8.Fibre to Fabric

Neelima lives in a small village. Her father is a salesman at a cloth shop. One Sunday she went there along with him. She was amazed to see so many varieties of cloth (fabrics). Her father and other salesmen were showing different types of fabric to the customers. They were telling customers about their smoothness, thickness, colour and shrinking property. They were also telling them how to take care of the fabrics, whether they were washable or needed to be dry-cleaned. She also noticed that some materials cost less than the others. On the way back home she asked her father many questions. Why was there a difference in the price? How are these fabrics made? What materials are these fabrics made of? Is the process of making fabrics the same for all types? Let us try to find the answers to Neelima's questions.

Fig. 1

Fig. 2

Types of Fabrics

List the types of clothes we wear in the following months:

Seasons	Cloths we wear
Summer	
Winter	
Rainy	

We can say that we use fabric as a shield to protect ourselves from different weather conditions. Along with protection, clothes can also be a symbol of beauty and status. Choice of fabric may vary from person to person. Somebody may like to wear clothes made up of light, thin, shiny fabrics. Another person may like to wear clothes that are bright coloured and made of coarse fabrics.

Fabrics for casual and formal wear may be different. Personal choice, personality of the owner and the cost of fabric are all-important factors in the selection of the perfect fabric.

Our purpose and the properties of a fabric together determines which type of fabric can be used for each purpose. Coarse fabrics can be used for mopping and making gunny bags but not for making clothes. Some other properties will have to be considered for choosing curtain fabrics.

Do you know?

The material used for making school bags is also a kind of fabric. Fabrics are not only used for making clothes; they are also used in making banners, flags, shoes, curtains, in book binding etc. Calico is a type of fabric used in book binding.

Activity-1: Things made up of fabric

List things in your house made up of any type of fabric. Classify them into cotton, silk, wool, polyester, terilyn, etc. Try to enrich the list as much as you can. For identifying the fabrics, you can take the help of your elders and teachers.

Table 1

Type of fabric	Things
Cotton	
Silk	Kurta, Sari, ...
Wool	
Polyester	
Linen	Trousers, ...

- Which kind of fabric is being used more in your house?
- How did you identify the type of fabric?

Cotton fabrics are somewhat thicker than polyester fabrics. Coarse cotton clothes are heavier. After washing, cotton clothes get wrinkled. Silk fabric is smooth to touch whereas woolens are somewhat heavier than silk fabrics.

- Try to find out the properties of each type of fabric (cotton, wool, polyester, etc.).
- Which properties were you able to generalize for a particular type?

What are fabrics made up of?

When you look at any fabric, it appears to be a single, continuous piece. Now look at it closely; what do you notice?

Activity-2: Threads in the fabric

Take a piece of fabric. With the help of a magnifying lens, observe how the fabric is. Pull out threads one by one from the fabric. Observe these threads. What did you observe?

Take one thread. Scratch its end. Observe it through a magnifying lens. Were you able to see the fine structure of thread?

Fig. 3

Take a needle and try to insert this thread into the eye of the needle. Can you? Isn't it difficult? Have you ever seen what people do to overcome this problem? Generally when we are not able to put thread into the eye of the needle, either we twist the end of the thread or we wet the end using saliva.

There are thread-like structures in the fabric. These threads are also called yarn. So fabric is made up of yarn. The end of the yarn is separated into thin strands. This thin strand of thread is made up of still thinner strands. These thinner strands are called fibers. Every fabric is made up of yarn. If it is cotton fabric, it is made up of cotton yarn which is derived from cotton fibre.

Fibre → Yarn → Fabric

Types of fibres

We know that there are different kinds of fibers like cotton, wool, silk, polyester etc. The fibers of some fabrics such as cotton, jute are obtained from plants. Silk and wool are obtained from animals. The fibres that are derived from plants and animals are natural fibres. Nowadays, clothes are also made up of chemically developed yarn like polyester, terylene, nylon, acrylic etc. These are all called artificial fibres.

Do you know?

Human beings in ancient times used leaves and skins of animals as clothes. Clothes were also made from metal. Warriors used to wear metal jackets during wars. You can see clothes like these in historical museums or in television shows.

Activity-3: Characterstics of fabrics

Collect some natural and artificial fabrics and observe the following characterstics. Record your observations in table 2.

Table 2

S. No.	Character	Natural fabric	Artificial fabric
1.	Water absorbing nature		
2.	Time taken to dry		
3.	Smell while burning		
4.	Result after burning		
5.	Stretching capacity of yarn		
6.	Smoothness		

- Which types of fabrics are smooth in nature?
- Which type of fabrics dry in a short time?

