CLASS IX
HOME SCIENCE
CHAPTER 4
UNIT X
TEXTILE FABRICS

NOTES

Textile:

- **A textile** is a flexible material consisting of a network of natural or artificial fibres (yarn or thread).
- **Natural fibres** are subject to lack of uniformity due to weather conditions, nutrition or soil fertility and disease.
- **Man-made fibres** are more uniform in size and other characteristics.
- **The raw materials** for weaving or knitting of the fabrics and garments products are yarns or threads.
- **A yarn** is a strand of fibres twisted or laid together by a process called spinning.
- **Yarn** is produced by spinning raw fibres of wools, flax, cotton, hemp, or other materials to produce long strands.

Yarn construction:

- **Yarns are broadly classified into the following three classes** depending on the number of strands used in yarn formation and method of spinning**:**

    1. Simple or Ordinary yarns: These are spun from any of the natural or man-made fibres but which are of regular throughout their length and in their physical properties. According to the number of strands present in the yarns simple yarns have further divided into three sub classes.

    - **a. Single ply yarns.**
    - **b. Multi ply yarns.**
    - **c. Cord or Cable yarns.**

    2. Novelty yarns or Complex yarns or Fancy yarns: Novelty yarns have regular cycle of uneven arrangement and may be unlike in any part.

    3. Textured yarns: Texturing is a treatment given usually to a manmade filament, after which it becomes curly, or acquires some forms of loops, coils or crimp.

Fibre:

- **Fibres** are **the fundamental units used in the fabrication of textile yarns and fabrics.**
- Fibres may be from natural source or man-made.
- In accordance with length of fibre, there are two classes of fibres, viz.
  - (i) Filament Fibre e.g. silk and
  - (ii) Staple Fibre e.g. nylon, polyster, cotton, wool, etc.

Filament Fibre: Yarns made from filament fibres are of two types, namely,

(a) Monofilament Yarns – a single solid strand of great strength and smoothness, and

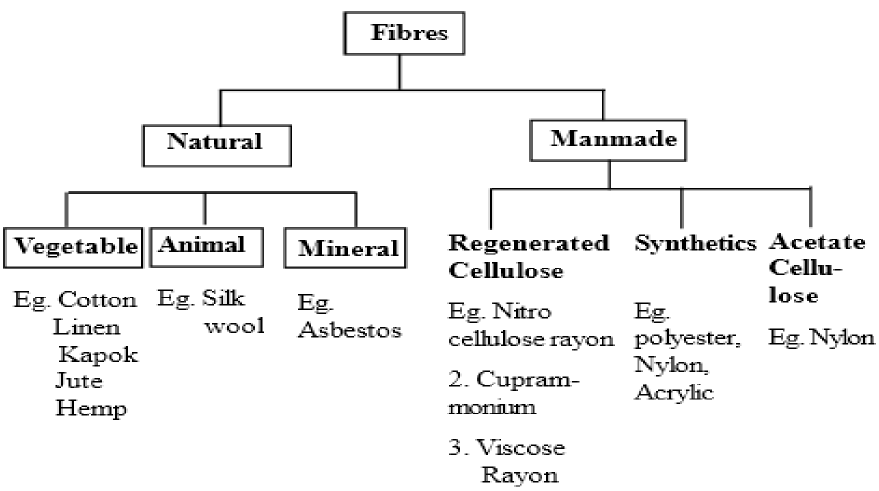
(b) Multifilament Yarns – a number of tiny filaments twisted together.

- **The only naturally occurring filament fibre is silk.**

Staple Fibre: These are made from short fibres bound together by twisting. These staple fibres can be natural (cotton, wool, jute, etc.) or man-made (viscose, nylon, acrylic, polyster, etc.). They are generally in length measuring in inches and range from three quarter of an inch to 18 inches in lenth.

- All natural fibres except silk are staple fibres.

