

# Easy to Read weaving handbook Part 1







#### **Partners**



ΧΑΡΟΚΟΠΕΙΟ ΠΑΝΕΠΙΣΤΗΜΙΟ HAROKOPIO UNIVERSITY















This handbook will help you learn weaving.

The information you will find in this handbook comes from the tradition of five different countries in Europe.

Tradition is what people used to do in the old times.

In this handbook you can find information about:

- · What weaving is.
- Which tools and materials you need to weave.
- How to make thread from fleece.
- · How to dye threads naturally.
- How the loom works.
- How to learn weaving
- How to learn different weaving techniques.

This handbook comes in 2 volumes:

- · Easy to read weaving hand book Part 1
- Easy to read weaving hand book Part 2

The Five countries that participated in writing this handbook are Greece, Romania, Albania, Portugal and Spain.



## Easy to read weaving hand book Part 1:

Chapter 1 – Introduction on weaving and the loom

Chapter 2 – Learn about the materials

Chapter 3 – Learn hand teasing and hand carding

Chapter 4 – Learn spinning

Chapter 5 – Learn to dye threads

Chapter 6 – Learn about the loom

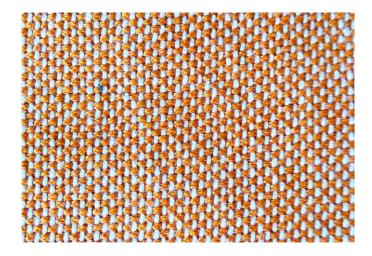
Chapter 7 – Learn about the tools and equipment used in weaving



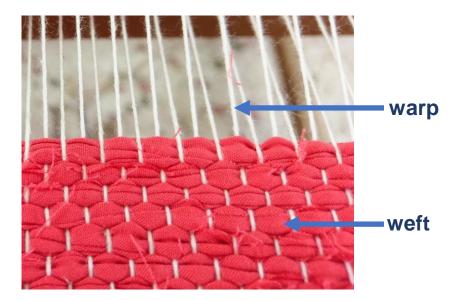
# What is weaving?

Weaving is the creation of cloth.

The cloth is created by 2 sets of threads that cross each other.



cloth



- One set is called the warp of the cloth.
- The other set is called the weft of the cloth.

The weft yarns go over \( \bigcap \) and under \( \bigcup \) the warp threads to create a cloth.



## What is a loom?

A loom is a device that holds the warp yarns taut.

The loom helps with weaving the weft over and under the warp.

Some types of looms are:



frame loom



table loom



floor loom



## Weaving materials and threads

In weaving I can use a different type of thread for my warp and my weft.



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

I will choose my thread according to what I want to weave.



## **Choosing the warp threads**

The warp threads needs to be:

- Strong
- Durable

I usually use:

- Cotton warp
- Linen warp

## **Choosing the weft threads**

I can use thicker threads.

I prefer natural materials like:

- Cotton
- Wool
- Linen



# **Weaving materials : Threads**

When I buy threads I find them in different forms:



Ball



Skein



Hank



Cone



# Learn about the materials

## **Material Qualities**



# 1. 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

Threads can be dyed in many colors.

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



Yarns can also be died with natural dyes.

Natural dyes come from plants.



## 3. Thread weight

Threads come in many different weights.

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.







#### 4. Texture

Threads can have many different textures.

They can be:

- Hard Soft
- Shiny Mat
- Smooth Lumpy/ Hairy



# 5. Other qualities

There are thread qualities that I need to think about when I choose my threads.

Some of them are:

- Absorbency
- Weight
- Durability
- Elasticity



#### Learn wool teasing and hand carding



## Wool teasing and hand carding

The sheep are sheared in order to make wool thread.

Their fleece is scoured and washed.

When the fleece is clean and dry it is ready for wool teasing and carding.

This process will make the fleece ready for spinning.



wool teasing

hand carding

Photo by Takis Tloupas, 1972, "Fleece teasing in Gioulberi" http://takis.tloupas.gr/cPath/1\_3\_42/PORTFOLIΟΠαραδοσιακές%20ασχολίεςΓυναικείες%20ασχολίε%ΕF%B F%BD.html



## Fleece or Wool Teasing

It is a process done by hand.

