



by Sandi Rosner

In the Netherlands, it's *steekverhouding*. In the U.K., it's tension. In Portugal, it's *amostra*. In any language, understanding gauge is essential to successful knitting.

Gauge is a statement that describes the specific number of stitches and rows required to create a piece of knitted fabric of a certain size. Pick up any knitting pattern and you'll see a statement that looks something like this:

### **Gauge**

22 sts and 28 rows = 4"/10cm in Stockinette st using size 6 US/4mm needles.

### **Why is Gauge Important?**

Every pattern is planned with a specific stitch gauge in mind. If you work the project at a different gauge than the one called for in the pattern, your finished piece will turn out to be a different size. Let's say you're working a sweater that measures 40 inches (101.5cm) at the bust. If the pattern calls for a gauge of 22 stitches over four inches (10cm), you would be instructed to work over 220 stitches. If it turns out that you're knitting 20 stitches over four inches (10cm) instead of the called for 22, you're going to end up with a piece that measures 44 inches (112cm) around—and that's going to make a big difference in the way the finished sweater will fit.

### **Yarn, needles, stitch pattern, and the hands of the knitter all influence gauge.**

Let's start with the yarn. The thickness, fiber content and loftiness of a particular skein all have an impact on gauge. Most yarns have a recommended gauge listed on the label, but designers often choose to work the yarn at a different gauge than recommended by the manufacturer. A looser gauge will produce an airier fabric with plenty of drape—just the thing for a lace shawl or silky top. A tighter gauge will produce a thicker, sturdier fabric, ideal for making socks or more structured garments.

The size and type of needle used will also affect the size of the knitted stitches. Cast on the same number of stitches in the same yarn in needles of two different sizes and you'll get two completely different gauge measurements. That's because the larger needle will make larger stitches than its smaller counterpart. But size isn't the only needle consideration. The material the needles are made of can also impact gauge. You may find that you knit tighter when working on a slick aluminum or nickel needles and looser on less-slippery wood and styles.

These swatches below were both knit in Lorna's Laces Honor, using size 5 US/3.5mm needles. The swatch on the left was knit on Clover bamboo needles; the swatch on the right with brass Addi Lace needles. The difference is striking.



*The swatch on the right was knit on size 5 US/3.75mm brass Addi Lace needles and has a gauge of 24 sts and 32 rows = 4"/10cm. The swatch on the left was knit on size 5 US/3.75mm bamboo Clover needles and has a gauge of 20 sts and 33 rows = 4"/10cm. Both swatches are 40 stitches wide and 50 rows tall. The yarn is Lorna's Laces Honor, 70% baby alpaca, 30% silk.*

The same needles and the same yarn can also produce a different gauge when they're used in different stitch patterns. Cables and ribbing pull in, so they usually yield more stitches per inch/centimeter than other stitches. The holes inherent in lace make it expand; the more holes, the looser the gauge will be. Garter stitch is always shorter and usually wider than stockinette stitch. Many people find that they purl looser than they knit, so patterns with lots of purl stitches can have a looser gauge.

The swatches shown here are all 40 stitches wide and 50 rows tall. Each was knit in the same yarn (O-Wool Classic) using size 7 US/4.5mm needles. But as the photos show, different stitches yielded very different gauges.



*All three swatches are 40 sts wide and 50 rows tall. All were knit on size 7 US/4.5mm ebony needles. The yarn is O-Wool Classic, 100% organic Merino wool. The cable swatch measures 29 sts and 30 rows = 4"/10cm, the stockinette stitch swatch is 18 sts and 27 rows = 4"/10cm, and the garter stitch swatch is 15 sts and 36 rows = 4"/10cm.*

The final factor contributing to gauge lies (literally) in the hands of the knitter. When I owned a yarn store, we offered a class called the Block of the Month Club. One Saturday morning each month, a dozen knitters would gather to learn a new stitch pattern. These were worked in blocks that were planned to be six inches (15cm) square, with the intent that the finished squares could be assembled into a scarf or throw. Everyone worked the blocks with the same yarn (Cascade 220), and everyone used size 7 (4.5mm) needles. At the end of the class, the finished blocks measured anywhere from five to six inches (12.5-15cm) square. Same yarn. Same needles. Same stitch pattern. Different knitters.

We all have a natural tension with which we knit. You may be a tight knitter or a loose knitter. Neither is good or bad. One is not better than the other. You just need to know which you are and make appropriate allowances in your knitting.

## Measuring Up

Every group has the self-confident knitter who declares, "I always knit to gauge." Usually, this is given as an excuse for not making a gauge swatch. It may well be true, but there's no guarantee the person who wrote the pattern you're following knits to the same gauge. There is no standard. The gauge given in a pattern or on a yarn label is determined by the person who knit the samples or wrote the pattern. And the only way to make sure that you are knitting to the same gauge as that written on the label or in the pattern is to take the time to make a gauge swatch.

Designers make swatches. Lots and lots of swatches. Big ones. That's because they understand that those squares of stitching provide an unequalled opportunity for experimentation, education

and play. Along with helping the designer discover how a particular yarn will look and behave when knitted up, swatches are also great vehicles for testing out stitch patterns and color combinations. Smaller and less-time consuming than a sweater, they're a canvas for creative exploration without a lot of commitment. But they also serve a technical purpose—they determine the gauge for the piece, something the designer needs to write the pattern and the knitter needs to execute it properly.

