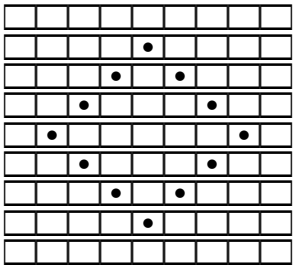
Chapter 210

WORKING PATTERN REPEATS

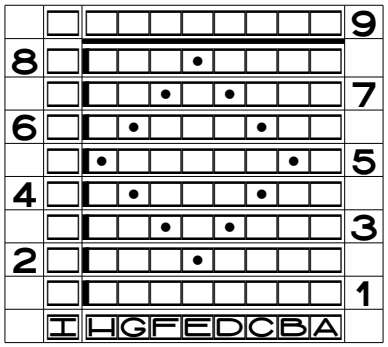
So far, the swatches and projects have been small, and their charts show every stitch of every row. These projects would make good coasters, hot pads, or small dish scrubbers, depending on the yarn used.

If we want to make a large item, like a sweater or blanket, with a pattern that gets repeated many times, then we need to understand how to work from charts with *pattern repeats*.

Let's use the small version of the purl-diamond project's motif. The chart in that section was



Here's the chart with dark lines showing the *stitch repeat* and the *row repeat*.[1] The chart has been put in a multi-column, multi-row table.



The bold lines are the repeat boundaries. The bold vertical line between stitches H and I, made with the Stitch Repeat marker under the | symbol, shows the boundary of the *stitch repeat*. The bold horizontal line between rows eight and nine, made by making the cell border heavier, shows the boundary of the *row repeat*.

What do these terms mean? How do we interpret the chart?

For the purposes of the following discussion, we will assume that we have cast on forty-one stitches and that there are no border stitches of any kind on the sampler.

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[1] We'll figure out how to ***create*** such a chart in the next chapter, once we've learned how to read them.

The Stitch Repeat

To work from the chart, we would work stitches A through H, the first eight stitches, in the normal way, reading the stitches from right to left, since row one is a public-side row.

Since the stitch-repeat marker is after stitch H, it directs us to go back to the beginning of the row to stitch A and work stitches A through H a second time, when we again come to the stitch-repeat marker. We keep working stitches A through H in the same way all the way across the piece until we have only one stitch left. We should have worked stitches A through H five times, using up forty of the forty-one stitches.

The Plus Stitch

When we have only one stitch left on the needle, we work stitch I, the ***plus stitch***.

It isn't obvious on row one, so pop up to row five for a minute. Imagine we have worked row five all the way across until we have only one stitch left. At that point, we work stitch I. Since we started row five with a knit stitch *before* the right point of the *first* purl-diamond motif, the plus stitch I gives us a knit stitch *after* the left point of the *last* purl-diamond motif.

In other words, the plus stitch usually mirror-images how the pattern began, so that the left edge looks the same as the right edge (or finishes the last motif neatly if the motif is not symmetrical).

Private-Side Rows

When we have finished chart row one, we go on to chart row two. We work it exactly the same way that we worked row one.

Are you thinking, *Wait! Row two is a private-side row! What do I do?*

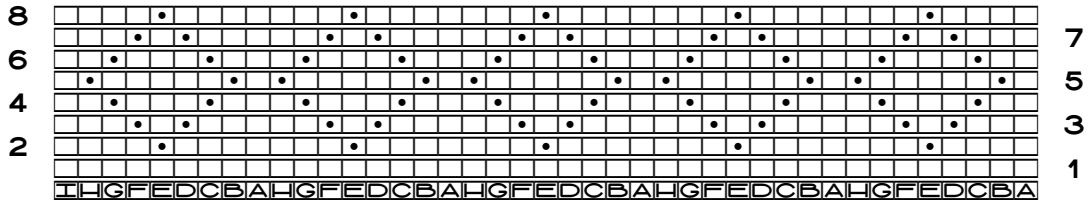
Since on a private-side row we either turn the chart upside-down or read the chart from left to right, the first stitch we work would be the plus stitch, stitch I. Then we work stitches H through A. When we have worked stitch A the first time, we go back to the first stitch after the stitch-repeat marker, stitch H, and work stitches H through A a second, third, fourth, and fifth time.

