

Once all this information has been calculated, we know all the elements concerning the **quantity of yarn**:

- 360 warp ends each 21.6 ft. (6.52 m) long, for a total of 2,600 yd. (2,350 m);
- 4,320 picks at a width of 18 in. (45 cm), for 2,160 yd. (1,950 m).

The amount of warp yarn is always a little more than the amount of weft yarn, since some parts of the warp are not woven (used at the front and back of the loom and the fringe). It is a poor reference to check our calculations, but it is sometimes useful.

Warp Color Order Charts

So, we know we need 360 lengths of yarn at 7.2 yards (6.5 m) each. But which yarn? In what order? In what color?

Warp color order charts provide an overall look at the number of threads in each color in the order of threading in a very visible and colorful way, if possible. They also help to check if the thread count is right and if the patterns chosen are feasible. Sometimes we will have to readjust the width of the weave to fit the selected patterns, so that they are complete.

The threading sequence presented in the section “The Script: Project Record Sheets” (see p. 70) showed 12 steel blue threads, 36 sky blue threads, and then 12 steel blue threads again. This arrangement will be repeated with new colors or in a new order.

The following warp color order chart shows the sequence for winding the warp with the number of passes of the yarns of each color for these placemats.

Table 6 Warp color order chart

Steel blue	12	12							36								60
Sky blue		36							12	12							60
Pink			12	12									36				60
Fuchsia				36						12	12						60
Lime					12	12									36		60
Lichen green							36								12	12	60

Placed near the warping board, this chart is easy to read and prevents mistakes. In this example, we first wind 12 steel blue threads, then 36 sky blue, then 12 steel blue again, then 12 pink, 36 fuchsia, and 12 pink, then lime and lichen, and the warping continues according to the instructions of the chart read from left to right, until the 360 warp threads have been wound. Let’s never deprive ourselves of this kind of double entry table, which is a precious tool to check our counts and the total number of warp threads.

The Warping Board, an Essential Tool for Length, Tension, and the Cross

Absolutely necessary order, as without it, it would be impossible to recognize where you are, and all would be in danger of being lost.

Diderot, *L’Encyclopédie*, 1st Ed. 1751

Winding the warp is the process of organizing all the warp ends needed to cover the width of the desired weave with the same length and tension. It does not matter if you dress your loom from the back to the front or from the or from the front to the back. To each his own method!

A warping board, or a warping mill, is necessary because we are in a small space. If we lived in Peru or the Middle East, we would plant two stakes spaced 7 yards (6.5 m) apart. If we lived with the Dogon people in West Africa, we would use our house. We would plant two stakes in the earthen wall, and we would walk around the house.

If you don’t have a warping board or mill, you can firmly attach some rods or pegs to a table, as long as the length and the cross are there.

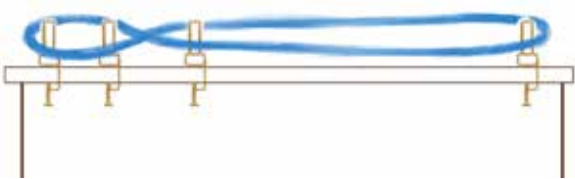


Figure 7 A makeshift warping board

However, a warping board is part of the list of basic materials. It is made using pegs. It takes up little space, is inexpensive, and is ideal for shorter warps. In any case, the idea is to set it up ergonomically, at a height that matches your height, preferably vertically, and never against the light, so as to be able to wind the warp with a smooth movement.

With a mill, while more cumbersome and more expensive, you can wind a much longer warp. It is simple and comfortable to use. One hand turns the mill while the other goes up and down to guide the yarn. In addition, by placing it at the right height, you can sit down, and that’s pretty nice!

To understand how we are going to use this tool, let's imagine the warping board as an illustration of our loom, where each part of the warping board matches a part of the loom:

- The peg on the warping board at the beginning of the warp will be replaced, on the loom, by the front tie-on rod, which is connected to the loom's cloth roller;
- The pegs used to make the cross will be replaced by the lease sticks;
- The peg at the end of the warp will be replaced by the back tie-on rod, attached to the warp beam.

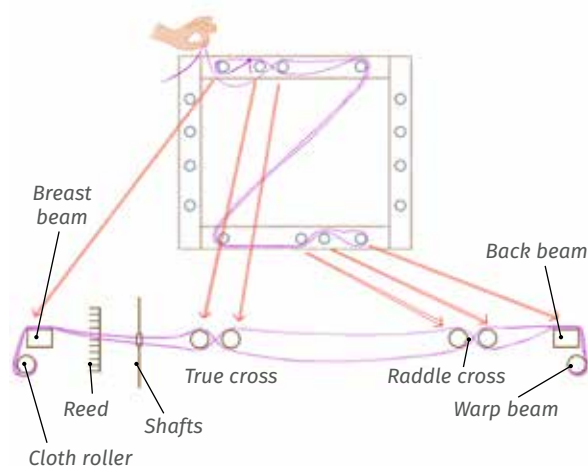


Figure 8 *Parallels between the warping board and the loom*

Let's complete this correlation between the warping board and loom and "spread out" the warping board to match up to our loom. Let me insist a little on this analogy. We are going to think as if we could warp our loom from one beam to the other. If the warping board was spread out, we would wind the warp from one peg to the other. We would then undoubtedly better understand this operation of winding the warp.

