Welcome to the Ruth Dabritz Legacy Weaving Project Introduction to Weaving on a Floor Loom

Table of Contents

SYLLABUS

(All times are approximate)

DAY ONE

9:00 am	Introductions, description of what we will do in the workshop
9:30 am	Basic weaving vocabulary and terminology
10:00 am	Plan the project
10:30 am	Measure the warp using a warping board
Noonish	Break for lunch
1:00 pm	Sley the reed
2:30 pm	An introduction to the Wolf Pup loom
3:00 pm	Thread the loom

DAY TWO

9:00 am	Review of Day One, Questions/Comments/Concerns
9:30 am	Complete threading the loom
10:30am	How to wind a bobbin and work a shuttle
11:00 am	Beam the warp
11:30 am	Tie-up the treadles
Noonish	Break for lunch
1:00 PM	Tie to the front beam and put in a header
1:30 pm	Check for weaving errors, make any corrections, then weave the rest of the day

DAY THREE

9:00 am	Review of Day Two, Questions/Comments/Concerns
9:30 am	Weave
Noonish	Break for lunch
1:00 pm	Weave
3:00 pm	Directions for finishing the pieces
3:30 pm	Where do you go from here? Resources for new weavers

Introductions

Let's start by getting to know each other. We'll all share our names a little bit about our past experience with fiber, including weaving, knitting, spinning, crocheting, etc.

Activities:

- Share names and backgrounds with others in the class
- Peruse the reference books available to the class

A note about the weaving process

If you ask 10 different weavers how to do something you'll probably get 15 different answers. Like a lot of things, there are few rights and wrongs in weaving, and there are often several ways to do something. What will be right for you is what works best for you and what is most comfortable. As you weave more and repeat tasks over and over you'll likely find your own ways to do things that work for you. This aspect of weaving is reflected in the books provided to help you learn how to weave, including the ones that we have available for your use. The lesson materials reference three of the more popular general books. There are several books for beginning weavers, and many, many more books dedicated to weaving specific styles or types of weaving. They don't always agree on exactly how to do things, but they all provide methods that work for lots of weavers, and may work well for you, too.

A note about the class

The class is designed to be very hands-on, and since we all have different strengths and weaknesses and different levels of experience the class is expected to be very self paced. We'll all start out together, but will quickly reach a point where some will be ready to move on before others. When you're ready to move on to the next step just let an instructor know and we'll make sure you know what needs to happen and will help you get started.

Don't be concerned if others seem to be moving faster than you. Weaving is not a competitive sport, and the goal is for you to be comfortable and enjoy yourself as you learn the basics of weaving!

Terminology and Overview of The Weaving Process

Weaving, like most crafts, involves it own unique set of tools and terminology. We'll get started by learning some of the basic terms and getting a quick overview of the weaving process.

Activities:

- Review the steps involved in weaving projects
- Define the order in which the steps are completed
- Get an overview of the toolkits and supplies supplied

Terms:

Beams
Beams run from side to side on the loom. Typically there are 2 in the front and 2 in the back. In the front there is a rotating beam called the cloth beam which is where the woven cloth collects, and a stationary front beam, sometimes called the front or breast beam, which holds the warp threads up in a parallel plane when the shafts are idle. In the back there is a rotating beam called the warp beam which is where the warp threads are wound and held, and a stationary back beam which holds the warp threads up in a parallel plane when the shafts are idle. On some looms the front or back beams may be removable to aid in warping the loom.

Beater
The beater is used to place the weft within the warp while weaving. In many looms the reed is mounted in a frame and can be used as a beater. In a rigid heddle loom the plastic heddles are used as the beater.

Chain, Warp Chain
The chain, also referred to as a bout, is a set of warp threads that have been measured and prepared for installation on a loom for weaving. The chain contains the cross and is often shortened in order to make the entire warp more manageable and easier to manipulate.

Chaining
Chaining is a method of shortening the warp chain to make it shorter and easier to manage.

Cross
A place in the warp chain where individual warp threads pass each other in an “X” so that each thread is locked in order and the warp can be put onto the loom with less risk of tangling. The cross is held in place by ties and lease sticks until the warp has been beamed and the cross is no longer necessary.

Draft
The draft is the set of instructions that tells you how to prepare and weave a cloth to create a specific pattern.

Floating Selvedge
Floating selvedges (not to be confused with floats) are extra warp threads added to ensure that the weft will always have a warp thread on the very edges of the cloth to go around before returning back into the cloth. Since they are floating they will run through the reed but will not run through any heddles. Floating selvedges are weighted and hang off the back of the loom to ensure proper tension.

Header
The header is yarn, thin sticks, paper strips, or other material that is initially woven into the warp to spread the warp evenly across the loom, and provides the weaver with a firm, even surface to work from. It can also provide an initial test of correct threading and tie-up before weaving with the desired weft.

Heddle
The heddle is a component that can be found in the heddle frame of some looms to shed the warp threads more easily. Each warp thread will need to go through a separate hole in the heddle before you start weaving. The heddle can be made of flat metal, wire, or plastic (Texsolv). A rigid heddle is typically made of plastic set in a wood frame. A group of heddles in a frame is referred to as a shaft.

Lease Sticks
Lease sticks are a pair of thin wooden sticks used to preserve the cross in the warp during the process of attaching the warp to the loom which is often referred to as dressing the loom.

Loom
A loom is a device used for weaving. There are many different types of looms used by handweavers; you'll be using a jack floor loom in this class. The three basic types of floor looms are jack, countermarche, and counterbalance. Other common types of handweaving looms include table, rigid heddle, inkle, backstrap, pin, frame, band, dobby, and tapestry looms. Looms are used to hold warp threads under tension and allow the weaver to manipulate the warp threads to allow a weft thread to be introduced, thereby creating cloth.

Reed
The reed is a piece of equipment to keep a set width between the warp threads, and which can be used as a beater for placing the weft.

Selvedges
Selvedges are the edges of the cloth where the wefts turn around the outside warp threads. Floating selvedges are extra warp threads that are weighted and left hanging off the back of the loom; these are added to the edges of the warp to provide a consistent place for the weft to catch when it turns and goes back into the cloth.

Shaft
A shaft is a frame that holds the heddles and moves them up and down to create a shed. Floor looms tend to have an even number of shafts and at least one treadle per shaft. [NOTE: Older books (and some older weavers) may refer to this as a "harness" and the terms were at one time used interchangeably, but the term "harness" increasingly is no longer used by the weaving community for this purpose.]

Shed
The shed is the space where weft threads are introduced to create cloth. Sheds can be closed or open. A closed shed exists when the warp threads lie flat across the loom and no shuttle can pass through. An open shed occurs when the weaver moves a shaft to split the shed into an upper and lower section, creating a gap through which the **shuttle** can pass and install the weft thread between the warp threads to create cloth.

Shuttle
The shuttle is a piece of equipment that is used to carry the weft thread while weaving. When hand weaving, the shuttle is passed through the shed. Some examples are boat shuttles, end-feed shuttles, stick shuttles, ski shuttles, inkle shuttles, netting shuttles, and band loom shuttles.

Sley; Sley the Reed
To sley the reed means to place warp threads through the slots in the reed in sequence from the order provided by the cross. The “sley” refers to the number of warp threads per dent. For example, to achieve 20 ends per inch, the sley would be 2 warp ends per dent using a 10 dent reed.

Tie-Up
The tie-up is the way that treadles are attached to the shafts to raise and/or lower them in groups to create the desired pattern.

Treadle
Treadles are pedals of a floor loom that are used to raise and/or lower the shafts in a way to create a shed. The act of stepping on the treadles is “treadling.”

Treadling
The act of stepping on the treadles is “treadling.” Treadling is done in a specific order according to a draft in order to create a desired pattern.

Warp
Threads attached to the loom and placed under tension while you are weaving. Individual threads of the warp are referred to as warp threads or warp ends.

Weft
Yarn interlaced with warp to create a textile.

The Weaving Process

Plan your project

Start your project by planning it. The planning worksheets in the next section starting on page 18 will help you determine how much yarn you will need to ensure you have enough material to complete your project. When planning is complete you'll be able to move on to the next step - measuring the **warp**. A copy of the worksheets is provided as an appendix for your use with later projects.

Measure the warp, secure the cross

After you've completed the worksheets and you've obtained the yarns you need you'll measure out the yarn to create the **warp chains** that you'll use to warp the **loom**. In order to ensure that you maintain the order and separation of the threads you will create and secure the **cross** then tie and **chain** the warp to make it easier to manipulate.

Sley the reed

After measuring the warp you'll move on to **sleying the reed**. This begins the process of preparing the loom for weaving by inserting the warp threads in the correct order into the **reed**. To maintain the cross as you sley the reed you'll insert **lease sticks** into the warp chains.

Thread the heddles

After pulling the threads through the reed you'll move the reed to the loom and secure it in place on the **beater** frame, then pull the individual threads from the reed through the **heddles**, following the chosen **draft** for your project.

Wind on to the warp beam

After threading the heddles the next step is to secure the warp to the warp **beam** and wind the warp onto the loom, being careful to leave enough yarn in front of the reed to allow securing it to the cloth beam.

Tie on to the cloth beam

When the warp is wound on with about 12 inches of thread left in front of the reed, cut the end loops, remove the lease sticks and tie onto the cloth beam in 1 inch increments, keeping even tension across the warp. When the tension is even, tie bows to secure the knots holding the warp threads in place..

Tie up and Test

Tie up the **shafts** to the **treadles** and test the tie up by stepping on each treadle to make sure the correct shafts are going up and down.

Check for threading errors

Step on each treadle and ensure that you have an adequate **shed** that is clean and free of crossed threads or other errors. Step on a treadle, find and correct errors, and repeat as needed until all errors are corrected.

Weave

Put in **floating selvedges** if/as needed. Weave in the **header**. Prepare your **shuttle** and weave using the treadling described in your worksheet.

Finishing Your Work

After taking the project off the loom the last step is wet finishing, sometimes referred to as just finishing. Wet finishing allows the fibers to full and relax into their final position.

Step 1 - Planning Your Project

Most projects will start with some planning, including a little bit of math. You don't want to start working on something and run out of yarn before you're done, so this step helps you make sure you have enough fiber to finish your project, and lets you calculate how long your warp needs to be, which is something you'll need before you can move on to the next step.

Activities:

- Define our sample project
- Learn how to calculate the amount of fiber needed
- Learn about other project planning considerations
- Complete worksheets to define and plan the class project
- Calculate the amount of yarn you'll need for your project and the warp length you'll need to put on the loom.

References:

- Chandler, *Learning to Weave*
  - Planning a Project, pg. 103 - 110
- Osterkamp, *Weaving for Beginners*
  - Planning a Project, pg. 285 - 298

Terms

Beat, Beating
Beat refers to the evenness (even vs. uneven) and force (heavy vs. light) by which the weft is pushed into the warp. Beating is the action of pushing the weft into the warp to get the desired design in the textile.

