

Building a Cardboard Loom (thanks to Eavan o'leary, the Cork Handweavers Guild, and Susa Weaving)



Loom from Cork Handweavers Guild

Suggested materials:

- at least 2 large strong tray-style cardboard boxes (plus some extra cardboard for other parts)
- a packet of bamboo skewers
- 8 small fishing weights (you can use metal washers or bolts)
- 4 small bulldog/binder clips
- fine strong thread (for example size 10 crochet cotton)
- twine or strong yarn (not too slippy or thick)
- pvc tape or duct tape
- double-sided tape
- strong glue
- Pack of strong velcro (hook and loop fastener) stickers
- scissors
- a darning needle
- a book or other heavy object (to hold the reed in place while you are making it).



Gather your supplies

Added by Paula:

- ruler
- box cutter
- cutting board
- pencil & marker
- clamps or larger binder clips
- small square (if you have one)
- garden shears to cut bamboo skewers
- beads - for the harness lifts
- hot glue gun and glue
- measuring tape

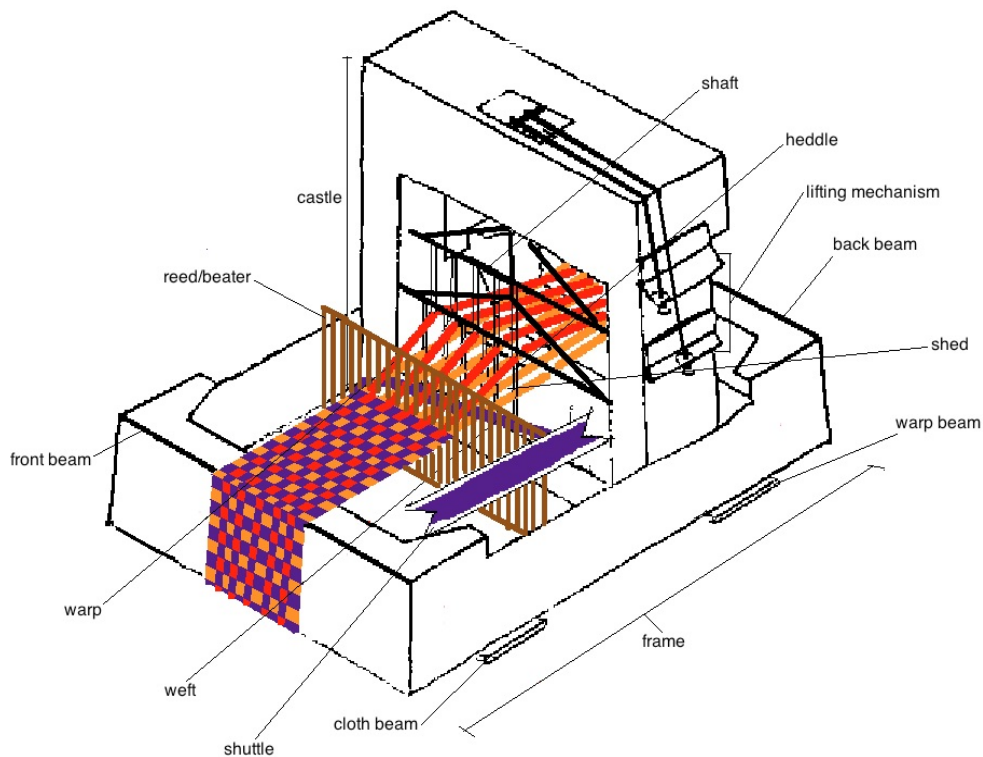
A note about materials:

The list above shows the materials used by the Cork Handweavers and additional supplies Paula used. If you don't have the same materials I'd encourage you to be creative and adapt the design to use whatever you have available. The real joy of this project is in the creation of 'something from nothing'!

A note about measurements:

From the Handweavers: We purposely left out measurements from these instructions. We used our materials to guide us, and suggest you do the same. Paula included her measurements for reference.

The Parts of the Loom



Loom – A device used to hold yarn under tension so that cloth can be woven.

Castle – The vertical part of the loom.

Frame – The supporting part of the loom which holds the castle in place.

Warp – The long yarn threads that are held under tension on the loom (shown in red and yellow).