• Do you find any relation between smoothness and time to dry?

• Which fabrics gives ash when they are burnt?

Silk fabrics are slippery and shiny in nature, whereas cotton fabrics may be coarse as well as smooth. When we burn fabric made up of artificial fibres it gives a pungent smell.

Natural Fibres

Cotton, jute, wool and silk are some common examples of natural fibres. In this section, we will discuss cotton and jute in detail. Cotton is obtained from cotton balls or cotton fruits. Usually cotton plants are cultivated in black soil. In our state, cotton crop is widely grown in districts like Prakasam and Adilabad, Nalgonda and most of the districts of Telangana region.

• Look at the Andhra Pradesh map and list out the places where cotton is grown.

Activity-4: Making cotton yarn.

Collect cotton balls from nearby houses or cotton growing fields (Fig. 4). Remove seeds from the cotton balls and separate cotton. Take a small piece of cotton; observe it using a magnifying lens or under a microscope. What do you observe?

Fig. 4

You will see small hairy structures. These are the fibres of cotton. After maturing, cotton balls burst and open. Then we can see white

coloured strands of cotton fibre. Cotton is usually picked by hands. When cotton wool is separated from seeds, it is called ginning.

Making yarn from cotton fibre: Cotton fibre is collected after removing the seeds from the cotton ball. This cotton fibre is cleaned, washed and combed. This fine cotton fibre is used to make cotton yarn. Yarns are dyed and coated with chemicals.Then they become strong enough to make fabrics.

Activity-5: Spinning yarn

Take cotton ball and remove seeds from it. Take some of it in one hand and gently start pulling out cotton by using thumb and forefinger (Fig. 5(a)). Continuous twisting of the fiber will make yarn. Is it strong or not?

Fig. 5 (a)

The yarn that we make from cotton wool is not strong enough to be used for weaving. To get strong yarn from fibre, Takli (Fig. 5 (b)) an instrument for spinning has been used since olden days. Charka (Fig. 6) is also used to make yarn. The process of making yarn from fibers is called spinning.

Fig. 5 (b)

Do you know?

In Nalgonda district, cotton is widely grown. To pick up maturing cotton balls from cotton plants, children works in field as child labour. Some voluntary organizations along with government are working to eradicate child labour. Think, why are children forced into labour? Give your own solutions to this problem.

Fig. 6

Do you know?

During the freedom struggle, Mahatma Gandhi encouraged people to wear clothes made of homespun (khadi)yarn. People burnt imported clothes during Swadesi movement.

Jute yarn

Have you seen gunny bags? Where do you see them? Paddy, Chilli and other commercial crops are packed in gunny bags. All bags of these types are made up of coarse jute fabric.

These bags are suitable for carrying heavy material. Do you know how jute yarn is made? Is this process same as that for cotton or is there any difference?

Like cotton, jute yarn is also useful in making fabric. It is also called golden fibre. Jute fabric is not the same as cotton fabric. It is harder, stronger and more rough.

Making of Jute Yarn

Jute fibre is obtained from stem of jute plant. The stem of the harvested plant is cut and immersed in water for some days. When the stem is soaked in water it becomes rotten and easy to peel. Then the fibres are separated from the stem to make jute yarn.

Activity-6: How is jute yarn?

Collect gunny bags. Pull out the threads from the bag and observe under magnifying lens. You will see strands of yarn. Observe how the fibre looks like? compare these fibers with cotton fibers.

Do you know?

We all use polythene bags for different purposes. Polythene is very difficult to decompose. To protect our environment, we should use cloth bags instead of polythene bags.

In the same way fibre is made from Red sorrel (Gongura) and Bamboo. Hemp and flax are also plant fibres which are used in making clothes but in smaller quantities as compared to cotton.

Yarn to fabric

The yarn that is prepared from fibre is used to make fabric.

Fig. 7

Strands of yarn are arranged in vertical and horizontal rows in a loom to weave fabric.