When we finish the fifth set of stitches H through A, we should have worked all forty-one stitches. Note that if we don't have eight stitches left when we begin the last repeat of stitches H through A, we have made a mistake somewhere along the way.

We work each of rows one through eight this same way, flipping the chart right-side up or upside-down as needed (or reading left to right on the private-side rows while leaving the chart the right-side up all the time).

After We Complete the First Eight Rows

What we've actually worked so far could be charted like this:



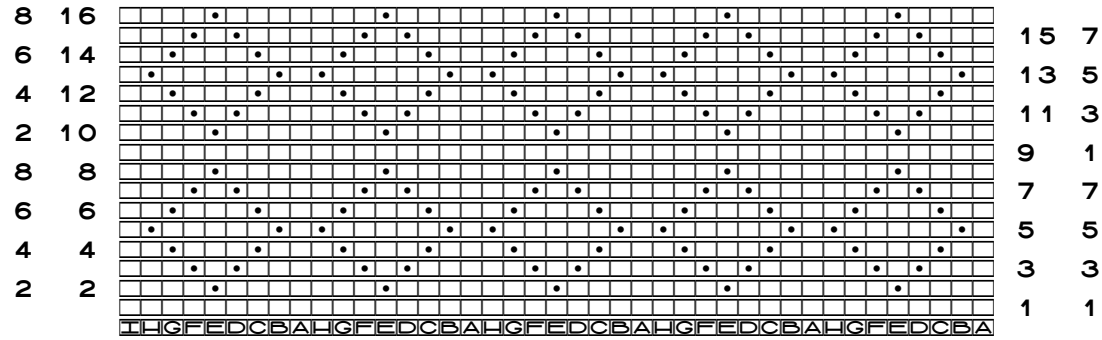
From this as-worked chart, we see that on each row, we've worked stitches A through H five times, and we've worked the plus stitch, stitch I, only once.

The Row Repeat

When we get to row eight, we see it has a bold line above it. Just as the bold ***vertical*** line showed the end of the ***stitch*** repeat, the bold ***horizontal*** line means we have finished the last row of the ***row*** repeat.

So we start back over again with row one.

When we've worked the row repeat twice, we will have worked the equivalent of this chart:



The outer two columns contain the stitch pattern's row numbers, while the inner two columns are the project's row numbers.

When we complete pattern-rows one through eight for the second time, we once again go back and start with pattern-row one. We would work as many sets of rows one through eight as needed, whether because the directions say how many times we should work those eight rows or because we decide the item is long enough.

The Plus Row

You might be able to guess what we do now. Since we repeated pattern-rows one through eight as many times as necessary, we work pattern-row nine just once to finish up.

In the same way that the plus stitch balanced out each row, to make each row end the same way it began, to make the right and left edges be mirror images (or finish neatly an asymmetrical motif), the plus row balances out the pattern vertically, making the last row of the entire piece mirror-image the very first row (or finishing it if it isn't symmetrical).

Since there is a row of knit stitches ***below*** the ***first*** row of diamonds, row nine puts a row of knit stitches ***above*** the ***last*** row of diamonds.

The Plus Row Usually Has the Same Stitch Repeat

Even though the sample chart's plus row doesn't actually show the stitch repeat between stitches H and I, we do need to work the same stitch repeat (stitches A through H) all across the plus row.

Charts may not show the stitch repeat in the plus row, so if that's the case, we simply must remember to extend the stitch repeat into the row repeat on our own.

Stitch Repeat, Row Repeat, or Pattern Repeat?

Sometimes project instructions will use the generic term *pattern repeat* instead of either of the more explicit terms *stitch repeat* and *row repeat*.