Ends per inch (epi) or Sett
The number of warp threads per inch as measured in the reed. Ends per inch is dependent on the type of thread being used, the type of weave structure being woven, and the desired qualities in the finished cloth.

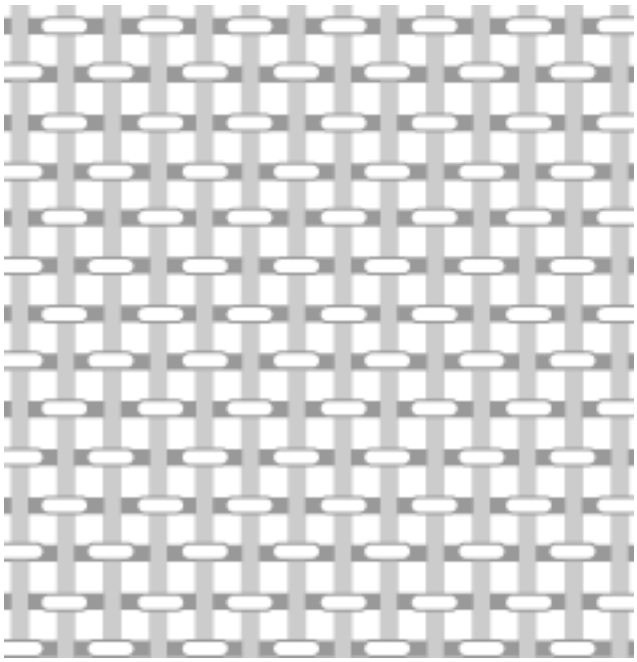
Floats
Floats are the lengths of thread that lie on the surface before being tied back into the cloth. Floats are common in twills and other patterns. Long floats are typically not desired as they can snag on things as cloth is being handled.

Loom Waste
Warp that could not be woven or used in the woven piece as fringe. For example, warp used to tie knots and that is behind the reed cannot be used for weaving and is wasted.

Pick
A single pass of a weft thread through the shed.

Picks per inch (ppi)
Picks per inch refers to the number of weft threads in an inch of cloth as measured in the woven cloth while it is still on the loom. Just as with ends per inch, picks per inch is dependent on the type of thread being used, the type of weave structure being woven, and the desired qualities in the finished cloth.

Plain Weave
This is the simplest weave structure/weaving technique and is generally the first learned. To create this pattern, the weft thread passes over and then under the warp thread without skipping any threads. Sometimes the plain weave is also referred to as tabby or linen weave. It creates a sturdy and long-lasting fabric.



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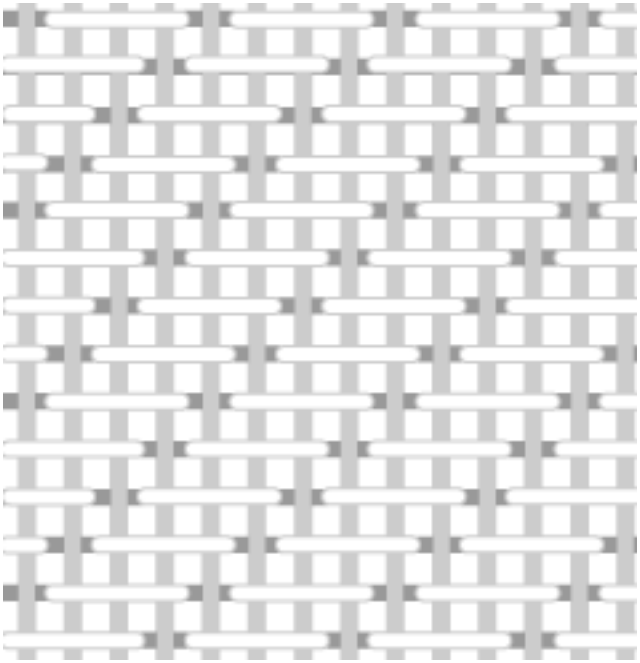
https://www.thebeginningartist.com/weaving-terms/

Shrinkage
Many yarns will shrink during wet finishing. Therefore, the rate of shrinkage must be considered when planning a project. The best way to determine the amount of shrinkage to expect is to weave a sample and measure it before and after finishing.

Take Up
Take-up refers to the curving of warp threads over and under weft threads, and the curving of weft threads over and under warp threads. The amount of take up you have will impact the consequent shortening or narrowing of a piece and potential thickening of the cloth, and will impact how you lay out the weft threads for beating into the cloth.

Twill
Twill creates distinct diagonal lines through the weave by passing over and then under a specific number of threads in one pick, and then shifting the pattern slightly in one direction on the next pick. Common types of twill are jeans twill, herringbone, birds-eye, and point twill. The twill pictured below is referred to as a 3/1 twill.



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Warp End
Individual threads of the warp are referred to as warp threads or warp ends.

Weave Structure
Weave structure refers to the pattern or draft used when weaving cloth. The structure you choose to weave will impact different aspects of the cloth, including how well it drapes, its strength, and the way it reflects light.

Our Project - Small Table Mats

For this class we will be weaving small table mats. The mats will measure approximately 8 inches by 10 inches. We'll wind enough warp to complete 4 mats. The first will be **plain weave**, the second will be **twill**. The third and fourth mats will be up to you. We'll also try out different ways to finish the edges of your mats.

During the planning step we'll consider the impact of **shrinkage**, **take-up**, and the need for sampling.

As we go through the sample Project Worksheet be sure to fill in your worksheet to document your project!

You'll need to refer to your worksheet throughout the class, so keep it handy.

Project Worksheet

Name: _____

Date Started:_____ Date Finished:_____

1. PROJECT DESCRIPTION

What is being woven?	
How many?	
Weave Structure?	
Source/Inspiration?	

2. PROJECT DIMENSIONS

	After Finishing	Before Finishing
Width		
Woven length		
PLUS Hem or fringe length		
= Total woven length		

3. WARP DESCRIPTION

Material	
Ends per inch (epi)	
Width in reed	
Total warp ends	
Floating selvedges	
Sley/Reed	
Source/Cost	

4. WEFT DESCRIPTION

Material	
Picks per inch	
Source/Cost	

5. WARP CALCULATIONS

Calculation #1: Total Number of Warp Ends

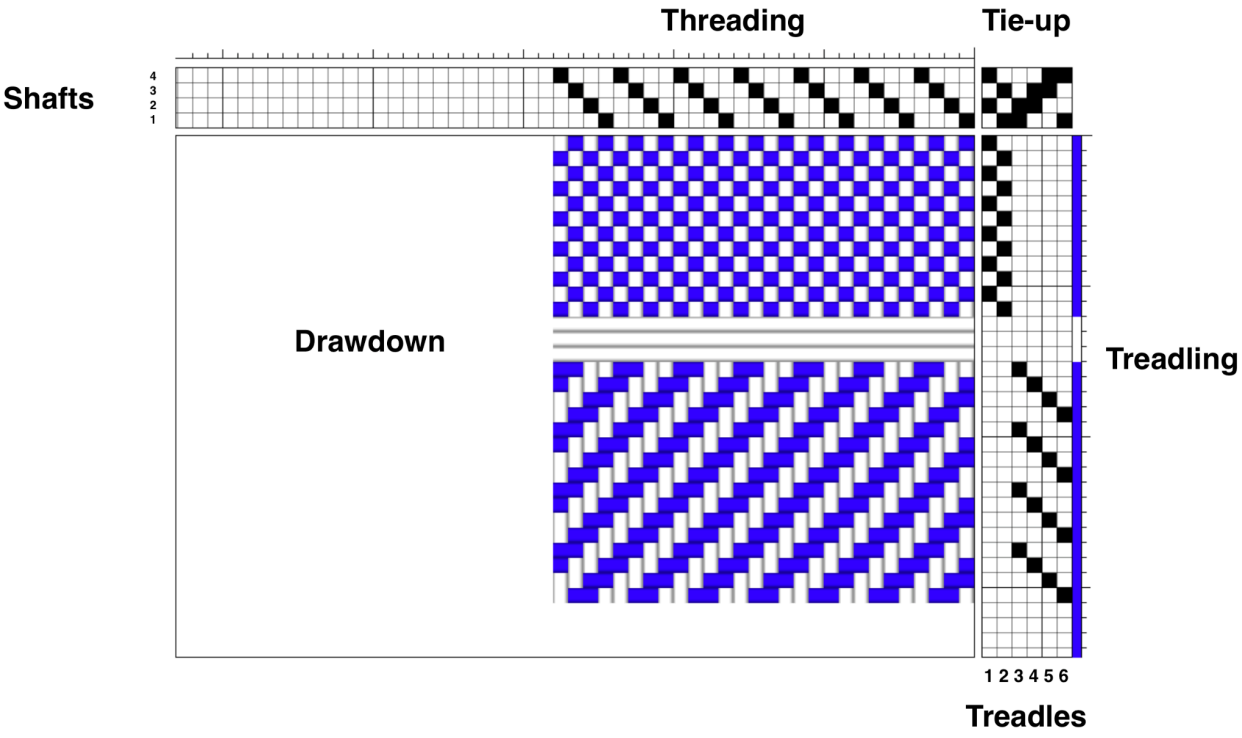
Ends per Inch (epi)		This is the total number of individual threads per inch across the piece(s) being woven
X Width in the reed		The is the width across the piece as measured in the reed before weaving (i.e., before draw-in)
= Total Number of warp ends		The product of epi and width in reed is the total number of warp threads in the piece(s)

Calculation #2: Warp Length

Total Article Length, in inches		This is the total length of one piece, including the hem, fringe, or other finishing technique [NOTE: 12" REFLECTS 1" HEMS ON EACH END; IF A KNOTTED FRINGE IS DESIRED, THIS NUMBER WILL BE LARGER]
X Number of Articles		The total number of pieces desired from the warp
= Subtotal of warp length, in inches		The product of the items above gives the amount of warp needed for the number of articles desired BEFORE accounting for any loss of warp length
+ Take-up & Shrinkage		This is an adjustment to account for the lost warp length that occurs during weaving and finishing. Some warp loss is caused by the take in deflection of each warp end that happens when the weft is inserted; some happens when the warp under tension on the loom relaxes once removed from the loom; and some is caused by physical shrinkage when the finished piece is washed to create whole cloth. A rule of thumb is to increase the total by 10%, rounded UP to the nearest inch.
= Total Woven Length		This is the total amount of warp that is needed to weave the body of the piece(s)
+ Loom Waste, in inches		Loom waste is warp that cannot be woven. Some warp secures the warp at the front and back of the loom and some is lost in the castle. Waste depends on the depth of the loom and how generous the weaver makes their ties at the front and back of the loom.
= Warp Length, inches		Woven length plus waste for warp length in inches
= Warp Length, yds		Divide by 36" for warp length in yds (always round UP)

6. WEAVING DRAFT (THREADING, TIE-UP, TREADLING)

Read drafts from the center out to the edge. So, for threading you read right to left, but for the tie-up you read left to right. For the shaft order you read bottom to top, but for treadling order you read top to bottom.



