Chapter 21 - Concepts and Principles of Measurement

Metric unit equivalences 5 minutes and 37 seconds

Let's have a look at the relationships between different metric units of length. We have metres, decimetres, centimetres, millimetres for example, now one metre is ten decimetres because a decimetre is a tenth of a metre, a centimetre is one hundredth of a metre so that's a tenth of a decimetre and a millimetre is one thousandth of a metre, so there are a thousand millimetres in a metre and a millimetre is one tenth of a centimetre. Now we can see the relationship in these terms, to convert metres to decimetres, we multiply by ten the decimetre is a tenth of a metre. There are ten decimetres in each metre. To convert decimetres to centimetres, we multiply by ten. To convert centimetres to millimetres we multiply by ten or if we go in the other direction of course we use the inverse operation. We divide by ten. It's really important that children and their teachers have this kind of structure clearly in their heads for converting between different metric units.

So here we go, let's try 35cm how many millimetres is that? Multiply by ten, three hundred and fifty. How many decimetres is 35cm well we divide by ten, three point five and we divide that by ten again to change it to metres-zero point three five metres. Let's have another example one point zero seven five metres. Change that to decimetres, we multiply by ten. Ten point seven five, change that to centimetres, multiply by ten again, a hundred and seven point five and change that to millimetres, one thousand and seventy-five. So, one point zero seven five metres is one thousand and seventy-five millimetres for example. Let's have a look at eight millimetres, we're heading to express that in metres going step by step, we divide by ten once, we divide by ten again and we divide by ten again. So, eight millimetres is zero point zero zero eight metres.

Let's have a look at the relationship between kilometres and metres, a kilometre is one thousand metres. Ok so each kilometre is one thousand metres so to change

kilometres to metres, we multiply by a thousand in the other direction, we divide by a thousand. So, two point five kilometres for example is two thousand five hundred metres multiplying by a thousand. Or seven hundred and fifty metres, divide by a thousand nought point seven five zero kilometres. One point zero five kilometres, change that to metres, we multiply by a thousand. Ok, now that will work in exactly the same way umm…whatever numbers we're using. So, thirty-five metres divide by a thousand, zero point zero three five kilometres. Remember that dividing by a thousand moves the decimal point three places to the left, multiplying by a thousand moves the decimal point three places to the right.

Now the relationship between litres and millilitres is the same as the relationship between kilometres and metres, metres and milli…. millilitres are the two basic units of liquid volume and capacity. A litre is one thousand millilitres. So, we convert litres to millilitres by multiplying by a thousand and we convert millilitres to litres by dividing by a thousand. Well here are exactly the same results as we've just had for converting kilometres and metres, because we're multiplying and dividing by a thousand. Two point five litres, two thousand five hundred millilitres. Seven hundred and fifty millilitres, zero point seven five zero litres. One point zero five zero litres, multiply by a thousand, one thousand and fifty millilitres. And one last one, thirty-five millilitres divide by a thousand zero point zero three five litres. That's very basic but really important stuff there.