



Types of Sequences Teaching Ideas

Learning Objective: To identify and continue sequences.

Success Criteria:

- To recognise different types of sequences.
- To continue a number sequence.
- To solve problems involving sequences.

Context: This lesson could be used as a stand-alone lesson on different types of sequences. Alternatively, you may wish to use this as an introductory lesson before moving on to generating sequences from their n^{th} term. No knowledge of algebra will be required at this stage. For higher ability students, you could use the [Types of Sequences Matching Activity](#) or [Types of Sequences Crossnumber](#) as an introductory homework or starter activity.

Starter

Warm-Up

In pairs or individually, students should find the next terms of each of the “sequences”. This is a warm-up activity designed to get students thinking about patterns and how they might relate these patterns to maths. If students finish early, they should be encouraged to design their own patterns or “sneaky sequences” to test their partners.

You will notice the word “sequence” is not yet used. Through whole-class discussion of the warm-up activity, this word will likely be mentioned by a student, at which point you can move through to slide 4 for further discussion of the subject.

Main Activities

Sequences

Ask students what they understand by the word “sequence”. They might use phrases such as “number pattern” or “a list of numbers”, or they might provide examples. Should you wish to prompt further discussion on the terminology needed for this subject, simply click through slide 4 until the relevant words appear. Students should be encouraged to provide a definition for each term or an example of how it might be used. For instance, “generate the next term in the sequence” or “find the difference between the terms in the sequence”.

What’s the Same? What’s Different?

This activity is designed to encourage students to begin thinking about how they might recognise certain sequences. By looking for similarities and differences in the sequences, they will develop their ability to categorise types of sequences, though they will not yet have names for these. You can introduce these names as they begin to categorise the sequences, or you may wish to move on to slide 6 for your pupils to make formal notes. The slide includes linear, geometric and Fibonacci sequences as well as the triangular and square numbers. Possible responses are included below in order for you to target questions to the group.

Possible responses:

- They have the same difference between terms.
- They have the same first term.
- They are doubling.



- They have different differences between the terms.
- Some have terms that are being added to, some have terms that are being multiplied.

Note: you may wish to print the [What's the Same? What's Different? Activity Sheet](#) if you require your students to make notes.

Your Turn

Once you have established understanding, distribute the relevant activity to the class.

- Crossnumber – a simple crossnumber that encourages students to use their understanding of types of sequences to fill in the grid.
- Matching Activity – this matching activity has some missing terms – both questions and answers – to encourage critical thinking.

Plenary

Display the spiral picture on slide 7. There are a number of options here:

- Ask students to continue the pattern and look for sequences within the picture.
- Count the number of dots on each straight line and look for sequences.
- Count the number of small lines on each straight line and look for sequences.
- For each of the above, predict the next three terms or find a way of describing the sequence.
- Ask students to create their own spirals and look for sequences.
- Ask students to list the numbers in order (1, 2, 3, 4) on the spiral. Do they notice any patterns in the diagonals?

Possible homework ideas:

- Ask students to further investigate the Fibonacci sequence and its relationship with nature. Can they find any examples where they live (cauliflowers, monkey puzzle trees and pine cones provide a nice starting point).
- Ask students to investigate the golden ratio and construct a golden spiral for a display wall.
- Create a matchstick sequence. Take pictures/draw it and write down the rule and the next three terms.
- Beginning with the term 3 (or any number you choose), ask students to find five different ways to continue this sequence and describe the rule.

