

THE GREAT EIGHT

Math skills: Addition and multiplication
You will need: Pencil and paper
Difficulty level: 1

Introduction:

- ◆ Ask your students to do the multiplication in the next table.
- ◆ Now ask them to add the sums together and write the total under the 'add' column. It's a great way to learn about patterns.

multiply	add
1x8=	
2x8=	
3x8=	
4x8=	
5x8=	
6x8=	
7x8=	
8x8=	
9x8=	

- ◆ Ask them if they think that it is also going to work for large numbers.

Multiply	add	multiply	add
29x8=		34x8=	
30x8=		35x8=	
31x8=		36x8=	
32x8=		37x8=	
33x8=			

Why it works?

The series 8×1 , 8×2 , 8×3 , 8×4 , etc. can be written as a series of additions: 8 , $8 + 8$, $8 + 8 + 8$, $8 + 8 + 8 + 8$, i.e. the series is generated by adding 8 to the previous number. This is the same as adding nine and subtracting one. However, as we already know, adding nine makes no change to the sum of the integers. Therefore the net result of adding nine and subtracting one is to reduce the successive members of the series by 1. However, when the series reaches 1 the next number is not 0 but 9. For the number to be 1 the successive sums of the integers must be of the form 10, 100, 1000, etc. If the original number is reduced by 1 the sums of the integer will be 9, 99, 999, etc. which all successively sum to nine. Hence this series reduces by 1 until it reaches 1 and then goes to 9 and so on.