General Population Weaving Handbook

ΙΔΡΥΜΑ ΚΡΑΤΙΚΩΝ ΥΠΟΤΡΟΦΙΩΝ
ΙΚΥ

Erasmus+
Co-funded by the Erasmus+ Programme of the European Union

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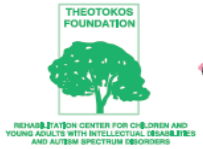

General population weaving handbook

The purpose of this handbook is to teach the art of weaving by utilizing information gathered from the folk traditions of the participating European countries of this program.

It is aimed for various categories of people, general public, people with mental disabilities, special need groups etc.

It's aim is to reveal the true knowledge of weaving art , as it stems from traditional folk art and its healing power. As the Greek folklorist Kitsos Makris mentions, weaving "perfectly tunes breathing with the rhythm of the heart". It is also a unique opportunity for each participant country to look into their weaving tradition and share it!

It combines:

- Information about weaving gathered from participating European countries according to their tradition / folk art and their local materials.
- An easy to read and comprehend method that is inclusive of various categories of people, general public, people with mental disabilities, those with special needs etc.
- The methodology and education needed in order to set up weaving learning programs.

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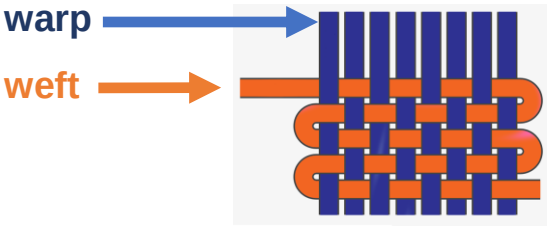
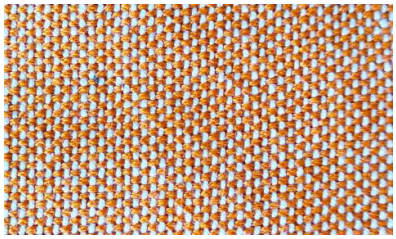
What is weaving?

Weaving is the creation of cloth by crossing 2 distinct sets of threads perpendicular to each other.





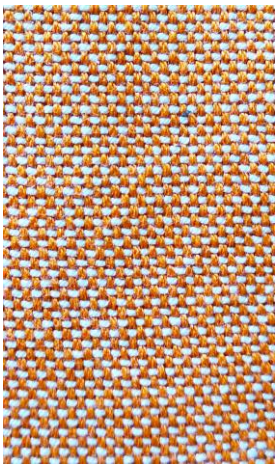
cloth

One set is the vertical threads of the cloth and is called the warp and the other set is the horizontal one that is called the weft.
The weft yarns go over and under the warp threads to create a cloth.

There are different types of cloth according to how visible the warp and weft threads are in the cloth.

In a balanced weave, the weft and the warp threads are equally visible.

If the weaving is not balanced, the cloth is either warp or weft faced.
When the warp threads cover the weft, it is called a warp faced weaving.
When the the weft threads completely cover the warp, it is called weft faced weaving.



balanced weave

warp faced weave

weft faced weave

The Loom

A loom is a device to holds the warp yarns taut so that is easy to weave the weft over and under the warp.

They are many types of looms that can vary in appearance and complexity. From a simple frame used as a loom to a specially designed multi shaft floor loom.

Although looms can appear very different, the principles is always the same. The warp threads are kept taught and in more elaborate looms, there is a mechanism that raises or lowers the threads creating a space between the threads. This is called the shed, where the weft thread passes through.

frame loom

back strap loom

vertical loom

table loom

floor loom

Weaving materials _ Threads and yarns:

When weaving I need to choose the right thread for my warp and weft.

Depending on what I want to weave, I will choose my yarn accordingly.

Choosing the warp :

I use a tightly spun yarn in order to be:

- Strong
- Durable

I usually use:

- Cotton warp
- Linen warp

Choosing the weft:

I usually use yarns thicker than my warp threads, but any type of yarn can be used as weft.

Weaving materials : Threads

When I buy threads I find them in different forms:

Skein

Cone

Ball

Hank

1. Material composition

This shows what the thread is made out of.

Threads can be:

- Natural
- Man-made / synthetic.

I choose natural fibers because they are of better quality.

Natural fibers are from:

- Animals (wool, silk etc.)
- Plants (cotton, linen, hemp, bamboo etc.)

2. Colour

Yarns can be dyed in many colours.

I choose colours I like and try to make harmonious color combinations.

There is a large variety of colours on the market but I can dye yarn on my own. I can use both synthetic and natural dyes.

Cotton in a variety of colours

Wool dyed with flowers

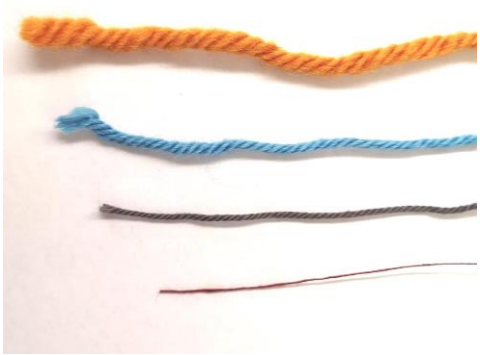
3. Yarn weight

Yarns come in many different weights/ sizes.

This means they have different thickness (different diameter).

I choose yarn weight according to how thick or thin I want my weaving to be.

The thicker my yarn is, the thicker my weaving will be and vice versa.



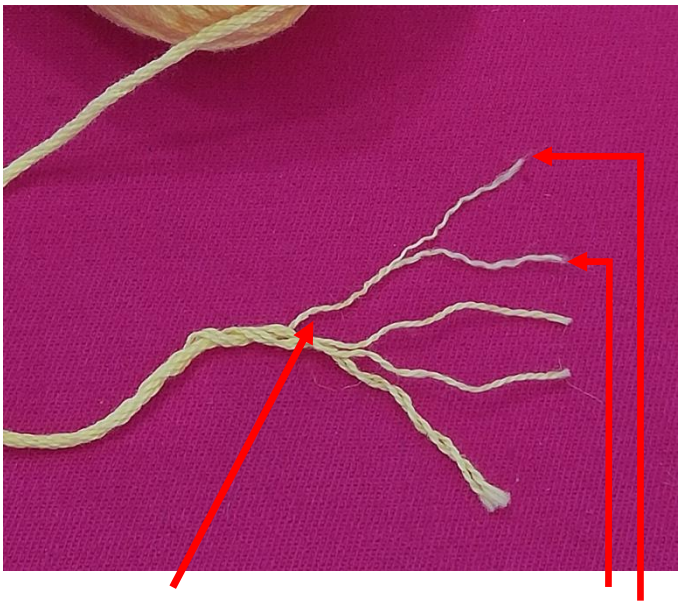
Yarn sizing

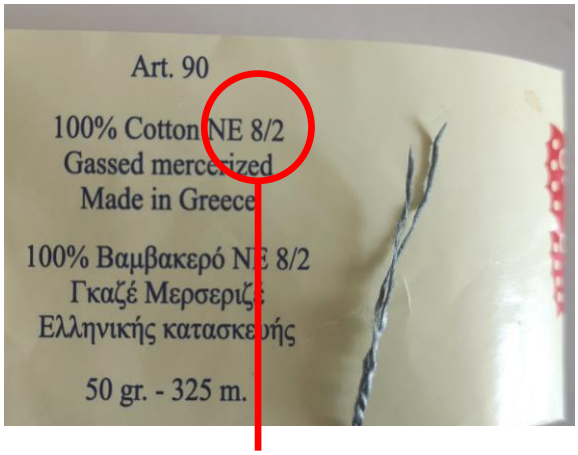
When buying yarn, it comes in different sizes. The size refers to the yarns' thickness.

Most yarns have numbers that refer to their size and yarn structure.

When I take a piece of yarn and untwist it between my finger, I will see that most of the time it is made of many strands called ply's. Each ply can be made from more than one single strand.

5 Ply yarn





8/2 : size 8 – 2 ply yarn

The first number refers to the thickness of the yarn and the second to the number of ply's.
Each material has its own system of sizing.
A no.8 cotton yarn will not be the same thickness as a no.8 wool yarn.
Also sizing may vary between different brands.

It is always advised to get samples before ordering yarns.

4. Texture

Yarns can have many different textures.

They can be:

- Hard - Soft
- Shiny - Mat
- Smooth – Lumpy/ Hairy

5. Other qualities

There are more material qualities that can help me make the right choice of yarn.

Some of them are:

- Absorbency
- Weight
- Durability
- Elasticity

Wool teasing and hand carding

After having scoured and washed the fleece, we proceed with the wool teasing and carding.
This process will prepare the fibers ready for spinning.

wool teasing

hand carding

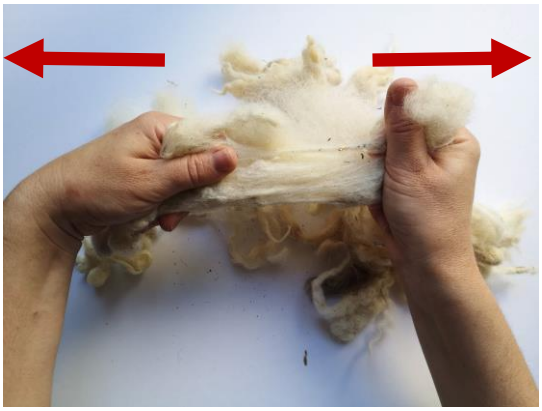
Photo by Takis Tloupas, 1972, “Fleece teasing in Gioulberi”
http://takis.tloupas.gr/cPath/1_3_42/PORTFOLIOΠαραδοσιακές%20ασχολίεςΓυναικείες%20ασχολίε%EF%BF%BD.html

Fleece / wool teasing

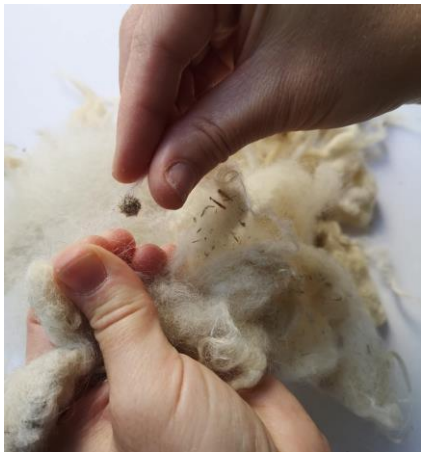
It is a process done entirely by hand.

During the teasing process, the fleece is cleaned by the debris found on the sheep.

Step 1
I use the already scoured and dried fleece.



Step 2
I use my fingers
to pull the fibers apart.



Step 3
I remove any debris found and unwanted fibers.

This can be burrs and twigs, very coarse fibers or different coloured fibers.

Step 4

The fleece will become clean fluffy and more uniform.

It is now ready for the next stage, hand carding or combing.

Hand carding and fleece combing

Hand carding and fleece combing are the last processes that the fleece goes through in order to prepare the fibers for spinning.

With these processes, the fibers:

- get untangled
- become straighter and smoother
- get aligned, making it possible to spin

wool combs

We use two types of tools:

- Fleece (wool) combs
- Hand carders.

These tools come in pairs and are always used together.

Wool combs have long metal prongs.

They come in different sizes.

They are suitable for long fibers like flax and long pile fleece.

These fibers are ideal for making thinner yarns. Ideal for warp threads or fine weft material.

hand carders

Hand carders have many fine metal teeth on their surface.

They also come in various sizes.

They are ideal for shorter fibers like cotton and short pile fleece.

Hand carding process

Step 1

Make sure the carders are clean before using them.

I spread some of my teased fleece on one of the carders.

Step 2

I hold the carder still
(the one with the fleece on).

With the other carder,
I start combing the fibers .

The fibers will slowly transfer from one carder to the other.

The carders need to move in a parallel motion.

This way:
- The wire teeth will not tangle
- The fibers will get easily untangled

Step 3

I repeat the process of transferring the fibers from one carder to the other a few times.

The wool fibers will be ready when they become soft, fluffy and clean.

Step 4

When the fibers are ready

I carefully remove them from the carder.

I make them into a small roll (rolag).

As I keep on carding I will add fiber to the rolag.

When I prepare enough material, I can proceed to the next process called spinning.

Hand spinning

Spinning is the act of making thread from fibers.
You need to pull and twist the fibers simultaneously in order to make he thread.

The tools used for spinning are the distaff and the spindle.
They both come in different sizes and shapes.

Securing the rolag on the distaff

Step 1
I need to tie a string on the distaff.

Step 2
I slide the rolag on the distaff.

Step 3
The distaff goes through the rolag.

Step 4
I pull the string tightly under and over the prong of the distaff.

Step 5
I make sure the rolag is tightly held.

Step 6
I tie off the string.

Spinning warp thread

Warp and weft threads are spun in a different way.
Warp thread needs to be spun tightly to make it stronger.

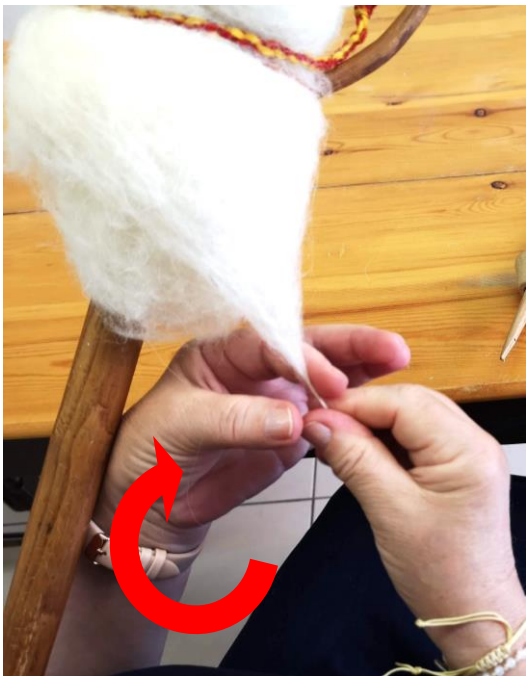
I spin the spindle a different way for the warp and the weft.
The motion is different as well as the direction of the spinning.

Step 1

I need to sit comfortably on a chair
and hold the distaff under my arm.

Step 2

I use my fingers to pull some of the fleece.
As I am pulling the fleece I need to twist it simultaneously.
The direction of the twisting is clockwise.



Step 3

As I pull and twist with both fingers, the thread is slowly created.

Step 4

When the thread is approximately 25 cm, I can tie it to the spindle.

Step 5

I tie it with a knot on the top of my spindle.

Step 6

I twist the thread to make a loop.

Step 10

I untie the thread from the top of the spindle.

Step 11

I hold the thread in the lower part of the spindle.

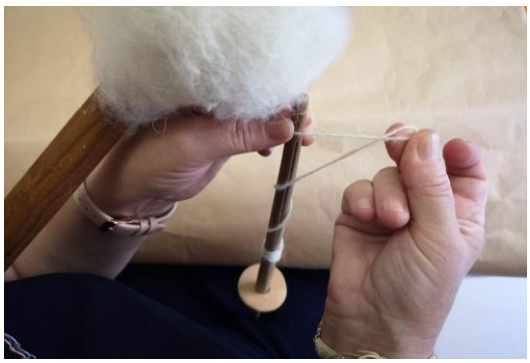
Step 12

I start winding the thread around the spindle.

I always wind clockwise.

Step 13

I twist the thread to make a loop.



Step 7

I put the loop over the top of the spindle.

I pull the thread to secure it on the spindle.

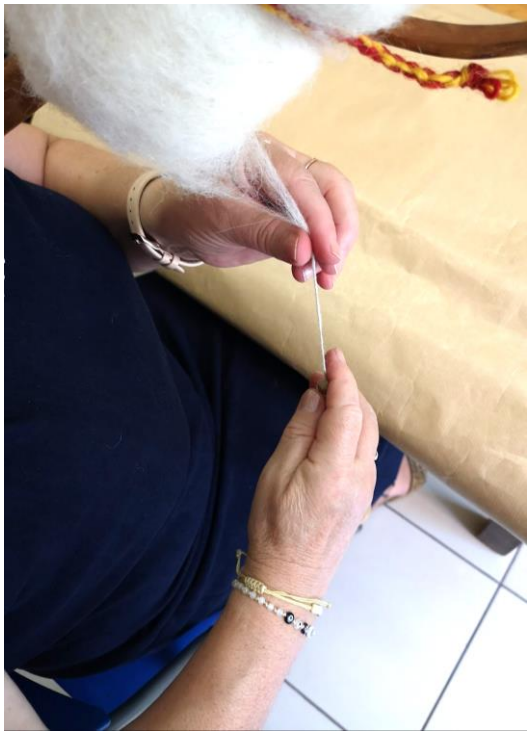
Step 8

I let the spindle hang and I spin it clockwise.

With my fingers on one hand, I spin the spindle.

With the fingers on my other hand,
I keep pulling the fleece.

I do this at the same time.
It takes practice to get it right!



Step 9

I try to make the thread evenly thin.

I want to make about 50 cm of thread.

Step 14

I put the loop over the top of the spindle .

I pull the thread to secure it on the spindle.

This will secure the thread on the spindle.

Step 15

I carry on spinning.

When my thread is long again:

1. I untie the loop on the top of the spindle
2. I wind my thread
3. I make a new loop
4. I secure the loop on the top of the spindle.
5. I carry on spinning.

Step 16

The more I spin, the more thread I make.

Spinning weft thread

Weft is spun less tightly than the warp thread.

To spin weft thread, I spin the spindle the opposite way of that for the warp.

To make weft thread, I spin the spindle anti-clockwise.

Step 1

I need to sit on a chair and be comfortable.

I hold the distaff under my arm.

Step 2

I use my fingers to pull some of the fleece.

As I am pulling I twist the fleece.

The direction of twisting is anti-clockwise.

Step 3

I pull the fleece with one hand and

I twist with my fingers of the other hand.

The twist for making weft is anti-clockwise.

The thread is slowly created.

Step 4

When I make thread around 30 cm long,
I wind it on the spindle.

I hold the spindle upside down.

I hold the thread in the middle of the spindle.

Step 5

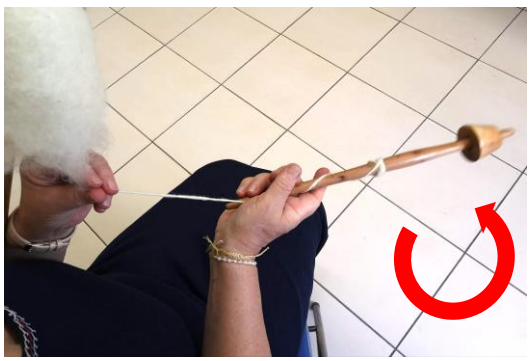
I wind the thread tightly around the spindle.

Step 6

I hold the spindle on the top.

I turn the spindle sideways.

I start turning the spindle anti-clockwise.

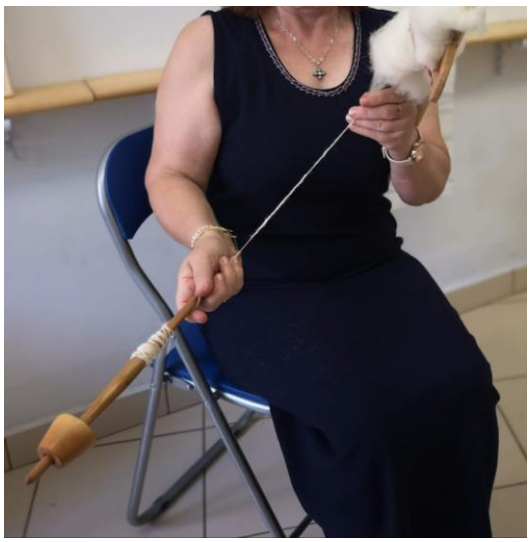


Step 7

To make thread:

- One hand pulls the fleece with the fingers
- The other hand turns the spindle

When



Step 8

When the thread gets too long to handle,

I wind it on the spindle.

I continue spinning.

Step 9

The spindle will fill up with thread.

Step 10

I have 2 types of thread.

A thin one to use as warp and

A thicker one to use as weft.

Dyeing yarn with natural dyes

Man used natural sources to dye yarn for many centuries before synthetic dyes were discovered.

The dyes came from:

- Plants (flowers, leaves, barks, roots etc..)
- Animals (insects, insect eggs, shells etc..)

Types of natural dyes and mordanting

There are 2 types of natural dyes:

- Substantive or direct dyes, are the ones that give color directly the the fiber.

- Adjective or additive dyes, are the ones that require the use of a mordant (chemical assist/ mineral salts) to bring out the color of each dyestuff and bond with the fiber.

Different mordants are used for different types of fiber.
More specifically, plant fibers use different types of mordants to animal fibers.

We will be looking at dyeing wool.

Methods of wool dyeing

There are 4 methods of dyeing wool with natural dyestuff.

1st - The wool is boiled first with the mordant and then in a fresh bath with the dye.

2nd - The wool is boiled first with the dye, and when it has absorbed as much of the color as possible the mordant is added to the same bath, thus fixing the color.

3rd - The wool is boiled with the mordant and dye in the same bath together. The color, as a rule, is not so fast and good as with a separate bath.

4the- The wool is mordanted, then dyed, then mordanted again. This method is adopted to ensure an extremely fast color.

Mordants

The mordants (mineral salts) that are used with wool dyeing are:

1- Alum (Aluminum Potassium Sulfate)

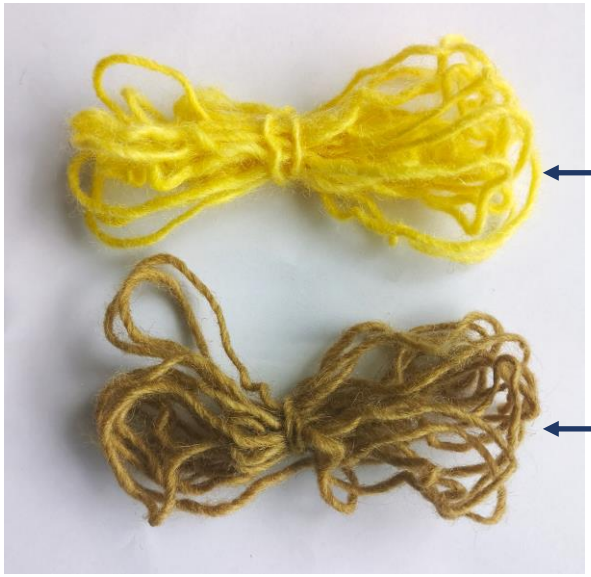
2- Iron (Ferrous Sulfate)

3- Copper (Copper Sulfate)

4- Chrome (Potassium dichromate)

5. Tin (Stannous chloride)

The use of each mordant will have an effect on the color of the dye. Each mordant will have a different effect. Iron for example will make the dye darker.



Wool dyed with “weavers broom” and Alum

Wool dyed with “weavers broom” and Iron

The dyestuff is sensitive when in contact with different minerals and materials. For this reason we try and use stainless steel containers and utensils in order not to effect the color of the dye bath.

Dye bath and pH

The color of the dye is linked with the pH of the dye solution.

pH is a measure that indicates how acidic or alkaline (basic) an aqueous solution is.

We can alter the pH of the dye by adding substances such as vinegar, lemon juice, cream of tartar, chalk etc..

By altering the pH of the dye, its color will change.

Substances that will make the dye more acidic are:
Vinegar, lemon juice, cream of tartar, tannins etc..

Substances that will make the dye more alkaline/ basic are:
Bicarbonate of soda, ash, ammonia, chalk etc..

Madder root dye with vinegar (acidic dye)

Madder root dye

Madder root dye with bicarbonate soda (alkaline/ basic dye)

Natural dyestuff

We can find natural dyestuff in:

- Flowers
- Plant leaves
- Weeds
- Fruit
- Nut and fruit shells and peels
- Tree barks
- Roots

Not all plants produce enough dyestuff to make them suitable for natural dyeing.

For yellow- orange- brown shades try the following dyestuff:

- Weavers broom, *Spartium junceum* (flowers)
- Wood sorrel, *Oxalis stricta (*flowers)
- Marigolds*, tagetes* (flowers)
- Chamomile (flowers)
- Dandelion*, Taraxacum* (flowers)
- Turmeric , *Curcuma longa*(roots)
- Fig tee, *Ficus carica* (leaves)
- Almond tree, *Prunus dulcis* (leaves)
- Dahlia (flowers)
- Eucalyptus tree (bark and flowers)
- Onions, *Allium cepa* (bulbs)
- St. Johns Wort, *Hypericum perforatum* (flowers)

For red- pink shades try the following dyestuff:

- Avocado, *Persea americana*(pit and skin)
- Prickly pear, *Opuntia* (fruit)
- Eucalyptus tree (leaves- bark)
- Madder, *Rubia tinctorum* (root)
- Kermes, *Kermes vermilio*
  (eggs of coccus ilicis on kermes oak)
- Cochineal, *Dactylopius coccus* (insect dye)

For blue- purple shades try the following dyestuff:

- Indigo, *indigofera* (leaves)
- Black beans, *Vigna mungo* (beans)
- Woad, *Isatis tinctoria* (leaves)
- Corn flower, *Centaurea cyanus* (flowers)
- Hyacinth, *Hyacinthus* (flowers)
- Coleus plant, *Solenostemon*, (leaves)

For green- khaki- brown shades try the following dyestuff:

- Spinach (leaves)
- Spearmint (leaves)
- Nettles (leaves)
- Artichoke (leaves- flower)
- Chamomile (stalks)
- Weavers broom, *Spartium junceum* (stalks)
- Sorrel (leaves)

For brown- black shades try the following dyestuff:

- Ivy, *Hedera* (leaves)
- Dandelion, *Taraxacum* (roots)
- Juniper tree (berries)
- Acorns
- Kermes oak (bark)
- Carob (pods)
- Walnut husks
- Walnut shells

Raw materials for dyeing

Dyestuff can be used in fresh or dried form.

Fresh dyestuff

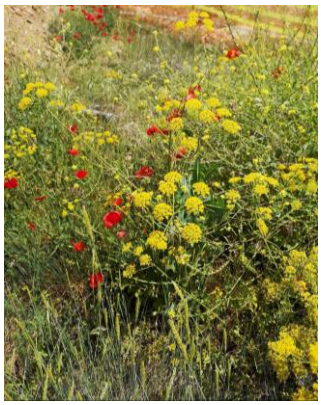
When fresh dyestuff is used (flowers, leaves, etc..), it is advised to use them as soon as possible after they have been collected.

Fresh dyestuff doesn't need to be soaked in order to produce color.
It can be added directly to water in order to create the dyebath.

Fresh dyestuff usually produces bright colors.
While preparing the dye bath we don't want the water to exceed 85^{o}C in order to maintain the brightness of the color.

If for some reason we have collected fresh dyestuff and we are unable to use it the same day, it is advised to put it in an airtight container and keep it in a freezer until the day of making the dye bath.

I need to weigh it before putting it in the freezer.
I need at least the same weight of dyestuff as the weight of yarn I am going to dye.
If I were to dye for example 1 kg of yarn I would need at least 1 kg of fresh dyestuff (flowers, leaves etc..)
The larger the quantity of dyestuff I use, the deeper the color I will get.



Dried dyestuff

When dried dyestuff is used (flowers, leaves, roots, barks etc..) they need to be soaked in water first. That aids in releasing all the color in the dye bath. Thicker and harder raw materials need more time soaking that thinner materials.

When using barks or roots they need to be soaked in water for at least 2 days. It helps if I break them down in smaller pieces, or to pound them with a mortar and pestle. They can also be boiled briefly before they are left to soak, as warm water will help the process of extracting the dye.

Dried flowers, leaves and skins that are more fragile don't need to be soaked in water, but might need a bit more time boiling while preparing the dyebath.

The weight of the dried dyestuff can be less than the weight of the wool that is being dyed.

Again, the larger the quantity of dyestuff I use, the deeper the color I will get.

Pre-mordanting wool

Pre-mordanting is the procedure by which the wool is prepared for dyeing in a bath of water and a mordant.
In this case, the wool will be pre-mordanted with a mixture of Alum and Cream of tartar.

In order to pre-mordant wool I will need:

- Clean wool for dyeing
- Alum (potassium alum sulfate, $KAl(SO_4)_2$)
- Cream of Tartar
- Precision Scales
- Thermometer for liquids
- A tub
- A stainless steel pot
- A cooking hob (gas or electric)
- A spoon and a pair of tongs
- A glass jar
- A pair of gloves
- Water, hot and cold
- A pencil and paper for note keeping

It is advised to do all dyeing and mordanting outdoors.
If that is not possible, find a well ventilated space.
Despite the fact most ingredients used are natural, it is advised not to inhale them and to wear gloves when handling them.

All utensils and pots used for dyeing and mordanting must be kept for the sole purpose of natural dyeing. Do not use them for cooking!

Step 1

I need to weigh the wool and make a note of it. The wool needs to be clean.

Step 2

I need to wind the wool into a loose hank.

Tying it loosely will ensure the wool will get evenly dyed .

Step 3

The wool needs to be soaked in water for 1 to 2 hours before it goes into the mordant bath.

Step 4

I need to calculate the amount of Alum and Cream of Tartar that need to go into the water according to the weight of the wool.

I need:
15% of the weight of the wool in Alum
and
6% of the weight of the wool in Cream of Tartar.

If I had 100gr of wool,
I would need 10 gr of Alum and 6gr of Cream of Tartar

I have 156gr of wool,
therefore I need 23,4 gr of Alum and 9,36 gr of Cream of Tartar

Step 5

I weigh the Alum and the cream of tartar and add it in a jar of hot water.

I need to stir the mixture well, so as the ingredients to dissolve completely.

Step 6

I poor the liquid from the jar into a pot with enough water to cover the wool.

Step 7

I need to strain the excess water from the wool and place it in the pot.
I need to turn on the hob, and increase the temperature of the liquid gradually without exceeding 85 ^{o}C.
I need to use a thermometer to check on the temperature frequently.

If the water boils, the wool will start to felt.

Step 8

Occasionally, I need to stir the wool gently without getting it tangled.
It needs to stay on the hob for 1 hour.
I then let it cool down inside the mordant.

Step 9

Once it has cooled down, we remove it from the mordant and hang it to dry in the shade.

If the dyebath is ready, I can proceed with the dyeing process while the wool is still wet.

Dyeing with Madder root

The Madder plant (Rubia tinctorum) is a small bush that grows in the south of Europe.

Its root is a potent dyestuff and is ideal for yarn dyeing .

It is usually used dried.

I can find it in shops selling spices and in many countries they still use it to dye eggs red for Easter. It can also be sourced from specialist dye suppliers.

Natural dyestuff are almost impossible to color match, despite the fact I might be using the same recipe.

For this reason, I go by certain principals and experiment with dyes until I am happy with the color results.

I start by weighing the madder root.
In order to dye 100 gr of wool I will use 60 gr of madder root.

The more I put in, the deeper the color that will be produced.

Step 2

I add boiling water in the pot with the madder root.
Because it is a root it will need to soak in the water for 24 hrs.

After that, I will bring the pot to a boil for about 30 minutes until it releases all its dye In the water.

Step 3

When the dye cools down, I will sieve it.
The madder root can be disposed in the garden, as it is a natural material.

I will then split my dye in to 4 parts in order to make 4 different colored dyes from the same dyestuff.

Step 4

The wool needs to be wet before entering the dye bath. It needs to have soaked in water for 1 to 2 hours. This will ensure it will be dyed evenly.
The wool also needs to be the same temperature as the dye bath.
We avoid putting warm wool into cold water and vice versa as the texture of the wool will be affected.
Attention needs to be paid when rinsing the wool from the dye bath.

Step 5

I take one part of the dye and poor it in the pot. I place the wool in the dye bath and increase the temperature gradually.

I need to keep the temperature below 85^0C.
I use the thermometer frequently to check the temperature.

Step 6

Occasionally I need to stir the wool gently, to ensure it is fully immersed in the dye.
With a pair of tongs I pull the wool out to check the color.

The more I leave it in the dye bath, the deeper the color will get. There is a risk it might get dull, so I need to check it frequently.

It might take from 15 minutes to a whole day to achieve the desirable color.

Step 7

When I am happy with the color I need to rinse the wool in fresh water if the same temperature.

The dye bath that is left can be used again several times. It will produce a weaker color every time it is used.

Once the wool is thoroughly rinsed out it can be hang to dry in the shade.

Once it is dried, it is ready to use.

The color of dried wool is usually lighter than what it was when wet.

Dye bath with madder root and vinegar

Step 1

I place 1 part of the initial dye in the pot.
I add a couple of spoonful's of vinegar until I see the color of the dye bath change.
The color should change to more orange.
If vinegar is not available it can be substituted with lemon juice.
.

Step 2

I add the pre soaked wool into the dye bath.
I repeat steps 5- 6- 7 of dyeing with madder root on page 15.

I need to remember to keep the temperature of the dye bath below 85^0C.

Step 3

When I achieve the desired color I:

- remove the wool from the dye bath
- rinse it out thoroughly
- hang it to dry in the shade

The wool is dyed a bright orange color.

Dye bath with madder root and chalk

Step 1

I use a glass jar and I add :

- hot water
- part of he initial dye and
- a spoonful of ground chalk

Step 2

I need to stir the mixture until the chalk is fully dissolved. The color of the liquid will turn to pink.

Step 3

I then poor the mixture into the pot with the original dye. I stir again until the mixture is fully homogenized.

Step 4

I add the pre soaked wool into the dye bath. I repeat steps 5- 6- 7 of dyeing with madder root on page 15.

Once dried, the result is a vivid pink color.

Dye bath with madder root and iron

Iron (Ferrous Sulfate) comes in powder form and is widely used as a fertilizer for plants. We can find it at most garden centers.

It can be toxic and will stain the skin, so gloves must be worn when handling it.

Step 1

I use a glass jar and I add :

- hot water
- part of he initial dye and
- a teaspoon of iron

Step 2

I seal the lid of the jar and shake the mixture until the iron is fully dissolved.

The color will darken instantly.

