NIOS lesson adaptation project

by Embrace Volunteers

(A community initiative of Harchan Foundation Trust)

CHAPTER -10

FIBRE TO FABRIC

This project is aimed at supporting children with different needs. Information provided is adapted to the best of knowledge by the volunteers. For complete information please refer to the NIOS resources in https://www.nios.ac.in/online-course-material/secondary-courses.aspx.

K - What does the child KNOW	W - What does the child WANT to know	L - What has the child LEARNT
	Fibres – Natural and man-made	
	Characteristics of fibres	
	Types and source of fibres	
	Types of Novelty yarns	
	Weaving and knitting – Different types of weaves	

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Keywords and meanings

KEYWORD	MEANING
Ornamental	decorative
Porous	Something has many small holes in it, which water and air can pass through
Absorbent	(of a material) able to soak up liquid easily.
Distinguished	dignified and noble in appearance or manner.
Synthetic	Made by chemical synthetic
Weave	Form by interlacing a long thread passing in one direction with others.

FIBRE

SOURCES

- Natural
- Man-made

LENGTH

- Long
- Short

Characteristics

Fabrics-wise

- Cotton
- Flax
- Jute
- Wool
- Silk
- Rayon
- Synthetic

Identification

1) By visual test and feel of the fabric

2) By using Burning Test

FIBRE

NATURAL

Cellulosic fibre: Obtained from plants.

Cotton Balls

Protein fibres: Obtained from animal sources.

Silk worm

MAN-MADE

Regenerated fibre: Small cotton fibres are dissolved in chemicals and converted into solid fibres.

Synthetic fibres: are made using petrochemical products.

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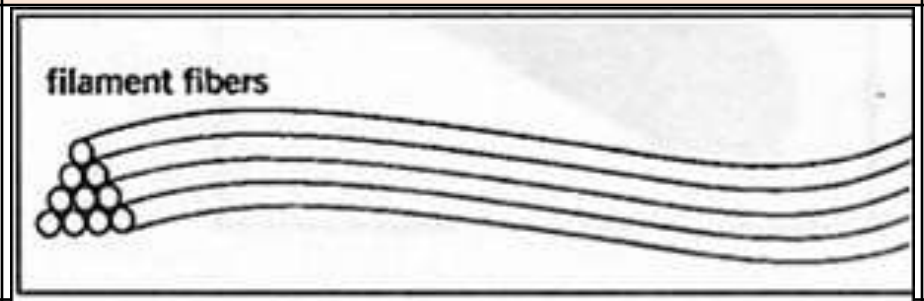
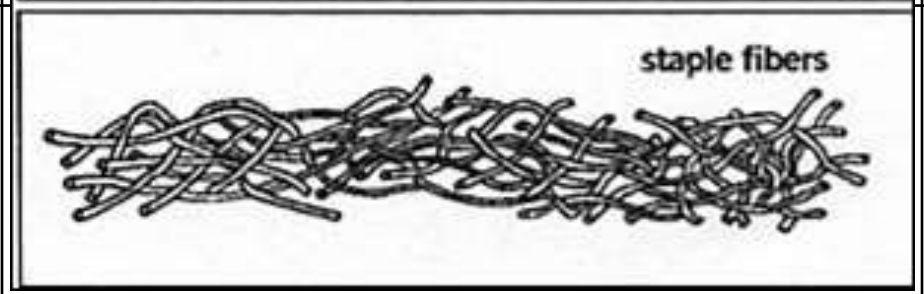
DEFINITION: ***A fibre is a fine hair-like strand and is the basic unit of textiles from which we make yarns and then the fabric.***

Classification according to the Length of Fibres

	Length of fibre	*Class*	*Appearance*	*Unit of Measurement*
FIBRE LENGTH	**Long**	**Filament fibres**		**Yards/metres**
	Short	**Staple fibres**		**Inches/ centimetres**

