

Toe-up Gusseted Heel Tutorial

originally posted on May 12, 2007

Minor changes have been made for the pdf version.

Underlined blue words are links. Access the links from the pdf document or from the original post.

I am a big fan of toe-up socks. Partly because I have large feet and I always worry about running out of yarn and partly because it just feels right to me. I also have high arches. Afterthought and short-row heels don't give me the fit I am looking for. I have been searching for the right heel and have even invented a few. My [Penny Socks](#) and [Banana Blossom Socks](#) use two different attempts at finding the "right heel". Both work in these patterns, but neither one is versatile enough to be used on any sock at any gauge.

I started thinking about heel construction and realized that I was trying to reinvent the wheel. Why not turn a top-down heel upside down?

It is pretty simple. And, it works at all gauges. I have tested it on socks knit at 6 sts/in and socks at 9.5 sts/in (shown in this tutorial) as well as fingering weight socks. This tutorial will work the math for this sock for my foot (10.25 inches long). I incorporate negative ease in the circumference and a little bit in the length of the foot because I like a snug fit. You should adapt this to suit your foot. I would love to hear what you learn.

Please note that the numbers in this tutorial are for the sock shown. I have tried to make calculating these numbers straightforward. (Let me know if this is not the case.) **You will need to calculate the numbers you need if you are using a different number of stitches.**

This tutorial is designed for a high arch. For a lower arch, see the modifications at the bottom.

Knit your sock from the toe-up using your favorite methods. When it reaches about 65% of the total length of your foot you will start on the heel flap. The math for calculating this is 10.25 inches x 0.65 = 6.7 inches. I usually use about 6.5 inches.



The first time I used this method, I made the flap with all of the sole stitches. The flap seemed to come up too far over my heel and it looked a bit clunky. Now I use 2/3 of the sole stitches and it has a much cleaner look. This sock is knit on 80 stitches, 40 soles stitches and 40 instep stitches. So $40 \text{ sts} \times \frac{2}{3} = 26.7 \text{ sts}$. I want an even number, either 26 or 28. I used 26 sts for the flap. This means 14 sole stitches will remain unworked. They are shown on the lower horizontal needle (7 sts on each side of the flap). I don't knit with that needle as shown, it is just to help you see what I'm doing; it is awkward and unnecessary to have it there. I place the extra stitches on the adjacent needles. The pins are to keep the flap from rolling while I took the picture.



Work until the sock including the flap measures about 90 - 95% of the total length of your foot. End on a right side (RS) row. 10.25 inches x 0.95 = 9.7 inches. I used 9.5 inches. Again the lower horizontal needle and pins are just for clarity.

Here is what the sock looks like without the second horizontal needle. It looks like a tie to me.



On to the heel shaping. First we need to determine the number of heel stitches we will use. The heel stitches will be the middle stitches (you'll see what they are in a minute). I use 1+ inches. In this case 10 stitches. We need the remaining flap stitches to be divisible by 4. Since this flap is worked on 26 sts and we are using 10 heel stitches, that leaves 16 stitches (I call them side stitches) which is divisible by 4.

Heel shaping starts on a wrong side (WS) row as follows:

- (WS) slip 1 purlwise, purl until 2 stitches remain on the left needle, turn work.
- (RS) slip 1 knitwise, knit until 2 stitches remain on the left needle, turn work.
- (WS) slip 1 purlwise, purl until 4 stitches remain on the left needle, turn work.
- (RS) slip 1 knitwise, knit until 4 stitches remain on the left needle, turn work.



Continue in this manner until you have only the heel stitches (10) remaining, ending on a RS row. In this case it is 10 heel stitches. There should be 8 stitches on each side of the heel stitches. $8 + 10 + 8 = 26 =$ the total number of flap stitches. Turn work to the WS.

Now we need to incorporate these stitches. You should be on a WS row.

slip 1 purlwise, purl heel stitches - 2 (for this sock it is $10 - 2 = 8$), slip, slip-purl (SSP, see below), purl 1, turn work. Even number of stitches remaining on left needle.

slip 1 knitwise, knit heel stitches - 1 ($10 - 1 = 9$), k2tog, knit 1, turn work. Even number of stitches remaining on left needle.

slip 1 purlwise, purl heel stitches (10), SSP, purl 1, turn work. Even number of stitches remaining on left needle.

slip 1 knitwise, knit heel stitches + 1 ($10 + 1 = 11$), k2tog, knit 1, turn work. Even number of stitches remaining on left needle.

