Untouchability is Inhuman and a Crime

A publication under Free Textbook Programme of Government of Tamil Nadu

Department of School Education
The study on textiles, designing and fashion has taken a great leap in the last decade. People with a creative mind and students who are interested in gaining more knowledge in this field of arts, choose textiles and designing subject, to gain knowledge about the basics of textiles and dress designing to improve their skills and become good professionals in future.

This textbook is verbally crafted with this as a major objective. The knowledge sharing is done on two concepts. Concept one covers comprehensively on the complete background and basics of fiber, yarn and fabric. Concept two focuses on dress designing and garment construction. The basic tools for sewing, sewing machine, parts of sewing machines and procedure for designing, pattern making and sewing of dress are discussed in a very vivid manner. This will help a budding designer to get strengthen in the area of sewing and create variations using various pattern making techniques.

We all know that textile industry plays an important role in being the backbone of the country. In the recent years, many textiles institute have been set up to meet the increasing demands and interest in this field of study. Therefore it has become quite necessary to publish a book in this subject which is easily intelligible to the readers.

Readers of the subject are sure to find the book extremely useful, convenient and interesting as well. Further, simple language is used for easy reading and understanding. Another important feature of the book is that all the patterns are illustrated with diagrams and examples. It is very much sure that students will find it valuable and understand in a better way.
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SEWING TEACHER

SMALL TAILORING UNITS

WEAVING AND KNITTING MILLS

SPINNING MILLS

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JOB WORK FOR EMBROIDERY AND SURFACE ENRICHMENT
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- Open the QR code scanner application
- Once the scanner button in the application is clicked, camera opens and then bring it closer to the QR code in the text book.
- Once the camera detects the QR code, a url appears in the screen. Click the url and goto the content page.
1.1 INTRODUCTION

In this modern era clothing is as important as food. Clothing is an indicator for one's good health and behavior. Clothing lays the foundation for one's personality development and standard of life, as the saying goes clothes make up the man.

1.2 ORIGIN OF SEWING AND FABRIC

The beginning of sewing and fabric dates back to the Stone Age man. The Stone Age man used animal skin as clothes to protect them from animals and climatic changes. Early man also used grasses, reeds, leaves, barks and stem to cover his body. When man learnt to live in one place (near the river beds) and to cultivate crops for food, he also slowly mastered the art of fabric making. The major fibres used were cotton, silk, linen and wool. During the 18th century man started spinning (twisting of fibre) and hand weaving (interlacing of yarn) to produce fabrics. Only during the 20th century men started to manufacture artificial yarns and are called as man-made yarns.

Primarily, clothing was a kind of drape in earlier years. Clothes were also decorated with colour, prints and embroideries. Today clothes are designed in computers. Digital clothes to monitor one’s health are also available in the market.

1.3 PURPOSES / NEED FOR CLOTHING

Clothing is a basic cover for human body. Clothing varies based upon sex, climatic conditions, standard of living, occupation, religion, nationality and personal liking.
The major reasons for using clothing are discussed below:

1.3.1 Protection

- Clothes protect human skin from climatic changes like rain, (Figure 1.1), snow, wind, extreme cold and heat conditions.

- Clothes helps to absorb sweat from the body, prevents one from sudden chillness and acts as a barrier between the human body and accidental burns, scratches and rough surfaces.

- Clothes are a life saving insulating garment for people living in extreme cold and hot climates.

  Example: Eskimos, keep themselves warm by using fur clothes which traps warm air from the body and does not allow cold air from external environment to touch the body.

1.3.2 Safety

Some sports and occupation requires clothes which can provide safety from accidents. Examples:

- Protective pads (Figure 1.2), helmets (Figure 1.3) used in football and cricket.

- Asbestos clothing for fire fighters.

- Bullet proof vests for police and military men

- Florescent orange vests for road workers.

1.3.3 Sanitation

Special clothes and accessories are worn regularly by people in specific occupations for sanitation purposes.

Examples: Doctors (Figure 1.4), Nurses, sanitary cleaners and people working in food production institutions
wear uniforms, gloves, face masks, caps to prevent contamination by germs.

1.3.4 Modesty
Covering the body in a proper way is considered as modesty. This varies from people to people, nation to nation.

*Example:* A sleeveless, low neck top and highly decorated skirt may not be considered as a modest for an office wear (Figure 1.5).

1.3.6 Uniforms
One of the easiest ways to identify a group is through uniform. Uniforms are related to jobs like police force, fire department and military. Athletic teams and sports person in a team wear uniforms of particular colour. People working in the service occupations such as, restaurant, airlines, employees wear special uniforms (Figure 1.7).

1.3.7 Tradition
Tradition has been followed in all countries with reference to clothing. Due to traditional reasons specific colours and dresses are used in different occasion.
Example: White or black colour garment for marriages and funerals, black robes, cowl and mortarboard caps with tassels used by graduates (Figure 1.8).

1.3.8 Insignias

Patches, badges or emblems pinned or machined to jackets and dresses is a symbol of insignias.

Examples: National Service Scheme (N.S.S), National Cadet Corps (N.C.C) (Figure 1.9), badges. Even in school and sports T-shirts, insignia is in the form of school first letter or company for whom the team is playing.

1.3.9 Status

Clothing is a symbol of status also. It helps to identify the position of an individual. These clothings and accessories are more expensive with recent designs and styles.

Example: Clothing and accessories like the crown used by queens and kings (Figure 1.10).

1.3.10 Decoration

Adornment or decoration is considered important by every individual. Clothing can enhance one’s look through decoration of garments and use of accessories. Even the cave men decorated themselves with painting using colours from berries and tattooing their bodies with sharp pins or needles.

When was the first form of tattooed humans found?

Otzi the iceman was the oldest discovery of tattooed human. This dates between 3370 and 3100 BC. Apart tattooed human figures are also found in at least 49 archaeological sites including locations in Greenland, Alaska, Siberia, Mongolia, Western China, Egypt, Sudan, the Philippines, and the Andes.
1.4 THEORIES OF CLOTHING

Clothing theories are developed based upon the use and growth of clothing. The four major theories of clothing are modesty, immodesty, and adornment and projection theory.

1.4.1 Modesty Theory

The basic importance of clothing is to cover or conceal the private parts of the human body.

*Example:* Leaves used around the waist and bust, by Stone Age women as clothing.

1.4.2 Immodesty Theory

Historical records on clothing mention about clothing used to attract opposite sex. According to this theory the basic idea of clothing is attraction seeking.

*Example:* Tight fitting pants and garments which expose body parts.

1.4.3 Adornment Theory

Right from the origin of mankind, people were trying to beautify themselves. Clothing has always supported this idea and helped one to form beautiful appearance. Wearing beautiful garments gives an aesthetic appearance.

*Example:* Decorated blouse with embroidery and stone work.

1.4.4 Protection Theory

Clothes have always been used for protection against extreme climatic conditions such as winter, rainy and summer. Exposure to dangerous materials and environment such as furnace, boiler and thermals stations require special clothing.

*Example:* Woolen coats – winter season, rain coats – rainy season and boiler suits – for people working in a furnace.

1.5 CLASSIFICATION OF CLOTHING

Clothing is classified based on the following five aspects:

1. Based on method of wearing.
2. Based on the area of usage.
3. Based on gender.
4. Based on occasion.
5. Based on occupation.

1.5.1 Clothing based upon the Method of Wearing

Clothing can be grouped based upon the method it is worn. They are draped clothing, slip on clothing, open stitched clothing, closed clothing and sheath clothing.

1.5.1.1 Draped Clothing

Draped clothing is clothes which run into meters and are draped over the body or certain method of wearing.

*Example:* Indian saree draping: Maharashtra – Saree is pleated and tucked between legs; Gujarat – Saree pallu is draped, over the bust from right side shoulder; Tamil Nadu – Saree is pleated in front and draped over left shoulder (Figure 1.11).
1.5.1.2  Slip on Clothing
Slip on clothing is single piece with an open, around the neck line which is pulled through the head and the garment falls from shoulder.

Example: Petticoats without openings.

1.5.1.3  Open Stitched Clothes
Open stitched clothes are clothes that are worn for decorative purposes over another dress. They are stitched with an opening in the front.

Example: Overcoat (Figure 1.12).

1.5.1.4  Fitted Clothing
Fitted clothing is stitched to fit the body of an individual are also called as closed fitted clothing.

Example: Kurta.

1.5.1.5  Sheath Clothing
Sheath Clothing is the specialty clothes that are molded to a specific shape and made into a hard shaped garment.

Example: Bullet proof amours used in wars (Figure 1.13).

1.5.2  Clothing based upon the area of Usage
Clothes can be grouped based on their usage on different parts of the body as clothing for head, neck, upper bodice, lower bodice (hip) and leg.

1.5.2.1  Head Clothing
Clothes worn around the head are called head clothing. They are usually used for protection, decoration or as a symbol of status.

Example: Woolen caps to protect in winter, turban used for decoration during Indian marriages.

1.5.2.2  Neck Clothing
Clothes used around the neck are known as neck clothing. These are also used for protection or decoration.

Examples: The mufflers around the neck in winter and scarfs used by teenagers for decoration.

1.5.2.3  Upper Bodice Clothing
Clothes used over the upper bodice or chest part of a human body is called as upper bodice clothing.

Example: Men’s shirts, kameeze.
1.5.4 Classification of Clothing Based on Occasion

Across the globe every human has his own culture and festivals. Each of them is well defined by use of specific clothing.

Example: The Kerala wedding costume wherein the women use blouse and mundu, men use silk dhoti and towel over the shoulder (Figure 1.16).

1.5.5 Classification of Clothing Based on Occupation:

Clothes are always related to work and work place. Depending upon the work, clothes are designed, so that it can help the weavers to carry out their jobs easily.

Example: The coat and hat of a chef. The coat contains pockets to hold spoons and other accessories, whereas the hat prevents fall of hair into the cooking items (Figure 1.17).
1.6 SUMMARY

Clothing is rightly known as the second skin of human. This lesson described the growth of clothing during the early ages and the major uses of clothing. Clothing is basically used for modesty, protection, immodesty and adornment. Clothing is further classified based on various criteria’s like place of usage, time, occupation and so on. Shortly the clothing adds beauty and protection to every one.

POINTS TO REMEMBER

- Twigs, barks and leaves are early clothing.
- Clothing is used to cover every part of the body.
- Clothing protects one from climatic changes.
- Clothing adds identification and status.
- Clothing has changed from basic fibres like cotton to digital clothing.

ACTIVITIES FOR THE TEACHER

- Download clothing used during various periods – Stone age, New stone age, Digital and show it to the students.

ACTIVITIES FOR STUDENTS:

- To collect pictures of different types of clothing based upon
  - Seasons and Occupation
  - Prepare an Assignment
Glossary

1. Eskimo  People living in North Canada, Alaska, Greenland and East Siberia.
2. Asbestos  Type of Mineral fibre extracted from silica.
4. Identification  To denote specific group or class.
5. Drape  To cover; covering over.

Internet Resources

https://www.youtube.com/watch?v=EyC1MXS9YDI&t=17s  Different Types of Clothes in India
https://www.youtube.com/watch?v=okYBOzz950A  Types of Clothes

Questions and Answers

Part – I

1. Objective Questions:

   1. When was artificial yarns manufactured
      - (a) 19th Century
      - (b) 20th Century
      - (c) 18th Century
      - (d) 17th Century

   2. Clothes make the
      - (a) Man
      - (b) Woman
      - (c) Boy
      - (d) Girl

   3. Asbestos clothing are used by
      - (a) Military men
      - (b) Football player
      - (c) Cricket player
      - (d) Fire fighters

   4. _______ clothes run into meters and are draped over the body base according to individual preference.
      - (a) Draped
      - (b) Open sewed
      - (c) Closed
      - (d) Sheath

   5. In Kerala, for wedding men wear ________________
      - (a) Silk dhoti and towel
      - (b) Rayon dhoti and towel
      - (c) Cotton dhoti and towel
      - (d) Polyester dhoti and towel
PART – II

II. ANSWER IN THREE (OR) FOUR POINTS :
1. What is safety in clothing?
2. Define insignias.
3. Define protection theory.
4. List the clothing based on gender.
5. Write short note on clothing based on occupation.

PART – III

III. ANSWER IN A PARAGRAPH :
1. How will you justify clothing as protection?
2. Explain clothing based upon the method of wearing.
3. Explain clothing based upon the area of usage.

PART – IV

IV. ANSWER IN ONE PAGE :
1. Describe the purpose of clothing.
2. What are the theories of clothing?

Answers for Objective Questions:
1. (b) 2. (a) 3. (d) 4. (a) 5. (a)
2.1 INTRODUCTION

Natural fibres are taken from the plant and animal sources. Since they are available naturally in the plant, animal or minerals, they are called as natural fibres. Cotton, silk and wool are the most well known natural fibres. There are several other commonly used natural fibres like jute, flax, linen and asbestos.

Plant Fibres
Seed Fibre
The fibres that are collected from various plant seeds are known as seed fibres. Example: Cotton (Figure 2.1).

Leaf Fibre
The fibres that are taken or collected from leaves are known as leaf fibre. Example: Pineapple and banana (Figure 2.2).

Which is the oldest natural fiber?
Flax is the earliest known natural textile fabric seen used in about 5000 BC. Flax is the material used to make linen which is seeing a huge come back today in drapery and upholstery.

Figure 2.1 Seed Fibre – Cotton
Textiles and Dress Designing

**Bark / Bast Fibre**
Wood pulp is collected from the outer bark or stems of plant, which is used for making fibres known as bast fibres. These fibers are used for the packaging purposes and for paper production. Example: Jute (Figure 2.3).

**Fruit Fibres**
The fibres that are taken from the fruits are known as fruit fibers. Example: Coir (Figure 2.4).

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**What are Phloem Fibers?**
Phloem fibers are plant skin fibers, also known as bast fibers. These fibers are collected from the inner skin/bark of the plant known as phloem. Some of the most common bast fibers are flax, hemp, and ramie. These fibers are classified as hard and soft fibers.

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**2.2 COTTON**

**2.2.1 Introduction**
Most of the people wear cotton fabric. People like cotton fabrics more than any other fabric. Cotton (Figure 2.5) was being used even before 3000 BC. Cotton fabrics are both soft and strong. Cotton is most popular and widely used fabric. Heavy weight cotton fabrics are even used as roofing of houses, making footwear and bags.

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**Figure 2.4 Fruit Fibres – Coir**

**Figure 2.3 Bark/Bast Fibre – Jute**

**Figure 2.2 Leaf Fibre – Banana**

**Figure 2.5 Cotton**

<table>
<thead>
<tr>
<th>Principle Origin</th>
<th>Natural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generic Name</td>
<td>Seed Hair</td>
</tr>
<tr>
<td>Chemical Type</td>
<td>Cellulosic</td>
</tr>
<tr>
<td>Common Name</td>
<td>Cotton</td>
</tr>
</tbody>
</table>
2.2.2 Growth and Production
Different types of cotton fibres can be produced from the same cultivation area. It takes 200 – 220 days for the cotton plant to grow fully. Sunlight and humidity are needed for the growth of cotton. Some varieties of cotton need 3-5 millimeter of rain for its growth. The quality of cotton depends upon the soil type, atmospheric condition and fertilizers used. In South India, cotton is sown during the month of September and October whereas during the same period it is harvested in North India. Therefore, India cultivates cotton throughout the year.

2.2.3 Cotton Cultivation and Harvesting

Soil
For cultivation of cotton clay, sand and red sand are highly adapted.

Climate
The climatic condition needed for the growth of cotton is warmth and moisture content in air. There should be continuous rain during sowing of cotton; this will help for the fast growth of the plant. Apart from this, a good sunlight, moderate warm temperature is also needed throughout the growth period.

The Time of Sowing
It can be sown from April to August. The duration for full growth is 120-180 days.

The Method of Sowing
At first, the land is ploughed well, so that the air moves freely within the soil. The seed is sown between 1-15 meter gaps each. The seeds will start germination within 10-14 days. Later, the growth will be much quicker. The strong plants are selected and replanted with equal space. The flowers start appearing within 2-3 months. Later, the fruit starts to grow with a green colour seed. The cotton seeds will be present inside the fruit. In these seeds the cotton fibres will start growing from outside. Later, the fully grown cotton fruit (Figure 2.6) will blast and the cotton fibres will come out.

Harvesting
The cotton fibre should be collected at once; otherwise the cotton fibre with seed will be carried away by wind. Dust particles will also spread over cotton fibre, resulting in colour change of the fibres. Harvesting can be done by hand or by using machines. Next, the harvested cotton fibres are sent to ginning mills (Figure 2.7).