Iron will make colors darker, but it must be used sparsely, because it can also make colors dull.

Step 3

I then poor the mixture into the pot with the original dye. I stir again until the mixture is fully homogenized and add the pre soaked wool.

I repeat steps 5- 6- 7 of dyeing with madder root on page 15.

Color variations from madder root dye baths

1. Madder root with vinegar- 12 hr. in dye bath
2. Madder root with vinegar- 30 min in dye bath
3. Madder root with alum and vinegar- 1 hr. in dye bath
4. Madder root with alum- 1 hr. in dye bath
5. Madder root with alum and chalk- 1 hr. in dye bath
6. Madder root- 2 hr. in dye bath
7. Madder root with bicarbonate soda- 12 hr. in dye bath
8. Madder root with bicarbonate soda- 2 hr. in dye bath
9. Madder root with bicarbonate soda- 30 min in dye bath
10. Madder root with alum and iron- 1 hr. in dye bath

I can make labels to mark each yarn.

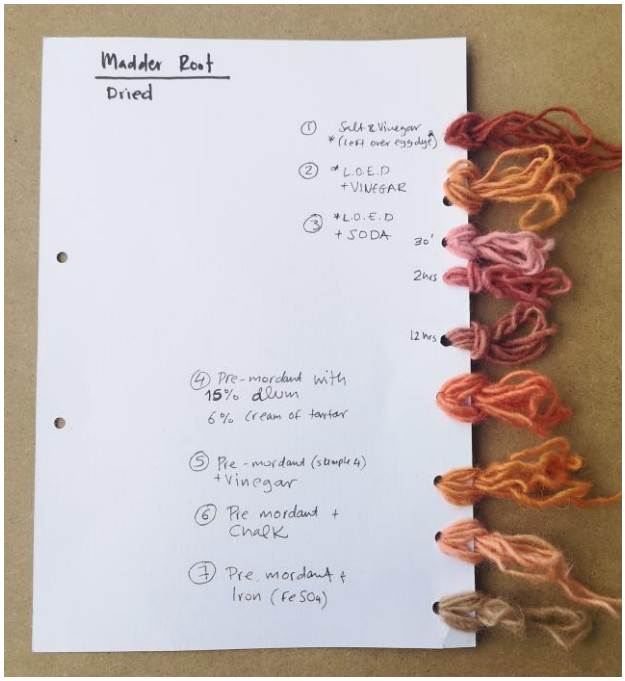
I need to tie a label on each yarn
Writing down information about the ingredients I used during the dyeing process.

Making a sample book is very useful for future reference.

I use a piece of card and make holes on one side.
I thread some yarn through each hole and write the ingredients used for each dye next to it.

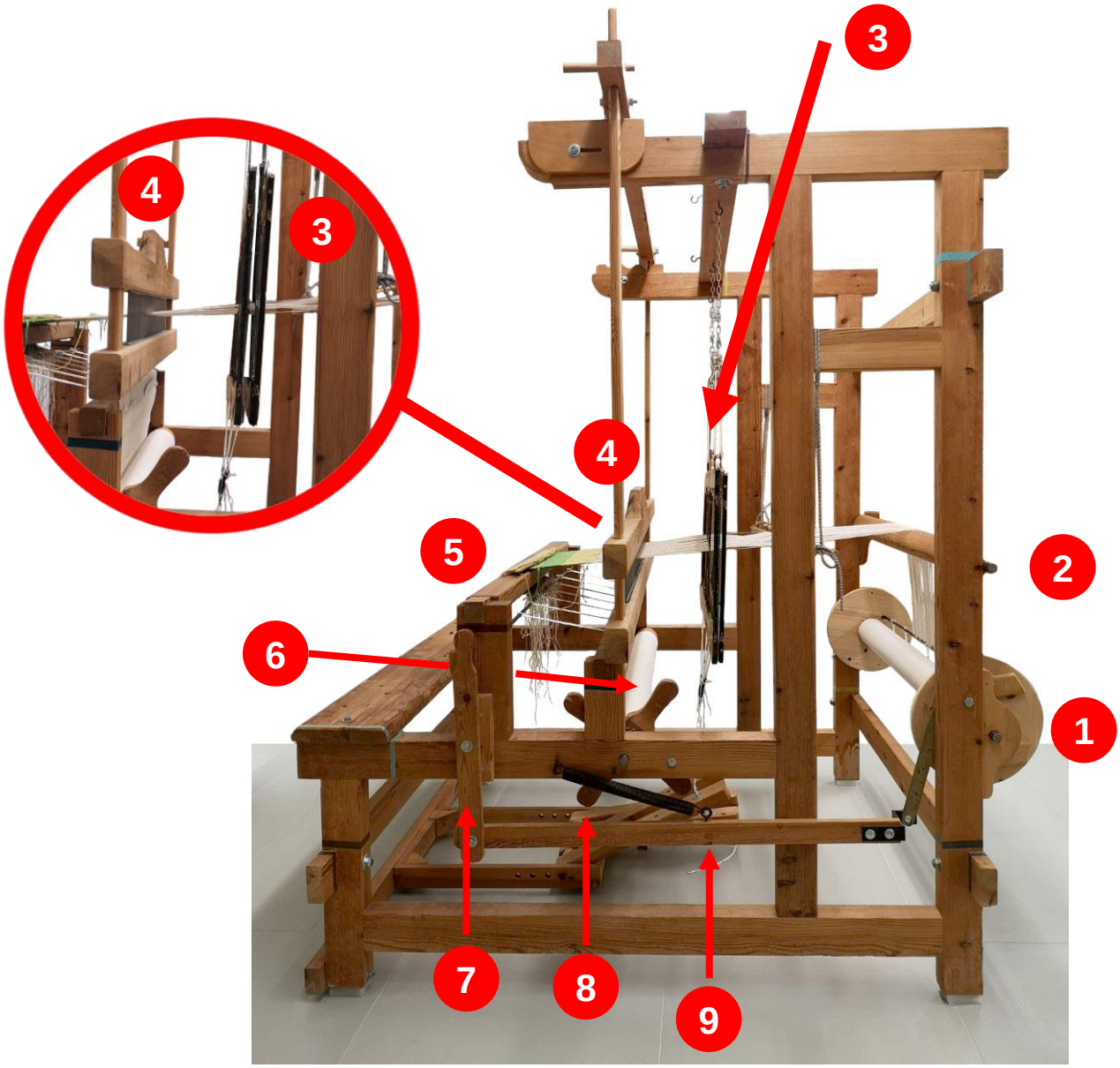
I can also make notes on times or any other remarks I would like to remember.

I can keep these cards with the wool samples in a folder.



There are many types of looms but they have very similar parts.
This is a counterbalance floor loom with the following parts:

1. Warp beam
2. Back beam
3. Shafts with heddles
4. Beater with reed
5. Front beam
6. Cloth beam
7. Tension release lever
8. Cloth crank
9. Treadles



Chapter contents:

!. Warp calculation

Warping the loom can be a lengthy and complicated process.

For this reason it is advised to load the loom with many meters of warp thread in order to weave many projects.

When calculating how many meters of thread I need, I need to allow some extra meters for :

1. Loom waste.
   This is the thread that can not be woven in the beginning and the end of the warp.

2. Weaving headers

3. Thread for tassels if my projects require them (I.e. scarves, carpets etc.)

4. Weaving samples

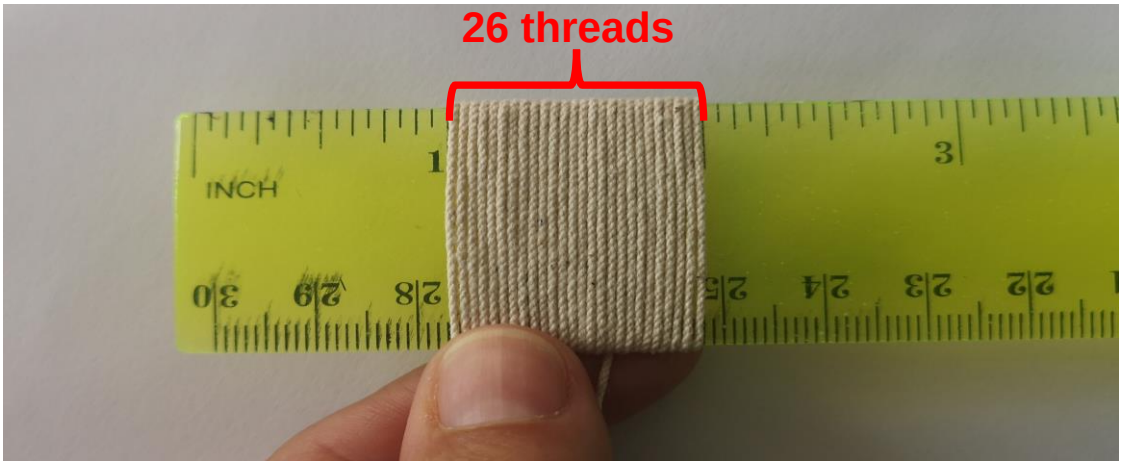
5. Material shrinkage.
   Most threads will shrink when washed. Allow 5-15% extra according to the material used.

Choosing the correct reed for the loom

When I have decided on the warp thread I want to use, I need to choose the right reed to use with it. This takes a bit of experience, but for the novice weaver it is always advised to make a small sample before warping the whole loom.

To find out which number reed to use, I wind my warp around a ruler until it covers the space of an inch. I wind it around the ruler without leaving any gaps.

I count how many threads it takes to cover 1 inch (or 2,5 cm)



In this case it is 26 threads.

If I am weaving a balanced weave with the same thickness weft thread I need to divide this number by 2.
In this case it is 13 warps. The reed I would be choosing is a size 12 d.p.i. (dents per inch) which is the closest reed available. Its better to go a size down rather than a size up.

If the weft yarn is thicker than the warp I need to use a sparser reed which means it will have less dents per inch. In this case it can be a 10 d.p.i. or even an 8 d.p.i. reed.

Once I have decided on the reed size and know how wide I want my weaving to be I am ready to calculate how many meters of warp thread I need.

Calculating the weight of the warp needed for warping.

For this example I will be using a 10 d.p.i. reed.

I want my weaving to be 40 cm wide and the total length of the warp to be 10 m.

I am using cotton twine size 10/6 (size 10, 6 ply)

Since I am using a 10 d.p.i. reed:

- I will have 10 threads every inch or 2,5cm.
- This means that I will have 40 threads per 10 cm.
- For the whole width of my weaving (40 cm) I will have 160 threads (40 * 4 = 160 threads)
- I need to add any extra warp threads I might use for the selvages.

In this example I will add 4 more threads as I want 2 of the warp threads on each side to be doubled.

The total number of warp threads will be 164

The total length of the warp I will need is:

164 threads * 10 meters total length = **1640 meters of thread.**

Calculating the weight of the warp needed for warping.

In order to calculate the weight of cotton warp thread I can use a mathematical formula.

$$\textbf{Weight in grams} = \frac{\textbf{Number of warps * meters of warp * 0,59}}{\textbf{The size of the warp thread divided}}$$

In our example the weight of the warp is :

$$\textbf{Weight in grams} = \frac{\textbf{164 * 10 * 0,59}}{\frac{\textbf{10}}{\textbf{6}}} = \frac{\textbf{967,6}}{\textbf{1,67}} = \textbf{579,4 gr}$$

The weight of the total warp thread needs to be 579,4 gr.

I will always round the number up ,so I need to make sure I have 600 gr of warp thread to start warping.

2. Winding the warp

Warping is the procedure by which the warp threads are prepared and arranged in order to dress the loom.

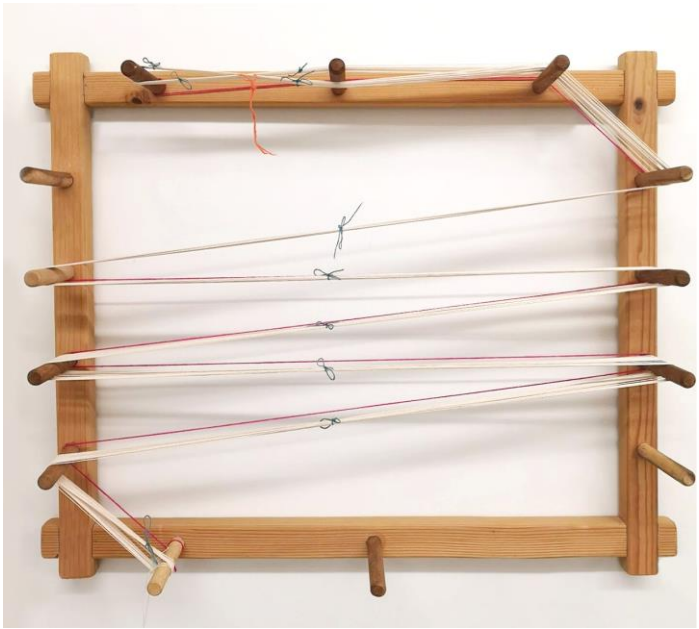
By winding the warp I succeed in having all warp threads:

- In pairs (even number of threads)
- The same length
- One parallel to the other
- With even tension
- Forming the cross

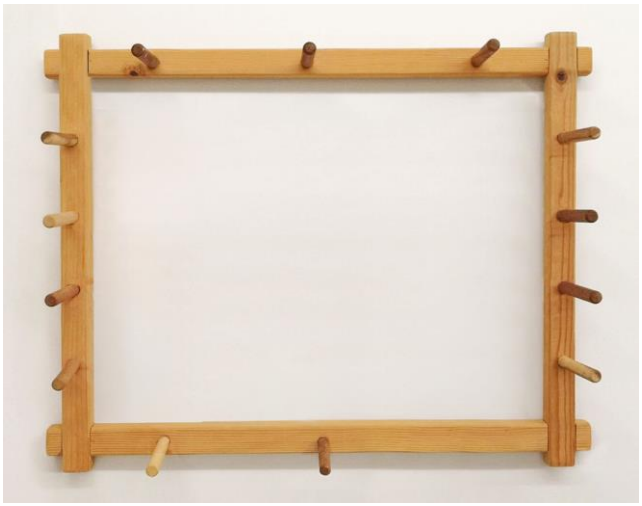
The process of winding the warp needs to be done by the same person in order to ensure even warp tension.

It is a crucial procedure as it determines the quality of the final woven piece.

There are professionals, usually women, that specialize in warping as well as electric warping mills.



Warping board with warp threads



Warping board

Warping mill

A warping board is a wooden frame with wooden pegs on every side.

Warping boards vary in size and can be constructed to suit everybody's needs, according to the space available and the desired warp length.

Each side of the warping board has the same number of pegs.
Usually, the bottom board has two pegs and the top board has 3 pegs.

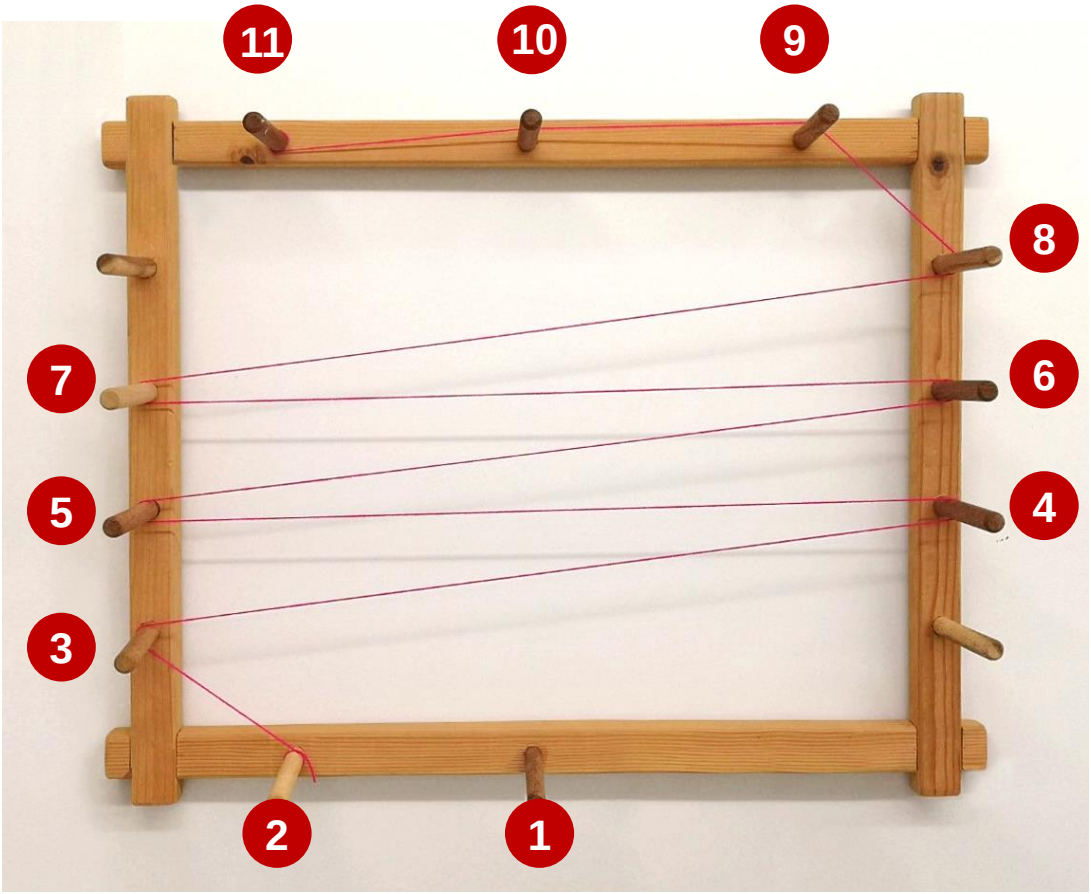
The 2 pegs that are used to make the cross with (peg 10 and peg11 on page 11) and a third one (peg 9 on page 11).

Every peg is approximately 15- 20 cm long and has a diameter of 2 cm.
The pegs are placed around 15 cm apart.
The two pegs that are used to make the cross (peg 10 and peg 11 on page 11) have a gap that is larger than 15 cm with the third peg (peg 9 on page 11).

The use of a warping board is very practical if:

- You don’t have a lot of space
- You don’t have a large warp number
- You don’t want the warp to be more than 10m long

3. Using a warping board



- Take a piece of thread that is of different colour and texture to the warp threads in order to use it as a warping guide.
  Cut the thread slightly longer than the desired warp length as it needs to be tied it on both ends.
- Begin by tying one end to the last peg used for making the cross (peg 11).
- I follow the route 11- 10- 9- 8- 7- 6- 5- 4- 3- 2 on the pegs in order to use the full length of my thread and I tie the other end of the thread on peg 2.

If my thread was longer, I could have also used the extra pegs on the sides of the warping board.
If I wanted to have some more weaving space and I had enough warp thread, I could have tied my thread on peg 1.

This thread is the guide I will use in order to prepare my warp threads.

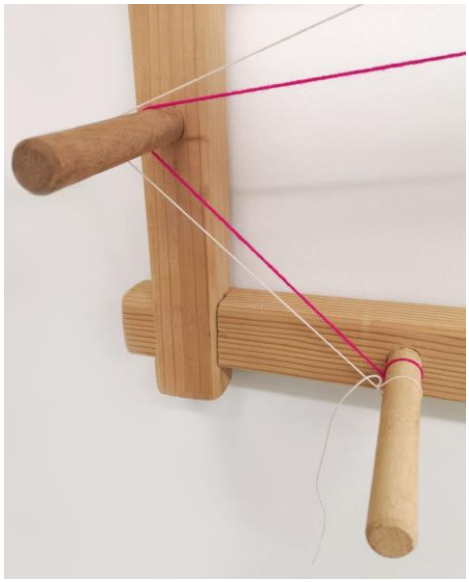
Preparing the warp

Step 1

Place a ball of thread in a container.

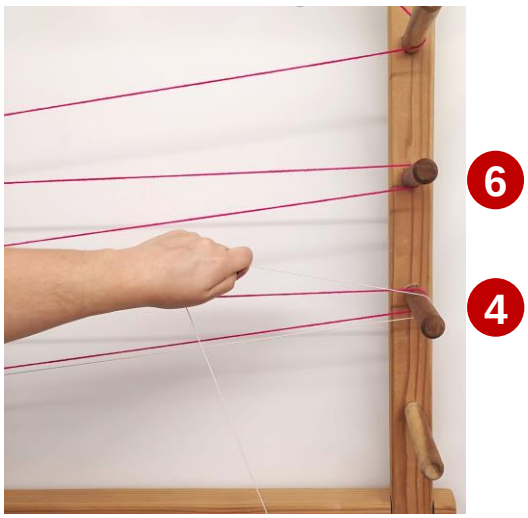
Step 2

Tie the beginning of the thread on peg 2.
Begin winding the warp on the lower part of the warping board on peg 2 .
It is the peg which the guide thread is tied on.



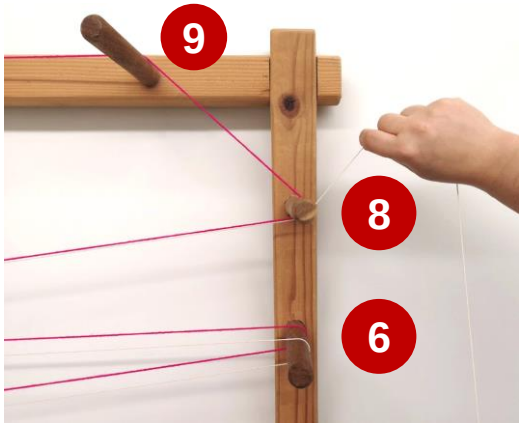
Step 3

Follow the route marked by the guide thread accurately from peg 2 until peg 9.



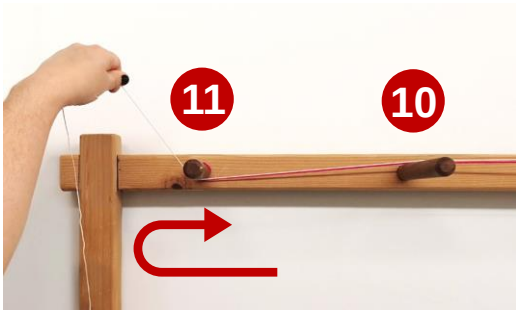
Step 4

Keeping an even tension of the thread while winding the warp is essential.
Too much tension might make the pegs on the board bend.



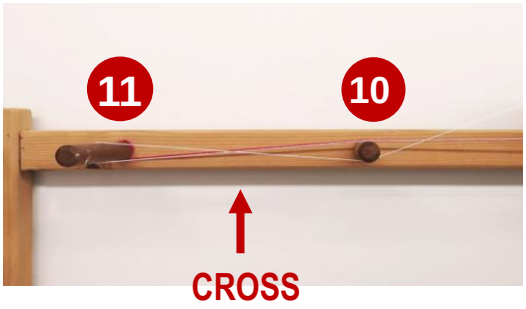
Step 5

When you get to the two pegs that you will use to form the cross, take the thread over peg No 10 under peg No 11 and under peg No 10 again.



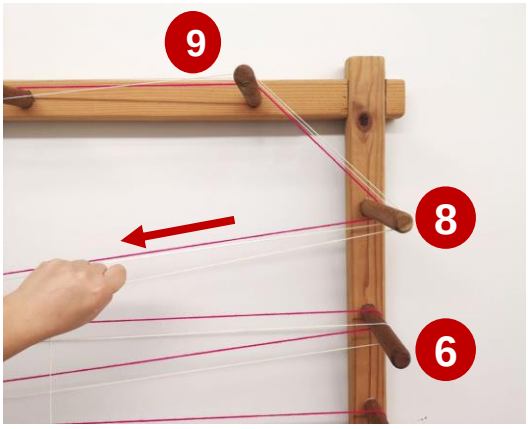
Step 6

This is how the cross is created, which is the most important part of warping.
Even if one of the threads gets intertwined, the warp will not work.



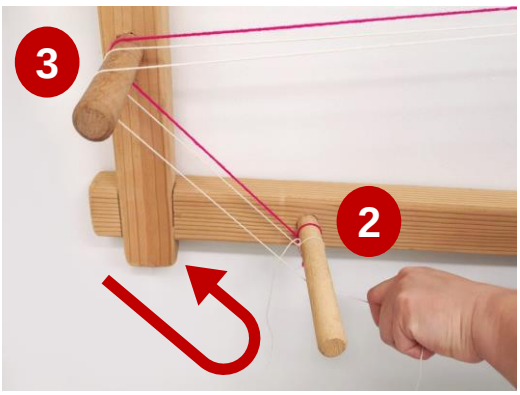
Step 7

After peg No 10 follow the route indicated by the guide thread back to peg No 2.



Step 8

When you get to peg No 2 you have wound the first pair of threads.
At this point, pass the thread under peg No 2 and follow the previous steps.
Repeat the same steps until I reach the desired thread count.

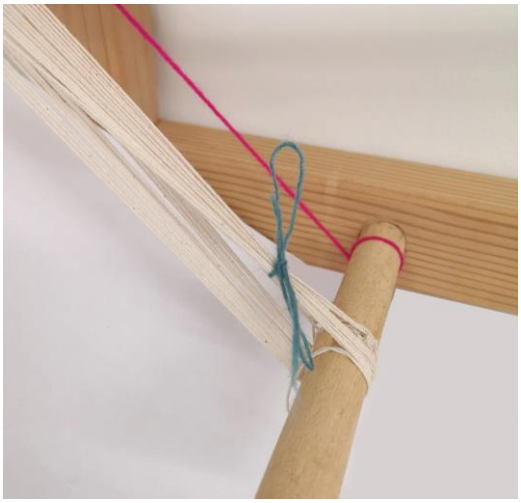


Step 9

Count the threads between pegs 3 and 4 (or 4 and 5) and tie bundles of 20 threads in order not to loose count.

Step 10

When you finish winding the warp, tie the warp thread on peg 2, where you started warping from.

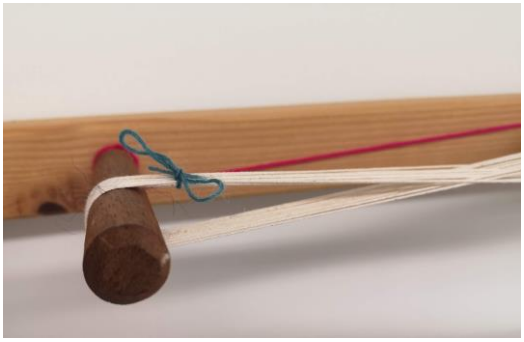


If you run out of thread while warping, do not tie on the new thread using a knot. Tie off the end of my thread on peg 2 and cut off any remaining thread. Then tie on the new thread on the same peg (peg 2) and carry on with winding the warp.

If you find a knot in the thread while winding you need to go through the same process as mentioned above.

Step 11

Use a piece of thread of different colour and texture from the warp threads in order to tie the loops formed around the first and last pegs (2 and 11).
This helps keep the warp threads in place as I remove them from the warping board.

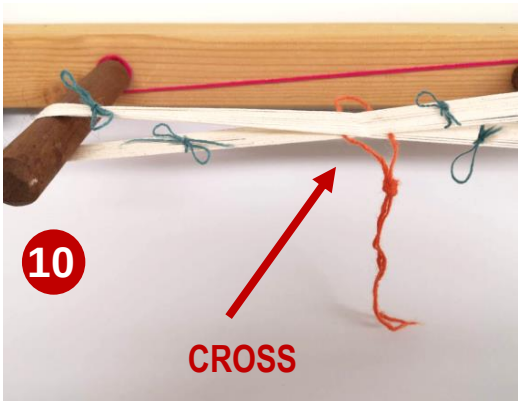


Step 12

Continue tying the warp in different paces between pegs 3-4, 4-5, 5-6, 6-7 and 7-8 in order to keep it untangled when removing it from the warping board.

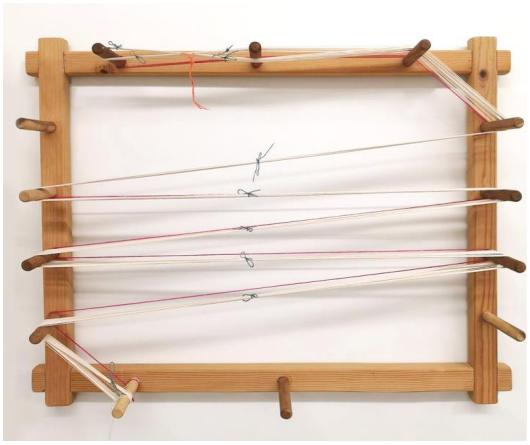
Step 13
Tie the cross to keep it intact between pegs 10 and 11(Orange thread in the image).

I also tie the thread bundles created around the cross to make sure the cross stays intact while removing the warp threads from the warping board(blue threads in the image).



Step 14

The warp is now ready to be removed from the warping board.



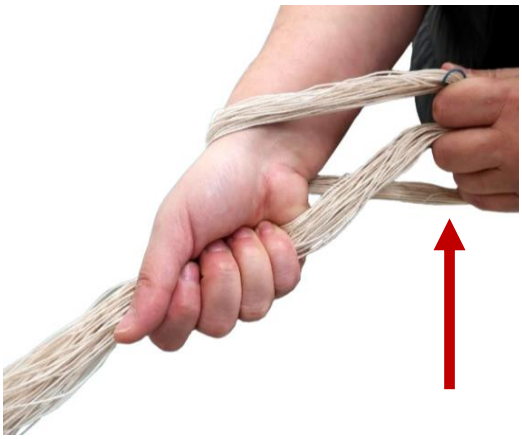
Removing the warp threads from the warping board

Step 15

In order to remove the warp threads from the warping board, place your left hand in the loop created around peg No 2 and I pull the threads off the peg with caution.

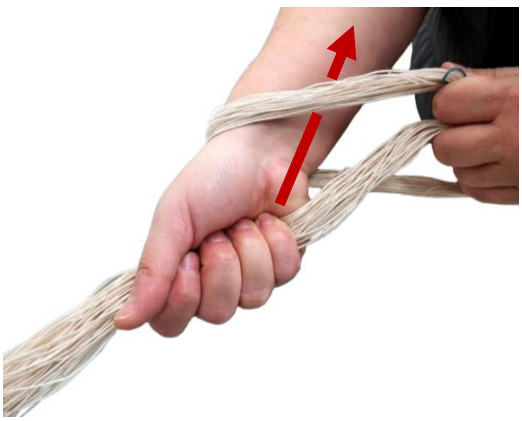
Step 16

Use your left hand to hold the loop secure.



Step 17

The right hand (that is in the loop) pulls the next part of the warp through the loop.



Step 18

This is how the first loop of the chain is created and you continue the same way creating a longer chain.

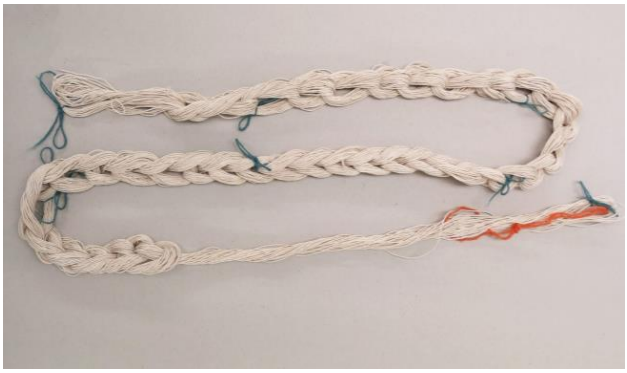
This way you will gradually remove the warp from the warping board.

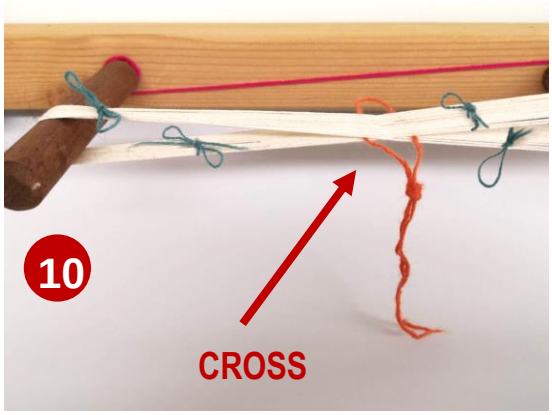
Step 19

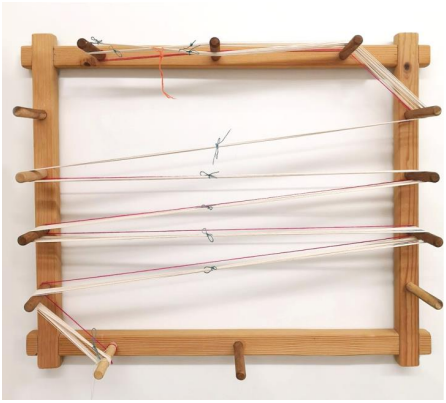
Carry on until you get close to the cross and then pull the warp threads through the last loop in order to secure the chain.

Step 20

The warp is now ready and I can take it to the loom.



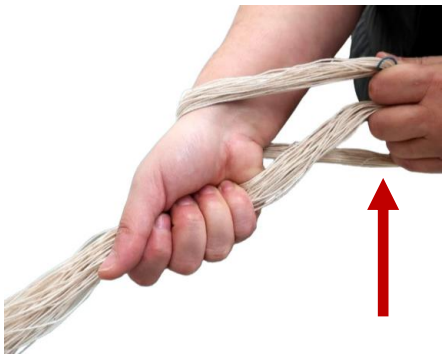




13. Tie the cross to keep it intact between pegs 10 and 11. (Orange thread in the image). I also tie the thread bundles created around the cross to make sure the cross stays intact while removing the warp threads from the warping board. (blue threads in the image)

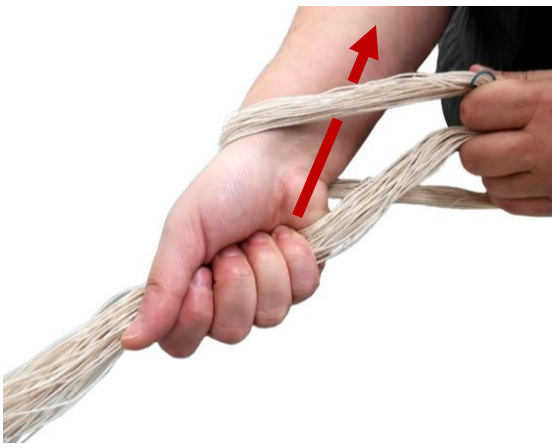
14. The warp is now ready to be removed from the warping board.

