

Intro. To Fiber Arts

Fiber, Yarn, Fabrics



What is a Fiber?

◎ *A fiber is a natural or synthetic filament that can be spun into yarn.*

◆ Natural – start as a plant or animal.
(Cotton, Wool, Silk, Bamboo, Hemp)

◆ Synthetic - Created from chemical compounds.
(Nylon, Polyester, Spandex)

What is Yarn?

◎ *Yarn* is fibers that have been spun together and used to make fabric.

◎ The amount of “twist” in the yarn produces different characteristics:

- Loose twist – bulky, soft, fuzzy fabrics
- Tight twist – smooth, shiny fabric.



What is Fabric?

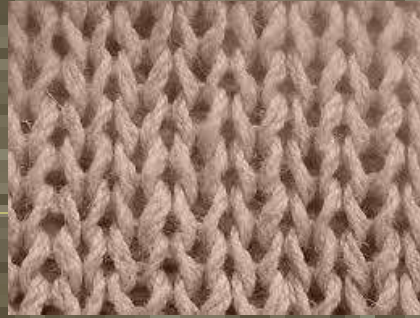
- ◎ *Fabric* refers to any material made through felting, knitting or weaving.
- ◎ The word “fabric” is also a synonym for the word “*textile*.”
- ◎ *Textile* refers to any material made of interlacing fibers.

Felted Fabric

A non-woven fabric formed when subject to heat, moisture and pressure or agitation.

Oldest method – dating back to 6500-3000BC – where felt applique motifs were found in wall paintings.



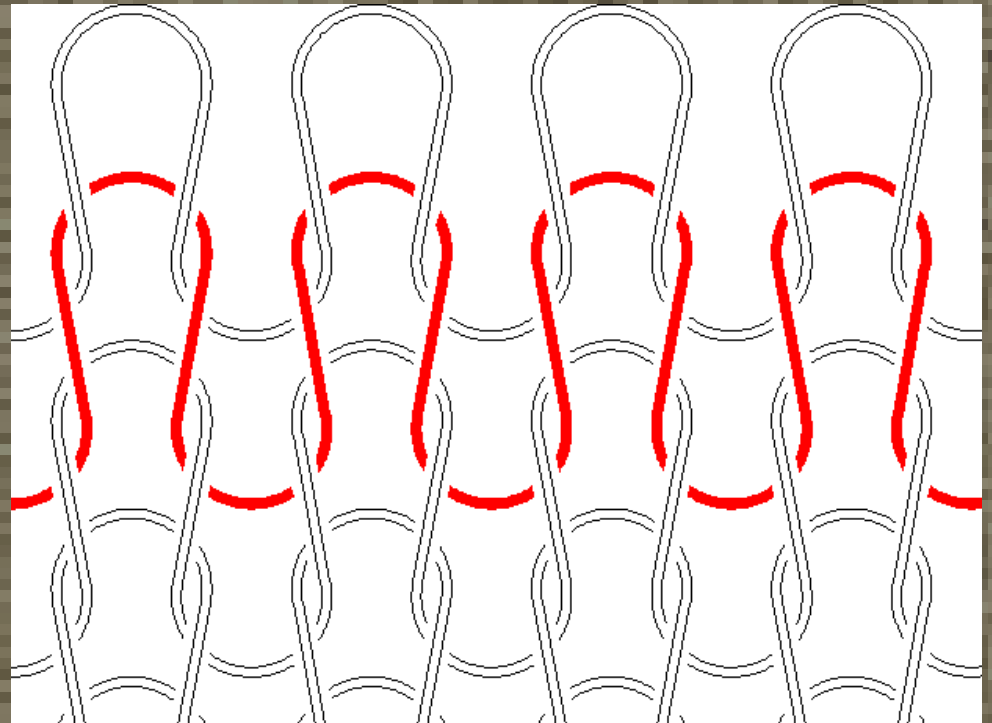


Knit Fabric

A fabric made
interlocking loops of
one or more yarns
together by hand with
knitting needles or by
machine.

Examples of knitted
fabrics:

- Jersey Knit
- Velour
- Rib Knit

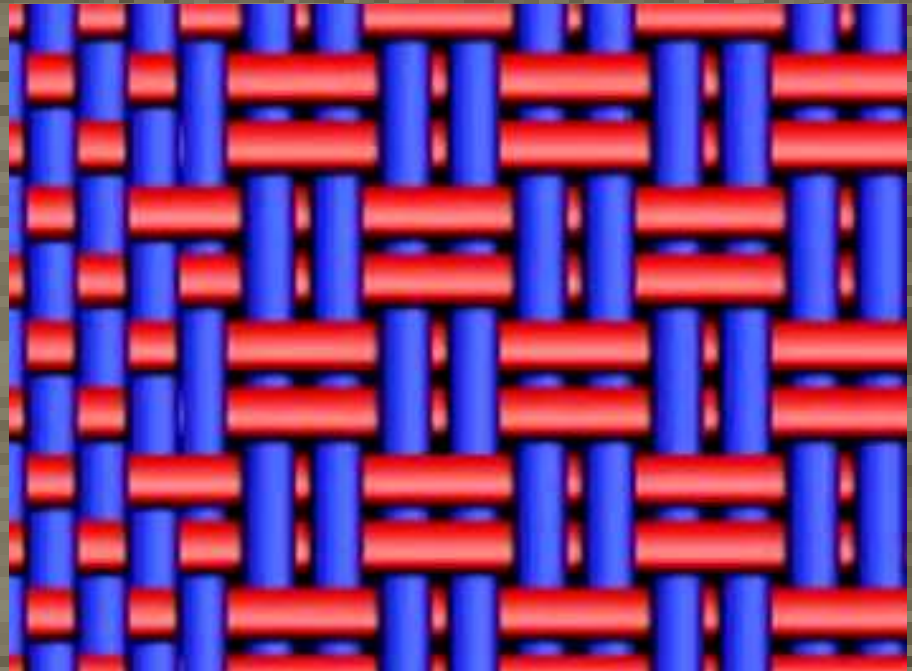


Schematic diagram of a knit
fabric.

Wikimedia Commons, 2005.

Woven Fabric

- Woven fabric is composed of TWO sets of yarns interlaced at right angles: The warp & the weft.

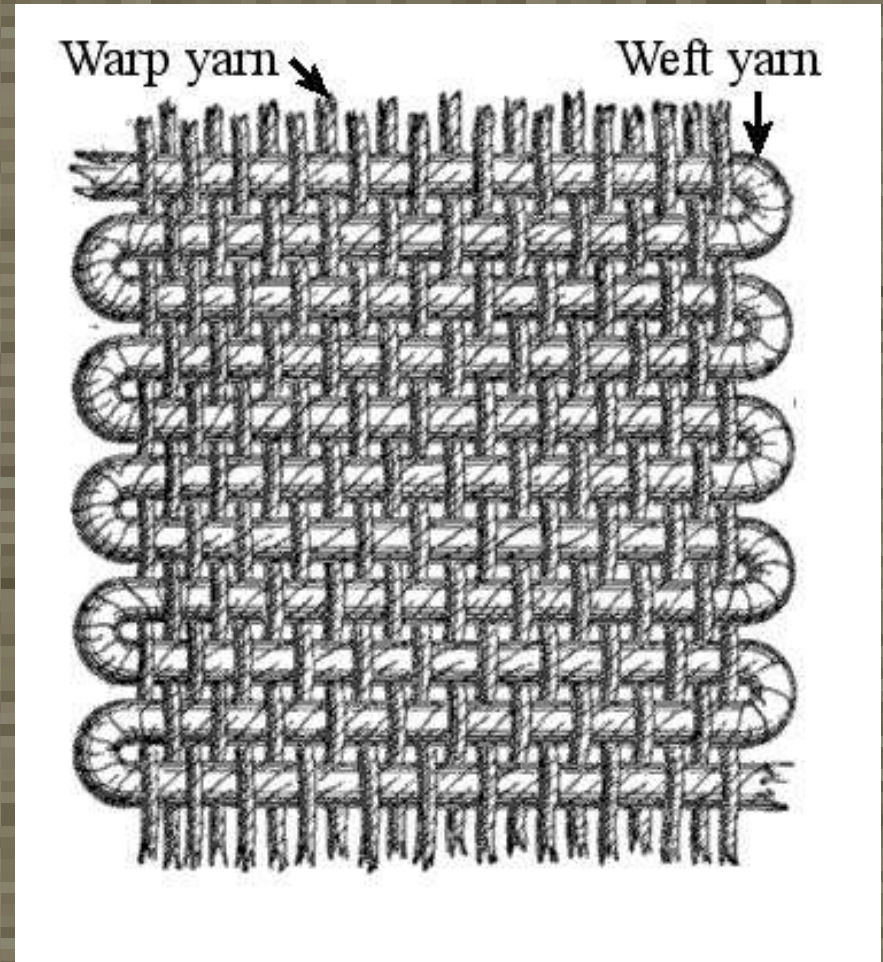


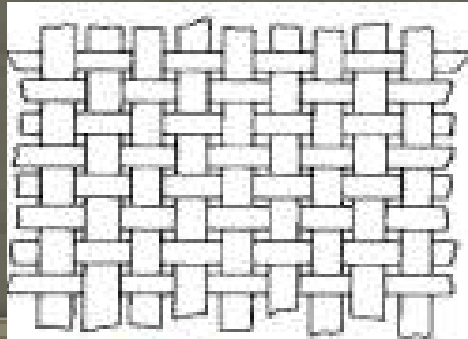
https://www.youtube.com/watch?v=G3G1_KqfbzA

Warp & Weft

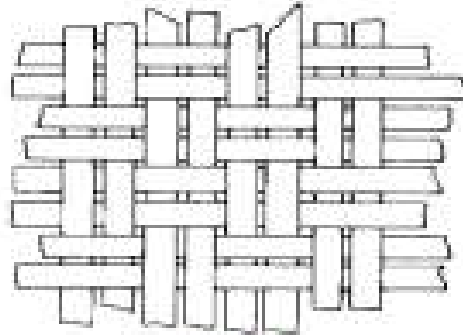
◎ **The warp** yarn runs the length of the fabric.