Ginning
The harvested seeds are dried using warm air, and stored for ginning. Ginning is the process of separation of fibres from seeds. Later using special machines the fibres are separated from the seeds. The separated fibres are called lint, which have a staple length of 15 to 50 mm. The very short fibres are called linters. Hundred kilogram of clean cotton seeds yield 35 kg
of fibres, 62 kg of seeds and 3 kg of waste. The lint’s are compressed into bundles of 500 kg and sent to spinning mills for yarn production.

2.2.4 Characteristics of Cotton

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luster</td>
<td>Low</td>
</tr>
<tr>
<td>Tenacity / Strength</td>
<td>Medium</td>
</tr>
<tr>
<td>Elastic Recovery</td>
<td>Low</td>
</tr>
<tr>
<td>Elongation</td>
<td>7%</td>
</tr>
<tr>
<td>Resiliency</td>
<td>Low</td>
</tr>
<tr>
<td>Density</td>
<td>1.54 g / cm³</td>
</tr>
<tr>
<td>Moisture Absorption</td>
<td>8.5%</td>
</tr>
<tr>
<td>Dimensional Stability</td>
<td>Good</td>
</tr>
<tr>
<td>Reaction with Acid</td>
<td>Weakens fibres</td>
</tr>
<tr>
<td>Reaction with Alkalies</td>
<td>Resistant (Mercerization)</td>
</tr>
<tr>
<td>Effect of Sunlight</td>
<td>Weakens fibres slowly</td>
</tr>
<tr>
<td>Insects</td>
<td>Silverfish damages the fibre</td>
</tr>
<tr>
<td>Reaction to Flame</td>
<td>Burns readily</td>
</tr>
</tbody>
</table>

2.2.5 Common Uses of Cotton

- Clothing (Frocks, Socks, Towels, Saree, Dress Materials).
- Household Textiles (Bed Spread, Pillows).
- Medical Textiles (Absorbance Pads, Bandages).

Animal Fibres

The animal fibres are obtained from animals or insects in the form of hair or a liquid substance like saliva. It is full of protein. Example: Hair from goat, Kashmir goat, camel, rabbit and saliva of silk worm.

Which is the strongest natural fiber?

The strongest natural fiber is spider silk. It is the toughest fiber. It is light, flexible fiber but at the same time it is five times stronger by weight than graded steel.
2.3  SILK

Silk is commonly known as the “Queen of Fabric”. It is a very fine long smooth protein fibre. It is a secretion of silkworm. Silk was first found by the Chinese Princess and after many years the technique was passed on to other countries. Silk can be cultivated or it is found in forests as wild silk. Cultivated silk variety is the Mulberry silk. The common wild silk varieties are Eri, Tasar and Muga silk. The process of cultivation of silkworm for silk production is called as sericulture.

<table>
<thead>
<tr>
<th>Principle Origin</th>
<th>Natural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generic Name</td>
<td>Proteinaceous</td>
</tr>
<tr>
<td>Chemical</td>
<td>Secretion of silk worm</td>
</tr>
<tr>
<td>Common Name</td>
<td>Silk</td>
</tr>
</tbody>
</table>

### 2.3.1  Production of Silk

The production of silk involves many sub division,

- Sericulture.
- Silkworm egg hatching.
- Feeding the silkworm.
- Spinning silk thread from cocoon.
- Silk filament reeling.
- Silk throwing.
- Weighting of silk.

**Sericulture**

Sericulture is a process in which silkworms are cultivated. Bombyx mori is the species used by most of the commercial silk industry. Silk worms are fed with mulberry leaves. Therefore mulberry trees are grown. The mulberry leaves are cut into small parts and given as feed to silk worms.

**Egg Hatching**

As per modern scientific methods, eggs are produced for fertilization from mulberry silkworms. The produced eggs are collected and stored under suitable conditions so that it will be used whenever it is needed.

**Feeding the Silkworm**

The collected eggs are kept in the incubator for hatching at 18°C to 28°C. Heat is required for hatching of the eggs, which takes about one week to 10 days. Eggs are hatched into larva or caterpillars of quarter inch lag. The tiny hatched worms are kept with the mulberry leaves in a plate. Care is taken to feed the worms at regular intervals. After eating more and more leaves, the worm becomes bigger in size of 3 inches. After the full growth, it stops eating and there is change in colour of the silkworm. It takes approximately one month for the silkworm to achieve the full growth. The fully grown worm swings its head and secretes a substance from the ends of its mouth, and the secreted substance solidifies on contact with air. Using this substance the silkworm forms a cocoon around its body. This substance is a continuous, thin filament made of sericin and fiberoin. The silkworm takes two to three days for formation of the cocoon. The well grown cocoons are selected for the fertilization and the others are used for the making of silk fibre. Cocoons are put in hot chamber and steam is passed. This process is called staving or stifling to destroy chrysalis inside the cocoon. This process would prevent silk filament breakage (Figure 2.8).
Spinning Silk Thread from Cocoon

The cocoons (Figure 2.9) are put in hot water, so that the gum on the outer shell is removed. After that, using a stick the loose fibres is slowly unreeled.

Figure 2.8 Feeding the Silkworm

Figure 2.9 Silk Cocoon

2.3.2 Silk Filament Reeling

It is passed through an eyelet and reeled on to a wheel. The fibres are moved from left to right hand slowly and rolled up. This process is called reeling. Three to ten fibres are combined to make a suitable silk filament.

Throwing

The reeled silk is known as raw silk. The process of transferring silk fibre to yarn is known as throwing. This is sorted based upon size, colour, length or quantity. The raw silk skeins are soaked in warm water with soap or oil. This softens the sericin and helps in the movement of the threads. The skeins are placed on light reels and the silk is wound on the bobbins after mechanical drying. When the strands are wound, desired amount of twist can be given. If two or more yarns are wound it is called doubling. Based on the requirements the twist may be given in the same or opposite direction. In order to make yarns into fabrics, the yarns are dyed first. The yarns are washed with soap water to remove sericin. This process is called degumming. The silk filaments are reeled into skeins. This is packed into small bundles called books, which is kept ready for marketing.

Weighing of Silk

The silk fabric manufactures buy silk yarns in kilograms for cloth production. During degumming process the silk weight is lost. In order to increase the weight of silk which was lost in degumming the silk yarns are treated with chemical and metals. This process increases the weight of fabric and is called weighting of silk. This processes increase the weight of the silk but the natural elasticity is lost.

The silk also gets deteriorated on exposure to sunlight, perspiration and dry cleaning.

2.3.3 Characteristics of the Silk Fibre

<table>
<thead>
<tr>
<th>Shape</th>
<th>Like glass rod</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>30,000 – 39,000 cm</td>
</tr>
<tr>
<td>Elasticity</td>
<td>More</td>
</tr>
<tr>
<td>Stretch ability</td>
<td>More</td>
</tr>
<tr>
<td>Flexibility</td>
<td>Medium</td>
</tr>
</tbody>
</table>
2.4 WOOL

- Wool is one of the oldest fibres used for protection from cold climate.
- In Tamil wool is called as KAMBULI. The hair of sheep (Figure 2.10), camel and rabbit are also used as wool fibres. They were woven as garments and used. Even during early days, woolen clothes were worn by the people.

### 2.4.1 Processing of Wool

The best wool (Figure 2.11) can be obtained from animals which are free from diseases and chemicals and fed with nutritional diet. Wool can be taken from sheep’s by two methods- namely wool shearing from live animals or pulled off from the skin of...
dead animals. The wool obtained by shearing is called fleece or clipped wool. The wool obtained from dead animals is called pulled wool. Sometimes, chemicals are added in the food of animals which result in the loss of hair. This is wool is weak when compared to mechanically sheared wool. The pulled wool and sheared wool can be mixed for yarn formation.

2.4.2 Manufacturing of Wool

Wool Grading and Sorting
Wool fleece is classified based on the quality. It is graded based on the parts of animal from which it is sheared.

Best quality wool used for clothing- sheared from shoulder and sides.

Lesser quality wool used for rug making- sheared from lower legs.

Wool Cleaning and Scouring
The sheared wool has some natural oil present in them. This collected wool is known as grease wool. It is packed in bales then washed and sorted again. The recycled wool fibre is obtained by separately reducing the unused and used material to a fibrous mass by picking and shredding process called garneting. Further to remove the oil content, the fibres are washed in dilute acids, which is known as carbonizing. The resultant wool is called extract. Further the wool is washed with alkaline solution known as scouring. The washed wool is dried. Care is taken to leave 12 to 16% of moisture in the wool. The scoured wool is fluffy therefore it is treated with vegetable oil which helps in making the softness of wool suitable for spinning. The wool is further dyed and blended if required.

2.4.3 Characteristic of Wool Fibre

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shape</td>
<td>Fibre contain scales</td>
</tr>
<tr>
<td>Length</td>
<td>3.75</td>
</tr>
<tr>
<td>Elongation</td>
<td>Good</td>
</tr>
<tr>
<td>Fibre luster</td>
<td>Medium</td>
</tr>
<tr>
<td>Elasticity</td>
<td>More</td>
</tr>
<tr>
<td>Stretchability</td>
<td>More</td>
</tr>
<tr>
<td>Flexibility</td>
<td>More</td>
</tr>
<tr>
<td>Density</td>
<td>1.30 – 1.32 g/cm³</td>
</tr>
<tr>
<td>Reaction with acid</td>
<td>Not affected</td>
</tr>
<tr>
<td>Reaction with alkalies</td>
<td>Most of alkalies destroy the fibre</td>
</tr>
<tr>
<td>Absorbency</td>
<td>Good</td>
</tr>
<tr>
<td>Reaction to sunlight</td>
<td>More heat affects the fibre.</td>
</tr>
<tr>
<td>Flame</td>
<td>Burns slowly in direct flame, but self extinguishing.</td>
</tr>
<tr>
<td>Insects</td>
<td>Damaged by moths and carpet beetles</td>
</tr>
<tr>
<td>Drying</td>
<td>Prolonged drying</td>
</tr>
<tr>
<td>Dyeing</td>
<td>Absorbs acid and basic dyes readily.</td>
</tr>
</tbody>
</table>
2.4.4 Common Uses of Wool
- Clothing (Winter Clothes – Muffler, Sweaters, Caps)
- Household textiles (Blankets, Rugs, Carpets)
- Industrial Textiles (insulation material used to keep the object warm)

2.5 SUMMARY
Natural fibres play a very important role in the growth and development of textiles and clothing. These fibers are obtained from naturally available sources like plants, animals and minerals. Due to their properties they are safe to use. They are used for manufacturing a wide range of products used in our day to day life like clothing and home textiles. They also help in the production of medical and industrial textiles.

POINTS TO REMEMBER
- Natural fibers are obtained from natural sources.
- Cotton, wool and silk are the commonly used natural fibers.
- Cotton is obtained from seeds and is a plant fiber. Cotton is preferred by most of the people across the globe. Cotton is an all season fibre.
- Wool and silk are animal fibers which are obtained from sheep and silkworms respectively.
- Cotton is also used as winter clothes.
- Silk is also used as festival fabric in India.

ACTIVITIES FOR THE TEACHER
- To display the natural fibres and explain.
- To explain the manufacturing process of the natural fibres through power point.
- To arrange for field visit to spinning mill and silk reeling unit.

ACTIVITIES FOR STUDENTS
- To collect the fabrics made with natural fibres and prepare an album.
### GLOSSARY

<table>
<thead>
<tr>
<th></th>
<th>Fibre Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Seed Fibre</td>
<td>Fibres collected from various seeds, (Plant)</td>
</tr>
<tr>
<td>2</td>
<td>Leaf Fibre</td>
<td>Fibres collected from leaf cells.</td>
</tr>
<tr>
<td>3</td>
<td>Bark Fibre</td>
<td>Fibres collected from outer bark / Stems of plant.</td>
</tr>
<tr>
<td>4</td>
<td>Fruit Fibre</td>
<td>Fibres collected from the fruits.</td>
</tr>
<tr>
<td>5</td>
<td>Cotton</td>
<td>Soft and smooth, cloth.</td>
</tr>
<tr>
<td>6</td>
<td>Animal Fibre</td>
<td>Fibers taken from the animals / Insects.</td>
</tr>
<tr>
<td>7</td>
<td>Silk</td>
<td>Fiber from silk worm, Queen of fabric.</td>
</tr>
<tr>
<td>8</td>
<td>Wool</td>
<td>Fiber from animals. The oldest fibres used for protection from cold climate.</td>
</tr>
</tbody>
</table>

### INTERNET RESOURCES

<table>
<thead>
<tr>
<th>Link</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="https://www.youtube.com/watch?v=ypUkIR894AM">https://www.youtube.com/watch?v=ypUkIR894AM</a></td>
<td>Types of Natural Fibres</td>
</tr>
<tr>
<td><a href="https://www.youtube.com/watch?v=0hoHvN289Xs">https://www.youtube.com/watch?v=0hoHvN289Xs</a></td>
<td>Cotton Fibre from Field to Fabric</td>
</tr>
<tr>
<td><a href="https://www.youtube.com/watch?v=0hoHvN289Xs">https://www.youtube.com/watch?v=0hoHvN289Xs</a></td>
<td>Making of Cotton Fibre</td>
</tr>
<tr>
<td><a href="https://www.youtube.com/watch?v=0hoHvN289Xs">https://www.youtube.com/watch?v=0hoHvN289Xs</a></td>
<td>Making of Silk Fibre</td>
</tr>
<tr>
<td><a href="https://www.youtube.com/watch?v=vA-4M-xlGEs">https://www.youtube.com/watch?v=vA-4M-xlGEs</a></td>
<td>Making of Wool Fibre</td>
</tr>
<tr>
<td><a href="https://www.youtube.com/watch?v=rDqY2mLoolw">https://www.youtube.com/watch?v=rDqY2mLoolw</a></td>
<td>Hand Carding</td>
</tr>
</tbody>
</table>
QUESTIONS AND ANSWERS

PART – I

I. OBJECTIVE QUESTIONS:

1. Cotton is obtained from which part of the plant?
   (a) Seed   (b) Leaf   (c) Fruit   (d) Bark

2. Pick out the natural fibre.
   (a) Rayon   (b) Nylon   (c) Silk   (d) Acetate

3. This fibre is strong and lustrous.
   (a) Cotton   (b) Silk   (c) Linen   (d) Wool

4. The elasticity of cotton is
   (a) 8%   (b) 9%   (c) 7%   (d) 6%

5. Fibre obtained from animal.
   (a) Nylon   (b) Cotton   (c) Linen   (d) Wool

PART – II

II. ANSWER IN THREE (OR) FOUR POINTS:

1. Mention the favorable season for cultivation cotton.
2. Brief on the method followed for the production of silk.
3. State the process of silk weighing.
4. Explain the processing of wool.
5. Account the manufacturing process of wool.

PART – III

III. ANSWER IN A PARAGRAPh:

1. What are the properties of cotton?
2. Write about the properties of silk.
3. Briefly explain the properties of wool.

PART – IV

IV. ANSWER IN ONE PAGE:

1. Describe the cotton manufacturing process.
2. How silk is manufactured?
3. Explain wool with respect to types, processing and manufacturing process.

Answers for Objective Questions:

1. (a) 2. (c) 3. (b) 4. (c) 5. (d)
3.1 INTRODUCTION:

Man-made fibres are fibres which as the name say are made by man with a combination of natural products along with chemicals. The main advantage of these fibres is properties of the natural product used can be improved. Manmade fibres are made by preparing a viscous solution which is passed through the spinneret to form the fibre, which is cooled and solidified as it comes out of the spinneret. It is a small round metal with large number of tiny holes.

3.2 RAYON:

The rayon fibre is made with pure cellulose. Cellulose is the substance which is obtained from the cell walls of the woody part of trees and cotton plant. Cellulose is commonly used for making products such as paper. The rayon fibre that has been formed with regenerated or re-formed cellulose substance is called as regenerated cellulose fibres.

Rayon is the first man-made fibre and its production has been prophesied as long ago as 1664 by Robert Hooke, an English naturalist. He believed that it is possible to make an “artificial glutinous” composition which can resemble the silk-worm fibre. Man-made textile fibres were officially recognized in 1925 when the Federal Trade Commission (FTC) permitted the use of the name “rayon” from yarns obtained from cellulose or its derivatives. With the increase in production of man-made fibres, FTC ruled again in 1937 that any fibre or yarn produced chemically from cellulose must be designated as rayon.
When was the First Manmade Fiber Made?

