



FIBRE TO FABRIC

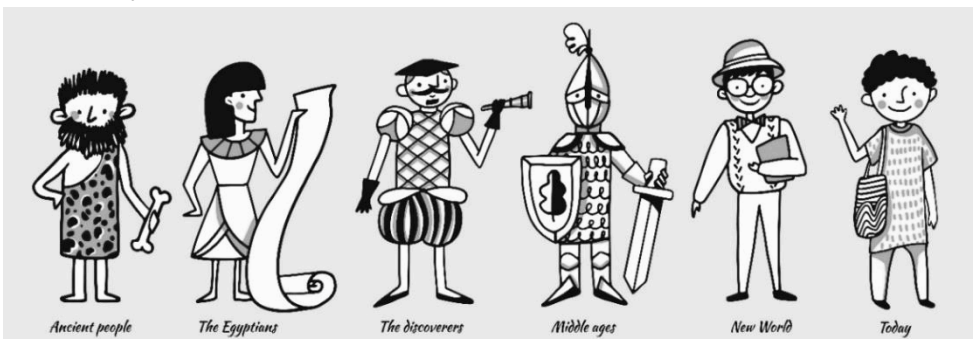


Concepts Covered

- Natural fibre, Plant fibre, History of Clothing, Fibres to yarn, Yarn to fabric, Weaving, Knitting, Way to cotton fabrics, Production of cotton, Production of jute, Flax, Hemp, Coir, Information about Animal and Man-made fibres.

Introduction

- Appearance is the most important factor in our daily life style.
- In current society a person's appearance, dress and clothing do matter a lot.
- Clothes are important in our life because they guard our body against weather conditions such as heat, cold, and rain.
- They are also protecting us from insect bites.
- In addition to that, they make us look good.
- There are different types of clothes like the leather jacket, jute hats, silk saree, cotton dress, etc.
- The materials used in all these clothes are leather, jute, silk, and cotton, etc.
- In most cultures, clothing was introduced as a method of protecting their body against extreme weather conditions like strong winds, intense heat, and cold.
- In particular, the weaves of clothes prevent the circulation of air around the skin and thus, avoid the exit of the air reheated by the skin, which makes people feel uncomfortable and cold.



History of Clothing

- In ancient times, people used the bark and big leaves of trees or animal skins and furs to cover themselves.
- After people began to settle in agricultural communities, they learnt to weave twigs and grass into mats and baskets.
- According to archaeologists, the earliest clothing likely consisted of fur, leather, leaves, or grass that were draped, wrapped, or tied around the body.
- Archaeologists have identified sewing needles of bone and ivory from about 30,000 BC.
- It is believed that wool was the first animal fibre to be weaved into cloth.
- People started raising sheep to wool about 6000 years ago.
- Domestication of silkworms to produce silk occurred around 3000 BC in China.
- Fibre plants such as cotton and hemp came into use after the development of agriculture.
- These fibres were spun into thread and made into clothes.



Ancient Clothing Style & Bone sewing needles

Production of Wool from Sheep

- There are two types of fibres in sheep's hair: the rough beard hair and the soft under hair.
- The soft under hair are present just near the skin of the sheep.
- Wool is made from the soft hair of the sheep because of its fine quality.
- Selective Breeding: Sometimes sheep are selected to gain a breed that has only fine, soft hair on the skin and less or no hard hair. This process is called selective breeding.
- The sheep are generally fed with grass, common leaves, pulses, oil cakes, and dry fodder.
- Sheep are reared (breed and raised) in places all over India such as Jammu and Kashmir, Rajasthan, Arunachal Pradesh, and Gujarat in order to acquire wool from them.

Process of obtaining Wool from the Hair Fibre of the Animals

Step 1: Shearing

Step 2: Scouring

Step 3: Sorting

Step 4: Removing of burrs

Step 5: Coloring of Wool Fibres

Step 6: Rolling of Wool

Fibre and Fabric

- Many a time, when we try to thread a needle, the end of the thread is separated into a few thin strands.
- This makes it difficult to pass the thread through the eye of the needle.
- The thin strands of thread that we see, are made up of thinner strands called fibres.
- Fabrics are made up of yarns and yarns are further made up of fibres.
- The fibres present in our food are called dietary fibres.
- They are made up of cellulose.
- They form an important component of our food.
- In animals, fibres are present in muscles and also as hair or fur.
- These fibres are made up of long chains of proteins.
- The process of turning fibres into fabric can be outlined as:

Fibres to Yarn:

- Fibres are generally thin and short in length.
- When a bunch of fibre is pressed and twisted, it can be converted into long, strong threads called yarn



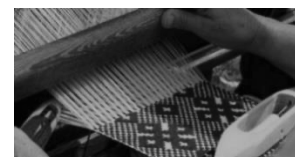
Yarn to Fabric:

- There are many ways by which fabrics are made from yarns.
- The two main processes are:



Weaving

- A fabric is made up of two sets of yarns arranged together.
- The process of arranging two sets of yarns together to make a fabric is called weaving.
- Weaving is done on devices called **looms**.
- Small looms which can be operated manually are called **handlooms**.