Weft – The yarn that is passed over and under the warp threads by the weaver to build up cloth. (shown in purple)

Beams – The warp threads are wound onto the warp beam. They then run over the back beam, and through the castle. In front of the castle the weaver adds weft to build up cloth. The cloth then runs over the front beam and is collected on the cloth beam.

Reed (and beater) – The reed controls the width of the warp and keeps the warp threads evenly spaced. The beater is used to move the weft into place. In this loom the reed and beater are combined into one piece.

Heddles – Each warp thread is threaded through a string heddle. When the heddle is raised, it causes the warp thread to be raised.

Shaft – The shafts hold groups of heddles. The shafts can be raised in various combinations so that different groups of warp threads are raised at different times. This loom has 4 shafts that hang in the castle (only 2 shafts are shown in picture).

Shed – The vertical space created between groups of warp threads when one or more shaft is raised.

Shuttle – The shuttle is loaded with weft yarn and passed through the shed by the weaver.

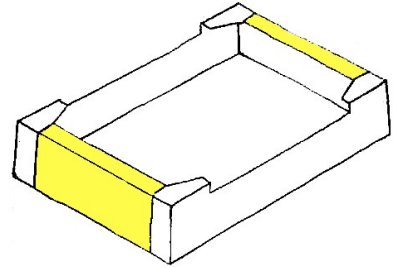
How to build your loom

The Frame

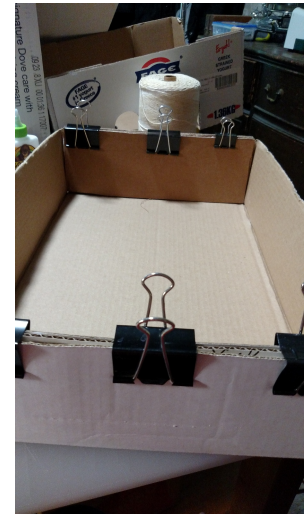
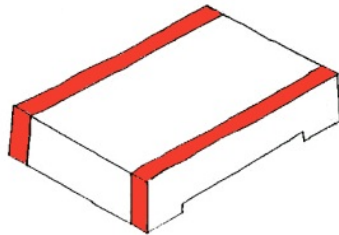
Trim any tabs and cover up any rough edges by adding some light cardboard to the sections shown above in yellow (use glue or double-sided tape).

Paula's bottom box outside dimensions: Added 3 pieces of cardboard to the ends (the yellow sections) to add strength, and then put duck tape over the top of the ends. Glue them on let glue cure for 24 hrs.

18" x 11 1/2" x 4"



Velcro is composed of two strips of fabric, one is made up of hooks (feels rough to the touch) and the other is made up of loops (feels softer to the touch). Turn box upside down. Fix strips of the hooked side velcro to the back and underside, as shown by the red areas above.



Reinforcing the ends

The warp and cloth beams



My cloth & warp beams

Cut a piece of stiff cardboard (if you wish you can glue multiple layers together for added strength). **Paula's beams: 10 1/4" x 3"** - glued 3 pieces of cardboard together.

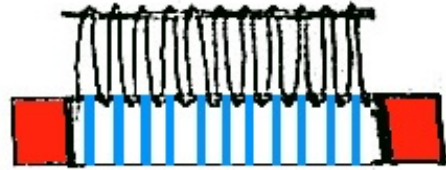
The piece should be the same width as the loom or close to the same.. Add velcro (looped side) to the end sections shown in red. Do this on both sides of the piece of cardboard. **Paula's notes:** make sure the velcro on beams match up with the velcro on the loom bottom.

Using a square knot, tie a length of strong yarn near to the end of one skewer.



Use this yarn to lash on a second skewer. Do this by looping it around both, as shown above, until you reach the end. You may want to make half hitches to secure each wrap. Secure the yarn to the first skewer with a square knot.

Paula's notes: figuring the size of and making this part took a bit of figuring. I figured it to be the length of the beams inside the velco sections. Then I chose 3: for the distance between the two skewers (my box has a height of 4"). I anchored the skewers and using clove hitches anchored the string on both skewers at each wrap. I put a drop of glue at the beginning and ending of the threads.