Usually it's clear from the context exactly which of the two specific repeats the instructions are referring to. In other cases, *pattern repeat* will mean the combination of the stitch and row repeat.

Advantage of Charting Only the Pattern Repeat

One obvious advantage of charting only the pattern repeat is that the chart symbols can be a lot bigger! Compare the symbol sizes in the two as-worked charts with the one that shows only the pattern repeat.

Review: Stitch and Row Repeats

There are a few key points to take away from working this first chart with pattern repeats.

Work the Stitch Repeat Over and Over Across the Row

Each time we finish working the stitch repeat, we go back to the beginning of the chart and again work through to the stitch-repeat marker. We keep working those same chart stitches

until we don't have enough stitches left to do another repeat. At that point, we work the plus stitch.

We Can Use Ring Markers Between the Pattern Repeats

The ring markers will let us know by the end of each repeat if we have made a mistake. For this pattern, we would have a ring marker every eight stitches (counting from the right on a public-side row), and there would be just one stitch to the left of the last ring marker (or we could omit the last ring marker and have nine stitches, the eight from the final stitch repeat and the single plus stitch, after the last marker).

For this pattern, ring markers aren't necessary. But the technique is the same for complicated patterns.

There are patterns that we might call "marker-unfriendly." See the section at the end of the chapter for ideas on working such patterns.

Work the Plus Stitch Only Once per Row

The stitch outside the stitch repeat is the plus stitch, which gets worked only one time on each row. Whether the plus stitch is at the beginning or end of the row depends on whether we're working a public- or private-side row.

Work the Row Repeat Over and Over

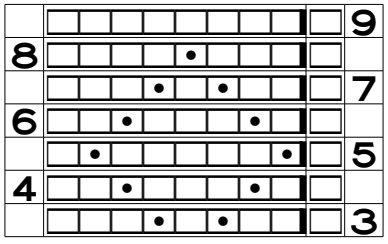
The row repeat gives the project its length (or height). We work the row repeat to desired length or as many times as the instructions tell us to.

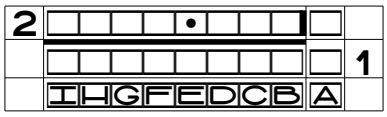
Work the Plus Row Only Once

When we have worked as many row repeats of the pattern rows as directed or desired, we work the plus row to finish off the pattern the same way it started.

A Variation on the Chart

Plus stitches and rows don't always come after the pattern repeat. We can have plus stitches and/or rows ***before*** the pattern repeat. Suppose the purl diamond chart was drawn this way:





How would we interpret this chart?

The Stitch Repeat

Let's start the discussion with row three, which is the first public-side row within the stitch repeat, still assuming we have cast on forty-one stitches.

The plus stitch on each row is stitch A. So on public-side rows three, five, seven, and nine, we would work stitch A, then we would work stitches B through I repeatedly across the remaining forty stitches.

For private-side rows two, four, six, and eight, we would work stitches I through B five times, then on the final stitch, we would work the plus stitch A.

Even with the plus stitch on the right edge of the chart, the project as worked has a knit stitch both before the first diamond and after the last diamond.

The Row Repeat

The plus row is row one. So we would work row one once, interpreting stitch A as the plus stitch (since it's outside the confines of the stitch repeat on rows two through nine, even though there's not an explicit stitch-repeat marker on row one), then we would work rows two through nine.

When we complete row nine, we go back to row two, the first row past the row-repeat marker, and work rows two through nine again. We work rows two through nine as many times as directed or desired, and then we bind off.

Note that we still have mirror-image plain knit rows both below the first row of diamonds and above the last row of diamonds.