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Types of fibres	Name of fibre	Sources
NATURAL FIBRES		
Plants (cellulosic)	cotton	Cotton ball
	linen	Bark of flax stalk
Animal (protein)	wool	Hair of sheep, goat, rabbit, llama, etc.,
	silk	Silk worm
MAN-MADE FIBRES/ MANUFACTURED		
Regenerated	Rayon (viscose, acetate)	Cotton linters or wood pulp + chemicals
Synthetic	Nylon	chemicals
	Polyester	chemicals
	acrylic	chemicals

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Fibre	Characteristics
Cotton	• Cotton fabrics are absorbent, porous and cool and allow the body heat to go out. • Fabric made out of it are strong, durable, and easy-to-wash and used in summer-wear. E.g., dresses, sarees, towels and bedspreads. • It wrinkles very easily.
Flax	• It is a **'bast fibre',** and fabric made from it is called linen. • The fabric is suitable for summer-wear. E.g., shirts, saree • It wrinkles easily.
Jute	• Is also a **'bast fibre'.** • The fibres are hairy and rough. • It is used for making gunny bags and slippers.
Wool	• Is obtained from the fleece of goats, sheep, rabbits, etc., • Fabric made out it is used for winter-wear. E.g., sweaters, shawls, coats.






Fibre	Characteristics
Silk	• Is a natural, protein filament produced by silk worm. • Fabric made out of this fibre is used for formal wear. E.g., Shirts, Sarees, Kurtas. • It is called **"Queen of the fibres".**
Rayon	• Man-made filament fibre. • It's also called **'artificial silk'** or **'art silk'** • They are **'thermoplastic'** in nature, i.e., they are heat sensitive and melt easily. • The fabric used to make shirts & pants and other dresses.
Synthetic	• Made from petroleum products, E.g., nylon, polyester, acrylic, etc. • These are also **'thermoplastic'** in nature. • Fabrics made out of this, do not wrinkle. E.g., Dress material, sarees

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Identification of fibres by visual test and feel of the fabric

Fibres	*Appearance*	*Touch*	*Feel*	*Care required*
Cotton	Dull in appearance but lustrous when starched	Feels smooth and soft to touch	Gives a cool feeling	Wrinkles easily more, if it is starched
Linen	Low to medium luster	Soft and smooth texture	Gives a warm feeling	Wrinkles easily
Jute	Dull	Rough and hairy texture	Gives a warm and rough feeling	Does not wrinkle easily
Wool	Medium to low luster; poor quality has no luster	Soft, smooth and absorbent; also bulky to look at	Warm to touch	Does not wrinkle easily

Identification of fibres by visual test and feel of the fabric – (2)

Fibres	*Appearance*	*Touch*	*Feel*	*Care required*
Silk	Delicate looking and lustrous	Smooth, soft and light	Warm to touch	Does not wrinkle easily
Rayon	Can be lustrous or without it	Soft and shiny, but heavier than silk	Gives cool feeling	Wrinkles easily
Synthetic fibres	Can be dull or semi-dull or lustrous acrylic fibres look like wool	Heat sensitive soften and melt on application of heat	Most fabrics feel warm	Able to withstand friction and do not wrinkle, hence easy to care

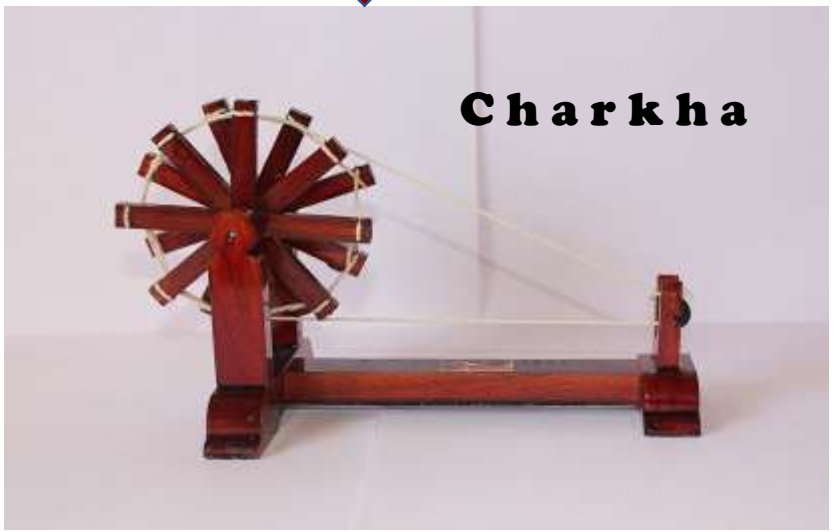
Identification of fibres using Burning Test