Removing the warp threads from the warping board



15. In order to remove the warp threads from the warping board, place your left hand in the loop created around peg No 2 and I pull the threads off the peg with caution.

16. Use y left hand to hold the loop secure.



17. The right hand (that is in the loop) pulls the next part of the warp through the loop.

18. This is how the first loop of the chain is created and you continue the same way creating a longer chain. This way you will gradually remove the warp from the warping board.

19. Carry on until you get close to the cross and then pull the warp threads through the last loop in order to secure the chain.

20. The warp is now ready and I can take it to the loom.

It is very practical at this stage to weigh my warp for future reference.

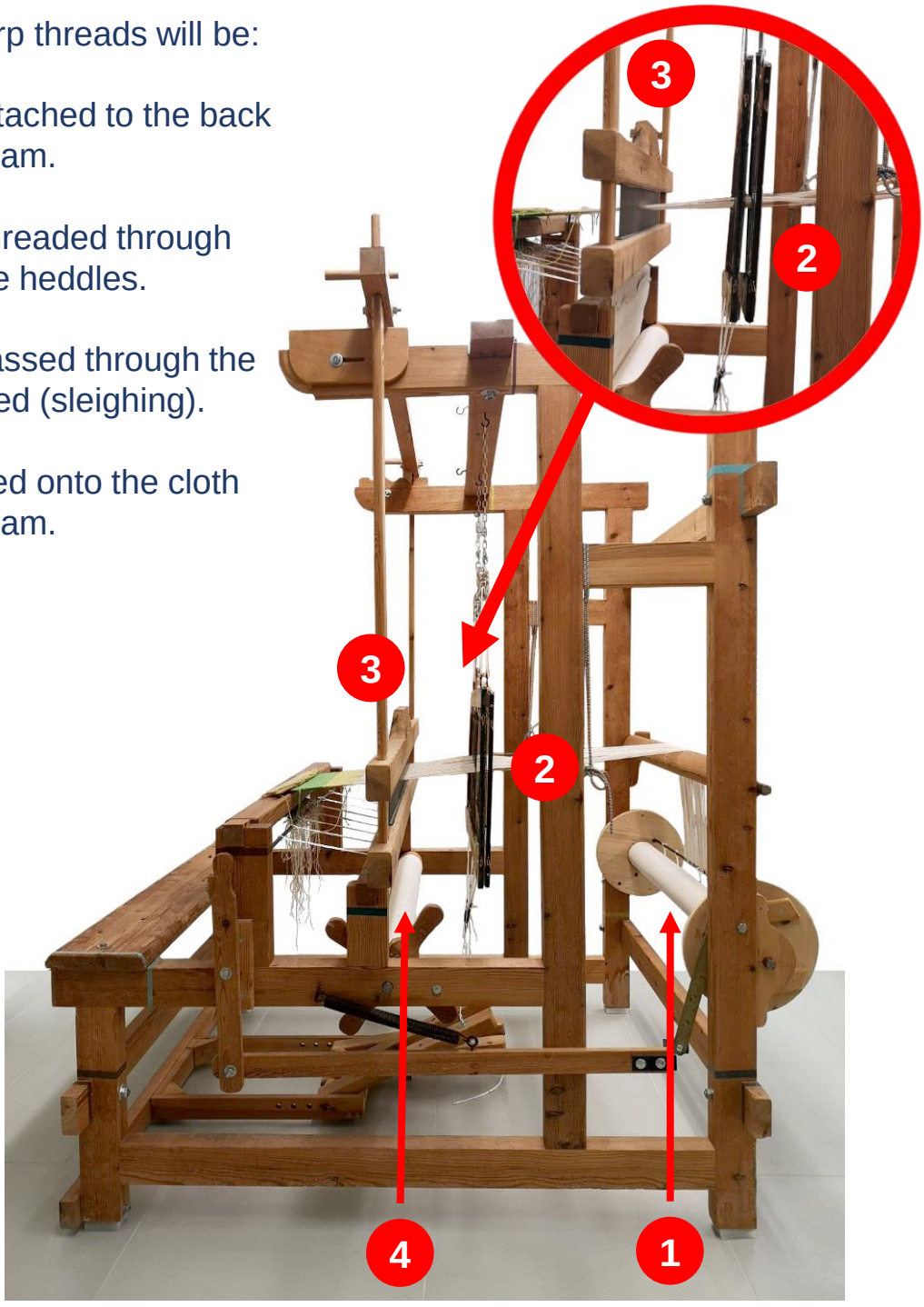
4. Warping/ dressing the loom

There are 2 ways of warping the loom.
Warping front to back and back to front.

We will be demonstrating the back to front method.

My warp threads will be:

1. Attached to the back beam.
2. Threaded through the heddles.
2. Passed through the reed (sleighing).
3. Tied onto the cloth beam.



5. Attaching the warp on the warp beam

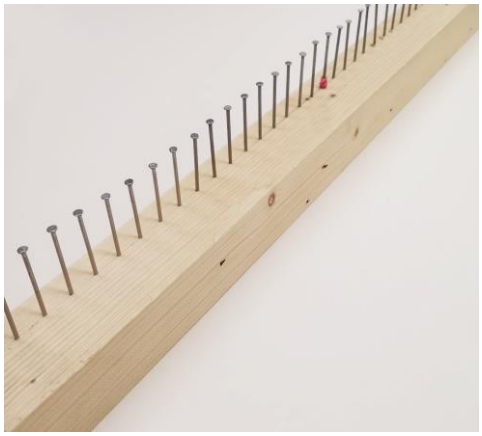
Equipment for warping the loom

In order to warp the loom, also known as dressing the loom, I need a pair of cross (lease) sticks or a thick piece of rope, 4 rods and a raddle.

1. The cross or lease sticks are 2 smooth wooden sticks that keep the warp threads in the right order, while dressing the loom and during weaving.

2. The apron rods are usually metal rods that are attached onto the aprons of the warp and cloth beams.
I need 2 rods per beam.
On the warp beam, the apron rods (also called back apron rods) assist with the attaching of the warp threads as well as warp spreading.
On the cloth beam, the apron rods (also called front apron rods) assist with tying the warp threads in bundles. Each bundle has approximately 10- 20 threads depending on the thickness of the thread used. They also help with achieving even warp tension.

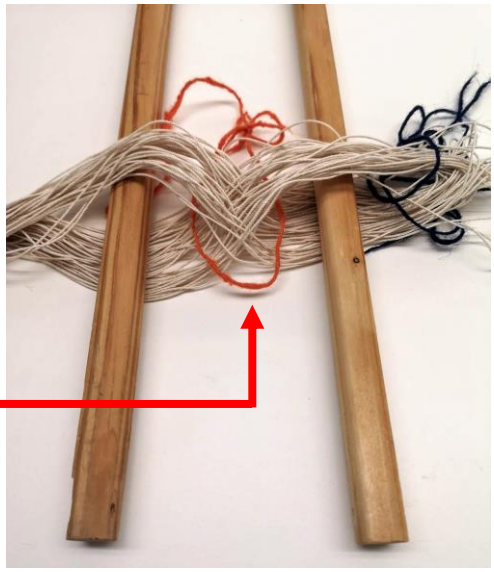
3. A raddle is a wooden beam with nails on (or wooden pegs) spaced equally apart. The gap between each nail is 1 cm.
We use a raddle in order to space out the warp threads evenly according to the desired cloth width. It will also keep the threads spread out while we are winding the warp on the beam.



Raddle

Inserting the cross/ lease sticks through the warp

I need to pay great attention when I am inserting the cross/ lease sticks through the cross of the warp threads.



The thread (here in orange) that I used to secure the cross while the warp was still on the warping board, helps me insert the cross sticks through the cross by keeping the right thread order.

When I finish with inserting the cross sticks through the warp threads, I tie the sticks together at both ends.

This is done to secure the cross while dressing the loom and during weaving.
The cross sticks are tied with an approximate gap of 5 - 10 cm.

Attaching the warp to the back apron rod and warp spreading

I tie the raddle securely on the back beam of the loom (left , right and center).

I insert one of the apron rods through the loop created by the warp threads on the side of the cross.
I divide the threads in half. I then tie the apron rod with the threads on to the rod that is attached to the back apron on this exact spot (middle of the rod).
This way I know that I have the same number of threads on each side of the binding.

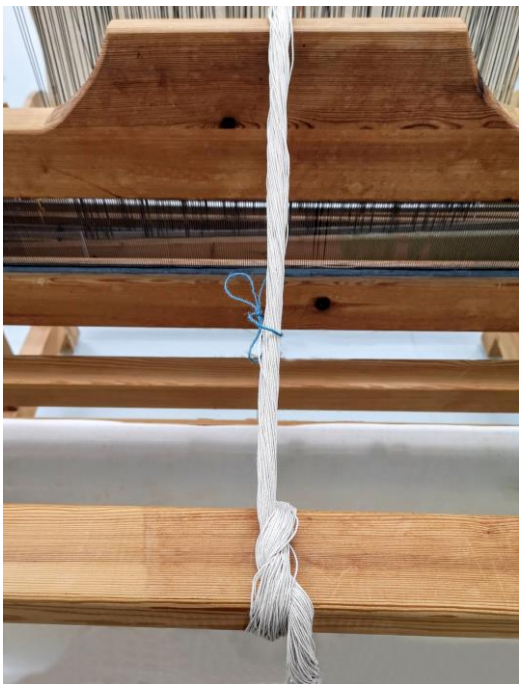
Besides the middle, I also tie the apron rods together at both ends to secure them and keep them parallel to each other.

I then pass the apron rod behind the nails in order to start spreading the threads on the slots of the raddle.

I also attach the cross sticks on the sides of the loom to help me with the spreading of the warp.

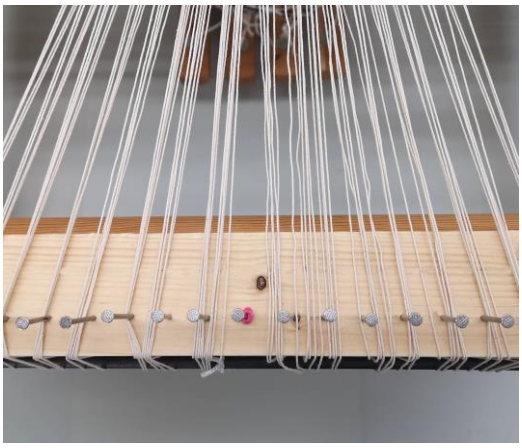
I also tie the other end of the warp onto the front beam.

This helps the threads not slipping while I am spreading the warp on the raddle.



I calculate how many threads I need on each raddle slot, according to the number of threads I have and the width of my woven cloth.

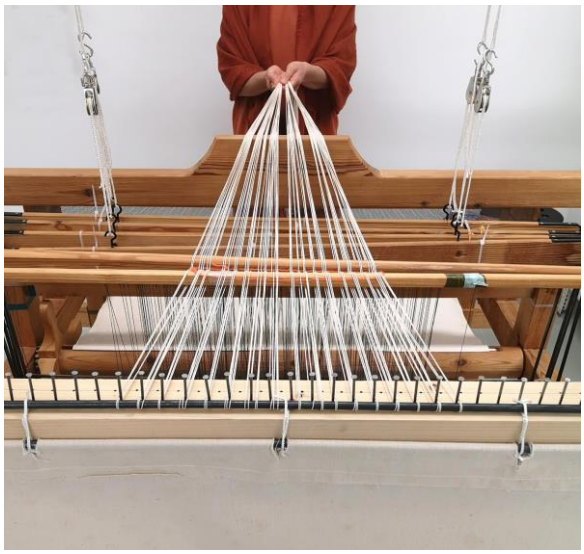
Every slot on the raddle needs to have the same number of warp threads.



Once I have finished with spreading out the threads on the raddle, I can start winding the warp on the warp beam.

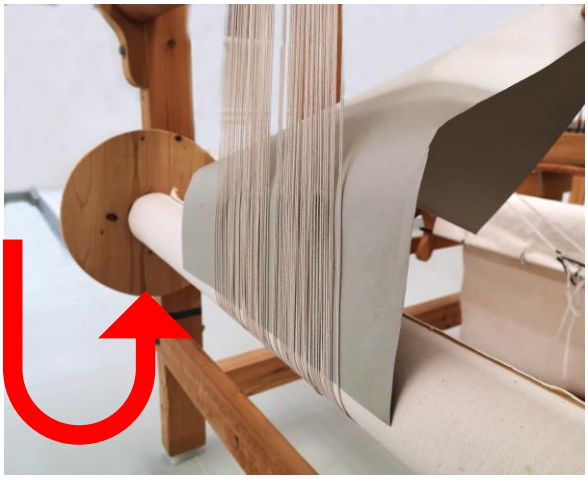
6. Winding the warp on the beam

In order to wind the warp onto the warp beam, 2 people are needed. If I have a lot more threads or a much wider cloth, the assistance of an extra 2 people is needed.



One person needs to stand on the front part of the loom, approximately 1 m away from the front beam, holding the threads taut and using their fingers to comb them.

Meanwhile the other person stands on the back side of the loom, and winds the threads on the warp beam.
He/ she is in charge of ensuring the cross stays intact while winding (no broken threads), as well as pushing the cross sticks towards the heddles when it is needed.
He/ she also pays attention to the threads on the raddle and keeps them in place while winding.



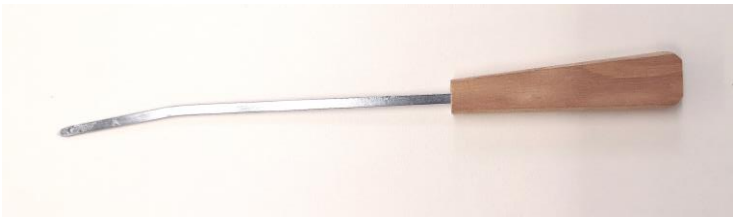
It is advised to place a piece of paper or card as a separator, to keep the layers of the warp from catching on each other. This is useful when unwinding the warp during weaving.

7. Threading the heddles

I am now going to proceed with threading the warp threads through the heddles.
Before I begin I need to have decided on the type of weave I am going to do and how many shafts I will be using. In this example I will be threading 2 shafts and doing a plain / tabby weave.
With this type of threading I can weave a rag rug, a kilim rug or a plain fabric.

I will need:

- 1 threading hook
- 2 pieces of string or strips of fabric

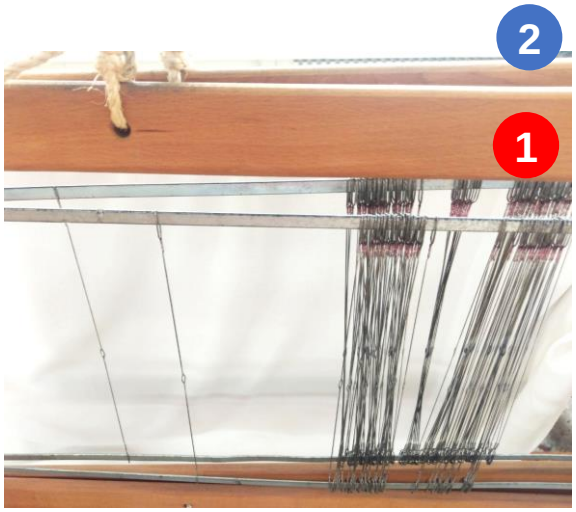


Before I begin:

I have 2 shafts that need to be threaded, so I need the correct number of heddles on each shaft.
For example, for 200 warp threads I will need 100 heddles on each shaft.
I need to thread the heddles in the following sequence.
I thread the first heddle of shaft No 1 followed by the first heddle on shaft No 2 and I continue with threading the second heddle on each shaft, followed by the third heddle on each shaft etc.

Shaft No 1, is the one that is closer to the weaver and shaft No 2 is the one behind it (the one that is closer to the back beam).

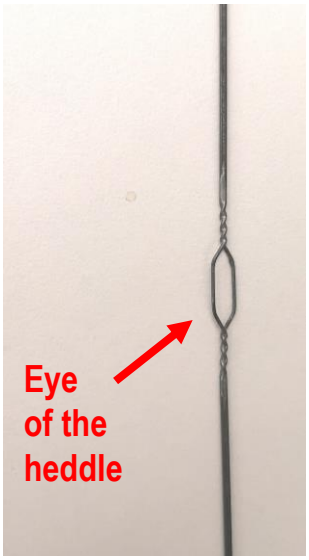
I tie the shafts together in order for them to be more stable as I am threading the heddles.



Every warp thread needs to pass through a heddle.

Each heddle, whether metal or string, has an opening in the middle called the eye of the heddle.

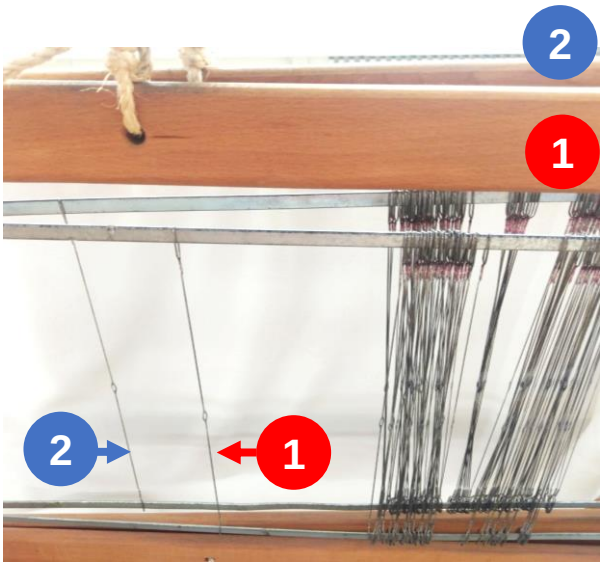
The warp thread passes through the eye of the heddle.



I push all the heddles to one side (here towards the right).

I pull apart the first heddle of each shaft.

So I have the first heddle on shaft No 1 and the first heddle on shaft No 2.

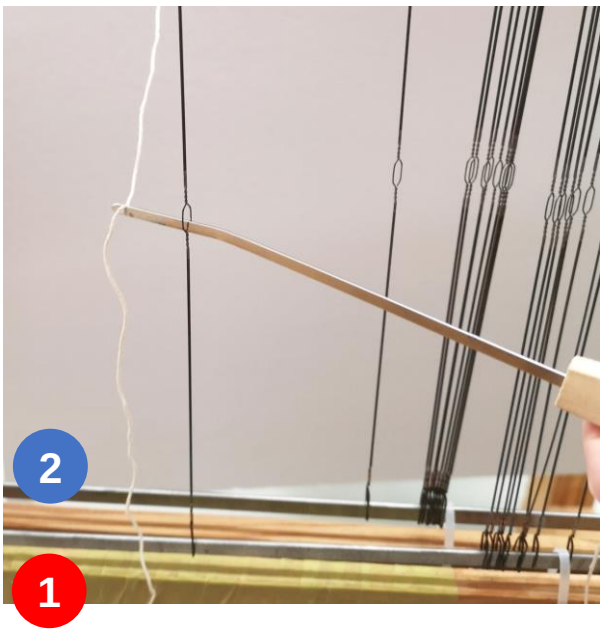


I take the first warp thread from the cross.

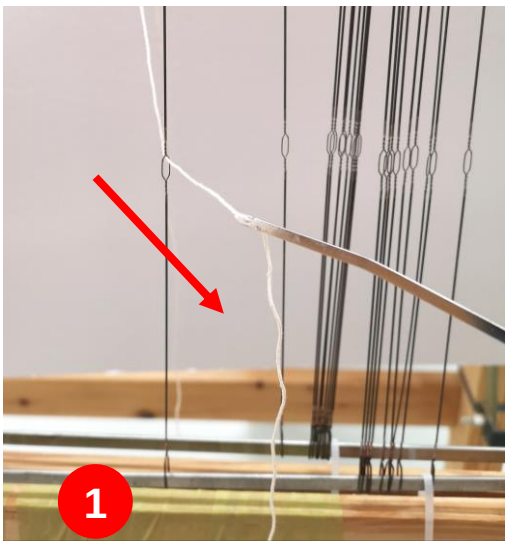
I insert the threading hook in the eye of the first heddle on shaft No 1.

The notch of the hook need to face the cross.

I insert the first warp thread in the notch of the hook.

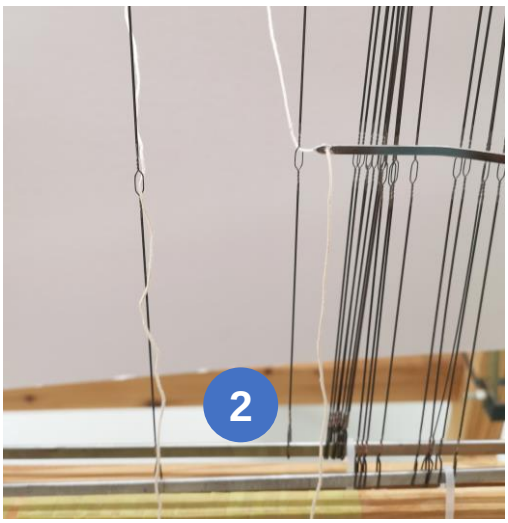


I pull the thread through the heddle.

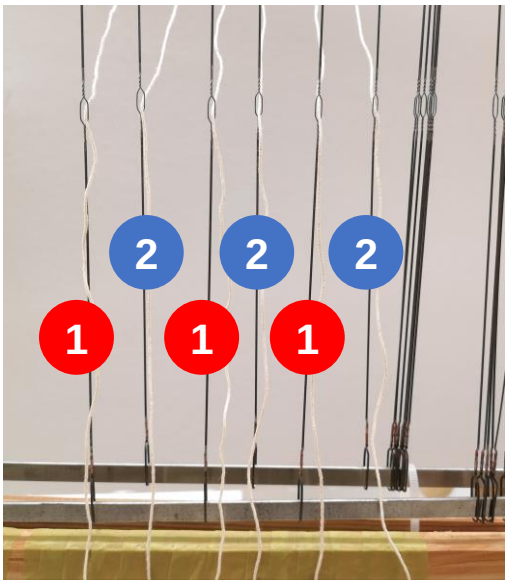


I pull apart the second warp thread from the cross and I thread it through the first heddle on shaft No 2.

I pull apart the second pair of warp threads that I will be threading and carry on in the same manner.



I need to continue threading the heddles by keeping the right sequence.



I check the right order of the threads every 10 to 15 threads to make sure no mistakes were made and I tie them into bundles with a slip knot.

I continue threading the heddles until all the warp threads are used up.

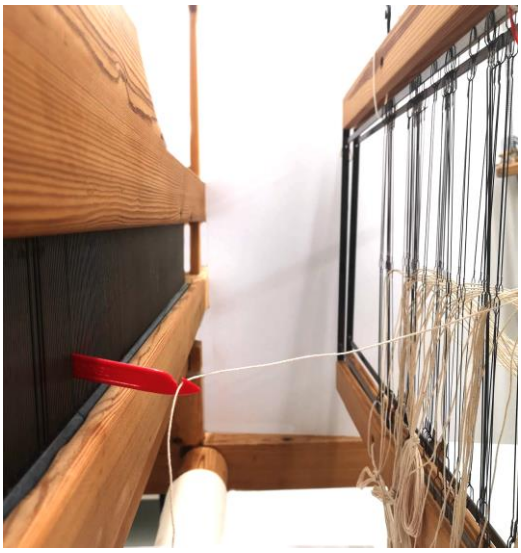
When all my warp threads have been threaded through the heddles, I am ready to proceed onto the next stage of dressing the loom, which is called sleying the reed.

Useful tips:

- For the selvages, it is advised to thread each heddle with one thread instead of two. When I sley the reed, I will pass 2 threads on the same dent of the reed.
- I need to constantly check for mistakes during the process of threading the heddles. It will save me a lot of time if I manage to find mistakes sooner rather than later!
- We will be taught how to thread the heddles on 4 shafts on the chapter about weaving cloth.

8. Sleying the reed

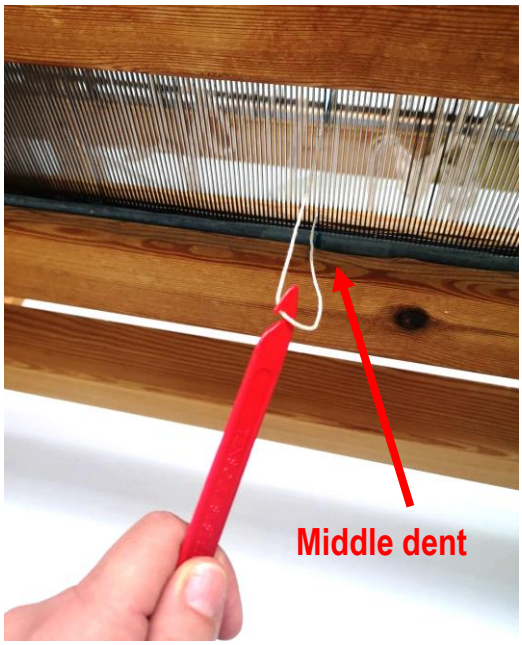
Sleying the reed is the process of threading the reed with the help of a sley hook.



I divide the warp threads that have been threaded through the heddles in half in order to begin with the sleying.

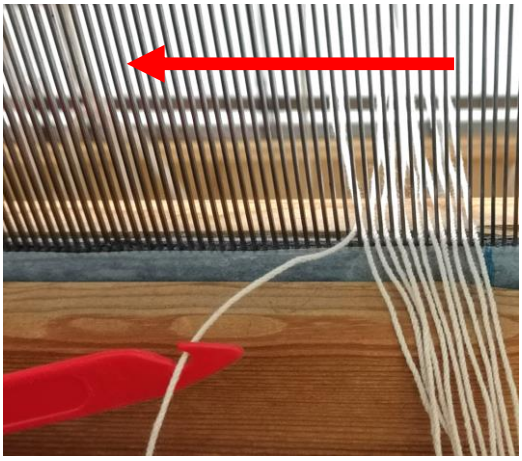
I have made a mark on the 2 middle dents of my reed using a marker or a thread and I start from there (middle).

Here I will be starting from the middle and sleying towards the left.

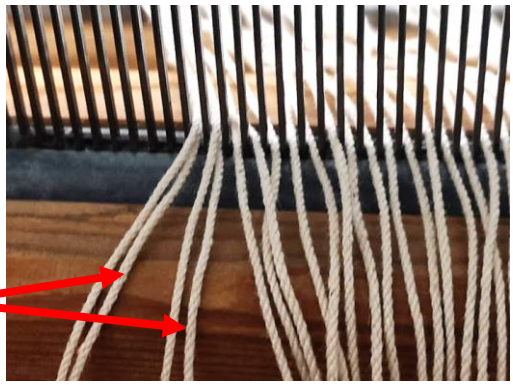


I pull a thread through each dent following the correct order of the threads coming from the heddles.

When I finish sleying the threads towards the left, I go back to the middle and start sleying the rest of the threads towards the right.

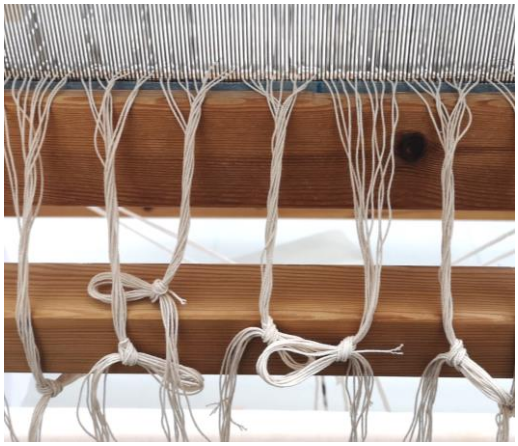


There are double warp threads on the selvages, so I thread them through the same dent on the reed.



Finally, I tie my threads in bundles with a slip knot, so they don't slide out of the reed.

I need to make the bundles have an even number of threads, in order to help me out with the next stage, which is the tying of the warp on the cloth beam.

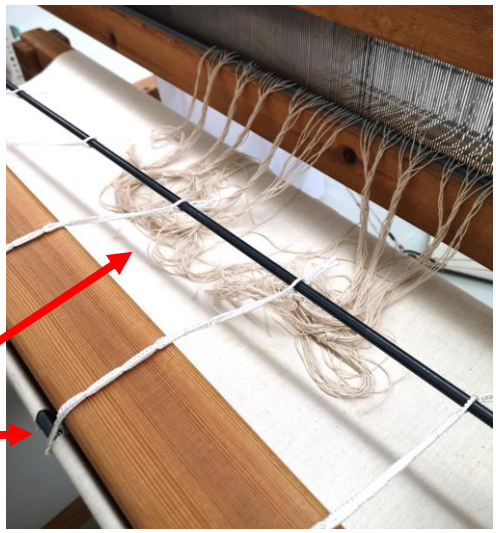


9. Tying the warp on the front apron rod

The last stage of warping the loom is tying off the warp on the front apron rod.

The warp is tied onto one of the 2 apron rods that are attached to the cloth beam. The 2 apron rods are parallel to each other.

In this case the rods are attached to each other with equal length strings.



Attaching the apron rods

An other way of securing the rods to the apron cloth is by passing one rod through the apron cloth with slots and tying a piece of string on one end of the rod.

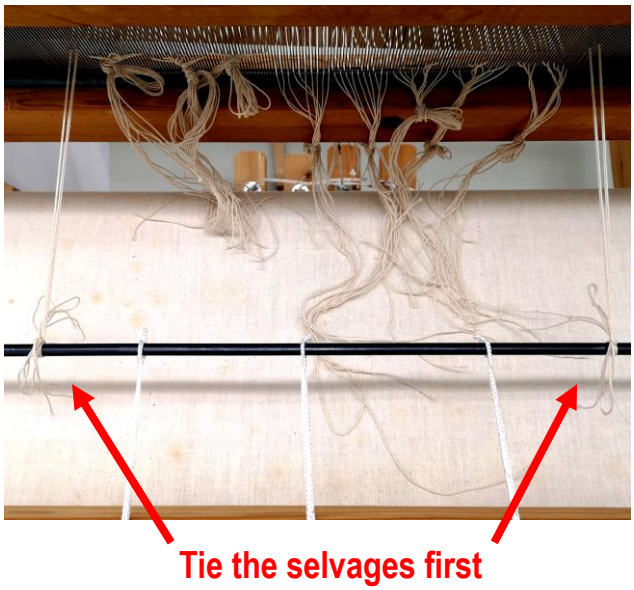
I then attach the second rod by passing the string over and under both rods crating a zig zag shape.

I tie off the string on the other end of the rod.

The 2 rods are secured and parallel with each other. I can now start tying my warp threads on the outer rod.

Step 1

I start off by tying my selvages on the rod closer to the beater.

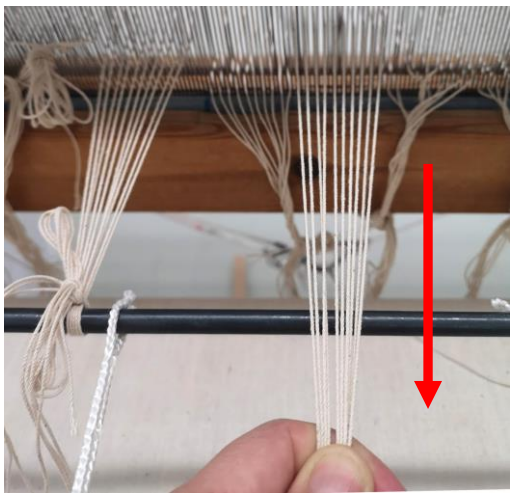


Step 2

I continue by tying the rest of the thread bundles, starting from the middle and working my way towards the selvages.

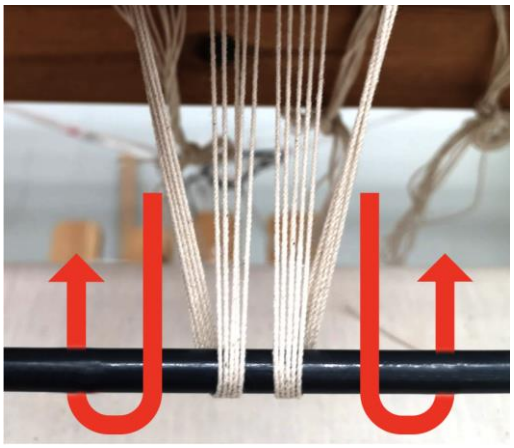
Tying the warp on the front apron rod needs to be done by the same person, in order to ensure that there is an even tension of the warp threads.

1. I untie the slip knot and pull the threads of the first bundle towards me. I make sure the threads are not intertwined. I can use my fingers to “comb” the threads in order to separate them.



2. I pass the threads over the apron rod.

3. I divide my bundle into 2. Each bundle needs to have the same number of threads.



4. I pass the threads over and under the apron rod while pulling the threads taut towards the reed.

5. I tie a half square knot in order to secure them on the apron rod.

6. I continue by tying all the warp bundles in the same way.

7. I need all the threads to have the same tension. To ensure that, I pass my hand over the threads. By stroking them, I feel if the tension is even. If some bundles are tighter or looser than the others, I will need to retie them until even warp tension is achieved.

   The selvages need to be tied slightly tighter than the the rest of the warp threads.

8. When I am happy with the tension, I use a single or a double bow knot to tie off the warp in order to have it secured.

9. The warp is now tied off. In order to start weaving, I need to check some more points for the loom to work smoothly while weaving.