The Classifications of Textile Fibres on the basis of their origin are as given below:



Characteristics of different fibres

Fibres	Appearance	Strengh	Conductor of heat	Microscopic view
1. Cotton	It is a dull fibre	Stronger when wet	Good conductor of heat	It is seen as flat and twisted like a twisted ribbon
2. Wool	Dull, wavy and rough fibre	Weak fibre, becomes weaker when it is wet	Bad conductor of heat	It resembles a worm with horny scales
3. Silk	Smooth, shiny and straight	Strongest of natural fibres	Poor conductor of heat	It has a double rod structure
4. Nylon	Smooth and shiny	Strongest among all fibres	Poor conductor of heat	It looks like a glass rod

- Fabrics/Garments are manufactured either by weaving, knitting or felting.
- In weaving operation, the lengthwise yarns which run from back to front of the loom form the basic structure called "warp".
- The crosswise yarns are the "filling" also known as "weft" or "woof".

Fabric construction:

- **Weaving** is a method of fabric construction in which at least two set of yarns are interlaced at right angles.
- **Selvedge**: The lengthwise edges of a fabric are made stronger and firmer by increasing size or count of warp yarns in that area.
- **Warp yarns or ends:** The yarns that run lengthwise in a fabric (parallel to the selvedges are called warp yarns.
- **Filling or weft:** The yarns that run from selvedge to selvedge are the filling yarns.
- **Count of the cloth:** Thread or cloth count is the number of warp and filling yarns in one square inch of the fabric as it comes from the loom.
- **Balance of cloth:** The balance of fabric is determined by the proportion of warp yarns to weft yarns. If the number of warp and weft yarns is nearly the same in a square inch, the fabric has a good balance.

Parts of Basic Looms:

1. The Warp Beam: It holds the lengthwise yarns.

2. The Heddles: These are the wire or metal strips with an eye located in the centre through which the warp ends are threaded.

3. The Harness: It is the frame that holds the heddles in position.

4. The Shuttle: It holds the filling or the weft yarn and is passed backwards and forwards across the loom.

5. The Reed: It is the frame which is located directly in front of the harness.

6. The Cloth Beam: It is located at the front of the loom and holds the completed fabric.

Classification of weaves:

Plain weaves: It is the least expensive and most commonly used weaves for both thick and sheer fabrics. It requires only two harnesses.

Plain weave variations:

a. Rib weave: This is a variation of plain weave. In this, heavier yarns are used in the warp than those in the weft and this produces a ribbed effect.

b. Basket weave: This is a balanced weave. Basket weaves are made with two or more adjacent warp yarns woven as one, and two or more filling yarns placed in the same shed. The most common basket weaves are 2 / 2 or 4 / 4.

Twill weave: In the twill weave, the filling yarns float over and under the warp yarns in regular variations to form diagonal lines. Variations of twill weave are the herring bone twill weave, the broken twill weave and the zigzag twill weave.

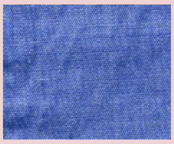
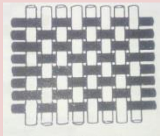
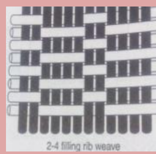
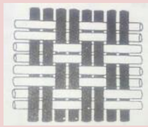
Satin weave: The satin weave produces a smooth lustrous fabric that drapes well. It is made with long floats with the yarns interlacing as far apart as possible to avoid a twill line effect.

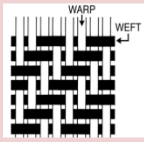
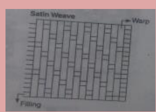
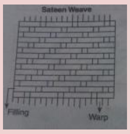
Sateen weave: It is the reverse of satin weave. If more filling yarns show on the surface it is called a filling face or sateen weave.

Knitting: Only one thread is used in this process. The yarn is wound round a needle to form loops which forms one row. This row of loops is caught by another row of loops and so on till a continuous length of cloth is made.

Felting: It is the massing and flattering together of many fibres by beating and by applying pressure or steam to the fibres. It is made wholly or partly of wool fibres which can stick to one another firmly when pressure is applied and thus forms a cloth.

Diagram of different weaves

Weaves	Fabric	Diagram
Plain weave		
Rib weave		
Basket weave		

Weaves	Fabric	Diagram
Twill weave		
Satin weave		
Sateen weave		

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