Rayon, was the first man-made fiber created in 1910 and it was called ‘artificial silk’. Viscose is the most common form of Rayon.

3.2.1 Types of Rayon

Based on the method of manufacture, at present there are two principal types of rayon.

1. Rayon or Viscose
2. High Wet Modulus Rayon (regenerated rayon)

In High Wet Modulus Rayon (HWM), the original material (cellulose) is changed chemically into another form, which is then changed or regenerated into cellulose again. These changes produce the final product that is purified cellulose in the fibre form.

3.2.2 Manufacturing Process of Viscose Rayon

For making viscose rayon, wood chips or cotton linters are treated with chemicals to produce sheets of purified cellulose that resembles white blotters. This purified cellulose is soaked in caustic soda which produces sheets of alkali cellulose. These sheets are then broken up into fluffy white flakes or grains called cellulose crumbs. The crumbs are aged for 2-3 days under controlled temperature and humidity.

Liquid carbon disulphide is then added to these cellulose crumbs which turn it into a light orange substance called cellulose xanthate. The cellulose xanthate crumbs are then dissolved in a weak solution of caustic soda, which turns it to a thick viscous solution resembling honey in colour and consistency. This thick solution is called viscose. The viscose is aged, filtered and vacuum treated to remove the air bubbles present, as they may cause the filament to break. This treated viscose solution is then forced through the holes of a spinneret into sulphuric acid which coagulates the cellulose of the cellulose xanthate to form pure regenerated cellulose filaments (Figure 3.1).

3.2.3 Finishing Process

A wide variety of fabrics can be produced by viscose rayon. Spun rayon fabrics can be used for making fabrics that resemble cotton, linen or wool. Rayon filament yarns can be used for making fabric that resemble silk. Various finishes can be
applied to these rayon fabrics to improve their serviceability and to enhance their appearance. The most common finishes given to rayon fabrics are as follows:

<table>
<thead>
<tr>
<th>Finish</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calendaring</td>
<td>For smoothness</td>
</tr>
<tr>
<td>Embossing</td>
<td>For decorative effects</td>
</tr>
<tr>
<td>Flame retardant</td>
<td>For fire protection</td>
</tr>
<tr>
<td>Napping</td>
<td>For warmth and softness and to resemble wool</td>
</tr>
<tr>
<td>Preshrinking</td>
<td>For greater dimensional stability</td>
</tr>
<tr>
<td>Stiffening</td>
<td>For better appearances</td>
</tr>
<tr>
<td>Water repellence</td>
<td>For resistance to water and rain</td>
</tr>
<tr>
<td>Wrinkle resistance</td>
<td>For better shape retention</td>
</tr>
</tbody>
</table>

3.2.4 Properties of Rayon

<table>
<thead>
<tr>
<th>Property</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shape</td>
<td>Thin long filament</td>
</tr>
<tr>
<td>Size</td>
<td>Diameter varies from 12 to 40 microns (controlled by manufacturer)</td>
</tr>
<tr>
<td>Luster</td>
<td>Varies from brightness to dullness</td>
</tr>
<tr>
<td>Strength</td>
<td>2.4 – 3.0 Pa m³/kg</td>
</tr>
<tr>
<td>Elongation</td>
<td>19 – 24%</td>
</tr>
<tr>
<td>Elasticity</td>
<td>82%</td>
</tr>
<tr>
<td>Density</td>
<td>1.5 g/cm³ for all rayon types</td>
</tr>
<tr>
<td>Moisture</td>
<td>Upto 10.7%</td>
</tr>
<tr>
<td>Dimensional stability</td>
<td>Poor</td>
</tr>
</tbody>
</table>

3.2.5 Uses of Rayon

The uses of Rayon are:

- The rayon is used to create clothing such as blouse, jackets, sportswear and dresses.
- It is used in textile industry for making textile belts.
- Rayon is used for making tyre.
- It is also used for making carpets and surgical dressings.
- Rayon is used for a wide range of fabrics for household.

What is special about the year 2009?

The International Year of Natural Fibers is celebrated in 2009. It emphasizes on fibers produced by plants and animals. It does not include modern man-made artificial and synthetic fibers such as rayon, nylon, acrylic and polyester.
3.3 ACETATE

Acetate fibres are chemical compounds of cellulose and not the pure cellulose as in rayon fibres. These chemical compounds have their own unique properties and in fact the various types of cellulose acetate fibres differ from each other in properties. In 1865, Pant Schutzenberger discovered the reaction of cellulose acetate. Later in 1903, the German chemists Arthur Eiechengeun and Theodore Becker invented the fast soluble form of cellulose acetate.

In 1904, cellulose acetate was developed by Camille Dreyfus and his younger brother Henri in England, during World War I. It was used as a non flammable lacquer for the fabrics used for covering the wings and fuselage of aircrafts. In 1918, they perfected the technique of spinning this substance into lustrous filaments of “artificial silk”. Subsequently, British Celanese Ltd. started the production of this fibre. In 1924, the commercial production of acetate fabric started in the United States by Celanese Corp. In 1954, the Celanese Corp. of America undertook the production of a variation of this chemical called cellulose triacetate. This product is marketed by the Celanese Fibres Marketing Co. under the trademark Arnel.

3.3.1 Types of Acetate

The different types of acetate are
1. Diacetate
2. Triacetate.

3.3.2 Manufacturing Process of Acetate

Pure cellulose is formed by converting cotton linters or wood sheets. This pure cellulose is steeped in glacial acetic acid and aged under controlled temperature for a period of time. It is then mixed with acetic anhydride and a small amount of sulphuric acid as a catalyst to facilitate the reaction which produces a thick and clear liquid solution of cellulose acetate. This liquid is then passed through the spinneret to form these fibres which is solidified and rolled on the bobbins for later use (Figure 3.2).

![Diagram of the manufacturing process of acetate](image-url)
3.3.3 **Properties of Acetate and Triacetate**

<table>
<thead>
<tr>
<th>Property</th>
<th>Acetate and Triacetate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shape</td>
<td>Can be modified as per requirement</td>
</tr>
<tr>
<td>Size</td>
<td>Thin long filament</td>
</tr>
<tr>
<td>Luster</td>
<td>Variation from brightness to dullness</td>
</tr>
<tr>
<td>Strength</td>
<td>Good</td>
</tr>
<tr>
<td>Elongation</td>
<td>Good up to 25%</td>
</tr>
<tr>
<td>Elastic recovery</td>
<td>Good</td>
</tr>
<tr>
<td>Resiliency</td>
<td>Low for acetate, but for triacetate it is good.</td>
</tr>
<tr>
<td>Dimensional stability</td>
<td>Good</td>
</tr>
<tr>
<td>Resistance to acids</td>
<td>Fair resistance to dilute acid, but cannot withstand concentrated acid.</td>
</tr>
<tr>
<td>Resistance to alkanes</td>
<td>Good resistance to dilute alkalis but cannot withstand concentrated alkalis.</td>
</tr>
<tr>
<td>Resistance to flame</td>
<td>Burns easily</td>
</tr>
<tr>
<td>Napping</td>
<td>On spun acetate for softness and warmth</td>
</tr>
<tr>
<td>Sizing</td>
<td>For better appearance</td>
</tr>
<tr>
<td>Water repellency</td>
<td>For resistance to water and rain</td>
</tr>
<tr>
<td>Wrinkle resistance</td>
<td>For better shape retention</td>
</tr>
</tbody>
</table>

3.3.4 **Finishing Process**

Depending upon the kind of yarns used and the final effect desired, different finishes can be given to acetate fabrics. The most common finishes are:

- **Embossing** For pattern or design
- **Heat setting** For crease and shape retention
- **Moiréing** For permanent watermarking effect

3.3.5 **Uses of Acetate**

The uses of acetate are:

- The breathable nature of the fabric makes it suitable for use as a lining fabric for apparels.
- Acetate is used for making cigarette filters and other filters, ink reservoirs for fibre tip pens.
- It is used for making high absor-bency products like diapers and surgical products.
- It is also used for making eyeglass frames.

3.4 **NYLON**

Nylon is a generic name given to a group of related compounds classified as Polyamides, just like cotton, linen and wool. Nylon is a long chain of linear concentrated polymer made from hexamethylene diamine and adipic acid. Nylon is the first synthetic fibre made in 1928 during a research at Dupont Company.

Nylon was invented by E.I.Du Pont de Nemours & Co. The credit of the discovery of the nylon goes to Dr.Wallace H. Carothers and his staff of organic chemists who worked in Du Pont’s chemical department. Realizing that there is a need of more active program of research
to provide new developments, Du Pont began a long range of programme in 1928. Du Pont now shifted from applied research to fundamental research, which primarily aimed to develop knowledge of chemicals, materials and processes.

After many months of research, Dr.Carothers assistant discovered a polymer, which was a clear, heavy molasses when molten and could be drawn out into filament. This was a polymer. It was called 6.6, because there were six carbon atoms per molecule. Later it was called Nylon. It is also known a polyamid.

Nylon is actually a group of related chemical compounds. It is composed of hydrogen, nitrogen, oxygen and carbon in controlled proportions and structural arrangements. Variations in the chemical structures can result in formation of compounds like plastic. The two types of nylon are nylon 6.6 and nylon 6.

3.4.1 Types of Nylon Yarns
The diameter of the nylon yarn filament can be determined by the rate of delivery from the pump to the spinneret and the rate by which the yarn is drawn away from the spinneret. The size of yarn, which is measured in denier, can be determined by the diameter and the number of filaments in the yarn. Based upon this nylon can be divided as Nylon 6.6, Nylon 6.12, Nylon 4.6, Nylon 6, Nylon 12 and so on.

- Monofilament Yarns.
- Multifilament Yarns.
- Stretch Yarns.
- Textured Yarns.
- Spun Yarns.

3.4.2 Manufacturing Process of Nylon
Required amount of hexamethylene diamine and adipic acid are mixed to form nylon salt. This salt is dissolved in water at the spinning mill and heated to get a concentrated nylon salt solution. The solution is placed in an autoclave under high pressure and heat which results in giant chain links structure called “Linear Superpolymers”. The solution is slowly passed over the autoclave and a molten nylon resin is deposited on wheel. This is sprayed with cold water to harden into opaque ribbon, flakes or pellets. On melting this pellets or flakes are passed through the spinneret to form nylon yarns (Figure 3.3).

3.4.3 Properties of Nylon

<table>
<thead>
<tr>
<th>Shape</th>
<th>Can be modified as per requirement.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>Thin long filament.</td>
</tr>
<tr>
<td>Density</td>
<td>1.1 g / ccm</td>
</tr>
</tbody>
</table>
Chapter 3 Man-Made Fibres

<table>
<thead>
<tr>
<th>Property</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lustre</td>
<td>Varies from brightness to dullness</td>
</tr>
<tr>
<td>Strength</td>
<td>Good</td>
</tr>
<tr>
<td>Elongation</td>
<td>Good</td>
</tr>
<tr>
<td>Elastic recovery</td>
<td>100%</td>
</tr>
<tr>
<td>Resiliency</td>
<td>Good</td>
</tr>
<tr>
<td>Moisture absorption</td>
<td>8%</td>
</tr>
<tr>
<td>Dimensional stability</td>
<td>Excellent</td>
</tr>
<tr>
<td>Resistance to acid</td>
<td>Poor</td>
</tr>
<tr>
<td>Resistance to alkalis</td>
<td>Good</td>
</tr>
<tr>
<td>Sunlight</td>
<td>Affected by sunlight</td>
</tr>
<tr>
<td>Insects</td>
<td>Normally damages the fibres</td>
</tr>
<tr>
<td>Resistance to flame</td>
<td>Self extinguishing</td>
</tr>
<tr>
<td>Moireing</td>
<td>For shimmer effect</td>
</tr>
<tr>
<td>Molding</td>
<td>For shaping fabrics</td>
</tr>
<tr>
<td>Nylonizing</td>
<td>For increased absorbency</td>
</tr>
<tr>
<td>Water repellence</td>
<td>For added protection against water</td>
</tr>
<tr>
<td>Dyeing</td>
<td>For imparting colour to the fabric</td>
</tr>
</tbody>
</table>

3.4.4 Finishing Nylon Fabrics

Nylon fabrics can be given various finishes.

- **Antistatic finish** For reduction of electrostatic build up
- **Embossing** For patterns or designs
- **Heat setting** For permanent shape

3.4.5 Uses of Nylon Fabric

- Nylon is used in women's stockings or hosiery. It is also used as a material for producing socks, swimwear, shorts, track pants, active wear, draperies and bedspreads.
- Nylon is used for making fishing nets, ropes, parachutes and tyre cords.
- Nylon is used in cookware since it has a relatively high continuous service temperature.
- Nylon is used for making plastic machine parts as it is low cost and long lasting. It is often commonly used in the electronics industry for its non-conductivity and heat resistance.

3.5 SUMMARY

Man-made fibres are a combination of natural products and chemicals. All man-made fibres and synthetic fibres are filaments, their length thickness can be modified based on the end product. Man-made fibres can be mixed with natural fibres to produce blended yarns. All the man-made fibres and synthetic fibres are used for clothing and household articles.
POINTS TO REMEMBER

- All man-made and synthetic fibres are filament. They are manufactured by preparing a suitable solution and passing through the spinneret.

- Rayon is made by mixing natural cellulose substance and chemicals.

- Rayon is thin long filament, which is smooth with excellent dimensional stability.

- Acetate is also formed with a combination of cotton linters, wood sheets and chemicals.

- Acetate is known for its elasticity and dimensional stability.

- Nylon is a long chain of polymers made from hexamethylene diamine and adipic acid.

- Nylon has good strength, elongation elasticity and dimensional stability.

ACTIVITIES FOR THE TEACHER

- Download the manufacturing processes of any one manmade fiber and show it to the students.

ACTIVITIES FOR STUDENTS

- Collect pictures and samples of manmade fibers.
# GLOSSARY

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td><strong>Cellulose Fiber</strong></td>
</tr>
<tr>
<td>2.</td>
<td><strong>Spinneret</strong></td>
</tr>
<tr>
<td>3.</td>
<td><strong>Glutinous</strong></td>
</tr>
<tr>
<td>4.</td>
<td><strong>Calendaring</strong></td>
</tr>
<tr>
<td>5.</td>
<td><strong>Emboss</strong></td>
</tr>
<tr>
<td>6.</td>
<td><strong>Flame Retardants</strong></td>
</tr>
<tr>
<td>7.</td>
<td><strong>Preshrinking</strong></td>
</tr>
<tr>
<td>8.</td>
<td><strong>Stiffening</strong></td>
</tr>
<tr>
<td>9.</td>
<td><strong>Wrinkle</strong></td>
</tr>
<tr>
<td>10.</td>
<td><strong>Catalyst</strong></td>
</tr>
</tbody>
</table>

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**INTERNET RESOURCES**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><a href="https://www.youtube.com/watch?v=RUCqwYc91Bw">https://www.youtube.com/watch?v=RUCqwYc91Bw</a></td>
<td>Natural Fibres and Synthetic Fibres</td>
</tr>
<tr>
<td><a href="https://www.youtube.com/watch?v=y479OXzCBQ">https://www.youtube.com/watch?v=y479OXzCBQ</a></td>
<td>Making of Nylon</td>
</tr>
<tr>
<td><a href="https://www.youtube.com/watch?v=cn6K1m7yH0I">https://www.youtube.com/watch?v=cn6K1m7yH0I</a></td>
<td>Polymer Melt Spinning</td>
</tr>
<tr>
<td><a href="https://www.youtube.com/watch?v=f_AvqnMTJjg">https://www.youtube.com/watch?v=f_AvqnMTJjg</a></td>
<td>Making of Rayon</td>
</tr>
<tr>
<td><a href="https://www.youtube.com/watch?v=FCzI--Sk5Zs">https://www.youtube.com/watch?v=FCzI--Sk5Zs</a></td>
<td>Making of Acetate</td>
</tr>
</tbody>
</table>
QUESTIONS AND ANSWERS

PART – I

I. OBJECTIVE QUESTIONS :

1. Cellulose is obtained from the cell walls of
   (a) Woody plants  (b) Plastic  (c) Metals  (d) None

2. Rayon filament yarns can be made for fabrics that resemble _________
   (a) Cotton  (b) Silk  (c) Wool  (d) Jute

3. ________ is used for making high absorbency products like diapers and surgical products.
   (a) Rayon  (b) Acetate  (c) Nylon  (d) HWM Rayon

4. ____________ is also known as polyamide.
   (a) Rayon  (b) Acetate  (c) Nylon  (d) HWM Rayon

5. All man-made fibres and synthetic fibres are _______________
   (a) Cellulosic  (b) Polyamide  (c) Diacetate  (d) Filaments

PART – II

II. ANSWER IN THREE (OR) FOUR POINTS :

1. What are man-made fibres?
2. What is rayon?
3. Give some uses of acetate fabrics.
4. Give some uses of nylon fabrics.
5. What are the raw materials used for manufacturing of nylon?

