

**AT A GLANCE**

Exploring different ways to factorise numbers.

**RESOURCES**

Number rods  
Factor Challenge sheet

**School to provide:**  
*Paper and pens*  
*Base-10 apparatus*

**ADAPTING THE LESSON**

**Making it easier**  
Start the learners off with halving in the Factor Challenge.

**Extending the learning**  
Ask the learners to record their equations before they use the rods in the Factor Challenge.

**THINGS TO WATCH OUT FOR**

The learners need to be clear that the factors must all be the same, e.g. 8 has the factor 4 because two 4s fit inside. 3 and 5 also fit inside but are not factors because they are two different numbers.

**MATHEMATICAL LANGUAGE / VOCABULARY**

1, 2, 3 and 6 are **factors** of 6.  
When we find factors of a number we call it factorisation.  
6 is a multiple of 3.

**SKILLS PRACTICE**

Generic Games from Pathways 1, 2, 3 or 4.

**TEACHING TO MASTERY (concrete → pictorial → abstract)**

Today we are going to look at factors and how we can use them to find new number facts.

Let me show you an example of some factors.

If I take a brown number rod how many ways do you think I can make the same length as the brown using all the same rods?

Model as you go along, leaving the whites, reds and purples in place. Let the learners work alongside, modelling and finding out for themselves.

Let's try: we can have whites.

How many whites will we need? 8

We can have reds. How many reds can we have? 4

What about light green? *It doesn't work.*

Purple? 2

Yellow? No

Dark green? No

Black? No

Equation  $8 = 1 \times 8 = 2 \times 4 = 4 \times 2 = 8 \times 1$

TEACHING TO MASTERY (concrete → pictorial → abstract)

**So it works for white, red and purple. Why is that?**  
 Allow the learners to talk and suggest some ideas

**Let's think about our times tables and write some ideas down.**

**What would these rods all be worth if the white was one? The brown? 8**

Write '8'

**The white? 1 and how many of them make a brown? 8**

... = 1 x 8...

**The red? 2 and how many of them make a brown? 4**

... = 2 x 4...

**The purple? 4 and how many of them make a brown? 2**

... = 4 x 2...

**And, of course, there's the brown.**

... 8 x 1

**Take out a dark green rod.**

**Now see how many ways you can find to make the same value as the dark green using rods that are all the same size. 1 x 6; 2 x 3; 3 x 2; 6 x 1**

Lay out the rods and record the number sentence

$$6 = 1 \times 6 = 2 \times 3 = 3 \times 2 = 6 \times 1$$

**Why do you think these numbers work for 6 and 8?**

Because 6 is in the 1, 2, 3 and 6 times tables; 8 is in the 1, 2, 4 and 8 times tables.

**We call these numbers, factors, because multiples of them fit exactly inside the larger number. When we find factors we call it factorisation.**

**So 1, 2, 3 and 6 are factors of 6.**

**1, 2, 4 and 8 are factors of 8.**

**Do you think there is another colour in the rods tray that has factors that aren't just that colour and white?**

**Which colours might work and why?**

