SECURITYSERVICE MI5

SECRET INTELLIGENCE SERVICE MI6

GCHQ

THE FIBONACCI SEQUENCE

At the UK's intelligence services – MI5, MI6 and GCHQ – we help keep people and communities across the UK safe and secure. To do this, we need people from a wide range of backgrounds, with a variety of different skills.

The Fibonacci sequence is something that was first described by Indian mathematicians around 1300 years ago. But it was introduced to the West by Leonardo of Pisa, otherwise known as Fibonacci, in 1202. Fibonacci was a famous mathematician who not only introduced this sequence, but also introduced Arabic numerals to Europe. So, without him, we might still be counting in Roman numerals!

THE MATHS BEHIND THE SEQUENCE

The sequence has a special property – if you divide each number in the sequence by the previous one, the numbers get closer and closer to the same number, which is approximately 1.618. The Greeks discovered this number well before Fibonacci and they called it Phi. Nowadays, it's sometimes called the Golden Ratio – artists use it because it's believed to create the most aesthetically pleasing pictures.
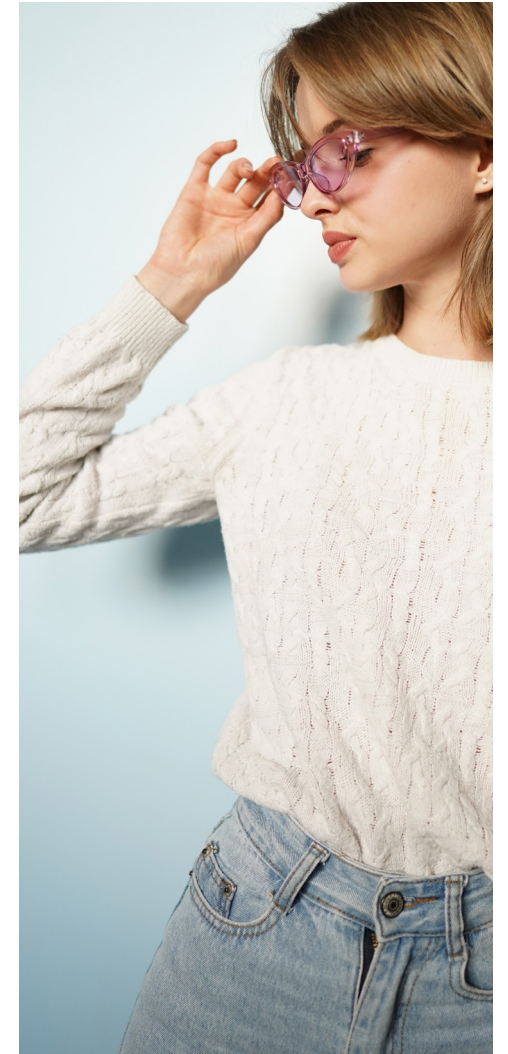
FINDING THE SEQUENCE IN NATURE

You can find lots of examples of the Fibonacci sequence in nature. Flowers will generally have 3, 5, 8 or 13 petals or seeds. It's also linked to the Golden Rectangle and the Golden Spiral, which also appears a lot in nature – for example, on snail shells, flower heads and even in space nebulae.

THE GOLDEN RECTANGLE
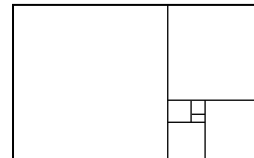
THE GOLDEN SPIRAL

INTELL

THIS IS HOW THE FIBONACCI SEQUENCE STARTS.

WHAT ARE THE MISSING NUMBERS?

0, 1, 1, 2, 3, 5, 8, **?**, 21, 34, 55, 89, 144, **?**, 377...

WHAT WOULD THE TWENTIETH NUMBER IN THE SEQUENCE BE?

HERE'S THE ANSWER

For the first missing number, adding the 5 to the 8 will give the answer of 13.
Adding the 89 to the 144 give's an answer of 233 for the second.
The twentieth number in the sequence is 4181.

INTELL