Fibres	*Near flame*	*Type of burning/flame*	*Odour of burning*	*Residue*
Cellulosic fibres – cotton, linen, jute, rayon, etc.,	Catches fire easily	Continue to burn with a bright flame; have an afterglow.	Burning paper-like smell	Light, feathery, greyish/black smooth ash
Protein fibres – wool, silk	Smolder and burn	Slow flickering flame; sizzle and curl.	Burning hair or feather-like smell	silk- crisp, dark ash; wool- dark, irregular, crushable bead
Synthetic fibres – nylon, polyester, acrylic, etc.,	Shrink on approaching flame.	Soften, melt on approaching flame.	Mixed smell of chemicals.	hard, black, uncrushable bead.

Process of Yarn making

SPINNING

TRADITIONAL



MACHINE

STEPS FOR MAKING YARNS

1. Cleaning
2. Carding
3. Combing
4. Spinning
5. Winding

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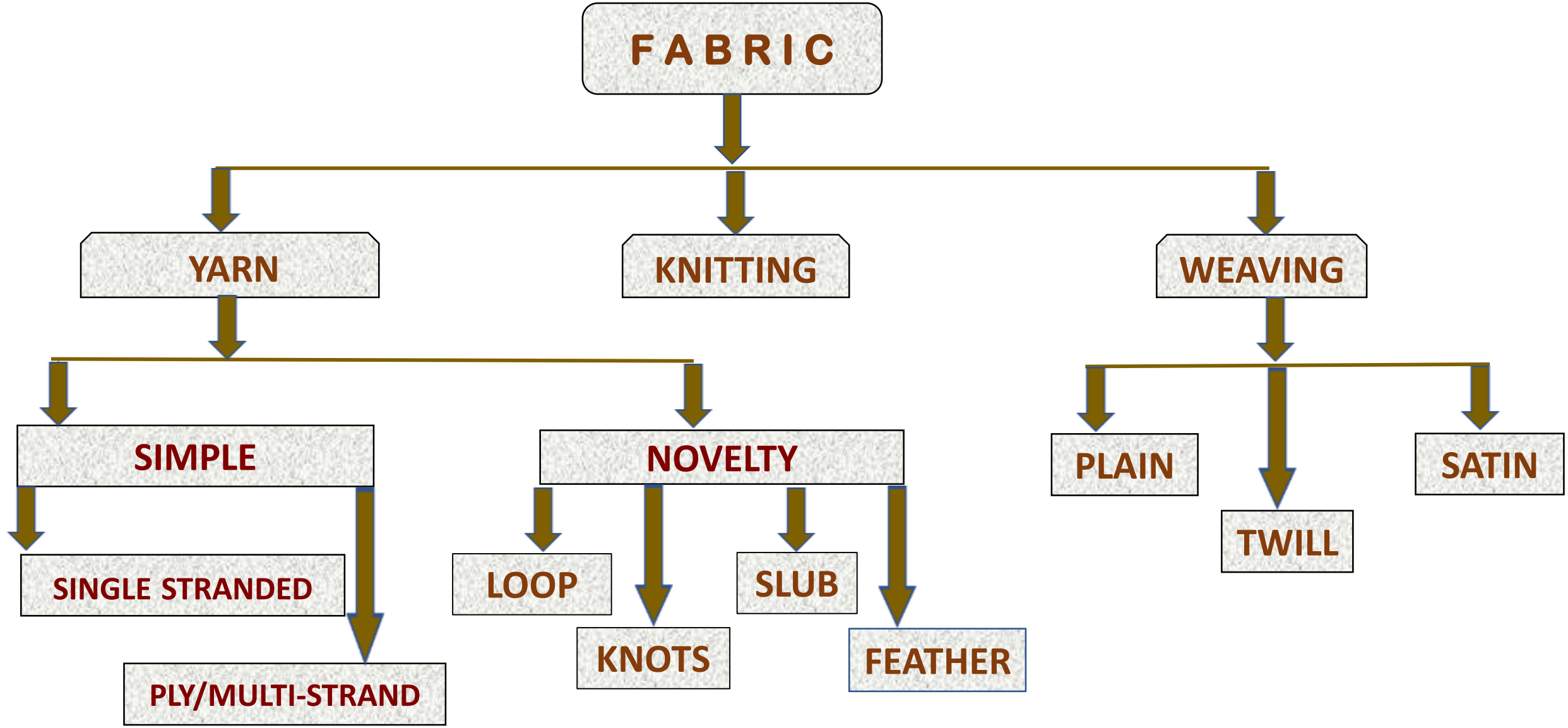