7. NOTES/REMINDERS/IDEAS FOR FUTURE PROJECTS

Step 2 - Winding the Warp and Securing the Cross

After you've calculated how much yarn you need and you've made sure you have enough, you're ready to start working with your yarn. We'll start by using a warping board to wind our warp - the long threads that go onto the loom. During that process we create and maintain a cross - a spot in the warp where alternating threads take different paths on the board. This cross will give us an orderly set of threads to work with for the next step.

Activities:

- Define our sample project
- Learn the steps involved in winding a warp
- Learn the use of a warping board
- Learn the use and importance of 'the cross'
- Review the steps involved in winding a warp
- Wind the warp for our class project
- Create the warp chain and secure the cross for your project

References:

- Chandler, *Learning to Weave*
  - Warping Front to Back, pg. 26 - 34
- Osterkamp, *Weaving for Beginners*
  - Front-to-Back Warping, pg. 155 - 162
  - Knots, pg. 389 - 356

Terms:

Apron
A heavy cloth or set of cords attached to the warp and cloth beams to which the warp (at the back of the loom) and woven cloth (at the front of the loom) are attached and provides an extension to help reduce loom waste.

Choke Tie
A tie around the warp threads that bundles them tightly and securely together.

Lease Sticks
Lease sticks are a pair of thin wooden sticks used to preserve the cross in the warp during the process of dressing the loom.

Thrum
A short length of string left over from a previous weaving project. Thrums are the left over warp threads that couldn't be woven when a project is complete. See Loom Waste.

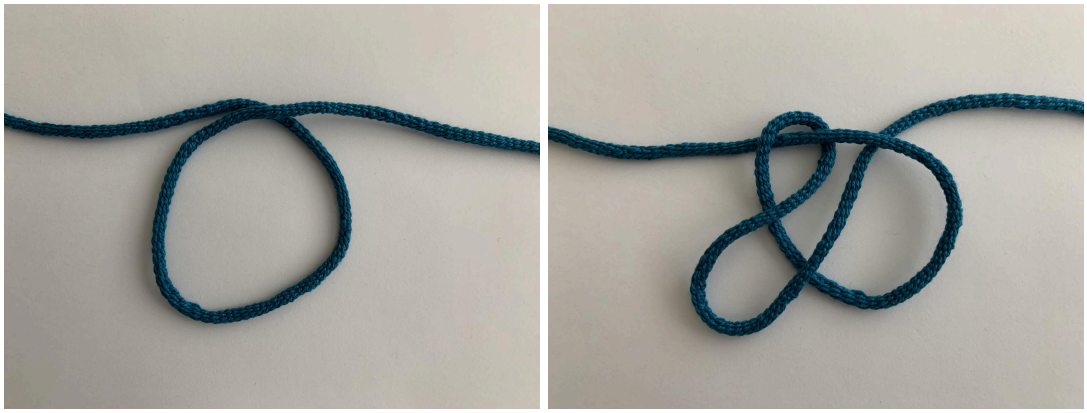
Warping Board
A device used to create a warp chain. Pegs provide a pathway for the warp to be wound with a cross at one or both ends of the warp and for all warp ends to be the same length. Other devices are warping mills and warping pegs.

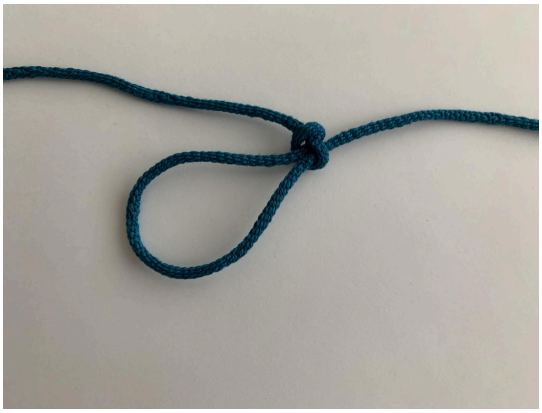
Knots

Now that you've got your project planned and you know what you need in terms of materials, you're ready to secure the yarns that you need and start winding your warp. But first, a small digression about knots.

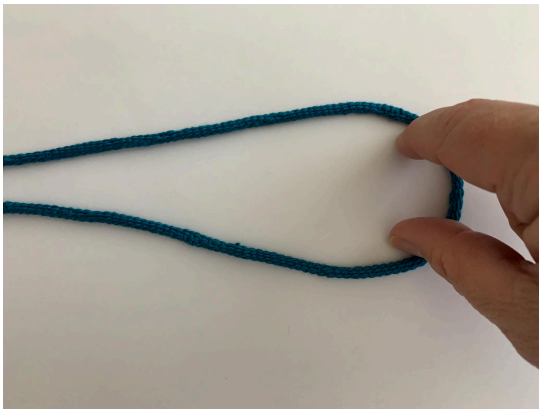
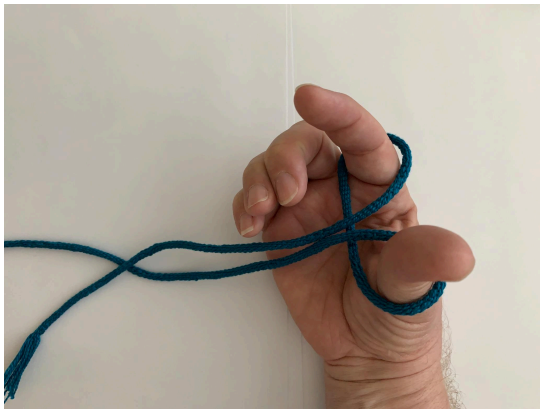
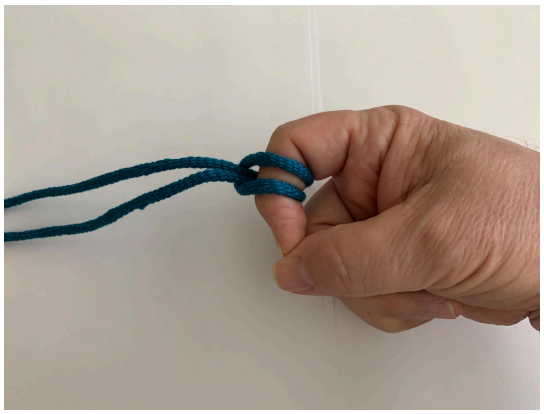
When winding the warp and preparing the loom there are a handful of knots that will help you keep things neat and easy to handle. Some knots are made to be easily untied, while others are intended to be more permanent and secure. Knowing where each knot falls on that scale will help you pick the right knot for the right task.

Unfortunately (or fortunately, for you) it's harder to describe a knot than it is to actually tie it. Your instructors can show you how to tie any of these knots. You can also find a plethora of pictures, drawings and videos online to learn any of these knots.

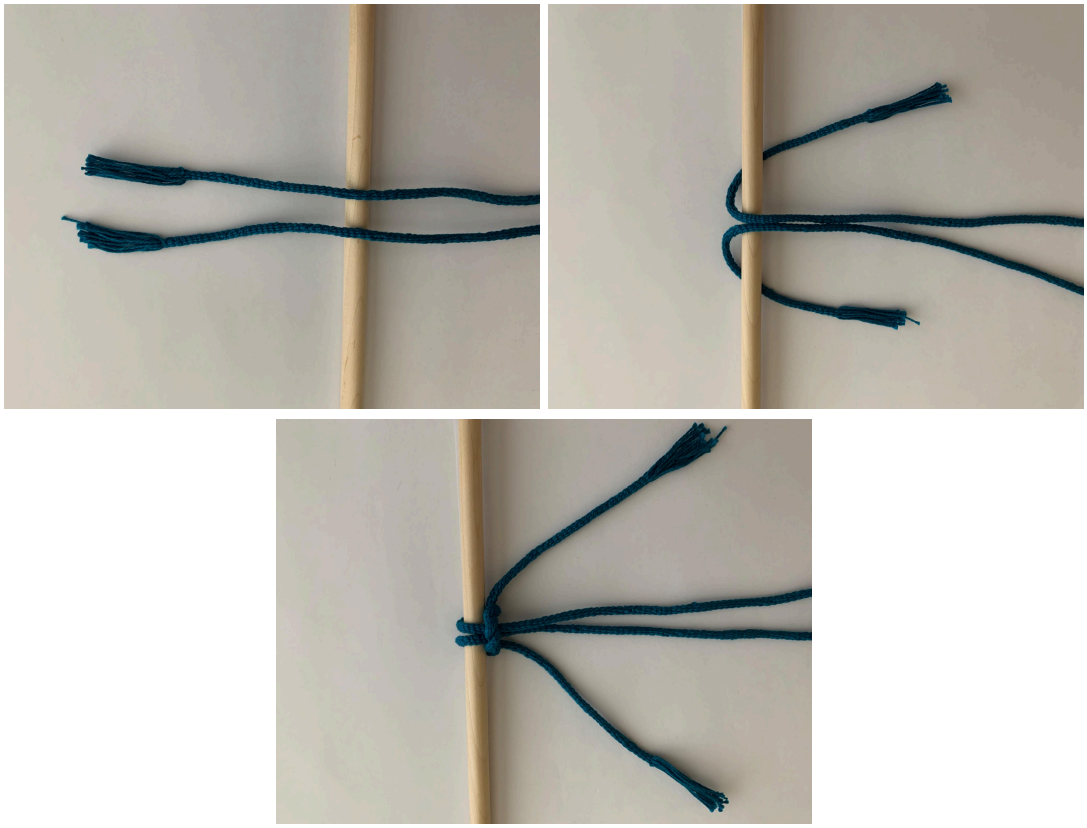




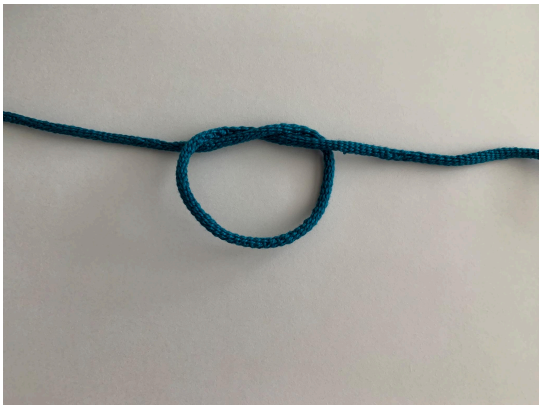
- **Slip Knot** - A slip knot is a temporary knot that can be easily untied with a simple tug of a string tail. Create a slip knot by starting with a loop in the yarn with the short tail behind the longer supply side of the yarn. Then reach through the loop and pull another loop from the supply side of the thread (not the short tail) through the first loop. Hold the loop with your left hand and pull the tail end with your right to tighten the knot. The resulting knot surrounds the supply side on the left and can slip back and forth, making the final loop larger and smaller. To untie the knot simply pull the yarn ends away from each other on both sides of the knot. You can use a slip knot to create the loops at the beginning and end of your warp.

