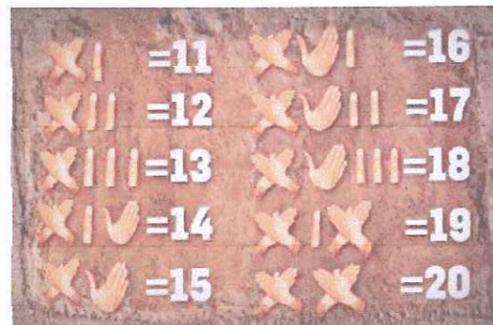


LEONARDO FIBONACCI

Birth : 1175 (after J-C) in Pisa

Death : 1250 (after J-C) in Pisa



Leonardo Fibonacci was an Italian mathematician of the XIII century. Among other, he brought the arabian numbers to the European people which replaced the roman numbers.

He also discovered a sequence of numbers called « The numbers of Fibonacci » :

0, 1, 1, 2, 3, 5, 8, 13, 21, etc

As you can see, each number of this sequence is the addition of the two numbers before :

$$0+1=1 \quad 1+1=2 \quad 1+2=3 \quad 2+3=5 \quad 3+5=8 \quad 5+8=13$$

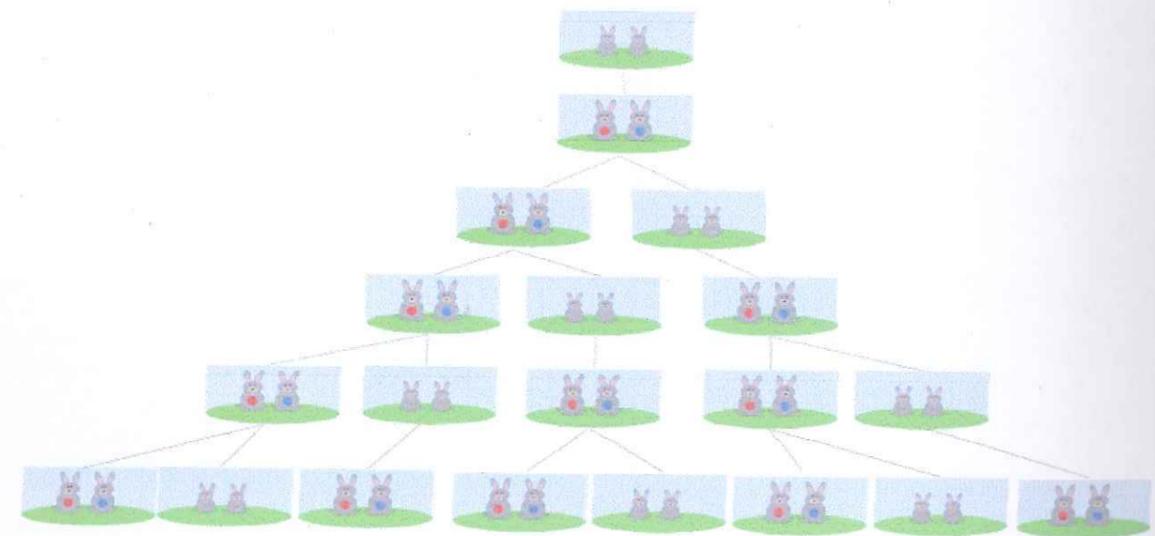
The equation to calculate Fibonacci's numbers is :

$$F_x = F_{x-1} + F_{x-2}$$

Let's back to the XIII Century....To find this sequence, Fibonacci did an experience with rabbits, yes you understood right : with rabbits !



He wanted to determine the evolution of the population of rabbits after 1 year : starting with a male and a female at the beginning, he calculated the monthly population considering that a couple of rabbits could only reproduce themselves 1 month after their birth, giving life to a new couple another month later.



At the beginning, we have 1 couple of rabbits, after 1 month the female of this couple is pregnant. The second month, a new couple is born so that we have 2 couples, and the female of the first couple is still pregnant. The third month, there are 3 couples, the first and the young couples whose females are both pregnant, and the newest couple,..etc..etc..

So we can determine the monthly evolution of the rabbit's population, which is the following :

1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144

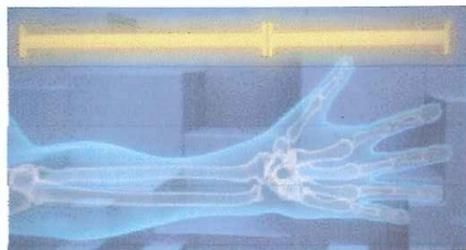
That's how he did to find this sequence !

To Go Further...

In fact, Leonardo Fibonacci has demonstrated that the nature is not really random as many people think it is...

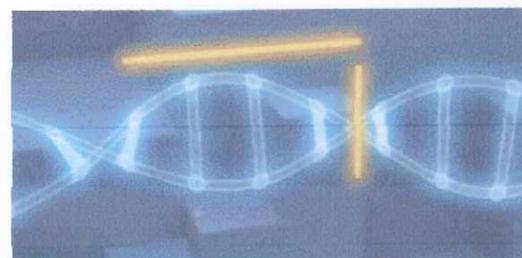
Let us note that if you divide each number of the Fibonacci's sequence by the previous one, you always find a number which evaluates to match with the golden number :

$$1.618 = \varphi$$

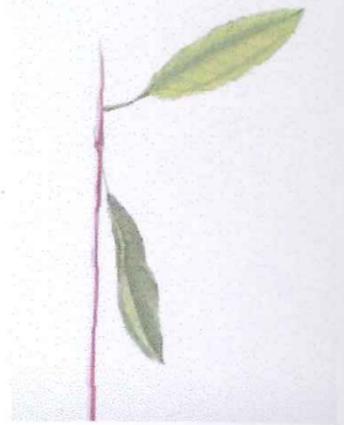


Let us have a look at the X-rays image of a human arm : if you divide the length of the front arm by the length of the hand, you get the golden number.

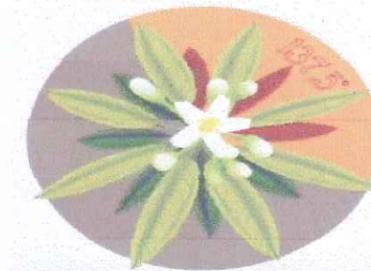
And it's the same between the width and the length of a cycle of the double helix of the DNA molecule.



An other example is the following : each plant is growing up, avoiding each new leave to appear on the top of any other, making sure each of them could get the necessary light to grow up. Any leave appearing on the top of another will effectively make it disappear.



To avoid this situation, we need to find the angle that can allow each new leave to get the necessary light to live.



If you divide 360° by the golden number, you get 137.5° which is exactly the angle used by nature to let the plants to grow up as described before. This angle is called « the golden angle ».

Theses relations between the numbers of Fibonacci and the golden angle could explain the number of spirals of the seeds of flowers or the scales of fruits.

And this golden angle was used by many by painters but in many other domains also

So, are you impressed by this famous mathematician, his sequence of numbers and those incredible statements and findings ?