10. Attaching the treadles

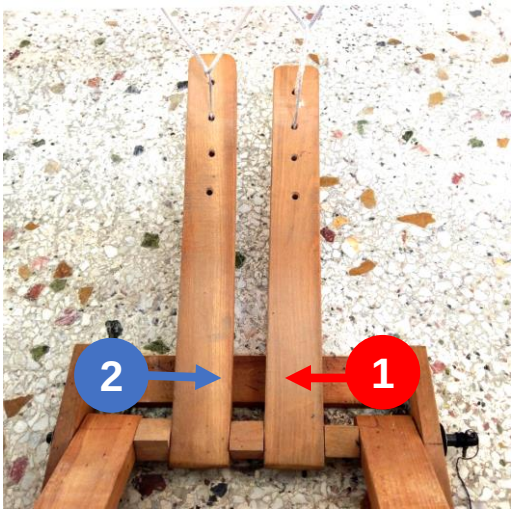
Every loom has its own way of attaching the the treadles to the shafts. The loom that we are using is a traditional counterbalance loom and the treadles are tied directly to the shafts.

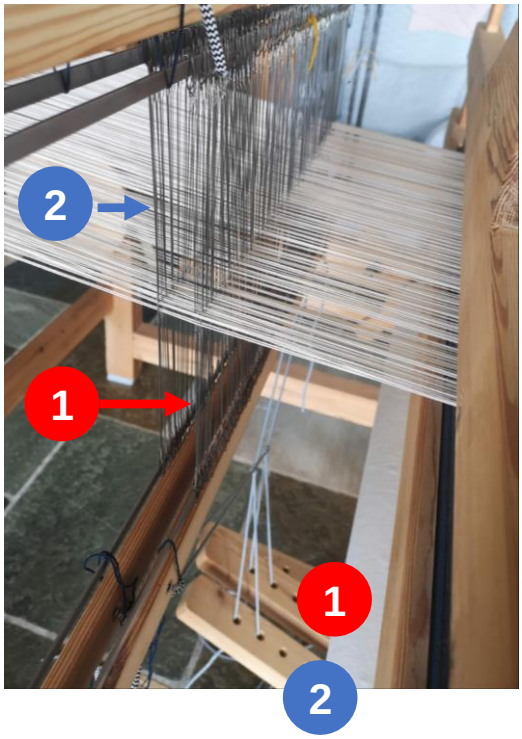
So each treadle corresponds to a shaft directly.

Since I am using 2 shafts I will need to tie 2 of the treadles on my loom.

I will attach:

- Treadle No 1 which is on the right side (right leg) with Shaft No 1.
- Treadle No 2 which is on the left side (left leg) with Shaft No 2.

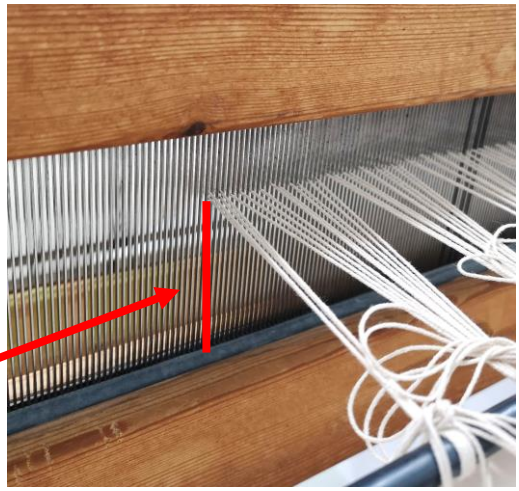




When I step on the first treadle (No 1), I am going to have and open shed with the first selvage thread on the right hand side being pushed down.

I also need to check that the warp threads, when the shed is closed, reach 2/ 3 of the reed height.

In order to achieve that, I need to adjust the height of the shafts.



I also need to alternate on stepping on my treadles in order to open both sheds and make sure they are wide enough for my shuttle to pass through comfortably.

I am now ready to start weaving.

11. Spreading the warp threads by weaving a header

I can see that the warp threads are not parallel near the rod. They create V shapes. In order to open them up and space them evenly as well as parallel to each other I need to weave a header. This can be done with a different yarn than the one I will be using. It is faster if I use a thick weft yarn or rag yarn.

There are many ways of doing this.
I begin with weaving 3 lines without beating. I make sure to leave excess yarn on the selvages, so that they don't pull in once the warp threads spread. Once I weave 3 lines, I use my beater and I carry on weaving (plain weave) and beating normally.

After about 5- 10 cm of weaving the warp threads are parallel to each other.
This woven part is called the header and it will work as a base from which I will start weaving. Once my weaving is cut from the loom, I will unwind this part.

It is advised to weave a header in the beginning and the end of each woven piece. This will secure each weaving and create a space between the pieces.

Tools and equipment used in weaving

In order to weave on a loom I need some additional equipment.

Shuttles

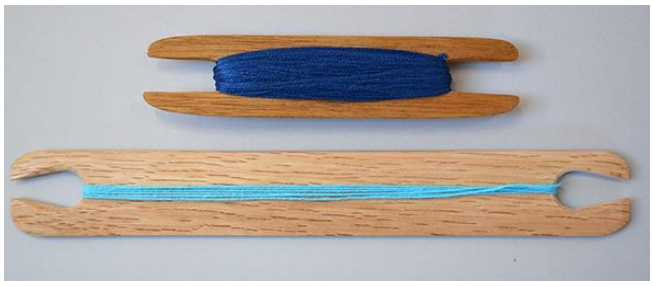
I use shuttles by winding yarn on them.

It is the tool that helps me pass my yarn through the shed.

There are different types of shuttles.

1. Stick shuttle

Can be used with most threads.

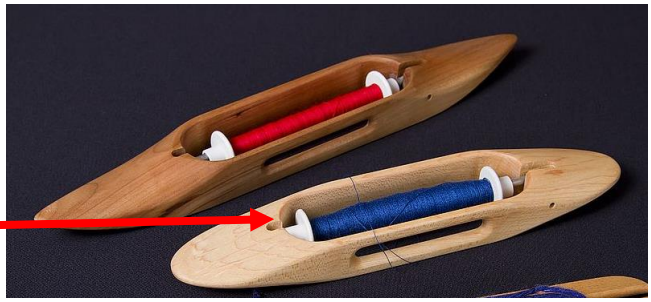


2. Ski shuttle

Best used with thicker thread and rags.

3. Boat shuttle

Best used with fine threads.
They contain a bobbin.



4. Yarn swift

It rotates and keeps thread taut and untangled.

It helps me make yarn balls.

Together with a spool winder.
I can wind bobbins too.

Yarn swifts are made of wood but can be made
From metal too.

Traditional yarn swift

Umbrella swift

5. Manual ball winder

This tool is used to turn thread into balls.
It is easy and quick.
There are many types on the market
usually wooden or plastic.

6. Spool / Bobbin Winder

With this tool and a yarn swift,
I can wind spools and bobbins.

These are placed in shuttles or used for the process of warp winding.

Modern bobbin winder

Traditional spool winder

7. Temple or Stretcher.

This tool helps me keep straight selvages.
Selvages are the edges of my weaving.

It is made of metal or wood.

It is an adjustable tool.
I can adjust it to the width of my weaving.

It has small metal pins on each end.

I am careful when I use a temple on thin weavings.
It might rip the cloth.

8. Threading hook

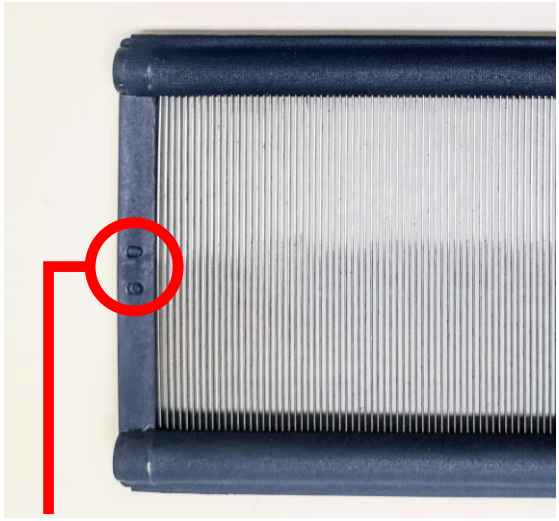
This tool helps me pass the thread through the heddles.

9. Sley or reed hook

It is the tool that helps me pass the thread through the reed.

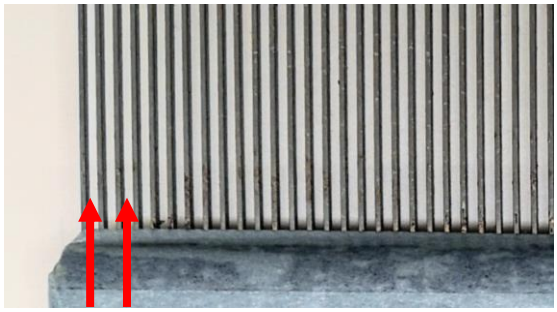
This is called sleying the reed.

9. Reed



The reed is a part of the loom. It is held by the beater.
It is used to separate the warp threads and space them out evenly.
The slits on the reeds are called dents.
The warp threads pass through the dents.

Reeds come in different sizes according to how many dents are found per inch (2,5 cm) Or per 10cm.



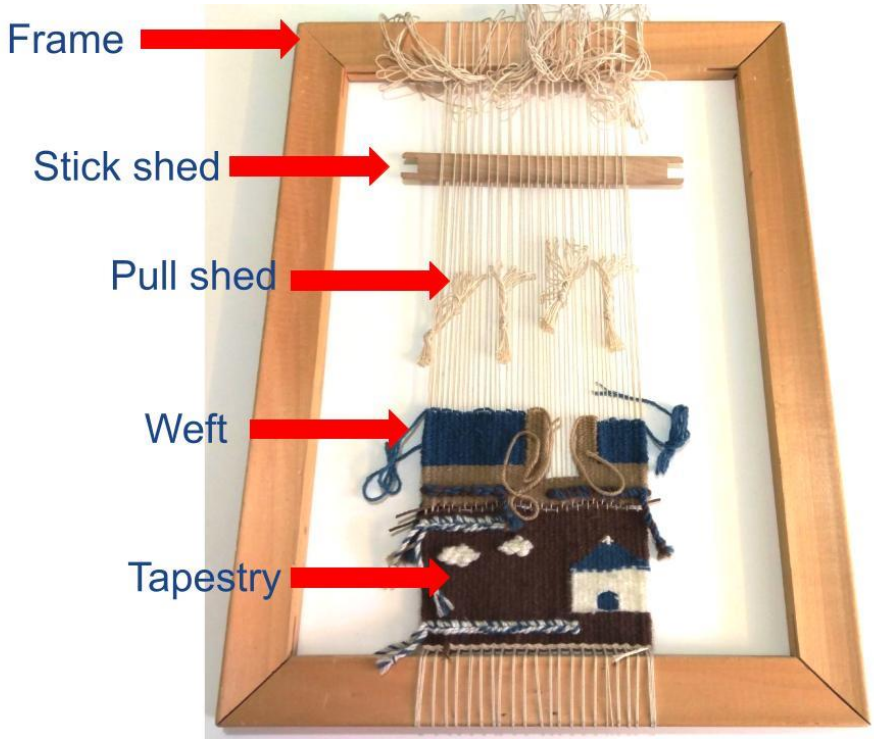
A size 6 d.p.i (dents per inch) reed is the same as a size 24 reed in cm.

The higher the number of the reed, the denser the reed is.
The higher the the number of the reed, the finer the thread needs to be in order to pass through the dents.

I need to choose the right reed according to my weaving project and warp thread.

It is always advised to weave a small sample before a project to make sure the chosen reed works harmoniously with the chosen warp and weft threads.

Basic information on weaving a frame loom



Weaving a frame loom requires:

- A frame of any size (usually over 30cm*40cm)

- Thread that will be used for warp (usually cotton thread that is strong and can support the tapestry once it is removed from the frame)

- Thread that will be used as weft.

The weft can be passed through the warp threads with the use of “butterflies”.

Creating “butterflies” prevents the weft from being tangled.

frame

warp thread

weft thread

The width of the tapestry depends on the number of warp threads I will use and the spacing between them.

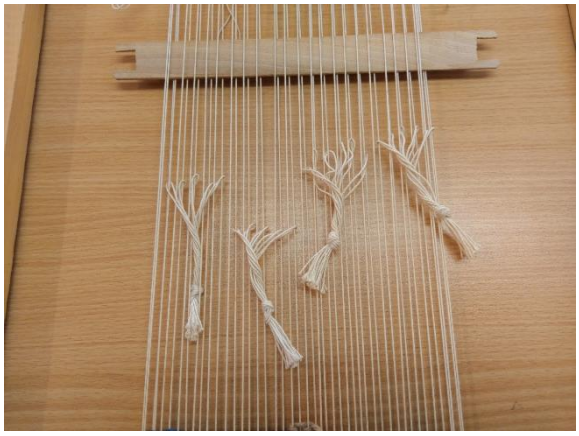
- The weft and the warp are always interrelated. As a guide rule the weft should fit easily between the warp threads.

- The thickness of the warp and the weft depends on the tapestry I want to create. A thick weft may not cover the warp threads. A thin weft may not create the desired outcome when creating shapes and can take longer to weave.

The frame loom is usually weaved vertically. That is, I use the longer side to weave so I can take advantage of the space between the upper part of the frame and the tapestry, to open the sheds and pass the weft.

The process of weaving speeds up with the use of some tools that create two sheds.

The warps need to be divided into sheds so the weft can interlace between the warp threads.

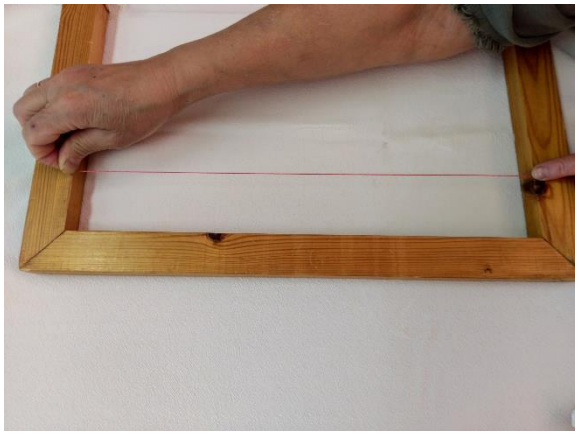


There are many ways of warping a frame loom.

We are going to demonstrate warping the frame with pairs of threads.

It is a method takes up more time initially but it is more convenient to tighten up the warp threads evenly to begin with but also control the tension of the warp threads at any point.
If a pair of warp threads loosen up, you can retie them at any point.

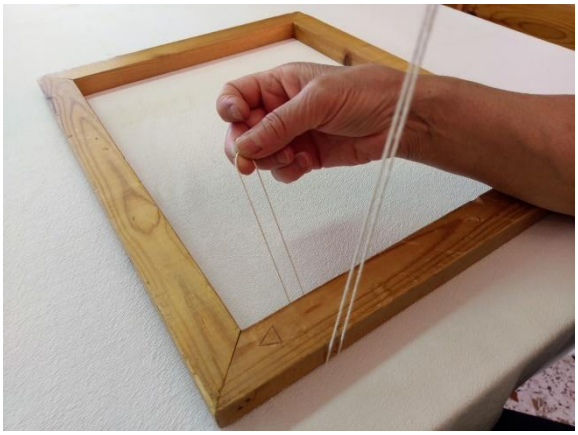
Warping the frame loom (pairs of warp threads)



I cut a “guide” warp thread measuring 4 times the opening of the frame.

I use the guide to cut the next warp threads.

I save time by not measuring every thread.

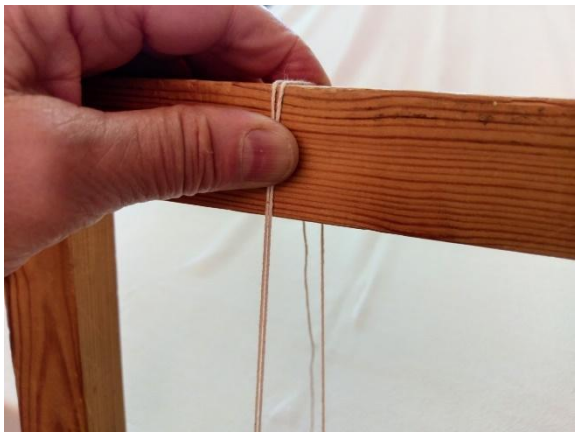


Hold the edges of the thread together and circle the bottom part of the frame.

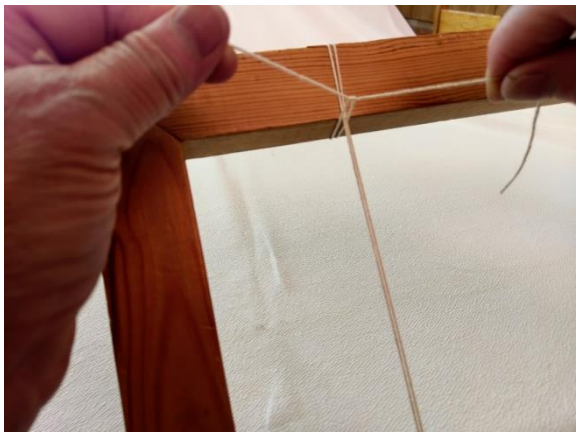
I bring the edges inside the loop that is formed and tighten the thread.

Lead the two warp threads towards the top part of the frame.

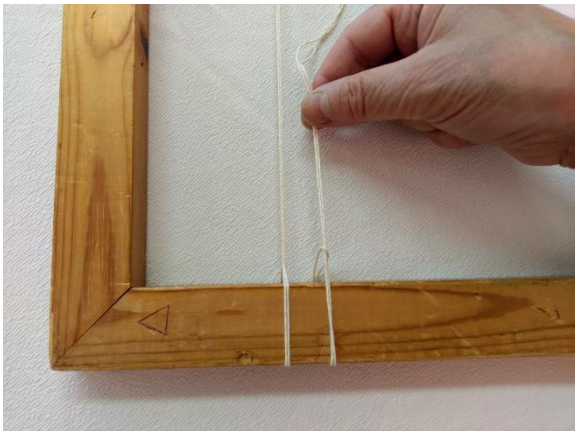
The threads must be straight with no twists.



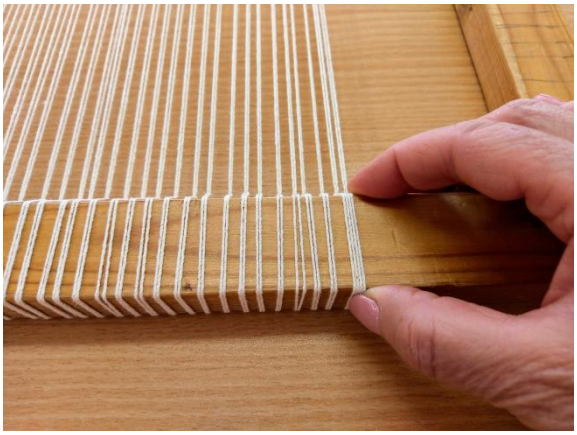
My thumb holds the warp threads in place.



Circle the frame with the two threads and tie a bow.

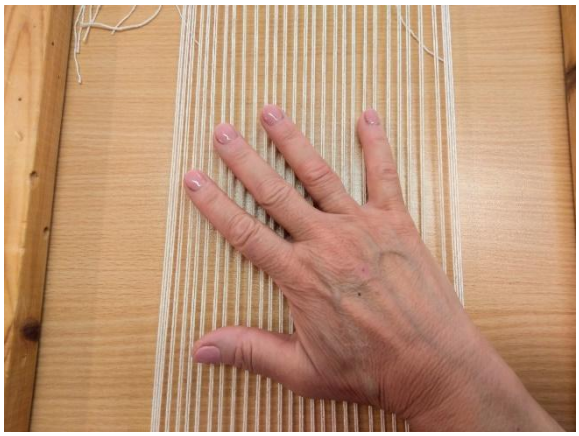


I continue placing more pairs of thread until I reach the desired number of warp threads.



To create a selvage, I will join closer together the first and the last couple of warp threads.

I can follow the same steps by holding the frame the other way round.
That is, to place the loop on the top part of the frame and then tie a bow on the bottom part.



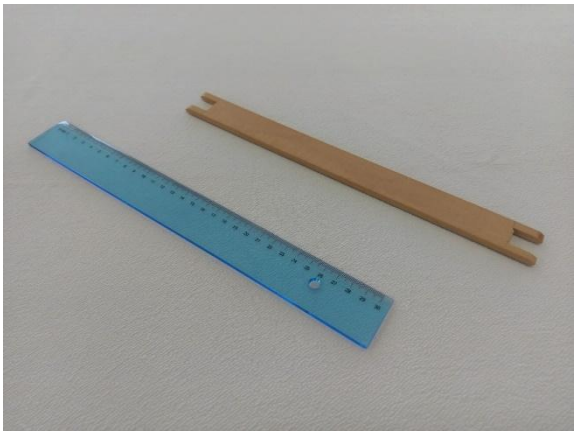
When all the warps are tied, I check the threads for even tension by gently bouncing my hand on the threads.

To fix the tension of warp, untie the bow and release or tight the warp.

Preparing the sheds

The stick shed

I will use a flat thin piece of wood or any other material of the same shape (for example a ruler)



Keep in mind that the length of the shed stick should be less than the width of the frame loom so it can fit inside the frame.

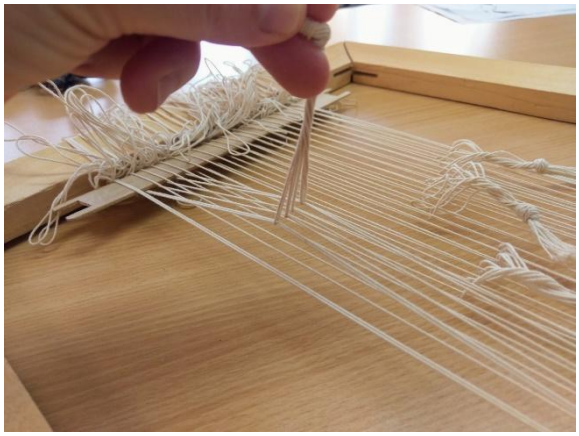
I pass the stick through the warp threads by placing it over and under each warp thread.
I place the stick under the first pair of warp threads to create the selvage.
I place the second pair of warp threads under the stick, to create the selvage.
On the third pair, I place the first thread over and the second one under the stick.
I follow the same step with rest of the threads.
On the last two pairs, I place double threads over and under the stick to create the right selvage.

Once the shed stick is through the warps, I turn the stick into a vertical position.

The warp threads are separated creating a shed.

The pull shed

The second shed will be formed with the use of loops that will pull the warp threads.



I need to cut strands of warp threads 25 cm long to create the loops for the pull shed. I cut a guide of a different colour and then use the warping thread to cut the loops. The number of strands depends on the number of the warp threads I warped the frame. Half of the warp threads need to have loops.

I place the loops around the warps that are on the back of the stick shed.

The first loop will go around the pair of warp threads of the selvage that is on the back of the stick on the left side.

The first pair of the warp threads will be lifted by the shed stick.

The second loop will be placed around the fourth warp thread.

The third around the sixth and so on.

Once I place five loops, I will join them all together.

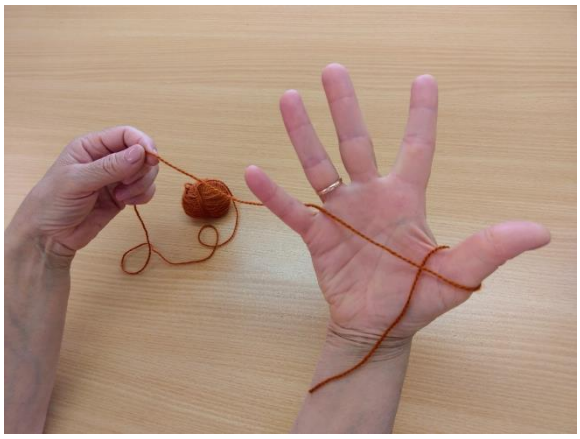
Holding all edges on one hand, I will even out their lengths and make sure they don’t twist around.

I tie the edges with an overhand knot.

I follow the same steps with the rest of the warp threads.

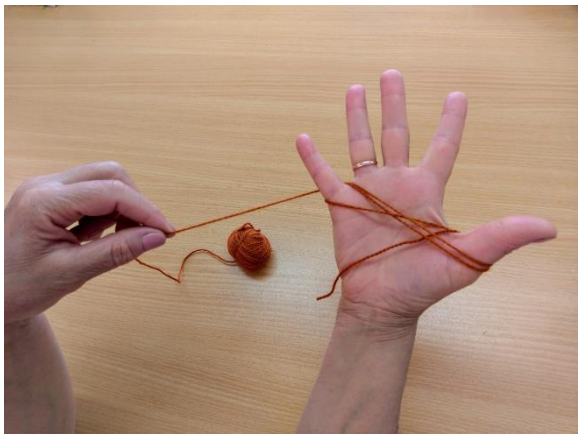
The frame loom has now two sheds.

Preparing the weft

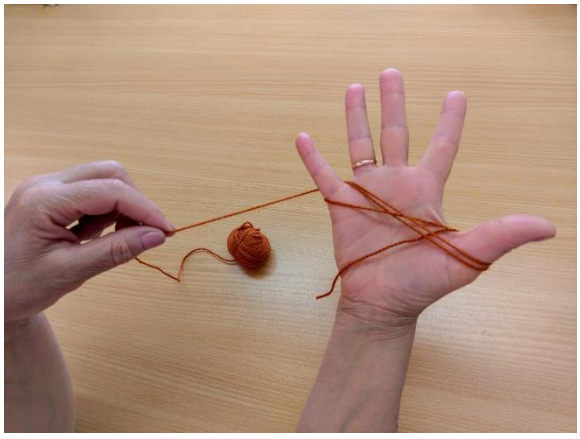


I open my palm and place the thread between my thumb and the rest of my fingers.

Leave a 20 cm tail hanging



I circle my thumb and start winding the weft around my thumb and my pinkie, making figure of eight shapes.
Wind10 to 15 turns.

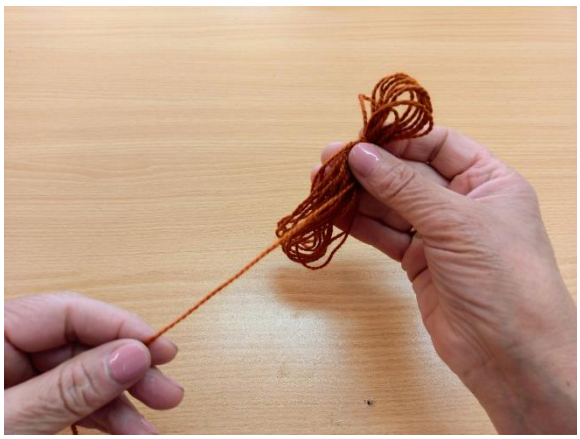


Once I complete the winding, I remove gently the weft from my hand.

I wrap the weft around the loop.

After several (4 to 5) turns, I complete the butterfly with a half hitch knot.

Cut the excess weft with a pair of scissors.

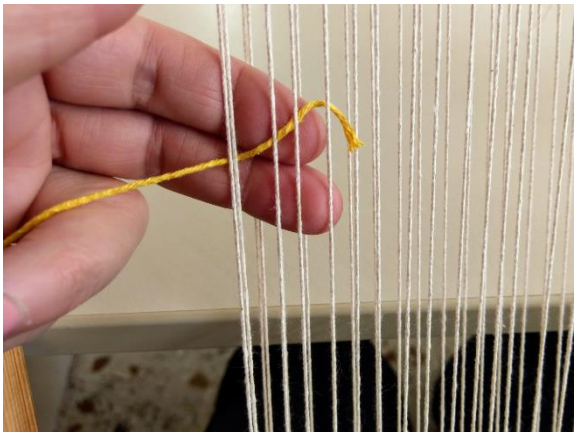


To unwind the weft, I pull the tail of the butterfly.

Plain weave

I place the frame loom in my lap.

I place the shed stick into a vertical position to create a shed

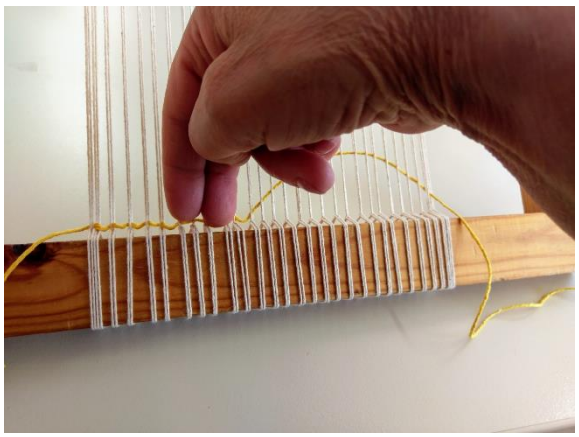


I pass a header inside the shed. The header must be under the first warp thread.

For the header I can use a piece of warp thread. In this example the header is yellow.

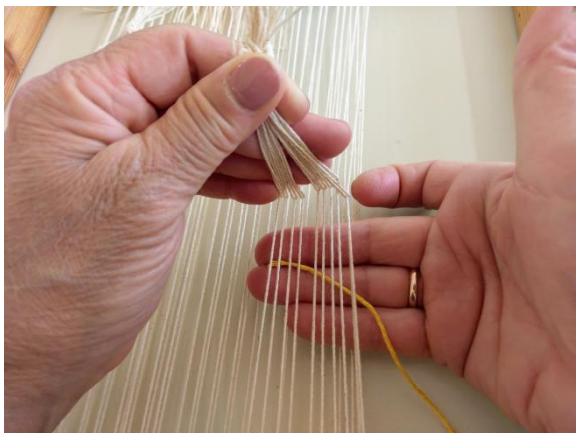
The header will be removed from the tapestry, when the tapestry is completed.

Place the shed stick into a horizontal position to close the shed.

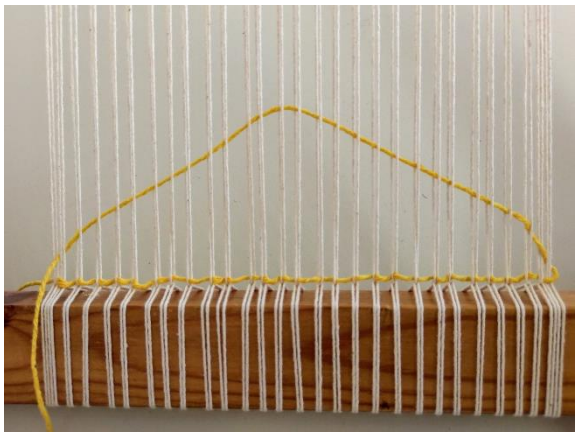


Push the weft down towards the bottom of the frame.

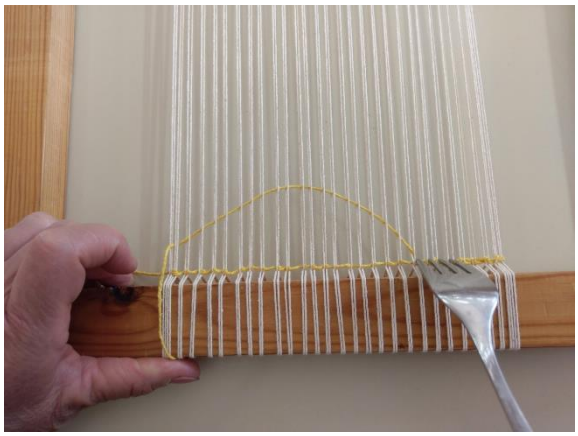
I lower the weft from the side of the tail towards the butterfly.



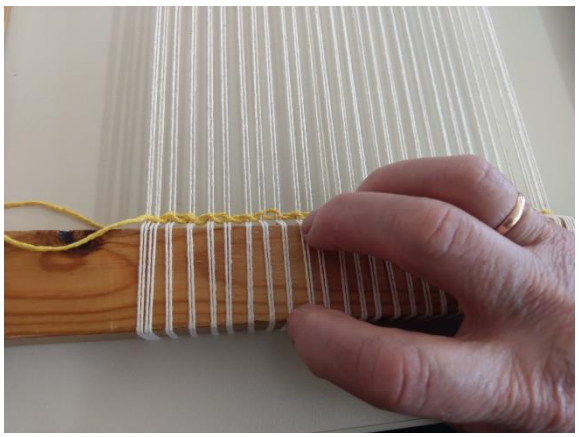
Pull the first group of pull sheds from the right and pass the header.
I pass the header from the rest of the loops in turn.



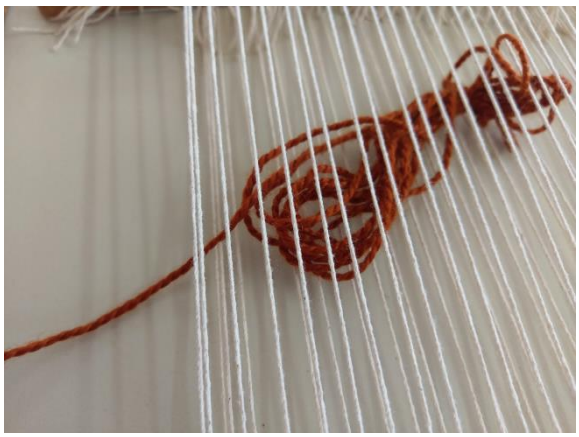
I check the selvage and create an arrow shaped curve.



Push the header to the bottom of the frame.
I can use a fork to tap the weft.
Trim off the header.



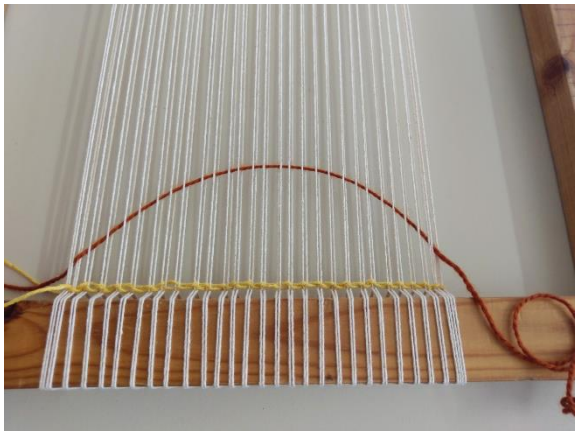
Check the spacing between the warp threads and make any necessary adjustments.



