



### What should I already know?

- How to generate linear number sequences
- How to describe linear number sequences
- How to describe positions on the full coordinate grid (all four quadrants)

### What will I know by the end of the unit?

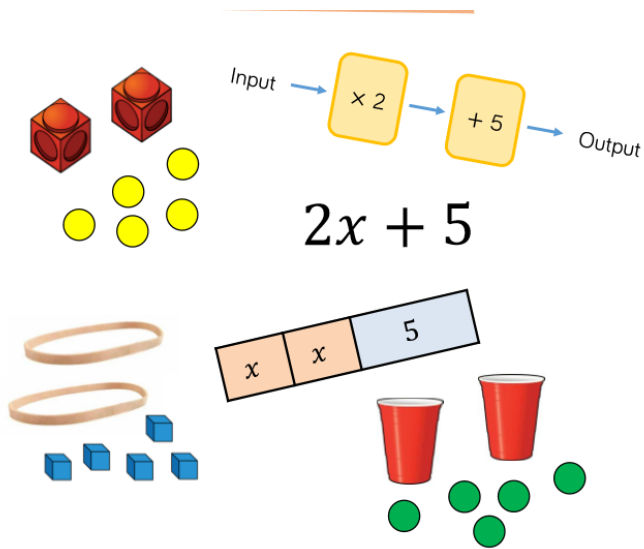
- How to describe and continue a sequence given diagrammatically
- How to predict and check the next term(s) of a sequence
- How to represent sequences in tables and graphs
- How to recognise the difference between a linear and non-linear sequence
- How to continue numerical sequences
- How to continue non-numerical sequences
- How to explain the term to term rule of numerical sequences in words
- How to find missing numbers within sequences

### Vocabulary

<b>Sequence</b>	ordered sets of numbers, shapes or other mathematical objects, arranged according to a rule.	<b>Difference</b>	the difference between two quantities or values involves subtraction.
<b>Rule</b>	the pattern a sequence follows	<b>Constant difference</b>	the difference between two numbers does not change after adding or subtracting the same quantity to both numbers.
<b>Position</b>	the comparison of where something is related to another object or its surroundings.	<b>Ascending</b>	arranged from smallest to largest.
<b>Term</b>	one of the numbers in a sequence, e.g. 1, 3, 5, 7, ...	<b>Descending</b>	arranged from largest to smallest.
<b>Term to term</b>	a rule that defines the value of each term in a sequence if the previous terms are known.	<b>Arithmetic</b>	a common number sequence where ... the same value is added each time.
<b>Table</b>	mathematical information organised in columns and rows.	<b>Second difference</b>	is obtained by taking the difference between consecutive first differences
<b>Graph</b>	a visual diagram used to represent statistical information or functions and equations.	<b>Geometric</b>	a number sequence where successive numbers are multiplied by the same value each time.
<b>Linear</b>	number pattern is a sequence of numbers whose difference between all the terms is the same	<b>Fibonacci sequence</b>	in a Fibonacci sequence each number is the sum of the two numbers before it
<b>Non-Linear</b>	do not increase from term to term by a constant amount	<b>Axis</b>	real or imaginary reference line. (Axes –plural)



**Diagram**



**Key Information**

In lessons we will explore sequences in detail using diagrams and lists of numbers.

Technology will be used to produce graphs so we can appreciate and use the word linear and non-linear linking to the patterns we have spotted in the sequences.

Students will practice using calculators when finding the changes between terms or subsequent terms

What would the fifth term in this sequence look like?



How might this sequence continue?



Describe the ways in which your sequences are similar and how they are different.

**Investigate/Homework tasks**



- Homework will be set from the booklet issued by your teacher
- You should complete at least 30 minutes of maths tasks on Maths Whizz (not games). Please attend help sessions if you do not have access to the internet at home
- Additional work you could complete:
  - Find out more about the meaning of the vocabulary list using <http://www.amathsdictionaryforkids.com/>
- To challenge yourself:
  - Investigate the key questions typed in red text
  - Explain the key questions typed in purple text

**Key skills/Timeline/Topic Questions**

- Is there a quick way of counting the squares/circles/lines in each diagram? Does this help you predict how many squares/circles/lines there are in the 10<sup>th</sup> term? The 100<sup>th</sup> term?
- Why does it make sense to join up the dots up on the graphs we have produced in lessons?
- **Make up your own sequence and represent it as many ways as you can**
- How is a linear sequence different from a non-linear sequence?
- What do you look for in a sequence to decide if it is linear?
- Can a linear sequence be decreasing?
- How many terms do you need to be able to write a linear sequence?
- Why does the common difference help us work out the next term in a linear sequence?
- **Do geometric sequences always grow faster than arithmetic sequences?**
- How would you explain the difference between an arithmetic sequence and a geometric sequence?
- How many terms are there between the first and the third term?
- How many differences are there between the first and the third term?