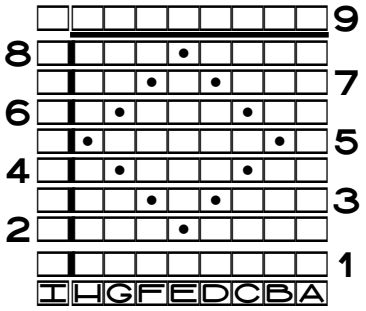
Two More Versions of the Same Chart

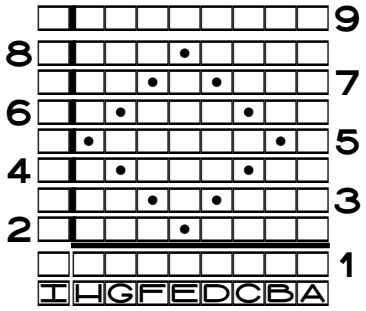
Since the chart could show the plus stitch before or after the stitch repeat, and it could also have the plus row before or after the row repeat, there are actually four combinations, resulting in four different charts.

Plus Stitch After Stitch Repeat

The chart on the left is the one we started with at the beginning of the chapter. The row repeat is worked first, then we work the last row, which is the plus row, just once.

In the chart on the right, the stitch repeat is still stitches A through H, and the plus stitch is still stitch I. But the plus row is before the row repeat. So row one is worked just once, then rows two through nine are worked over and over as the row repeat.



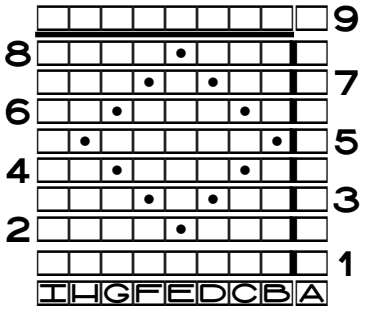


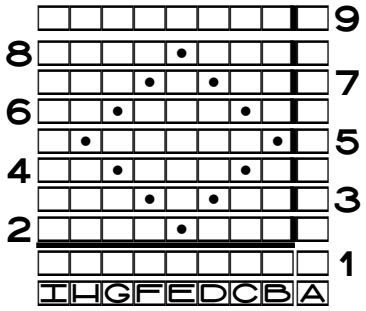
Plus Stitch Before Stitch Repeat

In these two charts, the plus stitch is stitch A. So stitch A is worked only once per row, and stitches B through I are worked over and over across the piece.

In the chart on the left, the row repeat is rows one through eight, and row nine is the plus row.

In the chart on the right, the plus row is row one, worked just once at the very beginning, and the row repeat is rows two through nine.





Most Charts Are Clear

In all four of these small charts, regardless of where the plus stitch and plus row are, it's clear which part of each chart forms the pattern repeat, both horizontally across the stitches and vertically up the rows.

In general, most charts will be similarly clear about which part of the chart shows the pattern repeat itself and which parts form the plus stitches and plus rows.

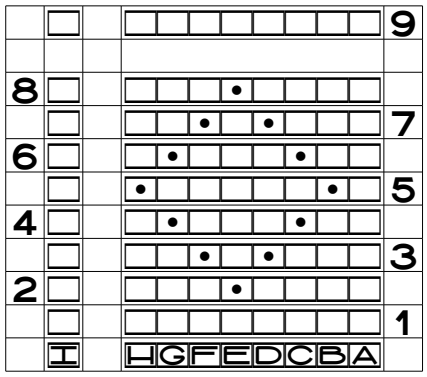
The stitch repeat is usually the bulk of the stitches width-wise, while the plus stitches are

often fewer in number. The row repeat is likewise usually the bulk of the chart's rows, while the plus rows amount to just a few rows.

An Alternate Way to Show the Pattern Repeat

It can get fiddly to change the width of a single side of a row of table cells to indicate the row repeat, and using the stitch-repeat marker can also be troublesome.

If we don't want to work that hard, we could also use an empty row and an empty column to indicate the stitch and row repeat.



Note that marking the stitch repeat with a blank column means that the stitch repeat appears in the plus row explicitly, which might be a good thing.

