Sock heels and toes
Socks are tubes of fabric that include shaped areas for heels and toes. There are numerous ways to construct these shaped areas, and since knitted fabric is stretchy, any of these methods can accommodate a variety of foot shapes. However, some variations fit certain shapes of feet better, allowing for a more comfortable fit. We’ll explore some of the more common ways to knit heels and toes, and how to customize them.

Socks can be knitted top-down or toe-up, and we’ll look at any changes in how the heels and toes are knitted depending on the direction of your knitting. Knitters tend to develop specific preferences for types of heels and toes, so it is worth your time to try different methods.

Heels and toes are the areas of a sock that get the most abrasion, so reinforcing them will help make them last longer. You can buy sock yarn that already contains some nylon content for added strength, or choose tightly twisted yarns which are more durable than loosely twisted ones. You can purchase nylon reinforcing thread for socks in a variety of colors to coordinate with your yarn; simply add the nylon thread when you get to the heels and toes, holding it along with your sock yarn and knitting the two strands as one.

Including detailed step-by-step directions for all the heels and toes mentioned here would make this article book-length, so I have instead included references at the end. Note that terminology is not standard; I have used the most common names for the various heels and toes, but you might encounter them called something else.

Most importantly, you should know that you can substitute the heel or toe of your choice into any pattern you’re using. All heels are generally worked on about half the leg stitches, and all toes are similar in length, making substitutions easy. You are the boss of your knitting, and it is not heresy to alter a pattern, so don’t be afraid to experiment!

Toes
Toe shaping involves reducing the number of stitches at the end of the foot to narrow the sock where the end of your foot narrows. The different types of toe vary in where the decreases (top-down) or increases (toe-up) are placed and the rate of decrease/increase.

Top-down
Wedge toe: The wedge toe has paired decreases occurring on the sides of the foot, on both the sole (bottom of the foot) and instep (top of
the toe. (see the Lightning Bolt socks). You will typically perform the decreases every other row, four per round (two on each side), alternating with all-knit rows, until the number of foot stitches has been decreased by half, then decrease every row until the number of stitches is down to one-fourth. You then arrange all the remaining sole stitches on one needle and the remaining instep stitches on another, and graft the stitches together with Kitchener stitch.

One variation involves working a double decrease at each side rather than two single decreases. Another involves grafting the toe seam perpendicularly to the standard wedge toe by decreasing down to 8 sts, then placing on each needle half the instep sts and half the sole sts and grafting; this is called a Mitten Toe (see figure 1), and forms a continuous, decorative band around the tips of the toes.

For pointy toes, you can either do an extra decrease round or two, yielding fewer stitches remaining at the tip, or you can do all your decreases on alternating rounds until one-quarter of the stitches remain, which makes the toe longer and pointier, angling it more steeply. For rounded toes, you can delete one or two of the final decrease rows, ending with more stitches remaining for a wider tip. Note that these changes will alter the total length of the knitted toe, which usually measures 1.5-2” in length, depending on how many decreases you do and how often. If you change the toe length in a pattern, you will need to adjust the number of rounds on the foot to compensate. To calculate how much of the foot length to reserve for an altered toe, you can knit a sample of the toe and measure it, or calculate how many rows your proposed toe will require, and use your row gauge to calculate the length. The total foot length should be ½ to 1 inch shorter than your foot, so the sock can gently stretch over your foot; this prevents loose sock fabric from bunching up in your shoes.

Round toe: The round toe, or gored toe, has decreases spaced evenly all around the toe. You do more decreases per round than with a wedge toe, so decreases are done less often, usually every 3 to 5 rounds, forming no decrease lines for a smooth look. Or, you can work a number of plain rounds between decrease rows equal to the number of stitches between decreases, for ever closer decrease rounds (see Happy Iris socks). Since no mirroring is required of the decreases, they can all be the same; k2tog decreases give subtle decrease lines, and left-leaning decreases give more prominent decorative decrease lines. Decrease until about 8 sts remain, then gather the sts at the tip of the toe.

A round toe with only four decrease points is call a star, or four-gored, toe (see figure 3). It has decrease points on both sides and in the middle of the instep and sole. Decreases are made every other round, making a prominent decrease line, until eight stitches remain. For the best look, the total number of leg stitches should be a multiple of four, so that the spaces between the decreases are equal. If your number of leg stitches are not divisible by four, increase or decrease the needed number of stitches to make it so.