◎ **The weft** yarns also called “**the fill**” runs perpendicular to the warp yarns.

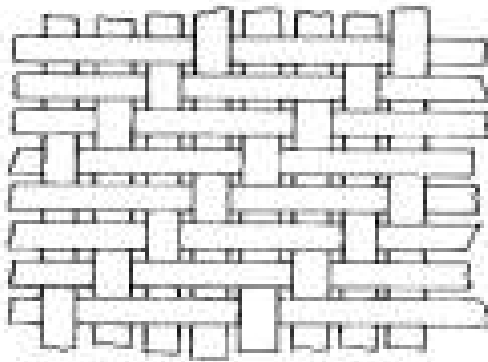




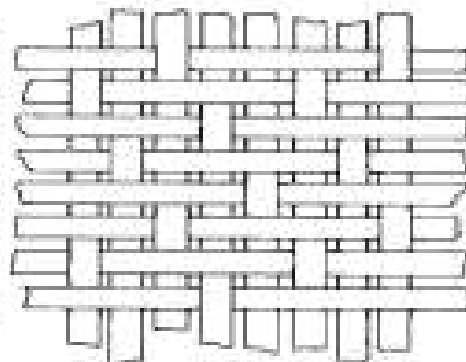
Plain weave



Basket weave



Twill



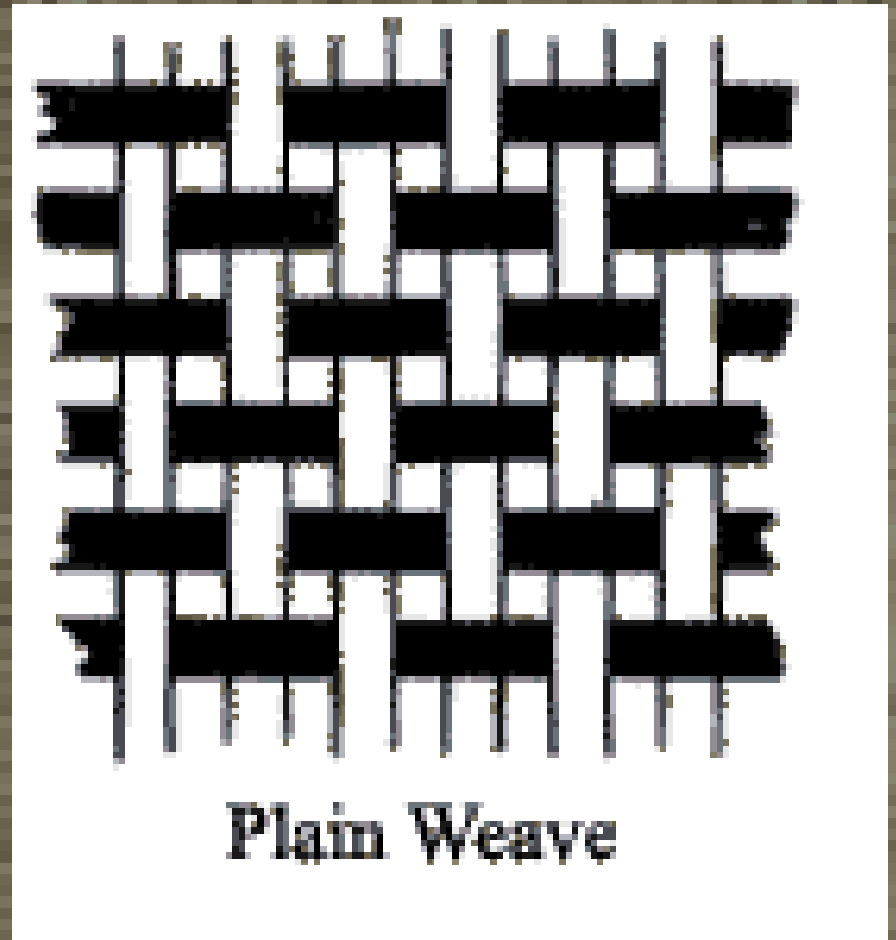
5 harness satin

4 Basic Weaves

- 1. Plain
- 2. Basket
- 3. Twill
- 4. Satin

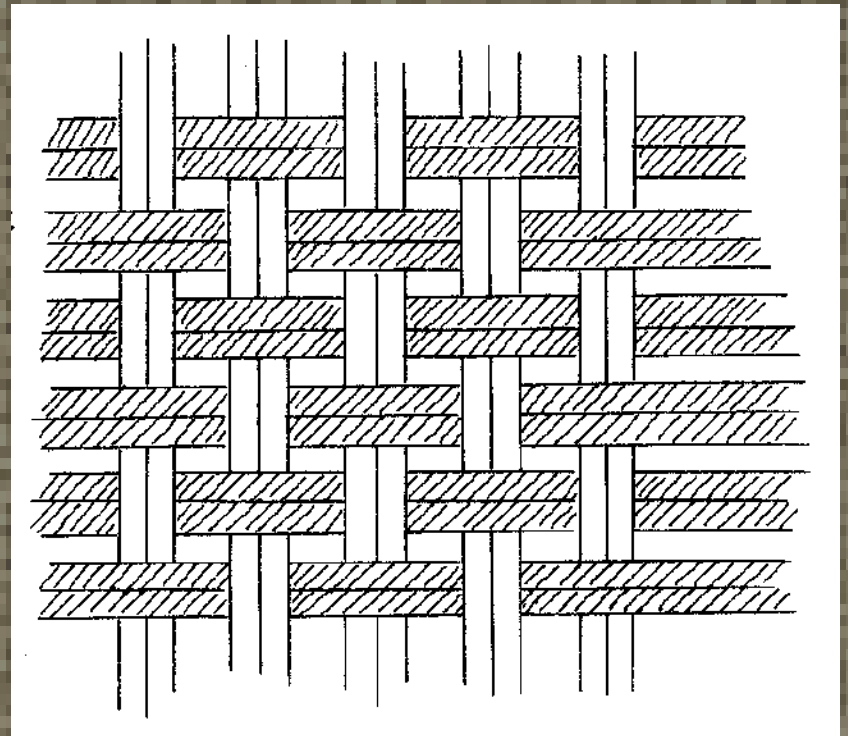
Plain Weave

- Plain weave is a simple over-under pattern. It can be identified by its checkered appearance.
- Examples of plain weave fabrics: Poplin, Chiffon, Taffeta, Grosgrain.



Basket Weave

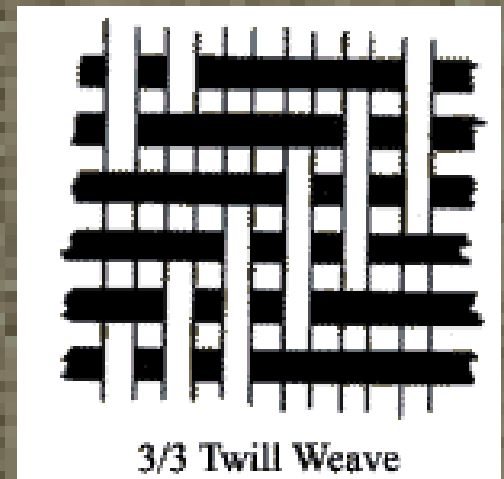
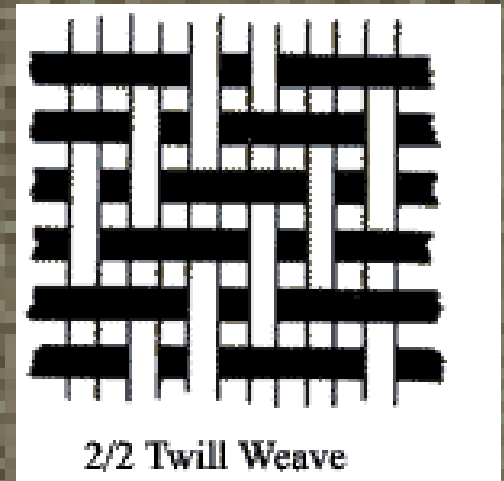