- **Larks Head** - the larks head knot is used primarily to snitch the warp onto a stick or tie onto the apron bar.
    - **Larks Head from a loop:** If the threads are looped or knotted at the end, split the threads with your thumb and index finger going down through the threads to separate the threads into two even groups. Twist your hand, keeping the threads apart, and rotate your hand and fingers so that your finger and thumb are encircled by the threads and your finger and thumb now point up. Bring the tips of your thumb and finger together, then move both bundles of thread to your finger. A stick can then be placed in the knot in place of your finger, and that stick can then be tied to the apron.



- **Larks Head from two loose ends:** If the threads are loose ends with no knot or loop then separate the threads into two even groups and pull them over the bar, then down and around the bar, bringing the two groups of ends up on either side of the full bundle. Bring the two groups together and tie a surgeon's knot to secure the bundle. While they will hold fairly well while you tie your warp onto the cloth beam they aren't so tight that you can't untie and adjust if you find the tension on your warp isn't even or consistent.



- **Overhand Knot** - Overhand knots are the simplest, and perhaps most used knots. For an overhand knot just loop the threads around each other just as you would at the beginning of making a bow or tying your shoes.

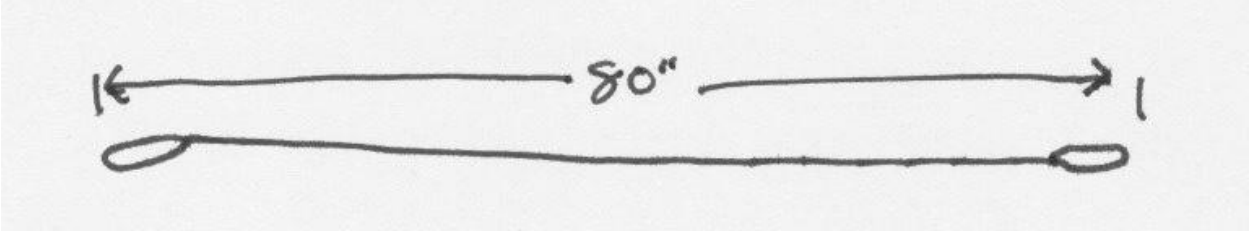
- **Surgeon's Knot** - Surgeon's knots are handy because they're easy to tie and will hold under moderate tension but are still able to be undone fairly easily. For a surgeon's knot start by looping the threads just as you would at the beginning of making a bow or tying your shoes, but pass the tail around **twice** instead of just once. The extra pass provides more surface tension that will prevent the knot from slipping easily. When securing the knot, pass the tails in the opposite direction to the first.

- **Bows and Half-bows** - bows and half-bows are temporary and easy to undo. If you can tie your shoes you can tie bows and half-bows. The only issue with bows and half bows is that you need extra yarn to tie them, and depending on when and where you use them the loops may end up contributing to your loom waste.

- **Square Knot, also known as a reef knot** - Square knots are essentially a bow with the tails passed in the opposite direction in the second pass and pulled through instead of leaving loops.

Measure and Wind the Warp

Using a yardstick to measure, make a guide string the length of the warp that you need. Refer to your planning sheets for this measurement. For the class project, the warp is 80 inches long, or just over 2.5 yards. It's a good idea to make a loop at one end and hold that against the end of the yardstick as you measure. When you have the desired length make another loop so that the total length of your guide thread is 80 inches.

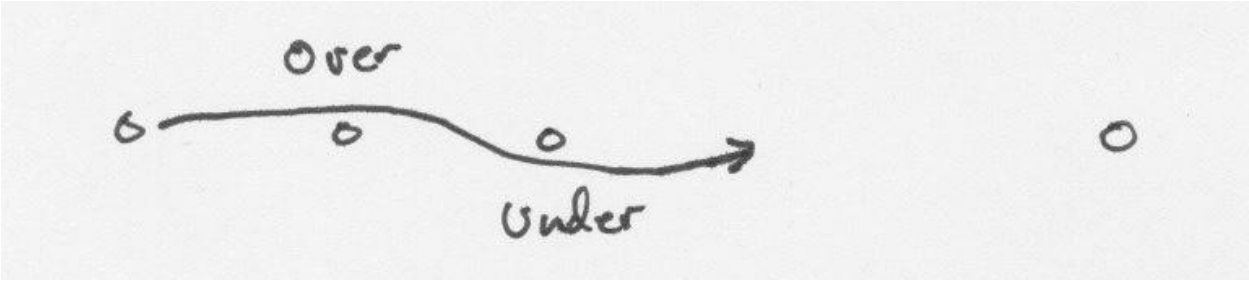


Take a loop from one end of the guide string and slip it over the peg at the upper left corner of the **warping board**. Follow across the top of the board with the guide string and around the peg at the upper right corner. Continue down and across the board, fitting the guide string over the pegs so that the string is all used up. Slip the second loop over a peg so that the string is taut. This establishes the path you'll use to wind your warp and create a warp chain of the desired length for your project. Running the thread from one end to the other will give us one warp thread, and then running the thread back up to the beginning will give us another. So, one complete run with the warp thread down and back gives us 2 threads, or 2 ends for our warp chain.

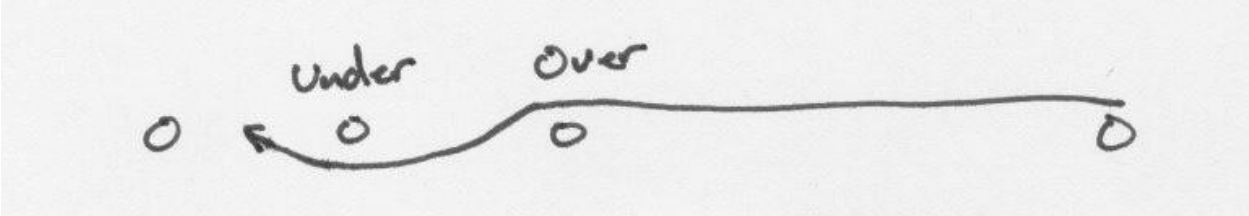
As we follow this path with the thread we need to create what is called the cross. The cross is a place in the warp chain where individual warp threads pass over each other in an X, usually between the second and third pegs. Creating and maintaining the cross keeps each warp thread in order so that the warp can be put on the loom with less risk of tangling.

Begin creating your warp by tying a slip knot to create a loop at the end of your warp thread and placing that loop over the first peg at the top left corner of the warping board where your guide string begins.

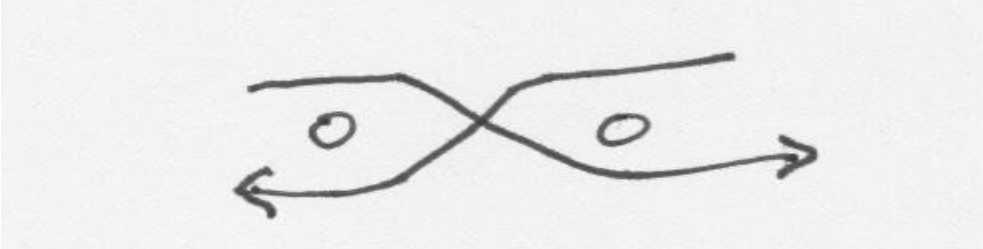
Then begin to follow the guide string across the top of the board. To create the cross take the thread **OVER** the second peg and **UNDER** the third peg before continuing to the upper right corner of the board.



Now, take your warp thread and continue along the path of your guide string down to the end of the guide. Loop around the peg at the end of the guide string and follow that path back up to the top. As you come around the peg at the top right corner you'll repeat the process from the start, going **OVER** the next peg and **UNDER** the peg after that before returning to the starting peg.



By always going **OVER** the first peg you encounter and **UNDER** the second you'll create that cross that we need to keep things in order. This may be confusing at first, but if you remember that the pattern is **OVER - UNDER** as you go past those pegs you'll be fine. If you find that you have 2 threads next to each other that take the same path stop and ask for help.



Continue to measure the warp down and back the full length of the guide string, remembering to keep the warp cross. **Remember that the measurement of the warp down and back counts as two (2) ends.**

After winding 12 ends, use a **thrum** as a counting string to mark a section of the warp. Simply tie the thrum around the 12 ends in the bundle at the cross with a simple overhand knot. Our project calls for 12 ends per inch, so each 12 threads will be one inch of the total width of the project. Repeat until you have a warp chain of 60 ends which will give us 5 inches of warp on the loom. If you miss the cross, stop and ask for help. Don't unwind the warp. Also, be careful where you count threads. Many find it easiest to count at the cross, while others will count the loops at the bottom warp peg.

Secure the cross by tying a “suitcase handle” with a thrum on the top of the warp on either side of the cross. The suitcase handle is a string with one end tied around the threads going over the first peg creating the cross and the other end tied around the threads going over the second peg in the cross. With the threads on either side of the cross bundled like this you can use the handle to move the chain to the table where you’ll sley the reed knowing that the cross is secure.

Next, secure each end of the warp by tying a thrum around the beginning and ending loops, and tie a **choke tie** securely around the threads about a foot beyond the cross. Note that with longer warps you may want to add more choke ties to keep things neat. We now have a secured warp with the cross secured that we can work with.

To make the warp shorter and easier to handle you can chain the warp as you take it off the warping board. To chain the warp, create a loop at the end of the warp, then reach through the loop and pull the thread bundle further up the warp through the loop and create a new loop. Repeat the process of pulling the warp threads further up the warp bundle through each successive loop until you reach the choke tie near the cross. You can now remove the chain from the warping board.

For our project we need 120 ends for our warp. Rather than wind all 120 ends together on the warping board we’ll wind 2 groups of 60 threads each. This will give you 2 chances to practice this part of the process.

When done with both warp bundles lay the chains out on a table. Lift the suitcase handles to show the cross. Slip the **lease sticks** into the chain, one on either side of the cross, and tie the ends of the lease sticks together. This secures and preserves the cross for the next step in the process.

Parts of the Loom and More Terminology

You've got your warp ready. Time to learn about the parts of the loom and where your warp needs to go, and some more terms used in weaving.

Activities:

- Learn more terms used in weaving
- Learn the names of the major parts of a loom

References:

- Chandler, *Learning to Weave*
  - Getting Familiar, pg. 14 - 21
- Osterkamp, *Weaving for Beginners*
  - The Basics, pg. 3 - 12

Terms

Brake
A device on a loom to hold the warp beam steady which along with a ratchet on the cloth beam allows the weaver to place the warp under tension. The brake can be released as needed, allowing the weaver to advance the warp and wind the woven cloth onto the cloth beam. The brake is released by pressing on the brake pedal. The brake pedal on the classroom looms is to the right of the treadles.