Short-row toe: This toe is used to match the diagonal lines of a short-row heel (see figure 2). Once the end of the foot is reached, short rows are worked on the instep only, while the sole stitches are held. Reduce by one stitch at each side until only about 20% of the stitches remain (this is the tip of the toe). The rows are then increased back one stitch per row until you are back up to half the foot stitches. These stitches are grafted together with the held sole stitches using Kitchener stitch. You can also start the short rows on the sole stitches and Kitchener them to the held instep stitches, but if your Kitchener stitch isn’t perfect, best to hide it on the sole.

Any of these toe styles also work for mitten tips, where you are similarly decreasing hand stitches for the tips of the fingers.

Top Down

Round toe: A reverse round (gored) toe can also be made, though this is less popular because it requires a finicky circular cast on.

Heels

Heels provide the area at the back of the foot and the 90 degree turn needed to go under the foot. As with toes, there are a number of ways to achieve this.

Top Down

Heel flaps look like a square of fabric at the back of the heel. They are worked on half the total sock stitches (you can fudge it a couple of stitches either way if needed in order to maintain any instep pattern). The instep stitches are held for later, and the flap is worked back and forth, usually with the first stitches of every row slipped to make a neat chained edge for picking up gusset stitches. They are most often made with slipped stitches, which makes the flap fabric denser and more durable.

They are generally worked square, as high as they are wide. This fits well for those with high insteps. If a longer or shorter length fits your foot better, you can simply knit several more or fewer rows in the flap (if your socks heels creep down into your shoes, then your flap is probably not long enough). If you have unusually narrow (or wide) heels, you can work the flap on fewer (or more) than half of the number of leg sts, though this may interfere with the instep pattern.

While slipped-stitch heels are common and durable, heels can be worked in stockinette stitch, with or without a decorative garter edge. You can also work a colorwork pattern on the heel, or carry the leg stitch pattern down onto the heel, if desired.

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The slipped stitches in the heel flap can be arranged to all line up in rows, giving an appearance similar to ribbing (see figure 1), or can be offset every other row for a different look, called an Eye of Partridge heel (see Happy Iris socks, which have an eye of partridge heel with garter edge).

After the flap is completed, a heel turn is worked to shape the curve that goes under the heel. Most often, a trapezoidal heel turn is worked; this type of heel is called a French Heel. The half-handkerchief, or V heel, variation has a narrower heel turn by leaving fewer stitches unworked in the center of the heel flap. The Dutch, or square heel, has a square rather than trapezoidal heel turn; the decreases occur right on the edges of a set of 6 or so center stitches, unlike the heel turn in the French Heel, in which the decreases continually move toward the edges of the heel (directions for a French heel turn can be found in the Happy Iris Socks pattern). The Dutch heel tends to be narrow, though you can broaden it by increasing the number of center stitches between decreases when the heel turn is begun. The less-used Band Heel is a Dutch heel without a gusset.

It is best to work heel flaps all on one needle, to avoid a ladder in the middle of the heel. When you rejoin to the foot, pick up an extra stitch on each side between the instep and sole, and knit it together with a sole stitch on the next round; this avoids a hole where you rejoin in the round.

Short row heels are the ones with a diagonal line like store-bought socks (see figure 2). These heels are shorter than heel flaps, and a better fit for those with low insteps. They are also less bulky than heel flaps, being worked in stockinette stitch, so they give a snappier fit. For a wider heel, you can work the short rows on 60% of the total stitches instead of 50%, but check to make sure this won’t interfere with the pattern on the instep. For a higher instep, you can knit another half or three-quarters of an inch above the short row heel in a compatible pattern (stockinette if the heel is in stockinette, garter if it’s in garter) to add length to the heel; this is done while the instep sts are being held and you are knitting flat, in order to add length to the heel only.

Short row heels are also worked on half the total stitches, and are symmetrical top to bottom, so are worked the same whether you knit them top-down or toe-up. You work one fewer stitch each row until you are down to the number of stitches you want for the base of the heel. For wider heels, leave more stitches unworked (do fewer rows); for narrower heels, leave fewer stitches unworked. To avoid holes when working short rows, you can use any short-row technique (such as wrapped stitches). When you rejoin the instep stitches to knit in the round, you will probably need to pick up a stitch in the gap between the instep and sole stitches in order to avoid a hole where those stitches have stretched while working the heel.