- Basket weave is a version of the plain weave. It is an over-under pattern created with an equal number of warp & weft yarns woven as a group.
- Basket weave fabrics include: canvas and oxford cloth.

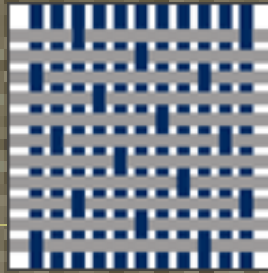


The image shown is a 2x2 basket weave. Most common are 2x2 or 4x4. Variations include 2x1 and 2x3.

Twill Weave

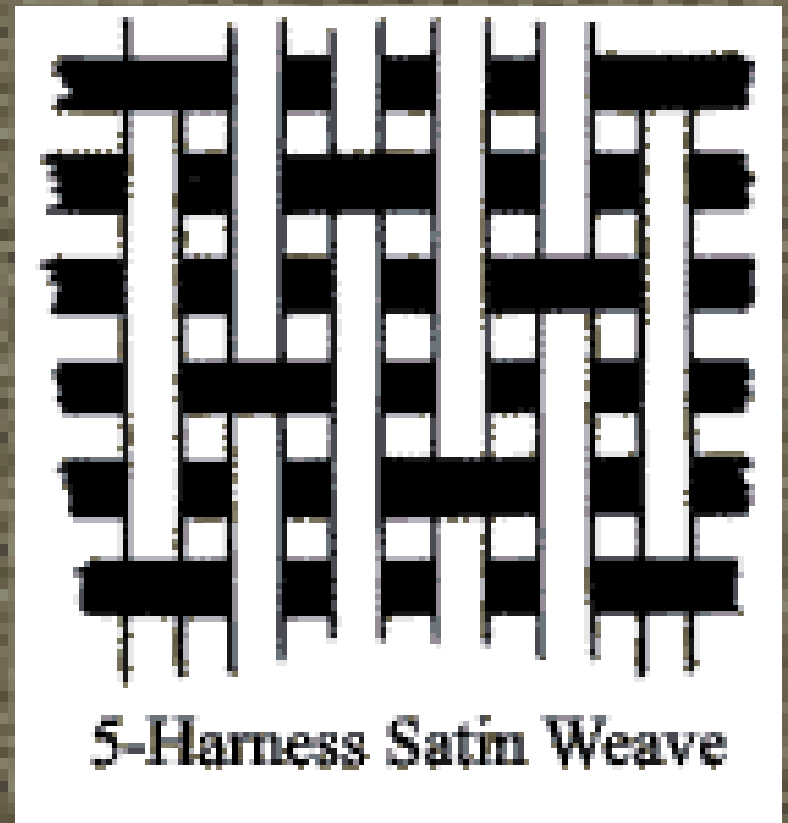
- A twill weave can be identified by its diagonal lines also called a wale.
- Created by each weft yarn floating across two or more warps with a progression of interlacing by one to the right or left.
- Examples of twill weave include: Denim, Herringbone, Houndstooth, Tweed.