PART – III

III. ANSWER IN A PARAGRAPH :

1. Write a short note on acetate fibre.
2. Name the common finishes given to rayon fabrics.
3. How is nylon manufactured?

PART – IV

IV. ANSWER IN ONE PAGE :

1. Explain the manufacturing process of viscose rayon.

Answers for Objective Questions:
1. (a)  2. (b)  3. (b)  4. (c)  5. (d)
4.1 INTRODUCTION

Yarn is formed by twisting of fibres together. Both the natural and synthetic fibres are used for making yarns. Yarn is also made of long filaments which are twisted together. It is a continuous strand of fibre or filament suitable for knitting, weaving to form textile fabric. By using a yarn, knitted and woven fabrics are made.

4.2 YARN FORMATION

Yarn occurs in the following forms:
- Twisting of fibres together.
- Fibres are arranged together without twist.
- Filament fibres are joined together with more or less twist.

4.3 TYPES OF YARN

Yarn can be made by using short and long fibres. It can be classified into two types.
Who are the contributors for the development of Spinning Mule?

James Hargreaves was a weaver, carpenter from Lancashire, England. He was one of three inventors responsible for mechanizing spinning. Hargreaves was the one, who improved it with spinning jenny in 1764. Later in 1769 Richard Arkwright patented the water frame and finally Samuel Crompton combined both the creations to develop the Spinning Mule.

Characteristics of Spun and Filament Yarn

<table>
<thead>
<tr>
<th>Spun Yarn</th>
<th>Filament Yarn</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Made with short fibres (e.g.: Cotton and wool)</td>
<td>Made using long filaments (e.g.: Silk)</td>
</tr>
<tr>
<td>2. Protruding fibres are visible</td>
<td>Protruding fibers are not seen</td>
</tr>
<tr>
<td>3. Looks dull and fuzzy</td>
<td>Looks smooth and lustrous</td>
</tr>
<tr>
<td>4. Pilling is seen</td>
<td>Pilling is not seen</td>
</tr>
<tr>
<td>5. Attracts dust easily</td>
<td>Do not attract dust easily</td>
</tr>
<tr>
<td>6. Gives warmthness</td>
<td>Gives coolness</td>
</tr>
<tr>
<td>7. Bulky</td>
<td>Little bulkier</td>
</tr>
<tr>
<td>8. Snagging easily</td>
<td>Snagging depends upon the type of fabric</td>
</tr>
<tr>
<td>9. Stretch depends upon yarn twist</td>
<td>Stretch depends upon yarn twist</td>
</tr>
<tr>
<td>10. Absorbs quickly</td>
<td>Absorbency depends on the fibres</td>
</tr>
<tr>
<td>11. Number of twist is limited can be made</td>
<td>Very high or very low twist can be made</td>
</tr>
<tr>
<td>12. Manufacturing process is difficult</td>
<td>It can be manufactured easily</td>
</tr>
</tbody>
</table>

a. Balanced Yarn
An evenly twisted yarn is called as balanced yarn and is used for making smoother fabric.

b. Unbalanced Yarn
Unevenly twisted yarns are called as unbalanced yarns and are used for making crepe and textured surface fabric.
4.4 YARN TWIST

Fibres are arranged around an axis by means of twist. Twisting adds strength to the yarns. Number of twist determines the appearance and strength of the yarn.

Yarn twisting can be done in two directions. They are:
- S twist or clockwise or right hand twist.
- Z twist or anticlockwise or left hand twist (Figure 4.1).

4.5 CLASSIFICATION OF YARN

- Single Yarn
- Ply Yarn
- Corded Yarn

4.6 YARN NUMBERING SYSTEM

Yarn numbering system defines the relationship between the length and weight of the yarn. It can be classified into two types namely direct and indirect system.

Single, Ply and Corded Yarn

- Single Yarn
  Single yarns are directly twisted from fibres.
- Ply Yarn
  Two or more single yarns are twisted together. This is also known as ply yarn.
- Cord Yarn
  Two or more ply yarns are twisted together to form a cord yarn (Figure 4.2).
4.7 YARN MANUFACTURING PROCESS

Fibres are twisted together to form a yarn. This process is called as spinning. Spinning process includes all process from cleaning the fibres to opening the bale for twisting of yarn.

4.7.1 Opening and Picking

The fibres are collected from various bales which are mixed together and finally the yarn is produced. Simultaneously, impurities such as lint, dirt, seeds, leaves and stems are removed by the machines (picker, breakers and intermediates). After cleaning, the fibres are loosen end and formed like a lap.

4.7.2 Carding

Lap is unrolled and drawn into a revolving cylinder, which contains fine hooks or wide bristles. These will pull the fibres in one direction and form them into a thin film. It is known as carding. This film is drawn into a funnel shaped opening. The yarn comes out in the form of round rope like strand called sliver (Figure 4.3).

4.7.3 Combing

It is a process of straightening the fibre. Short fibres are combed out. The long fibres are again formed into a sliver called comb sliver (Figure 4.4).

Who discovered Cotton Ginning?

Eli Whitney

Cotton is the most widely used clothing material, but it became common only in mid-1800s, when Eli Whitney’s discovered cotton gin, This made the removal of cotton fibers from the seeds easily.
Chapter 4 Yarn Production

4.7.4 Drawing
In drawing process, several slivers are drawn together. Slivers are drawn to form a single sliver of the same diameter (Figure 4.5).

4.7.5 Roving
The combined sliver or condensed combined sliver is taken to the slubber of a series of machines called Roving frames. A slack twist is given to the yarn sliver (Figure 4.5).

4.7.6 Spinning
Spinning is the next process after roving. Spinning frame is made up with a number of spools. The roving passes through the ring spinning mechanism, which is drawn again and twisted. Required size and twist of yarn is obtained and wound on bobbins properly. Now bobbin is ready to be used for weaving (Figure 4.6).

4.8 SUMMARY
Yarns are necessary for fabric construction. They can be knitted, woven or knotted. Spinning is the process in which fibres are twisted into yarns. Yarns influence the texture, appearance and performance of fabric. Different types of yarn are manufactured and used for various end applications.

POINTS TO REMEMBER:
- Yarns are strands of fibres, filament and other material used for construction of fabric.
- Fibres can be twisted together or grouped together.
- Yarns are made from natural or man made or blended fibre.
- Opening and picking, carding, combing, drawing, roving and spinning are the process involved in yarn manufacturing.
1. Yarn  
   Twisting of fibres together to form a thread.
2. Spun yarn  
   Made using short fibres.
3. Filament yarn  
   Made using long fibres.
4. Balanced yarn  
   Made using evenly twisted yarn.
5. Unbalanced yarn  
   Made using unevenly twisted yarn.
6. Single yarn  
   Directly twisted from fibres.
7. Ply yarn  
   Two or more single yarns are twisted.
8. Cord yarn  
   Two or more ply yarns are twisted.
9. Yarn numbering  
   Yarn numbering systems used to express a relationship between a unit length and weight of yarns.
10. Spinning  
    Fibres are drawn and twisted together to form a yarn.

**INTERNET RESOURCES**

- [How Yarn is made from Raw Fibres?](https://www.youtube.com/watch?v=9pyMh0Ll-8k)
- [How Yarn is Dyed?](https://www.youtube.com/watch?v=HPpjP-kRoZk)
## QUESTIONS AND ANSWERS

### PART – I

I. **OBJECTIVE QUESTIONS:**

1. Filament yarns are ________________________
   - (a) Smoother
   - (b) Bulky
   - (c) Duller
   - (d) Cooler

2. Staple fibres are ________________________fibres
   - (a) Long
   - (b) Bulky
   - (c) Fine
   - (d) Short

3. Ply yarns are made of ____________________ yarn
   - (a) Single
   - (b) Two or more Single
   - (c) Corded yarn
   - (d) None

### PART – II

II. **ANSWER IN THREE (OR) FOUR POINTS:**

1. Define yarn.
2. What are the types of yarn?
3. Classify yarn number system.
4. What is yarn twist?
5. Define balanced and unbalanced yarn.

### PART – III

III. **ANSWER IN A PARAGRAPH:**

1. Brief note on single, ply and cord yarn.
2. Describe yarn numbering system.

### PART – IV

IV. **ANSWER IN ONE PAGE:**

1. Difference between spun and filament yarn.
2. Explain yarn manufacturing system.

*Answers for Objective Questions:*

1. (a)  
2. (d)  
3. (b)
5.1 INTRODUCTION

Fabric can be made by different methods. Fabric is the combination of yarns to make a full sheet. Fabric can be made by weaving, knitting and non-woven techniques. Weaving and knitting methods require long yarns but non-woven method can use small fibres also. Weaving is the name given to the interlacing of two sets of yarns, warp and weft at right angles and the fabric thus formed is called as woven fabric. The warp yarns are those yarns which lie in the lengthwise direction of a fabric and the crosswise yarns are called weft. The direction of the yarns is considered important in garment designing. The lengthwise edge of fabric is called selvedge. Grain indicates the direction of the warp or weft yarn. If the yarns are not at right angle, it is called off grain.

5.2 DIFFERENCE BETWEEN WARP AND WEFT

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Warp</th>
<th>Weft</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Warp yarns are stronger</td>
<td>Weaker yarns can also be used</td>
</tr>
<tr>
<td>2.</td>
<td>If twist is more then the length of yarns per inch is also more</td>
<td>Twist and length of yarns per inch is less</td>
</tr>
<tr>
<td>3.</td>
<td>Ply is preferred for warps</td>
<td>Singles can be used</td>
</tr>
<tr>
<td>4.</td>
<td>Stretchability is low</td>
<td>Stretchability is high</td>
</tr>
<tr>
<td>5.</td>
<td>Plain yarns are more preferred</td>
<td>Novelty yarns and textured yarns can be used</td>
</tr>
</tbody>
</table>
5.3 **WEAVING**

Weaving is the simple technique of making a fabric. The lengthwise and crosswise yarns are overlapped (interlaced) one above the other in an alternative manner. This process of interlacing is done on loom. Loom is a wooden / metal machine, which holds the warp yarns and facilitates the weft yarn to pass up and below the warp to form the woven structure.

The technique of fabric construction by weaving was probably known as spinning during the ancient times. In the course of time, looms were made which were simple and hand operated. The fabric woven in these looms is called hand loom fabric. Today power loom has taken place of the hand operated loom which can weave fabric faster and with less defects in comparison to hand looms (Figure 5.1).

Looms can be classified into various categories. This classification is based upon the picking operations used by the loom. The looms which use shuttles for weft insertion are called conventional shuttle or fly shuttle looms. The fabric woven in this loom has more defects as it used large wooden shuttle which causes abrasion resulting in more broken yarns. These looms are also very noisy and PPM (Picks Per Minute) is also low.

![Figure 5.1 Shuttle Loom](image)

The looms which use other devices to bring the filling yarn through the fabric are called shuttleless looms. These looms have high productivity with fewer fabric faults (Figure 5.2).

![Figure 5.2 Jacquard Loom](image)

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Warp</th>
<th>Weft</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>Filamentous yarns are preferred as warps.</td>
<td>Spun yarns are used.</td>
</tr>
<tr>
<td>7.</td>
<td>These are parallel to the selvedge.</td>
<td>Weft is perpendicular to selvedge.</td>
</tr>
<tr>
<td>8.</td>
<td>Yarns are finer in warp-wise direction as they have higher twist.</td>
<td>Yarns may be thicker or finer with medium twist.</td>
</tr>
<tr>
<td>9.</td>
<td>Most garments are cut in lengthwise direction.</td>
<td>Some garment parts such as collars are cut in this grain for decoration.</td>
</tr>
</tbody>
</table>
The major parts of a loom are described below:

**Major Parts of a Loom:**

- **Warp Beam:** This is a round roller/cylinder on to which the warp/lengthwise yarns are arranged one after another in a parallel manner (Figure 5.3).

- **Whip Roll:** A small guide roller over which the warp yarns pass, as they move to the lease rod.

- **Lease Rod:** Two guide rod between the whip roll and the heddles, to separate the alternative warp yarns.

- **Heddles:** Small wire made out of steel. They are a set of vertical wires laid into the hardness frame. This helps in the movement of the warp yarns (Figure 5.4).

- **Harness:** A wooden frame to separate warp yarn such that a shed (V shaped gap) is formed, through which weft thread is passed.

- **Bobbin:** Small long plastic or metal holder on to which the (filling) weft yarns are wound.

- **Shuttle:** A wooden / plastic boat shaped device which hold the bobbin with the weft yarns. This moves from right to left pulling the weft yarn in its place (Figure 5.5).
Reed: A vertical wooden frame with very close steel wires. Each warp yarns pass through each wire. The gap between the wires is known as dents (Figure 5.6).

Breast Beam: This is a bar, which guides the newly woven cloth towards the cloth beam.

Cloth Beam: A wood or steel roller on to which the woven cloth is wound after weaving (Figure 5.7).

5.3.1 Basic Weaving Operation

The yarns intended for warp must pass through some basic operations like spooling, and warping to prepare them to withstand the strain during weaving.

5.3.1.1 Spooling

Winding of warp yarns on large spools, or cones which are placed on a rack called creel is known as spooling. These yarns are then wound on the warp beam (Figure 5.8).

5.3.1.2 Sizing

The warp yarns are unwound and dipped in a sizing bath which consists of starch. The slasher machine covers every yarn with a coating which adds strength to the warp yarns to withstand the stress, during weaving (Figure 5.9).

Who discovered the first automatic loom?

Jacques de Vaucanson, a French artist who lived between February 24, 1709 – November 21, 1782 was the first man to design an automatic loom.

Figure 5.6 Reed

Figure 5.7 Cloth Beam

Figure 5.8 Spooling

Figure 5.9 Sizing
5.3.1.3 Warping
Warping is the process of winding the sized warp yarns on the warp beam which will be placed over the loom. The warp beam is located at the back of the loom and holds the lengthwise yarns. It controls and releases the warp yarns as the weaving process is carried on. The warp ends are threaded through the heddles held by the harness. Every basic loom has a minimum of 2 heddles. The number of heddles in a loom varies from 2 to 12 for basic weaves, but for fancy weaves the number increases up to 32. The heddles help in the movement of warp yarn to form the shed, through which the shuttle carries the filling yarns. Once the filling yarn is passed through then reed is pushed to put the filling yarn in its place (Figure 5.10).

5.3.1.4 Fabric Making
The interlacing of warp and weft yarns results in woven fabric making. This is done on a loom through four main processes. They are shedding, picking, beating up and taking up and letting off processes.

- Shedding can be described as raising the specific warp yarns by the hard movement of the heddles; to form a ‘V’ shaped gap known as shed for the weft yarns to interlace through.

- Picking is the processing of interlacing/passing the filling yarn (weft) through the shed formed from right to left (Figure 5.11).

- Beating up is also known as battening. This is the process of pushing the filling yarn (weft) firmly into its place by the movement of the reed. Beating arranges the filling yarns parallel to each other very closely to create a woven structure.

- Taking up and letting off is the process of winding up woven cloth into the cloth beam and releasing more warp yarns from the warp beam for weaving.

5.3.2 Terms Used in Woven Fabrics
The common terms used while weaving are given below:

5.3.2.1 Selvedges
Selvedges are the lengthwise edges which run on both sides of the fabric. They are usually 0.5 to 1.5 cm broad. Selvedges prevent the fabric from raveling. It is strong with more number of warp yarns.
There are different types of selvedges namely plain selvedge, tape selvedge, split selvedge, fringe selvedge, fused selvedge and adhesive finished selvedge (Figure 5.12).

5.3.2.2 Thread Count
The number of warp (ends) and weft (picks) per square inch of fabric is called thread count or fabric count. The higher the fabric count the more strong and more durable is the fabric. Fabric with higher thread count is more expensive and is denoted by X x Y. Example 30 x 50 thread count means 30 and 50 yarns in warp and weft direction for one inch. When the number of warp and weft yarns are almost equal the construction of fabric is called balanced and when the difference in warp or weft yarns is more than the other, it is called an unbalanced construction.