Knitting

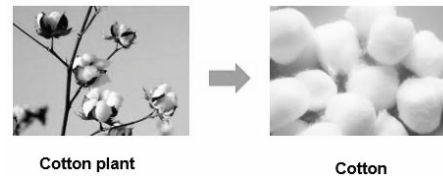
- In knitting, a single yarn is used to make a piece of fabric.
- A single yarn gets pulled out continuously as the fabric, gets unravelled (separated).
- Knitting is done by hand and also on machines.
- Weaving and knitting are used for making different kinds of fabric

Plant Fibres

- Plant fibres may be obtained from the plant's fruit (e.g. cotton or coir), stems (e.g. flax, jute, kenaf and hemp) or leaf (e.g. sisal).
- Plant fibres can be obtained from various parts of a plant. They are **biodegradable** (which decomposes completely by the action of micro organism).
- Fibres are very thin threads.

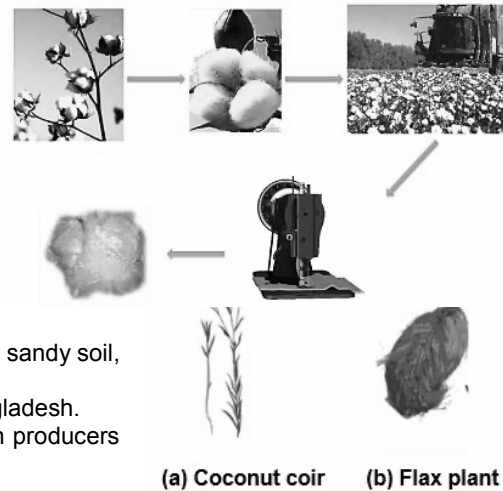
Cotton

- Cotton is a natural fiber harvested from the cotton plant.
- Cotton is one of the oldest fibres with traces of cotton over 7,000 years old recovered from archaeological sites.
- Cotton is also one of the most used natural fibres in existence today, with consumers from all classes and nations wearing and using cotton in a variety of applications.



Production of Cotton

- The cotton plant is a shrub. It grows well in black soil and warm climate. It needs moderate rainfall.
- As shown in the picture above, the cotton plant has a small, green fruit called the cotton boll. The boll has seeds inside, which are surrounded by cotton fibres.
- Raw cotton and ginned cotton are obtained from cotton fibres. Ginning is done to separate the cotton fibres from seeds.



Jute

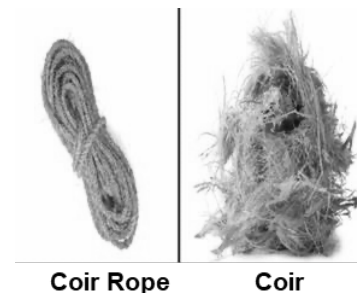
- Jute is a fibre obtained from the bark of the jute plant.
- It is cultivated during the rainy season.
- Jute grows best in loamy soil (mixture of sand, silt, and clay), sandy soil, and clayey soil.
- Almost 80% of the world's high-quality jute comes from Bangladesh.
- India, Bangladesh, China, Nepal, and Thailand are the main producers of jute.

Production of Jute

- The jute plant grows 6 to 10 feet in height and has no branches.
- The stem of the jute plant has a thick bark that has fibres inside it.
- Jute grows well in regions where it rains a lot.
- Jute fibres are obtained from the stem of the plant by retting.

Coir

- Coir is the fibre obtained from the outer covering of the fruit of coconut palm.
- Coconut palms grow to about **25** metres tall in sunny, humid areas on a wide variety of well-drained soils with a constant supply of fresh water.
- Coir is produced as a by-product of other coconut products such as copra (dried coconut flesh), oil and coconut flesh.
- The fibrous layer of the fruit is separated from the hard shell by driving the fruit down onto a spike to split it (de-husking)



Synthetic/Man-made Fabrics

- Synthetic fibres are used for making synthetic fabrics, which are chemically made in factories.
- They are much cheaper than natural fabrics.

Nylon, Rayon, Terylene, Polyester, etc.

- Synthetic fibres are strong, of uniform thickness and very smooth.
- Synthetic fabrics do not have much space between their fibres and therefore do not allow air to pass through **them easily**.
- They are non-biodegradable.

Blended Fabrics

- The yarn of these fabrics is made by using both Natural as well as Synthetic fibres.
- These are made from both terylene (synthetic) as well as cotton (natural).
- Adding synthetic fibres to natural fibres increases the strength of fabric, makes it durable and easy to maintain **because, synthetic fibre is the strongest, followed by mixed, followed by natural fibre.**

Finishing of Fabrics

- The fabric is further bleached or dyed.
- Finishing is done to make it suitable for household use.

Solved Examples

(1) List the steps involved in the preparation of fabric.

Answer: The following steps are involved in the preparation of fabrics:

- (i) Obtaining fibre,
- (ii) Preparation of yarn from fibres by spinning,
- (iii) When two sets of yarn are involved, yarns are woven on looms to make a fabric. When a single yarn is used, the fabric is prepared by knitting.