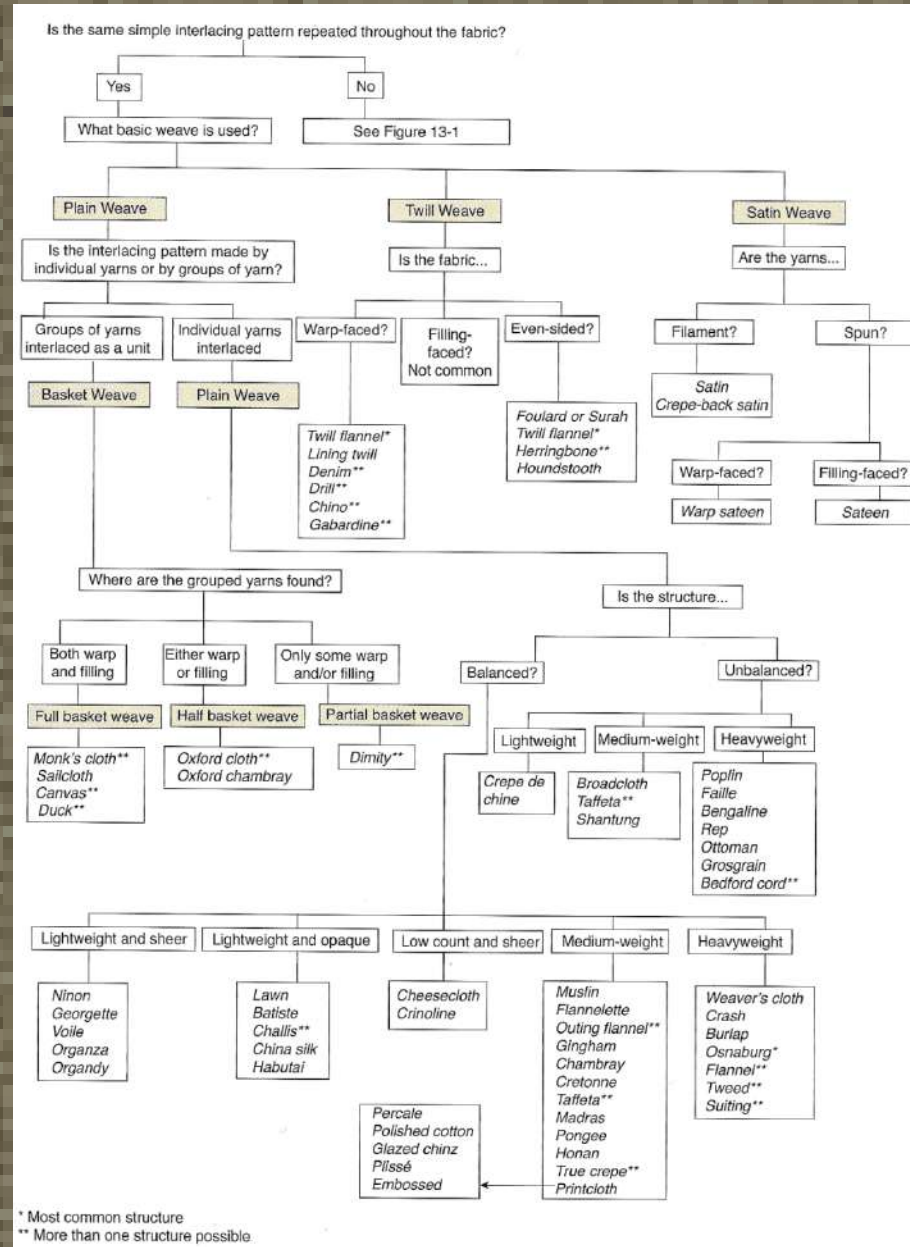
Satin Weave

- Satin weave is characterized by long floats of warp yarn. The warp yarn goes over four weft yarns before being woven under a single weft yarn. There is a simple 4 over, 1 under pattern.
- Satin fabric is made from long filament fibers in either polyester or silk.