Having a more compact warping board, inevitable with our limited indoor space, seems to make the concept and the actual process of the warping unclear. During the whole weaving process, all warp threads must maintain equal tension. Warping is the first step! This is not a case of vigorously stretching out the yarn, but smoothly pulling it taut with the same tension throughout. We naturally associate the word "tension" with "hyper"; let's enjoy some "hypo" tension instead!

For this reason, we prefer to warp all our threads on the same day. Depending on our mood, we are indeed more or less tense.

Here's how to proceed. Stand relaxed in front of the warping board, hands swinging from right to left, body limber, as if you were ready to dance. No need to pinch the yarn, but with your hand, lightly move it from peg to peg. With a flowing movement, the left hand goes around the left pegs, the right hand around the right pegs. The body gets less tired if it is straight in front of a vertical warping board. The work will be easier if there is adequate light. Do not place the board in front of the window as backlighting is bothersome and tires the eyes.

In order for the threads to have the same tension, they must unwind easily and in the same way. We never warp two yarns packaged differently, for example one in a skein and the other in a cone! If that happens, transfer the yarns onto bobbins, so that they will unwind freely and identically. The balls will be placed in pots to prevent them from rolling around and getting tangled. Cones will be placed close by. Often, it is easiest to wind warp yarn on bobbins that will be placed on a creel, a frame with rods on which the spools are hung, so there is no risk of tangling or getting slowed down.

To wind the desired length of warp, I start by making a guide string of the same length by taking a solid yarn in a very different color than the yarn to be warped. With this guide string, on the warping board, I look for a path for the thread using a movement that will be the most natural for my hands. This thread will be my guide. There is no one way better than another, as long as you have the length and one or two crosses. I am most comfortable with a warping board or mill where four pegs are lined up. It is in the center of this line that I make the cross.

I start by tying a loose loop and then slip it around the first peg, the equivalent of the front tie-on rod on the loom. I finish in the same way.

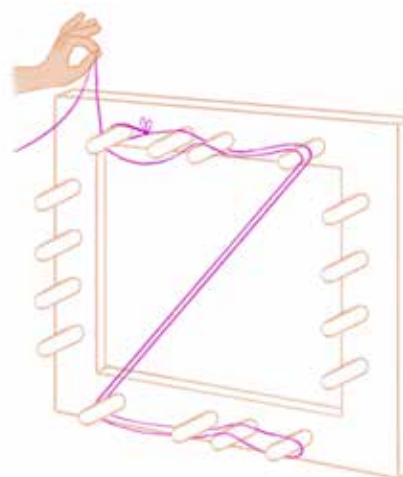


Figure 9 *Starting to wind the warp*

So that the threads stay in the same order they are wound and don't get mixed up when we take them off the warping board, we will cross them each time we go between the second and third pegs. This is the indispensable **thread-by-thread cross**, the invaluable, almost sacred, method that no weaver can do without! For a flowing movement, carry the yarn as if writing a figure eight with your hand, in the direction that suits you. This movement will soon become quite spontaneous.

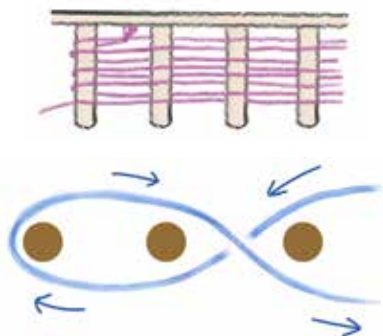


Figure 10 The thread-by-thread cross

To keep count of the number of threads, you can take a contrasting color thread and simply slide it around every 10 threads. Don't make a knot as that will be in the way later on; a simple crisscross will suffice. Another efficient and practical method is to make what I call a **raddle cross**. I place it at the end of the warp, between the last four pegs, where I cross the yarn in sections, with the number of threads per section determined by the desired density.

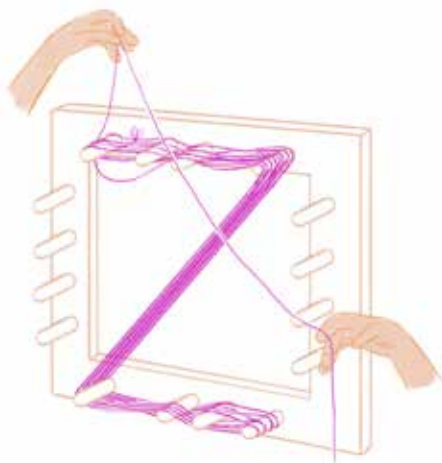


Figure 11 The two crosses made when winding the warp

In our scenario, the density chosen is 20 ends per inch (8 per cm). So between the third and fourth pegs of the

warping board nearest the end of the warp, I cross the opposite way every 20 threads. This trick makes it very easy to keep count of your threads; each group of threads corresponds to a 1-inch (2.5 cm) width of warp. This cross will make it much easier to distribute the warp between the teeth of the raddle during the next step of warping the loom.