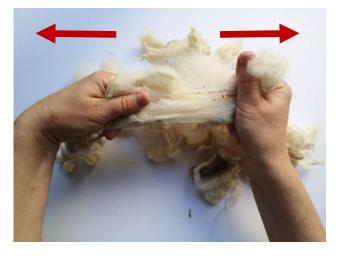
During the teasing process, the fleece:

- Is cleaned by the debris found on the sheep
- Softens and becomes fluffier
- Is prepared for hand carding.



Step 1

I use the clean and dried fleece.



Step 2

I use my hands to pull the fleece apart.





Step 3

I remove any debris found and unwanted fibers.

This can be:

- burrs and twigs
- very coarse fibers
- different coloured fibers



Step 4

The fleece will become:

- clean
- fluffy
- more uniform

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



## Hand carding and fleece combing

Hand carding and fleece combing are used to prepare the fleece for spinning.



wool combs



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

We use two types of tools:

- Fleece (wool) combs
- Hand carders.



hand carders

These tools come in pairs.
They are always used together.

Wool combs have long metal prongs.

Hand carders have many fine metal teeth on their surface.

They both come in different sizes.

Wool combs work best with long fibers like flax and long pile fleece.

Hand carders work best with short fibers like cotton and short pile fleece.



# **Hand carding process**



Step 1

Make sure the carders are clean.

I put 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 move in a parallel motion.

#### This way:

- The wire teeth will not tangle
- The fibers will get easily untangled





#### Step 3

I transfer the fleece from one carder to the other a few times.

The fleece will be ready when it becomes:

- Soft
- Fluffy
- Clean



Step 4

When the fleece is ready

I carefully remove it from the carder.

I make it into a small roll.

This is called a rolag.



I keep on carding and add to the rolag.

When I have made big rolags, I can go to next step called spinning.

Spinning turns the fleece it into thread.





# What is spinning?

Spinning is the act of making thread from fibers.

You pull and twist the fibers in order to make the thread.



The tools used for spinning are:

- The distaff
- The spindle

They come in different sizes and shapes.

The spindle

The distaff





# 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

I want the distaff to go through the rolag.



Step 3

I pass the string over the rolag tightly.

I pass the string under the distaff prong.





# Step 5

I pass the string over the rolag again.

I pass the string under the distaff prong.

I pull the string tightly to secure the rolag



## Step 6

I tie off the string.

I make sure the rolag is secure.

I am ready to start spinning.



## **Spinning**

I use a different way to spin warp thread to weft thread.

Warp thread needs to be spun more tightly to make it strong.

I spin the spindle a different way for the warp and a different way for the weft.

I also pin the spindle towards a different direction for the warp and for the weft.

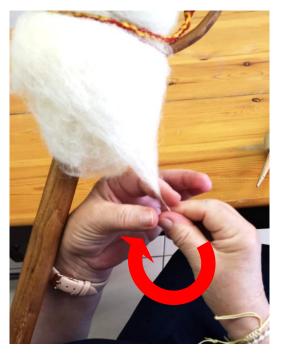
## **Spinning warp thread**



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 the twisting is clockwise.







Step 3

I pull and twist with both fingers.

The thread is slowly created.



Step 4

I want to make thread approximately 25 cm.

I can now 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 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.



I spin it in the same direction as before.

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 8

I try to make the thread evenly thin.

I want to make about 50 cm of thread.





Step 9

I untie the thread from the top of the spindle.



Step 10

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



Step 11

I start winding the thread around the spindle.

I always wind clockwise.





Step 12

I twist the thread to make a loop.



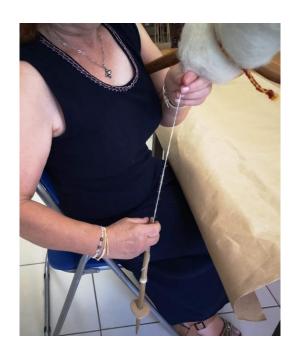


Step 13

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 14

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 15

The more I spin, the more thread I make.



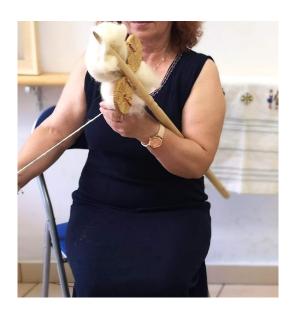
## **Spinning weft thread**

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.

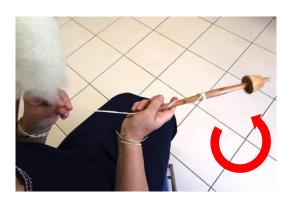
I hold the spindle upside down.

I hold the thread in the middle of the spindle.