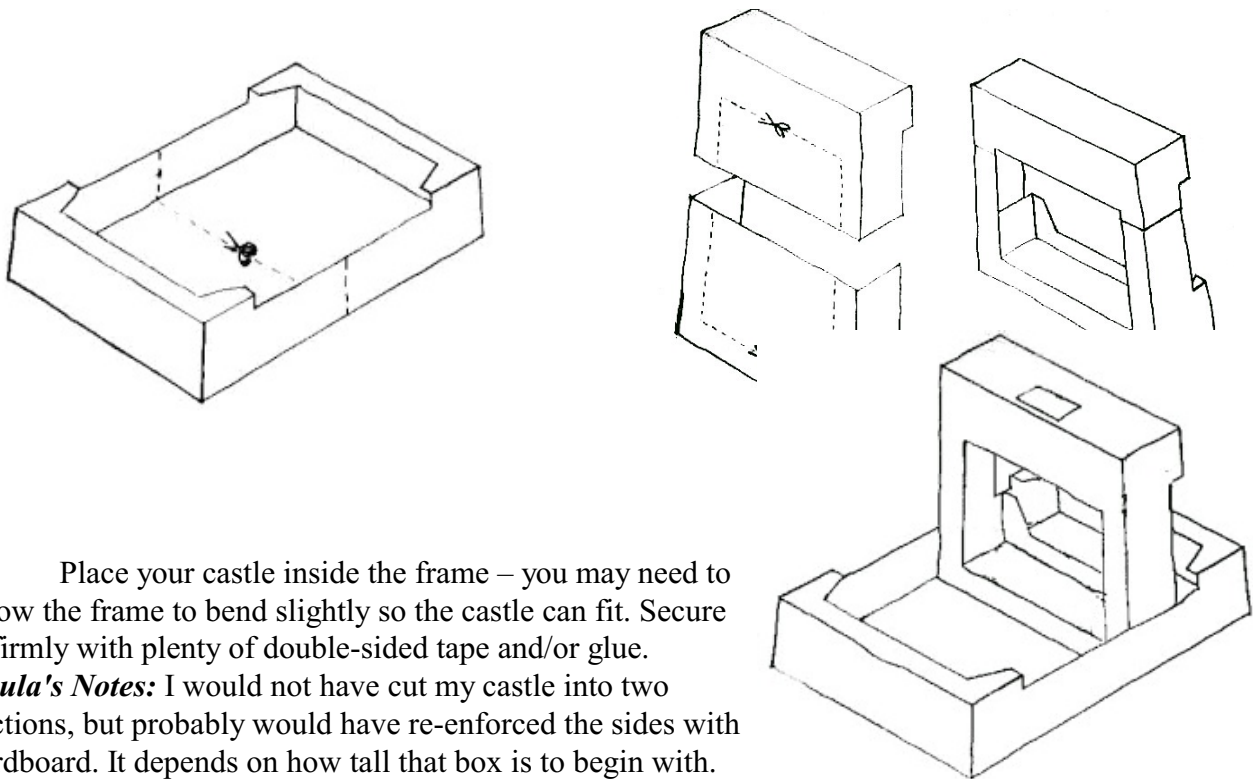


Finally, using pvc tape or duct tape (shown above in blue), tape the first skewer to the cardboard beam. Use plenty of tape and wrap the skewer tightly to the beam in multiple places. **Paula's notes:** anchor the skewer that will remain loose while you wrap the tape on the beam and bottom skewer. I would trim the tape so that it fits between the strings as shown with the blue markings.

Repeat so you have 2 beams.

The Castle

Cut a box in half. Cut a section out from each half as shown. Slot one half inside the other and secure with double-sided tape or glue. **Paula's notes:** I found everywhere they said you could use double-sided tape, I did not think it was strong enough, therefore, I used glue or duck tape. Lee says that there is a woodworker's double sided tape that would work, but I just used glue - a couple of times - hot glue. Also it might be a good idea to make sure the opening is just shorter than your bamboo skewers - I didn't know that and ended up placing two skewers on the inside of the castle opening to keep the harnesses from swinging out through the opening.

