Dani:

November 23rd is in a few days. This day is special for two reasons. I got engaged on that day, and when spelled out in numbers it is 1, 1, 2, 3. This is the beginning of the Fibonnaci sequence.

The Fibonnaci sequence is a pattern of numbers in which each number is added to the one previous to get the next number. So we start with 1, then 1. 1 plus 1 equals 2, so 2 is our next number. 1 plus 2 equals 3, 2 plus 3 equals 5, and so on. Our sequence goes 1, 1, 2, 3, 5, 8, 13, 21, and infinitely more.

The Fibonnaci sequence was introduced in 1202 by the Italian mathematician Leonardo Pisano, also known as Fibonacci. He wrote in his book *Liber Abacci* about a problem involving rabbits:

Jorden:

"A certain man put a pair of rabbits in a place surrounded on all sides by a wall. How many pairs of rabbits can be produced from that pair in a year if it is supposed that every month each pair begets a new pair which from the second month on becomes productive?"

Dani:

So we have a pair of rabbits who we assume will have a male and a female in a month. That new pair will have a pair in another month. You'll add up the month's previous rabbits to the current one to get the next month's number of rabbits. This produces the patterns of numbers known as the Fibonnaci sequence.

Of course, the idea of each pair of rabbits having exactly one male and female every month is unrealistic, but we do see this in other populations, like honeybees.

(buzzing sound)

The males come from unfertilized eggs, and so will have 1 parent. Females are produced when the queen mates with a male, and they will have two parents. The males will then have 2 grandparents, 3 great-grandparents, 5 great-great grandparents, and so on. While the females have 3 grandparents, 5 great grandparents, 8 great-great grandparents and so on. The ancestry of the bees will follow the Fibonnaci sequence.

Now, you may be asking yourself, why is this sequence so important? Why do we care about these imaginary rabbits and bee parentage?

Well, the Fibonnaci Sequence is all around us. In nature, plants arrange their petals and leaves in spirals following the Fibonnaci sequence to get the optimal sunlight. The numbers of branches of trees are always a Fibonnaci number and will grow new ones following the Fibonnaci sequence. Many other plants like sunflowers, pineapples, and cauliflowers are made up of spirals following the Fibonnaci sequence.

The Fibonnaci sequence is also full of ratios between the different numbers. The ratio of one number to its next number approaches 0.618 while the ratio of alternate numbers approach 0.382. If you divide one number by the number that is three places to the right, the ratio is 0.2352.

These ratios appear in many places, but they play an important role in the stock market.Once a stock has reached one of these ratios, they tend to stop before resuming the previous trend. So investment bankers use Fibonnaci numbers to help them decide when to invest.

These ratios are also seen in the way other spiral plants arrange themselves, even if they don't follow the numbers of the Fibonnaci sequence.

So the next time you're outside...

(birds singing)

Try to look at the spirals of the flowers, and count the branches of a tree and see if you can find some Fibonnaci numbers.

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