Lamms
Bars between the treadles and the shafts. Cords from the lam are connected to the treadles to allow the treadles to move the shafts as needed to create a pattern according to a draft.

Parts of a Loom

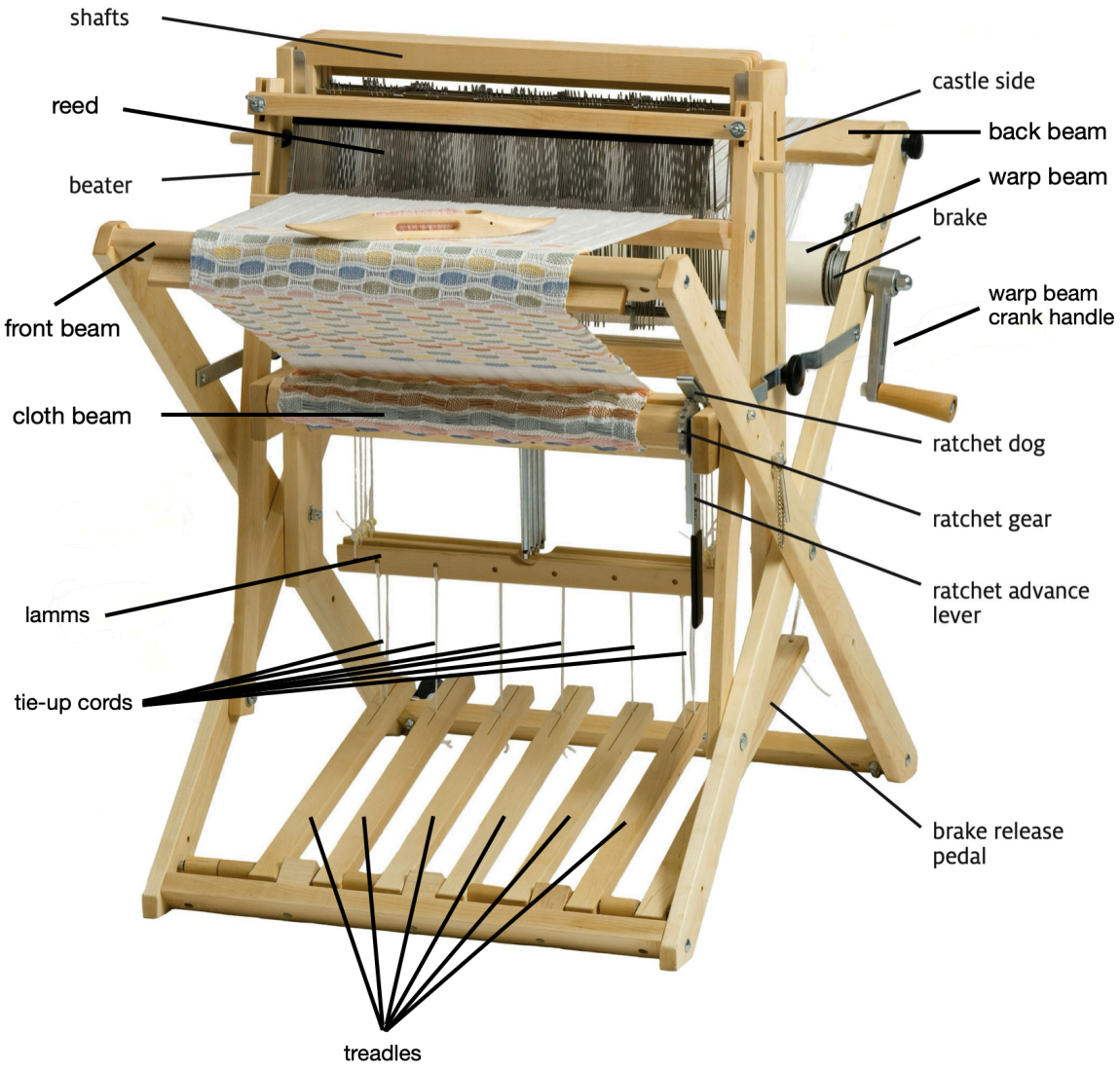


Photo courtesy of Schacht Spindle Company, Boulder, CO

Step 3 - Sleying the Reed and Installing the Reed in the Beater

The first step in moving the warp to the loom is sleying the reed. This is where you find out why we created the cross on the warping board.

Activities:

- Review the location and use of the reed
- Remove the reed from the beater frame
- Setup the reed in a holder for sleying a reed
- Sley the reed with the warp threads from your warp chains

References:

- Chandler, *Learning to Weave*
  - Warping Front to Back, pg. 34 - 38
- Osterkamp, *Weaving for Beginners*
  - Front to Back Warping, pg. 160 - 166

Terms

Dent
The long slots in a floor loom reed (or slots and holes in a rigid heddle) that the warp threads pass through are referred to as dents. Reeds are sometimes referred to by the number of slots per inch in a reed, such as “a 15-dent reed” means a reed with 15 slots per inch. European equipment uses the metric system, with the number of dents per 10 centimeters (approximately 4”).

Dressing the Loom
The entire process of placing the warp onto the loom (to include a sleyed reed, threaded heddles, filled warp beam, and attachment to the cloth beam).

Reed Stand
A reed stand holds the reed off the loom to facilitate sleying the reed.

Sley; Sley the Reed
To sley the reed means to place warp threads through the slots in the reed in sequence from the order provided by the cross. The “sley” refers to the number of warp threads per dent. For example, to achieve 20 ends per inch, the sley would be 2 warp ends per dent using a 10 dent reed.

Sley Hook
A sley hook is a thin hand-held device used to pull warp threads through the slots of a reed. A sley hook may be made of metal, plastic, wood, resin, or other suitable material, and it may have one end smaller than the other so that it can also serve as a heddle hook.

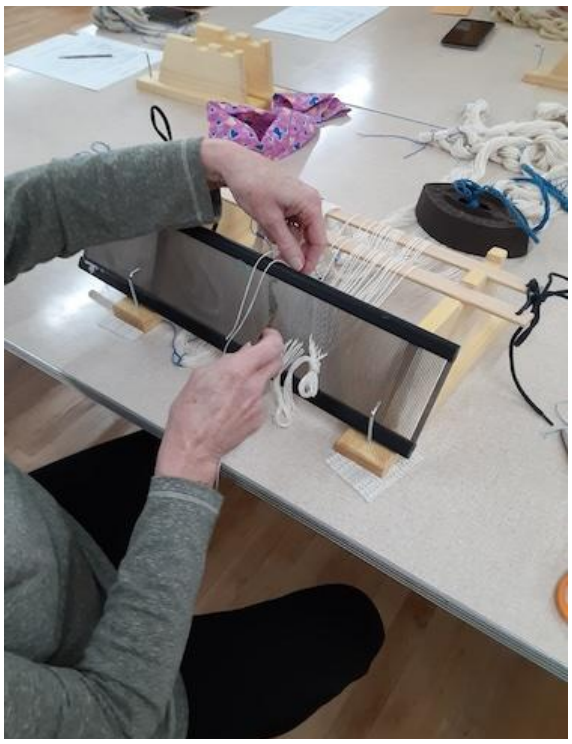
Sley the Reed

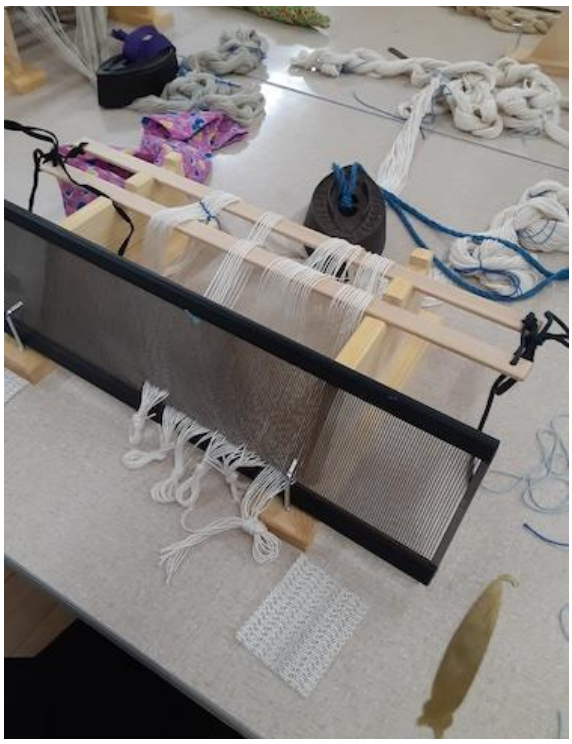
In a fully dressed loom each warp end is tied to the warp beam, runs up and over the back beam, through the heddles, then through the reed, over the front beam and finally it's tied to the cloth beam. In this next step we prepare the warp to be placed on the loom by running each warp end through the slots or dents in the reed. This process of pulling the warp threads through the reed is referred to as **sleying the reed**. To make this easier, we'll remove the reed from the beater and move it to a **reed stand** that we can place on a table.

Start by placing the warp on a table behind the reed and reed stands with the chain curled up towards the back of the table and the end loop and lease sticks in front of you just behind the reed. Make sure you have a couple feet or so of warp at the looped end before the lease sticks that you can work with as you pull the ends through the reed. Weigh down the chain with some weights - heavy books work well for this - to keep it secure. Then you can cut the loop end to create the individual ends to be pulled through the reed. It's best to center the warp in the reed. To facilitate centering the warp there's a thread tied to the center **dent** in the reed. Starting from the center use the **sley hook** to reach through the empty dent in the reed, hook the warp end behind the reed, then pull the warp thread through the reed, leaving about a foot or so of warp thread in front of the reed. Sley one of the warps chains from the center to the edge, then do the other chain, again from the center out to the edge.

Continue to work your way across the reed, pulling each warp end **in order** through the dents in the reed until every warp end is pulled through the reed. As you work across the reed, be sure to tie groups of warp ends in a slip knot, 12 in a bundle which for this project is each inch in the reed, to prevent the warp from being accidentally pulled out of the reed. It's also a good idea to check the dents in the reed and each of the threads in the warp as you tie the knots to ensure that you haven't skipped a dent, or accidentally placed 2 warps ends in a single dent.

After sleying the reed it's a good idea to do a visual inspection and make sure that the threads all run parallel to each other from the front of the reed, through the reed and out beyond the lease sticks. If there are crossed threads it means you didn't take those threads in the correct order through the reed, and you'll want to correct that before proceeding.





When the reed is completely sleyed, use thrums to attach the lease sticks to the reed. There's a hole in the end of each stick that you can use to tie the sticks to the ends of the reed. Then you'll take the sleyed reed to the loom and place it in the beater. Install the reed into the beater frame with the slip knots facing the heddles and the warp chains on the breast beam. Center the reed in the beater bar so that your warp (which is centered in the reed) is centered in the loom. Once the reed is in the beater bar and properly centered, secure the top of the beater bar and tighten the wing nuts.