Place the stick shed into a vertical position.

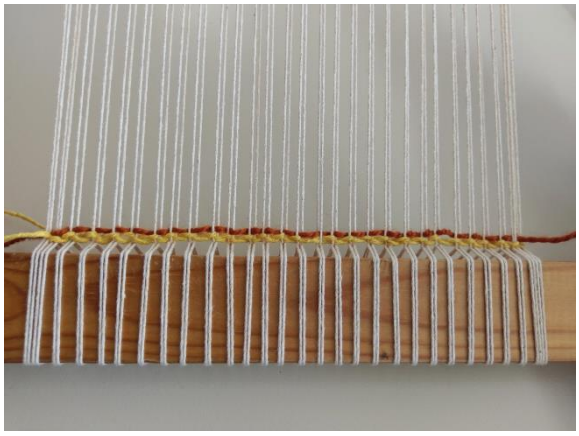
Pass the weft through the shed.

The weft must be under the first warp thread.

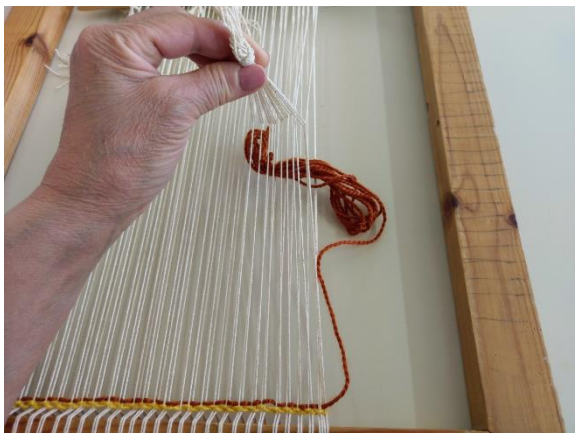


When the weft reaches the other side of the warps, I place the shed stick into a horizontal position.

I create a curve with my weft.



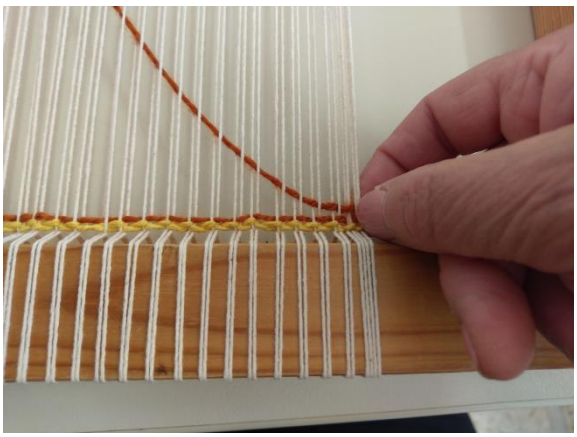
I push the weft towards the bottom part of the frame.



Now I will use the pull shed.

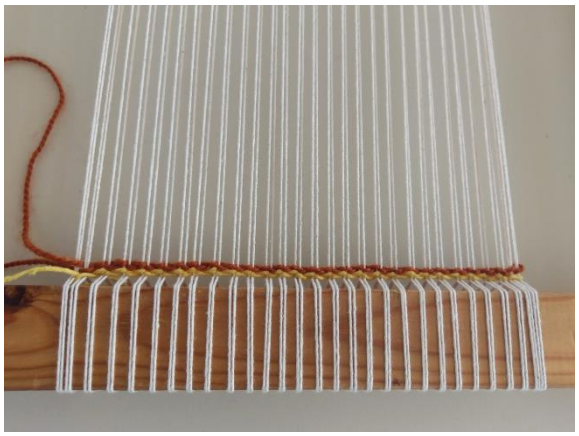
Grabbing the first pack of loops on the right, I pass the weft through the shed.

Weave the rest of the line by pulling the pull sheds in turn.

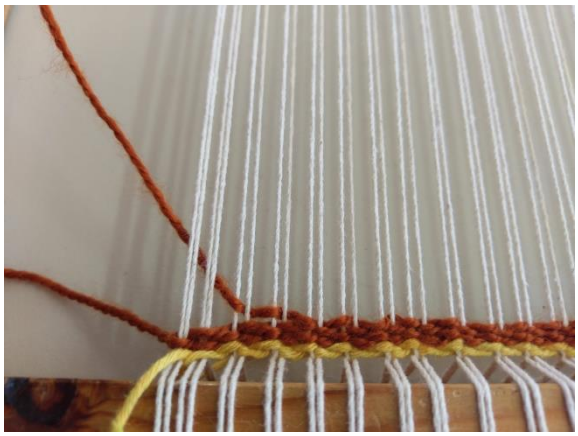


Check the selvage.

Hold the thread of the selvage and gently pull the weft so it barely touches the warp threads.

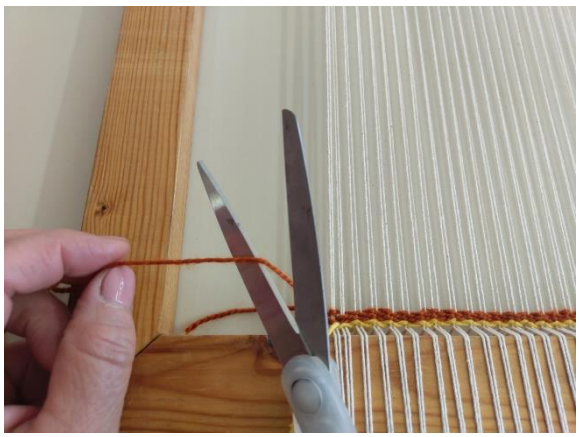


Push the weft towards the bottom part of the frame.
Repeat the steps and weave the desired number of rows.



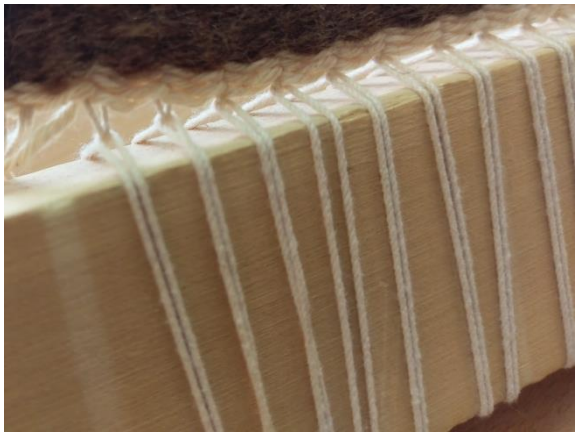
To secure the weft, place it under the last selvage warp threads.
The weft is now under the two selvage warp threads.

Make a half hitch round the last selvage warps and bring the weft under itself.



Pull gently the knot to tighten it and trim off the weft thread.

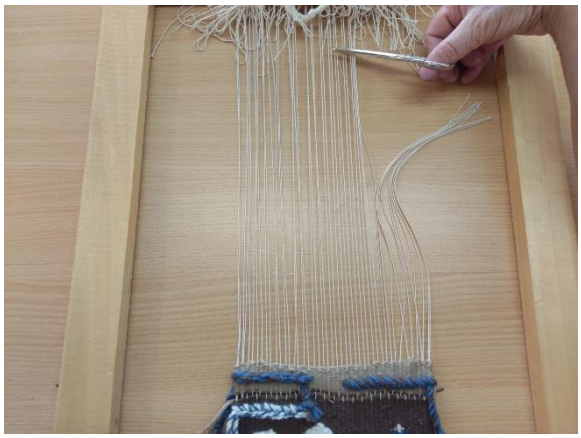
Cutting the tapestry from the frame loom



When the warps are warped in pairs, I need to cut the warp threads in two places.

On the opposite side of the loop on the bottom part.

Cutting the warp thread on the opposite side will not leave enough thread to create a knot. The tapestry will peel off.



I cut the top part of the warp threads leaving enough space to tie the knots.

I can also untie the bows to use the warp threads for any desired decoration.

I remove the header to tie the warp threads.

I tie simple fringe knots with the warp threads.

The tapestry is removed from the frame.

Chapter Content:

Basic information and choosing fabrics to cut and recycle.

1. Things I need to know at weaving a rag rug
2. Cut fabric and turn it into weft
3. Winding the shuttle
4. Weaving the header
5. Plain weave using one colour
6. Plain weave one colour : joining weft
7. Plain weave: changing colour
8. Removing the rug from the loom
9. Simple fringe knot on the warp ends of a rag rug
10. Cutting strips for shag weave
11. Shag weave rug

Practice weaving a rag rug.
Practice weaving a shaggy rug.

1. Things I need to know about weaving a Rag rug

Weaving a rag rug is one of the most popular types of weaving.

With the use of 1000gr of fabric strips, I can weave a piece of rug sized around 100cm x 75cm.

- **Warp:** A 10/6 hemp cotton yarn is suitable for a durable rug.
- **Reed:** 8 or less (i.e. 7 or 6) dents per 2,5cm
- **Weft:** Strips of fabric 1 to 3 cm wide, depending on the fabric I will use.

Useful Tips:

- Using rags justifies the name of the rag rug.
- The thicker the warp, the sparser the reed. The thinner the warp, the denser the reed.
- Using thick weft will make the warp visible in the rug.
- Using thin weft, the warp will barely be visible in the rug.

2. How to cut fabric and turn it into weft

I will need: a pair of scissors, old fabrics

Cut off the hems on the fabric (in case there are any).

Fold the fabric in two.
Place it on my working table.

When I use light weight fabric, I cut wider strips (around 2,5 to 3 cm).

Use the scissors to cut strips.

When I use heavy weight fabrics, I cut narrower strips (around 1,5 to 2 cm).

To turn the fabric into a long strip:

Place the fabric on the working table unfolded.

Start cutting the fabric in a 1,5 to 3cm
wide strip.
Stop cutting around 3cm before the
edge of the fabric.

Rotate the fabric 90 degrees.
Start cutting again just before the edge.

Keep rotating the fabric until the whole fabric has turned into a long strip.

Useful tips:

- Try to use fabrics made out of cotton (outgrown clothes, old sheets, etc.). Prefer fabrics with no elasticity
- I can use different fabrics in thickness and texture if I want to create a shaggier look rug.
- Use old shirts but cut off the bottom hem and cut across the garment near the armpits. There is no need to keep the upper part of the shirt that has the sleeves and neckline.

3. Winding the shuttle

I will need: a stick shuttle, a long strip of fabric for weft

I hold the shuttle with my left hand.
With my right hand I grab the weft.

Using my left thumb, I hold the weft attached to the shuttle.
With my right hand I circle the weft around the pointy part of the stick.

Pull the weft so it is tightened. Using my right hand, I wind the weft around the shuttle..

This the easiest way to wind a shuttle.
Wind it around 20 to 25 times.

I can wind the shuttle in a different way:

Holding the weft, I make figure 8 shapes at the one side of the shuttle.
This way of winding can hold more weft in the shuttle.

I keep on wrapping until the one side is full.

I wind the other side of the shuttle in the same way.

I cut the strip and the shuttle is ready.

Useful tips:

- To wind the same amount of yarn on the shuttle every time, I can count the number of wraps.
- By moving the wrist on the hand that holds the shuttle, I make it easier for my other hand to fill it.
- I can make a slip knot to secure the weft on the shuttle before I begin to wind it.

4. Weaving the header

I will need: A long strip of fabric to use as a header, warps tied on the cloth roller.

When the warp is tied on the cloth roller of the loom, I use the header to spread the warp evenly so there are no gaps in between the warp threads.
The header also prevents the rug from peeling off, when it is removed from the loom.

Open the shed and place the weft. Pull the weft from the center and form an arrow shaped line. Change treadle.

I pull the beater towards myself and gently slide the weft.
I do not want to beat at this stage.

I pass the weft into the shed again. I leave a loose edge on my weft.
I need to leave it loose so it can expand and fill the gaps between the warp threads.

Keep on weaving the header.
Remember to pull the beater gently.

Weave a few rows until all the gaps in between the warps are filled.

Useful tips:

- Once the rug is finished, I will weave another header. I want to have a header at the beginning and at the end of each rug.
- The header is an easy way to check for threading errors and fix them before the weaving begins.
- When the rug is cut off the loom, the header will keep my weft in place until I finish knotting.
- The header serves as a firm foundation for beating the weft into place.
- Using smooth cotton strips as a header that contrasts well with the warp makes it easy to distinguish the header and the weft.

5. Plain weave

I will need: stick shuttle, two-shaft loom with treadles

I place my right foot on the right treadle with my toes touching the rope and my heel lying on the treadle.
I put pressure on my foot and the treadle moves downwards.

The shed is open.
Through the shed I will pass the shuttle with the weft.

My left hand grabs the center of the beater and pushes it towards the shafts.
The shed turns wider when approaching the reed. This
is why I always push the beater towards the shafts.
My right hand holds the shuttle and places it in the shed.

I pass the shuttle inside the shed.
The shuttle should slide by the reed where the width of the shed is larger at that point.

When the shuttle sticks out of the shed, I swap hands. My right hand holds the beater.

My left hand pulls the weft gently from the shed until it touches the selvage.
I try not to pull the weft tightly because it will ruin the selvage.

My right hand holds the weft on the selvage and keeps it in place. I need to pull my weft gently on each side but not to leave a loop. The weft should barely touch the salvage.
I place my hand on that spot so I can secure the weft from being pulled inside the warp.

My left hand holds the weft from the center of the warps.
I move the weft towards the beater creating an arrow shaped line.

Change the treadle.
The weft is caught between the warps. Beat the beater.

I start all over again.
My left hand holds the shuttle, my right hand pushes the beater and my left foot is walking the treadle.

Useful tips:

- Before I place the shuttle in the shed, I let loose two rounds of my weft.
- Rag rugs need hard beating. In this way the rug will be dense and tight.
- When the woven rug approaches the beater by 10 cm, I need to advance the rug to the cloth roller.
- The rug must be within the reach of the beater.
- When the beater beats the front beam and not the rug, I need to wind the warp to the back beam. I release the tension from the back beam and wind it drawing the rug towards the back beam.

6. Joining weft of same colour

I will need: two-shaft loom with a rag rug weaving in progress, strips of fabric, stick shuttle.

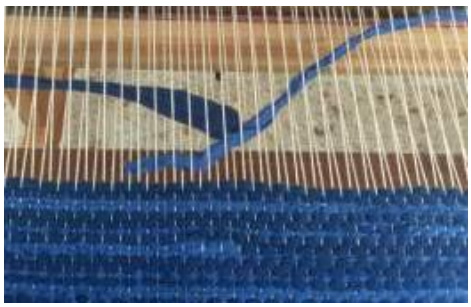
When my weft is not long enough to finish off a row, I need to join in a new weft.

I cut the edges of both wefts (old and new) in half, for 4- 5 cm.
When the two wefts join, the result will be smoother.

Step on the treadle and pass the weft that is left over in the shed.

Lower the edge of the weft towards the woven rug.
Using my hand, I tuck down the edge of my weft towards the rug.
I always remember to make an arrow shaped line with my weft.

Pass the weft through the same side as the remaining weft.
The new weft passes over the old one.



I stop pulling the weft when it crosses over the old one for about 4 to 6 warp threads.

I let the edges of the weft stick out of the warps.
When the two edges of the wefts join, they will resemble one continuous weft.

I lower the edge of the new weft and tuck it down, on top of the old one.
One hand holds the joint and the other one creates the arrow shaped line with the weft.

Change treadle and beat the beater.

Continue weaving the rug.
I cut the edges that stick out of the rug, once I remove the rug from the loom.

7. Change colour in a rag rug

I will need: two-shaft loom dressed with rag rug appropriate warp, two different coloured strips of fabric, scissors, stick shuttle.
When I want to change the colour on my rug, I can easily do so by joining in a new coloured strip.
To have a nicer outcome it is better to do the joining at the side of the Rug.

In this rug I will join the brown weft with the red one.

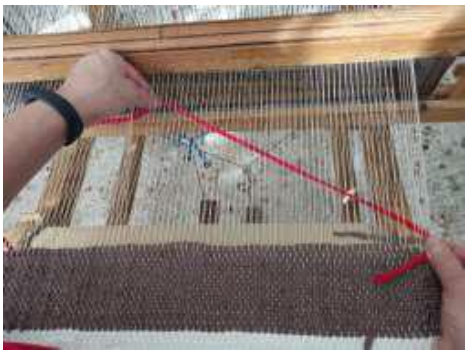
I need to cut the strip of the weft I weave with around 5-6 cm outside the shed.

To create a neater joint, I cut the edge of the weft in half lengthwise for 4 cm.

Walk the treadle.
Place the weft inside the shed. Leave the edge of the weft sticking out of the warps.

Pass the new coloured weft towards the same direction. The edge of this new weft is already cut in half lengthwise for 4 cm.

Pull the weft until a piece (6-8 cm long) is left outside the shed.



I use one hand to hold the weft that is left outside the shed.
Using my other hand, I hold the weft and extend my arm towards the reed.
I try to form an arrow shaped line with my weft.

Change the treadle and hit the beater.

Place the rest of the weft inside the shed.
Leave the edge of the weft sticking out of the warps.

Remember to unwind some weft from the shuttle before moving on to the next row.

Walking on the same treadle, pass the shuttle through the shed.

Once I walk the treadle and beat the beater, the joint is ready.
I cut the strands that stick out of the joint later, when I will remove the rug from the loom.

8. Removing the rug from the loom

I will need: A woven rag rug with a header, scissors

Important note:
I will cut my rag rug in a way that I won't need to thread my loom again.

Before I begin to cut the rug, I check that I have woven a header at the end of the rug.

I advance the rug to the front beam and wind it.
I apply pressure using my upper body on the rug so that the warp threads remain loose between the beam and the beater. I wind it so I can have enough warp to later tie my fringe and enough warp in front of the reed to make a knot. Around 40 cm of warp will be enough for the fringe and to tie a knot on the warp that will be left on the loom.

I can use the front beam as a guide for cutting the warp straight. I grab a tuft of warp threads and cut between my hand and the beam. Since there is no tension in the warp, the threads should fall in front of the reed once they are cut.

With every tuft of threads I cut, I tie the warps into a bow. I can also tie a simple double knot, trying not to tighten it too hard.
Tying the warp threads will minimize any accidental unthreading!

I continue cutting the warps and tying every tuft. Once I cut the last tuft of warp threads,
the rug will fall in my lap.

The next step is to set loose the front cloth roller and unwind the rug.
I roll the rug instead of folding it. Rolling keeps the loose ends in place until I finish knotting.

I place the rolled rug between the beater and the shafts.
The tied warp ends of the rug lie on the beater.

I untie the warp ends that were tied to the cloth of the front beam.

The rug is now removed from the loom.

The light green weft is the header.

I keep the header in place until I begin to tie the fringe.

Useful tips:

Once I finish the rug and weave the header, I check the front cloth roll. If there is enough space to wind another rug around it and the back beam holds enough warp as well, I can continue weaving without cutting the warps.

I need to leave enough warp in between the rugs, so I can later tie the fringe knot in both ends.

If I want to have a 10 cm long fringe in every rug, I will need 2 cm extra warp for the knot's twist. Therefore, the length of the warp between the two headers of the rugs must be at least 30 cm long.

9. Tying off the loose yarn and warp ends to finish off the rag rug

I will need: a rag rug with loose warp ends.
The warp ends should be at least 10cm long.

I place the rag rug gently on my working table.
I make gentle moves because the warps are loose and the rug can easily peel off.

I start removing the header so I can reach the first row of the rug.

For my fringe knot I will need 4 to 6 warp threads (depending on how dense the warp is).

I place my index finger where I want the knot to be.

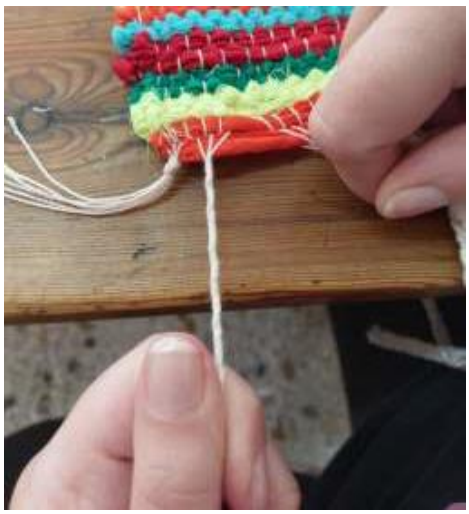
I circle the warp ends around my index finger.

I try to put the edge through the loop.

The warp threads are inside the loop.

My left hand holds the loop and stays steady where I want the knot to be.
My right hand pulls the warp ends so I can tighten the knot.

The first knot is ready.



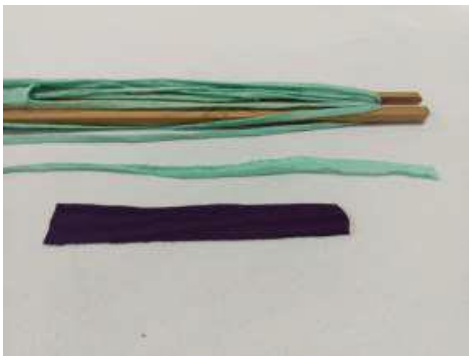
When it is difficult to put the warp ends inside the loop and pull them out of the other side, I can try another way to make the knot. I twist the warps between my index and my thumb.

It is easier then to pull them through the loop.

I place my right hand where I want the knot to be.
My left hand pulls the warp ends to tighten the knot.

10. Shag weave rug

I will need: loom dressed with warp suitable for rugs, several thick strips of fabric cut around 10cm long, strips of fabric to use as weft.



To weave a shaggy rug the thick strips must be thicker than the weft.

I always start a rug by weaving the header.

I then need to weave at least four rows of plain weave.

I place the second strip under the last warp of the previous couple and under the following warp.

I grab the first couple of warps that follow the selvage. I place the thick strip under the two warps.

I place the second strip under the last warp of the previous couple and under the following warp.

I continue placing the strips until I reach the selvage. Once I reach the selvage, I leave it without strips.

Once I finish the row, I weave two rows of plain weave.

I continue placing the strips in the same way as above.

When my shaggy rug reaches the desired length, I weave four more rows of plain weave.
I remember to finish off with my header.

Useful tips:

- Depending on how shaggy I want my rug, I will cut my thick strips accordingly. If I want a 5 cm long shaggy strip, I will cut 10-11 cm long strips.
- To weave a shaggy rug with sparse strips, I can do so by placing the strips under two warps and then leave some warps without strips.
- Cutting the strips can be time consuming. I can use cardboard to loosely wind my fabric around it. The length of the cardboard must be the half the length of the strip I will use (i.e. I will use a 5 cm cardboard to cut 10cm long strips). Once I have wound enough times, I use my scissors and cut the strips.
- I can also use the palm of my hand instead of a cardboard (but I must be extremely careful not to hurt myself!).
- I can use various kinds of fabrics to weave my shaggy rug. Multiple colours and fabric thicknesses can give a shaggier look to my rag.
- I can create patterns or designs while weaving a shaggy rug. I will need to place the strips according to the design I want to follow.

Chapter Content:

1. Preparation before weaving

Warp:

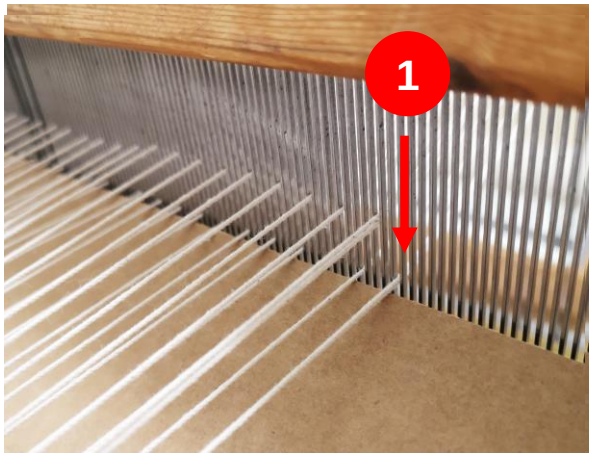
I will use a 10/6 cotton twine for my warp.

It is a strong and hard wearing thread making it ideal for kilim weaving.

Reed:
I will use a no. 7 reed.
It means it has 7 dents per inch (2,5cm).

If I use a thicker warp or weft I can use a sparser reed (i.e. no. 6).
If the warp or weft is thin, I can use denser reed (i.e. no.8).

Weft:
I choose the colours of the wooı I want to use and wind each shuttle with a different colour.
I try to make harmonious colour combinations.
I am now ready to start weaving.

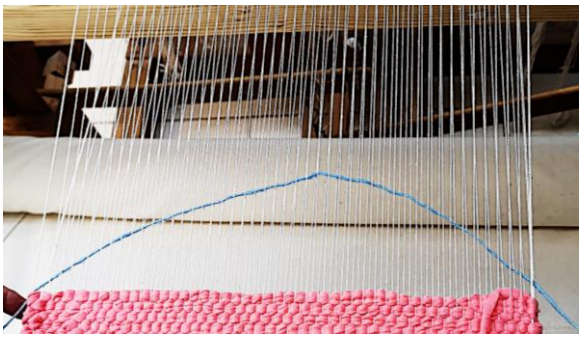


Before I start weaving, I need to make sure that when I open the 1st shed that the 1st warp thread moves down.

2. Starting to weave with 1 colour

I open the 1st shed. And pass my shuttle through the shed.

I start at the right side of the warp and end at the left side .



I create a curve with my thread. This will ensure straight selvages. I try to make approximately the same size curve on every line I weave.
I beat the beater.

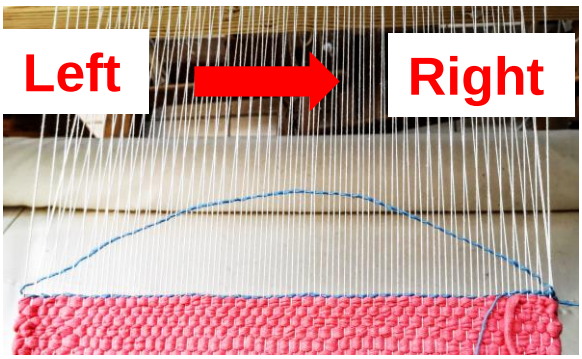
I change shed and beat again.

I pull the beater with both hands.

I have now woven 1 row.

On the right side of the warp, I weave in the loose end of the thread under the first row of weaving. This is called anchoring and it keeps the thread secure.

I can anchor the thread on both selvages.
I need to anchor the thread every time I switch colours or use a new thread.
.



After I have anchored my thread,
I continue to weave.
I pass my shuttle from left to right.

I always create a curve with
the weft, this is also called bubbling.

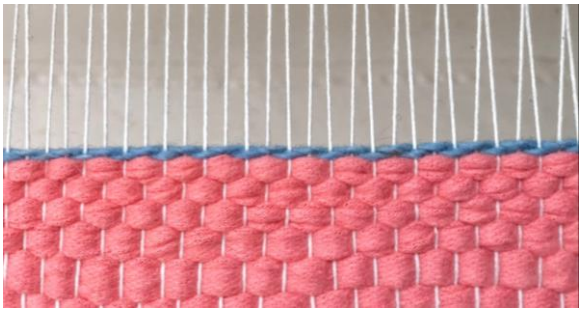
I need to fix the weft thread on the selvages in order to keep them straight.

I beat the beater.

I change the shed.

I beat again

I pull the beater with both hands.



I have woven 2 rows.

Rows are also called passes or picks.

Here I have woven 2 passes.

I continue weaving the same way:

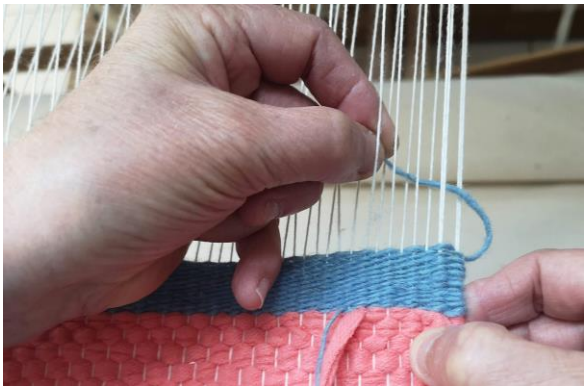
- I weave 1 row.
- I beat the beaer
- I change the shed
- I beat again

I continue weaving this sequence.

I continue weaving the same way:

- I weave 1 row.
- I beat the beaer
- I change the shed
- I beat again

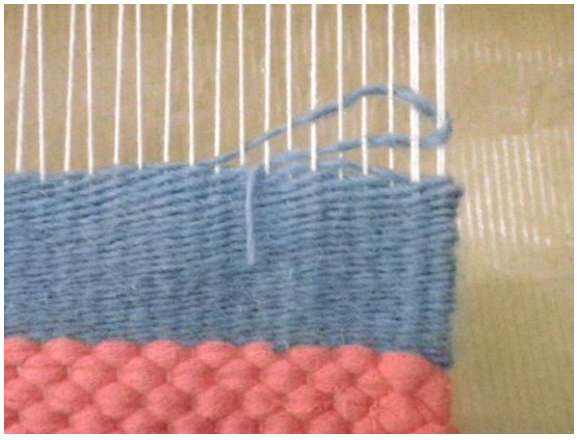
I continue weaving this sequence. When I am finished weaving I cut the end of my thread.



I anchor my thread end under the last pass.

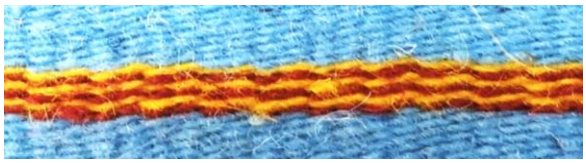
I beat again.

I am ready to add a new colour.



3. Weaving with 2 colours to make horizontal stripes

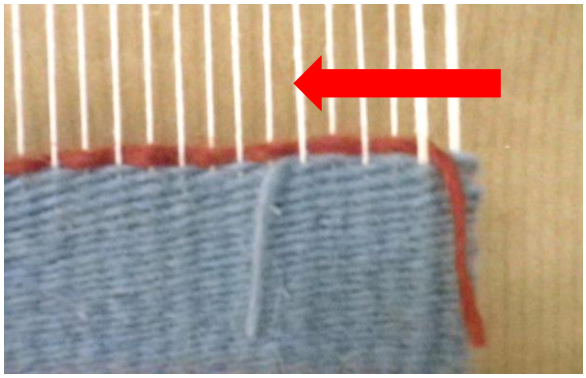
I will use brown and yellow threads to make stripes.



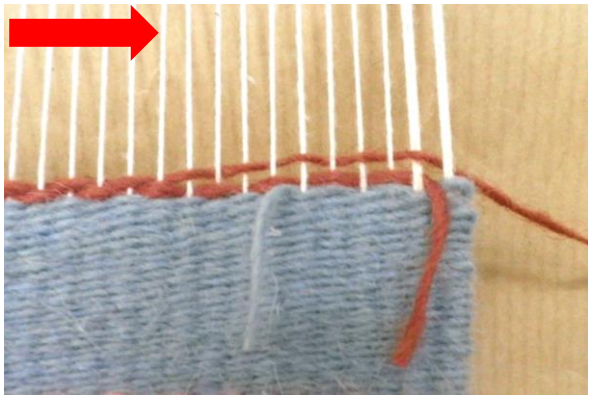
Iwill first weave a row with the brown thread.

I pass the thread from right to left.

I will leave the edge of my thread to hang.



I weave 1 more row with the brown thread.

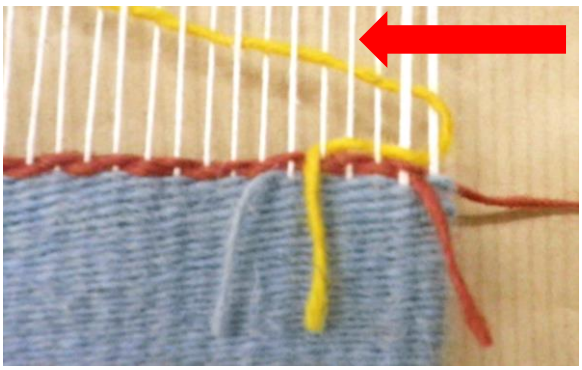


I will now use the yellow thread.

I weave 1 row with the yellow thread.

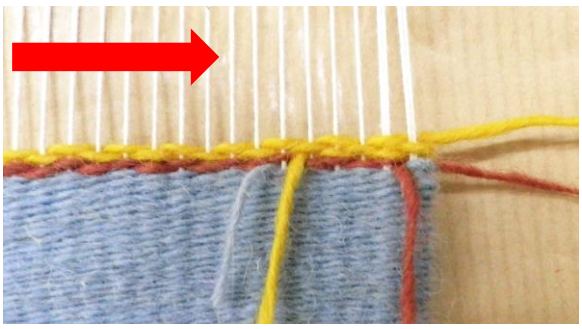
I pass the thread from the right to the left and anchor the end.

I weave 1 more row with the yellow thread.

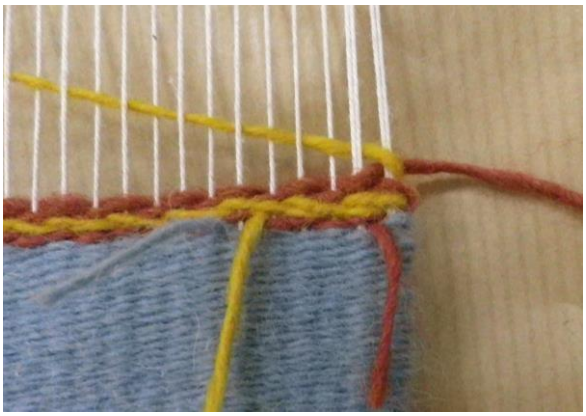


I weave one more row of yellow.

