

## Linear sequences KS3 Maths

**Sophie**

Aaaah!?! This is impossible!

**Mathsmutt**

Come on Sophie, linear sequences aren't impossible!

**Sophie**

No, Mathsmutt! Working here with you two is impossible! With Dad constantly banging, I'm never going to get my homework done.

**Mathsmutt**

Come on! Let's go see if we can help!

**Dad**

Oh I give up, Sophie. I'm putting the kettle on.

**Mathsmutt**

Ok, this is just like your homework. Let's make some pretty patterns!

Ta da!

My patterns are always 3 wide, with 2 tiles on the top. And the number of tiles at the bottom of each one increases by the same amount each time.

See? 5 tiles, 8 tiles, 11 tiles, 14 tiles. Do you see a pattern?

**Sophie**

It goes up by 3 each time!

**Mathsmutt**

Yup! And that means it's connected to the 3 timestable. So, now you can work any number in the sequence!

**Sophie**

Err... I can?

**Mathsmutt**

Ok, let's look at the patterns again.

1 blue row, times 3, plus 2 white is 5 tiles.

2 blue rows, times 3, plus 2 white is 8 tiles.

3 blue, times 3, plus 2 white, is 11 tiles!

And so on!

# Bitesize

So what if we want to make a really big pattern? How do we know how many tiles we need in total?

Let's break it down.

Well, our blue rows are always 3 tiles wide. So it's times 3. If we don't know how many tiles there are in each blue column, we can call that the Nth, or Unknown.

And then we add the 2 white. Now we can work out how many tiles there are in any pattern we want, just by finding the rule, which is 3 times N, plus 2, or  $3N+2$ !

**Sophie**

So, if it's 20 blue tiles tall, it's 3 times 20, plus 2. 62 tiles!

**Mathsmutt**

Correctamundo!

**Sophie**

A-ha! Now I can finish my homework!

**Dad**

Eh? Wow, Sophie! You did all this? Brilliant! But have you finished your homework?

**Sophie**

Yes, Dad. And now I'm all... 'tiled' out!

Heheh!

**Mathsmutt**

Cheers!