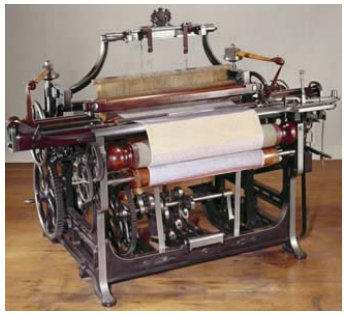

Fig. 8

Spinning of yarn on large scale is now done by using machines. Two sets of yarn arranged together to make fabric is called weaving. Weaving is done on looms. The looms that are worked by man power are called handlooms (Fig. 7). Power

looms are run by machines. (Fig.8)

Activity-7: Mat making

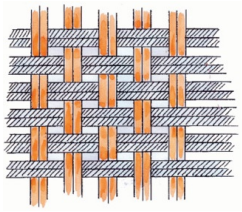

Fig. 9

Take coconut leaves or two different colour paper strips. Cut and remove middle vein of the leaf to get two halves. Now put these strips parallel to each other (Fig. 9). Take one more strip and insert horizontally and alternately between the vertical strips. Finally you will get a sheet like structure. This is the way a mat is prepared. In the same manner, weave a paper sheet by using paper strips.

The handloom industry is well developed in our state. Places like Gadwal, Venkatagiri, Siricilla, Narayanpet, Dharmavaram, Pochampalli, Mangalagiri and Kothakota are famous for handloom industry. Warangal is famous for carpet industry.

Keywords

Fabrics, fibres, yarn, natural fibres, artificial fibres, ginning, spinning, weaving, looms

What we have learnt

- Cotton, wool, silk, jute are all derived from plants and animals. They are called natural fibres.
- Fibres made of chemicals are called artificial or synthetic fibres.
- Tiny strands like structures are called fibres. These fibres are converted into yarn. Yarns are woven together to make a fabric.
- Cotton fibres are made from cotton ball.
- Jute fibre is obtained from the stem of a jute plant.
- The process of removing seeds from cotton wool is called ginning.
- Making yarn from fibre is called spinning.
- Handlooms or power looms are used in weaving fabrics.

Improve your learning

1. What will happen if a rain coat is made from cotton fabric? Why?
2. Make a flow chart showing the process of getting a fabric (clothes) from cotton plant.
3. Coconut is also a fibre. Name somethings made of coconut fibre.
4. Classify the fabric of following items as natural or artificial-Dhothi, Venkatagiri saree, jeans, umbrella cloth, bed-sheets, your shirt or skirt, rain-

coat, gunny-bags.

5. Explain the process of making yarn from cotton wool?
6. Small strand like structures are called

a. fabric b. fibre

c. loom d. cocoon

7. Making fabric from cotton yarn is called.....
8. What would you do to remove wrinkles from your shirt or skirt?
9. Prepare a bag using cloth. Collect pieces of fabric and make designs on your bag by using them. Display it on school display day.
10. Make a scrap book containing pictures of different types of fabric and name them.
11. With the help of an atlas, discuss with your teacher and prepare an information chart about spinning mills in our state.
12. Collect news items about handloom workers and cotton growers. Analyze one news item in your own way.
13. While purchasing your dress what doubts would you want to clarify from the shop keeper?
14. What did you do to know whether artificial fibers give pungent smell while burning. Write the steps of your experiment.
16. The clothes that we wear have a great background. Track the stages (from seed to dress) and write your feelings about the people working at different levels of the track.
15. Observe these logos.

What does this means? Collect information about this from your school library.

Who Said:

THE STORY OF JUTE

In our state in the districts of Visakhapatnam, Srikakulam and Vijayanagaram jute is widely grown. There is an interesting story about jute.

Long long ago a man was grazing his cattle in the forest near his village. Suddenly it started raining. It did not stop for days. He saved himself by

climbing on to a tree. Almost all the forest got submerged in floods. After a couple of weeks he got down from the tree and walked through soaked plants in the mud. He observed that peels of plants stuck to his legs. He went home and removed those peelings from his body. One day his wife saw the dried peels and noticed that they were so strong and spun a thread. Haven't you understood what the plant is?

Corn fibre is a new innovation in the textile industry.

Silk is commonly obtained from silkworms. However, in recent times, scientists have come up with an innovation wherein silk is produced from spiders.

Coir fibre is thick and strong and is hence ideal for use in rugs, sacks and brushes.

The hair of the yak is very useful in the production of warm clothes, mats and sacks.

Charles Macintosh was a Scottish chemist who invented (1823) a method for making waterproof garments.

Waldo L. Semon invented a way to make polyvinyl chloride (PVC) useful. He created vinyl.

In 1970, Toray Industries scientist Dr. Miyoshi Okamoto invented the world's first microfiber.

Polyester, the most commonly used manufactured fiber, is made from petroleum.

Rayon, derived from wood pulp.