Naming & Diagramming of Woven Fabrics are based on:

- Fabric Structure
- Fabric Weight
- Yarn Type
- Yarn Balance
- Finishes



History of Weaving



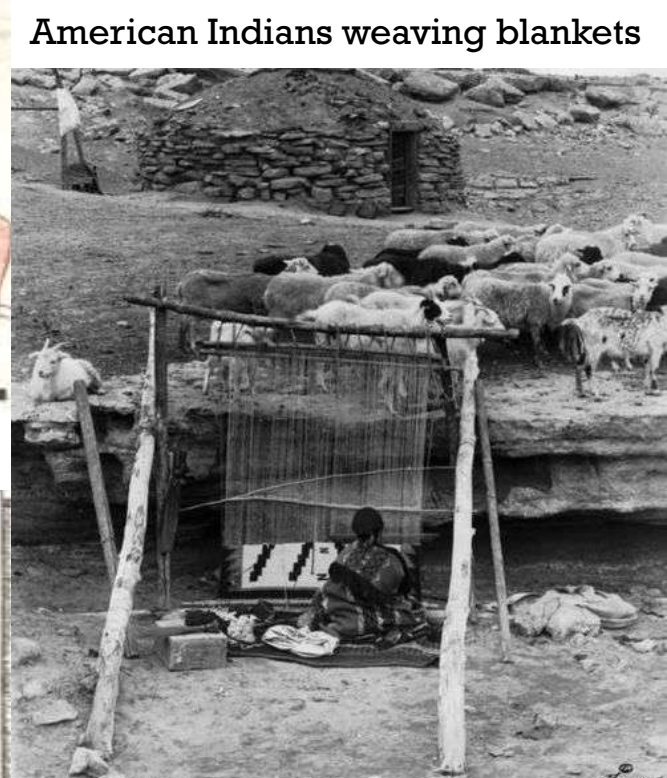
<https://www.youtube.com/watch?v=hhHjTNntxAQ>



Indian weaver preparing his warp



Egyptian slaves weaving



Middle Eastern woman and children weaving a rug



Indian weaver at a manual loom



Hawaiian lauhala weavings



African man weaving kente cloth



Egyptians

- Egyptians were weaving clothes using flax fibers as early as 5000BC.





Persians

● Ancient Persians were weaving carpets dating back 3500BC.



Pre-Contact Tribes in America: Navajo Blankets & Rugs

- Textile weaving was a dominant craft in the early 1000s. (AD)



"Teec Nos Pos"
(colorful, with
very extensive
patterns)



"Ganado"
(red dominated patterns
with black and white)



"Two Gray Hills"
(predominantly black
and white, with
traditional patterns)

African Cultures

- African people from Ghana and the Ivory Coast have been weaving Kente cloth since 1200s. All of the colors used in Kente cloth are symbolic.



Hawaiian Lauhala Weaving

- Hawaiians and the peoples of the Pacific have been performing Luahala weaving using the leaves of the Hala tree.



Europe & Modern-Day America

1733 - John Kay invented the flying shuttle.

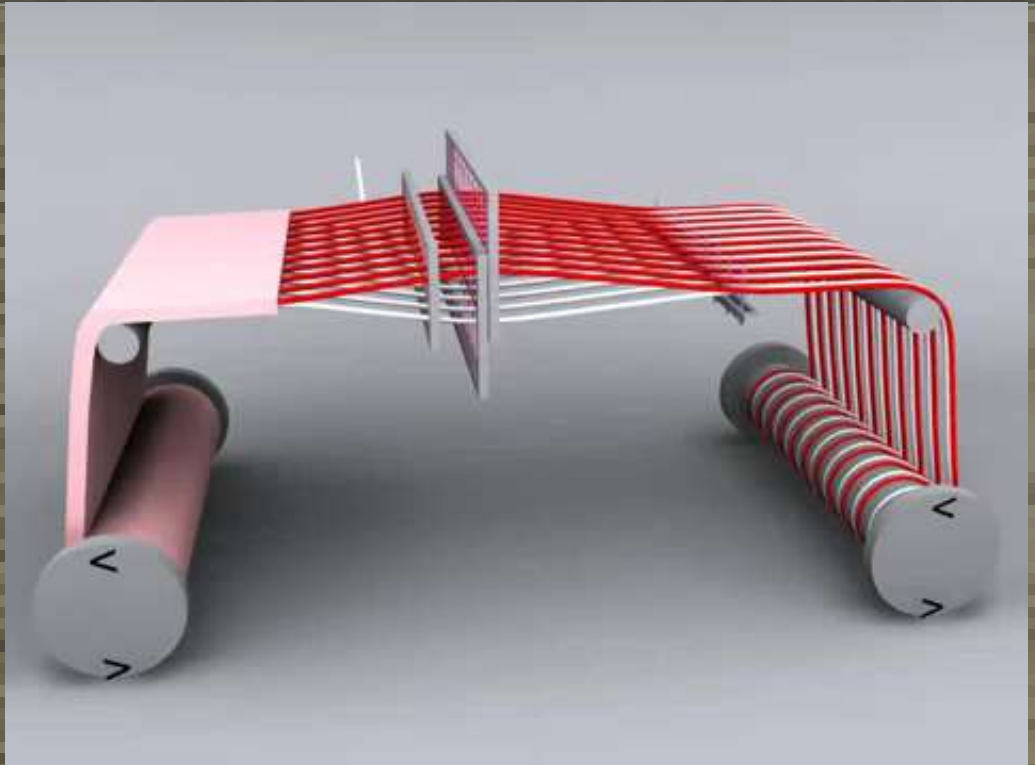
1764 - Spinning Jenny was invented.



