

## Chapter 12 - Written Methods for Multiplication and Division

### Short Division 5 minutes and 16 seconds

Short division is a standard written algorithm for dividing by a single digit number. I'm going to work through first of all, four thousand nine hundred and forty-four divided by six. Most of the time I'm going to be thinking to myself, how many sixes can I get from this number? From four thousand nine hundred and forty-four. So I'm thinking in terms of the division here as the inverse of multiplication. Well we set the calculation up with a bus shelter and we put the number four thousand nine hundred and forty-four into the shelter to help us keep track of where we are, we're going to put some headings in. Thousands, hundreds, tens and units and there's the six we're dividing by. How many of those sixes can we get if we have four thousands, nine hundreds, four tens and four ones. Now as we do the calculation to help us to focus on where we are, I use a piece of card, which I can then place over the calculation to hide the bits we're not looking at yet. So I'm starting here looking at the four thousand and asking how many sixes can I get from four. Clearly I can't get any so I move along to the next position. Those four thousands, I'm now thinking of as forty hundreds so I have altogether forty-nine hundreds. Forty nine divided by six is eight because six eights make forty-eight and I have one to carry into the next position.

So, so far, I have eight hundred sixes from the forty-nine hundreds. Now moving to the tens position, with the one we've carried from the hundreds we have altogether fourteen tens to divide by six. Fourteen divided by six, well two sixes make fourteen two sixes are twelve and that gives us a remainder of two, two tens of course which we carry over into the units position so we now have twenty-four units and we have to divide twenty four by six. Well four sixes make twenty four and that completes the calculation. So there we have the result eight hundred and twenty-four.

Let's do another example, two thousand five hundred and seventy-nine divided by twelve, right now this is not dividing by a single digit number, but you can use your division if you know your twelve times table. Or you could divide by twenty-five if you know your twenty-five times table. Or you could divide by thirty-seven if you happen to

know your thirty-seven times table. You could use short division, provided you know the products of the number you're dividing by.

Well here we go, we set this up in the same way, I'm thinking to myself how many twelves can I get from two thousand, five hundred and seventy-nine. Here goes the bus shelter, two, five, seven, nine inside there thousands, hundreds, tens and units and we're dividing by twelve. Here comes my piece of card to help me focus. First of all, I have two thousands, can I get any twelves from two obviously not enough, so I move along to the next position the hundreds now I have twenty five hundreds I'm dividing by twelve. How many twelves in twenty five? Two twelves are twenty-four. So I can get two hundred twelves from the twenty five hundreds, two twelves are twenty four, that's one remainder which I carry over into the next position and that one hundred becomes ten tens so altogether I now have seventeen tens to divide by twelve. Well obviously, I can get one twelve from seventeen with remainder five, so I carry five tens into the unit's position so I now have fifty-nine units to divide by twelve. Can I get five from that? Five twelves, no that's sixty, that's too many, four twelves are forty-eight, that's as many as I can get so we get four in the units position. Four twelves are forty-eight, that means we have eleven left over that we haven't used from that fifty-nine and that's our remainder. So there's the result of my calculation, two hundred and fourteen, remainder eleven. That's short division.