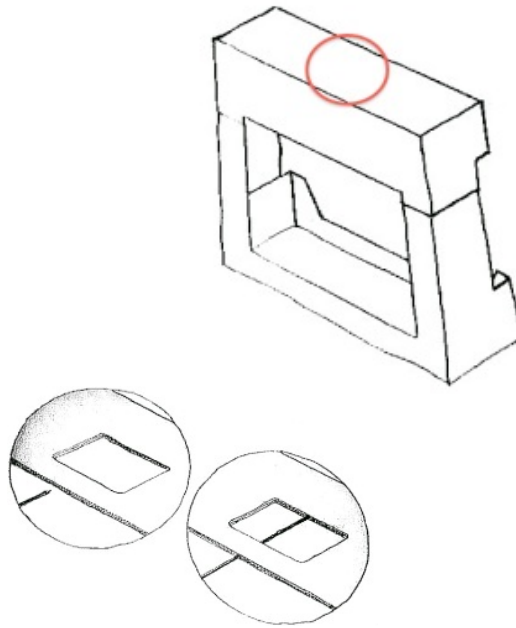


Place your castle inside the frame – you may need to allow the frame to bend slightly so the castle can fit. Secure it firmly with plenty of double-sided tape and/or glue.

Paula's Notes: I would not have cut my castle into two sections, but probably would have re-enforced the sides with cardboard. It depends on how tall that box is to begin with.



Loom & Castle
showing one heddle



Bar for hanging shafts

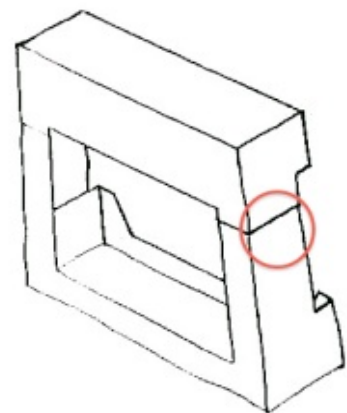
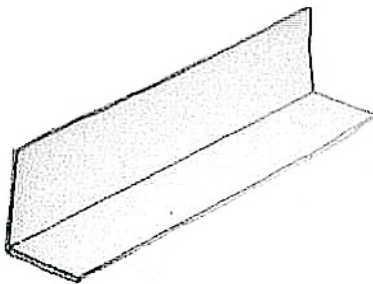
Many cardboard boxes have a handle hole in the section marked by the red circle at the top of the castle. If there is none, cut one out. This is where you will place the bar for hanging the shafts.

Insert a skewer through the corrugation, as shown above. Push it all the way through, and trim away any excess. This becomes the bar to hang the shafts. *Paula's notes:* make sure the skewer/bar is at the center of the castle, not just the opening. You want the harnesses to be centered when they are hanging. I used small garden shears to cut the skewer here and anywhere else I needed to cut them.

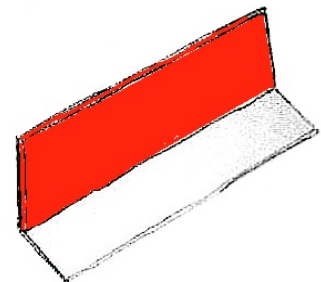
The lifting mechanism (part 1)

Cut out a piece of cardboard to fit on the side of the castle in the position shown above by the red circle.

Make it at least 2 inches tall, and fold it as shown below.