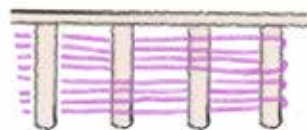


Figure 12 Groups of warp in the raddle cross

This crossing of threads in sections is done automatically when several threads are wound on together, with or without pegs to wind around. There as well, to easily count the number of crosses, interlacing a colored thread will keep us from having to count and recount so often. Pass it around every 4 sections, for example. In our example, the multiple colors of the warp will be enough to identify the number of threads without having to add an additional marker. Putting on too many counting threads or making knots is often the mistake of the beginner who is afraid of not doing it right and who, as a result, gets more muddled. Sometimes less is more. The right marker will suffice!

Never tie a knot in the warp; if necessary, at the end of a ball, or when changing colors, **the knot will be at the beginning or end of the warp**, in an area that will not be woven.

Once all our warp is wound, before removing it from the warping board, **the yarn must be secured**, as some areas are very valuable. Remember the drawing on the previous page comparing the warping board to the loom. We want to move this warp, while protecting the four crucial locations: the first peg, which will be replaced by the front tie-on rod stick, the two pegs of the thread-by-thread cross, which will be replaced by the lease sticks, the two other pegs of the raddle cross, which will be replaced by the cross sticks at the beginning of installing the warp on the loom, and finally the peg at the end of the warp, which will be replaced by the back tie-on rod. We are therefore going to tie these critical places with sturdy pieces of yarn or string in a contrasting color to carry the warp to the loom. These are called transport ties.

If it helps you, I suggest using colored threads to help differentiate the beginning and end of the warp:

- **Green** thread, tied at the true cross near the beginning of the warp, which will be placed at the front of the loom;

- **Red** thread, tied at the raddle cross, which will be placed at the rear of the loom.

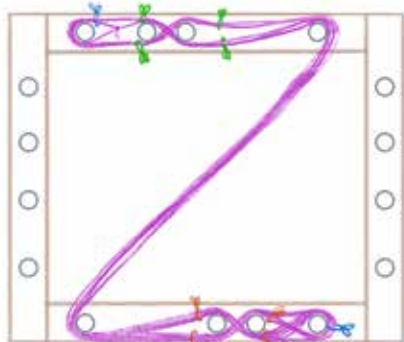


Figure 13 Ties used to keep the cross intact

Moving the warp to the loom is sometimes a cause for concern, as it is true that a few mistakes are enough to make a mess of our warp and tangle with our nerves! So, if tying up the true cross with four green ties and the raddle cross with four red ties can take away a little stress, why not do it! And to help differentiate, I suggest using a yarn that is neither red nor green to tie the warp at the beginning peg and the turning (end) peg.

The start or end loops of the warp will be loose enough for the tie thread to pass through to tie up the warp so it can be carried to the loom.

Check that there are five ties at the beginning of the warp as well as at the end, the four protecting the cross and the one at the very end. Make knots that can be removed without the help of scissors, or a tie that is firmly attached but wide enough to allow a scissors blade to pass through without risk of cutting the warp. However, these ties must be firm so that they do not come undone by themselves. If the warp is very long, add some choke ties every yard or so to keep the threads together.

Once you have secured the crosses and the loops at the beginning and end, you can remove the warp from the warping board using the following method. First take the part of the warp that will be at the front of the loom, the one near the true, thread-by-thread cross. Then, gradually, remove the warp from the warping board by making a loose chain with your hands acting as a crochet hook. Stop when there are about 20 inches (50 cm) of length left.

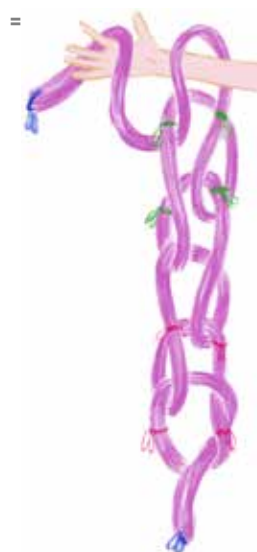


Figure 14 Chaining the warp for easier handling

If you want to dress your loom from the front to the back, you will take the end of the warp first, so that the true cross is close at hand. In this case, there is no need to make a raddle cross.

Some people have difficulty making this chain. There is an easier option: simply wind the warp around a dowel or tube of some kind. The idea is only to free the chain from the warping machine and to place it in such a way that it doesn't move, especially unintentionally—by a cat or perhaps a child?



Figure 15 An alternative to the chain

Our warp is thus safe and secure and can be transported, if necessary, by slipping it into a bag and attaching the last loop to the handle of the bag. When the time comes, the chain can be spread out on the loom.