5.3.3 Factors Affecting the Durability of the Fabric
The durability of a fabric depends on various factors. The most common are listed below:
- The kind and quality of the fibre.
- The tensile strength of the yarn.
- The amount of twist in the yarn.
- The use of ply yarns as compared with singles.
- The use of uniform yarn rather than novelty yarns and
- The compactness of a fabric.

5.4 WEAVE STRUCTURES
The interlacing of warp and weft yarns to make woven structure is divided into different groups based upon the interlacing as basic weaves and fancy or surface figured weaves. Basic weaves are a group of weaves which are formed with interlacing of the yarns at right angles only to form a square pattern (Figure 5.13). Fancy weaves are weaves which form decorative patterns by the use of extra warp or weft yarns. Basic and fancy weaves are further classified base upon the type of interlacement and yarns used.

Figure 5.12 Selvedges

Figure 5.13 Weave Structure
Classification of Weaves

<table>
<thead>
<tr>
<th>Weaves</th>
<th>Basic Weaves</th>
<th>Fancy / Surface figured</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plain Weave</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basket Weave</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Twill Weave</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satin Weave</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rib Weave</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

WEAVES AND THEIR PROPERTIES

<table>
<thead>
<tr>
<th>Type</th>
<th>Structure</th>
<th>Properties</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plain Weave</td>
<td>Warp and weft interlaced alternatively</td>
<td>Flat, look identical on both sides.</td>
<td>Cheese cloth. Voile</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yarn count even</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Balanced fabrics</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inexpensive</td>
<td></td>
</tr>
<tr>
<td>Basket Weave</td>
<td>Two or more warp interlaced with one or more weft</td>
<td>Flat</td>
<td>2 x 2 blouse material.</td>
</tr>
<tr>
<td></td>
<td>Variation of plain</td>
<td>Variation of plain</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Create checker board effect</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Identical on both sides.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Use of coloured yarns for variation</td>
<td></td>
</tr>
<tr>
<td>Rib Weave</td>
<td>Use of cords or different type of thicker yarn in warp or weft</td>
<td>Heavy</td>
<td>Poplin Taffeta</td>
</tr>
<tr>
<td></td>
<td>Cord in warp is known as warp rib</td>
<td>Drapes well</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cord in weft is known as weft rib</td>
<td>Creates texture and design</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Structure</td>
<td>Properties</td>
<td>Example</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------------------------------------------------</td>
<td>-------------------------------------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Twill Weave</td>
<td>Need three or more than three heddles.</td>
<td>Heavy</td>
<td>Denim Drill</td>
</tr>
<tr>
<td></td>
<td>Warp or weft interlaced with two or more counterpart yarns in progressive manner</td>
<td>Strong firm texture</td>
<td></td>
</tr>
<tr>
<td></td>
<td>If from right to left, known as right hand twill</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>If from left to right, known as left hand twill</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satin</td>
<td>Need four or more heddles.</td>
<td>Smooth</td>
<td>Satin</td>
</tr>
<tr>
<td></td>
<td>Warp interlaced after four or more yarns, forming floats</td>
<td>Lustrous</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Excellent drape</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Floats on the wrong side</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Slippery</td>
<td></td>
</tr>
<tr>
<td>Sateen</td>
<td>Need four or more heddles.</td>
<td>Smooth</td>
<td>Sateen</td>
</tr>
<tr>
<td></td>
<td>Weft interlaced after four or more yarns forming floats</td>
<td>Lustrous</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Excellent drape</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Floats on the wrong side</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Slippery</td>
<td></td>
</tr>
<tr>
<td>Pile</td>
<td>Extra set of warp or weft interlaced over ground yarns of plain or twill to form loops</td>
<td>Soft</td>
<td>Terry Towels</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Good absorbent</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provides warmthness</td>
<td></td>
</tr>
<tr>
<td>Swivel</td>
<td>Extra weft interlaced to form small design on the surface</td>
<td>Decorative design</td>
<td>Dotted Swiss Cloth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yarn may be pull out at the back</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Multi coloured fabric</td>
<td></td>
</tr>
<tr>
<td>Lappet</td>
<td>Extra warp / weft interlaced to form small design</td>
<td>Decorative design</td>
<td>Grenadine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Only one colour used for decoration</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Durable</td>
<td></td>
</tr>
<tr>
<td>Double Cloth</td>
<td>Extra set of warp / weft yarn to interlace two woven fabrics together</td>
<td>Two reversible fabric</td>
<td>Blanket Cloth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Can be two different fabric/ varying in colour and design</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Strong and heavy</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thick</td>
<td></td>
</tr>
<tr>
<td>Leno</td>
<td>Two warps twisted together with a weft yarn to create open mesh.</td>
<td>Durable variation created by use of corded yarns</td>
<td>Marquisette</td>
</tr>
</tbody>
</table>
### Details of different type of woven fabrics (Figure 5.14) are presented below

<table>
<thead>
<tr>
<th>Type</th>
<th>Structure</th>
<th>Properties</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dobby</td>
<td>Small geometrical designs, created by special loom attachment known as Dobby attachment.</td>
<td>Decorative design, Corded effect, Good appearance, Simple and attractive</td>
<td>Huckaback, Pique</td>
</tr>
<tr>
<td>Jacquard</td>
<td>Interlacing of warp at various weft yarn at different points to create designs using control mechanism</td>
<td>Intricate designs, Multi coloured effect, Drape well, Durability</td>
<td>Brocade, Tapestry.</td>
</tr>
</tbody>
</table>

Figure 5.14  Types of woven fabrics

**When was the first fabric sewn?**

Archaeologists believe that people used to sew together fur; hide, skin, and bark for clothing as far back as 25,000 years ago.

**What are calicoes?**

The first cotton prints in America were called calicoes and were made around 1780. They were named after calico, which comes from Calcutta, India, where these hand-woven printed fabrics were made.
5.5 KNITTING

The second most important fabric construction method after weaving is knitting. Knitting is the process of making loops and throwing the yarns through loops to form a fabric. In the earlier days knitting was considered as a unique technique of making fabric using wool fibres. The oldest knitted products are socks found in Egypt tombs. Knitting is done using long stick like needles. The first knitting machine was invented in 1589, by Reverend William Lee. It slowly developed and today the market is filled with complex knitting machine to produce a huge range of knitted fabric.

5.5.1 Classification of Knitting

Knitting is divided into two main groups as warp and weft knitting. Warp knitted fabrics are produced by a series of yarn forming loops in the lengthwise direction of the fabric. Weft knitted fabrics is produced when one continuous yarn forms the loops in the crosswise directions. The most common types of warp knit fabrics are Tricot knit, Raschel, Milanese and Simples knit. The different kinds of weft knits are plain, purl and rib. Both weft and warp knitting can be incorporated in the jacquard mechanism to produce fancy knitted fabrics.

5.5.2 Knitted Fabric Making

Knitted fabric is constructed by forming the yarns into loops. The vertical rows of loops stitches in knit fabric are known as wales and the horizontal rows of loops are called courses. The loops are formed by a group of needles or shafts, which are arranged one after the other in the knitting machine on the needle plate. The needles are evenly placed. Sinker is used to pull the needles down, which pulls the yarn into the previous loop. The knitted fabric is pulled down and rolled at the base of the machine and collected for further use.
5.5.3 Uses of Knitting
Knitted fabrics are used for (Figure 5.15)
- Clothing (Underwear, Sweaters)
- Home furnishing (Curtains, Towels)
- Medical textiles (Grip Bandages)
- Industrial textiles (Wipes, Absorbent Pads)

5.6 NON-WOVEN
The fabrics which are produced directly from bonding or entangling the fibres or filaments are called non-woven fabrics. The bonding is done by mechanical, thermal or chemical means. Non-woven can be divided into durable, non durable or disposable and semi durable types. The properties of non-woven fabrics vary because they are made with different type of fibres in different methods, depending upon the end product.

5.6.1 Types of Non-Woven
Non-woven are grouped based on the method of production and life of the fabric. Based upon the production non-woven are grouped as felts and bonded fabrics.

Based on non-woven fabrics quality they are classified as durable, non durable, disposable and semi durable types. There are two main types of non-woven namely felts and bonded fabrics.

Felt fabrics are made by interlocking of fibres by any suitable mechanical or chemical method, with action of moisture and heat. The basic techniques of fabric construction like weaving, spinning and knitting are not used. Bonded fabric can be described as fibres compressed by pressure and heat.

The properties of non-woven fabrics vary because they are made with different types of fibres in different methods, depending upon the end product.

5.6.2 Uses of Non-Woven
Felts are used in home furnishing and bonded fabrics are used in sanitary pads and diapers. Durable non-woven are used for cap, interlining and interfacing for home furnishing, upholstery, carpets and filters. Disposable non-woven are fabric which can be used only once like diapers, sanitary
napkins, surgical and industrial masks, bandages and towels. Semi durable non-woven are used for shirts, curtains, bags, lining material, wicks backing fabrics for picture frames, ribbons, hospital bed linens and operation theatre clothes. (Figure 5.16)

5.7 DIFFERENCE BETWEEN NON-WOVENS AND WOVENS

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Non-wovens</th>
<th>Wovens</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Fabrics are made directly from fibres</td>
<td>Fibres are first made to yarns and then inter woven to form fabric</td>
</tr>
<tr>
<td>2.</td>
<td>Variations are made by different types of bonding</td>
<td>Variations are made by using different types of yarns and weaving them by different weaves</td>
</tr>
<tr>
<td>3.</td>
<td>They are able to spring back into shape after bending or stretching.</td>
<td>They are not as good as non-woven after bending or stretching</td>
</tr>
<tr>
<td>4.</td>
<td>They are good in absorbing shocks</td>
<td>They are not good in absorbing shocks</td>
</tr>
<tr>
<td>5.</td>
<td>They are easy to shape</td>
<td>They are not easy to shape</td>
</tr>
<tr>
<td>6.</td>
<td>They do not ravel</td>
<td>They ravel from both warp and weft direction</td>
</tr>
<tr>
<td>7.</td>
<td>The edges need to be finished</td>
<td>The edges need to be finished</td>
</tr>
<tr>
<td>8.</td>
<td>They are sound absorbent</td>
<td>They are not sound absorbent</td>
</tr>
<tr>
<td>9.</td>
<td>They have good insulation properties which gives warmth</td>
<td>They do not have insulation properties except in cases of worsteds</td>
</tr>
<tr>
<td>10.</td>
<td>They will not tear</td>
<td>They will tear</td>
</tr>
<tr>
<td>11.</td>
<td>Their breaking load is low</td>
<td>Their breaking load is high</td>
</tr>
<tr>
<td>12.</td>
<td>Holes cannot be mended very satisfactorily</td>
<td>Holes can be mended</td>
</tr>
<tr>
<td>13.</td>
<td>There is little or no elastic recovery in felt fabrics</td>
<td>They have fairly good elastic recovery</td>
</tr>
<tr>
<td>14.</td>
<td>Non-wovens should be washed and ironed carefully and should not be subjected to pulling or twisting</td>
<td>Washing and ironing depends upon fibre, yarn and weave used for construction</td>
</tr>
</tbody>
</table>

5.8 SUMMARY:

Fabric making has been one of the important invention in the world of textiles. Weaving produce strong fabrics through interlacing of yarns whereas knitting produces flexible fabrics through interloping of yarns. Fibres which are very short with poor spinability can be used for making non-woven fabrics. All these types of methods of fabric production, make a wide range of fabrics to suit all application in day to day life.
POINTS TO REMEMBER

- Weaving is interlacing of yarns at right angles in warp and weft direction.
- Looms are used for the manufacturing of woven fabric.
- Knitting is interloping of yarns.
- Non-woven fabrics are entangled fibres, pressed together by mechanical or chemical processes.

ACTIVITIES FOR THE TEACHER

- Download the weaving, knitting operations through U-Tube and present these videos to students.

ACTIVITIES FOR STUDENTS

- Collect samples for different types of woven, knitted and non-woven samples and prepare a album.

GLOSSARY

1. Beam - A cylinder made of wood or metal for holding warp yarns.
2. Dent - Space between two reeds.
4. Heddle - The heddles are metal strips with an eye located in the center through which the warp yarns are passed.
5. Grain - The direction of yarns in a fabric.

INTERNET RESOURCES

<table>
<thead>
<tr>
<th>Link</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="https://www.youtube.com/watch?v=npAKRmyEi3A">https://www.youtube.com/watch?v=npAKRmyEi3A</a></td>
<td>Difference between Knit and Woven Fabrics</td>
</tr>
<tr>
<td><a href="https://www.youtube.com/watch?v=mWB8JReKTuY">https://www.youtube.com/watch?v=mWB8JReKTuY</a></td>
<td>Basic Knitting</td>
</tr>
<tr>
<td><a href="https://youtu.be/YYWlevX7Kw0">https://youtu.be/YYWlevX7Kw0</a></td>
<td>Weaving</td>
</tr>
</tbody>
</table>
QUESTIONS AND ANSWERS

PART – I

I. OBJECTIVE QUESTIONS:

1. A gap formed for interlacing of filling yarns in the loom is called _____________
   (a) Picking  (b) Shedding  (c) Beating  (d) Weaving

2. The number of yarns in the warp and weft direction per square inch denotes ____
   (a) Thread count  (b) Yarn count  (c) Course  (d) Wales

3. The first knitting machine was invented in the year _____________
   (a) 1630  (b) 1540  (c) 1589  (d) 1619

4. Good bending and stretching properties are obtained in ________ fabrics
   (a) Woven  (b) Non-woven  (c) Knitting  (d) Dobby woven

5. Terry towel fabrics is an example of ________ weave
   (a) Leno  (b) Lapped  (c) Swivel  (d) Pile

PART – II

II. ANSWER IN THREE (OR) FOUR POINTS:

1. What is warping?
2. Give the classification of knitting.
3. Discuss the uses of non-woven fabrics.

PART – III

III. ANSWER IN A PARAGRAPH:

1. Describe the parts of a loom.
2. What are non-woven fabrics?

PART – IV

IV. ANSWER IN ONE PAGE:

1. Outline the difference between woven and non-woven fabrics.
2. List the difference between woven and knitted fabrics

Answers for Objective Questions:

1. (b)  2. (a)  3. (c)  4. (c)  5. (d)
6.1 INTRODUCTION

In clothing construction, varieties of tools are used. It is important to learn about the use of tools and their properties before constructing clothing.

Tools used in Dress Making
The tools used in dress making is classified as:

- Measuring tools
- Pattern drafting tools
- Marking tools
- Cutting tools
- Stitching tools
- Pressing / Ironing tools

6.2 MEASURING TOOLS

A perfect measurement is needed to construct a well fitted garment. The measuring tools help to note the distance between two points in the human body which is needed for pattern making and in drawing the paper pattern. The most important measuring tools are measuring tape, meter scale and ruler (Figure 6.1).

Measuring Tape
A measuring tape commonly known as inch tape is a plastic or narrow ribbon like cloth structure with marking of measurement. It can be called a flexible ruler. It has a long metal on one side and a short curved metal on other side to hold the tape.
firmly. The measuring tape has a marking of 60 inches on one side and 150 cm on the other side. It is used for taking body measurements and for drawing patterns on paper and fabric.

**Meter Scale**

Meter scale is a wooden, plastic, or steel with thin narrow strip marked in inches and centimeters on either sides. It is used to draw paper pattern and to mark pattern on fabrics. It is also used in marking the length of the fabric and samples.

**Ruler**

Ruler is also known as scale or foot ruler. It is a plastic, wooden or metal strip which is marked at regular intervals. Normally the marking are marked in inches on one side and centimeters on the other side. It is used to draw straight line. In dress making it is used for marking the garment shapes like tucks, hems, to draw lines and to mark points.

### 6.3 Pattern Drafting Tools

Pattern drafting tools are used for drawing the patterns. The common pattern drafting tools used are brown sheet, dress model, bell pin, pin cushion and wooden table (Figure 6.2).

**Brown Sheet**

Brown papers are simple unbleached papers. They are brown in colour. They are used for drawing paper patterns. This is then transferred on to the fabric. This helps to minimizes fabric wastage.

**Dress Model**

A dress form is a plastic or paper mesh duplicate of human figure. It is three dimensional form. Dress forms are available for standard sizes in the market. It is used for drawing the patterns followed by draping technique. The fabric is kept on the dress form and by moving the fingers the wrinkles are removed and pinned. The outline is drawn to get the patterns.

**Bell Pins**

Bell pins are thin metal needle like structures with a circular head on the top. They are available in different thickness and heights. Generally medium height thin pins are used for pattern and dress making. They help to hold the patterns in place while transferring the pattern details on fabrics. They are also used for marking patterns on slippery fabrics.

