**Vision Empower & XRCVC**

Teacher Instruction KIT

# Fibre to Fabric

Syllabus: NCERT
Subject: Science
Grade: 7
Textbook Name: NCERT- Science Textbook for class VII
Chapter Number & Name: 3. Fibre to Fabric

## 1. OVERVIEW

1.1 OBJECTIVES AND PREREQUISITES

### Objective

- Outline the process of creating wool and silk fabric.

### Prerequisite Concept

- Fibre to Fabric
  *Grade 6, Chapter 3. Fibre to Fabric*

### Content Index

*Kindly Note: Activities marked with * are mandatory*

## 2. LEARN

2.1 KEY POINTS

Wool comes from sheep, goat, yak and some other animals. These wool-yielding animals bear hair on their body which keeps them warm. Wool is derived from these hairy fibres. Wool commonly available in the market is sheep wool. Yak wool is common in Tibet and Ladakh. Mohair is obtained from angora goats, found in hilly regions such as Jammu and Kashmir. Wool is also obtained from goat hair. The under fur of Kashmiri goat is soft. It is woven into fine shawls called Pashmina shawls. The fur (hair) on the body of camels is also used as wool. Llama and Alpaca, found in South America, also yield wool.

Processing fibres into wool

Step1: Shearing - The fleece of the sheep along with a thin layer of skin is removed from its body. This process is called shearing. Machines similar to those used by barbers are used to shave off hair. Usually, hair is removed during the hot weather. This enables sheep to survive without their protective coat of hair. The hair provides woollen fibres. Woollen fibres are then processed to obtain woollen yarn.

Step2: Scouring - The sheared skin with hair is thoroughly washed in tanks to remove grease, dust and dirt. This is called scouring. Nowadays scouring is done by machines.

Step3: Sorting- The hairy skin is sent to a factory where hair of different textures are separated or sorted.

Step 4: The small fluffy fibres, called burrs, are picked out from the hair. These are the same burrs which sometimes appear on your sweaters. The fibres are scoured again and dried. This is the wool ready to be drawn into fibres.

Step 5: The fibres can be dyed in various colours, as the natural fleece of sheep and goats is black, brown or white.
Step 6: The fibres are straightened, combed and rolled into yarn. The longer fibres are made into wool for sweaters and the shorter fibres are spun and woven into woollen cloth.
The processing of fibre into wool can be represented as follows:
Shearing → Scouring → Sorting → Cleaning of burrs → Dyeing → Rolling

Silk fibres are also animal fibres. Silkworms spin the 'silk fibres'. The rearing of silkworms for obtaining silk is called sericulture.
The female silk moth lays eggs, from which hatch larvae which are called caterpillars or silkworms. They grow in size and when the caterpillar is ready to enter the next stage of its life history called pupa, it first weaves a net to hold itself. Then it swings its head from side to side in the form of the figure of eight (8).
During these movements of the head, the caterpillar secretes fibre made of a protein which hardens on exposure to air and becomes silk fibre. Soon the caterpillar completely covers itself by silk fibres and turns into pupa. This covering is known as a cocoon. The further development of the pupa into moth continues inside the cocoon. The silk yarn (thread) is obtained from the cocoon of the silk moth.
The most common silk moth is the mulberry silk moth. The silk fibre from the cocoon of this moth is soft, lustrous and elastic and can be dyed in beautiful colours.

A female silk moth lays hundreds of eggs at a time. The eggs are stored carefully on strips of cloth or paper and sold to silkworm farmers under hygienic conditions of temperature and humidity. The eggs are warmed to a suitable temperature for the larvae to hatch from eggs. This is done when mulberry trees bear a fresh crop of leaves. The larvae, called caterpillars or silkworms, eat day and night and increase enormously in size. The larvae are kept in clean bamboo trays along with freshly chopped mulberry leaves. After 25 to 30 days, the caterpillars stop eating and move to a tiny chamber of bamboo in the tray to spin cocoons. Small racks or twigs may be provided in the trays to which cocoons get attached. The caterpillar or silkworm spins the cocoon inside which develops the silk moth.
Processing silk: A pile of cocoons is used for obtaining silk fibres. The cocoons are kept under the sun or boiled or exposed to steam. The silk fibres separate out. The process of taking out threads from the cocoon for use as silk is called reeling the silk. Reeling is done in special machines, which unwind the threads or fibres of silk from the cocoon. Silk fibres are then spun into silk threads, which are woven into silk cloth by weavers.

2.2 LEARN MORE
None

## 3. ENGAGE

3.1 INTEREST GENERATION ACTIVITY

## Interest generation activity

**Activity1: Different fabrics**

*Materials Required*: None

*Prerequisites:* None

*Activity Flow*

- Ask the children 'What are they wearing today?'
- What do they wear when they go to bed? Have they noticed the difference in the material? Which is softer? Do they know where they come from?
- Tell them, today they would learn how clothes are made.