Continue in this manner until all the side stitches have been incorporated. There will be fewer stitches now than you worked on the flap. Half of the side stitches have been decreased by the SSP's and k2tog's. For this sock, there should be 10 heel stitches plus half of the side stitches ($10 + 16/2 = 10 + 8 = 18$).





Here is another view of the heel from the side. As you can see there are no holes, just a clean look.

Now we need to pick up gusset stitches along each side of the flap. To make this easier, I evenly divide the stitches at the heel onto 2 needles.



Pick up one stitch in every slipped stitch along the side of the flap. I pick up both loops of the slipped stitch because I prefer that look. When you get to the base of the flap there will be a gap between the last slipped stitch and the rest of the foot stitches.

Pick up one more stitch (gap stitch), one row below the last slipped stitch. With the same needle, work

across the sole stitches that were set aside when you reduced the flap to 2/3 of the sole stitches. I like to do this so that when I work the gusset decreases, I am not at a gap between needles. It helps to keep the decreases snug and clean looking. It also returns the stitches on the instep needles to their original number.



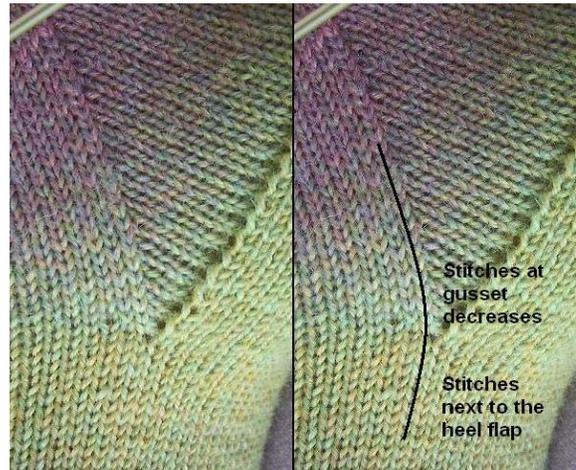
Repeat (but in reverse) for the other side of the flap. When all of the stitches are picked up, it will look like this. I now consider the back of the heel to be the start of the round. Work one round before the gusset decreases.

We will now decrease the gusset stitches until we are back to the original number of stitches at the foot (80 for this sock). Since the instep needles are restored to their original number of stitches (20 each), we will decrease until the sole needles have the same number of stitches ($20 \times 4 = 80$).



For a clean look I like to align the gusset decreases with the column of stitches adjacent to the flap stitches.

Here is an annotated version of the gusset decrease alignment. As it happens, the cleanest look comes from using the gap stitch as the line for decreasing.



Decreases are worked as follows:

Work from the back of the heel to one stitch before the first gap stitch, k2tog, work to the second gap stitch, ssk, work the rest of the round. Repeat this decrease round on every other row until you have the correct number of stitches.



Here is how it will look after a few rounds.

And, after decreases are complete.

Finish the leg and cuff as you desire.



Abbreviations:

k2tog: knit two stitches together by putting your needle into the second stitch and then the first stitch.

ssk: slip, slip, knit. Slip 1 knitwise (as if to knit), slip 1 knitwise, place both stitches back on the left needle and knit the stitches together through the back of the loop.

SSP: slip, slip, purl. Slip 1 knitwise, slip 1 knitwise, place both stitches back on the left needle, purl the two stitches together by putting the needle through the back of the second stitch and then the first stitch (see picture at right).

sts: abbreviation for stitches.



Tips:

Pull all slipped stitches tight. This will help prevent holes at the heel shaping.

I find it easiest to do the gusset decreases on pattern rows (assuming that the pattern stitch is worked on every other row). That way I know all the thinking is happening on one round. It helps me keep track of what I'm doing.

Modifications:

For a lower arch, work the foot longer, maybe to 75% of the total foot length. The flap will still be worked until it is 90 - 95% of the total foot length. The flap will end up shorter and therefore you will have fewer stitches to pick up along the flap and fewer stitches to decrease.

You may want to adjust the number of flap stitches slightly to work with the stitch pattern at the leg.

I hope you find this tutorial helpful. Please let me know if you have any questions.

I view my tutorials and patterns as guidelines. Please make any modifications that make sense for your style and fit. And, then, tell me what you have learned.