**Pin Cushion**

Pin cushions are small foam pads to hold pins. This prevents the slipping of pins.
while working on patterns, draping cutting and sewing. They are available in different sizes and shapes.

**Wooden Tables**

Wooden tables are one of the most important items needed for good pattern drafting and cutting. The width of table varies from 60 – 100 cm and the height is usually 150 cm but the height varies depending upon the height of the person who is drafting or cutting the patterns.

### 6.4 MARKING TOOLS

Marking tools are items, which are used for drawing the patterns on paper or on fabrics. These tools are used for marking the cutting lines, darts, tucks, neck curves, connecting lines and shapes. The tools include colour pencils (Red and Blue), Marking chalk, tracing wheel, tailor’s square and French curve (Figure 6.3).

**Colour Pencils (Red and Blue)**

Colour pencils are ordinary pencils which is available in the market. It is used for drawing the patterns on paper. Red colour is used for marking the cutting lines and the blue colour is used for marking tucks, darts and seam.

**Marking Chalk**

Marking chalk is a hard chalk used for marking patterns. It is also called as Tailor’s chalk. It is used to draw the outline of the garment on the fabric. It is available in three colours (red, blue and yellow) and two shapes namely triangle and square. With the help of these chalks, curved parts can be drawn easily on the fabric.

**Tracing Wheel**

Tracing wheel is a small circular metal wheel attached to a metal or wooden handle. The disc has sharp teeth. This helps to create perforations, which indicate the cutting lines. It is used for transferring very small pattern details on the fabric (Examples: Darts, notches). It is used for marking more number of fabrics at the same time.

**Tailor’s Square**

Tailor’s square is a ‘L’ shaped scale. It is also known as ‘L’ scale. It is used for drawing typical squares or rectangles. It has both inches and centimeters marked. It is available in wood, steel and plastics.

**French Curves**

French curve is a flat template made out of wood, plastic or metal. It is composed of many curves. It is used for drawing curved lines like necklines and armscyce lines in dress making. It helps in marking scalloped designs.

Figure 6.3 Marking Tools
6.5 CUTTING TOOLS

Cutting tools are used for cutting paper pattern, fabric and thread. The most common cutting tools include scissors, shears, pinking shears, embroidery scissors, electric scissors, seam rippers and thread clipper (Figure 6.4).

Scissors
Scissors have round shaped handle with two sharp blades. The length of blades varies from 10 to 15 cm. The handles are made of plastics or metals. It is used for cutting threads, separating the stitches and other cutting in proper way during stitching.

Shears
Shears is bigger and heavier scissors with a small ring as handle for thumb and a larger ring for the other four fingers. The length of these blades ranges from 20 to 30 cm. It is made up of metal. It is also called as Tailor’s shears.

The weight and the size of the shears must depend upon the work and the fabric weight. While cutting the fabric, the handle of the shears should touch the table and the sharpened edge must be slightly higher than the table level. A fabric cutting shears should only be used for cutting the fabrics.

Pinking Shears
Pinking shears are shears with sharp toothed zig zag edges. They are lighter in weight when compared to shears. It is used for decorative purpose. It also prevents the raveling of yarns from the fabric edges.

Electric Scissors
Electric scissors are scissors which are operated by power. They are similar to scissors. Electric scissors are used for cutting light and heavy weight fabrics more easily and quickly.

Figure 6.4 Cutting Tools

Who invented Scissors?

Early scissors were used in Europe until the 16th century. The other type of scissors, known as pivoted scissors, were invented by the Romans around 100 A.D. Pivoted scissors are made of two cross blades that pivot somewhere between the tip and handles; these are the scissors that are most commonly used in modern times.
6.6 STITCHING TOOLS

Stitching tools are the tools which enhance the sewing action by hand and machine. The common stitching tools are needle, thread, thimble, needle threader, bodkin and loop turner (Figure 6.5).

Needle

Needles are thin, long metal stick like structures. It has a sharp edge on one end and hole called eye on the other end. The thread used for sewing is passed through the eye.

Needles used for hand sewing or embroidery is called hand needle. Needle which is used in the machine is called machine needle. Size and number of the needle should be based on the type of fabric.

There are different types of needles. Long needles are used for darning. Ordinary needle are used for stitching normal stitches and for tacking. Embroidery needle have a long and oval hole. The points may be sharp or blunt depending upon the stitch. The needles should be stored carefully in a rust proof paper to prevent from rust.

Thread

Thread used for sewing is long smooth yarn wound on spool or reel. The selection of threads varies based upon the colour, thickness and type of fabric. The sewing threads are usually made of cotton or nylon. Silk threads are also available.

Thimble

Thimble is a small tumbler shaped tool. It is made up of plastic or metal. It is used to protect the finger from being pricked by the needle when sewing. It is used in the middle finger.
**Needle Threader**

Needle threader is a small metal which has a small flexible loop through which thread is passed through. The loop is then passed through the eye of the needle to thread the needle. It is very useful for elderly people.

**Bodkin**

Bodkin is a variation of needle with a large eye on one side and blunt edge on the other side. It is used to insert or pull cords, tapes or ribbons through casings

*Example:* To insert cord in sari petticoat.

**Loop Turner**

Loop turner is a long metal with a hook at one end and a circle at the other end. It is used to turn bias tubing to the right side

*Example:* Fabric loops.

---

### 6.7 PRESSING / IRONING TOOLS

Pressing is the process of removing wrinkles from stitched garments. Pressing or ironing is the last step in dress designing. It is very important because it results in a neat finish and enhances the look of the garment. The most common pressing tools are iron box, iron board, sleeve board, seam roll and press cloth (Figure 6.6).

**Iron Box**

Iron box is made up of metal (Aluminium, steel or copper). It is heated with charcoal. Today Teflon coated iron boxes are available. This is heated by steam. Electrical iron box is the best for ironing.

**Iron Board**

For ironing special boards are also available in shop. They have padded tops, covered with suitable fabric. This helps in ironing. The height varies based upon the height of the user. It should be kept in a perfect place without any ups and downs in the board.

**Sleeve Board**

Sleeve board is used to iron the narrow parts and sleeves. It is similar to an iron board.

**Seam Roll**

Seam roller is a soft cushioned oval shaped board. It is used for ironing the small parts in a garment. Ironing, helps to press down the seam allowance on wrong side of the fabric.

**Press Cloth**

Press cloth is a fabric piece which is used to press the garment to be ironed in a damp condition. This fabric shall be colour fast without starch.
6.8 SUMMARY

In clothing construction various tools are used. Tools are used to take body measurements and to draft pattern. Fabric cutting also requires certain tools. After garment stitching, it is folded and pressed with certain tools. Therefore in garment sewing right from body measurement to pressing specific tools are used. Each of these tools should be selected and maintained with great care.

POINTS TO REMEMBER

- Good quality tape is needed for body measurements.
- Marking tools are used to mark different parts and cutlines.
- Stitching tools are used while sewing or embroidering.
- Pressing tools are used to remove wrinkles.

ACTIVITIES FOR THE TEACHER

- Demonstrate the use of various tools.

ACTIVITIES FOR STUDENTS

- Draw the tools used for sewing.

GLOSSARY

2. Drafting Method of drawing pattern with mechanical precisions on paper.
5. Meter scale Device used for measuring.
7. Bell pins Pin used for holding the paper pattern with cloth.
8. Thimble Cap worn to protect finger while sewing.
9. Scissors Used for cutting thread.
10. Bodkin Tool used for pulling cords.
QUESTIONS AND ANSWERS

PART – I

I. OBJECTIVE QUESTIONS:

1. _______________ is the drafting tool
   (a) Dress model (b) Ruler (c) Thread (d) Tracing wheel

2. The important tool in taking body measurement
   (a) Scale (b) Measuring tape (c) Tracing wheel (d) Thread

3. To prevent the fingers from needle pricking we must use this tool
   (a) Needle (b) Scissor (c) Thimble (d) Thread

4. The red colour pencil helps to mark
   (a) Stitching line (b) Cutting line (c) Darts (d) All the above

5. If tracing wheel is used along with this tool it makes the marking more prominent.
   (a) Carbon sheet (b) Tailors chalk (c) Pins (d) Pin cushion

6. A length of measuring tape is
   (a) 100 cm (b) 110 cm (c) 130 cm (d) 150 cm

PART – II

II. ANSWER IN THREE (OR) FOUR POINTS:

1. Write notes on drafting tool.
2. Write about marking chalk and tracing wheel.
3. Explain a pressing tool.
4. Write notes on measuring tape.
5. What are the different types of needle?

PART – III

III. ANSWER IN A PARAGRAP :H

1. Write the difference between shears and scissors.
2. Explain stitching tool.
3. Write notes on marking tools.

PART – IV

IV. ANSWER IN ONE PAGE:

1. Explain in detail about the different types of tools used for sewing.

Answers for Objective Questions:

1. (a) 2. (b) 3. (c) 4. (b) 5. (a) 6. (d)
7.1 INTRODUCTION:

Basic stitches are the fundamental stitches which have to be learnt before doing actual sewing. It is necessary to learn basic stitches to do temporary and permanent stitching. Basic stitches are used as embroidery, decorative gatherings, placket openings, necklines and hemlines. Basic stitches are classified as follows:

- **Constructive Stitches**
  - Temporary Stitches
    - 1. Even Tacking
    - 2. Uneven Tacking
    - 3. Diagonal Tacking
    - 4. Tailor’s Tacking
  - Permanent Stitches
    - 1. Running Stitch
    - 2. Back Stitch
    - 3. Hem Stitch
    - 4. Whipping

- **Decorative Stitches**
  - 1. Stem Stitch
  - 2. Straight Stitch
  - 3. Fly Stitch
  - 4. Seed Stitch
  - 5. Cable Stitch
  - 6. Chain Stitch
  - 7. Lazy Daisy Stitch
  - 8. Magic Chain Stitch
  - 9. Blanket Stitch
  - 10. Satin Stitch

**LEARNING OBJECTIVES**

- To gain knowledge about the various types of basic stitches.
- To acquire skills in sewing basic stitches.
- To learn about basic and embroidery stitches.
- To develop the skills in using embroidery stitches for decorative purposes.
7.2 TEMPORARY STITCHES

7.2.1 Even Tacking

Description
- It holds two or more fabric layers together.
- It is used for tacking seams and other edges before stitching.
- Stitches are made in equal lengths.

Method
- Work the stitches from right to left.
- Bring needle on the right side of the fabric at 1.
- Take down needle at 2 to the wrong side of the fabric.
- Again bring needle up at 3 leaving blank space in between (Figure 7.1).

7.2.2 Uneven Tacking

Description
- This stitch is stronger than even tacking.
- It is used as guideline prior to machine stitching.
- It is also used to catch long folds.

Method
- Work the stitches from right to left.
- Bring needle on the right side of the fabric at 1.
- Take down needle at 2 to the wrong side of the fabric.
- Again bring needle up at 3 leaving half of the stitch length in between 2 and 3 (Figure 7.1).

7.2.3 Diagonal Tacking

Description
- It is used for holding two or three layers of fabric before sewing.
- Slanting stitch is done on the wrong side and vertical stitch on the upper side.

Figure 7.1 Temporary Stitches
**Method**
- Work the stitches from right to left.
- Bring needle at 1 on wrong side leaving the knot under fold.
- Take needle diagonally and insert at 2 on the folded edge.
- Bring needle at 3 just at the outer edge of the fold.
- Continue the process (Figure 7.1).

### 7.2.4 Tailor’s Tacking

**Description**
- It is used to mark dart line and pleat lines.
- It acts as a guide line on both the layers of fabric.
- Double strand contrast colour thread is used.

**Methods**
- Work the stitches from right to left
- Bring needle at 1 on the right side of the fabric.
- Take needle to the wrong side at 2
- Leave a loop as shown in figure and bring needle at 3.
- Maintain uniform distance between stitches (Figure 7.1).

### 7.3 PERMANENT STITCHES

These stitches are made permanently on the fabric. They need not be removed. Some of the permanent stitches are listed as follows:

1. Running.
2. Back.
3. Hem.
4. Whipping.

#### 7.3.1 Running Stitch

**Description**
- It is similar to even tacking but the stitches are much smaller.
- Stitches are fine and evenly spaced with matching colour thread.
- Darning, gathering and edge finishing can be done with this stitch (Figure 7.2).

**Method**
- Work the stitches from right to left.
- Take the needle up and down making small straight stitches.

![Figure 7.2 Running Stitch](image)

#### 7.3.2 Back Stitch

**Description**
- It is a strong stitch.
- It is substituted for machine stitch.
- Stitches are 0.25 cm long on the right side.
- Stitches are done with matching colour thread.

**Method**
- Work the stitches from right to left.
- Bring needle up at 1 and insert at 2.
Again bring needle up at 3 leaving one stitch space from 2 (Figure 7.3).

### 7.3.3 Hem Stitch

**Description**
- These stitches are very fine and evenly spaced.
- Stitches are not visible on the right side of the garment or fabric.
- Edges of sleeves, skirt hemline, neckline and handkerchiefs are finished with hem stitch.

**Method**
- Work the stitches from right to left.
- Bring needle up at 1 on the wrong side.
- Take needle slantly upto 2 and insert. Make a tiny stitch on the right side.
- Bring needle again at a point below 2.
- Continue to work 7 – 10 stitches in two to three cm (Figure 7.4).

### 7.3.4 Whipping Stitch

**Description**
- The stitch is used to finish the raw edges of fabrics.
- Edge of sleeves and kid’s collars are finished with whipping stitches.
- It is also called as rolled hem or over casting.

**Method**
- Stitches are made over the rolled edge of a fabric.
- Work the stitches from right to left and then from left to right.
- Bring needle up at 1 and take diagonally over the rolled edge.
- Insert and bring needle up at 2, take over the rolled edge. Insert and take needle up at 3.
- Continue the work till the end.
- Come back by making diagonal stitch.
- Insert needle at same point and make whipping stitches.
- Stop at point 1 and complete (Figure 7.4).

### 7.4 Decorative Stitches

Embroidery is the art of using decorative stitches. With these stitches ornamental motifs can be worked on almost all soft surfaces. It is important to know all the basic embroidery stitches so that the
learner can effectively uses them for creating beautiful design. Stitches are selected based on the fabric and garment.

7.4.1 Stem Stitch

Description

- It is a commonly used stitch in embroidery work.
- It is used to complete the outline of any design.
- It is also used as a filling stitch when worked closely.

Method

- Bring needle up at 1 on right side.
- Take down needle at 2 to the wrong side and up at 3, half way between 1 and 2.
- Insert needle and take needle just next to the point 2.
- The length of all the stitches should be the same (Figure 7.5).

![Figure 7.5 Stem Stitch](image)

7.4.2 Straight Stitch

Description

- These stitches can be worked in any direction.
- The stitches are worked in varying sizes to create an interesting effect.
- This is worked on a evenly woven fabric.

7.4.3 Fly Stitch

Description

- These stitches can be worked horizontally or vertically.
- It is also used as a single detached stitch.
It can be used well to cover a line or to do filling for a large space.

**Method**
- Bring needle up at 1 and down at 2 leaving a loop of thread.
- Bring needle up at 3 inside the loop, insert down at 4 outside the loop and catch a small straight stitch.
- Repeat the process (Figure 7.7).

### 7.4.4 Seed Stitch

**Description**
- This is a tiny running stitch.
- It is used to fill small motifs or space.

**Method**
- Bring needle up at 1 and insert at 2 catching a tiny stitch.
- Again bring needle up at 3 and take down at 4. This should be made closer to the first stitch.
- Repeat the process (Figure 7.8).

---

**Which is the oldest embroidery machine?**

Machine embroidery dates back to 1964, when Tajima started to manufacture and sell TAJIMA Multi-head Automatic Embroidery machines.

---

**Figure 7.7 Fly Stitch**

**Figure 7.8 Seed Stitch**
7.4.5 **Cable Stitch**

*Description*
- It is also known as side to side hem stitch.
- Looks like a brick stitch.

*Method*
- Mark 4 points
- 1, 2, 3 and 4 on a straight line.
- Take thread out at 1, insert at 3 and then take out at 2.
- To complete one set of stitch insert needle at 4 and take out at 3.
- Continue stitching as per instructions (Figure 7.9).

![Figure 7.9 Cable Stitch](image)

7.4.6 **Chain Stitch**

*Description*
- It is formed by making series of loops.
- It is the oldest of all stitches.

