

The Fibonacci Sequence: Maths : Year 6 : Summer Term

	Learning Objective	Overview	Assessment Questions	Resources
Lesson 1	To investigate the Fibonacci sequence and the patterns it creates.	Children are introduced to Fibonacci and the sequence of numbers he wrote about after theorising about a rabbit population. The children investigate the sequence through the hypothetical situation of Fibonacci's rabbit population before going on to draw a golden spiral using the squared Fibonacci sequence. Alternatively they can investigate the rabbit problem further by manipulating the problem with 'What if...?' questions.	<ul style="list-style-type: none"> Can children describe how the Fibonacci sequence is produced? Are children able to recall or calculate the first ten numbers in the Fibonacci sequence? Are children able to think of their own What if...? questions based on an investigation? 	<ul style="list-style-type: none"> Slides Rabbit Investigation Sheet 1A Squared Paper, compasses, colouring pencils/felt tip pens, coloured paper. Pattern Cards 1A Challenge Card 1A What If...? Cards 1A (FSD? activity only)
Lesson 2	To further investigate the Fibonacci sequence.	Children investigate deeper within the Fibonacci sequence of numbers to find patterns and comparisons within the sequence which make it special. They experiment with different 'What happens when...?' style questions about consecutive Fibonacci numbers. They must use their understanding of short and long multiplication to find different patterns and are challenged to describe these patterns and try to prove them always or sometimes true.	<ul style="list-style-type: none"> Can children use all four operations in a problem solving challenge? Are children able to use their understanding of number and sequences to justify their findings? Can children observe and record patterns and similarities in findings? 	<ul style="list-style-type: none"> Slides Challenge Cards 2A/2B/2C Teacher Notes 2A Plain paper Challenge Card 2D (FSD? activity only)
Lesson 3	To find the n^{th} term of a linear sequence.	Children are challenged to find the n^{th} term within a sequence by using the acronym DiNO to find a formula for the sequence. They must then use this formula to find the 10 th , 20 th and 100 th term in the sequences. The children work independently to find formulas for sequences or use their problem solving skills to solve the 'Lily Pad Swap' problem and find a formula for the sequence their results show.	<ul style="list-style-type: none"> Are children able to describe the rule for a given sequence? Can children use a method to find the n^{th} term formula? Can children use a formula to find the n^{th} term in a sequence? 	<ul style="list-style-type: none"> Slides Number Sequence Cards Worksheet 3A/3B Formula Cards Sequence Cards Worksheet 3C (FSD? activity only) Frog Tokens, Lily Pad Sheet, Teacher Notes (FSD? activity only)
Lesson 4	To investigate the Golden ratio.	Reflecting back on the Fibonacci sequence, the children explore the idea of the golden ratio in rectangles. They look at how their golden spirals from Lesson 1 show multiple golden rectangles within them and are challenged to test, draw or find golden rectangles by dividing the length by the width of different rectangles, showing their remainders to two decimal places and comparing their answer to Phi Φ .	<ul style="list-style-type: none"> Can children recall Phi Φ to 2dp? Can children describe what a golden rectangle is? Are children able to test a rectangle's measurements to find if it fits with the golden ratio? 	<ul style="list-style-type: none"> Slides Worksheet 4A/4B/4C Calculators Worksheet 4D/4E (FSD? activity only) Objects with rectangular faces e.g. books, DVD cases, photos/ photo frames, paper, tablets etc.
Lesson 5	To investigate the golden ratio in art, architecture and the human body.	This lesson introduces the children to the idea that the golden ratio has been used in art and architecture to make the product more visually appealing. They will explore how Leonardo da Vinci used the golden ratio in his illustration of the Vitruvian Man and express how the golden ratio is displayed in human features. The children will investigate this by measuring and testing features to see if they have the golden ratio when compared to one another.	<ul style="list-style-type: none"> Are children able to describe how to find if two measurements have a golden ratio? Can children find a mean average? Are children able to divide a number giving the remainder as a decimal to 2dp? 	<ul style="list-style-type: none"> Slides Art and Architecture Cards Facial Features Sheet 5A Measuring tapes, calculators, felt tip pens, plain paper Worksheets 5A/5B/5C Portrait Cards 5A Worksheet 5D (FSD? activity only)