(The eagle-eyed may have noticed that the first few charts already had the plus stitch in its own table column. Why? So that the dark border indicating the plus row would only be the width of the stitch repeat, not of the entire chart.)

One Last Point

While all the small charts in this chapter have shown a design with only one plus stitch on only one side, there are, in fact, many patterns that need more than one plus stitch. There could be two or more plus stitches on only one side of the stitch repeat, or there could be multiple plus stitches on both sides of the stitch repeat (and the number of plus stitches before and after the stitch repeat does not have to be the same).

In the same way, there might be any number of plus rows below the row repeat, above the row repeat, or both below and above the row repeat.

We'll see an example of a more complicated chart in chapter 230.

Charting Rules: Working Pattern Repeats

Since there can be multiple plus stitches and plus rows both before and after the stitch pattern's stitch and row repeats, we need to account for those possibilities.

> If there is only one stitch-repeat marker in the chart, then it should be clear which stitches are in the stitch repeat and which stitches are the plus stitches.

> We work the stitch repeat as many times as necessary across each row, and we work the plus stitches only once per row.

> If there is only one row-repeat marker in the chart, it should be clear which rows are in the row repeat and which rows are the plus rows.

> We work the row repeat as many times as necessary, and we work plus rows only one time.

Lessons Learned: Working Pattern Repeats

There are several lessons that fall out of learning to work pattern repeats from charts.

- Depending on the complexity of the pattern, we may want to put ring markers between the pattern repeats so that we will know by the end of each repeat if we have made a mistake.
- When we look in our pattern books and see that a pattern has a repeat of "8 stitches plus 3," we now know exactly what that means. We repeat eight of the stitches over and over along each row, and we work the three plus stitches on each row only once. If the pattern repeat is given as the even more terse "6 + 4," we know that we will work the six stitches of the pattern repeat over and over on each row and the four plus stitches only once per row.

You Already Knew How to Do This

Have you realized that you actually already knew how to work a pattern repeat?

You did. Really.

Because when pattern designers and editors put asterisks in lines of written-out direc-

tions, they are showing you, for that one row, where the pattern repeat is. You have seen and worked with indicators that say to work to a certain point, then go back to the starting point and work to that certain point again, and to work those same stitches over and over again all the way across the piece.

After the instruction that tells you to repeat the part between the asterisks, there may be extra stitches you have to work just once, at the end of that row. And there may well have been, before the first asterisk, stitches that you worked only once, at the beginning of that row.

The stitches before the first asterisk and the stitches after the last asterisk are the plus stitches for that row, just like plus stitches that are shown on the charted version of a pattern.

When a pattern tells you to repeat certain rows over and over again, that instruction is a written-out version of a chart's row repeat.

Charts and written-out instructions do the same thing. They simply do it in different ways.

Working Pattern Repeats in the Round

In circular knitting, the end of a round technically does not meet the beginning of the round, at least not in the way that it would if we worked flat and sewed the beginning of each row exactly to its own end.

Instead, working in the round on circs or DPNs means that each round connects to the ones before and after it in the same way that a Slinky's coils connect to one another. The knitting rounds coil around and around and around, just like the coils of a Slinky.

There are advantages and disadvantages to working in the round.

An Advantage

For the most part, plus stitches are needed to make the left and right edges of a piece match.

But if we are working a continuous tube, as for the sleeve or body of a sweater, or for a sock or hat, then every pattern repeat is going to need to bump up against another pattern repeat.

Since there is no beginning or end—since every instance of the pattern is sandwiched between two other instances—there is usually no need at all for the plus stitches we need to balance out the edges when we work in the flat.

So for a pattern whose stitch repeat is "12 + 2," we will almost certainly cast on some

exact multiple of twelve, whether it's 120, 240, or 1,200, and we get to ignore the "plus 2" altogether.[2]

A Disadvantage

Since the ends of the rounds don't actually meet their beginnings, then we are going to have what's usually called a *jog* where the rounds start.