Step 5

I wind the thread tightly around the spindle.



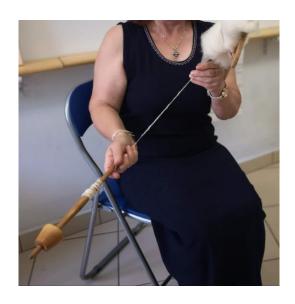
### Step 6

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.



## Dying thread with natural dyes

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



Natural dyes came from:

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



There are 2 types of natural dyes:

Direct dyes.

They give colour directly the threads.

Additive dyes.

They need a chemical to help with the dying. These chemicals are called mordants.



Bringing out the colour of each dye.

Bond the colour to the thread





#### **Natural dyes**



We can find natural materials that we use as dyes:

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

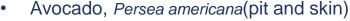


#### For yellow- orange- brown shades try:

- 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:



- 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:

- 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:

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



### For brown- black shades try:

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

### Learn to dye thread with natural dyes





## Mordanting wool before dyeing it.

The best way to use mordants is before adding the dye. Mordants are chemicals that help with the dyeing.

This way, the colours stay bright and don't fade.

I will mordant wool threads with Alum and Cream of tartar.

In order to mordant the wool I will need:



- Alum (potassium alum sulfate, KAI(SO<sub>4</sub>)<sub>2</sub>)
- 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











## Chapter 5:

#### Learn to dye thread with natural dyes



It is better to mordant and dye threads outdoors.

If it is not possible, keep windows open.

Most materials are natural but it is better to wear gloves when using them.

Use tools and pots only for dyeing and mordanting. Do not use them for cooking and dyeing.

The wool needs to be washed and clean.



Step 1

I need to weigh the wool and make a note of it.



Step 2

I need to wind the wool into a loose hank.

I tie it loosely so 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 get help to calculate:

15% of the weight of the wool in Alum and

6% of the weight of the wool in Cream of Tartar.





Step 5

I weigh the ingredients.



Step 6

I put some hot water in a jar.



Step 7

I add the Alum and Cream on Tartar in the water.

I stir it well so it dissolves completely.



Step 8

I poor the liquid from the jar into a pot with water.

I need enough water to cover the wool.





#### Step 9

I add the wet wool in the pot.

I increase the temperature slowly. gradually without exceeding 85 °C. I need to use a thermometer to check on the temperature frequently.

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



#### Step 10

I check the temperature with the thermometer.

I want the temperature to stay below 85 °C.

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



Step 11

I stir the wool gently.

It needs to stay on the hob for 1 hour.

I then let it cool down inside the mordant.





Step 12

I remove the wool from the pot when it has cooled.

I hang it to dry in the shade.

If my dye is ready, I can put it straight in the dye.



# Making dye with madder root.



The madder plant is a small bush that grows wild.

The root of the plant gives a very strong red dye.

We usually buy the root dried and chopped.



Step 1

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 madder root I use, the deeper the colour I will get.



Step 2

I put the madder root into the pot.

I add boiling water.

The root needs to soak in the water for 1 day.



Step 3

The next day the madder root is softer.

It has released some of its colour.

To release all of its colour I need to boil it.

I boil it for about 30 minutes.





Step 4

When the dye cools down, I sieve it.

I can throw the used madder root in the garden, as it is a natural material.

I then split my dye in to 4 parts.

I want to make 4 different colors with the same dye.



### Step 5

The wool needs to be wet when I put it in the dye.

I need to put it straight from the mordant in the dye.

Or I need to soak it in water for 1 to 2 hours.

This way the wool will dye evenly.

It is good to keep the wool at the same temperature.

If I put wool from hot to cold liquid or the opposite, the texture of the wool will be ruined.



# Dying wool with madder root



Step 1

I put the wet wool in one part of the dye.

I turn the heat up.



Step 2

I check the temperature with the thermometer.

I want the temperature to stay below 85 °C.

If the water boils, the wool will start to felt



### Step 3

I check the temperature with the thermometer.

I want the temperature to stay below 85 °C.

I check the colour until I am happy with the result.

It might take from 15 minutes to 1 day until I like the colour.

The more I leave the wool in the dye, the darker it will get.



### Step 4

When I am happy with the color I rinse the wool.

I rinse the wool to very well.

The water needs to be same temperature as the dye.





Step 5

When the wool is dry, it is a deep red colour.

I can use the left over dye again.

When I use the dye again, the wool colour will be lighter.



