NIOS lesson adaptation project

By EMBRACE Volunteers

(A community initiative of Harchan Foundation Trust)

Chapter 10

FIBRE TO FABRICS

(Printable Version)

- **Simplified Lesson**
- **Previous Year Questions with Answers**
- **Terminal Questions**

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LESSON 10

FIBRE TO FABRICS

CONTENTS

1. **FUNCTION OF CLOTHING AND HOUSEHOLD USES OF FABRICS:**
   - Clothes enhance our personality. It defines a person's habits, taste, social status, behaviour, etc.,
   - Clothing is influenced by season, climate, age, occasion, marital status, gender, community, feelings, etc.,
   - Apart from clothing, fabrics are also used in the house for furnishing, upholstery, kitchen needs, dusting, cleaning, etc.,

2. **Fibres and it's Classification:**
   - Fibre is the basic unit of fabric. A fibre is a fine hair-like strand and is the basic unit of textiles. Fibre can be obtained either through **Natural sources** or through **Man-made fibres.**
   - Fibres obtained from **Natural sources** can be classified as **(a) Natural fibre–** from**plant source** called **cellulosic fibre,** e.g., cotton and linen, and (b) **animal sources** called **protein fibres,** e.g., wool and silk.
   - **Man-made fibres**are made in laboratories using chemicals, which can be classified as
     (a) Regenerated fibres, made from extremely small cotton fibres or any other fibre such as wood pulp, milk protein, etc., and
     (b) Synthetic fibres, using petrochemical products, e.g., nylon, acrylic, polyester.
   - Fibre is also classified based on their length. Short-length fibres are called **staple fibres.** E.g., cotton, wool and linen, and long fibres are known as **filaments.** E.g., silk and all man-made fibres.
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3. **COMMON CHARACTERISTICS OF DIFFERENT FIBRES:**

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.
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

Identification of fibers 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.

4. YARNS, YARN-MAKING AND FABRIC CONSTRUCTION:

A **Yarn** is a long, continuous length of interlocked fibres. Strands of fibres are brought closer to each other by **twisting** to impart strength to the fibre strand, which is then termed as a **yarn,** which is then twisted into a **thread** to be used for sewing, embroidery etc.,

Yarn is made by **spinning,** which is the process whereby a group of fibres is pulled, drawn and twisted together. Spinning can either be **manual**, like charkha or can be by usage of **machine**, involving various steps like cleaning, carding, combing, spinning and winding, which is then packaged into balls, reels, hanks, cones, etc.

Yarns may be classified into two groups: (i) **simple yarns,** out of which most standard fabrics for clothing and house hold use are made,and **(ii) novelty yarns,** which are given different names, depending on their appearance like **loop yarn, knot yarn, slub yarn, feather yarn, etc.,** The appearance of the yarn decides their purpose of usage.

5. FABRIC:

Fabricis a pliable, strong sheet made from fibres or yarns. E.g., poplin, khaddar, mulmul, denim, rubia, terricot, etc. **Weaving** and **knitting** are the two most popular methods of fabric construction.

Weaving involves interlacing of two sets of yarns – **warp** and **weft** at 90 degree angles to each other, and the portion of end yarns which are woven very densely us named as **selvedge. Weaving** gives a firm fabric which do not stretch and are thus easy to handle and to print and embroider.

Weaves are broadly classified as **basic** and **novelty weaves.**

Most of the fabrics are produced in **basic weaves,** which are of three types, based on their construction, viz., – **plain, twill and satin.**

Plain weave: Maximum production of fabric is done in plain weave because it is inexpensive and most suitable for printing and embroideries. E.g., muslin, cambric, handspun, khaddar, voile, etc.

Twill weave: is distinguished by its continuous diagonal line called **wale.** It is suitable for work clothes and for men's clothes. E.g., gabardine, denim, jean, etc.

Satin weave: has a smooth and shiny surface but no design is visible on the surface of the fabric. Fabric woven in this weave is suitable for making formal wear garments. Satin fabric is an example of **satin weave.**

6. **KNITTING:**

Knitting is the process of formation of loops of yarns and drawing of new loops through those formed previously (**interlooping**). While **weft-knitting** can be done by hand or machine (to make sweaters, T-shirts, sock, etc.,), **warp-knitting** is possible only on machines.

