

Fibonacci scarf

The inspiration for this scarf was the story Fibonacci used to illustrate the generation of his famous sequence of numbers – 1, 1, 2, 3, 5, 8, 13 and so on.

Each number in the sequence is the sum of the previous two.

The story was about rabbits, and you can read it at the end of the pattern, if you are interested. You don't need to know or think about that to make the scarf, though.



Materials needed

Any yarn you like – not too scratchy!

Pair of knitting needles to suit your yarn

Crochet hook (optional)

Pattern

First 'leaf'



The scarf is made up of a series of shapes, which I am calling 'leaves', because that's what they look like to me.

Row 1: k1

Row 2: p1

Row 3: k1

Row 4: p2

Or, which is much easier, use a crochet hook or your fingers to make a chain of four stitches.

Rows 5, 7, 9, 11, 13, 15 and 17: Work to the end of the row, following these two rules:

Rule 1: Whenever you knit a stitch, immediately afterwards place a backward loop on your needle, thus making a new stitch.

Rule 2: To decide whether to knit or purl, look at how the stitch and its preceding neighbour were last worked. If it is already a knit stitch, always knit it. If it is a purl stitch which follows a knit stitch, always purl. If it is a purl stitch which follows another purl, knit it (and observe rule 1).

The number of stitches should increase with each odd row, following the Fibonacci sequence. In case you don't have the sequence memorised, here's how many stitches you should have on your needle at the end of each row:

Row 5	2 stitches
Row 7	3 stitches
Row 9	5 stitches
Row 11	8 stitches
Row 13	13 stitches
Row 15	21 stitches
Row 17	34 stitches

Rows 6, 8, 10, 12, 14, 16: Work each stitch as it appears. Knit the newly made stitches.

Row 18: k1 and turn the work.

Second leaf

You are now going to start working on the second leaf. All the stitches on your right hand needle belong to the first leaf. You will pick up just over half of them one at a time, and knit or purl them with the end stitches of your second leaf rows. Later, you will cast off the rest.

Row 19: Leaving the yarn at the back of your work, slip 1 stitch from the right needle to the left. You now have two stitches on your left needle. Knit these two together. Turn.

Row 20: p2tog. Turn

Row 21: as row 19

Row 22: as row 20

Rows 23, 25, 27, 29, 31, 33, 35: Slip 1 stitch from right to left, and knit it together with your first stitch, as in row 19, then work to the end of the row, following the rules given at row 5.

Rows 24, 26, 28, 30, 32, 34: Work back to the edge of the previous leaf, as per instructions in row 6. The last stitch you work should be purled together with the next stitch on the needle (one of the ones left over from the previous leaf). Turn. This is much easier to do than to describe.

Row 36: You have now made all the stitches for the second leaf. You should have 34 'second leaf' stitches and 16 remaining 'first leaf' stitches. Cast off 16 stitches, working each stitch as you find it. Cast off the next 18 stitches purlwise. Work the rest of the row (the remaining 'first leaf' stitches), knitting or purling each stitch as it appears.

Row 37: Cast off 15, working each stitch as you find it. You should have one stitch on the needle.

Third leaf

Place your stitch on the right needle. Pick up a thread from just behind the nearest cast-off stitch, on the tip of your left needle. Put the live stitch back on your left needle and knit the two together.

You want the cast off edge to be visible on the front of your work, as this marks the boundary between leaf 2 and leaf 3.

Row 38: Pick up a thread from just behind the next cast-off stitch (I mean behind when viewed from the front of the work – you are now on the wrong side, so you are picking up from the side of the work nearest you). Place this loop on your left needle and purl together with the stitch you have just knitted.

Row 39: Place your stitch on the right needle. Pick up a thread from just behind the nearest cast-off stitch, on the tip of your left needle. Put the live stitch back on your left needle and knit the two together.

Row 40: as row 38

Rows 41, 43, 45, 47, 49, 51, 53: Work to the last stitch of the row, following the rules given at row 5. If your last stitch is a purl, you should purl it together with a picked up thread from behind the next cast-off stitch. If your last stitch is a k1, m1, you should knit the last stitch, then make 1 by picking up a thread from behind the next cast-off stitch and purling that, instead of by making a backward loop.

Rows 42, 44, 46, 48, 50, 52: pick up a thread from behind the next cast-off stitch, as described at row 38. Knit this together with the first stitch of the row, then work to the end, as in row 6.

Row 54: pick up a thread from behind the next cast-off stitch, as described at row 38. Knit this together with the first stitch of the row, then turn the work.

Rest of the scarf

Repeat leaves 2 and 3 until you run out of yarn, or your scarf is as long as you want it. Cast off any remaining stitches.

Fibonacci's Rabbits

The original problem that Fibonacci investigated (in the year 1202) was about how fast rabbits could breed in ideal circumstances.



Suppose a newly-born pair of rabbits, one male, one female, are put in a field. Rabbits are able to mate at the age of one month so that at the end of its second month a female can produce another pair of rabbits. Suppose that our rabbits **never die** and that the female **always** produces one new pair (one male, one female) **every month** from the second month on. The puzzle that Fibonacci posed was...

How many pairs will there be in one year?

Read more about how to find the solution to the problem, and lots more about the intriguing world of Fibonacci numbers at <http://www.maths.surrey.ac.uk/hosted-sites/R.Knott/Fibonacci/fibnat.html>