# Dying wool with madder root and vinegar



Step 1

I put 1 part of the dye in the pot.

I add a 3- 4 spoons of vinegar.

I want the color of the dye to change.

The color should become more orange.

If I don't have vinegar I can use lemon juice.



I put the wet wool in the dye.

I turn the heat up and follow the same steps.

I check the temperature with the thermometer.

I want the temperature to stay below 85 °C.



Step 3

I check the colour until I am happy with the result.

The more I leave the wool in the dye, the darker it will get.

When I am happy with the colour I remove it from the dye.







Step 4
I rinse the wool very well.

The water needs to be same temperature as the dye.



Step 5
I hang the wool to dry.

The colour of the wool is a vivid orange.



# Dye bath with madder root and chalk



Step 1

I use a glass jar and I put:

- hot water
- some of the initial dye
- 1 spoon of ground chalk



Step 2

I stir the mixture well.

The chalk needs to be dissolved.

The color of the dye will turn pink.



Step 3

I poor the mixture from the jar to the pot.

I stir again until it is mixed well.

I turn the heat up and follow the same steps as before.



Step 4

I put the wet wool in the dye.

I check the temperature with the thermometer.

I want the temperature to stay below 85 °C.





Step 5

I check the colour until I am happy with the result.

The more I leave the wool in the dye, the darker it will get.

When I am happy with the colour, I remove it from the dye.



Step 6

I rinse the wool very well.

The water needs to be same temperature as the dye.

I hang the wool to dry



Step 7

When the wool is dry the colour is a vivid pink.



### Dye bath with madder root and iron



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

I need to wear gloves when using it.



Step 1
I use a glass jar and I put:

- hot water
- some of the initial dye
- 1 spoon of iron powder.



Step 2
I seal the lid of the jar and shake it.

I shake the mixture until the iron is dissolved.

The color will darken.

Iron powder makes colors darker.
It can also make colors dull so I use a small quantity.



Step 3

I poor the mixture from the jar to the pot.

I stir again until it is mixed well.

I turn the heat up and follow the same steps as before.





Step 4
I put the wet wool in the dye.



Step 5I check the temperature with the thermometer.

I want the temperature to stay below 85 °C.

When I am happy with the colour I remove it from the dye.



Step 6
I rinse the wool very well.

The water needs to be same temperature as the dye.



Step 7
I hang the wool to dry.

The colour of the wool is a light brown.



# Different colours with madder

I can see how by adding some ingredients to the dye I get different colours.

I can do this with all the natural dyes.



madder root



madder root and vinegar



madder root and chalk



madder root and iron



# **Making labels**



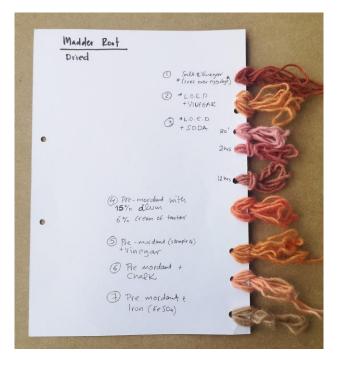
I make labels to mark each thread.



I tie a label on each thread.

On the label I write information about:

- The dye
- The Ingredients
- The dyeing process



I can also make a sample book.

I take a piece of card and make holes on one side.

I put some thread through each hole.

I write the ingredients used for each thread next to it.

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



# Hand operated table loom

This is a small hand operated table loom.

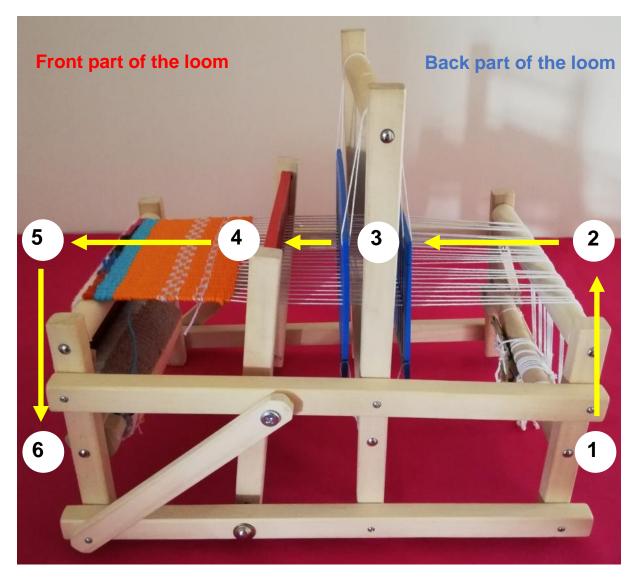
I will learn to weave on this loom.