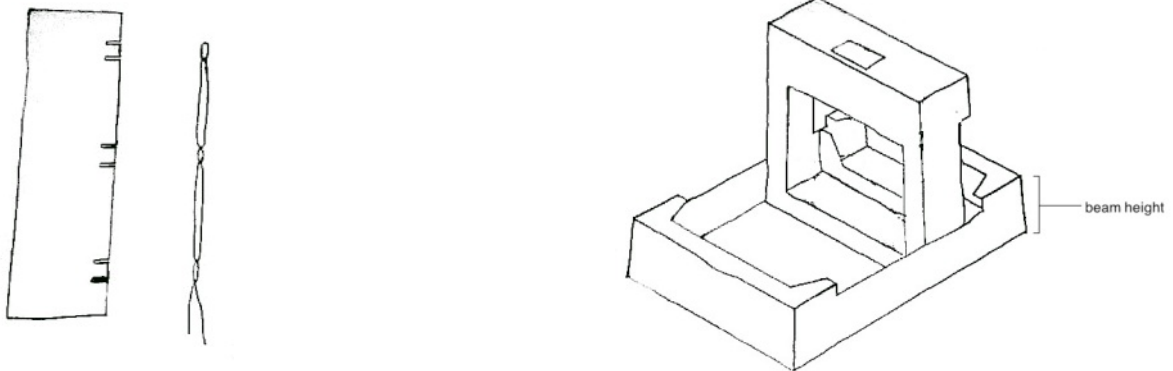


Cut a second piece about 1 inch tall and glue it where shown in red. Place it so the bottom edge is slightly lower than the fold line. This will stop the platform bending up too far. Glue the platform in place on the side of the castle. Make a second platform and set aside for later. This will be explained in "Part 2" below, after the heddles and shafts are made.



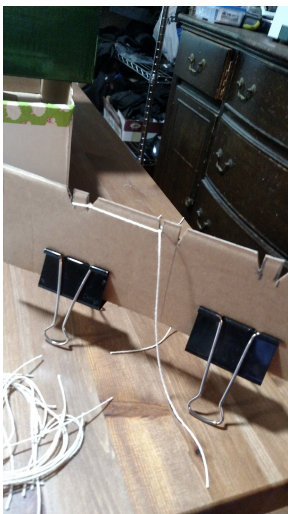
The Heddles

The picture shows a cardboard heddle jig on the left and a string heddle on the right. When a thread is run through center hole/loop, that thread should lay just on top of the front and back beams of the loom.

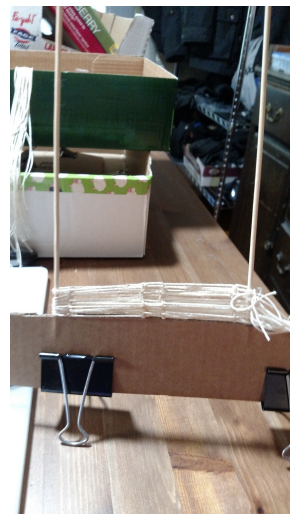


The height of the heddles depends on the beam height (shown above). Since you will have a bit of weight on the shafts, and the lower half of the heddles must fit within the size of the beam height. Work out the length of your heddles, maybe start with 1½" - 2" between upper and middle loops and lower and middle loops. Cut 6 notches in total as shown above. **Paula's notes:** I might make the lower half shorter to allow for ground clearance of the harnesses.

Lay a length of strong thread so the midpoint is in the first notch. Tie a square knot at each of the other notches. Be sure to keep tension on the thread between each knot, this will help ensure all your heddles are the same size. Slide the top loop of each heddle onto one skewer and the bottom loop onto another. One becomes the top bar of a shaft, the other becomes the bottom bar of the shaft. Repeat until you have the desired number of heddles on your shaft, then continue on a new set of skewers. Continue until you have completed heddles for all 4 shafts. We suggest 40 heddles per shaft, but feel free to choose fewer or more. **Paula's notes:** I made 20 per harness - I am not as ambitious as the Irish weavers.



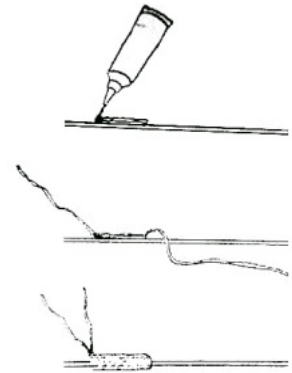
Tying the heddles



Loading the harness

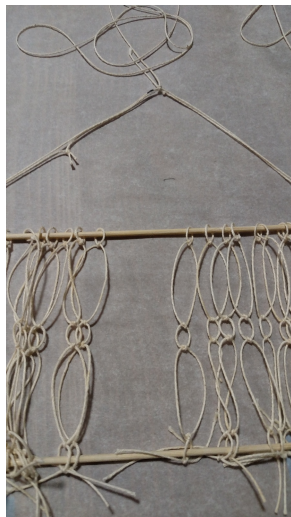
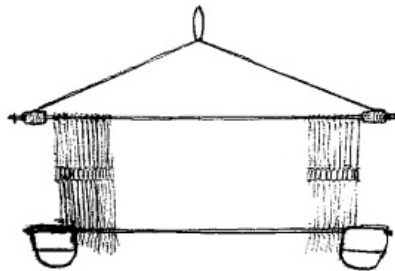
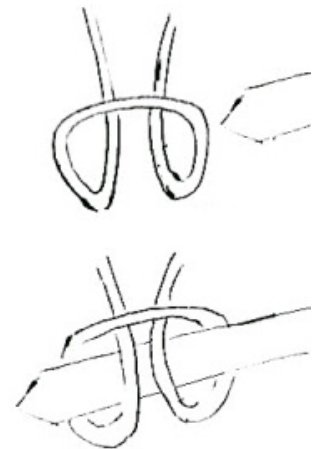
The shafts