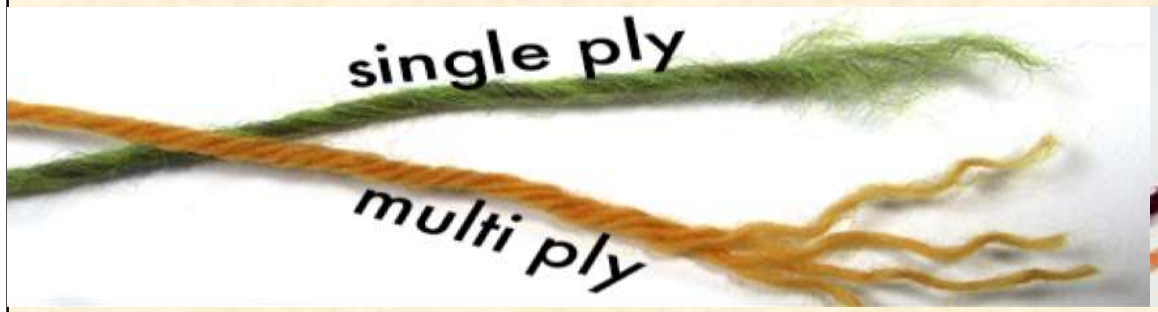
Classification of Yarns

Yarns are classified into 2 groups, Simple and Novelty.

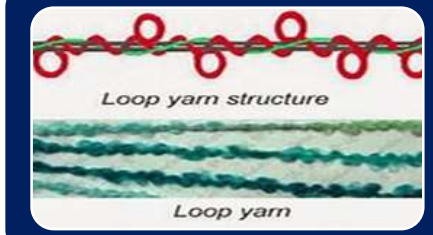
Simple Yarns: Has uniform thickness, smooth surface and equal number of twists per inch along its length. It is used for making standard fabric for clothing and household use.

Single strand: fine quality single strand is used for constructing light-weight and fine fabrics. Thick and rough quality single strand is used for making thick fabrics.

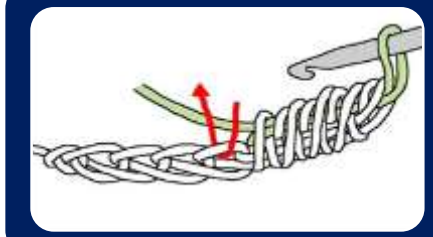
Ply yarn: These can be termed as two-ply, three-ply and so on, according to the number of strands used in the construction. These are more durable than simple yarns.