There are variations which make these rounder for a wider heel, such as Cat Bordhi’s Sweet Tomato Heel. You work two or three sets of short rows, with several stockinette full rounds of the sock (heel plus instep) in between working the back-and-forth short row sections.

The Strong Heel (named for its creator, Gerdine Crawford-Strong) is easy to knit, since it involves neither picking up stitches for a gusset nor working short rows. To form the heel, you continue knitting in the round, incorporating two increases on the heel stitches every other row. When the number of heel stitches is roughly doubled, a heel turn is worked back and forth to reduce back to the starting number of leg stitches. This allows for an uninterrupted pattern (except at the heel turn) for self-patterning yarns. The heel increases can be worked at the sides of heel or at the center back (see Lightning Bolt socks).

Common and shaped common heels have a heel flap but no heel turn. The flap is worked, then folded in half lengthwise and kitchenered shut at the bottom (the join will be under the heel), with gusset sts then picked up alongside the heel. The heel is square when observed from the side, and the gusset is small, so there is less room for a high instep. A variation is the shaped common heel, which includes decreases to round off the back of the heel (see Figure 3).

Toe up
Short row heels are worked exactly the same toe up as top down. You can also add half to three quarters of an inch to the upper part of the heel to accommodate a higher instep.

You can also work a heel turn and heel flap in reverse, as well as a Strong heel in reverse; these involve some calculations as to how much of the total foot length the heel turn will require, so that you know how much of the foot length to reserve for the heel.

An afterthought, or peasant, heel can be added after a sock is otherwise complete. This involves picking up stitches where the heel will be, either by clipping a stitch and unraveling half a row, or removing waste yarn which was knitted in. A wedge toe is then knit for the heel. With no gussets, these are best suited to low insteps. There are yet more variations of heels and toes to be found. The latest trend is in new sock architecture, moving gussets around to new locations on the foot. Sock knitting is indeed an old craft with continuing innovations. Understanding the basic construction of a variety of heels and toes gives you the tools you need to experiment and create your own customized socks for a perfect fit.

References:
HAPPY IRIS SOCKS
BY NANCY SIMET

These socks, with a flower growing out of grass (the green foot), make me smile every time I look at them. The picot hem and airy trellis design on the back complement the feminine flower. I tried swatching the flower in blues and purples, but the result was surprisingly bland, even though these are colors I love. The final version’s complementary colors (green with red/orange) add a vibrancy lacking in the purple/blue/green analogous color scheme.

Sizes: S (M, L)

Finished Measurements:
Foot circumference: 8”
Foot length: 9 (9.5, 10)“

DESIGNER NOTE: The sock stretches to fit a range of widths. However, if you desire a narrower width, use a smaller needle; for a wider width, add knit columns in MC to the sides of one or both charts. Note that the toe requires the foot to have a multiple of 7 stitches, so if you add a number of stitches other than a multiple of 7, you will need to adjust the total before beginning the toe.

Materials:
Knit Picks PALETTE (50g/231yds, 100% Peruvian Highland Wool): 1 skein each of:
#23728 White (MC), #25533 Tomato (CC1),
#24252 Cornmeal (CC2), #24557 Conch (CC3),
#24257 Edamame (CC4), and #24258 Green Tea Heather (CC5)
Size 1 (2.25mm) needles (dpns or 2 circulars)
or size needed to obtain gauge
Stitch markers
Tapestry needle
Nylon reinforcing thread for heels and toes (optional)

Gauge:
In St st, 33 sts & 44 rnds = 4”/10cm. To save time, take time to check gauge.

Stitch Patterns:
Flower (front of leg) – See Chart 1
Trellis (back of leg) – See Chart 2
Picot cuff
Using MC loosely CO 68 sts. Join in the round, being careful not to twist sts, and pm for beg of rnd.

TECHNICAL TIP: The directions are written for dpns but can easily be adapted for magic loop or two circulars by putting all the instep stitches (front of leg) on one needle and all the sole stitches (back of leg) on another.

Rnd 1-4: Knit all sts.
Rnd 5: *Yo, k2tog; rep from * around.
Rnd 6-9: Knit all sts.
Rnd 10: Fold up your work, wrong sides together, so that the cast on edge is against the needles and the eyelet round (rnd 5) is at the bottom. Knit the first st of this rnd with the first st of the cast on rnd, being sure to pick up the first st so that the picot hem doesn’t bias. Continue knitting the next cast on st with the next live st, to the end of the rnd.