On the top bar of your shaft move all heddles to the middle of the shaft. As shown, use glue and some thick strong yarn/twine to make a stopper near the end of the bar. Make another stopper on the other side. Repeat for all 4 shafts. Leave some space at the outer edge so there will be room for the hanging cord. Repeat for all 4 shafts.



Take a length of strong yarn/twine and tie the ends together to form a loop, as shown. Fold the loop in half and tie an overhand knot at the midpoint to form a smaller double loop. *Paula's Notes:* I did not make that center loop, make one, it saves some problems later.

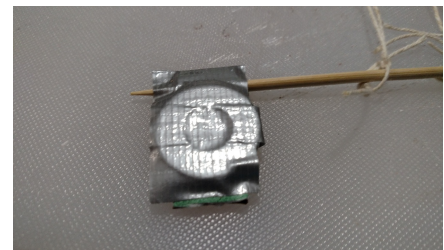
Using lark's head knots attach the long looped ends to the top bar of your shaft, just outside the stoppers. The stoppers will prevent the cord from slipping toward the middle of the shafts. *Paula's notes:* once I got the center of the hanger thread, I glued the lark's heads to the skewers for more stability - glad I did.



Harness with heddles

Hang a weight from each side of the bottom bar. (If using washers then add a folded piece of cardboard to stop the washers swinging and knocking into the other shafts.) Move half of the heddles to each side of the shaft. Hold the shaft by the top loop so that it hangs freely. Adjust the position of the weights until the shaft hangs level, without dipping to one side. (Be sure that you don't move the weight too far from the edge of the bar, as they may then restrict the movement of heddles. Try and adjust to go no further than the yarn/stoppers on upper bar) When you are happy with the positioning, glue the weights in place.

Paula's notes: I used duck tape for attaching the weights, might have rethought it, they might be hanging too close to bottom of the loom for my comfort.



Harness weight

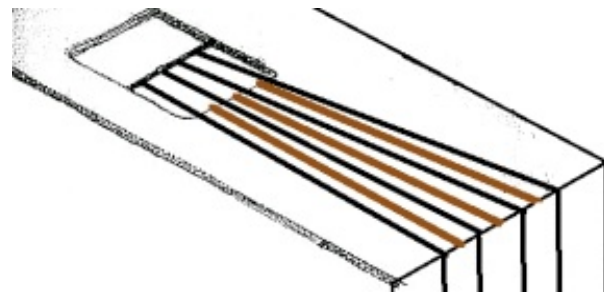
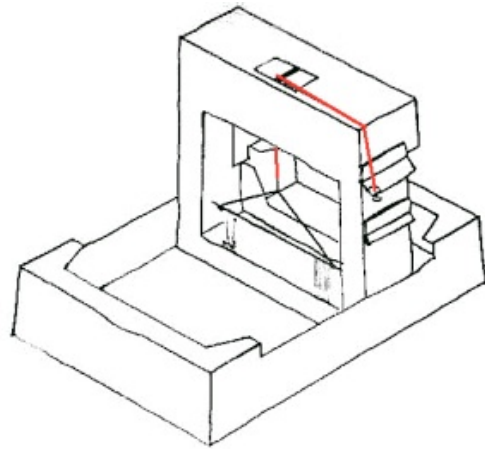
Hanging the shafts

Tie a length of strong yarn/twine through the top loop of the shaft. Run the yarn along the path shown in red so it runs over the top bar of the castle, across the top of the castle and tie it to a binder clip on the top platform. Tie it so that the weights of the shaft barely touch the bottom of the loom. Repeat for all 4 shafts. You should place the 4 shafts as close together as possible, but not touching each other.