A note about reeds

Reeds come in various lengths and sizes. Reeds are measured in terms of the number of slots/dents per inch. So, a 10 dent reed has 10 dents per inch, a 12 dent reed has 12 dents per inch, etc. Our project has 12 ends per inch, so a 12 dent reed makes sleying the reed easy and straightforward. At times you may need to accommodate something other than 1 to 1 sleying. There are books and websites that can provide guidance on how to accommodate these situations, for example 12 ends per inch in an 8 dent reed.

A note about warping

There are 2 basic methods for warping a loom - back-to-front and front-to-back. Both methods have their own fans, and they both will result in a loom that's ready to weave. The Chandler and Osterkamp books describe both methods, while the Parson and Sundstrom book describes back to front only. We are teaching you front-to-back. If you're curious about the other method you can read more about both methods and why some people prefer one method or the other in either of those books.

Step 4 - Thread the Heddles

After sleying the reed it's time to move the warp to the loom. Here you'll put the reed back into the beater and thread the yarns through the heddles.

Activities:

- Review the location and use of the heddles
- Learn about the different types of heddles
- Learn the basics of reading a weaving draft
- Learn the process for threading the heddles
- Review our project draft to determine how to thread the heddles
- Thread the heddles on the loom for our project

References:

- Chandler, *Learning to Weave*
  - Warping Front to Back, pg. 38 - 44
- Osterkamp, *Weaving for Beginners*
  - Front to Back Warping, pg. 166 - 168

Terms

Heddle (or Threading) Hook
A heddle hook is a thin metal or plastic hand-held device, usually longer and with a smaller hook than a sley hook, used to pull warp threads through the eye of a heddle. A sley hook may have one end smaller than the other so that it can also serve as a heddle hook.

Threading the Heddles

When the reed is sleyed you're ready to start threading the heddles. Before threading you would normally count the number of heddles needed for each shaft and then count the heddles on the loom to ensure that you have the heddles you'll need installed on each of the shafts. The classroom looms are set up with enough heddles on each shaft for the draft we're using, but if this were a different draft we might need to move heddles from one shaft to another.

Threading the heddles can be done with a threading hook, or just by using your fingers to put the warp end through the eye of the heddle.

Though you don't have to move heddles, you will find that each shaft has more heddles than you need. Some weavers prefer to count out the heddles so that there are an even number of unused heddles on each side of the loom, while some simply push all the heddles to one side and pull one at a time and they thread. Either approach is fine, but having extra heddles on both sides may help facilitate fixing threading errors if you misthread the heddles. Another reason for balancing the unused heddles is that a shaft with too many unused heddles on one side will be unbalanced, especially if the heddles are heavy. On some looms and in some situations the unbalanced shaft might tilt slightly to one side making the shed uneven. The empty heddles may rattle a bit as you weave, so clips are available to help hold them to the side to reduce the noise.

Heddles come in a variety of materials and styles including metal, thread, or Texsolv. The Wolf Pup looms come with metal inserted eye heddles. Inserted eye heddles have an oval metal eye that is angled slightly. As you thread them be careful to insert the hook at the same angle as the eye to avoid twisting the eye. You'll also want to ensure that the warp threads come straight through the loom and don't wrap around another heddle, and of course that they are threaded in the correct order. Warp ends should be parallel to each other and not cross at any point between the reed and the back beam.

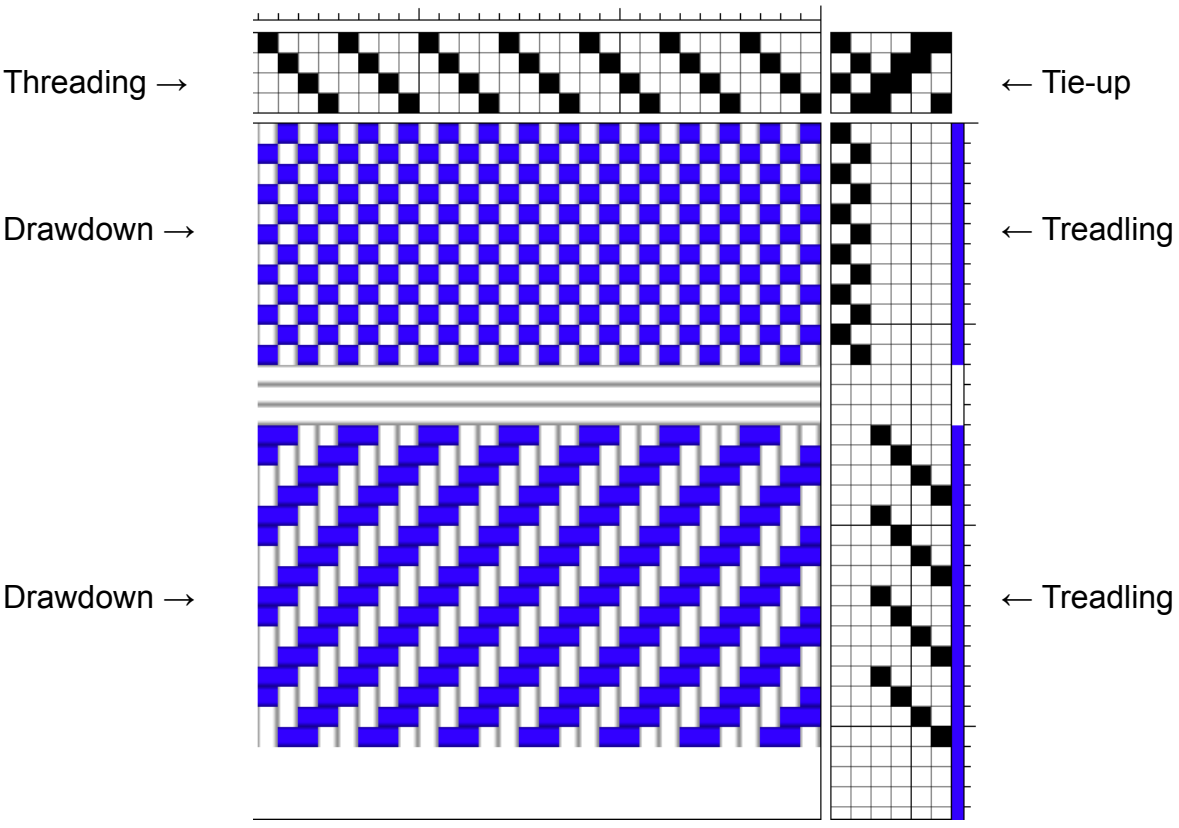
One by one, undo the slip knot from the bundle of threads you are working on and thread the heddles, one end per heddle, using a **heddle hook** or by simply feeding the end through the eye with your fingers. Many weavers will pull the heddles needed for

each bundle into the center of the shaft as they work across the warp. This allows for an easy check to help ensure that you've threaded the correct number of heddles for each bundle before moving to the next bundle. In our draft, the heddles are threaded in shaft order - 1 2 3 4 1 2 3 4, with shaft 1 being the shaft **closest to the reed** and the weaver during weaving. This is sometimes referred to as a straight draw. This will allow us to weave both plain weave and a twill pattern with the same threading.

To make threading the heddles easier the back beam of the Wolf Pup loom is removable. When all the threads of the bundle are threaded through the heddles, line up the ends evenly and tie a small overhand knot close to the end. Go to the next bundle, repeating until all 10 of the 1 inch bundles are threaded. Again, as with sleying the reed, it's good to check the threading before you tie each bundle.

Reading a Draft

The instructions for weaving a pattern are typically provided in something called a draft. For our project we're using the following draft.



The draft has 4 parts:

- A visual depiction of the pattern being woven called the drawdown.
- Threading instructions to show how to thread the warp in the heddles.
- Directions for tying up the shafts to the treadles.
- Treading instructions for how to weave the pattern.

Sadly, drafts are not all done the same way. Drafts might be written assuming a rising shed loom, like the Wolf Pups you will use in class. Other times the draft might be written assuming a sinking shed. It's always best to read the text accompanying any draft to determine the assumptions made about the loom and adjust accordingly.

Step 5 - Wind on to the Warp Beam

You have your warp threads going through the reed and the heddles. Now it's time to actually start securing it to the loom. First, you'll attach it to the warp beam, then wind on to the beam, inserting paper along the way to keep the layers of warp threads separated. This helps ensure even tension across the warp.

Activities:

- Review the location and use of the warp beam
- Connect and wind the warp onto the warp beam
- Separate the warp layers on the warp beam

References:

- Chandler, *Learning to Weave*
  - Warping Front to Back, pg. 44 - 51
- Osterkamp, *Weaving for Beginners*
  - Front to Back Warping, pg. 169 - 175

Terms

Beaming
Beaming (or “to beam the loom” or “rolling on”) is the act of connecting the warp to the warp beam and then rolling the warp onto the warp beam, using individual sticks or paper between layers of warp to ensure even tension.

Snitch
Snitching refers to using a larks head knot to connect two strings or a string to a bar or rod.

Connecting and Winding Onto the Warp Beam

After threading the heddles you’re ready to connect to and wind onto the warp beam. Do this by **snitching** on to a stick with a larks head knot, spacing the bundles across the stick so that the width of space occupied on the stick matches the space used in the reed. Then tie the stick to the back apron stick with strong ties evenly spaced across the sticks. There should be at least three (3) ties. Then reinstall the back beam that we removed before threading the heddles and carefully wind the warp beam until the stick is touching the warp beam, making sure that the stick is centered on the beam. You’ll need to step lightly on the brake release as you crank the beam to allow the beam to move smoothly and freely. Note that the crank must be engaged in order to roll the warp beam forward.

Now, pull the warp back to the front of the loom until you have consistent tension across the warp. It’s a good idea to strum, pull each section firmly to tension, then pull the beater bar forward to the breast beam, and wind onto the warp beam.

Slowly start winding the warp onto the warp beam with heavy paper or some other medium between each warp layer to keep the layers separate. Keeping the layers separate is important to ensure that the tension remains consistent across the warp. Strum and tension each bundle in the warp with every rotation. As needed, return to the front of the loom, strumming and tugging each bundle to retain consistent tension across the warp, and pull the beater bar forward to the breast beam. You may need to strum or comb the warp a few inches as you pull the beater forward. Continue to wind on, carefully removing the choke tie when it approaches the reed, until you have about 12 inches in front of the reed.

Step 6 - Tie on to the Cloth Beam

So you have one end of the warp secured to the loom, and you've wound much of it onto the warp beam. Now it's time to secure the other end to the cloth beam. You'll need to not only tie the ends of the warp to the beam, but you'll also need to check and adjust the tension on the warp. Consistent, even tension across the whole width of the warp is the goal.