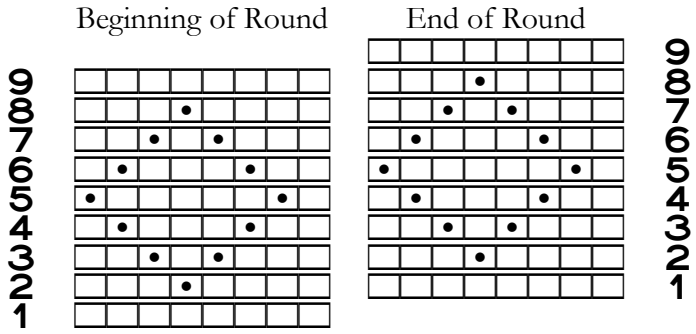
Imagine working the purl-diamond motif around a hat. The first row of diamonds will be in rounds two through nine just like we expect. But what happens at the point where each round begins is what causes the jog.

Let's look at a chart that shows the first diamond at the beginning of the round compared to the last diamond at the end of the round.

The motif at the beginning of the round is exactly where we expect.

But when we come to the end of each round, the end of the current round is going to be at the same level as the beginning of the next round. Think about a Slinky made with a metal band half an inch tall.

What in essence happens is that the last diamond is going to look like it's one round higher than the first. So even though our chart is correct and we work the chart perfectly, this as-knit chart shows what the piece actually looks like.



The disjoint that puts the end of round one at the same level as the beginning of round two is the jog that occurs when we work in the round.

[2] I do hate to hedge by saying "almost certainly," but there may well be patterns that require plus stitches even when worked in the round.

The jog is just a fact of life when we knit circularly. We have to decide if the advantages of working in the round outweigh the disadvantages.

what if we do the anti-jog trick for color knitting????? hard to do with this motif because an advancing slip stitch will hit the motif. What if we keep doing the slipped stitch one stitch earlier?

Some Patterns Are Not Marker-Friendly

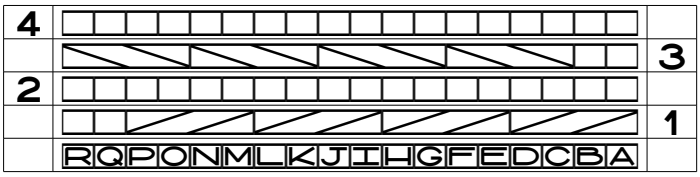
Some patterns and projects will not be as marker-friendly as the purl-diamond motif used as an example in this chapter.

Marker-unfriendly patterns typically have cables or decreases that use stitches across the boundary of two pattern repeats. Let's look at two examples with charts that show all the stitches instead of just the pattern repeat.

Marker-Unfriendly Pattern 1: Really Big Braid

multiple of 4 + 2
C4R: put 2 sts on cn and hold to back, K2, K2 from cn
C4L: put 2 sts on cn and hold to front, K2, K2 from cn
Row 1 (RS): * C4R *, rpt betw * across, end K2.
Row 2 and all WS rows: P.
Row 3: K2, * C4L*, rpt betw * across.
Rpt rows 1–4.

If we want four repeats, we need eighteen stitches, four for each repeat and two for the plus stitches, which we would chart this way:



We know the pattern is four stitches wide, but where do we put the stitch-repeat marker, whether we're using the knitting-font symbol under the | character or using a blank column?

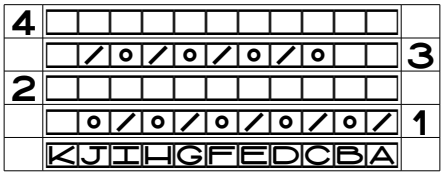
We can't put either indicator between stitches D and E, because we would have to cut the C4L symbol in half on row three. Nor can we put it between stitches H and I or between L and M. Again, those placements work for row one, but they would split the cables on row three into different stitch repeats.

If we tried to put markers on our needles based on row three, we would run into all the same issues when we finished the row repeat and started over again with row one.