PREVIOUS YEARS QUESTIONS

1 Mark Questions:

1.Twill weave gives the fabric: **1**

(a) Linen **(c) Sheen**
(b) Strength **(d) lustre**
Answer: b

2. Which of the following is NOT a natural fibre? **1**

(a) Silk **(c) cotton**
(b) Nylon **(d) wool**
Answer: b

1

3.This fibre is called the Queen of all fibres:

(a) Jute **(b) Silk**
(c) Cotton **(d) Wool**
Answer: b

1

4. Which weave is used to make cambric fabric?

(a) Twill **(b) Plain**
(c) Satin **(d) Sateen**
Answer: b

1

5. Which of the following is a cotton fabric?

(a) Poplin **(b) Crepe**
(c) Satin **(d) None of the above**
Answer: d

6.Muslin is a fabric which is **1**

(a)Lightweightand loosely woven **(b) Transparent and crisp**
(c) Heavy weight and thick **(d) Medium weight and plain**

Answer: b

1

7.An example of Regenerated fibre

(a) Silk **(b) Polyester**

(c) Rayon **(d) Wool**

Answer: c

8.Cellulosic fibres are obtained from **1**

(a) Plants **(b) Animals**

(c) Petrochemical products **(d) Metals**

Answer: a

9.Your mother made a sweater for you. Which technique did she use in it?

1

(a) Warp knitting **(b) Weft knitting**

(c) Felting **(d) Weaving**

Answer: b

1

10.Which fabric does not wrinkle easily

(a) Linen **(b) Silk**

(c) Rayon **(d) Cotton**

Answer: c

2 Marks questions:

1. What are cellulosic fibres? Give two examples of such fibres. **2**

Fibres obtained from plant source are called cellulosic fibres. E.g., cotton, linen

2.Differentiate between 'Slub yarns' and 'Feather yarns' **2**

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

Feather yarns: These have soft and fuzzy surface. E.g., rugs

3.Why do we prefer wearing cotton undergarments **2**

We prefer wearing cotton undergarments because they are cool and porous and allow the body heat to go out.

4. Give two examples of Protein fibres. **2**

The fibres that come from animal sources are known as protein fibres. E.g., wool, silk.

5. What are staple fibres? Give two examples of such fibres **2**

The fibres are classified as short or long. The short length fibres are called staple fibres. E.g., cotton, wool.

6. Write one advantage and one disadvantage of wearing clothes made of synthetic fibres. **2**

The advantage of wearing clothes made of synthetic fibres is that they have good strength and are easy to wash and dry quickly.
The disadvantage is that these fibres catch fire easily and can stick to the body.

7. What are filament fibres? Give two examples of such fibres **2**

Filament fibers refer to fibers of long continuous lengths, while staple fibers refer to those of shorter lengths. Synthetic fibers, such as nylon and polyester, are considered filament fibers.

8. What are the characteristics of thermoplastic fibres? Give its one example **2**

Thermoplastic fibres are synthetic fibres made from petroleum products. These fibres catch fire easily and can stick to the body. But these fabrics have good strength and are easy to care and maintain.

9. Define knitting. Give one example of a knitted product **2**

Knitting is the process of formation of loops of yarns and drawing of new loops through those formed previously (interlooping). E.g., sweaters, T-shirts, socks

10.Give two characteristics of twill weave **2**

Twill weave is woven on 3 to 4 harness loop. In this, one weft yarn moves over two and under one warp yarn.

3 Marks questions:

1. How is twill weave different from plain weave? Give one example each of the fabrics woven using these two weaves. **3**

Plain weave is the easiest weave where one weft yarn alternatively moves over one and under one warp yarn. It is an inexpensive weave. E.g., khaddar,

Whereas in Twill weave one weft yarn moves over two and under one warp yarn. Twill weave is woven tightly, and suitable for work clothes. E.g., denim.

2. Why is cotton considered the most suitable for summer wear and undergarments? Give three points. **3**

Cotton fabrics are absorbent, porous and cool and allow the body heat to go out. They are strong, durable and easy to wash.

Give three difference between plain weave and twill weave. **3**

- Plain weave is the easiest weave where one weft yarn alternatively moves over one and under one warp yarn.
- Maximum production of fabric is done in plain weave.
- It is an inexpensive weave.