Activities:

- Review the location and use of the cloth beam
- Tie the warp onto the cloth beam
- Test the warp for uniform tension across the warp
- Adjust warp tension for uniformity across the warp

References:

- Chandler, *Learning to Weave*
  - Warping Front to Back, pg. 51 - 54
- Osterkamp, *Weaving for Beginners*
  - Front to Back Warping, pg. 175 - 176

When the warp is wound on to the warp beam with about 12 inches of thread left in front of the reed it's time to tie on to the cloth beam. Push the beater back away from the front bean then carefully cut the end loops in front of the reed and remove the lease sticks.

Bring the rod from the cloth beam up and over the front beam towards the beater. Tie the warp onto the cloth beam rod in 1/2 - 1 inch increments using a larks head with the first half of a surgeon's knot. Some find it easier to start in the middle and work out, while others work from the edges, alternating left and right until they reach the center and all warp threads are tied. Both approaches work well to keep the rod from flopping around. Try to keep even tension across the warp. After all warp threads are tied to the rod check and readjust tension on the bundles as needed. The goal is to have nice, even tension across the entire warp. Be particularly mindful of the tension on the edges.

Step 7 - Tie Up, Check for Threading Errors, and Insert the Header

Your warp is on the loom now, and you're almost ready to start weaving. But first you need to check the draft and tie up the shafts to the treadles, then check for any threading errors. If there are any problems you'll need to fix those before you can actually start weaving. The last thing you need is a header - some scrap yarns inserted in the warp to spread the warp threads out evenly and remove any gaps from the bundles tied to the cloth beam.

Activities:

- Review the basics of weaving drafts
- Review the draft for your project.
- Review the location and use of the treadles
- Determine the tie up needed for our project
- Tie up the treadles for our project
- Test the treadles to ensure the tie up is correct
- Check the threading and correct any errors
- Insert the header

References:

- Chandler, *Learning to Weave*
  - Warping Front to Back, pg. 55, 92 - 96
- Osterkamp, *Weaving for Beginners*
  - Front to Back Warping, pg. 176 - 179, 168

At this point the warp has been measured out and attached to the loom. But before you can start to weave you have to attach the shafts to the treadles. The draft will provide instructions for these connections, referred to as the tie up. This is done by using strings to connect the treadles to the **lamms** that control the shafts.

After connecting the treadles to the **lamms** you will test the tie up by stepping on each treadle to make sure the correct shafts are going up and that you have an adequate shed. Make sure all the shafts are clear of threads, paper, scissors or any other weaving materials. Step on a treadle, find and correct errors, and repeat as needed until all errors are corrected. Each shaft should lift smoothly and raise only the threads in the heddles on that shaft. In addition, they should run parallel to each other, not crossing each other within a shaft or with other shafts. Ask for help if your shed seems narrow or if the shafts appear to be stuck or difficult to raise.

Insert the Header

After all errors have been corrected make one last check and adjust warp tension as needed. When the tension is even, tie the second half of the surgeon's knot without adjusting the tension to secure the warp. Weave in the **header** using scrap yarn. The header will spread the warp and remove the gaps that appear in the warp from where we tied the bundles to the rod connected to the cloth beam. This is often done with a yarn that is thicker than the warp and a different color from the weft you'll be using. For this project we can simply double up the threads that we'll use for weaving, or ask your instructor if they have something that can be used for the header. Start by positioning the rod from the cloth beam a couple inches from the front beam, between the beam and the heddles, and push the reed/beater bar back towards the heddles and away from the cloth beam rod. Step on the first treadle, which will raise shafts 1 and 3, and insert the header into the shed, positioning it a couple inches away from the rod. Do not beat. Now step on the second treadle to raise shafts 2 and 4 and insert the next section of header into the shed. Without beating, step on the first treadle again and place the next section of header into the shed. After the third pass you can pull the beater forward and draw the three passes together. This will spread the warp threads out more evenly and remove the gaps. If needed you can repeat this process until the gaps have largely been removed and there is uniform spacing between the warp threads.

You are now ready to weave.

Step 8 - Weaving

Finally, you're ready to weave! Time to wind a bobbin, insert it into a shuttle, and start weaving. The draft will tell you what treadles to use and in what order. Keep an eye on that beat. Remember, for this project you're placing the weft into the warp. Beating is for rugs and other projects that require a sturdier cloth.

Activities:

- Learn the different types of shuttles and how to load them for weaving
- Wind a bobbin or pirn and load your shuttle
- Check the draft and learn the steps to weave plain and twill cloth
- Learn how to tuck the tail when starting to weave
- Learn how to hem stitch the edges of your mats
- Learn the importance of careful beating when weaving
- Use correct treadling to weave your mats

References:

- Chandler, *Learning to Weave*
  - Warping Front to Back, pg. 55, 92 - 96
- Osterkamp, *Weaving for Beginners*
  - Front to Back Warping, pg. 176 - 179, 168

Terms

Beat, Beating
Beat refers to the evenness (even vs. uneven) and force (heavy vs. light) by which the weft is pushed into the warp. Beating is the action of pushing the weft into the warp to get the desired design in the textile.

Bobbin
A bobbin is a spool that holds weft thread and fits inside a boat shuttle.

Pirn
A pirn is analogous to a bobbin and is used in an end-feed shuttle

Shuttle
The shuttle is a piece of equipment that is used to carry the weft thread while weaving. When hand weaving, the shuttle is passed through the shed. Some examples are boat shuttles, end-feed shuttles, stick shuttles, ski shuttles, inkle shuttles, netting shuttles, and band loom shuttles.

Floating Selvedge
Floating selvedges are extra warp threads added to ensure that the weft will always have a warp thread on the very edges of the cloth to go around before returning back into the cloth. Since they are floating they will run through the reed but will not run through any heddles. Floating selvedges are weighted and hang off the back of the loom to ensure proper tension.

Weaving

Finally, it's time to weave! Select a shuttle and wind thread onto your bobbin or pirn as shown by your instructor, then begin weaving your first mat.

Mat 1

Weave the first mat using the weft thread and treadling described in your worksheet for a plain weave cloth. Remember from our project planning that weaving involves take-up. To minimize draw-in you will need to provide more weft than you might expect to accommodate the extra weft needed. Work with the instructor on an angle or bubble to minimize draw-in.

At some point you'll need to advance the warp, moving the woven cloth forward and onto the cloth beam and bringing more unwoven warp into position for weaving. You'll do this by loosening the tension on the warp using the ratchet handle on the cloth beam, then gently release the brake using the brake pedal, crank the cloth beam to advance the warp, and finally re-engage the brake and use the ratchet handle on the cloth beam to rotate the cloth beam and reassert tension on the warp. Looms have an area that's the sweet spot for weaving. Your instructor can help you find that area on the classroom looms.

As you weave, notice how the cloth looks. From the planning worksheet we specified the expected number of picks per inch when beating in the weft threads. After weaving a couple inches count the number of picks in an inch of your cloth. It doesn't need to be exact, but the closer you get to the specified pick count the more the pattern in the cloth will be balanced. It may be helpful to think 'placing the weft' instead of 'beating the weft.'

After you have woven 10 inches, cut and tuck the tail then insert spacers to allow enough thread for you to tie knots for fringe for the first mat and an inch for the fringe at the start of the next piece before moving on to the second mat.

Mat 2

Weave the second mat using the weft thread and treadling described in your worksheet for a twill cloth. Because the weft will sometimes not catch the outside thread on the return into the cloth we add floating selvedges to the warp. To do this measure 2 more warp threads. Run each thread through the reed and down along each side of the warp. Since these are floating warp threads they will not be threaded through heddles. Use a straight pin to secure one end to the cloth, then wind the remaining thread behind the back beam onto a weighted item and allow the weighted warp thread to hang over the back beam.

When weaving with floating selvedges the warp threads on the sides are in a neutral position and do not move as the shafts are raised and lowered. For each pick you'll pass the shuttle OVER the floating selvedge warp thread as the shuttle enters the shed, and then go UNDER the floating selvedge warp thread as the shuttle exits the shed. This will ensure that the warp threads on the edge are always engaged and you won't have floats along the very edges of your cloth.

How firmly or loosely you beat the weft into the cloth becomes more important when weaving twills. If you desire a 45 degree angle to the twill pattern then you will need to strive for a balanced weave by having the same number of picks per inch as there are ends per inch in the reed. If you beat too firmly the weft threads will compact and cause the angle to be too shallow. If you beat too loosely the weft will have too much spacing and the pattern will be too steep. It is often helpful to have a folded piece of paper to compare with to see how steep and straight your pattern appears in the cloth.

For the second mat use a hemstitch to finish the edges. After hemstitching the entire edge of the piece you can needle weave the tail back into the cloth. After weaving and adding the hemstitch at the end, add spacers before moving on to the next piece.

Mats 3 and 4

For the third and fourth mats you can choose either plain weave or twill, or identify a pattern from one of the pattern books available. You may also want to introduce a second shuttle and weave stripes. If needed, adjust the tie ups to support a new pattern. Weave the mats using the weft thread and treadling as needed. For these mats use whatever method you desire for finishing the edges.

Hemstitching

Decide how many picks you want within the hemstitching and how many warp ends in a bundle (the diagrams show 3 picks and 4 warp ends per bundle).

On the diagram:

- solid red arrows show stitches that will show on the top of the cloth
- broken red arrows show stitches that will show on the back of the cloth
- wide pale orange picks are for heading yarn or spacers between items

Record the number of picks, number of ends in a bundle, and what style of hemstitching you're using for each item so you can use the same numbers at the end of the piece, which is significant if it's long and you might not remember.

Use a blunt tapestry needle.

Right to left is usually easier for right-handed people, left to right is usually easier for left-handed people, but use whichever one is more comfortable for you.

At the beginning of the piece, measure a tail of the weft yarn 4-5 times the width of the warp, coming out of the side where stitching will begin, and then weave the three picks that will lie within the hemstitching. Lay in a contrasting colored thread in the same shed as the fourth pick, then continue to weave the first inch or two of cloth. The thread will help you in selecting the first three picks to include in the hemstitch. Set the shuttle aside and proceed to hemstitch across the warp. You can needle weave the tail into the cloth for an inch or two when done, then proceed with weaving the rest of the piece.

At the end of the item, before adding the picks that will be part of the hemstitching, place a piece of sewing thread in a contrasting color in the same shed as the last pick before hemstitching will start (thin orange line on the diagrams); remove it afterwards

For the first and final bundles, the hemstitching will include the outermost warp end, which might be a floating selvedge.

For each bundle, pick up the ends for that bundle and hold them while stitching that bundle. It's easier to pick them out next to the reed.