TECHNICAL TIP: I find it easiest to pick up a cast on stitch and put it on the left needle before working the k2tog. To find the next cast on stitch to pick up, look to see which stitch your working yarn is pulled through; pick up the next stitch.

Rnds 11: Knit one round.
Rnds 12 & 14: (Adding CC1) *K1 CC1, k1 MC; rep from * around.
Rnds 13 & 14: Knit 2 rnds in MC.

TECHNICAL TIP: If you tend to knit Fair Isle more tightly than stockinette, you can go up a needle size for this portion of the leg. Switch back to the smaller size when you start the heel.

Leg
Arrange sts, putting the first 33 sts onto one needle and the next 35 sts divided onto two needles.

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Work Chart 1 on first 33 sts (the front of the leg), and work Chart 2 on the remaining sts (the back of the leg, which will become the heel and the sole).

Work Chart 1 once, using the colors indicated, and continue with those colors around the back of the leg on chart 2.

Chart 2 is worked five times, plus row 1 once more. Note that the very first and the very last time that row 1 of Chart 2 is worked, sts #3 and #13 of the chart are to be worked in MC; this prevents the dots within the diamonds of the lattice from appearing above and below the lattice.

**TECHNICAL TIP:** If you used larger sized needles for the leg, switch back to smaller needles at this point.

**DESIGNER NOTE:** Knit Picks PALETTE comes in a wide range of colors for Fair Isle but contains no nylon content; adding nylon reinforcing thread to the heels and toes will make the socks more durable.

**Heel**

Break off MC and CC4, and attach CC5, the foot color. Knit one rnd, removing the beg of the leg and continue with those colors around the back of the leg to go all the way down to the sides of the leg to go all the way down to the toes, sl1, k3.

Work these four rows approx. 9 times or until heel flap measures about 2.25". For a higher foot, switch back to smaller needles at this point.

**Heel Turn**

Resume knitting in the round.

**Finishing**

Block, and weave in yarn tails.

**Reference:**


The charts for this pattern can be found in the Cast On extras section at TKGA.com.
Heel
Still working in the rnd, cont chart in pat and work 32 (36) sts for the instep. Work the next 15 (17) sts in pat, pm (use markers distinctive from the beg of rnd marker), knit 2 sts, pm, work the next 15 (17) sts in pattern.

DESIGNER NOTE: Increases are made in the back of the heel between the markers, keeping those stitches in Stockinette stitch, while the remaining stitches are worked in pattern. This way, the pattern extends all the way to the bottom of the foot.

Heel rnd 1: Work in pat to marker, sm, M1R, knit to next marker, M1L, sm, cont in pat to end of rnd (2 sts increased).

Heel rnd 2: Work in pat, knitting all sts between markers.

Rep heel rnds 1 and 2 until there are 60 (68) total heel sts. Make a note which row of the chart you are on, to resume in pat after the heel turn.

Heel Turn

DESIGNER NOTE: Remove heel markers as you come to them; the beg of rnd marker stays where it is.

Turn work to WS, working only the heel sts as follows:
Row 1 (WS): Sl1, p30 (34), p2tog, p1, turn.
Row 2 (RS): Sl1, k3, SSK, k1, turn.
Row 3: Sl1, p to within one st of gap; p2tog, p1, turn.
Row 4: Sl1, k to within one st of gap; ssk, k1, turn.

Rep rows 3 and 4 until all sts are worked and there are once again 32 (36) heel sts.

Foot
Start working in the rnd again, picking up an extra st in the gaps between the heel and the instep to avoid holes, and decreasing the extra sts away on the next rnd. Cont working in pat on the instep, picking up on the chart where you left off for the heel, and work St st on the sole. Cont until within 2” of desired length from back of heel, about 7.5 (8.5)”.

Next rnd: knit across the instep and half of the heel, moving the beg of rnd marker to the center of the heel.

Toe
Rnd 1: Knit to within 3 sts of the end of the heel, k2tog, k1. Knit the first instep st, ssk, knit to within 3 sts of the end of instep sts, k2tog, k1. Knit the first heel st, ssk, k to end of rnd.
Rnd 2: Knit all sts.
Rep rnds 1 and 2 until half the sts remain – 32 (36) sts. Repeat only rnd 1 (the dec rnd) until 20 (22) sts remain. Graft toe together with Kitchener stitch. Block and weave in all ends.

The charts for this pattern can be found in the Cast On extras section at TKGA.com.