When you see a gauge specification that reads "22 sts and 28 rows = 4"/10cm" do you automatically grab the specified needle size, cast on 22 stitches, work 28 rows in the called-for stitch pattern and bind off? If you do, you're making a mistake. Knitting a small swatch is like speed dating. You'll get a superficial first impression, but you can't discover everything you need to know about the yarn and pattern before you commit. A larger swatch is like several weeks of dinners, movies and walks in the park. You'll get enough information to decide whether to move forward.

To be worthwhile, your gauge sample should measure at least six inches (15cm) square. So cast on enough stitches for swatch at least that size. Using our example above, that means at least 33 stitches, though I'd probably do 40 because I like round numbers. Work in the stated stitch pattern until the piece is at least six inches (15cm) long, and then bind off. Now you're ready to measure. To measure for stitch gauge, place a ruler or tape measure in the middle of the swatch (measuring horizontally) and count the number of stitches in four inches (10cm). Half-stitches count. This swatch (knit in O-Wool Classic) has a stitch gauge of 18 stitches = 4"/10cm. To measure for row gauge, turn the ruler vertically and count how many rows are in 4" (10cm), again avoiding the edges. The row count for the swatch below is 27 rows = 4"/10cm.

click to see larger



18 sts = 4"/10cm.





*27 rows = 4"/10cm.*

If a fuzzy or highly textured yarn is making it difficult to count the individual stitches, try this trick: Lay the swatch on a table and use pins or a contrasting colored yarn to mark off a four-inch (10cm) section of the fabric. Now pick up the swatch and hold it up to a light. Stretch it a bit if necessary to see the stitches, and then count the number of stitches between the markers.

click to see larger



*The marked area is 4"/10cm square. This swatch was knit on size 9 US/4.5mm needles and measures 14 sts and 20 rows = 4"/10cm. The yarn is Nashua Handknits Creative Focus Mohair, 75% kid mohair, 20% wool, 5% polyamide.*

Now it's time to block your swatch. Many yarns change dramatically when steamed, washed, or pinned out and stretched. It's always better to know this up front. Skip this step and you risk ending up with a garment that fits only until the first time you wash it. Treat your swatch the same way you plan to treat the finished garment. If you plan to machine wash and dry the sweater, toss the swatch in with a load of laundry. If you plan to dry clean, steam your swatch thoroughly, gently pat and smooth it with your hands, then leave it flat to dry.

Once the swatch is dry, measure it again. Has the gauge changed? Make a note of this information. Sometimes a pattern will specify a pre-blocking gauge and a post-blocking gauge. If not, assume that the gauge listed in the pattern is the gauge after blocking.

## Assess the Results

Now comes the moment of truth. Compare the gauge of your swatch to the gauge specification for the pattern. Do they match? If so, congratulations! If not, try again with a different needle size. If you got more stitches to the inch/centimeter than you wanted, use a larger needle. If you got fewer stitches to the inch/centimeter, use a smaller needle. In general, changing the needle size by .5mm will produce a gauge change of half a stitch in every inch, but your mileage may vary. Make another swatch.

Even if your gauge is exactly what you want it to be, you are not through with your swatch. Did you enjoy knitting it, or did you find the stitch pattern a struggle? Will you enjoy making an entire sweater with that stitch pattern? (I'll abandon a project if the knitting isn't fun, and an honest evaluation of the swatch can save me from investing in a project that ends up glowering at me from my basket of UFOs.) Do you like the way the swatch looks and feels? Does it drape the way you want it to? Put the swatch in your pocket and play with it for a day. Is the degree of pilling tolerable? Will you enjoy wearing a sweater made from that fabric? You are about to invest hard-earned money and precious time in this project. Does your swatch make you excited to be doing so? If the answer is yes, dive into the project, but remember:

In the immortal words of the Yarn Harlot, "swatches lie."

The conditions under which you made your gauge swatch may not be the conditions under which you'll knit your entire sweater. Your gauge may change a bit in the course of the project. If you are sitting by the fire with a glass of wine knitting to the accompaniment of Bach's cello concertos, your knitting may be more relaxed, and you'll knit a little looser. If the kids are bickering, the dog just threw up on the rug and the car decided it needs a new alternator, it's understandable if you tighten up a bit.

Once you are a several rows into your project, check your gauge. Spread the knitting out on your lap, take a moment to admire it, and then pull out your ruler. Does your gauge still measure up? If not, make adjustments. There is no law that says you can't change needle size in the middle of a piece. If your knitting is a bit tighter than the desired gauge, get a needle one size larger. If you've loosened up as you settle into the stitch pattern, change to a needle one size smaller. You won't see a difference when you look at the piece, but the result will be a project that ends up closer to the size you want it to be.

## **What if You Don't Want to Worry About Gauge?**

Is it ever okay to forget about swatching? Of course! There is no need to make a swatch if the yarn is an old friend you've used many times before and if you don't care how big the finished project is. If you have a large family in need of winter hats and some leftover yarn in your stash, by all means skip the swatch and dive right in. The hat is sure to fit someone. If you are making a baby blanket using the pattern you've made for the last eight babies born in your family, don't hesitate to cast on. A couple of inches here or there won't make any difference.



But if you are going to spend time and money making a sweater that you actually want to fit a specific body, take care with gauge. Would you buy a car without a test drive? The more time and money involved, the more attention you should devote to your swatch. It is the best predictor of your final result and a key to successful knitting.