Lesson 11 Sequences

Oral and mental starter 15 minutes

Objectives

Recognise and extend number sequences (Y6)

Vocabulary

odd, even, triangular, square

Resources

individual whiteboards

Springboard 7 Unit 1

Give pupils practice counting on and back in equal steps from and to zero – this is one way of building up multiplication facts.

Move on to counting on, for example, from 8 in steps of 7: 8 15 22 29 ...; point out the link with the 7 times table.

Pupils will need more practice at counting back.

Q Count back from 41 in steps of 5.

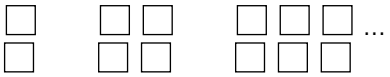
Give similar examples.

Springboard 7 Unit 1 pages 50–51 provides further examples that can be done orally.

Revise even numbers.

Q Think of the even numbers 2, 4, 6, 8 … What picture do you see? Draw it.

Make sure that pupils have a mental image of even numbers.

Pupils need a picture similar to: 

Ask pupils to explain the link between the numbers and the pictures.

Do the same for odd numbers, square numbers and triangular numbers (see Framework supplement of examples page 146).

Emphasise the link between the 'picture' and the numbers..

Main teaching 35 minutes

Objectives

Generate sequences from practical contexts (Y7)

Recognise squares of numbers to at least 12×12 (Y7)

Vocabulary

pattern, position, term

Resources

OHTs 11.1 and 11.2

OHT 11.3 (Plenary)

Introduce the task on **OHT 11.1**, which is based on a test question.

Discuss and establish ways of recording the information, for example:

pattern	1	2	3		
number of tiles	4				

For each question, establish how pupils worked out their answers.

Encourage pupils to move on from describing the pattern as +4 to seeing the link between the pattern number and the number of tiles ($\times 4$). Note, however, that this could lead pupils to a false conclusion: a $+4$ link between terms does not always lead to position-to-term relation of $\times 4$.

Use the example on **OHT 11.2** to clarify this.

Plenary 10 minutes

By the end of the lesson

pupils should be able:

- to generate sequences from spatial situations;
- understand links between a numerical sequence and a spatial pattern.

Framework supplement of examples page 154

Level 4

Investigate 'Growing steps' on **OHT 11.3**.

Q How many tiles will there be in the 5th, 6th and 10th patterns? How did you calculate the values?

Draw out the link with square numbers.

Q How many squares will there be in the 20th, 60th and 76th patterns?

Q How many squares will there be on the 3rd, 5th and 10th 'rows'?

These two questions provide opportunities to revisit mental and/or written methods of multiplication.

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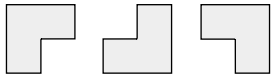
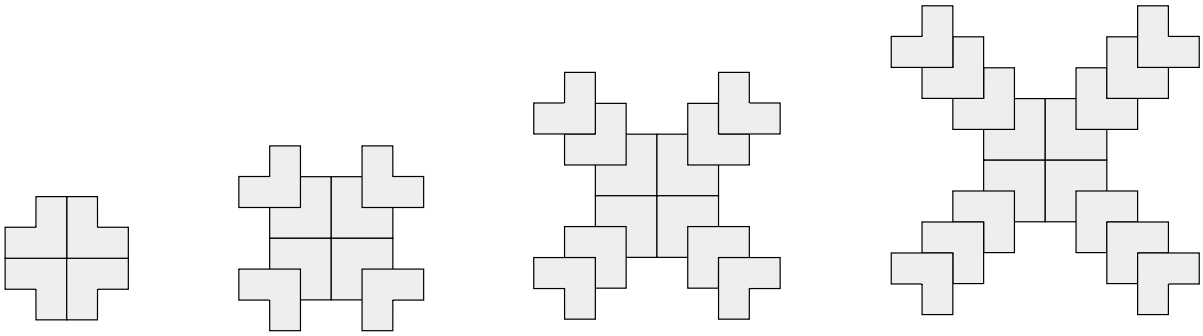
Patterns

Owen has some tiles like these: 

He uses the tiles to make a series of patterns.



pattern number 1 **pattern number 2** **pattern number 3** **pattern number 4**

1 Each new pattern has **more tiles** than the one before. The number of tiles goes up by the same amount each time. How many **more** tiles does Owen add each time he makes a new pattern?

2 **How many tiles** will Owen need altogether to make **pattern number 6**?

3 **How many tiles** will Owen need altogether to make **pattern number 9**?

4 Owen uses **40 tiles** to make a pattern. What is the **number** of the **pattern** he makes?

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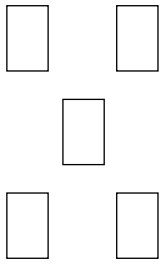
OHT 11.2

Growing patterns

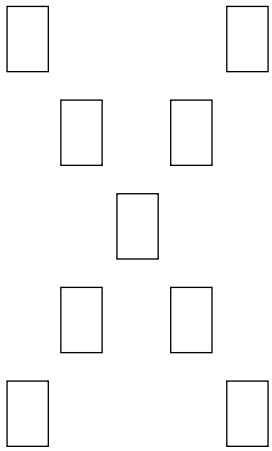
Investigate this growing pattern.

pattern 1

pattern 2



pattern 3



How many tiles will be in **pattern 6**?

If my pattern uses **29 tiles**, which **pattern number** is it?

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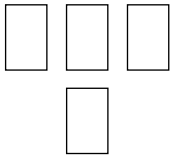
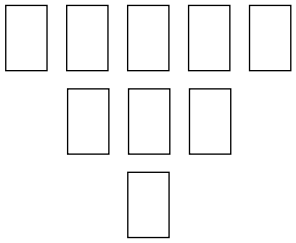
Growing steps

pattern 1

pattern 2



pattern 3



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