Types of Novelty Yarns



Loop yarn has loops, placed continuously along its length.
Example:- woolens



Knots/knops are made along the length of a yarn.
Example:- woolen and scarves

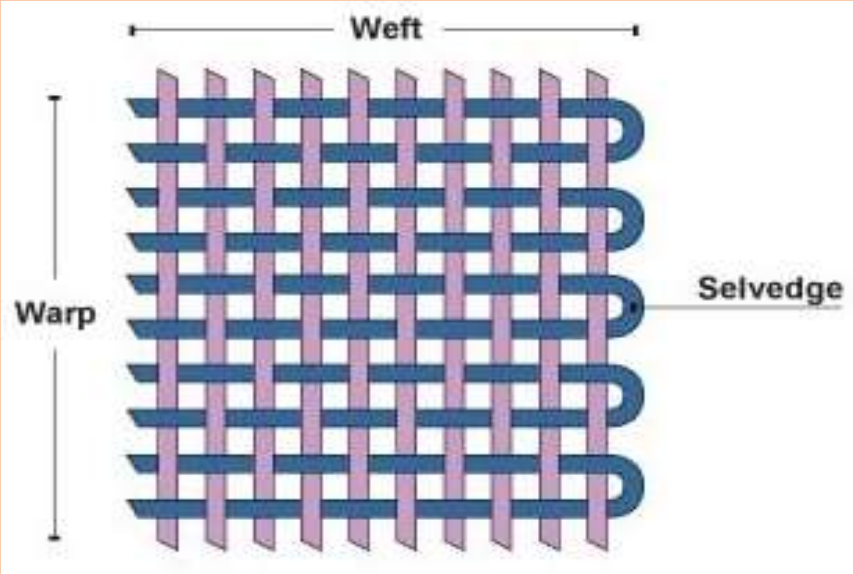
Slub yarns have ornamental effects in the form of soft untwisted (thick and thin) and twisted areas at frequent intervals throughout the length. Example:- curtains.

Feather yarn also called chenille yarns, these have soft and fuzzy surface. Example:- rugs

FABRIC

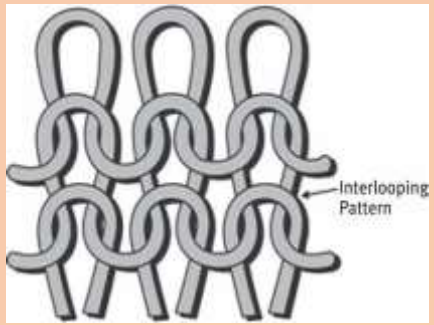
WEAVING

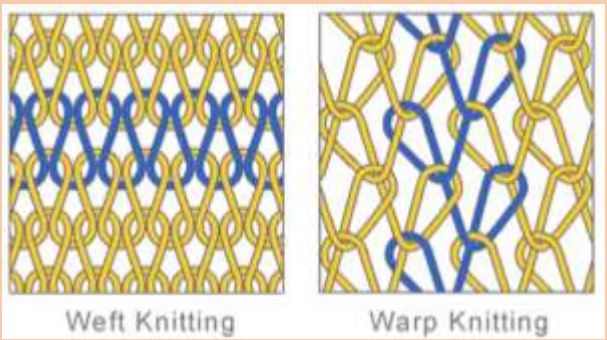
- Interlacing of two sets of yarns
- Warp and weft at 90 angles to each other
- Straight yarns are known as **warp** yarns
- Horizontal yarns are known as **weft** yarns
- The end yarns are woven densely and is named as **selvedge**