It is a very basic loom and simple to use.





# Hand operated table loom



- 1. Warp beam
- 2. Back beam
- 3. Heddles/ Shafts
- 4. Reed / Beater
- 5. Front beam
- 6. Cloth beam



# Warping the loom



Step 1

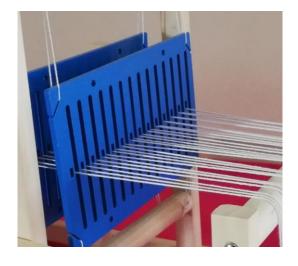
I tie the warp threads on the warp beam.

I wind the warp on the warp beam.



Step 2

I pass the warp threads over the back beam.



Step 3

I pass the warp threads through the heddles.

This is called threading the heddles.





Step 4

I pass the warp threads through the reed.

This is called sleying the reed.



Step 5

I pass my warp threads over the front beam.



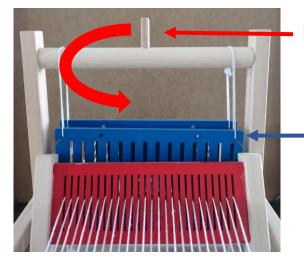
Step 6

I tie my warp threads on the cloth beam.

The cloth gets wound up here while I weave.



# **Operating the table loom**

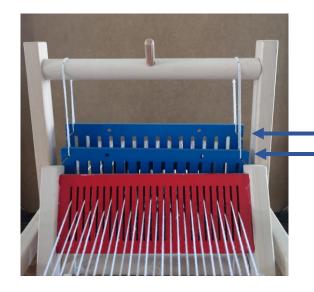


Handle to rotate and change shafts

### shafts

Rotate handle to move the shafts.

They move up and down.



When one shaft lifts the warp threads up, the other pushes the warp threads down.

shaft up shaft down



When the warp threads open, they create a shed.

shed







- Handle is points up
- Shafts are on the same level
- Threads are parallel to each other
- No warp opening to pass the weft



### Open shed 1:

- Handle points towards the front
- Front shafts moves down and
- Back shaft moves up
- 1 set of threads move down
- 1 set of threads move up
- The threads create a shed
- I can pass the weft through the shed



### Open shed 2:

- Handle points towards the back
- Front shafts moves up and
- Back shaft moves down
- 1 set of threads move up
- 1 set of threads move down
- The threads create a different shed
- I can pass the weft through the shed



### Tools and equipment used in weaving

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

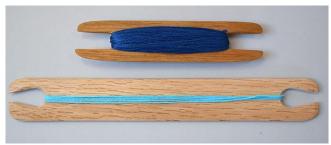


### **Shuttles**

Are the tools that I wind thread on.

It helps me pass the thread 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.

• bobbin

# Learn about the tools and equipment used in weaving





### 4. Yarn swift

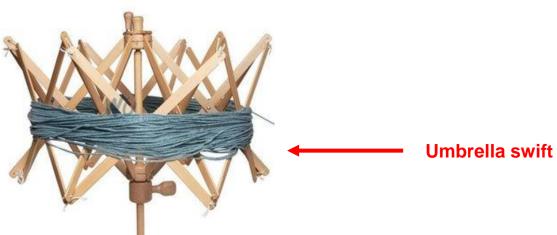
Rotates and keeps thread:

- Taut
- Untangled

Helps me make yarn balls.

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

**Traditional yarn swift** 







### 5. Manual ball winder

I use this tool to turn thread into balls.

It is easy and quick.

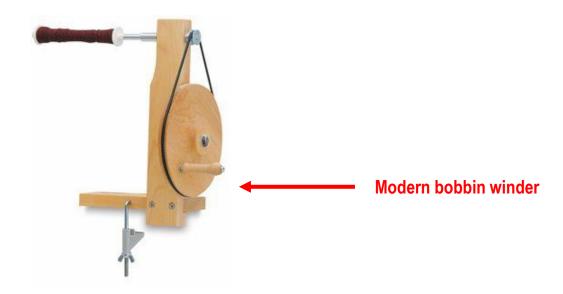


# 6. Spool / Bobbin Winder

I use this tool with a yarn swift.

I can wind spools and bobbins with it.

**Traditional spool winder** 



### Learn about the tools and equipment used in weaving







### 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.