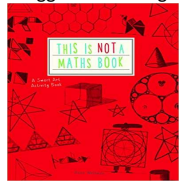


# Year 7 – Algebraic Thinking Sequences

Suggested reading



Want to know more? Scan the QR code to visit the curriculum overview for Year 7 Maths, including topic summaries, key words, and books that you may want to read in your own time



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## What do I need to be able to do?

By the end of this unit you should be able to:

- Describe and continue both linear and non-linear sequences
- Explain term to term rules for linear sequence
- Find missing terms in a linear sequence

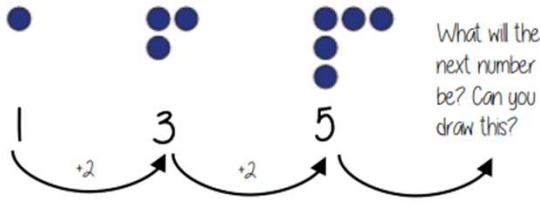
## Keywords

- Sequence:** items or numbers put in a pre-decided order
- Term:** a single number or variable
- Position:** the place something is located
- Rule:** instructions that relate two variables
- Linear:** the difference between terms increases or decreases by the same value each time
- Non-linear:** the difference between terms increases or decreases in different amounts
- Difference:** the gap between two terms
- Arithmetic:** a sequence where the difference between the terms is constant
- Geometric:** a sequence where each term is found by multiplying the previous one by a fixed non zero number

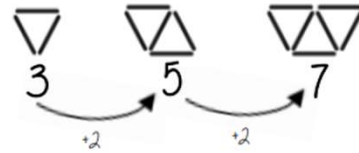


## Describe and continue a sequence diagrammatically

Count the number of circles or lines in each image



## Predict and check terms



CHECK – draw the next terms



### Predictions:

Look at your pattern and consider how it will increase.

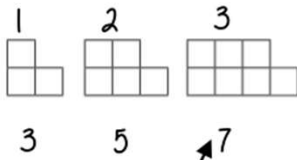
e.g. How many lines in pattern 6?

Prediction - 13

If it is increasing by 2 each time - in 3 more patterns there will be 6 more lines

## Sequence in a table and graphically

**Position:** the place in the sequence

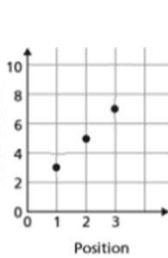


**Term:** the number or variable (the number of squares in each image)

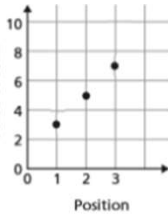
Position	1	2	3
Term	3	5	7



Because the terms increase by the same addition each time this is **linear** – as seen in the graph



Graphically



Position

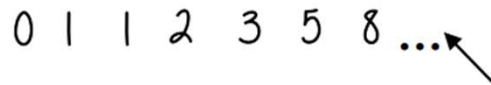
## Linear and Non Linear Sequences

**Linear Sequences** – increase by addition or subtraction and the same amount each time

**Non-linear Sequences** – do not increase by a constant amount – quadratic, geometric and Fibonacci

- Do not plot as straight lines when modeled graphically
- The differences between terms can be found by addition, subtraction, multiplication or division

**Fibonacci Sequence** – look out for this type of sequence



Each term is the sum of the previous two terms

## Continue Linear Sequences

7, 11, 15, 19...



How do I know this is a linear sequence?

It increases by adding 4 to each term

How many terms do I need to make this conclusion?

At least 4 terms – two terms only shows one difference not if this difference is constant (a common difference)

How do I continue the sequence?

You continue to repeat the same difference through the next positions in the sequence

## Continue non-linear Sequences

1, 2, 4, 8, 16 ...



How do I know this is a non-linear sequence?

It increases by multiplying the previous term by 2 – this is a geometric sequence because the constant is multiply by 2

How many terms do I need to make this conclusion?

At least 4 terms – two terms only shows one difference not if this difference is constant (a common difference)

How do I continue the sequence?

You continue to repeat the same difference through the next positions in the sequence

## Explain term-to-term rule

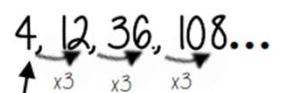
How you get from term to term

Try to explain this in full sentences not just with mathematical notation

Use key maths language – doubles, halves, multiply by two, add four to the previous term etc.

To explain a whole sequence you need to include a term to begin at...

The next term is found by tripling the previous term  
The sequence begins at 4.



First term