Marker-Unfriendly Pattern 2: Simplest Lace

multiple of 2 + 1
Row 1 (RS): * K2tog, yo *, rpt betw * across, K1.
Row 2 and all WS rows: P.
Row 3: K2, * yo, K2tog *, rpt betw * to last st, K1.
Rpt rows 1–4.

The chart is easy too. Let's do eleven stitches, five repeats and the plus stitch.



Again, for this pattern we don't really need ring markers. They'd just get in the way of the K2togs on either row one or row three. But plenty of lace patterns do a decrease with the last stitch of one repeat and the first stitch of the next.

Other lace patterns have us move the end-of-round marker backwards or forwards some number of stitches when we work circularly.

Ring Markers Can Save Yarn, Time, and Sanity

These patterns are both simple, so there's no need to use markers. But let's imagine a com-

plicated pattern with a twenty-stitch repeat, and we need to do everything we can to make sure we work correctly.

Maybe we're using an expensive yarn, so we want to minimize frogging. Maybe the yarn is grabby or simply doesn't rip without mangling itself, so we'd have to cut out the ripped yarn and join the ball in fresh. Maybe we're on a deadline for a gift.

What can we do?

Use Ring Markers Tied Together in Pairs

Instead of using a single ring marker per stitch repeat, set up some paired ring markers. Cut a longish piece of sewing thread or crochet cotton, and poke it through two ring markers. Tie the ends together with a simple overhand knot to make a loop. You'll need a loop with a pair of ring markers for the number of stitch repeats there are across the width of the project.

I like to keep my cast-on counting separate from my stitch-repeat counting, so I always count twice when I'm setting up a big project, once just to cast on the correct number of stitches, then a second time as I put in the markers between each stitch repeat.

Once you've cast on, if you've used split ring markers in the loops, push one marker of the first loop over the needle between the first and second stitch repeats (or between the plus stitches and the start of the first stitch repeat). If you've used solid ring markers, then as you work the first row, put just one of the ring markers on each loop over the right needle before each repeat.

In either case, leave the loop and the other ring marker hanging free. You'll have one marker over the needle and another one hanging down on the loop between each stitch repeat.

Slip the markers as you work row by row until you come to the row where the markers will be in the way.

Suppose you need to move each marker four stitches closer to the beginning of the current row. When you get to the first spot where you need a new marker, pick up the one hanging on the first loop, and put it over the right needle. Work to the spot where the other marker on the loop is, and drop that marker off the needle. Repeat as you go across the work.

Of course, you can just have the markers on the needle in the regular way instead of being tied together in pairs. Then you just need one extra marker, which you put in place when you get to the right spot. When you get to the next marker, take it off and use it to mark the next repositioned stitch-repeat boundary. Repeat across the row.

Tying Ring Markers Even If the Pattern Is Marker-Friendly

I'm a klutz. I freely admit it. I have bruises up and down my legs from walking into furniture.

I'm talking about the kind of furniture that stays in place, not the kind that moves around like in the Disney movie *Beauty and the Beast*.

Even for patterns that don't require moving the markers to different places for certain rows, markers tied together are handy if, like me, you ever send markers flying when you move them from the left needle to the right (which is why plenty of knitters don't like ring markers in the first place).

If you run a piece of crochet thread just through the ring markers, then if one ever does go flying off the needle, it can't disappear into a floor vent or under the couch, because it's on a leash tying it to its neighbors.

Actually, need to use a lark's head or simple overhand knot to help keep the leash at the bottom of the markers, and a small bead or other tiny weight might also be necessary to help keep the leash away from the needles. pics??

Don't skimp on the length of the thread used for the leash. If you ever want to put the work on a long piece of yarn (or satin ribbon—my fave because it slides out easily and doesn't leave behind fuzz) to check size or length, then the leashes on your ring markers have to be more than long enough to get around the, er, body part in question while the garment is tried on.