

Magical subtractions	Skills practised:
<i>Children subtract the digital root of a three-digit number from that number. Magic ensues!</i>	• Subtracting a single-digit number from a three-digit number • Adding three single-digit numbers
Conjecture: <i>The digital root subtracted from any three-digit number always leaves an answer with digital root 9.</i>	
What to do: <i>Children work individually or in pairs.</i> 1. Write a 3-digit number, e.g. 472. 2. Find its digital root by adding the digits until you reach a single digit number. So, $4 + 7 + 2 = 13$ and $1 + 3 = 4$. 3. Subtract the digital root from the number itself, e.g. $472 - 4 = 468$. 4. Add the digits of the answer to find its digital root, $4 + 6 + 8 = 18$ and $1 + 8 = 9$. 5. Try a new 3-digit number and repeat the process. 6. Do this at least six times. Have you tried numbers containing 0 in the tens? Or a 0 in the ones? Does it make any difference what the digital root is? Have you tried numbers with a digital root of 1? What about 2-digit numbers? Or 4-digit numbers? HINT: Find the digital root of all the numbers where you count in 9s from 0 up to 90.	
Aims: – To think logically in trying different options to test the hypothesis	Minimum number of calculations expected 12 - 25

Magical subtractions

1. Write a three-digit number.
2. Find its digital root. Add the digits together until you reach a single-digit number.
3. Subtract the digital root from the number itself.
4. Add the digits of your answer to find its digital root.
5. Try a new three-digit number and repeat.
6. Do this at least six times.

472
$4 + 7 + 2 = 13$
$1 + 3 = 4$
$472 - 4 =$

Try numbers containing 0 in the tens or a 0 in the ones.

Does it make any difference what the digital root is? Have you tried any numbers with a digital root of 1?

What about two-digit numbers? Or four-digit numbers?