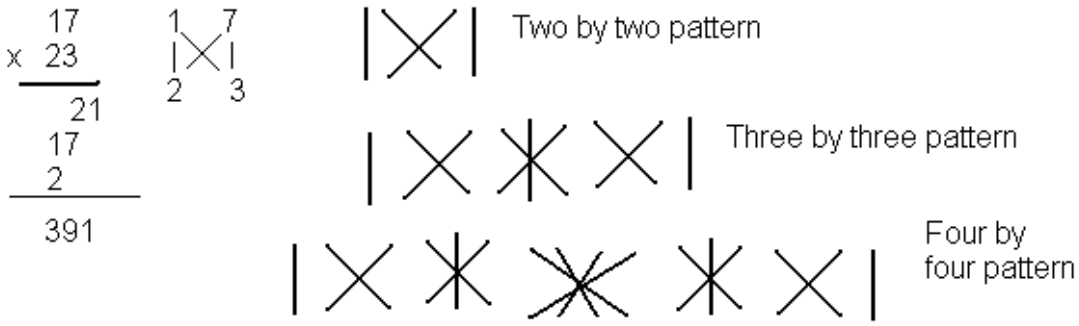
Shakuntala Devi's Neat Trick For Multiplying

(and, of course, why it works)

Let's take multiplying a binomial times a binomial first. 17 x 23 is (10 + 7)(20 + 3). In her wonderful book on speed mathematics, Figuring-The Joy of Numbers, Shakuntala Devi shows a pattern for multiplying that is really neat.

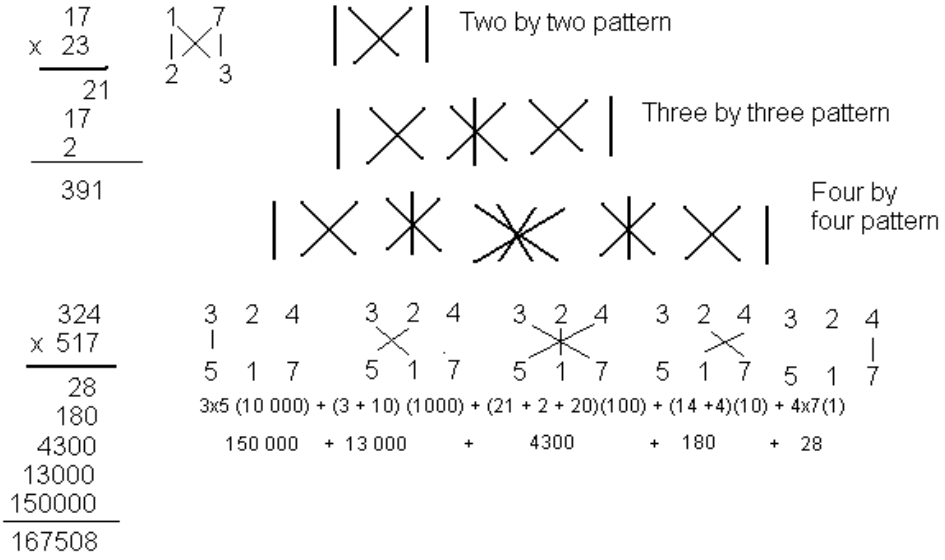
For the two numbers 17 x 23 = (10 + 7)(20 + 3) = 200 + 30 + 140 + 21 or 2 x 100 + (3 + 14) x 10 + 21. Now observe, 21 came from 3 x 7, they are directly above each other when written vertically, the 2 in 200 came from 1 x 2 and they are directly above each other when written vertically. The 3 and the 14 came form cross multiplying 1 x 3 and 2 x 7. In the following diagram, I have drawn that out below:



So, you can see how the two by two digit pattern works.

Now, if you move to a three by three digit, there even is a pattern to the pattern. Start on the right with a one by one, bring in the cross of the two by two, bring in a new cross for a three by three, now go back to another two by two cross and finish off with a one by one line where you multiply the two hundreds digits. Below, I have used the three by three pattern to do 324x517 = (300 + 20 + 4)(500 + 10 + 7).

Once you see how the patterns are invented and applied, you can carry on. It is not necessary to write down any of the numbers between question and answer. You can just write the answer, I keep the number to carry on my left hand and write the answer on the whiteboard with the right hand. I have had students attack a 5 by 5 and a 6 by 6 digit question and just write down the answer, no intermediate work!



There are so many shortcuts that you can come up with, once students realize that 2 digit numbers can be written as 10T + U and three digit numbers as 100H + 10T + U, and so on.