Whereas

- In Twill weave one weft yarn moves over two and under one warp yarn.
- Twill weave is woven tightly, and suitable for work clothes.
- Variation in diagonal lines produces various designs of twill.

3.What are regenerated and synthetic fibres? Give one example each **3**

Regenerated fibres are made from cotton linters or wood pulp and chemicals. E.g., Rayon.

Synthetic fibres are made from petrochemical products. E.g., Nylon

4 Marks questions:

1.How many harnesses are required to weave twill weave? Give its main characteristics? Also give one example of fabrics woven using this weave. **4**

Twill weave is woven on 3 to 4 harness looms.
Variation in diagonal lines produces various designs of twill.
It is suitable for work clothes. E.g., jeans.

2.Discuss the basic weaves used for making fabrics **4**

The basic weaves used for making fabrics are (1) Plain weave, (2) Twill weave, and (3) Satin weave.
Maximum production of fabric is done in plain weave.
Twill weave is woven tightly and suitable for work clothes.
Fabrics woven in satin weave are suitable for making formal wear garments.

3. What is the difference between warp and weft yarns? Give any two characteristics of plain weave. **4**

Straight yarns in fabric are known as warp yarn.
Horizontal yearns are known as weft yarns.
Characteristics of plain weave:
- Maximum production of fabric is done in plain weave.
- It is an inexpensive weave.

TERMINAL QUESTIONS

1. Give one difference between the following:

i) Coarse and fine yarn: 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.
ii) S and Z twist: Twists given to fibre strands for formation of a yarn can be either 'S-twist' (clockwise) or 'Z-twist' (anticlockwise)
iii) Four ply and cord yarn: Four ply are also known as cable yarns. These are usually made by plying two strands of two-ply yarns together. **Cord yarn** is a multiple strand yarn. Take 3/4/5 ply yarns and twist together and knot both the ends to get cord yarn. These are generally used for making ropes.
iv) Spun and filament yarns: Both, the fibres as well as filaments are spun into yarns that are then used for different end uses. Fibres available in the

filament form are first cut into short lengths and then made into yarns called spun yarns.

2. Why do Nylon, Polyester and Acrylic catch fire easily?

ANS: Synthetic fibres are made from petroleum products.These fibres are thermoplastic in nature i.e., they are heat sensitive and soften and melt on application of heat.

3. Read the case study given below and answer the questions given at the end:

Ginni was extremely unhappy because a red rash was spreading all over her body and was very painful. She had tried many local applications to get rid of them, but nothing helped. The rash was causing irritation and made her feel uncomfortable. She discussed her problem with her friend Shyama who suggested her to consult a doctor in the village dispensary. In the dispensary the doctor looked at her skin problem and noticed the fabric of her dress. She asked Ginny if she wore the same dress often. Ginni said yes because she liked the dress very much. It was a fashionable dress, easy to wear, carry and maintain. The doctor advised Ginni not to wear the dress again for sometime. In warm climate it did not allow the skin to breathe fresh air, caused sweating which led the skin to become irritable and cause the red rash. But Ginny was not convinced. She thought, everybody wore dresses made from similar material and had no complaints. If nobody else had any problem in wearing such clothes why she should have any. Surely she thought that her problem could not be due to the clothes she wore. So she did not stop wearing her favourite dress.

If you were Ginni's friend what would you advise her to do? How would you convince her?

ANS: The doctor has rightly identified that the fabric of Ginny's dress is the cause of her skin problem. We should, therefore, convince her by explaining to her about the difference between fabrics made out of fibres from **Natural Sources**i.e., plants or animals, known as natural fibres. e.g. cotton, wool, linen, silk, etc., and **Man-Made fibres** which are made in laboratories using chemicals which are of two types: a) Regenerated fibres –(Examples are rayon) and b) Synthetic fibres - which are made using various petrochemical products. (E.g., Nylon, acrylic and polyester). Sometimes synthetic fibres may cause allergies if worn next to skin.It is, therefore, advisable to use garments made of natural fibres which are eco-friendly in nature, or to wear an undergarment made of natural fibre below the favourite dress made out of synthetic fibre.