When you have hung all 4 shafts, tape 3 skewers (shown in brown) to the top of the castle to separate the hanging cords as shown. Trim them down to size if necessary.



Separators

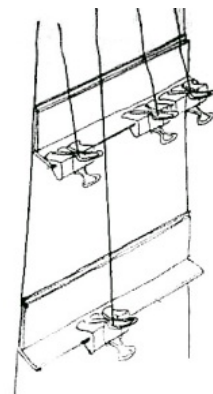


The lifting mechanism (part 2)



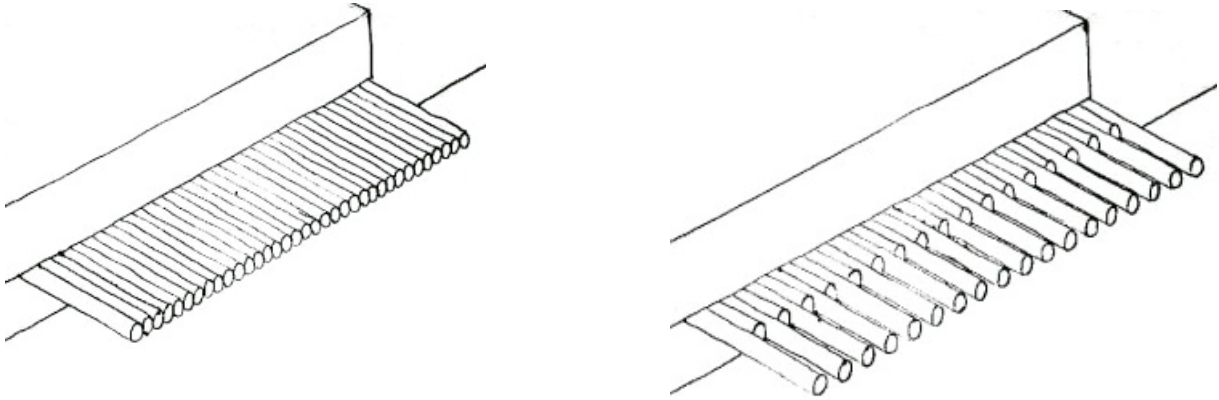
Lifting mechanism

Now the second (lower) platform needs to be fixed to the castle. To choose the position, try lifting your shafts and observing the heddles. To lift a shaft unclip the binder clip from the top platform and pull it downwards. When a shaft is raised the heddle eyes should be at a height just slightly lower than the top bars of the lowered shafts. (If you wish you can wait until you have a warp on the loom to complete this step, then you can be absolutely sure of the correct positioning). *Paula's notes:* I used beads and Lee helped me tie the lift cord to the beads. I cut slits in platforms to hold the beads. Either way works. For the future: I would use the clippy things.



The reed

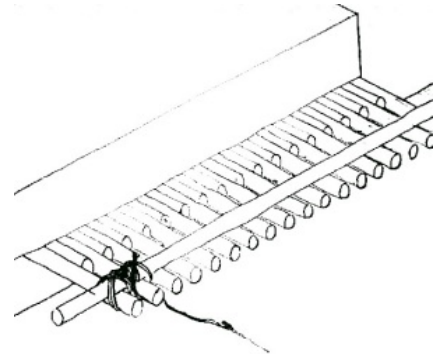
On the edge of a table lay a row of skewers side by side. Continue the row until it is about an inch shorter than the length of one skewer, ensuring that you have an odd number of skewers. Place a heavy weight, such as a large book, directly on top of the skewers to hold them firmly in place. (Please note that the picture above is not to scale – you will have a longer row of skewers!)



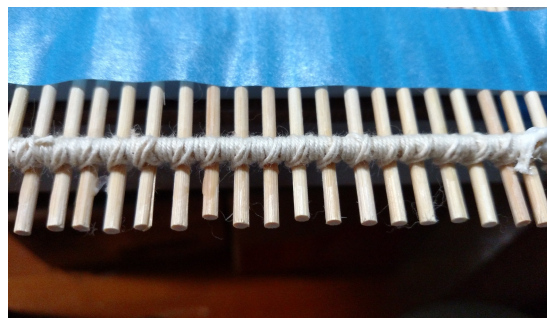
Push every second skewer to create a gap. (Those you push in will not be part of the finished reed, they are just used to create even sized gaps).