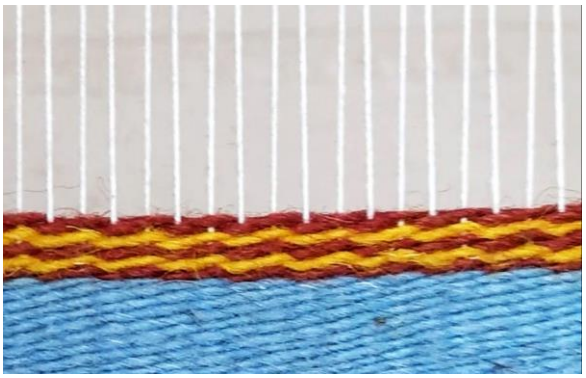
So far I have:
2 rows of brown and
2 rows of yellow
.



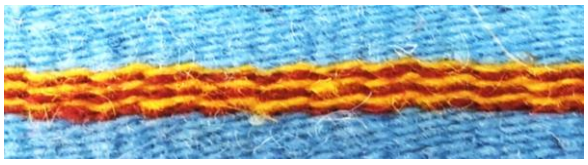
I carry on weaving in sequence
2 rows (passes) of each colour.



As I progress I can see the stripes being formed.
When I am happy with the weaving, I cut and anchor the threads.

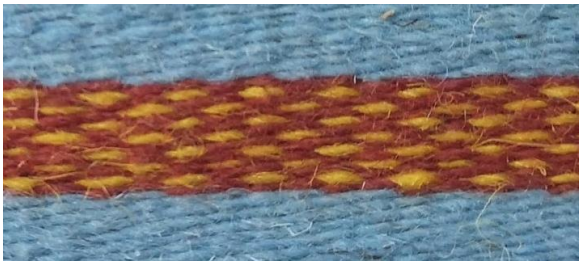


I continue weaving using the background colour.



4. Weaving with 2 colours to make dots.

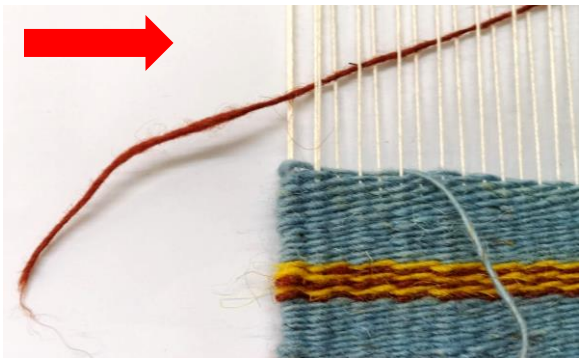
I will use brown and yellow threads to make a dot pattern.



I start on the side of the anchored thread.

I weave the brown thread from the left.

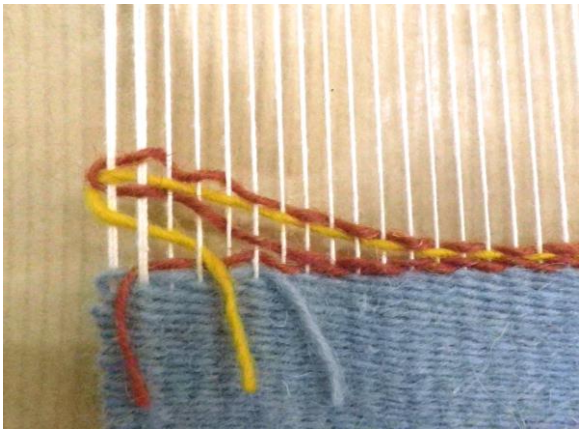
I leave the thread end loose.



I weave 2 rows of brown thread

and I weave a row of yellow thread.

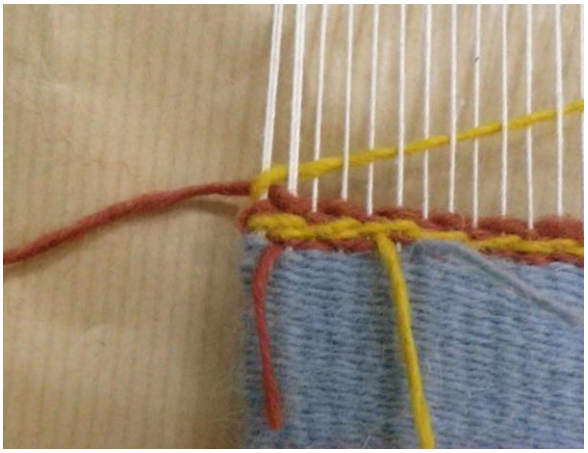
I anchor the yellow thread and continue to weave.



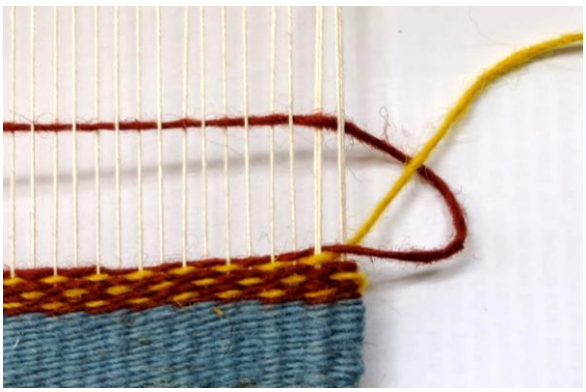
I weave 2 more passes of brown thread

and

I weave 1 more pass of yellow thread.



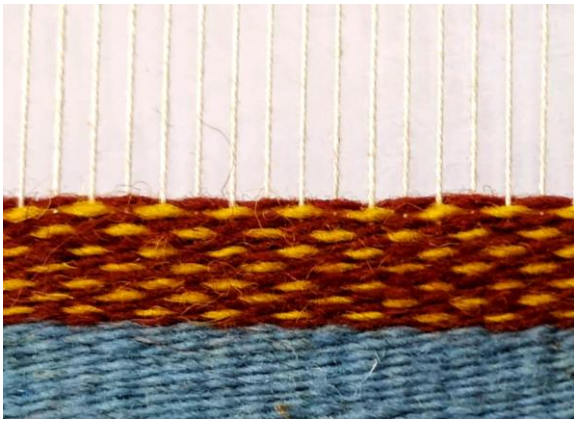
While I weave the 2 rows of brown and the brown thread meets the yellow one, I pass the brown thread around the yellow.
So the yellow thread goes through the loop created by the brown weft.



To get dots I weave the sequence below:

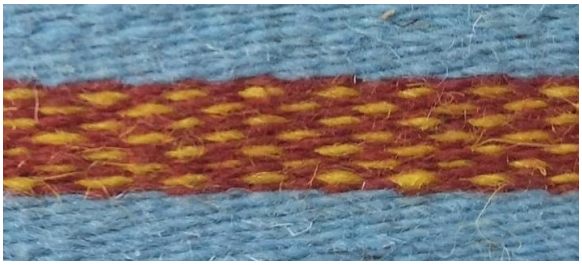
2 rows of brown thread
1 row of yellow thread

And I keep repeating the same sequence.



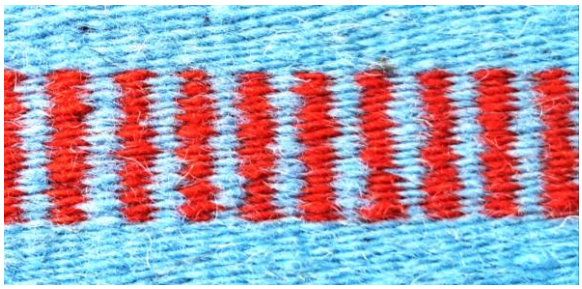
When I am happy with the weaving, I cut and anchor the threads.

I weave some more background colour.



5. Weaving with 2 colours to make vertical lines (pick and pick weave).

I will use blue and red thread to make vertical stripes.



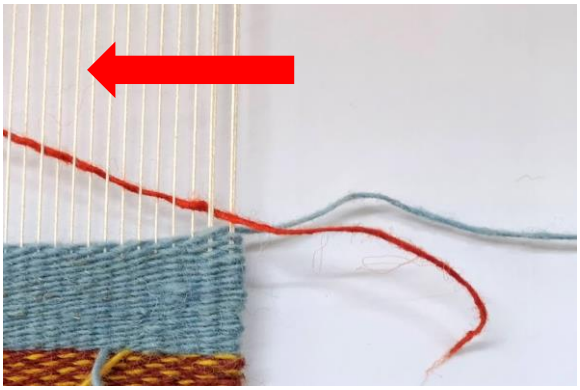
Blue is also my background colour.

This technique is called pick and pick weave.

I weave 1 row with the red thread.

I start from the side the blue thread ended.

I weave from right to left.

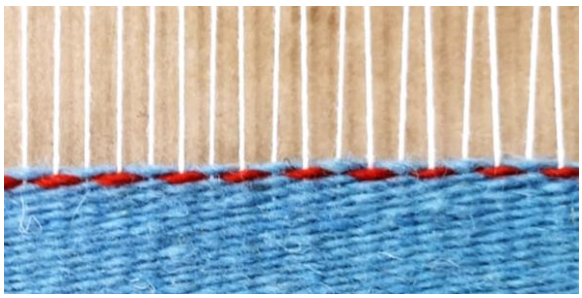


I weave 1 line with the blue thread.

The blue thread goes over the red
Thread and under the first warp thread.
I arrange the the threads at the selvages
And beat the beater.

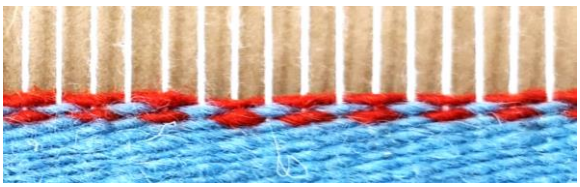
I have woven:

- 1 line of red thread
- 1 line of blue thread



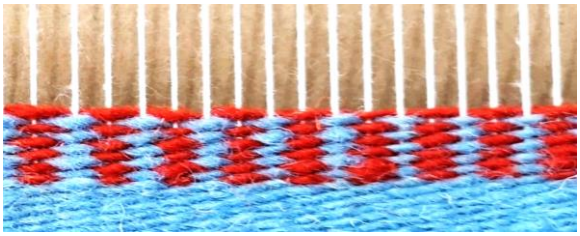
The pick and pick weaving sequence is:

1 line of red thread
1 line of blue thread



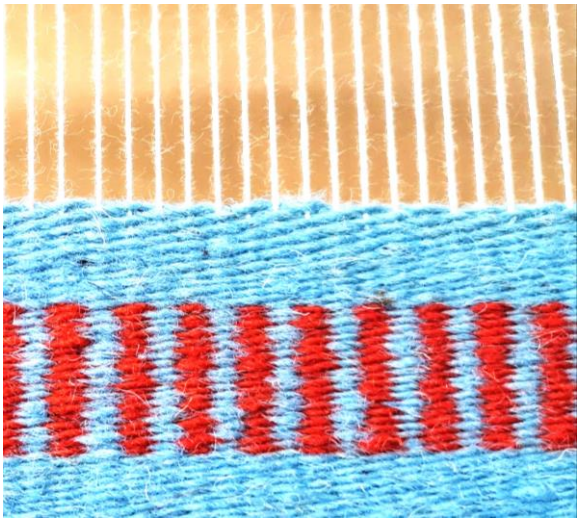
I repeat this sequence.

The more I weave the higher the lines get.

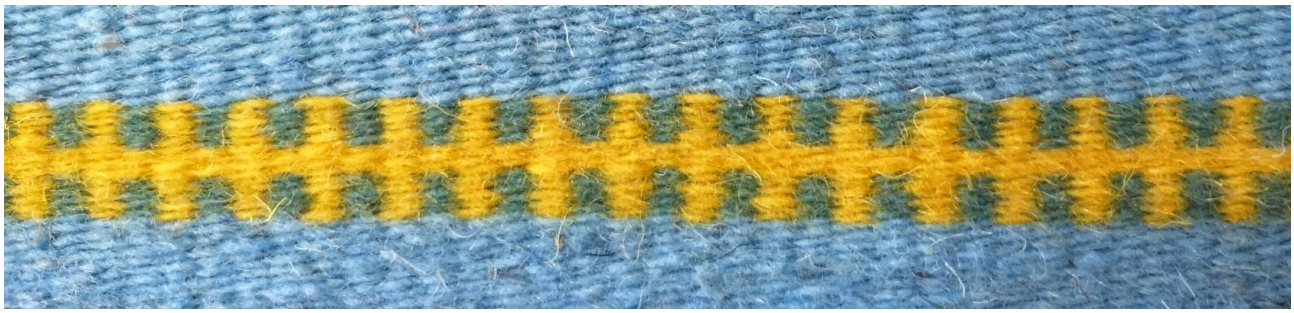


When I am happy with the height of the lines:

- I cut and anchor my thread.
- I weave more background colour.



6. Variation on pick and pick weave with 2 colours- cross design



For this pattern I will use yellow and green threads

Step 1:

Repeat 5 times and weave in sequence:

- 1 row of yellow thread
- 1 row of green thread

Step 2:

- Weave 6 rows of yellow thread

Step 3:

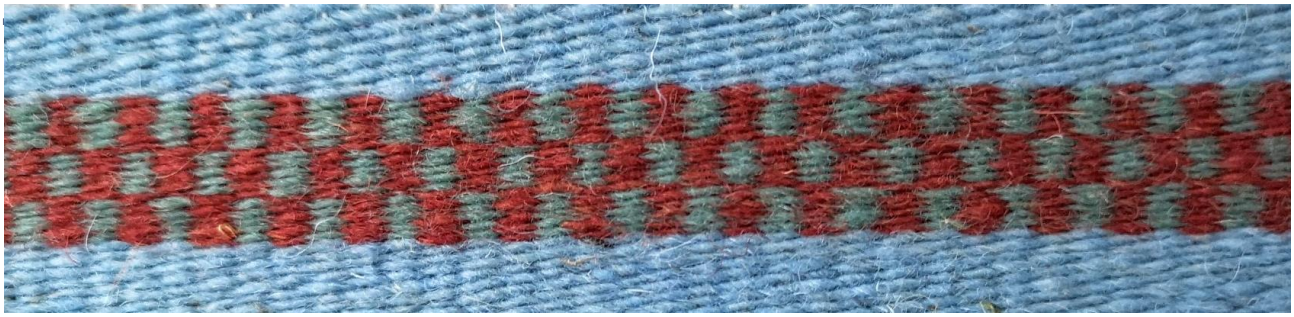
Repeat 5 times and weave in sequence :

- 1 row of green thread
- 1 row of yellow thread

Step 4:

- Cut and anchor yellow and green threads
- Weave more blue thread for background colour.

7. Variation on pick and pick weave with 2 colours- checkers design



For this pattern I will use brown and green threads

Step 1:
Repeat 5 times and weave on sequence:

- 1 line brown thread
- 1 line green thread

Step 2:

- 1 line green thread

Step 3:
Repeat 5 times:

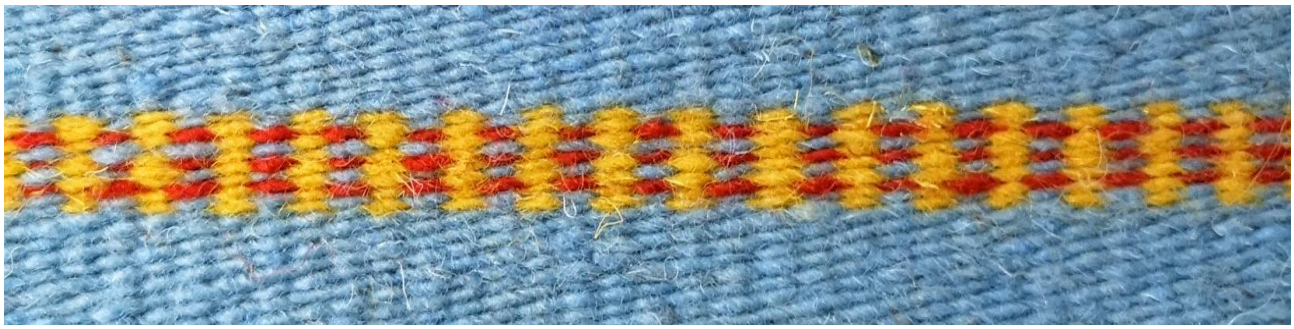
- 1 line green thread
- 1 line brown thread

I can repeat step 1 to step 3 as many times as I wish.

Step 4:
When I am happy with the design

- I cut and anchor brown and green threads
- Weave more blue thread for background colour.

8. Variation on pick and pick weave with 3 colours- fence design



This pattern is made with 2 colours and the background colour.
.
Here I use:

- orange thread
- yellow thread
- blue thread same as thread used for background

Step 1:
Weave in sequence:

- 1 row of yellow thread
- 1 row of blue thread
- 1 row of yellow thread
- 1 row of orange thread

Step 2:

Repeat above sequence as many times as you like.

For the above pattern we have repeated the sequence 3 times.

Step 3:

- Cut and anchor yellow and orange threads.
- Weave more blue thread for background colour.

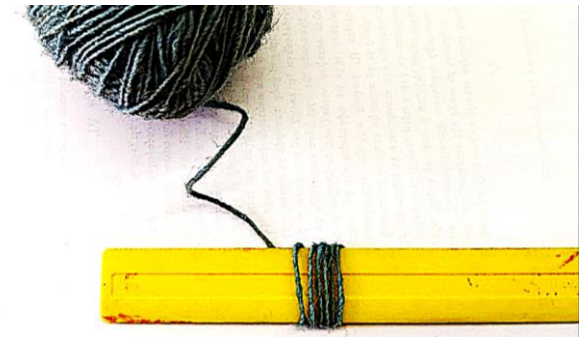
9. Shag weaving

How to make wool thread strands for shag weaving

Step 1:

I wind the thread around a ruler.

If I don't have a ruler, I can use a piece of card about 2,5cm wide.



Step 2:

I cut the thread in the middle of the ruler.

Step 3:

The strands of thread are ready

Step 4:

I need to make many strands to use in shag weaving.

When weaving a shag rug I always weave with an open shed.
I do not place wool strands on the 2 selvage warps on both sides of the rug.
I can use a single, double, triple or quadruple strands of wool depending on the thickness of the wool.
Traditionally shag rugs are woven using wool for both warp and weft.

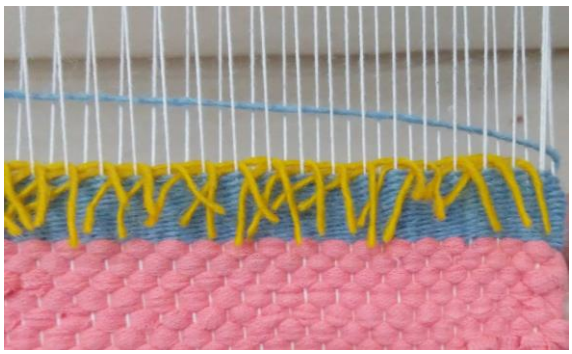
I start on the side that the last row has ended.
I open the shed.
I pass the first strand under the 2nd and 3rd open warp.

I pass the next strand under the 3rd and 4th open warp .
I pull the strands down.

I add more strands the same way.

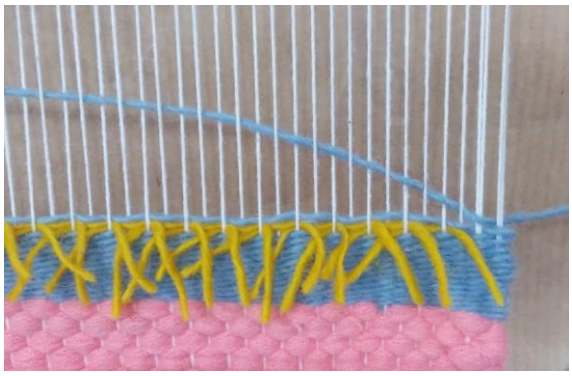
I continue until I get to the end of the row.
I keep the last 2 warp threads on the selvage empty.

When my row of strands is ready ,
I weave on the same shed a row of background colour.

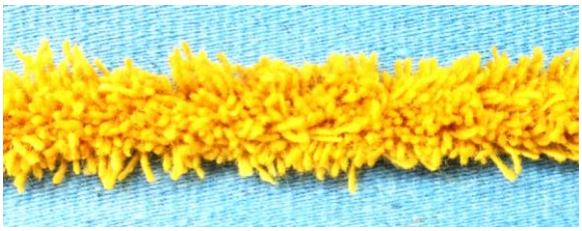


I beat the beater.

I change the shed and weave one more row of background colour.
I beat the beater hard.
These 2 rows secure the strands in place.
I can weave up to 4 double rows, depending on the wool thickness.



I carry on weaving as many rows as I wish.
I can weave a whole shag rag in this technique or use it in parts in a decorative way.



10. Making a butterfly

A butterfly of thread helps keep the thread in order.
It will not tangle when I use it.

I can make a butterfly with a single thread or more strands together.

Here I am using the thread doubled.
I am using 2 strands of thread.

I secure the thread with my thumb.

The loose end can be 15- 20 cm.

I start winding the thread.

I use my thumb and my little finger.

I use a figure-of-eight movement.

I make a loop around my thumb.

I wind the thread over my little finger.

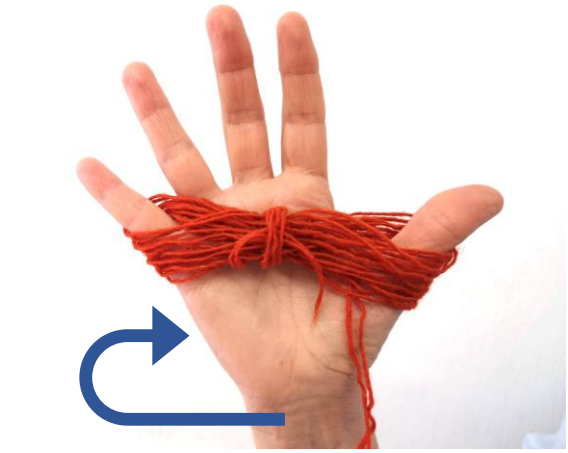
I make a loop around my little finger.

I wind enough thread around my fingers.

I pull the end of the thread behind the threads in the middle .

I wind the end around the middle.

I wind it 3- 4 times in order to secure it.



I pull the end of the thread through the loop created in the middle.

I remove the butterfly from my fingers.

The butterfly is ready to use.

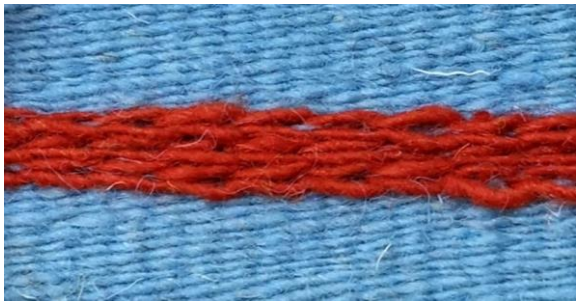
I pull the loose end of the thread to weave.

Pull this end to start weaving

11. Soumak weaving

An other very decorative technique is Soumak weaving.

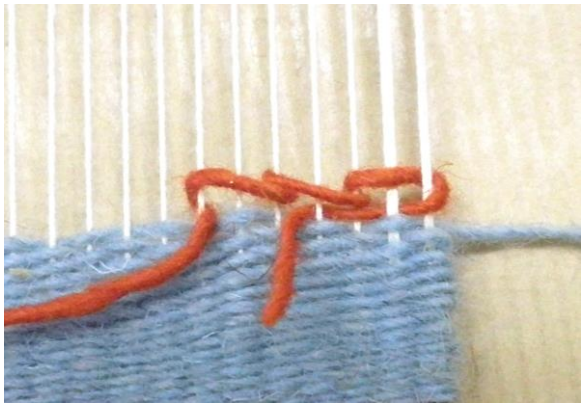
It can be woven with a single thread or a double.



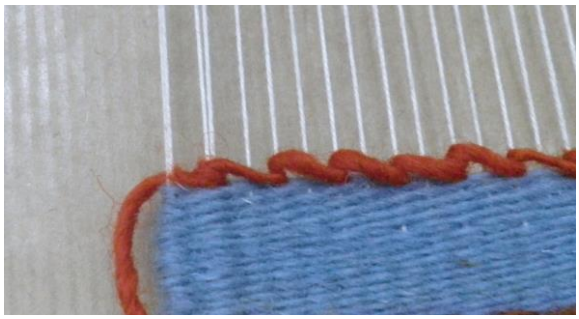
I weave soumak on a closed shed.
I weave it on the right side of the cloth.

I anchor my thread on the first couple of warps.

I pass the weft over the next 2 warps and under the 2nd warp.
This creates a loop.

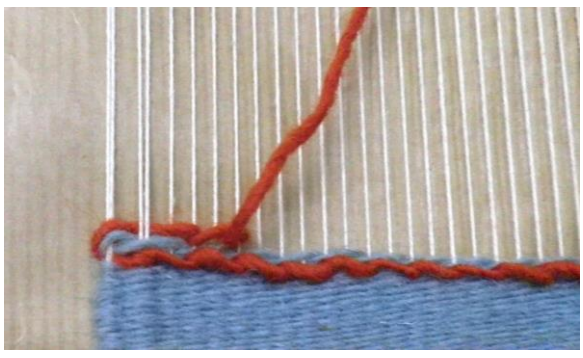


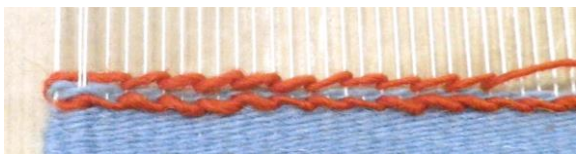
I continue weaving the same way until the end of the row.



I weave an other 2 rows of background colour.
With the shed closed, I weave one more row of soumak, towards the opposite direction.

As I weave the second row of soumak a braid is created.





13. Pibione weaving

With pibione weaving, I can create loops.

I need a wooden rod to create loops with.

The thicker the rod, the bigger the loops.

I weave pibione with an open shed.

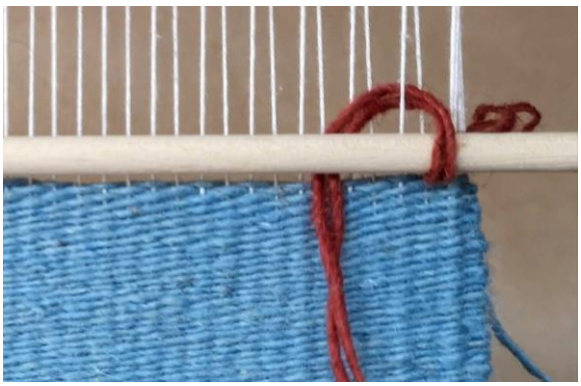
I need to open my first shed to start.

I place my weft on the first open warp thread.

I am using a double thread as weft.
I place the rod above my weaving.
I hold the rod in place.

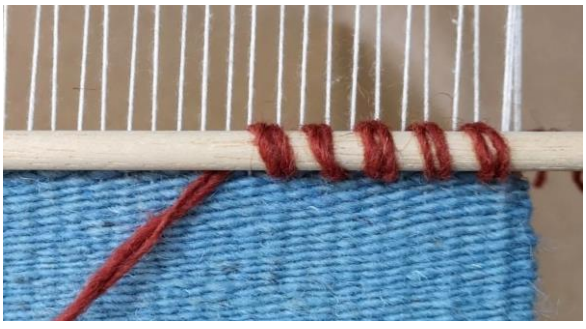
I take the weft and do the following:

- I pass it over the rod
- I pass it under the next warp thread
- I pass it under the rod



I have created one loop.

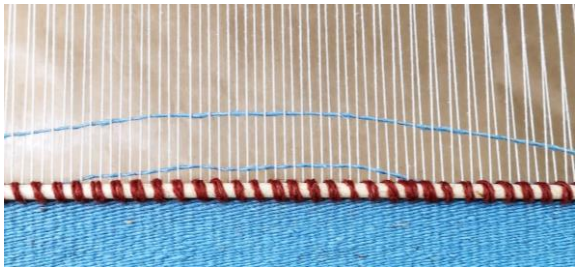
I repeat the steps above to make more loops.



I then anchor the end of my thread under the row of loops.

When I finish my 1st row of loops:

- I weave 2 rows of background thread (blue thread) to secure the loops.
- I beat the beater



Now that the loops are secured,
I remove the rod and beat the beater again.

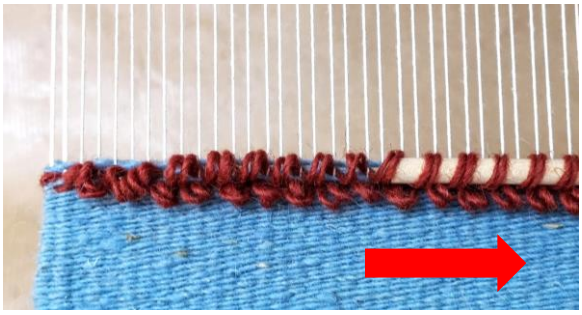
I continue weaving 1 more row of pibione.
I change the shed and repeat the same steps.
I take the weft and:

- I pass it over the rod
- I pass it under the next warp thread
- I pass it under the rod

After every row of pibione weaving,
I weave 2 rows with background thread.

I then remove the rod.

I carry on weaving the same way.
In the end I cut and anchor my thread.



There is a second way of weaving pibione in which I weave the row of loops on the same shed every time. To accomplish this, I pass the first row of background colour weft on the same shed as the loops. I change the shed and weave a second row of background colour. This is similar to the way I weave a shag rug. When the loops are woven on the same shed they are aligned horizontally and vertically.

13. Kilim slit weave technique

I use the kilim slit weaving and dovetail weaving technique to create shapes in rugs.

The basic rules for the kilim slit weaving and dovetail weaving are:

1. The kilim rug needs to be woven row after row, one butterfly after the other.

2. All butterflies must have weft of the same thickness.

3. I place each colour on the warp threads according to the pattern, but every colour must have an even number of warp threads.

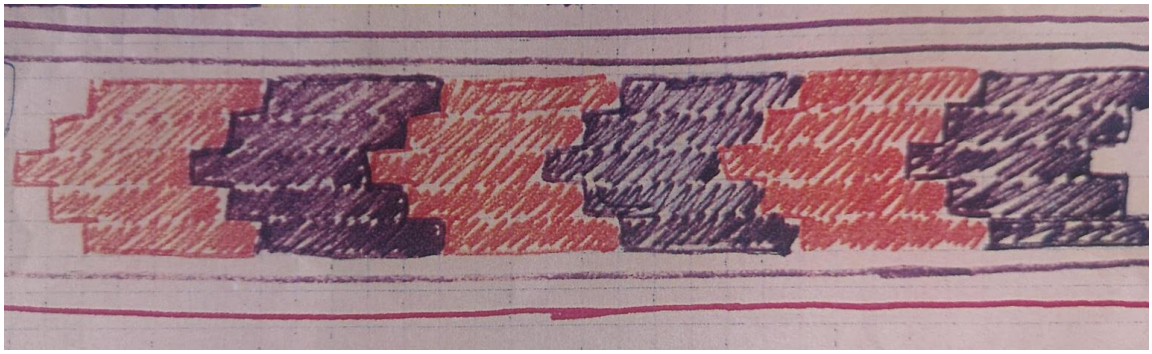
4. I always start on the right hand side of the shed with the first warp thread down.

5. I always start with a butterfly of the selvage colour. I start with the butterfly that hangs on the inner side of that colour (and not the edge). The rest of the butterflies will follow in sequence.

6. When I need to expand towards both directions to create the pattern, I always start by expanding towards the left first.
   I then expand towards the right.

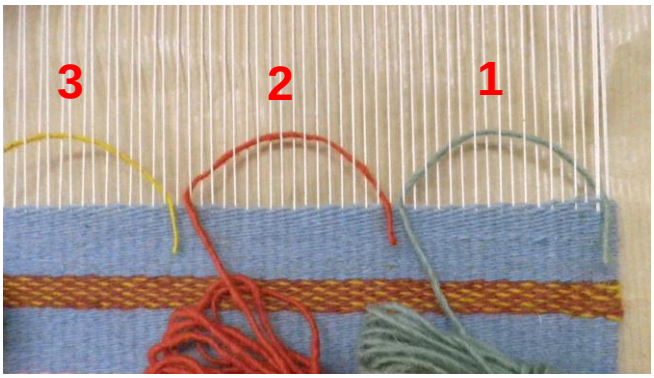
7. In dovetail weaving (instructions will follow), I must not forget that the warp that is used by both colours always belongs to the colour on the left.

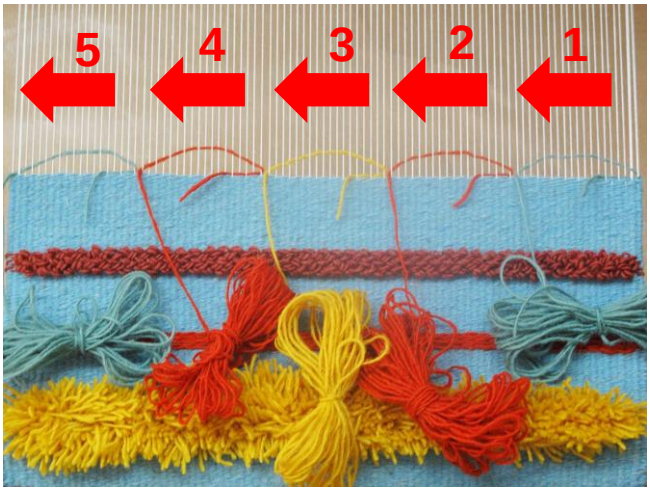
In slit weaving I usually follow a pattern like the one below.