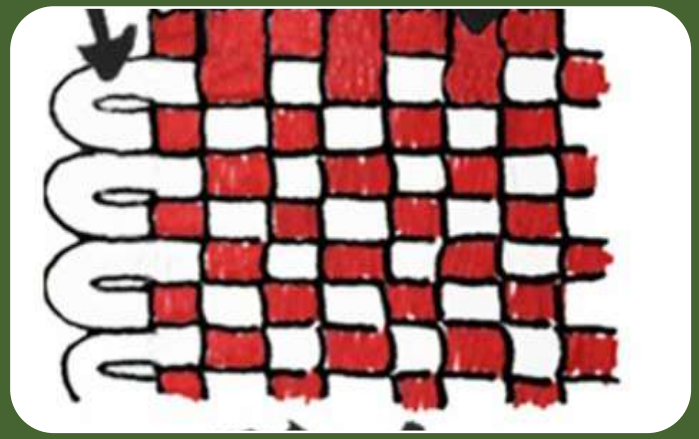


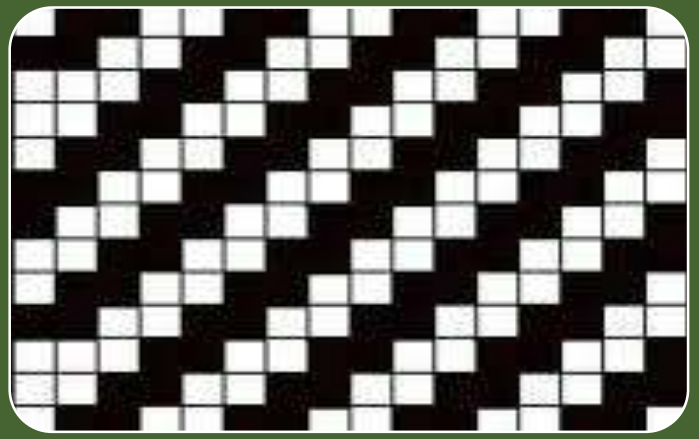
KNITTING

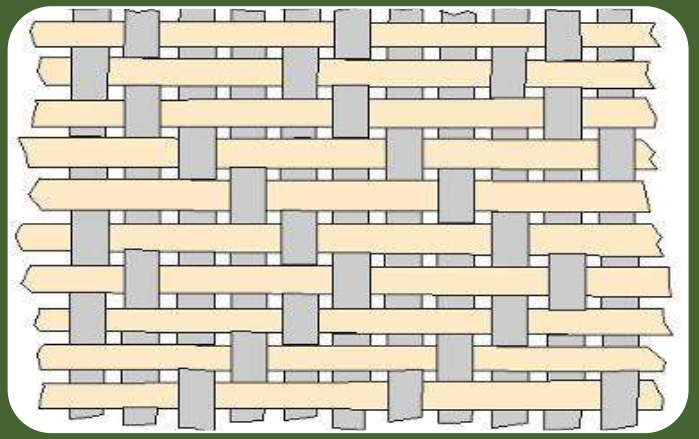
- It is the process of formation of loops of yarns
- and drawing of new loops through those formed previously (**interlooping**)
- **Weft knitting** can be done by hand and machines. E.g., sweaters, T-shirts & socks.
- **Warp knitting** can be done **only on machines**. E.g., casual wear, bedsheets, blankets.











Plain weave:

- also known as homespun, tabby or taffeta weave.
- one weft yarn alternatively moves over one and under another warp yarn.
- It is inexpensive weave, suitable for printing and embroideries.

E.g., muslin, cambric, organdie, poplin, voile, etc.,

Twill weave:

- It is woven on 3 or 4 harness loom.
- one weft yearn moves over two and under one warp yarn.
- Distinguished by a continuous diagonal line called ***wale.***
- Twill weave is suitable for work clothes because it is woven tightly.

E.g., gabardine, denim, jean, etc.,

Satin weave:

- It is woven on 5 to 12 harness loom.
- It differs from Twill weave as it has long yarns floating on the surface, and there is no design visible on the face of the fabric.
- Fabric woven in this weave are suitable for making formal wear garments.

List of Volunteers
Embrace-NIOS lesson adaptation project
(A community initiative of Harchan Foundation Trust)

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U R Ls of images used in this presentation