*Method*
- Mark the points 1 and 2.
- Take out needle at 1 and insert needle at the same point and take out needle at 2.
- Before taking the needle out wind thread from left to right and pull the needle gently to form a chain.
- To continue the second chain insert needle at point 2 and continue the sequence (Figure 7.10).

![Figure 7.10 Chain Stitch](image)

7.4.7 **Lazy Daisy Stitch**

*Description*
- It is one of the detached stitches.
- A single chain stitch form a lazy daisy stitch.

*Method*
- Pull thread from point 1 and insert the needle at the same point.
- Take out needle at 2.
- Wind thread from left to right, pull the needle and lock the stitch at point 3 (Figure 7.11).

![Figure 7.11 Lazy Daisy Stitch](image)
7.4.8 Magic Chain Stitch

**Description**
- This is a variation of chain stitch.
- Two coloured threads are used while stitching.
- Chain stitches are created by winding alternate colour threads. (Figure 7.12).

7.4.9 Blanket Stitch

**Description**
- This stitch is used to finish the blanket edges.
- It secures the edges and is stitched from left to right or from right to left.

**Method**
- Take needle at 1 and insert 2.
- Lay thread parallel to point 1.
- Insert needle at 2 and take out at 3.
- Loop the thread around needle to form a stitch (Figure 7.13).

7.4.10 Satin Stitch

**Description**
- Satin stitch is a filling stitch.
- It is used to cover small space.
- This is a straight and flat stitch.
**Method**

- Take needle at 1 and insert at 2.
- Pull the needle at 3 and insert at 4.
- Repeat the process and complete the filling of any pattern (Figure 7.14).

![Figure 7.14 Satin Stitch](image)

**7.5 SUMMARY**

Basic stitches are used as a foundation prior to garment construction. These are used to enhance the functionality and decoration of the garments. These basic stitches are used as guidelines while sewing. Embroidery stitches add interesting effect on garments. They can be applied on all types of kids, children, women and men garments.

**POINTS TO REMEMBER**

- Basic stitches are of two types namely constructive and decorative.
- Constructive stitches are used as guidelines prior to sewing.
- Decorative stitches are used effectively to add beauty to the garments.

**ACTIVITIES FOR THE TEACHER**

- To teach various basic and embroidery stitches.
- To make the students to prepare a design album for embroidery.

**ACTIVITIES FOR STUDENTS**

- To prepare motif for each embroidery stitch.
- To enthuse students to make a sample with embroidery stitches.

**GLOSSARY**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Tack</td>
</tr>
<tr>
<td>2.</td>
<td>Right side</td>
</tr>
<tr>
<td>3.</td>
<td>Right side together</td>
</tr>
<tr>
<td>4.</td>
<td>Wrong side</td>
</tr>
<tr>
<td>5.</td>
<td>Embroidery</td>
</tr>
</tbody>
</table>
INTERNET RESOURCES

<table>
<thead>
<tr>
<th>Internet Resource</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="https://www.youtube.com/watch?v=kKnBUa4l2k4">https://www.youtube.com/watch?v=kKnBUa4l2k4</a></td>
<td>Hand Embroidery for Beginners</td>
</tr>
<tr>
<td><a href="https://www.youtube.com/watch?v=mY83wGSJcT8">https://www.youtube.com/watch?v=mY83wGSJcT8</a></td>
<td>Basic Embroidery Stitches</td>
</tr>
<tr>
<td><a href="https://www.youtube.com/watch?v=EhISC7tZdMs">https://www.youtube.com/watch?v=EhISC7tZdMs</a></td>
<td>How to Sew for Beginners</td>
</tr>
</tbody>
</table>

QUESTIONS AND ANSWERS

PART – I

I. OBJECTIVE QUESTIONS:

1. Stitches are made of equal lengths in__________
   (a) Even Tacking (b) Uneven Tacking (c) Diagonal Tacking (d) Tailor’s Tacking

2. __________ is used for holding two or three layers of fabric before sewing.
   (a) Even Tacking (b) Uneven Tacking (c) Diagonal Tacking (d) Tailor’s Tacking

3. __________ is used to finish the raw edges of the fabric.
   (a) Back stitch (b) Hem stitch (c) Whipping stitch (d) Machine stitch

4. The art of using decorative stitches is called
   (a) Printing (b) Weaving (c) Embroidery (d) None

5. A tiny running stitch is also called
   (a) Stem stitch (b) Chain stitch (c) Fly stitch (d) Seed stitch

PART – II

II. ANSWER IN THREE (OR) FOUR POINTS:

1. What are the uses of even tacking?
2. Name some permanent stitches?
3. Describe whipping stitch.
4. What are the uses of back stitch?
5. Explain the method of making a hem stitch?

PART – III

III. ANSWER IN A PARAGRAPHS:

1. Explain the method of making a satin stitch?
2. Draw a simple motif showing 4 embroidery stitches?

PART – IV

IV. ANSWER IN ONE PAGE:

1. Describe any 5 decorative stitches.
2. Explain in detail constructive stitches.

Answers For Objective Questions:

1. (a) 2. (c) 3. (c) 4. (c) 5. (d)
8.1 INTRODUCTION

The development of sewing machine plays an important role in the garment industry. Sewing machine vary from simple tailor's model, home sewing machines, interlock stitch machine to highly developed computerized electric sewing machine. The team work of many inventors made the sewing machine to come into existence. During the industrial revolution in 1790, Thomas Saint invented sewing machine to stitch leather. In 1851, an American named Isaac Merritt Singer started a large scale sewing machine industry. Sewing machine came to India in the year 1935 for the first time Usha Sewing Machine was made by J.J.Engineering Company. Throughout the world many industries have introduced different type of sewing machines. Each sewing machine has its own use and characteristics. The most common varieties of sewing machines are:

- Embroidery Machine
- Button Hole Machine
- Button Attachment Machine
- Bar Tacking Machine
- Over Edging Machine
- Lock Stitch Sewing Machine

There are special machine which are used to attach piping, binding and ruffles.

Today most of these machines are electrical operated. Computerized machines are also available.
Who Invented the First Functional Sewing Machine?
The First Functional Sewing Machine was invented by French tailor Barthelemy Thimonnier in 1830. This instrument had hook like structure which produced chain stitches.

8.2 PARTS OF SEWING MACHINE

Parts and functions of a sewing machine are listed below (Figure 8.1).

Spool Pin
Spool pin is a small metal rod on the body of the sewing machine. The main function of spool pin is to hold the spool of thread (Figure 8.2).

Thread Guide
Thread guide is a small metal ring, on the face of sewing machine. It keeps the thread in position and guides the thread from the spool to the needle.

Tension Disc
Tension disc is a metal spring with concave disc and screw. The thread is fed into...
the tension disc in between the two concave disc, screw and spring to pass the thread freely to the needle. The screw can be adjusted to increase or decrease the tension (Figure 8.3).

**Take-up Lever**  
Take up lever is, hook shaped and the thread is passed through this to make upward and downward position, to pull thread in the sewing machine and to enable the needle to stitch.

**Needle Bar**  
Needle bar is a steel rod to hold the needle at one end with help of a clamp.

**Bobbin Case**  
Bobbin case is a metal circular cap shaped part which holds the bobbin. The upward thread helps to bring the lower thread in the bobbin from the bobbin case to make a stitch (Figure 8.4).

**What is a Bobbin?**  
A bobbin is a small cylinder like structure, on which wire, yarn, thread or film is wound. In non-electrical applications the bobbin is used for tidy storage without tangles. A bobbin provides temporary or permanent storage for yarn and may be made of plastic, metal, bone, or wood.

**Presser Foot**  
Presser foot is a heavy fork shaped steel rod which is attached to the presser bar. Presser foot holds the fabrics in the place while sewing (Figure 8.5).

**Presser Foot Lifter**  
Presser foot lifter is a lever attached to the presser bar. It is controlled by the presser foot and helps in raising and lowering the presser foot.
Stitch Regulator
Stitch regulator is a small vertical bar with markings and has a knob. It controls the length of the stitch on the fabric.

Bobbin Winder
Bobbin winder is a small rod in the front side of the wheel. It is used to wind thread and it controls the bobbin while winding thread. Bobbin winding should be carried out in medium speed. Increase in speed will result in stretching of the sewing thread which may result into breakage (Figure 8.6).

Clutch / Thumb Screw
Clutch or thumb screw is attached in the middle of fly wheel. If the screw is removed the machine will not work. Thumb screw controls stitching.

Slide Plate
This is a rectangular metal plate. It can be moved to insert and remove the bobbin.

Slide Plate
This is a rectangular metal plate. It can be moved to insert and remove the bobbin.

Fly Wheel
Fly wheel is a circular metal ring which helps the movement of the machine. It can be rotated manually or by power. It lowers and raises the sewing machine needle (Figure 8.7).

Needle Plate
It is a semi circular metal plate with a small hole through which the needle passes through. The needle enters inside the hole and picks the bobbin thread (Figure 8.8).

Feed Dog
The feed dog is a set of metal teeth. The feed dog helps the fabric to move after each stitch (Figure 8.9).

Face Plate
Face plate is a metal plate covering the needle bar, presser bar and take up lever.
It covers these parts and prevents them from dust (Figure 8.10).

![Figure 8.10 Face plate](image)

**Pedal**

It is made up of iron. It is pressed by foot to give pressure for the work of sewing machine. Pedal is found in leg operating machines which is connected to fly wheel through a belt.

### 8.3 OPERATING THE SEWING MACHINE

All sewing machines have a booklet (manual) which explains the parts of the machine and method of operating the machine. It is important to carefully read and understand it before actually using the sewing machine.

The points to remember, while stitching in a basic sewing machine

- First sit in a comfortable position on a suitable stool or chair in front of a machine.
- Learn to move your foot carefully at steady speed.
- Move the fly wheel and simultaneously move the legs. Pedal slowly and continuously to get hand and leg coordination.
- In case of electrical sewing machine move the foot or hand to press the electric motor.

- Practice stitching along straight and curved lines without threading.
- Select thread and needles based upon the fabric. For thin and delicate fabrics, fine threads and smaller size needles are selected whereas for thicker fabric, thick and larger size needles are best.

**When was electric sewing machine invented?**

The first electric machines were developed by Singer Sewing Co. and introduced in 1889. By the end of the First World War, Singer was offering hand, treadle and electric machines for sale.

- Bobbin winding is an important concept in sewing which has to be done with great care. Bobbin is placed on bobbin holder near the fly wheel. Thread is gently pulled from the thread and rolled upon the spool pin and passed through the thread guide. Thread is later wound on the bobbin by rotating the fly wheel.
- When the needle in the machine becomes blunt, it needs to be changed. For changing the needle, the take up lever has to be raised to its highest point and the needle clamp screw has to be loosened. This will remove the old needle. The new needle has to be fixed. The machine needle has a flat side with short groove and a round side with long groove. The round
side should face the side from which the machine is to be threaded.

- An easy method for recognizing tensions between the upper and the lower thread is to stitch diagonally across a square fabric folded on true bias and then stretch the cloth firmly between the fingers until one or both threads break. The broken thread is always with tighter tension. If the tensions are balanced both the threads break together and need more force to break.

- Adjustments are made on the upper thread by turning the screw on the tension regulator with the presser foot down. For adjustments in the lower thread, the tension is regulated by turning the screw carefully on the bobbin case using the screwdriver.

- For bottom threading, insert the bobbin into the bobbin case. The thread from the bobbin has to go be pulled through the slanting slot and a spring in the bobbin case. There should be a slight but noticeable tension and the bobbin should stay firm in its place. Extra thread about 5–7 cm long has to be left extending from the bobbin case. The slide plate should then be closed.

- For top threading the take-up lever has to be raised to its highest point and the thread is passed through thread guide to tension mechanism. The thread should then pass through the hole in the take-up lever from the side nearest to the tension disc. The remaining guide is then inserted into the needle from the side on which the last guide appears.

- For sewing, first the take-up lever has to be taken to its highest point by raising the presser foot and turning the fly wheel. The cloth is then placed under the presser foot with seam allowance to the right of the needle and the remaining cloth on the left. Now the wheel is turned until the needle enters the cloth at the exact starting point, and then the presser foot is lowered. The cloth can then be stitched by slowly starting the machine and guiding the cloth gently with both hands.

Who patented the Singer Sewing Machine?

The Singer Sewing Machine is patented. Isaac Merritt Singer did not invent the sewing machine, but he patented the first practical and efficient one, on August 12th, 1851.

8.4 CARE OF THE MACHINE

All sewing machines should be taken proper care to ensure satisfactory sewing and long life of the machine. Regular cleaning by removing lint deposit, dust and thread bits should be done. The machine should be oiled periodically by applying machine oil to all oiling holes and joints where one part rubs against another.

Chapter 8  Sewing Machine  77
## 8.5 CAUSES OF FAULTS AND REMEDIES OF SEWING MACHINE:

Problems faced by the sewing machine and how it can be solved are listed below:

### Breaking of Thread

<table>
<thead>
<tr>
<th>Reason</th>
<th>Remedies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unsuitability of thread used for the fabrics.</td>
<td>Suitable thread should be used for the fabrics, (For silk fabrics thin and delicate thread).</td>
</tr>
<tr>
<td>If tension disc is too tight.</td>
<td>Correct the tension.</td>
</tr>
<tr>
<td>Using low quality thread.</td>
<td>Use high quality thread.</td>
</tr>
<tr>
<td>Rotating the wheel in anti-clock wise direction.</td>
<td>Care to be taken to rotate the wheel in clock-wise direction.</td>
</tr>
<tr>
<td>The thread cuts when the machine is sewed in thicker layers of fabric.</td>
<td>Cut the broken thread, and sew again by slightly lifting the presser foot.</td>
</tr>
<tr>
<td>Fast movement of the fabric.</td>
<td>Life up the presser foot and slowly pull the fabric to its place and then stitch.</td>
</tr>
<tr>
<td>Fixing of needle unevenly.</td>
<td>Attach the needle correctly.</td>
</tr>
</tbody>
</table>

### Breaking of Needle

<table>
<thead>
<tr>
<th>Reason</th>
<th>Remedies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using unsuitable kind of needle.</td>
<td>Check and use correct needle.</td>
</tr>
<tr>
<td>Fixing of needle at lower lever.</td>
<td>Fix the needle correctly.</td>
</tr>
<tr>
<td>If needle is blunt.</td>
<td>Use a straight needle.</td>
</tr>
<tr>
<td>If shaft is lower.</td>
<td>Check the position of the needle in the needle bar.</td>
</tr>
<tr>
<td>Pulling of the garment backward while stitching quickly.</td>
<td>Raise the presser foot, lift the needle and carefully remove the garment.</td>
</tr>
</tbody>
</table>

### Looped Stitch

<table>
<thead>
<tr>
<th>Reason</th>
<th>Remedies</th>
</tr>
</thead>
<tbody>
<tr>
<td>If thread is stuck in the hook of the bobbin, then loop is formed.</td>
<td>Remove the stuck thread.</td>
</tr>
<tr>
<td>If tension disc is loose the loops are formed.</td>
<td>Correct the tension disc.</td>
</tr>
<tr>
<td>If thread is stuck in the tension disc.</td>
<td>Remove the thread in the tension disc.</td>
</tr>
</tbody>
</table>
## Formation of Crease in the Fabric

<table>
<thead>
<tr>
<th>Reason</th>
<th>Remedies</th>
</tr>
</thead>
<tbody>
<tr>
<td>If belt is small in size.</td>
<td>Use correct size belt.</td>
</tr>
<tr>
<td>Tightness caused due to excess oil.</td>
<td>Remove excess oil.</td>
</tr>
<tr>
<td>Uneven / loose winding of thread in the bobbin.</td>
<td>Rewind the thread.</td>
</tr>
<tr>
<td>Adherence of dust in the feed dog.</td>
<td>Clean the feed dog.</td>
</tr>
<tr>
<td>Winding of fabric in the fly wheel.</td>
<td>See that fabric is not wound in the fly wheel.</td>
</tr>
</tbody>
</table>

### 8.6 SUMMARY

Sewing machines has laid a strong foundation for the development of clothing and fashion. The Old Stone Age man used bone as needles and twigs to sew leaves for his clothing, but today man has a wide range of machines. Even motor machines which can stitch buttons, make hems and embroidery are available. Digital machines are also found in the market. This has given a great leap to the garment industry.

### POINTS TO REMEMBER

- Sewing machine was introduced during the 18th century.
- Sewing machine is made up of many parts like spool pin, thread guide, take up lever, needle bar.
- Stitches can be adjusted using the stitch regulator.
- Care and maintenance of the machine increases the quality of sewing and life of the machine.
- While sewing, one is likely to face many problems like breaking of thread and needles. This can be avoided or corrected by suitable methods.