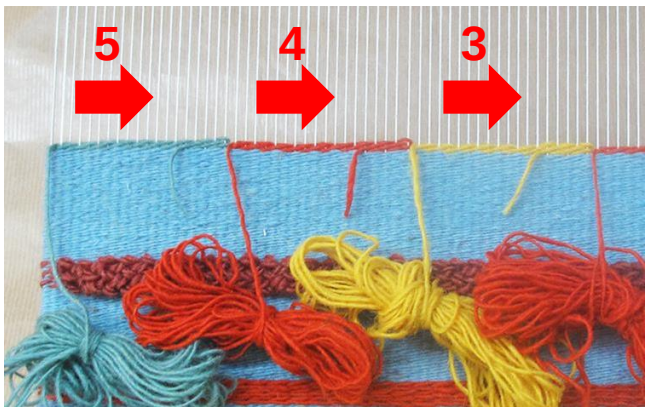
I will weave this pattern with steps.
I make 6 butterflies of thread:
2 *green
3 *orange
1* yellow

I divide my warp threads in 5 parts.
I position and a my threads in the same shed.
I always start on the first shed and the first warp thread down.
I always start with a butterfly of the selvage. I start with the butterfly that hangs on the inner side of that colour. In this case the green one on the right side.
I weave until the next colour starts.
I weave the all colours in sequence (1 to 5).





After I weave the whole line:
- I change shed
- I beat the beater

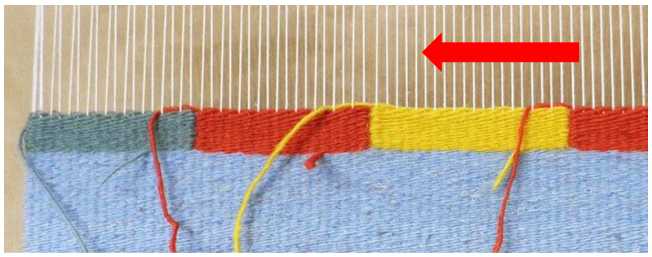


I now continue weaving from the left towards the right starting with the with the selvage color that hangs on the inner side.

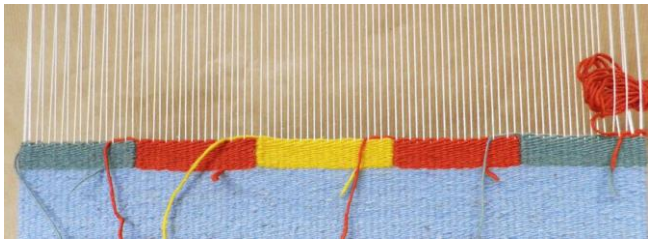
I weave all colours at the same time.

I want the steps to be 2 cm high.

When the direction is Right to Left:
I weave 4 more warps towards the left to make the step.
I do this on all colours.



I also add a new thread on the right.

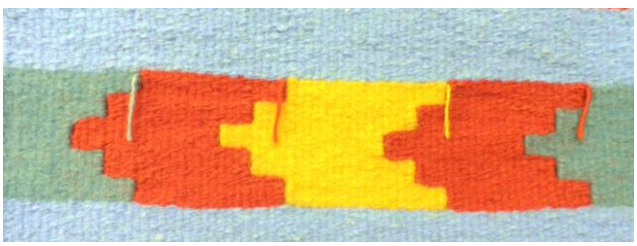


I look at my pattern.
I follow my pattern.

I weave the blocks foran other 2 cm.

When I make 3 steps, I go backwards.

I weave 2 more steps backwards.
To finish my pattern.
I anchor the ends of the thread on the top right side of each colour. I then cut my threads. I carry on weaving more background colour.
I will notice that slits are created between the bocks of colour on each step which is why this technique is called slit weaving.



14. Dovetail weaving

A dovetail join is when you weave 2 different weft threads on the same warp thread. This way you can create shapes and have blocks of colour next to each other , like we saw in the kilim slit weave technique, but without the slits. I always follow the basic rules of weaving like in the slit weave technique (p.154)

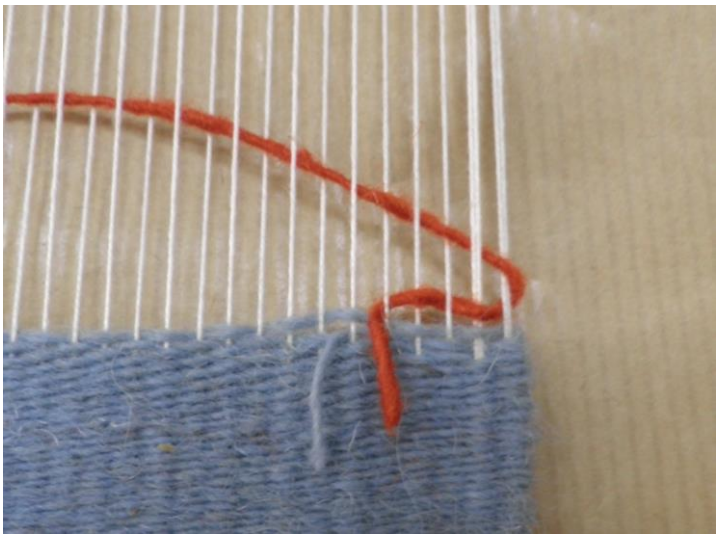
You usually follow a pattern. We will be demonstrating the technique by weaving the above simple pattern.

I start off by making three butterflies of wool in 3 colours. (1 brown- 1 yellow – 1 orange)

I divide my warp threads in 3 parts and place my threads accordingly. I always need an even number of warp ends on each colour.

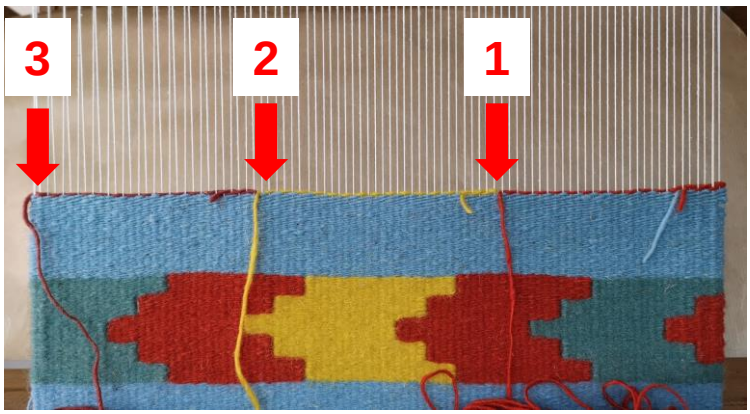
In order to anchor my thread, I lift the start of the thread and weave the end of the weft thread for a couple of warps under the woven row. I then push the anchored end down.

I do this for all 3 colours.

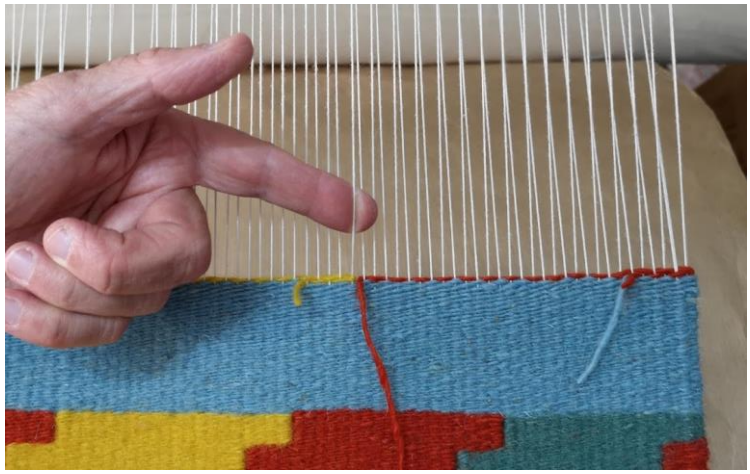


I then beat my threads.
I have woven the first line.

In dovetail weaving, I always start with the thread that is further in from the edge.
In this case no1, the orange thread.



In dovetail weaving, the colour that is on the right hand side will share the warp from the colour towards the left.
I pick the next warp thread towards the left, which in this case belongs to the yellow weft. This is the common warp thread that is going to be used by both colours.

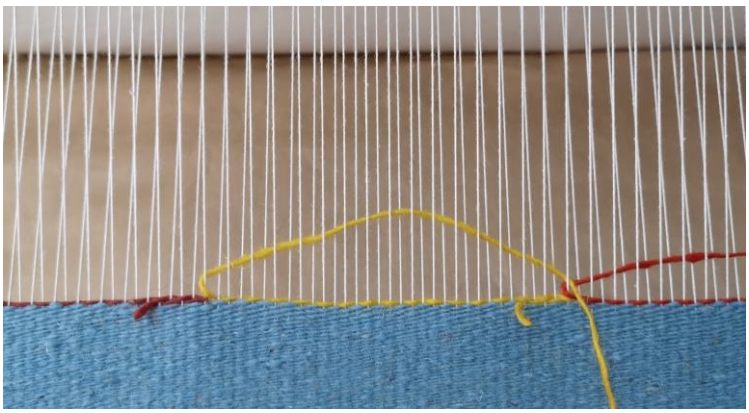


I change the shed, I wrap the thread around the common warp and weave my thread until the edge.

I do the same with the yellow thread that is next in line.

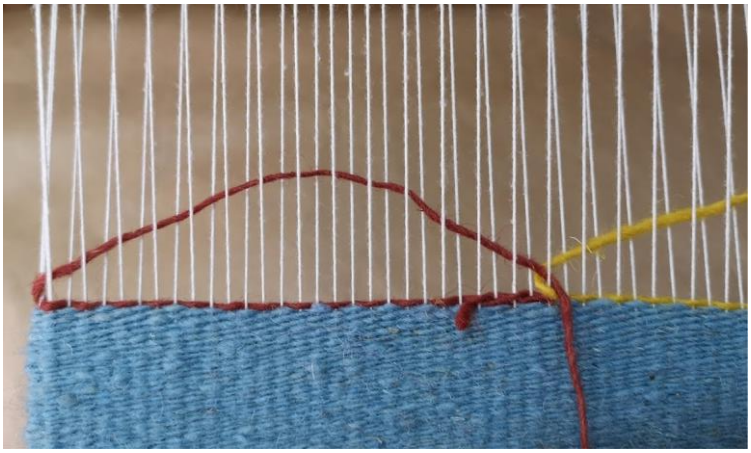
I pick up the warp thread towards the left that belongs to the brown weft.

I change the shed, I wrap the thread around the common warp and weave my thread until the starting warp of the yellow thread. It is now the common warp thread with the orange colour.



I do the same with the brown thread that is next in line. It is also the last colour on this row.

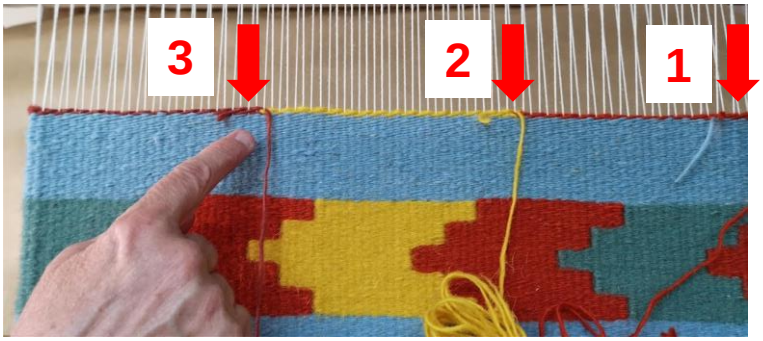
I simply weave back towards the commor warp thread with the yellow colour.



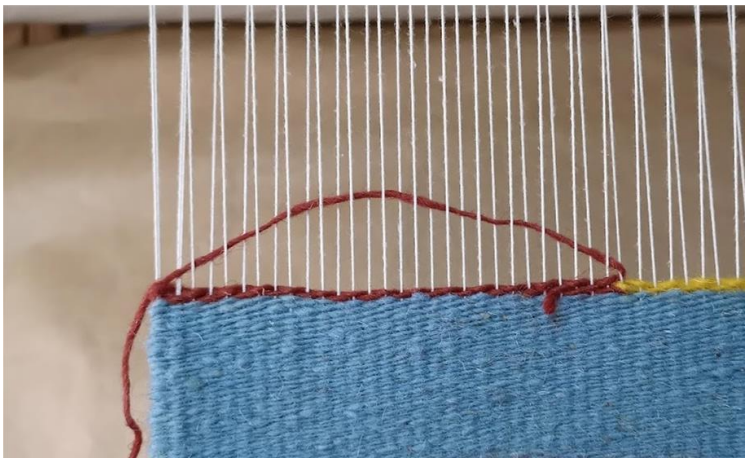
I beat with the beater.
The second row is now woven.

I start again with the thread furthest away from the selvage.

This time it is the brown thread (no. 3)

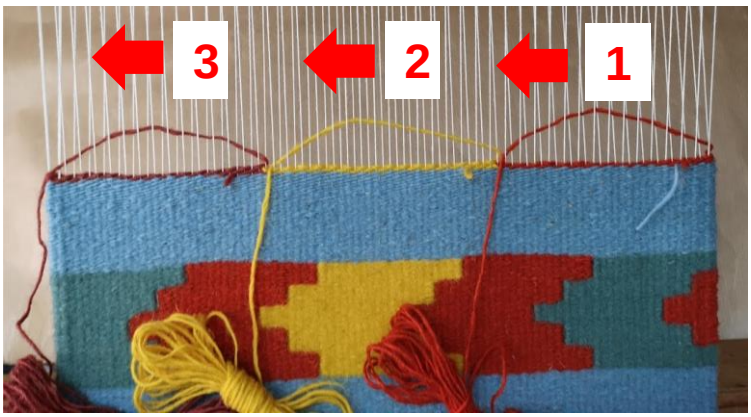


I do exactly as before.
I weave all the colours in the right order until I have the desired amount of rows.

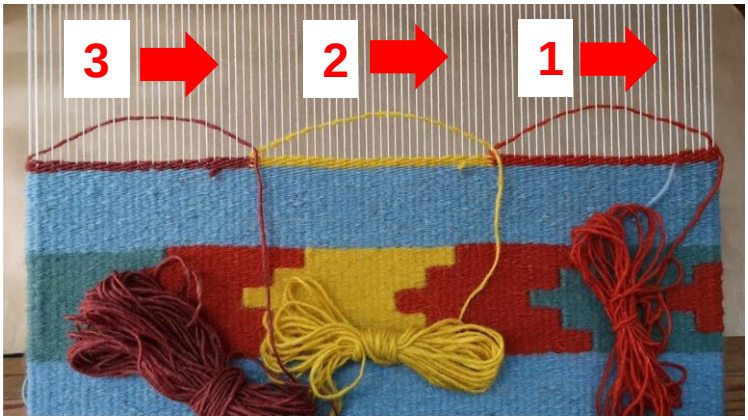


I make sure that I start from the correct thread, the one of the selvage colour that hangs further in from the edge.

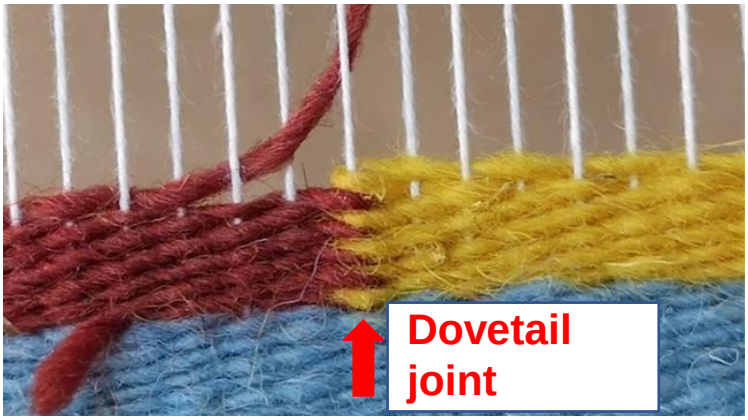
I need to weave each colour one after the other towards the same direction.



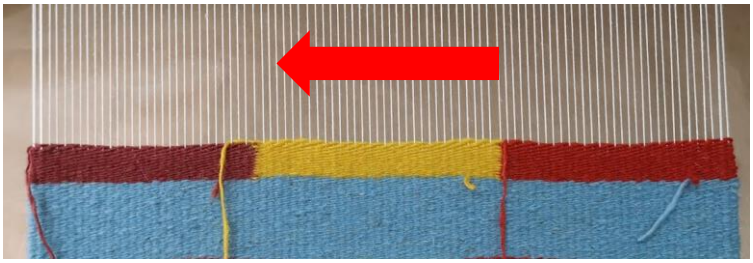
I repeat this as many times as is needed for the pattern to emerge.



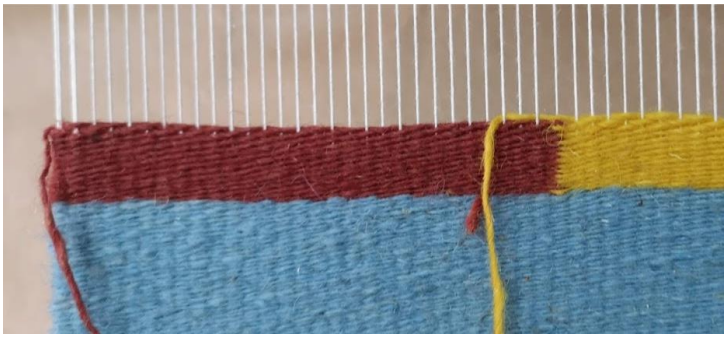
The weft threads of both colours need to be wound tightly around the warp thread in order to have a sharp edge.



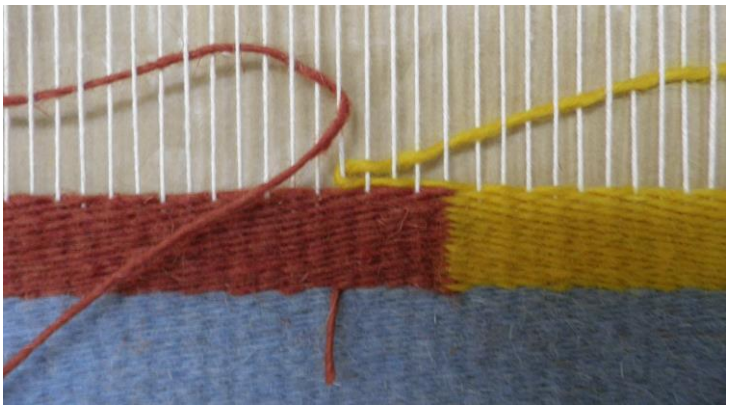
When I am ready to create the first step, I continue weaving each colour in its correct order and expand the pattern towards the left.



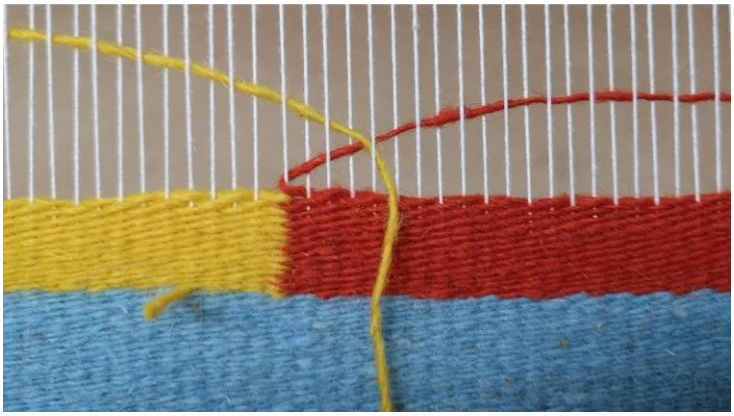
I weave toward the left with the yellow weft. I weave 4 more warp threads from the initial block of colour.
Since the warp where the dovetail joint takes place on the warp belongs to the colour on the left, I need to include that in the 4 warp threads I expand to.



I carry on weaving as before creating a new dovetail joint on the new warp thread.



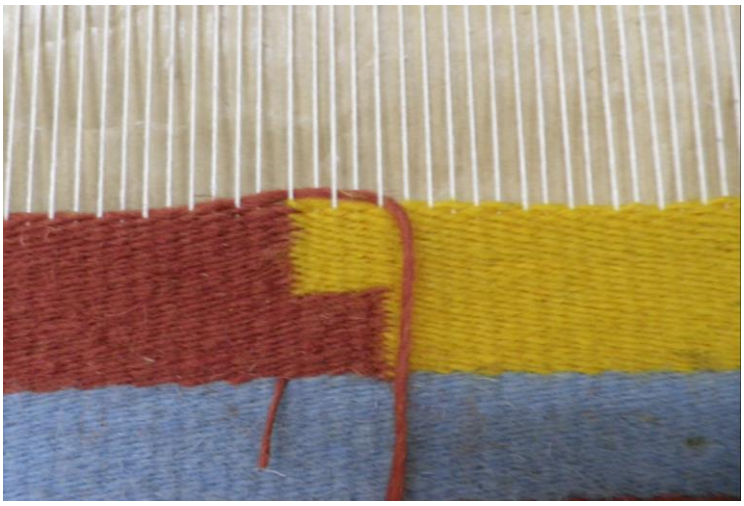
When I get to the other side of the yellow block I have woven, carry on weaving for 4 more weft threads. On this side the common warp thread belongs to the yellow so I need to expand 4 more warps excluding the common warp.



I carry on weaving in the same way as shown previously.
When the next step of colours is woven, I weave in again to create the pattern. I use the same common warps as before.

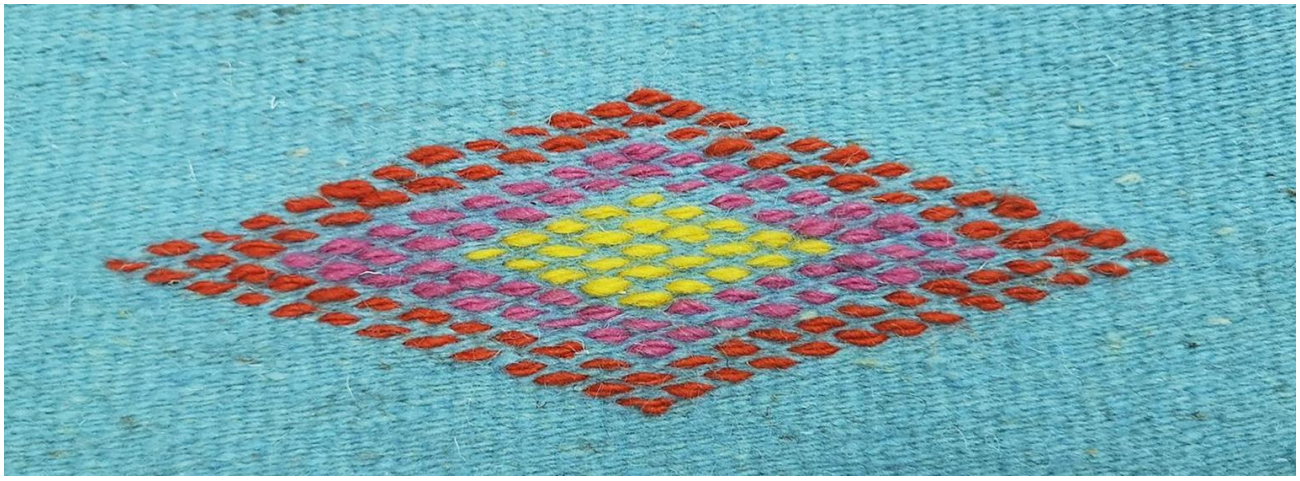
When I have finished weaving my pattern, I ancor and cut my weft ends.

When I change direction I weave in 4 warp threads on each side.



When I have finished weaving my pattern, I ancor and cut my weft ends.
I carry on weaving the background colour.

15. Inlay weaving technique

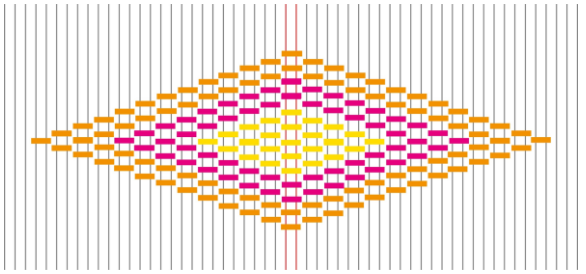


For the inlay weaving technique I need:

- Wool in a shuttle for the background.
- A pattern of a diamond shape
- Butterflies of double thread.

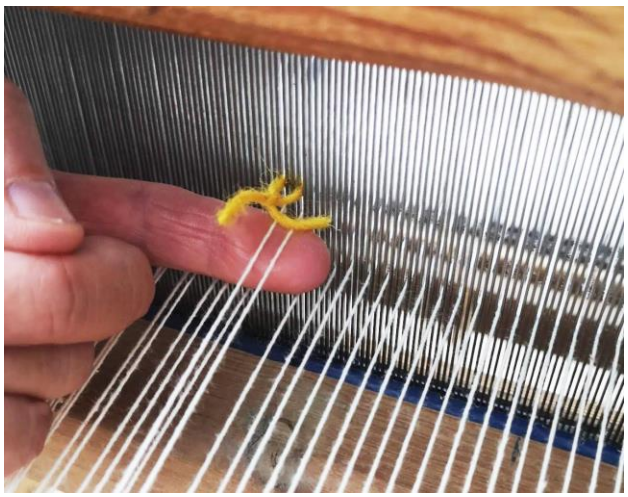
For this pattern I need:

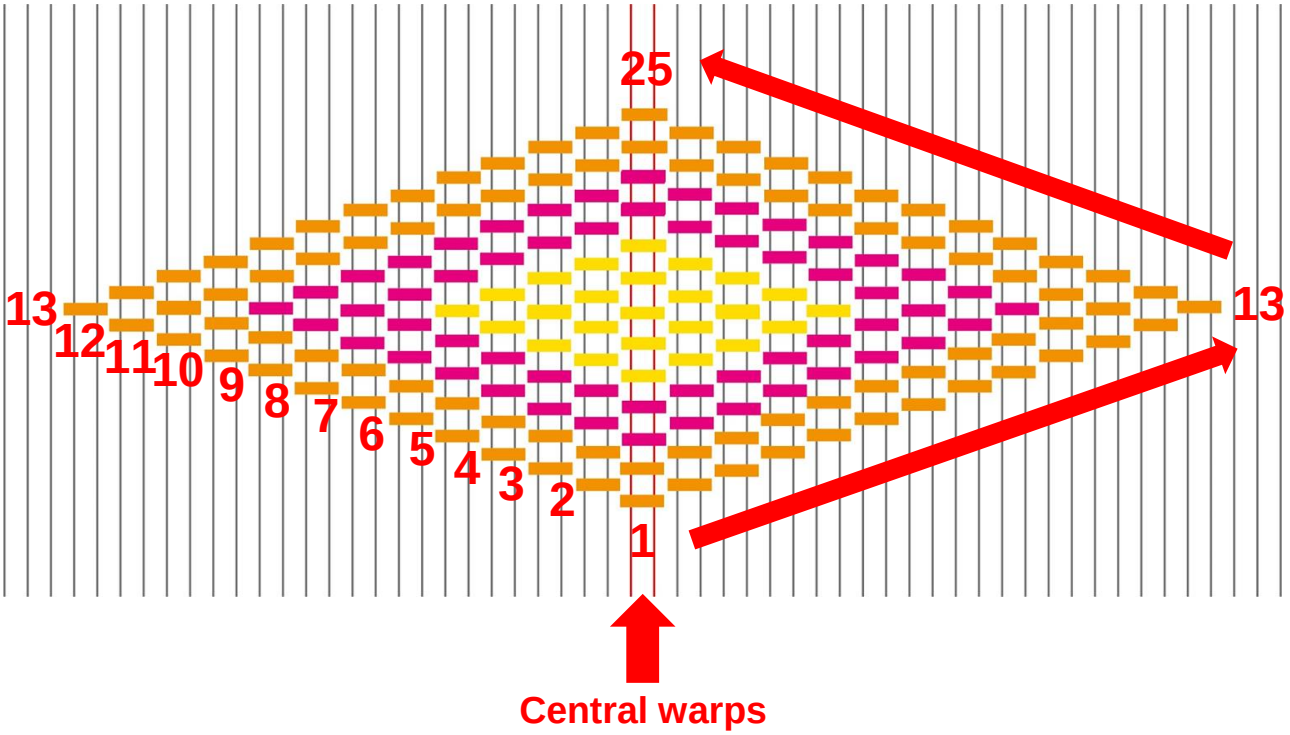
- 2 orange butterflies
- 2 pink butterflies
- 1 yellow butterfly
- A mirror



Before I begin weaving,I need to find the 2 central warps.

I use a thread to mark them on the reed.





This is the pattern I will follow.

I start weaving inlay from the bottom of the pattern row no.1

.

This technique is woven on the wrong side of the weaving..

I weave one line after the other (1 to 25).

I weave inlay technique on a closed shed.

I find the central pair of the warp threads.

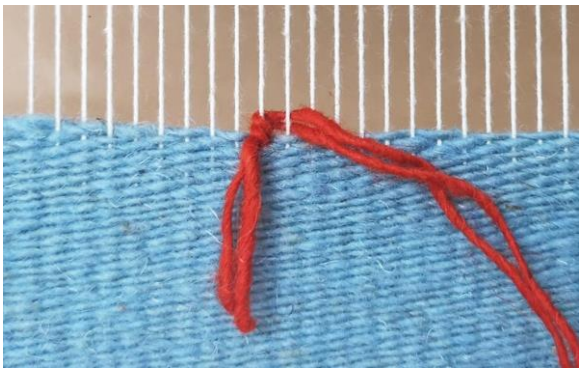
I use my finger to pass the thread under them.

The first thread I use is orange.

I anchor the thread on the left warp of the pair.

I pull down the anchored thread.

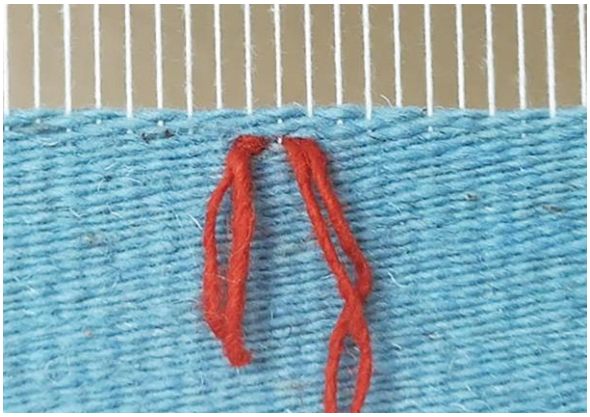
This is the first line of the inlay.



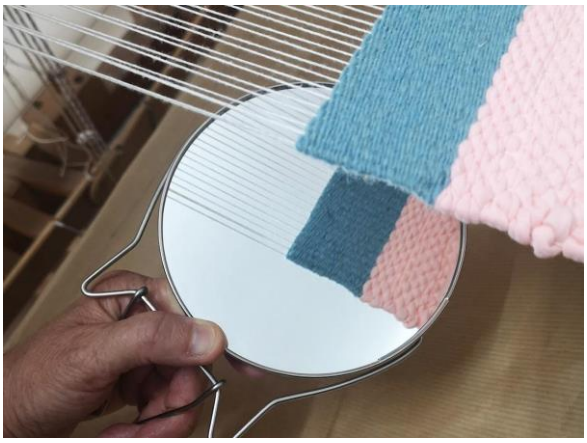
I weave 4 lines of background colour.

The inlay is woven back to front.

I see the back side while I weave.



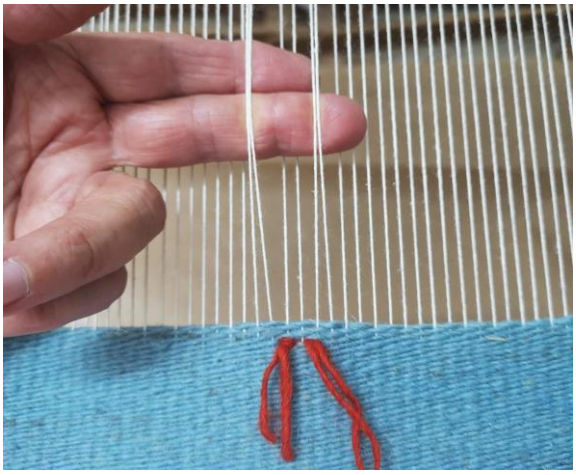
I use a mirror to see the back side of the weaving (right side of the cloth) .



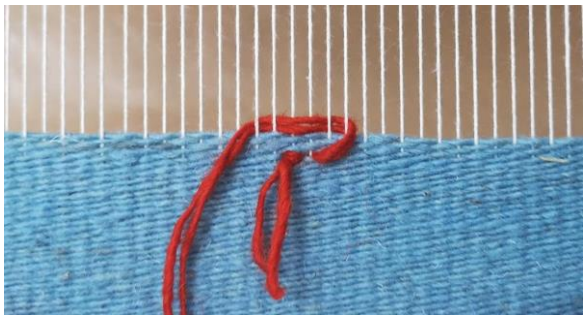
I follow my pattern and go to line 2.

I take the next 2 pairs of warps.

They are on the left and to the right of the central pair of warps.

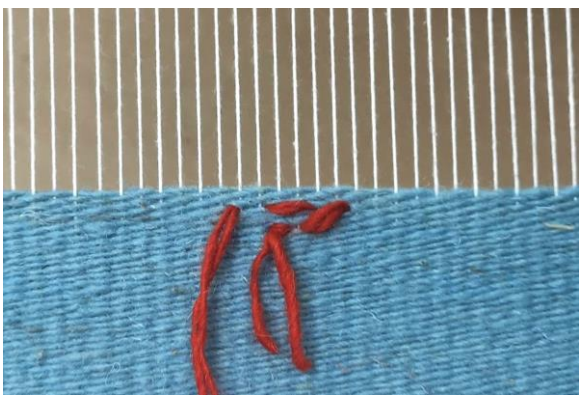


I pass my thread under the next 2 pairs.



