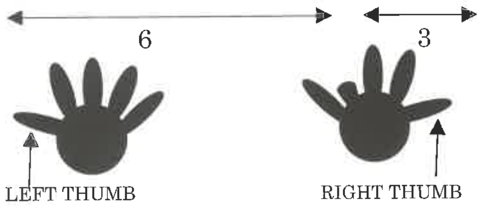
EXTENDING THE 9 TIMES TABLES, FINGER METHOD

John Radcliff
Mater Maria Catholic College

We all remember the primary school method of doing the 9 times tables on our finger. [See also 'Multiplication Made Easy' by Shane Scott in *Reflections* 45(4)—Ed.] For example, 9 × 7: bend down the seventh finger (from the left) and count the fingers either side to get a 2 digit number answer.



Gives 63

In this way we can calculate our 9 times tables from 9 × 1 to 9 × 10.

However, did you know that this method can be extended to 9 × 99.

I worked this out with two types of situation, so that's how I will set it out here.

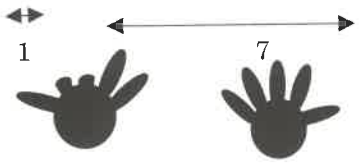
First, we need to extend the numbering of the fingers. In the above example the bent finger was 7; it can also be 17, 27, 37, ..., 97. Similarly for all the other fingers. Your left thumb is 1, 11, 21, 31, 41, ..., 91. Your right thumb is 10, 20, 30, ..., 100.

Type 1

When working with 9 × (11 to 20), you will need to hold down two fingers: the unit finger and the one before.

Example. 9 × 13 looks like the diagram below, keeping in mind that the answer is in the one hundreds. So, we have a default 100+ (yes, I know 9 × 11 = 99, but bear with me).

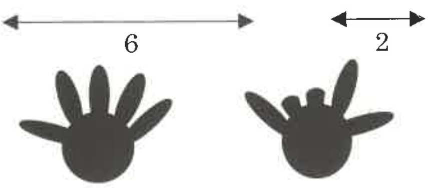
For 9 × 13 bend down finger three and the one before it. We have a default 100.



Gives 117

Because we have to bend down two fingers, we can't do 9 × 11 as 11 is the first finger (thumb) and we have no finger before it to bend down (this will be the second type). However, we can do 9 × 12 to 9 × 20.

Example. 9 × 18. We have a default 100.



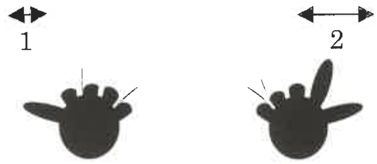
Gives 162

We can do the same thing for 9 × 21 to 9 × 29 bending down three fingers now and a default of 200+.

However, because we need to bend down three fingers we can't start until 9 × 23.

When we get to the 30s let's hold down four fingers and a default 300+, but we can't start till 24, and so on.

Example. 9 × 68: bend down seven fingers, default 600+ (can't start till 67). We have a default 600.



Gives 612

You can see the limitation that as you get to higher numbers you can do less in that set of 10 because you have to hold down too many fingers. This is where Type 2 comes in. It's essentially the same, but with a twist.

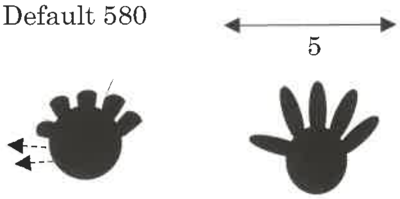
Type 2

Let's do 9 × 65.

Bend down digit 5 and as many as we can. We need to hold down 7 but can only do 5, we missed holding down 2. For each finger we missed, subtract 10 off the default (2 missed, so that's –20) and then proceed. So, the default was 600, but now it's only 580.

In these situations, you will only have fingers up to the right of the bent-down fingers. The tens column has come from the subtraction.

Default 580



Gives 585

Well that's it, you can now do the 9 times table up to 100 on your fingers.

I know it may be too complicated to show the students, they are better off with working from the 10 times tables! But it's not about the kids, not this time anyway. It's about the pattern. You gotta love the pattern.