Europe & Modern-Day America

- ◆ 1784 - Edmund Cartwright invented the first automatic loom.
- ◆ 1842 - Kenworthy & Bullough invented Lancashire Loom. (semi-automatic)
- ◆ 1842 - James Northrop invented a fully-automatic Northrop Loom with self-feeding shuttle.
- ◆ 1942 to present – The invention of automatic and shuttle less looms.

Weaving (on a loom) Process



<https://www.youtube.com/watch?v=ogjhvOuKLR8>

Weaving Process

5 Basic Steps:

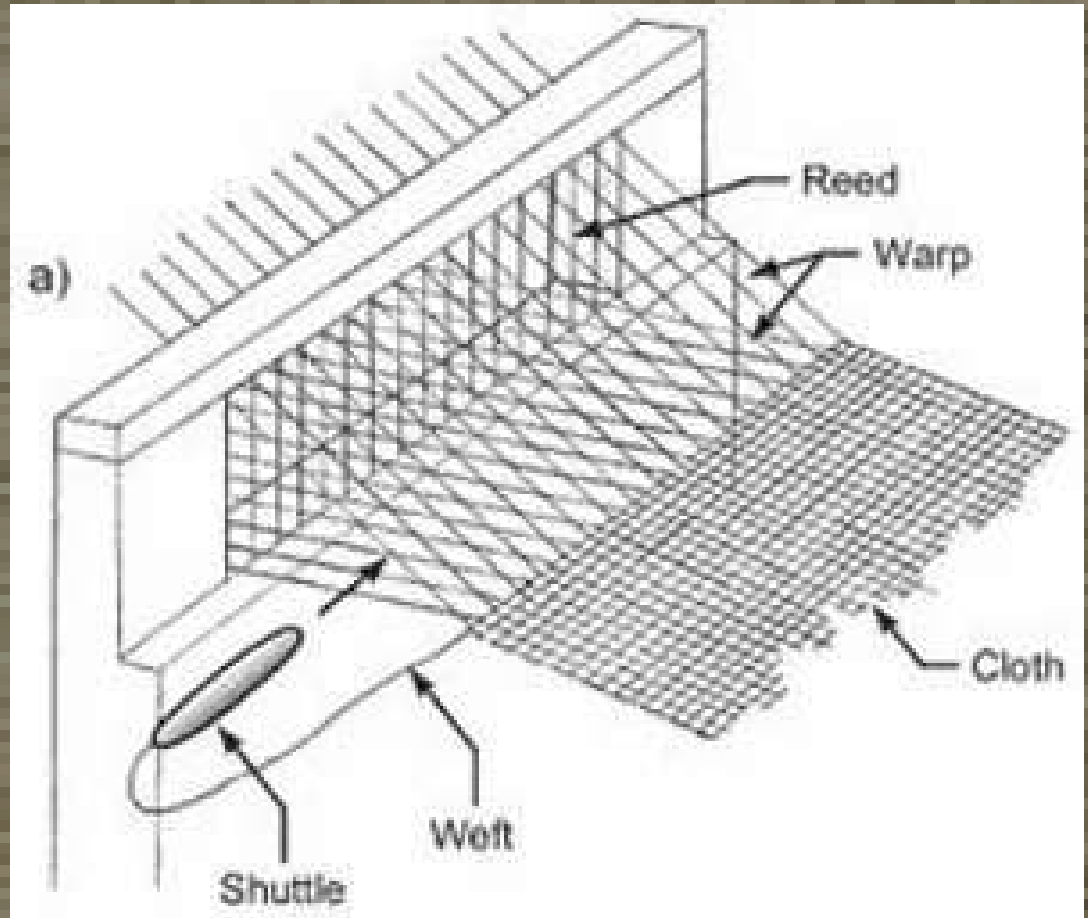
1. Shedding

2. Picking

3. Beating-Up

4. Left Off

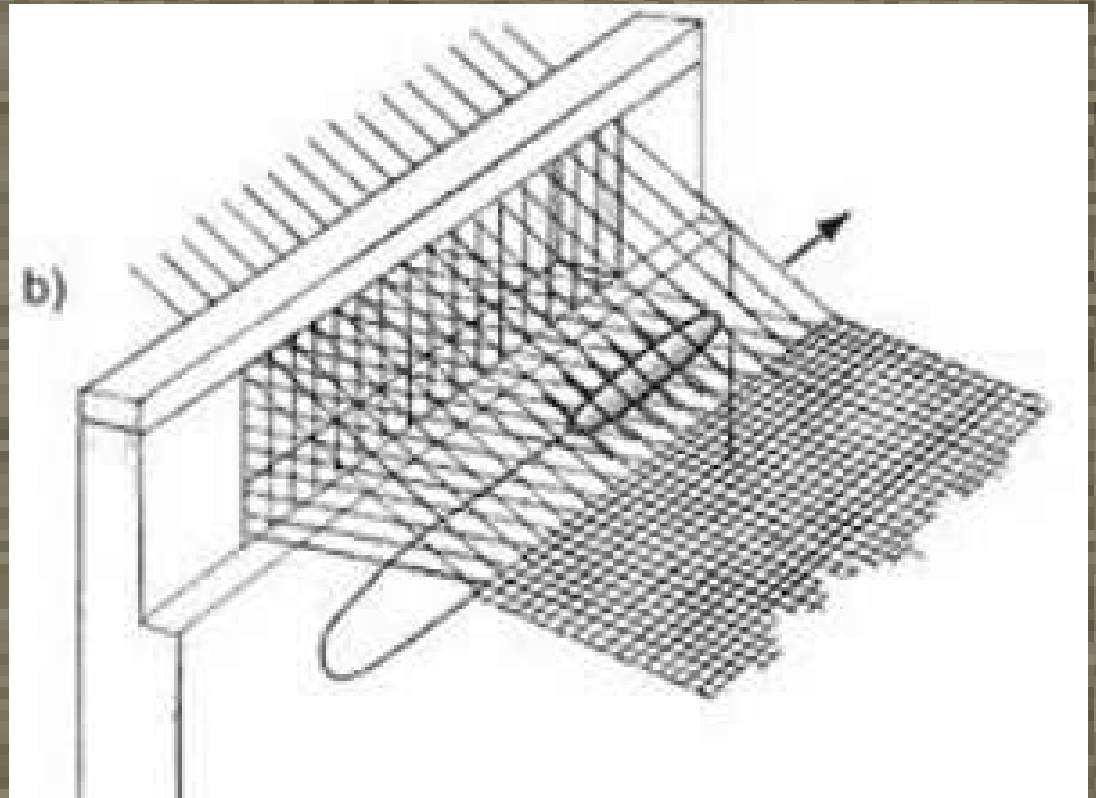