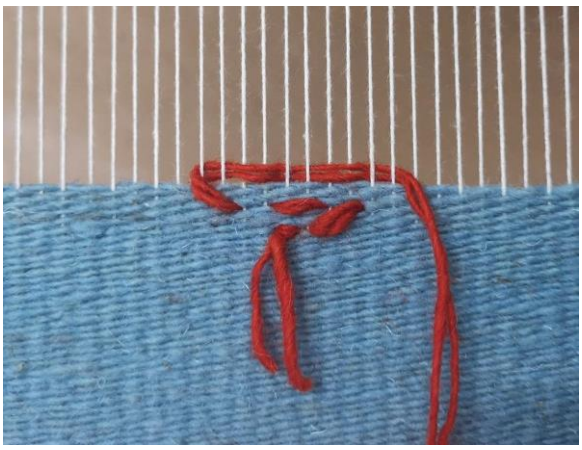
I weave 4 rows of background colour.

Every line of inlay weaving is followed by 4 rows of background colour weaving.



I follow the pattern.

I weave the inlay of row 3.



I pass my finger through the warps.

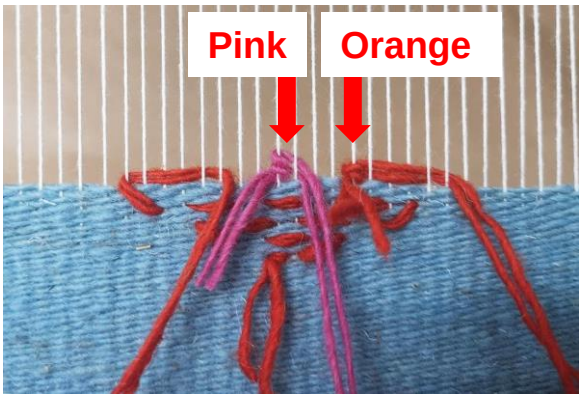
This makes the inlay have a better relief.

I follow the pattern and continue weaving.

When I get to row 5 I add the pink thread.

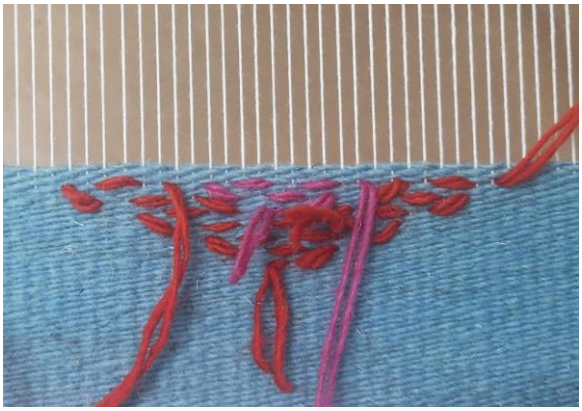
I also add a new orange butterfly.

This helps me weave both sides of the pattern simultaneously.



I follow the pattern.

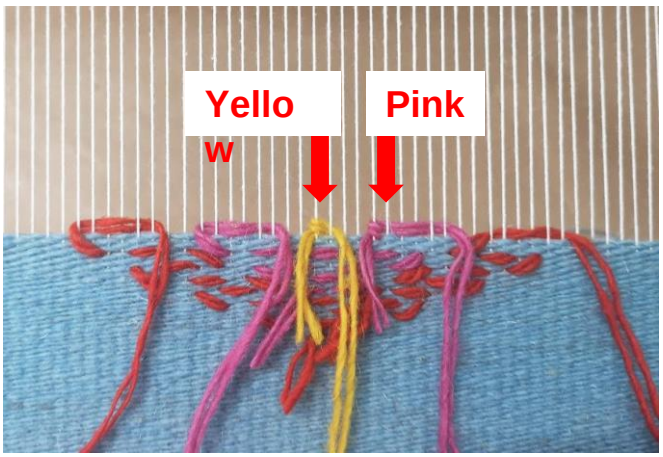
I always weave 4 lines between inlay.



When I get to row 9:

I add an anchor the yellow thread

I add 1 more the pink thread.



I follow pattern and carry on weaving.

I use the mirror to see the back side of the weaving (the right side of the cloth).

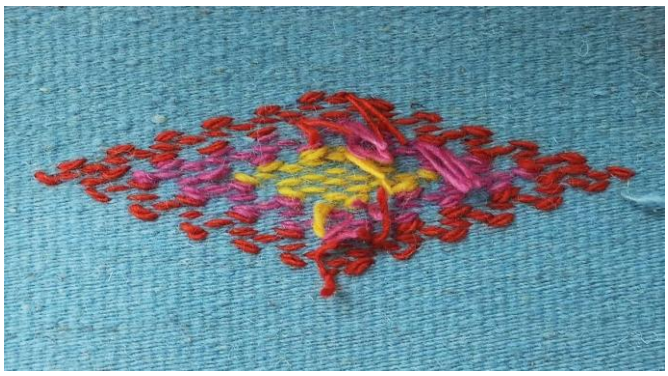
This helps me find possible mistakes.

When I finish the pattern,

I cut and anchor my threads.

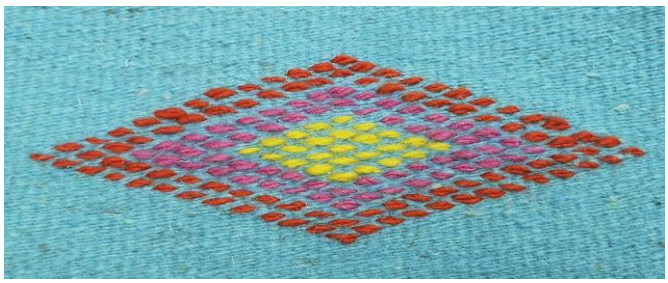
I weave more background colour.

This is what it looks like on the loom.



When I take it off the loom,

I can see the front side of the pattern.



Chapter Content:

1. Basic information on weaving a cloth
2. Winding and placing the bobbin in the shuttle
3. Plain/ tabby weave using one colour
4. Joining weft of the same colour
5. Joining weft of a new colour
6. Horizontal stripes with two rows of a different colour
7. Pick and pick technique
8. Hemstitch weaving technique
9. Cutting and removing the cloth from the loom
10. Tying off the warp ends
11. Simple warp tying techniques

Tidying up the loose thread ends to have a finished piece

Practice weaving a fine cloth

1. Basic information on weaving a cloth

To weave a cloth, I need to first decide the quality of the warp and the quality of the weft.

Once I decide upon these two, I can then choose the reed according to the weft and the warp.

Warp: To set the warp I need to define how many warp threads I want the cloth to have per 1 inch or per 2,5 cm.

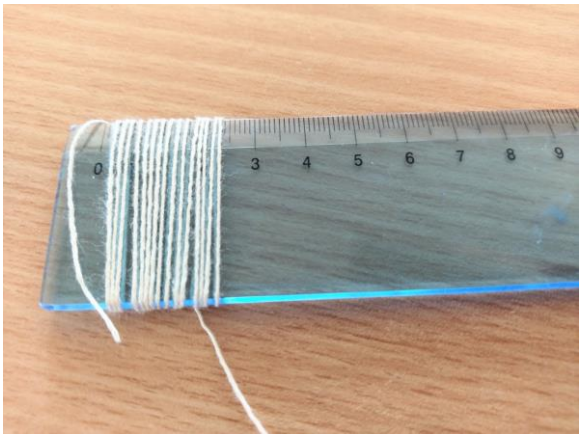
The number of warp threads per inch determines the fineness of the cloth.

The reed size depends on the number of dents per inch. (i.e. a reed size 6 indicates that the reed had 6 dents per inch, that is 6*2,5=15 warp threads per 2,5 cm.)

I can use a ruler and wrap the warp thread around it.

When placing the thread, I pay attention to even the distance between the warp threads on the ruler.

I spread the yarns according to how dense I want the warp to be.



Placing more warp threads will create a denser cloth. Placing less warp threads a sparser one. In this chapter, the examples shown have 13 warp threads per inch.

Once I decide the number of warp threads per inch, I multiply the number of threads per inch by the width of the cloth I want to weave.

In our example, the desired length is 14 cm.

14 cm * 13 threads / 2,5 cm = 73

At this point I will add 4 more threads for the selvage.

73 + 4 = 77

Thus, the warp I will use will have 77 threads.

Reed: Since I measured 13 warps per inch, I will use a 13 dents per inch (dpi) reed.

Reeds are also measured according to how many dents are per 10 cm. So a 13 dpi reed or in 10cm a 54size reed.

Weft: I choose the weft in relation to the warp.

The weft needs to be slightly thicker than the warp threads to weave a balanced cloth. I can use any quality of thread as a weft.

In our example, the weft is made of cotton.

2. Winding and placing a bobbin in the shuttle

I place the thread inside the bobbin.

Placing the thread facilitates the winding

I can place my ball of thread in a container.

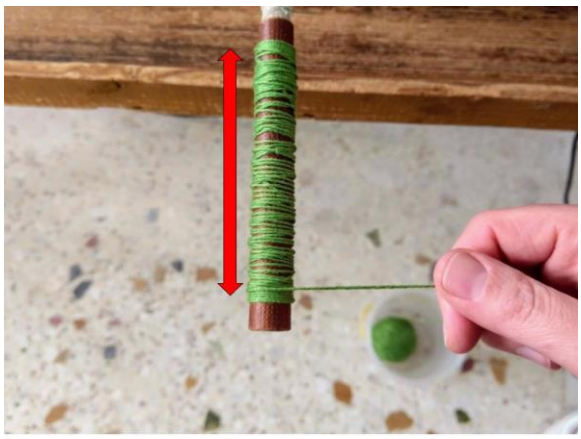
I place the bobbin in the winder.

The thread is trapped between the winder and the bobbin.

I start winding the bobbin.

I move the thread from one side to the other.

I need to hold the thread in my hand so it is slightly tight.



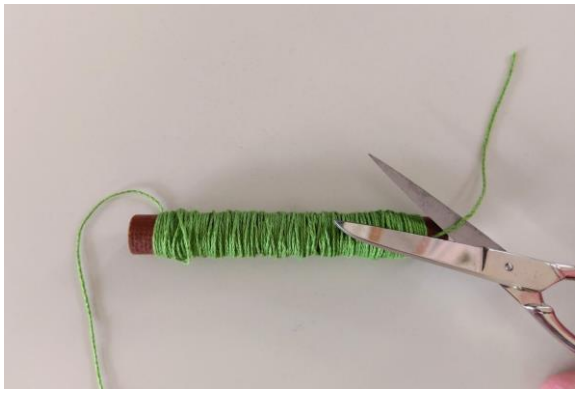
I need to fill the bobbin leaving 1 to 1,5 cm on each side without thread.

I need a bobbin that is winded not too loosely and not too tightly

The bobbin is winded.

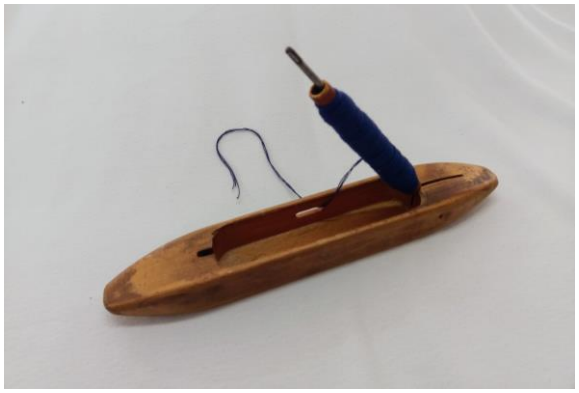
I remove it from the winder.

I need to cut the edge of the thread.



I cut the thread close to the bobbin.

The bobbin is ready.



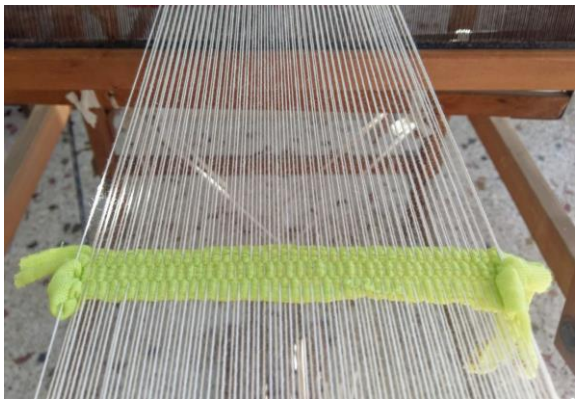
Placing the bobbin in the shuttle:

I place the winded bobbin in the shuttle.

The edge of the weft will pass through the opening of the shuttle.

Holding the shuttle with the opening facing me, the bobbin should turn clockwise, so the weft can unwind freely.

3. Plain weave / tabby weave using one colour



I remember to weave the header to keep the weft in place.

I always begin weaving from the right side of the warp.

I step on the right treadle and the first warp thread from the right must be lowered.

I place the shuttle inside the shed.

I push the shuttle slightly to pass through the shed.

The tension of the warps makes the shuttle slide inside the shed.

The shuttle must be close to the reed. The shed is wider towards the reed.

The weft is now inside the shed.

I leave the edge of the weft hanging on the right selvage.

I will place it inside the shed on the next row.

Change the treadle and hit the beater.

The weft is pressed on the header.

The edge of the weft is left outside the warps.

I place the end of the weft inside the shed leaving the edge stick out the warp threads.

I pay attention to the selvage. The weft is gently wrapped around the selvage.

I place the edge of the weft inside the shed.

I tuck the weft inside

I leave the edge outside the warps.

I pay attention to the selvage. The weft should just touch the selvage.

Stepping on the left treadle I throw the shuttle inside the shed.

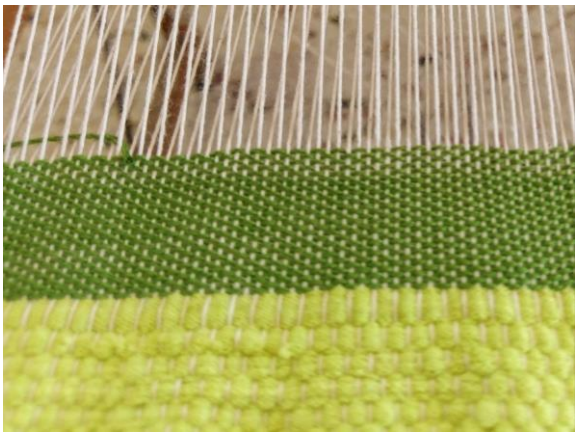
I continue weaving the cloth.

Useful tips:

Try to place my heel on the treadle and my toes right in front of the treadles' rope. This way it is easier to lower the treadle and open the shed.

4. Joining weft of the same colour

When the weft in the bobbin is over, I need to join more weft to keep on weaving.



I step on treadle 2.

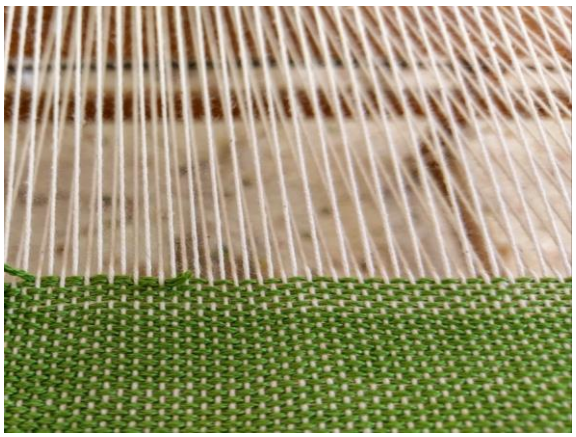
I place the end of the weft inside the shed.

Holding the shuttle with my left hand, I throw it in the shed.

The new weft passes over the old one.

The two wefts must overlap for 2-3 cm.

Change the treadle and beat the beater.



The old and the new weft are joined.

I can continue weaving the cloth.

5. Joining weft of a new colour

To change the colour of the weft, I need to cut the weft I was weaving and add the new one.

I always add a new colour on the side and not in the center of the cloth, to have a nicer outcome.

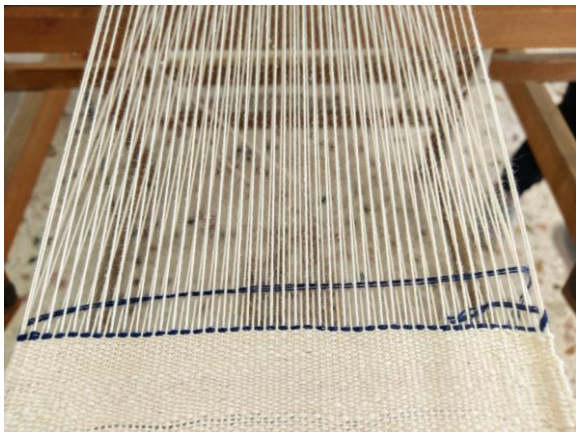
I cut the old weft around 6 cm outside the warps.

I tuck the edge inside the warps.

I throw the shuttle towards the direction of the previous weft. Right to left.

Leave the edge of the warp outside the shed.

Change the treadle and beat the beater.



I tuck the edge of the new weft inside the shed and continue weaving with the new coloured weft.

I keep on weaving with my new coloured weft.

6. Horizontal stripes with two rows of a different colour

To weave horizontal stripes of two different colours, I need to weave at least two rows of one colour, then weave at least two rows of another colour.

The white weft is on the right side of the cloth.

I step on the right treadle to open the shed.

I insert the new blue weft from the right side of the cloth.

I throw the shuttle in the shed.

The edge of the blue weft is left outside the warps.

Change the treadle and hit the beater.

Stepping on the left treadle, I need to place the blue weft inside the shed.

The weft is wrapped gently around the selvage.

Throw the shuttle with the blue weft from the left side.

Change the treadle and hit the beater.

The two wefts are on the same side.

I need to throw the white weft and weave a full row.

A full row equals two single rows.

I weave the desired number of stripes.

Once I finish the stripes, I cut the blue weft and place the end of it inside the selvage.

Continue weaving the cloth.

7. Pick and pick technique

The weft is on the right side and I step on treadle 1.

I throw the brown weft inside the shed, leaving the edge of the weft stick out of the shed.

Change the treadle and hit the beater.

I step on the left treadle.

I pass the white weft inside the shed.

The last warp threads of the selvage are up, I pass the brown weft through the loop from the upper side.

Change the treadle and hit the beater.

Tuck the edge of the brown weft inside the shed. Stepping on treadle 1, I throw the shuttle with the brown weft. I hold the shuttle with my left hand.

The brown and the white wefts are interlacing. Check the selvage.

Change the treadle and hit the beater.

The pattern begins to show.
Stepping on the left treadle I pass the white weft.
Check the selvage and hit the beater.

I now have both wefts on the right side.
I throw the shuttle with the brown weft.
The white weft is interlacing with the brown weft.

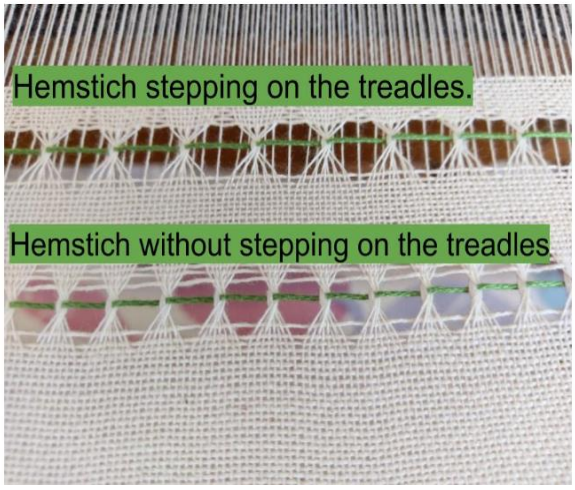
I continue weaving the desired number of rows.

Useful Tips:

- To change the positioning of the colours, I weave a complete row with one of the colours.
- I need to pay attention to the interlacing of the wefts, otherwise selvages will be ruined.

8. Hemstich

The width of the opening of the hemstich depends on the thickness of the thread and the size of the reed.
In this example the size of the reed is 20 dpi with one warp thread threaded in each dent.
To hemstich I will need a thread that is thicker than the weft. Usually a cotton perle kind of thread is suitable to hemstich.



Weaving hemstich without stepping on the treadle:

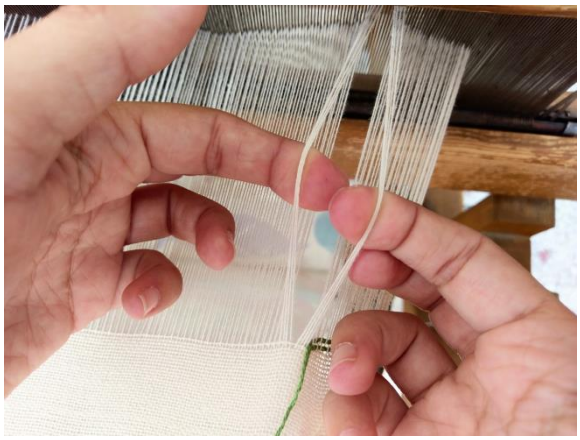
The weft is in my right hand.

I open the shed as if to weave a plain weave.

Place the end of the thread I will use to hemstich.

Secure the thread to around 3 to 4 cm on the side of the weft.

Change the treadle and beat the beater.
Place the thread inside the shed for as many warp threads as in the previous row.
Leave the rest of the thread to stick out of the warp threads.



At the end of the weaved thread, pick 4 warp threads with my right hand and 4 warp threads with my left hand and keep them separated.

Place the threads on the right under the ones on the left.
The threads that were on the right are now on top of my finger.

Pass the thread through the opening.
Pull the thread to tighten it by paying attention to the selvage.

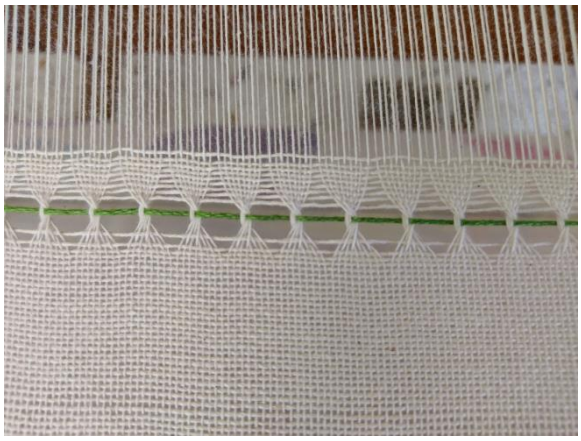
Create sets of 4 warp threads and follow the same steps to hemstich the rest of the warp threads.

Slide the reed gently towards the cloth.
Put pressure on the reed to set the hemstich thread in place.

At the end of the row, I place the thread for 3 to 4 cm inside the shed to secure it.

Change the treadle.

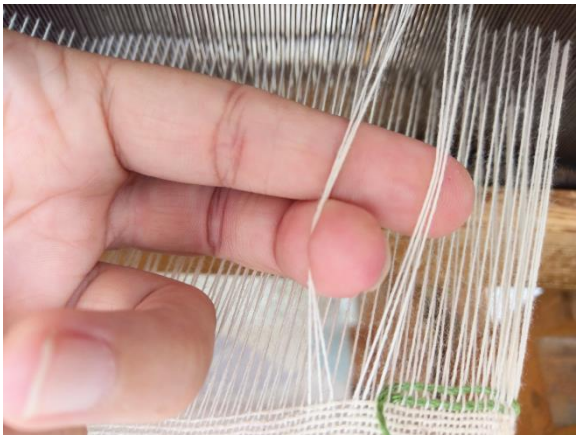
Place the thread inside the shed for as many warp threads as in the previous row.



Weave at least two rows of plain weave to secure the hemstich.

Weaving hemstich by stepping on the treadle:

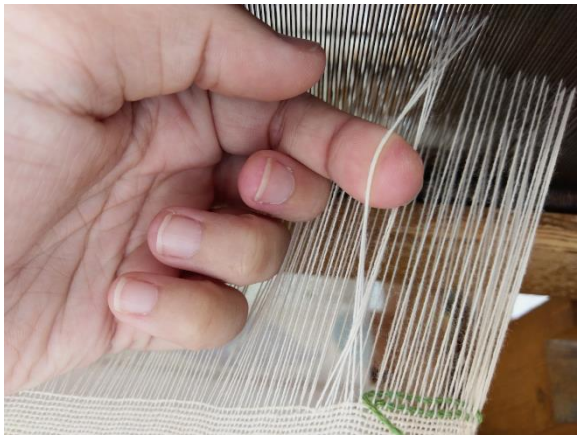
Secure the thread on the right side of the cloth.



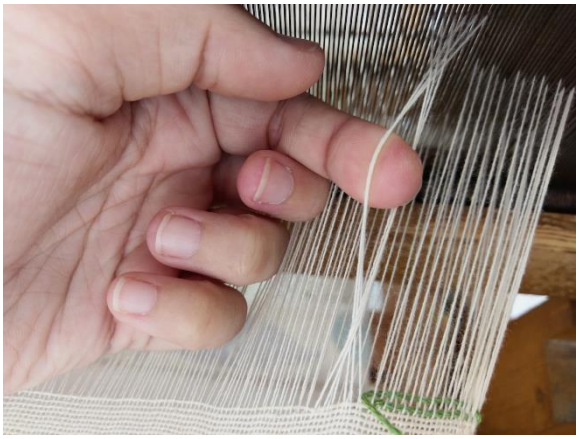
Step on treadle number 1.

Pick the next three warp threads on the left side and then three more.

Keep them separated.



Place the threads on the right under the ones on the left.
The threads that were on the right are now on top of my finger.



Pass the end of the thread inside the opening and pull the thread.

Repeat the steps for the rest of the warp threads.

Half of the warp threads are visible on the back creating a design.

At the end of the row, I place the thread for 3 to 4 cm inside the shed to secure it.

Change the treadle.

Place the thread inside the shed for as many warp threads as in the previous row.

Weave at least two rows of plain weave to secure the hemstich.

9. Cutting and removing the cloth from the loom

Once I complete the cloth, I weave around 6 rows of header.

The header keeps the weft in place and shows where the end and the beginning of the cloth is.

Using different coloured thread for the header makes it easier to distinguish it.

In this example the header is brown and the weft is blue.

I advance the rug to the front beam and wind it.
With my upper body I put pressure to the cloth so it stays loose between the front beam and the reed.

To keep the warp threads secured, I tie a bow knot (or a slip knot) after each tuft I cut.

Once I cut all the warp threads, all threads should be secured in knots in front of the beater.

The cloth is now on my lap.
It is better to roll it instead of folding it.

I keep on rolling the cloth.

I can cut the woven cloths as they are unfolded from the cloth roller.

I place the cloth on the beater.

The header serves as a guide to cut between the cloths.

In this example, the woven cloths will have no fringe.

10. Tying off the warp ends (simple fringe)

I grab some loose warp threads (around 10 –15 threads) with my left hand.

Twist the threads anticlockwise so you have something that looks like one thick thread

With my right hand, I grab the edge of the warp and move it towards the end of the woven cloth creating a loop.

I pass the edge of the warp around the loop and then through it.

I keep my left hand steady.

My right hand needs to move the loop towards the cloth.

My left hand is pulling the threads towards myself.

When the knot is tightened without having reached the cloth, I need to loosen it and start all over again.

11. Simple warp tying techniques

Double and tripled knotted fringe

To create a double knotted fringe, I need to first tie a simple fringe knot.

I pick the first pair of tassels, to create an overhand knot.

I follow the same steps with the simple fringe knot.

I leave some space from the first knot, to create a diamond shaped rhombus with the warp threads.

I keep on knotting the warp threads.

My right hand leads the knot to the spot I want to tighten it.

If the knots are not even numbered, I tie a knot with three tassels, as in the middle knot in the photo.

I can continue tying more overhand knots.

Always pick two tassels and turn them into one.

I trim off the excess threads once I complete the knotting.

Twisted tassels

To create a double knotted fringe, I need to first tie a simple fringe knot.

I pick the warp threads of the first knot and separate them in two. In this example, there are 4 warp threads in each knot.

I start twisting the first couple of threads between my thumb and my index fingers, clockwise.

Without releasing the threads, I place them between my middle and my finger ring.
I place the other couple of threads between my index finger and my thumb and twist them clockwise once again.

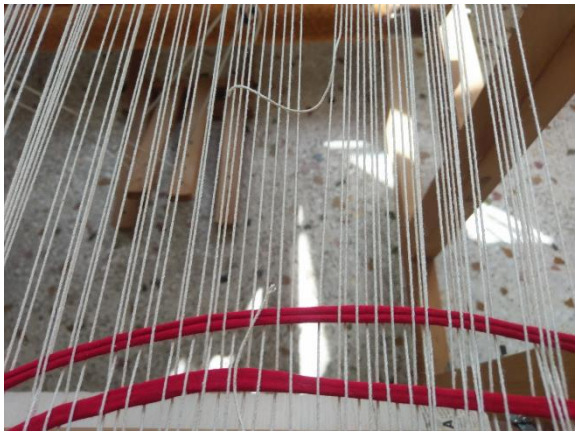
I hold both twisted ends in my hand and twist them anticlockwise.

I secure the twisted threads with an overhand knot.

I can trim off any excess warp threads.

Chapter Content:

1. Broken warp thread



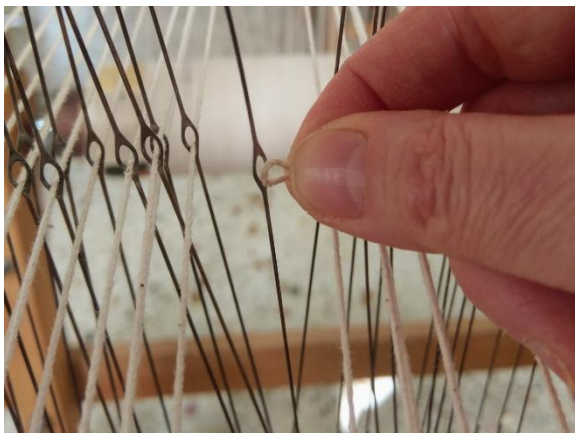
A loose thread on the cross stick is a sign of a broken warp.

A loose thread on the rag rug (or the cloth) is also a sign of a broken warp.

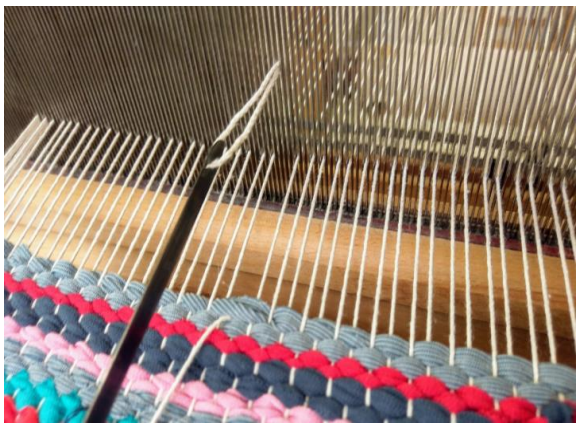
To fix the broken warp I need to tie it with a piece of thread from the same material I used as warp.

A 150cm long thread will serve as a new warp.

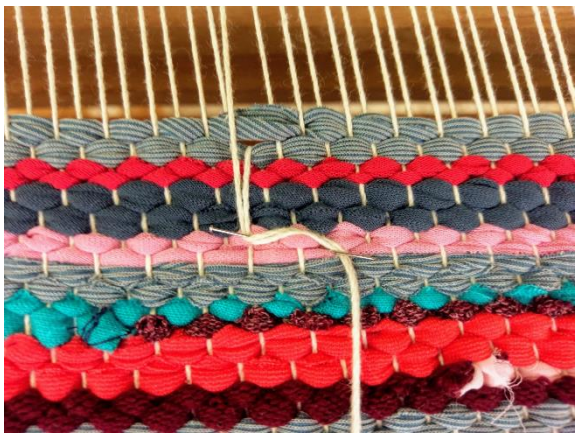
On the back of the loom, I tie the broken warp thread with the new using a weaver's knot.



Pass the thread through the empty heddle towards the reed.

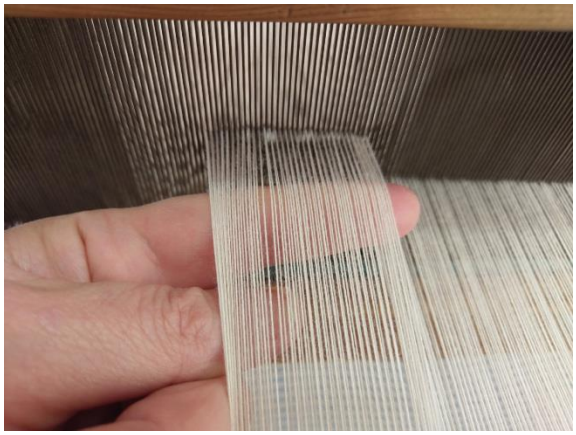


Sitting on the looms bench, I place the threading hook inside the empty dent and slide the thread towards me.



Pull the thread and keep it steady and tensed. Insert a needle in the rug and wrap the thread around the needle making figure eight (8) movements.

2. Broken warp in weaving a fine cloth



A small gap on the reed in between the warp threads, is a sign of a broken warp thread.
To point out the exact dent where the warp thread is missing, I place my finger under the threads.

A loose thread on the cross sticks is also a sign of a broken warp thread.

I tie the broken warp thread with the new one.
Pass it through the heddle.
Once I reach the reed, I will place my finger under the warp threads to locate the empty dent.

Secure the new warp thread with the broken warp with the use of a needle.

3. How to fix a loose selvage

I fold a piece of paper in half (transversely) over and over until it turns into a rectangular shape.

The length of the paper should be 5 cm wider than the loose selvage.

Wedge the paper inside the warp threads, in order to create tension to the loose warp threads.

Continue weaving as normal.

On the back roller, from the side of the loose selvage, I place the folded paper parallel to the warp threads.

4. Secure a warp thread around a needle

Place a needle in the cloth.
The head of the needle should be under the broken warp thread.

Place both the broken warp thread and the new warp thread around the needle.
I pull slightly the threads to create an even tension with the rest of warp threads.