

## Chapter 9 - Written Methods for Addition and Subtraction

### Decomposition-5 minutes 28 seconds

I'm going to work through a couple of examples of subtraction using the method of decomposition. Here's my first example, five thousand, three hundred and twenty-eight and I'm going to subtract from that two thousand, one hundred and forty-six. Notice, I've set this out with a fair amount of space and I've lined up the thousands, the hundreds, the tens and the ones. We start over here in the units position, no problem in doing eight subtract six, to get the answer two. But when we come to the tens position, we have a slight problem here because we have two subtract four. In order to do that, we have to move across to the hundreds position, where we have three hundreds and we're going to exchange one of those three hundred's for ten, tens. So here we go, we take one of these so we have two hundreds left. And we exchange that one hundred for ten, tens, so we now have twelve tens. And we can do twelve subtract four to give us the answer-eight- in the tens position. Then we can finish off in the hundreds position to subtract one. That gives us one and finally in the thousands, five subtract two to give us the answer three. Remember that we then check that if you add the two thousand, one hundred and forty-six, onto the three thousand one hundred and eighty-two, that is the answer, then you would expect to get back to five thousand, three hundred and twenty-eight. If you don't, then you've made a mistake.

Now here's my second example, four thousand, four hundred and forty-four and I'm going to subtract seven hundred and eighty-five. Notice in this example, there aren't any thousands in the second number. Right here we go, start over here in the units, four subtract five, that's a problem, so we need to move to the tens position and we're going to take one of those tens and exchange it for ten ones. So here we go, take one of these which leaves us with three tens, exchange that for ten ones and now we have fourteen of the unit's position and fourteen subtract five is nine. Now back to the tens column, we have three subtract eight, bit of a problem there so, we're going to have to take one of these hundreds and exchange it for ten tens, here we go, so we take one of these four

hundreds which leaves us with three hundreds and exchange it for ten tens, so we now have thirteen tens. Ok. Thirteen subtract eight is five. Now in the hundreds position, we have another problem, three subtract seven. So once again we need to go the next column and raid it. So we're going to go these four thousands here and exchange one of those which leaves us with three and exchanging that one thousand for ten hundreds so we now have thirteen hundreds and we can do the subtraction thirteen subtract seven-six. Finally in the thousands position, we have three thousands and we have nothing to take away from it so the result is three thousand. And there's the answer to this subtraction, three thousand six hundred and fifty-nine. Again we would check that with an addition, does three thousand, six hundred and fifty-nine added to seven hundred and eighty five take us back to four thousand, four hundred and forty four.

Well there we are, that's subtraction by decomposition remember the big principle, the key idea is exchanging one in one position for ten in the next position to the right. So remember that, one of these can be exchanged for ten of those. That's the mantra of decomposition.