Fibonacci's Math

Activity 2 - Fibonacci's Rabbits

How did Fibonacci discover his famous numbers?

In the year 1202, Fibonacci was presented with a problem: how quickly will the rabbit population grow under ideal conditions?

A 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?

This problem states several important factors:

- Rabbits take one month to grow up
- After they have matured (for one month) it takes a pair of rabbits one more month to produce thier frst pair of newly born rabbits.
- We assume that rabbits never die
- We assume that whenever a new pair of rabbits is produced, it is always a male and a female
- We assume that these rabbits live in ideal conditions
- The problem begins with just one pair of newly born rabbits (a male and a female). Given all this information, how many pairs of rabbits will there be in one year (12 months)?

*****See the diagram that follows which shows the number of rabbits which will result after four months*****

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Number of pairs: Explanation

One Pair: we start with one pair of newly born rabbits

One Pair: our rabbits take one month to mature

Two Pairs: At the end of second month, our rabbits produce one newly born pair, so that now we have two pairs of rabbits.

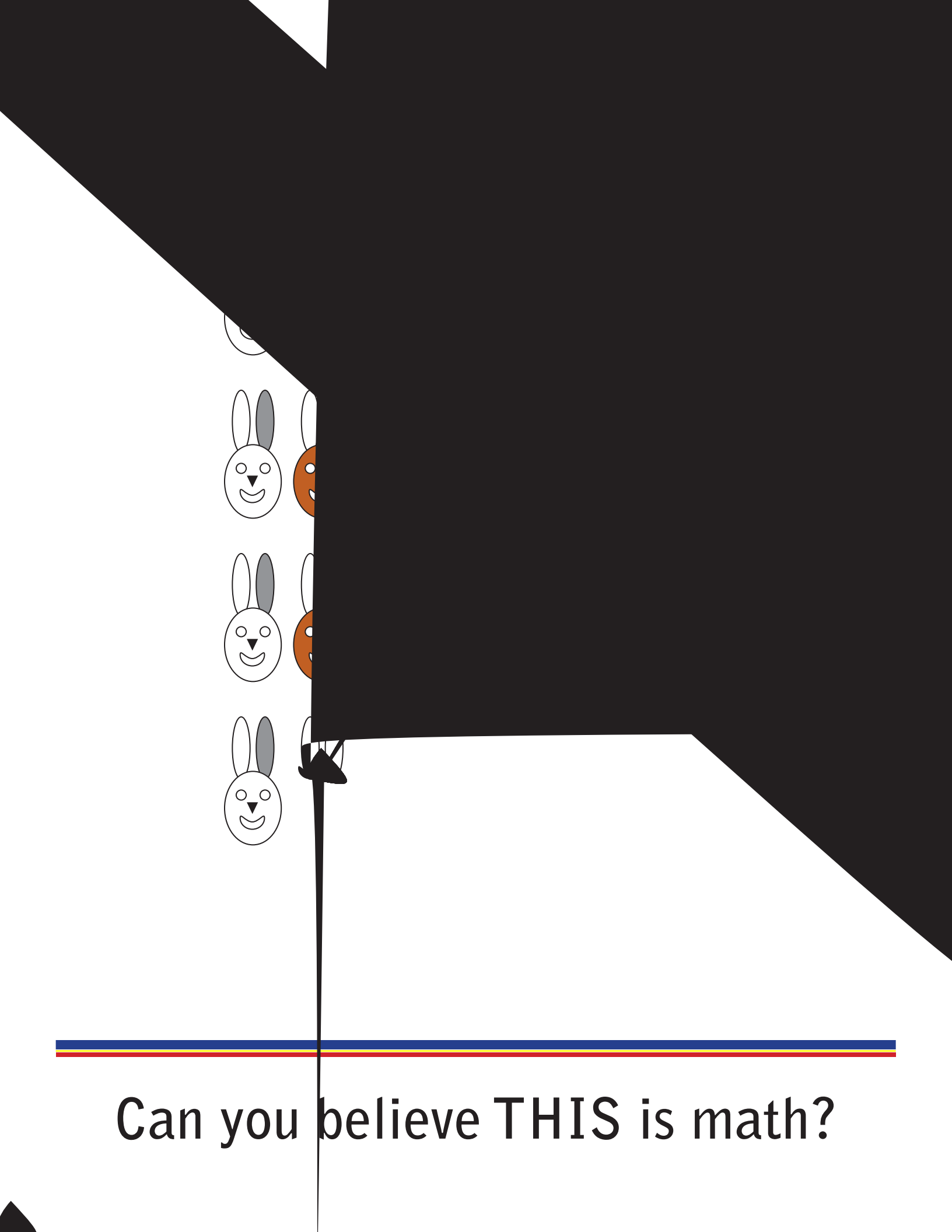
Three Pairs: At the end of third month, we have three pairs of rabbits (our original pair plus two pairs of babies)

Five Pairs: At the end of fourth month, one pair of babies of the original rabbits produce a newly born pair, while the other pair of babies mature, and our original rabbits produce another new pair. This gives us five pairs of rabbits.

The rabbit population creates the sequence: 1, 1, 2, 3, 5, ...

Activity Questions:

1. Can you complete the sequnce above for the next two generations of rabbits, i.e. two more months?
2. How many rabbits will there be at the end of the fifth month? At the end of the sixth month?
3. Do you recognize the sequence being formed? What are the numbers of rabbits at the end of the seventh and eighth months? How did you find that?
4. What was Fibonacci's answer to the original question? How many rabbits will there be in one year (at the end of 12 months)?



Can you believe THIS is math?