Getting ready to tie



Place another skewer on top of the row as shown. Thread a darning needle with some strong yarn and use it to wrap this skewer to those underneath. Wrap very tightly and be sure to fill the space between skewers too. Add glue every inch or so as you progress.

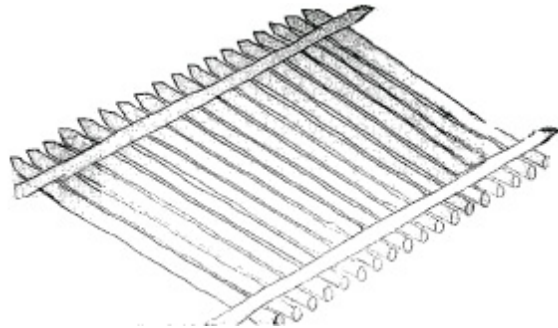


Tied on

To complete your reed repeat the glueing and wrapping process with a second skewer on the other end of the row of skewers. ***Make sure you remove the skewers that were used to create the gaps.***



My reed



Paula's notes: I did not cut my skewers, because the instructions did not say to. Although if you look at the drawing of the loom, it looks like the reed is shorter than mine. I would measure my skewers to be just a little above the "raised heddle" mark and maybe trim the skewers before tying it. After my tying, I was not willing to cut and retie.....just saying.

The shuttle

Cut out a piece of cardboard in the shape shown above (approximately 10 inches wide, or 25cm) to create a shuttle. Use tape to wrap it, covering any raw cardboard edges. You can cut a slit at the bottom of one of the "v's" to help hold the weft yarn in place when winding the shuttle. ***Paula's notes:*** I might wrap the shuttle in duck tape to make it smoother, but as I am a weaver, I have plenty of other types of shuttles - plastic and wood that I can play with.....one of my plastic netting shuttles will work perfectly.



You have now completed your loom – congratulations! ***First pour yourself a glass of wine or make yourself a cup of tea and just enjoy looking at the loom.***

Warping the Loom

In order to start weaving, you now need to prepare a warp and put it on the loom. There are many different ways to do this and many different resources you can consult.

An excellent book is:

Learning to Weave by Deborah Chandler

Paula's notes: I measured and cut the warp after figuring out how many ends (because I did not use all the heddles as my handspun is a little thicker than, say a cotton thread warp might be.) Generally, I would simply loop the warp beam rod through the end-loop of the warp, but I chose to use lark's head knots to attach the warp to the warp beam, it made warping and winding and such easier. You can use a crochet hook to help thread the loom, but I choose to use my traditional tool - a reed threader. I wound a short warp and could just attach (with the velco) the warp beam on the bottom of the loom, and pull the warp up and over the back beam to thread the loom. I then tied the warp to the cloth beam after threading and feeding the threads through the reed.

I used handspun wool to warp the loom...I should have used cotton. If using it with children I suggest cotton; the wool is a little sticky.



Warp on back beam



Tied onto the cloth beam



Warp attached on underside



Threaded, ready to go onto the cloth beam

There are 2 YouTube videos that I found useful, one is from the woman who let me use her plans, and the other I found and thought some folks might like a simpler rigid heddle-type loom. Go to YouTube and search for:

Eavan o'leary, weaving on a cardboard loom
Alessia Faggioli, shoebox loom

Possible upgrades: *these are some suggestions from the Irish group, but I did not try them, Paula*

- Add a few layers of cardboard between the bottom of the box and the beam attachment points – this will allow more warp/cloth to be wound.
- For an 8-shaft loom just add 4 more shafts and attach the lift platforms on the other side.
- Make the shafts “spring-loaded” by using elastic bands instead of springs (not sure exactly what this one means, but if you do, cool)

If you are going to do this, be patient — have a former boy scout or engineer on speed dial and know you are going to learn a lot. Document it, photograph it, and if it ends up in the dustbin, so be it, but weave at least a simple trivet or scarf on it before you chuck it out. - Paula



My finished loom



Weaving is going well



The end of the warp