



# 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!



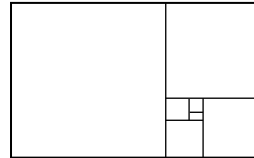
## THE MATHS BEHIND THE SEQUENCE

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.

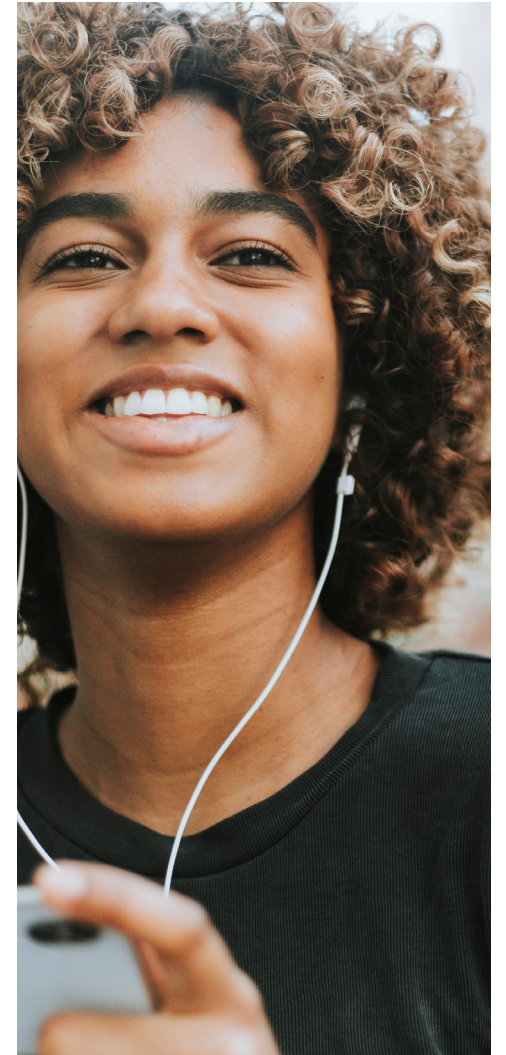
## FINDING THE SEQUENCE IN NATURE

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

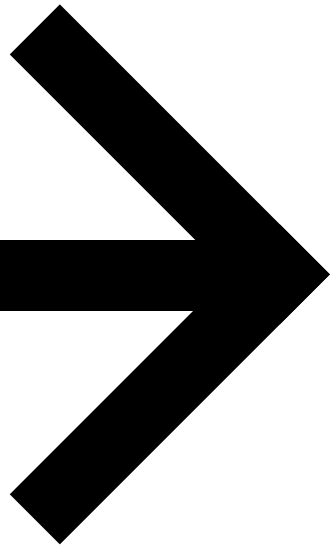


## THE GOLDEN SPIRAL



# FIND THE HIDDEN MESSAGE.

The Fibonacci sequence starts with 0 and 1 and involves adding the previous two numbers together to get the next one in the sequence. Using this information, **find the hidden message in this piece of text:**



There is a dark mountain, with patches of emerald green. It's hard work to climb, but reaching the very top to catch the sunrise in the morning is spectacular. It's something you must do. In the summer, the shadow creeps up the mountainside and you can feel the warmth approaching. It's an incredible feeling – you feel so alive.

But my personal favourite is to climb it on a crisp winter's morning. As the weak sun rises, you crunch through the snow and the mountaintops sparkle. You feel you must be at the top of the world, and you feel alone in the world, too. At those heights, you can hardly hear a sound – there are no birds or animals and the snow muffles everything. In fact, you feel completely at peace with the world. It's a magical feeling and there's absolutely nothing to break the spell.

I often go up there on my own at all times of year. But as a guide, it's my job to take others, too. It's very rewarding when you can share such a special place with other people, although I never take them to my favourite spot – that one's just for me! It doesn't seem to matter to them – they're always overawed by the view. But, of course, taking a group of people up there breaks the silence.

Luckily, most people want to go up in the summer. They're not mountain people, so they don't tend to appreciate the stark beauty of the landscape when it's covered in snow. To me, that winter landscape has its own unique beauty. But for most of my customers, it's the warmth of the sun they want.

I don't mind that – the mountains are in my blood, so I enjoy them all year round. In the spring and summer, the meadows are covered in flowers, bringing a different kind of beauty to them. But they attract a different kind of people, too. Some of them have never been to the mountains before and they don't understand there are rules you have to follow. They're city types, who don't appreciate that there are dangers around every corner. That's why they need a guide – someone like me to lead the way and remind them of the code of the mountains – never stray from the path, never pick the flowers and always stay in sight of the others.

It's hard work. But those clear winter mornings when I can climb up and appreciate the summit on my own make it all worthwhile.