5. Take-Up



Weaving Process

5 Basic Steps:

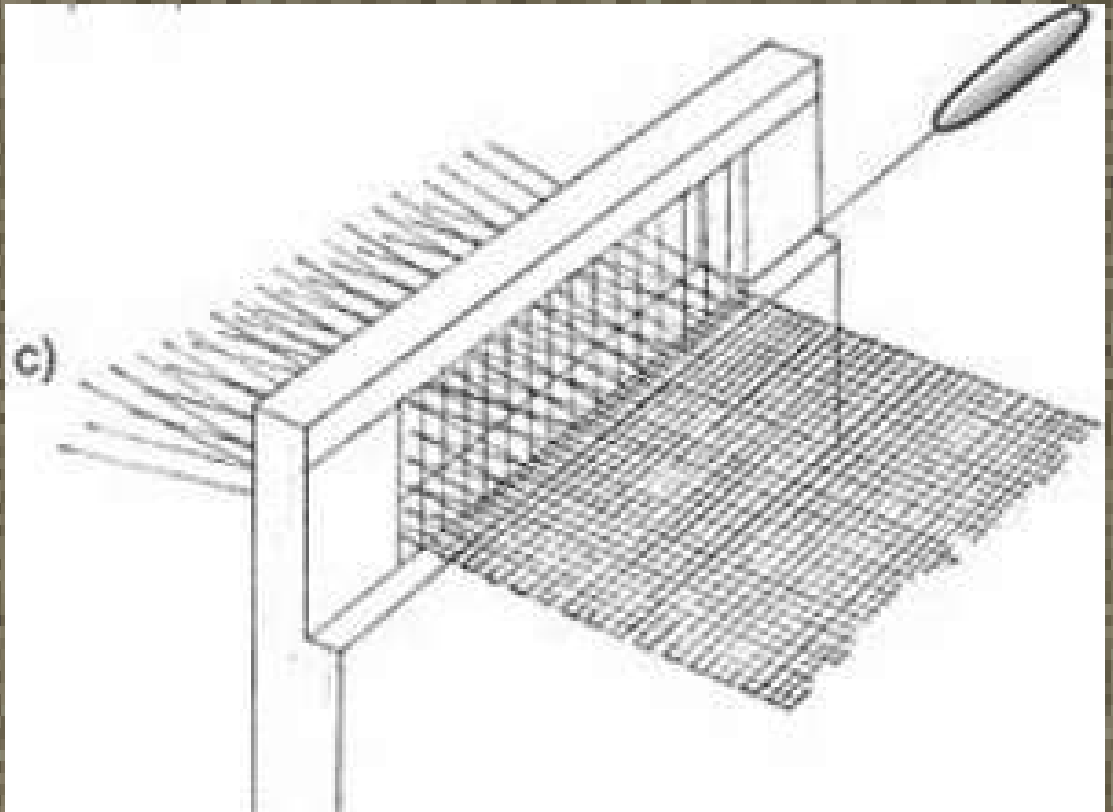
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Weaving Process

5 Basic Steps:

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Weaving Process

5 Basic Steps:

1. Shedding
2. Picking
3. Beating-Up
4. Left Off
5. Take-Up

4. The warp yarns are unwound from the warp beam during the above three processes.

5. Then the woven fabric is wound on the cloth beam during the above three processes.

RESOURCES

<http://www.tikp.co.uk/knowledge/technology/warping-and-weaving/>