Slide No.	Subject	U R L
6	Cotton balls	http://static.en.ch-rh.com/img/yw_004.jpg?k=1601272421000
	Silk worm	https://kj1bcdn.b-cdn.net/media/37224/download-1.jpg
	Regenerated fibre	https://images.reference.com/reference-production-images/question/aq/viscose-fabric_28b138acf09cc5c7.jpg?width=760&height=411&fit=crop
	Synthetic fibre	https://img.diytrade.com/cdimg/1320244/16970321/1/1289202844/recycled_polyester_staple_fiber.jpg
7	Appearance	https://centrefrontstudio.co.uk/wp-content/uploads/2017/06/filament-and-staple.png
8	Flax to linen	https://i.pinimg.com/originals/bc/d1/4f/bcd14fddf3ced282885a30ef086b4363.jpg
	Hair of sheep	https://i.ytimg.com/vi/e7z8UBZLexc/maxresdefault.jpg
	Regenerated fibre	http://emadara.com/wp-content/uploads/2017/03/kataloug_new_sort_8-11-93_pd_Page_23-500x500.jpg
9	Cotton fabric	https://ae01.alicdn.com/kf/UTB8GmB_kSnEXKJk43Ubq6zLppXaB/small-flowers-thin-cotton-fabric-navy-color-flowers-print-cotton-fabric-women-kids-dress-cotton-tissue.jpg
	Flax	https://ae01.alicdn.com/kf/HTB10C4qMXXXXXcBaXXXq6xXFXXXU/2017-New-Men-s-Shirt-Casual-Short-Sleeve-Linen-Shirts-Comfortable-Summer-stand-collar-shirts.jpg
	Jute	https://4.imimg.com/data4/SC/KI/MY-9916889/jute-shoes-500x500.jpg
	Woollen sweater	https://i.ebayimg.com/images/g/QCQAAOSwFz9eXPlv/s-l640.jpg
	Woollen shawl	https://i.pinimg.com/736x/c7/99/fa/c799fa7876e952ff1c5ca6f861ec55e6.jpg

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Slide No.	Subject	URL
10	Silk Saree	https://cdn.sareeka.com/image/cache/data2018/silk-stone-work-work-trendy-saree-80734-800x1100.jpg
	Rayon fabric	https://i.pinimg.com/originals/b2/c2/b9/b2c2b913790a5ef7d1442a24e271d399.jpg
	Synthetic fabric	https://familycasual.s3.amazonaws.com/Alpha/2015/M610SW_30.jpg
14	Chakra	https://organichook.com/wp-content/uploads/2019/05/81Jv4nEXFJL._SL1500_.jpg
16	Classification of yarns	https://www.marlentextiles.com/cmss_files/attachmentlibrary/ply.png https://www.tinkingturtle.com/wp-content/uploads/2015/09/yarnweight2-6.jpg
17	Loop yarn	http://4.bp.blogspot.com/-Z-kr4KFFrLE/VESPwj1SU0I/AAAAAAAABKU/o85HNLPkqG4/s1600/Loop-yarn.jpg
	Knots/knops	https://i.pinimg.com/736x/f2/b2/2f/f2b22f3c047b7be90811c415dc5abce2--crochet-cord-crochet-stitches.jpg
	Slub yarns	https://image.ec21.com/image/yunyun9860/OF0005248193_1/Sell_wool_slub_yarn.jpg
	Feather yarn	https://i.pinimg.com/originals/20/bb/30/20bb3093bffade7f0c28299a82736adb.jpg
18	weaving	https://1.bp.blogspot.com/-vv6oNv3jx8M/XDBRnbjhNeI/AAAAAAAAleg/FoGw29aepOE2-UjIs9hId_OquT_DlfjIQCLcBGAs/w1200-h630-p-k-no-nu/fabric%2Bconstruction.jpg
	Knitting - interlooping	https://www.degruyter.com/view/j/psr.2016.1.issue-7/psr-2016-0024/graphic/j_psr-2016-0024_fig_011.jpg
	Weft and warp knitting	https://2.bp.blogspot.com/-W3l86j6dO-g/WnG2-q4QwQI/AAAAAAAAiYU/ig20oI7XZl4092mkLc4f9YlpEkeeQIz5ACLcBGAs/ s1600/Warp-%2Band%2B%2528b%2529%2Bweft-knitted%2Bstructures.jpg

Slide No.	Subject	URL
19	Plain weave	https://64.media.tumblr.com/83e3bc4cb695e2183f4a18756caeb9df/tumblr_inline_mj7w4sQuy01reb5bc.png
	Twill weave	https://texnoteblog.files.wordpress.com/2013/09/download5.jpg
	Satin weave	http://www.fibermax.eu/index_files/image2482.jpg
20	Thank you	https://bellasunshinedesigns.com/wp-content/uploads/2017/05/satin.jpg

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