(2) Write the difference between natural and synthetic fibres.

Answer: The fibres of some fabric are obtained from plants and animals. These are called natural fibres. For example- cotton, jute, silk etc. The fibres that are made from chemical substances are called synthetic fibres. For example- nylon, polyester etc.

(3) Where does cotton, wool come from?

Answer: Cotton wool is grown in fields. Plants are grown at places having black soil and warm climate.

(4) How is spinning done on large scale?

Answer: Spinning is done on a large scale with the help of spinning machines. After spinning yarns are used for making fabric.

(5) What are fabrics made up of?

Answer: Yarns

(6) Describe the process of the formation of yarn from cotton wool.

Answer: The cotton wool is obtained from cotton plants. The cotton plants are grown in fields. They are usually grown in the places with black soil and warm climate. The fruits of the cotton plants called cotton bolls are about the size of lemons. After maturing, the bolls burst open and seeds covered with cotton fibres can be seen. From the cotton bolls cotton is picked by hands. Fibres are then separated from the seeds by combing. This process is called ginning of cotton. It is done by hand or by machines. These fibres are then converted into yarn.

(7) Describe the process of spinning and weaving.

Answer: Spinning: The process of making yarn from fibres is called spinning. In this process fibres from a mass of cotton wool are drawn out and twisted. By this fibre comes together to form a yarn. Spinning can be done by hand, by takli and charkha. On a large scale, spinning is done with the help of machines.

Weaving: The process of arranging two sets of yarns together to make a fabric is called weaving. The process of weaving can be done on looms. The looms are either-hand operated or power operated.

(8) What happened when people began to settle in agricultural communities?

Answer: When people began to settle in agricultural communities then they learnt to weave twigs and grass into mats and baskets. Vines, animal fleece or hair were twisted together into long strands. These strands were woven into fabrics.

(9) What happens after maturing of fruit of the cotton plant (cotton bolls)?

Answer: After maturing, the bolls burst open and seeds covered with cotton fibres can be seen. Then the cotton can be picked.

(10) What will happen if we pull the yarn from a torn pair of socks? Why so?

Answer: A single yarn gets pulled out continuously as the fabric gets unravelled. It is because they are made of knitted fabric.

Exercise

FILL IN THE BLANKS

- (1) Tightly compressed bundles of cotton are called_____.
- (2) For cultivation of cotton crops _____ soil is excellent.
- (3) Jute is cultivated in _____ season.
- (4) Silk is obtained from _____ of silk worm.
- (5) The stems of the jute plants are immersed in water to rot before separating the fibre. The process is called_____.

TRUE OR FALSE

- (1) Yarn is made from fibres.
- (2) Spinning is a process of making fibres.
- (3) Jute is the outer covering of coconut.
- (4) The process of removing seed from cotton is called ginning.
- (5) Weaving of yarn makes a piece of fabric.

OBJECTIVE TYPE QUESTIONS

- (1) Where do natural fibres come from?
(A) Plants (B) Animals
(C) Minerals (D) All of these
- (2) Which of the following trends and new developments in the 20* century have influenced clothing the most?
(A) Blurring of gender boundaries
(B) Importance of casual and sports attire
(C) Machinery and textiles and new dyes
(D) All of these
- (3) What material do we use for making wicks for oil lamps?
(A) Cotton wool (B) Silk cotton
(C) Nylon (D) None of these
- (4) Which of the following fibre is obtained from the outer covering of the fruit of the coconut palm?
(A) Hemp (B) Coir
(C) Flax (D) None of these
- (5) What is the name of the hand operated device used for spinning?
(A) Takli (B) Charkha
(C) Both of these (D) None of these
- (6) In ancient China, how did the status of a person affect their clothing?
(A) Scholars wore long blue gowns.
(B) Upper class women had colourful silk robes.
(C) Common people wore jackets and pants.
(D) All of these.
- (7) In Which type of soil does cotton grow best?
(A) Loamy soil (B) Sandy soil
(C) Black soil (D) None of these
- (8) What factors affect the type of clothing of people?
(A) Climate, customs and traditions, religion, status
(B) Temperature, body sensitivity, age, health
(C) Both (a) and (b)
(D) None of these
- (9) Nylon was used as a substitute for_____
(A) Silk (B) Cotton
(C) Wool (D) None of these
- (10) **Yarn** is made from fibre by the process of _____.
(A) Weaving (B) Spinning
(C) Stitching (D) None of these

Answer Key

FILL IN THE BLANKS

- (1) Bales
- (2) Black
- (3) Rainy
- (4) Cocoon
- (5) Retting

TRUE OR FALSE

- (1) True
- (2) False
- (3) False
- (4) True
- (5) True

OBJECTIVE TYPE QUESTIONS

- | | |
|---------|----------|
| (1) (D) | (6) (D) |
| (2) (D) | (7) (C) |
| (3) (A) | (8) (A) |
| (4) (B) | (9) (A) |
| (5) (C) | (10) (B) |