Subject	Year	Month	
Mathematics	9	November	Balcarras From strength to strength

Topic:

FIBONACCI AND QUADRATIC SEQUENCES

4 LESSONS

Content (Intent)

Prior Learning

Y7
- Continue any given sequence
- Finding the nth term of a linear sequence

Y8
- Generate a linear sequence from its nth term
- Find the nth term for **linear sequence**
- Square positive and negative numbers

Future Learning

- Finding the nth term of a quadratic sequence
- Compound Interest and Depreciation
- using Geometric Sequences

Objectives

- Recognise and use the Fibonacci sequence
- Generate Fibonacci type sequences and find the next two terms
- Generate terms of a quadratic sequence from a written rule (and continue a given quadratic sequence)
- Generate terms of a quadratic sequence from its nth term

For teaching purposes

Possible Questions
- A sequence has the first two terms 1, 2, … Show me a way to continue this sequence. And another. And another …
- A sequence has nth term $3n^2 + 2n - 4$. Jenny writes down the first three terms as 1, 12, 29. Kenny writes down the first three terms as 1, 36, 83. Who do agree with? Why? What mistake has been made?
- What is the same and what is different: 1, 1, 2, 3, 5, 8, … and 4, 7, 11, 18, 29, …

Misconceptions
- may think that it is possible to find an nth term for any sequence. A Fibonacci type sequence would require a recurrence relation instead.
- may think that the word 'quadratic' involves fours.
- may substitute into ax^2 incorrectly, working out $(ax)^2$ instead.

Pedagogical notes (implementation)

NCETM: Departmental workshops: Sequences
NCETM: Glossary

The Fibonacci sequence consists of the Fibonacci numbers (1, 1, 2, 3, 5, …), while a Fibonacci **type** sequence is any sequence formed by adding the two previous terms to get the next term.

'Fibonacci solver'.

How will understanding be assessed & recorded (Impact)

End of term Assessment in **December**
Exams in **May**
9BAM6 Sequences

How can parents help at home?

MathsWatch clips (Qualification KS3)
A22, A23b

Further reading/discussion

Reading / Enrichment

KM: Forming Fibonacci equations

KM: Mathematician of the Month: Fibonacci

KM: Leonardo de Pisa

KM: Fibonacci solver. Students can be challenged to create one of these.

KM: Sequence plotting. A grid for plotting nth term against term.

KM: Maths to Infinity: Sequences

NRICH: Fibs

Literacy

Term
Term-to-term rule
Position-to-term rule
nth term
Generate
Linear
Quadratic
First (second) difference
Fibonacci number
Fibonacci sequence

Numeracy Links

Careers Links

Artist
Biologist