3.2 CONCEPT INTRODUCTION ACTIVITIES

## Animal Fibre

**Activity 2: Animal Fibre- Wool**

*Materials Required: None*

*Prerequisites: None*

*Activity Flow*

- Ask the students to feel the hair on your body and arms and those on your head.
- Do they find any difference? Which one seems coarse and which one is soft?
- Explain to the students that like us, the hairy skin of the sheep has two types of fibres that form its fleece: (i) the coarse beard hair, and (ii) the fine soft under-hair close to the skin. The fine hair provides the fibres for making wool. Some breeds of sheep possess only fine under-hair. Their parents are specially chosen to give birth to sheep which have only soft under hair.
- This process of selecting parents for obtaining special characters in their offspring, such as soft under hair in sheep, is termed 'selective breeding'.

## Animals that yield wool

**Activity 3: Animals that yield wool**

*Materials required:* models of wool bearing animals, tactile map of India

*Prerequisites: None*

*Activity Flow*

With use of models of wool bearing animals orient the student to each animal type keeping in mind the following key features. For all animals explain the size, shape and colour in addition to the specific features listed below. Ask the students what animals they have seen and then talk about the size of these animals in comparison to known animals.
Yak,

- The hump
- The horns
- The long furry wool
- The face and structure and how it differs from a buffalo even though it may seem the similar

Sheep

- Ears
- Wool Type
- Face Structure

Mountain Goat

- Horns which differentiates it from a regular goat
- Shorter wool compared to yak
- Face, and its similarity to regular goat

Camel

- The tall neck
- The hump
- Small ears

Like this other animals such as alpaca, Angora goat, Llama, can be explained with their key features.
Ask them to find out words for sheep, goat, camel and yak in their local language.
While doing this activity, teachers can show the tactile map of India by marking the places where animals that provide wool are being found.

## Fibres to wool

**Activity 4: Fibres to wool**
*Materials required:* furry carpets/fabrics, wool
*Prerequisites: None*

*Activity Flow*

- Explain wool manufacturing through relevant content.
- Take some furry carpets and some less furry carpets and let the student feel the two to explain the concept of wool of yak v/s sheep v/s goat wool when found on the

animal. Explain how wool can be different colours, mixed colours and patterns can be created through it as well.

### Life history of silk moth

**Activity 5: Life history of silk moth**

*Materials Required:* tactile diagram of life cycle of a silk worm.
*Prerequisites: None*

*Activity Flow*

- With the tactile diagram of the life cycle of a silk work explain the process through which the silkworm develops the cocoon full of silk yarn.
- Take a small stick to depict the silkworm and reel of thread and with hand over hand technique demonstrate the student the repeated turns in shapes of 8 through which the silkworm covers itself into a cocoon. Take a sample of a solid thread ball to explain how hard a cocoon is.
- As per relevant content discuss how silk is farmed and processed. Explain how silk can be different colours, mixed colours and patterns can be created through it as well.
- Ask the students to collect pieces of silk cloth (home, tailor's shop) of various types and identify the types with the help of different textures.

### Artificial silk and pure silk

**Activity 6: Artificial silk and pure silk**

*Materials Required:* Artificial silk thread, pure silk thread, woolen fibre.
*Prerequisites: None*

*Activity Flow*

- Teacher can take an artificial (synthetic) silk thread and a pure silk thread. Burn these threads carefully.
- Ask the children to notice any difference in the smell while burning?
- Now, burn a woolen fibre carefully. Ask them, did it smell like burning of artificial silk or that of pure silk? And why?
- Explain to the children that the burning of artificial silk smell like burning paper and natural silk smell like burning hair. Just like silk, wool is also made up of proteins. So, burning a piece of woolen fabric also smells like burning of pure silk.

3.3 LET'S DISCUSS: RELATE TO DAILY LIFE*

Discuss with the students:

- Clothes and accessories that are worn by people.
- Different cloth material used for different clothes Blankets, quilts, bed sheets, bedcovers, Bags, Dust cloths, wash cloths, wiping cloths, mops, etc.
- Whether it is fair on the part of humans to rear sheep and then chop off their hair for getting wool.
- Process of boiling of cocoons before extracting silk fibres (killing the worms inside. Information about "ahimsa silk" , an alternative where worms are not killed can also be provided to the students.

## 4. EXERCISES & REINFORCEMENT

4.1 EXERCISES & REINFORCEMENT

### Stages of silk moth

**Activity 7: Stages of silk moth**

*Materials Required:* cut out tactile diagram of stages of the life history of the silk moth/ cut out cards having names of each stage of silk month in Braille.

*Prerequisites: stages of silk moth*

*Activity Flow*

- Use the cut out pictures /Braille cards with names of the stages of the life history of the silk moth, jumble them.
- Try and arrange the stages in the correct sequence in a cyclic form. Whoever does it fastest wins.
- Students can also describe the life history in their own words or they can write it down.

4.2 IMPORTANT GUIDELINES*

**Exercise Reading**

It is very important that the children practice their learning as well as their reading. Hence have the children read out the newly learned concepts from their textbooks or other available resources.

**Perform Textbook Activity**

It is good practice to have the children perform the textbook activities. Your textbook activities might not be accessible hence go through this resource to learn how to make textbook content accessible

**Provide Homework**

To evaluate their understanding and to help the student revise and implement the new learnt concept ensure to provide them with homework. Students should perform one or two of the questions mentioned above or from the textbook exercises with the teacher in Class and the remaining may be given for homework. Also, ensure that the student knows their special skills linked to independently using their accessible books as it will be critical to doing homework independently

*End of Document*