwroe.org.uk](http://www.grahamwroe.org.uk)

## Taking the test

Make sure you get to the test room early and that you know where you have got to go before the test day.

Before you enter the exam room, turn off your mobile phone!

Before you start the test make sure you understand all the buttons on the screen. Find the timer and make sure you know how to flag a question so that you can return to it later. Your time does not start until you open the first question. If you are not sure about anything ask the invigilator.

Take in plenty of paper and a pen and write down your working out. Number your questions on your working out to help you double check when you get to the end.

Keep an eye on the timer. After 15 minutes you should have attempted the first 10 questions. After half an hour, 20 questions. After 45 minutes 30 questions. After an hour you should be finishing off. Use the last 15 minutes to check your answers or redo questions you are not sure about. If you really can't do a question, rule out any silly answers and guess between the sensible ones. If you find you only have a minute left, guess the rest of the questions!

Don't panic! Keep calm and do your best.