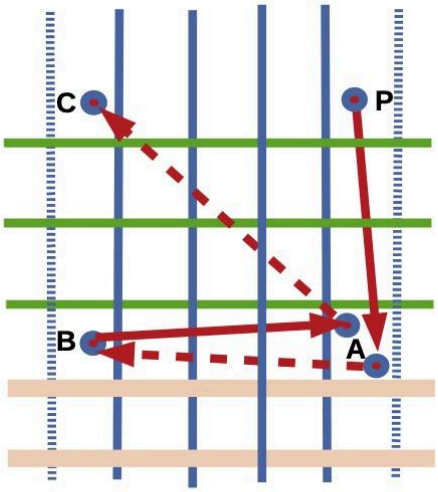
After hemstitching at the start of an item, you can place the end of the tail in a shed; at the end, loosen the warp and weave it in using the tapestry needle.

Hemstitching

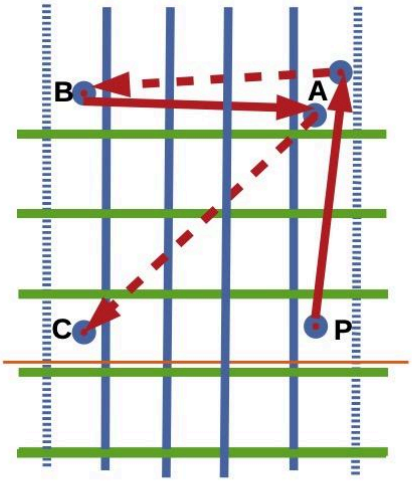
For the first bundle ignore P, then P is C from the previous bundle.
For each bundle:

- **A to B *under and across***
- **A to C *under and diagonal***

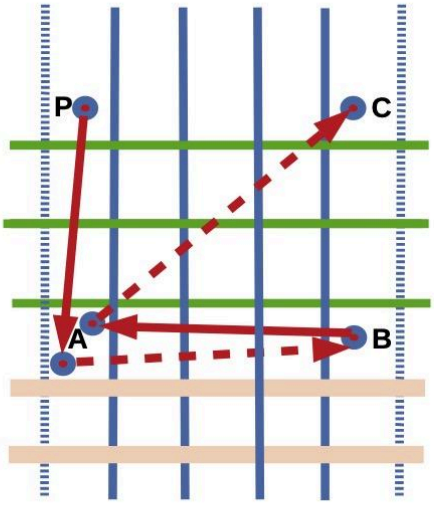
Start of weaving, right-handed



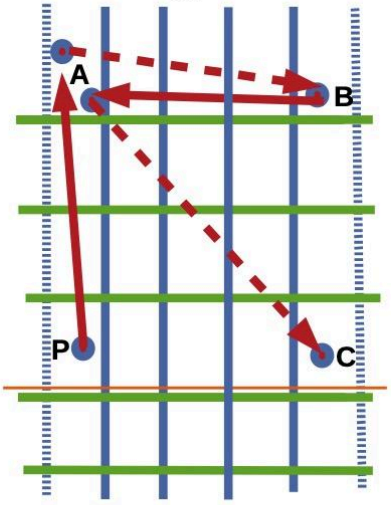
End of weaving, right-handed



Start of weaving, left-handed



End of weaving, left-handed



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Step 9 - Finishing Your Work

You're done weaving. Now what? Well, this is where you cut your work off the loom and finish your pieces. And finishing can mean different things depending on what you're making and who you ask. But remember - it's not finished until it's wet-finished.

Activities:

- Cut your pieces off the loom
- Learn about wet finishing your work

References:

- Chandler, *Learning to Weave*
  - 'Getting Familiar', pg. 15 - 21
- Osterkamp, *Weaving for Beginners*
  - 'The Basics', pg. 3 - 12

When you've finished weaving your pieces you'll release the brake and the ratchet dog to release tension on the warp and remove the weights from your floating selvedges. Cut the warp at a spot in the warp that allows for sufficient warp to finish the last piece. If doing a knotted fringe you'll want to leave enough warp to tie the knots. If you've hemstitched the last piece then you can leave a shorter fringe with an inch or two extra to allow for trimming after wet finishing. After cutting the warp from the warp beam in front of the heddles you can grasp both sides of the piece and pull to unspool the cloth from the cloth beam.

After taking the project off the loom the last step is wet finishing, sometimes referred to as just finishing. Wet finishing allows the fibers to full and relax into their final position. Finishing will vary depending on the fibers used in your project, but will usually include soaking in water with a small amount of detergent, agitating the fibers, and drying. Some fibers including natural wools and alpaca may also include a step called fulling.

Resources for Further Learning

Books and Magazines

- Deborah Chandler, *Learning to Weave*
- Peggy Osterkamp, *Weaving for Beginners*
- Anne Dixon, *The Handweaver's Pattern Directory*
- Marguerite Davison, *A Handweaver's Pattern Book*
- Handwoven Magazine
- Little Looms Magazine

Local

- Portland Handweavers Guild
- Multnomah Arts Center
- Fiber Rhythm Craft & Design
- Eugene Textile Center

Online

- Jane Stafford Textiles School of Weaving
- Kelly Casanova Weaving Lessons
- The Handweaving Academy
- Handweavers Guild of America
- ANWG - Association of Northwest Weaver’ Guilds
- WeGO - Weaving Guilds of Oregon
- Schacht Spindle Company

Conferences

- Convergence
- ANWG
- CNCH

Project Worksheet

Name: _____

Date Started:_____ Date Finished:_____

1. PROJECT DESCRIPTION

What is being woven?	
How many?	
Weave Structure?	
Source/Inspiration?	

2. PROJECT DIMENSIONS

	After Finishing	Before Finishing
Width		
Woven length		
PLUS Hem or fringe length		
= Total woven length		

3. WARP DESCRIPTION

Material	
Ends per inch (epi)	
Width in reed	
Total warp ends	
Floating selvedges	
Sley/Reed	
Source/Cost	

4. WEFT DESCRIPTION

Material	
Picks per inch	
Source/Cost	

5. WARP CALCULATIONS

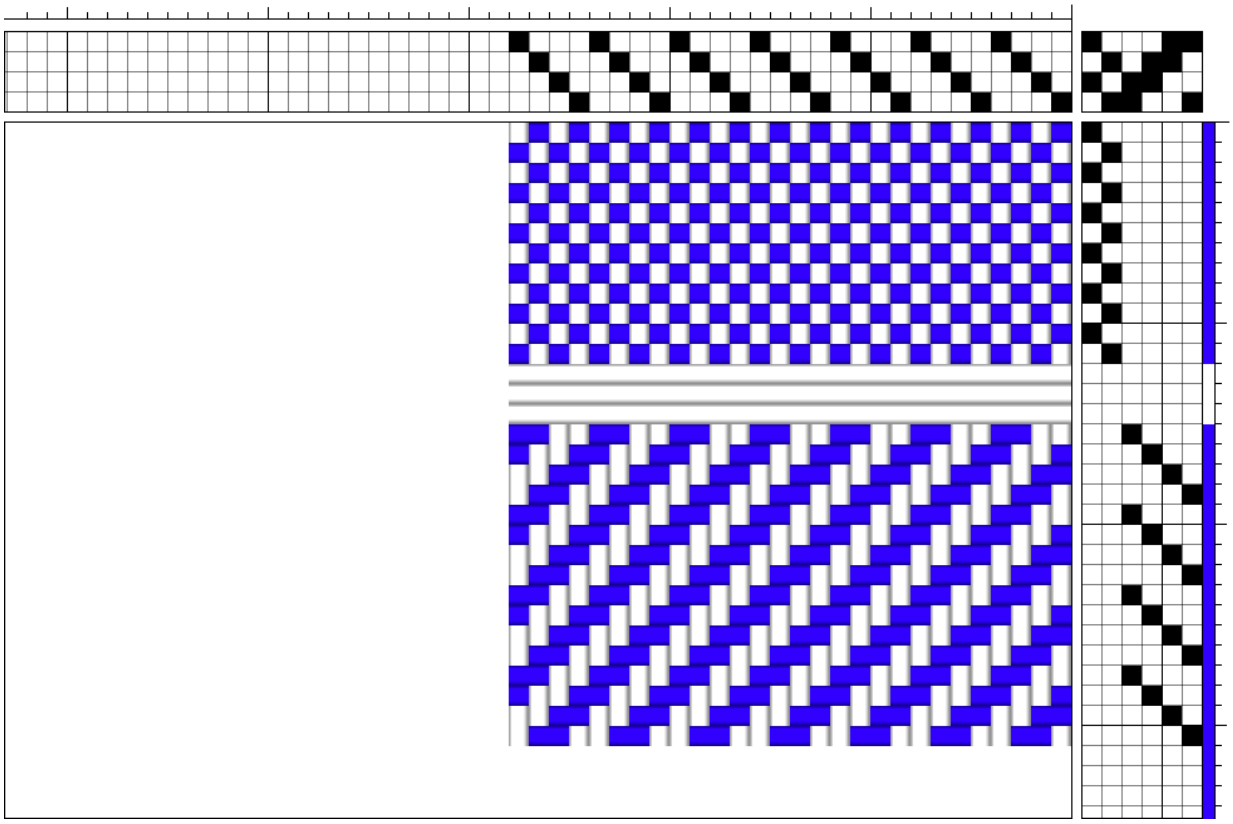
Calculation #1: Total Number of Warp Ends

Ends per Inch (epi)		This is the total number of individual threads per inch across the piece(s) being woven
X Width in the reed		The is the width across the piece as measured in the reed before weaving (i.e., before draw-in)
= Total Number of warp ends		The product of epi and width in reed is the total number of warp threads in the piece(s)

Calculation #2: Warp Length

Total Article Length, in inches		This is the total length of one piece, including the hem, fringe, or other finishing technique [NOTE: 12" REFLECTS 1" HEMS ON EACH END; IF A KNOTTED FRINGE IS DESIRED, THIS NUMBER WILL BE LARGER]
X Number of Articles		The total number of pieces desired from the warp
= Subtotal of warp length, in inches		The product of the items above gives the amount of warp needed for the number of articles desired BEFORE accounting for any loss of warp length
+ Take-up & Shrinkage		This is an adjustment to account for the lost warp length that occurs during weaving and finishing. Some warp loss is caused by the deflection of each warp end that happens when the weft is inserted; some happens when the warp under tension on the loom relaxes once removed from the loom; and some is caused by physical shrinkage when the finished piece is washed to create whole cloth. A rule of thumb is to increase the total by 10%, rounded UP to the nearest inch.
= Total Woven Length		This is the total amount of warp that is needed to weave the body of the piece(s)
+ Loom Waste, in inches		Loom waste is warp that cannot be woven. Some warp secures the warp at the front and back of the loom and some is lost in the castle. Waste depends on the depth of the loom and how generous the weaver makes their ties at the front and back of the loom.
= Warp Length, inches		Woven length plus waste for warp length in inches
= Warp Length, yds		Divide by 36" for warp length in yds (always round UP)

6. WEAVING DRAFT (THREADING, TIE-UP, TREADLING)



7. NOTES/REMINDERS/IDEAS FOR FUTURE PROJECTS

Index

This is a sample draft that can be used to try your hand at generating different patterns with the same threading.