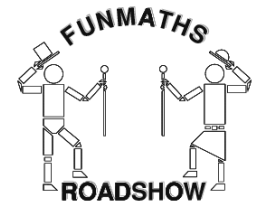


# Factorials



**Baseboard** none

**Resources** none

For any natural number  $n$ ,  $n!$  (referred to as **n factorial**) is defined to be the **product of all the natural numbers from 1 up to  $n$** .

The first few factorials are listed below

1!	1	1
2!	$1 \times 2$	2
3!	$1 \times 2 \times 3$	6
4!	$1 \times 2 \times 3 \times 4$	24
5!	$1 \times 2 \times 3 \times 4 \times 5$	120

**Puzzle 1** Factorials increase in size very quickly.  
You can see this by continuing the table above as far as  $10!$

**Puzzle 2** Simplify  $4! \times 3!$

**Puzzle 3** Simplify  $\frac{4!}{3!}$

**Puzzle 4** Simplify  $\frac{10!}{2!4!4!}$

**Puzzle 5** Simplify  $\frac{10!}{3!3!4!}$

**Puzzle 6** Simplify  $\frac{10!}{2!3!5!}$