### ACTIVITIES FOR THE TEACHER

- Demonstrate oiling the sewing machines.
- To show the problems faced during sewing and means to overcoming them.

### ACTIVITIES FOR STUDENTS

- Draw a sewing machine and name its parts.
- Collect pictures of different types of sewing machines.
1. Bobbin  Piece of sewing machine that holds the bottom thread.
2. Bobbin case  Part which hold the bobbin.
3. Stitch regulator  Helps to adjust stitch length.
4. Spool pin  Holds the thread.
5. Feed dog  Helps to move the cloth forward.

**Glossary**

**INTERNET RESOURCES**

<table>
<thead>
<tr>
<th>Internet Resources</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="https://www.youtube.com/watch?v=MC9nYWy9F6Q">https://www.youtube.com/watch?v=MC9nYWy9F6Q</a></td>
<td>Sewing Machine Parts and their Functions</td>
</tr>
<tr>
<td><a href="https://www.youtube.com/watch?v=_4Kl8l9uAjM">https://www.youtube.com/watch?v=_4Kl8l9uAjM</a></td>
<td>Parts and Terminology of Sewing Machine and their Functions</td>
</tr>
</tbody>
</table>

**QUESTIONS AND ANSWERS**

**PART – I**

I. **OBJECTIVE QUESTIONS** :

1. The needle bar is covered by ____________
   (a) Embroidery plate     (b) Thumb screw     (c) Side plate     (d) Face plate

2. In India the first sewing machine was introduced in the year __________
   (a) 1845     (b) 1832     (c) 1790     (d) 1935

3. Threading the bobbin is carried out with the help of ____________
   (a) Spool pin     (b) Bobbin     (c) Bobbin case     (d) Bobbin winder

4. The movement of the cloth forward is carried with the help of __________
   (a) Pedal     (b) Bobbin case     (c) Feed dog     (d) Needle bar

5. The operation of the sewing machine is carried out by rotating the __________
   (a) Fly wheel     (b) Presser foot     (c) Pedal     (d) Tension disc
PART – II

II. ANSWER IN THREE (OR) FOUR POINTS:
1. What are the different types of sewing machines?
2. Short notes on stitch regulator.
3. Write short note on care of sewing machine.

PART – III

III. ANSWER IN A PARAGRAPH:
1. Write about the process followed in threading the upper and lower thread of a sewing machine.
2. What are the reasons and rectification for needle breaking?
3. What are the cause for thread breakings and its rectification.

PART – IV

IV. ANSWER IN ONE PAGE:
1. Draw and explain the parts of sewing machine.
2. What are the defects of sewing machine and how will you rectify it?

Answers for Objective Questions:
1. (d) 2. (d) 3. (d) 4. (c) 5. (a)
9.1 INTRODUCTION:

Body measurement can be described as the distance between one points of human body to another point. Body measurement is required to construct a garment.

Good garment designing is based upon the perfect body measurements. Garment fitting is directly related to body measurements. The fashion designing students should know how to take a correct body measurements.

9.2 POINTS TO REMEMBER WHILE TAKING MEASUREMENTS

- A good quality flexible measuring tape should be used.
- Measurements should be taken on correct fitting garments.
- Special care should be taken while taking measurements for kids and elders, they should stand straight without bending.
- The person for whom the body measurements are taken should stand straight.
- Select the garment to be stitched and note down the body measurement for that garment; regarding fit, style and shape.
- Measurements should be taken over a thin correct fitting basic garments. Heavy garments should be avoided.
- For measuring vertical measurements, metal end of the long tape should be used.
- To measure horizontal measurements hold the tape parallel to the floor.
- While taking vertical measurements hold the tape measurements perpendicular to the floor.
- Proper order should be maintained while recording measurements. Record crosswise measurements first and then vertical measurements.
- Measurement tape should not be tightened or loosened while taking body measurements.

LEARNING OBJECTIVES

- To understand the basics of body structure.
- To gain knowledge about body measurements.
- To acquire skills in taking body measurements.
● For taking circumference measurements the tape should be passed over the required area with one or two figures in between. This will provide ease.

● Before measuring the waist, tie a cord around the waist.

● If the customer has a deviation in the proportion of his body note it down. Be careful to note it without giving any idea (embarrassing) the person.

● To avoid mistakes, take measurement twice.

● Personal preference of the wearer should be asked for length, ease and style.

9.3 HUMAN BODY STRUCTURE

In order to cut and sew a fabric into any garment, one should first know the person’s body shape and structure. The anatomy of the human figure is designed in a systematic manner. The height of body is divided into equal parts. This enables one to understand the calculations used in pattern making.

9.3.1 Eight Head Theory

Human body can be divided into 8 feet (8 heads) one feet is considered as measuring from head to chin (Figure 9.1).

<table>
<thead>
<tr>
<th>First part</th>
<th>From hair to chin.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second part</td>
<td>Chin to chest / bust</td>
</tr>
<tr>
<td>Third part</td>
<td>Chest to waist</td>
</tr>
<tr>
<td>Fourth part</td>
<td>Waist to hip circumference</td>
</tr>
<tr>
<td>Fifth part</td>
<td>From hip to mid thigh</td>
</tr>
<tr>
<td>Sixth part</td>
<td>From thigh to below knee</td>
</tr>
<tr>
<td>Seventh part</td>
<td>From knee to calf muscle</td>
</tr>
<tr>
<td>Eighth part</td>
<td>From calf to tip of toe</td>
</tr>
</tbody>
</table>

![Figure 9.1 Eight Head Theory](image-url)
9.4 TOOLS USED FOR TAKING BODY MEASUREMENTS

1. Measuring tape with 60” long.
2. Pencil to write measurements.
3. Paper to record measurements.
4. Cord to tie around the waist, bust and hip if required.

Method of Taking Measurements (Figure 9.2)

1. **Bust Round**: Measure around the fullest pat of the bust. tape should be placed just below the shoulder blades at the back.
2. **Round Hip**: Measure around fullest part of hip that is around the seat.
3. **Round Neck**: Measure from front neck to the back neck around the largest part of the neck.
4. **Shoulder Width (Back width)**: In the back side shoulder, Measure from left to right pit of the armhole.
5. **Waist Round**: Measure around the natural waist.

---

![Figure 9.2 Body Measurements](image-url)
Chapter 9 Body Measurements

Figure 9.2 (Continued)

Dress / Shirt Measurement Chart

1. Neck
2. Over bust
3. Bust
4. Under bust
5. Waist
6. Hips
7. Neck to heel
8. Neck to above knee
9. Above knee to ankle
10. Arm length
11. Shoulder seam
12. Arm hole
13. Bicep
14. Fore arm
15. Wrist
16. V neck cut
17. Shoulder to waist
18. Waist to above knee
19. Navel
20. Thigh
6. Shoulder Width: Measure from base of the neck to armhole in the shoulder.

7. Back Length: Measure from the neck base to the centre of waist.

8. Shoulder to Bust Length: Measure from the highest part of the shoulder to bust point.

9. Distance between the Busts: Measure a horizontal distance between the bust points.

10. Front Neck Depth: Measure from the neck to the depth as per customer preference.


12. Armhole Circumference: Measure around the underarm and armpit.

13. Upper Arm Circumference: Measure from around the fullest part of the biceps.

14. Sleeve Length: Measure from tip of the shoulder to any point as per the customers prefers.

15. Elbow Round: Measure around the elbow.

16. Wrist Round: Measure around the wrist.

**Skirt Measurements**

17. Hip Measurements / Circumference: Measure around the widest part of hip (7”/18cm below waist) without stretching or loosening the tape.

18. Seat Round: Measure seat round just below the hip circumference.

19. From Waist to Seat: Measure along the side from the waist to seat in a sitting position.

20. Skirt Length: Measure from waist as per the style of the garment. For e.g.: Knee length skirt = measure from waist to kneelength; Full length skirt = Measure from hip to toe length.

---

**What is the evidence of first body measurement recorded?**

In the 3rd millennium BC the Egyptian used cubit and in the Indus Valley units of length were used as to measure length. Cubit was the length of the forearm from the elbow to the tip of the middle finger. It was divided into the span of the hand. The length between the tip of little finger to the tip of the thumb (one-half cubit), the palm or width of the hand (one sixth), and the digit or width of the middle finger (one twenty-fourth).
Chapter 9 Body Measurements

9.5 SUMMARY

Accurate body measurements are the key to garment construction. Body measurements also help to alter a garment. Each body measurement is taken from a specific point to another point, which varies from individual to individual. Body measurement must be taken with great care and recorded at once.

Figure 9.3 Body Measurements with Body Rise
POINTS TO REMEMBER
● First decide the garment to be stitched.
● Note the required body measurement.
● Make the person stand straight and hold the tape properly while taking body measurements.
● Remember to keep the body measurements for future use.

ACTIVITIES FOR THE TEACHER
● Demonstrate the method of taking body measurements and record it.
● Collect and show pictures of figure irregularities and explain the method of taking body measurements for their figures.

ACTIVITIES FOR STUDENTS
● Prepare a body measurement chart by recording body measurements of any one person.

GLOSSARY
1. Body measurement structure  Measuring of body parts for construction of garment.
2. Eight head theory  Division of human body into 8 heads / parts.
3. Calf muscle  The fleshy part at the back of a person's leg below the knee.
4. Irregularities  The state or quality of being irregular.
5. Sleeve  The part of a garment that wholly or partly covers a person's arm.

INTERNET RESOURCES
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<th>Description</th>
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<td>How to take Body Measurements for Women's Kurti</td>
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### SAMPLE MEASUREMENTS FOR CHILDREN’S GARMENTS (in Centimeters)

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These are typical measurements for girls. For ages up to five, the body measurements (i.e., all except the last four items in the table) [apply to boys also]

### SAMPLE MEASUREMENTS FOR BOY’S GARMENTS (in Centimeters)

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* These measurements depend on the height of the person.
QUESTIONS AND ANSWERS

PART – I

I. OBJECTIVE QUESTIONS :
1. Human body can be divided into _____________________
   a) 6 heads       b) 8 heads       c) 9 heads       d) 5 heads
2. To avoid mistakes take measurements _____________________
   a) Twice        b) Once         c) Thrice        d) Four
3. For measuring distance between the bust measure ______________ between the bust.
   a) Horizontally b) Vertically c) Diagonally d) Crossly
4. For cutting and stitching any garment we should know the person ______________
   a) Body size    b) Shape        c) Structure     d) Body shape and structure

PART – II

II. ANSWER IN THREE (OR) FOUR POINTS :
1. How will you take bust round measurement?
2. What are the tools used for taking body measurements?
3. How will you take elbow and wrist measurements?
4. How will you measure round neck and front neck depth?

PART – III

III. ANSWER IN A PARAGRAPH :
1. Explain the factors to be considered while measuring the body.
2. What are the measurements required to make a skirt and explain?

PART – IV

IV. ANSWER IN ONE PAGE :
1. Elaborate on taking body measurement?
2. Draw and explain eight head theory?

Answers for Objective Questions :
1. (b)    2. (a)    3. (a)    4. (d)
10.1 INTRODUCTION

Patterns are basic structure of dresses made on paper to ones measurement or for standard body measurements. Patterns lay the foundation for dress making. Correct pattern will result in good fit and comfort of the garment. Basic patterns include bodice front, back, shirt front back and sleeve patterns. These patterns can be modified to create different varieties of dresses. Example: the basic sleeve pattern can be modified as puff sleeve. Basic patterns can be prepared either by drafting or by draping fabric on a model.

10.2 TYPES OF PATTERNS ON PAPER

There are different types of paper patterns which are
- Standardised paper pattern
- Individual paper pattern

LEARNING OBJECTIVES

✍ To gain knowledge about basic patterns and different types of pattern making methods.
✍ To acquire skills in pattern making.

How were patterns made before the invention of paper patterns?

Sized patterns didn't even exist before 1863. Women used to disassemble old clothing and use them as guides to create new clothing, and only few patterns came in one size.

● Block paper pattern
● Graded paper pattern
● Commercial paper pattern

Standardised Paper Pattern
The standardised paper pattern is prepared using standard body measurements.
This will suit a group of people with the specific chest measurements. This method is followed in training and tailoring schools (Figure 10.1).

**Block Paper Pattern**

Block paper patterns are prepared with thick cardboards of the standardized body measurements. These patterns are mostly used in the garment industry to cut bulk amount of garment in less time. These patterns are stored for further use also (Figure 10.3).

**Individual Paper Pattern**

Individual paper patterns are prepared using measurements of a particular person. It is done at home and some tailor shops. It is used to produce customized dresses (Figure 10.2).

**Graded Paper Pattern**

Graded paper patterns are prepared of five consecutive sizes (Example: 100, 110, 120, 130, 140 cm measurements) in one single pattern. The required size is traced and cut from this pattern sheet and used. These paper patterns help one to increase or decrease a paper pattern. These patterns are very useful for designers (Figure 10.4).
Commercial Paper Pattern

Commercial paper patterns are the ready-made patterns, available in shops for all body measurements. These come with instruction manuals and step by step guidelines about selection of fabric, preparation of fabric, marking, cutting and steps for sewing. Butter paper or tracing papers are used for the preparation of commercial paper patterns. Garment variation is also seen in some commercial patterns. The patterns are placed in envelopes with pictures of the garments on models and fabric combination in which the garment will look good (Figure 10.5).
Who made the first Commercial Paper pattern?

Ebenezer Butterick was an American tailor. Along with his wife Ellen Augusta Pollard Butterick, prepared the first tissue paper dress patterns with grading for multiple standard sizes. They started marketing it from 1863. The product was a revolution in home sewing.

10.3 METHOD OF PATTERN MAKING

Pattern making is an art to learn and should be followed carefully. Pattern can be made by three main methods namely

- Drafting method
- Draping method
- Commercial patterns

10.3.1 Drafting Method

Drafting is the system of drawing patterns on paper with mechanical precision on the basis of body measurements. A basic pattern should have a minimum number of darts and should fit the body comfortably without being tight or loose. Drafting can be done on ordinary brown paper which is not too thin. It can be done on thicker paper to be preserved for future use. Sometimes this is made on card board and used for many years. A sharp pencil, ruler, ‘L’ scale or set squares are needed to make a pattern with straight lines and smooth curves. The following principles should be understood before starting to attempt drafting. This method is easy but requires some calculation. Drafting has a set of instructions like “Draw a line AB measuring half waist round” which has to be followed to get the paper pattern (Figure 10.6).

What is Cloth Simulation Software?

Cloth simulation software's can draft patterns on the computer and visualize clothing designs by using the pattern creation tools and virtual sewing machines.

Figure 10.6 Drafting Method

View of Cloth Simulation Software
Important Points to Remember while Drafting Patterns

- Patterns should be made larger than the body size by adding ease allowance to the actual measurement. This gives the garment freedom of movement, ease, and comfort in wearing. Normally 5 cm allowance is given around the chest and 1 to 2.5 cm for other measurements.

- For identical designs where the right and left side of the garment are same, only one side is needed to be made in paper. It can be reserved and copied for the opposite side.

- It is better to draft the basic pattern block first then while cutting, seam allowances should be added to the pattern and markings should be made on the fabric.

The following construction detailed information should be recorded and marked clearly (Figure 10.7).

  a) Name of each piece of pattern.
  b) Number of pieces to be cut with each pattern piece.
  c) If seam allowance is included in the draft. Seam lines and cutting lines should be clearly shown using blue and red pencil respectively.
  d) Straight grain or lengthwise line should be drawn on all patterns with a red pencil as shown (← — →). This line indicates the direction in which the pattern has to be kept on the cloth so that it is parallel to the selvedge.
  e) Matching notches or balance marks should be provided along seams to show which seams are to be joined together.
  f) It is advantageous to cut outward notches at centre front and centre back of pattern pieces as it helps at the time of assembling the garment and stitching collars.
  g) Folding lines, dart marking, pleat markings etc. should be clearly shown.
  h) Draping technique can be mastered by carefully following the instruction and drawing the patterns in a systematic manner.

10.3.2 Draping Method

Toils and modeling are another common terms used to describe draping. Draping is the manipulation of fabric on a three dimensional form by a designer to obtain perfect fit and harmony between the fabrics and design of the garment and the silhouette of the individual. The material is modeled around a dress stand or human body to see the fit. It is checked, marked and then cut and finally stitched. There are several types of dress forms available.
in the market but the most commonly used ones are:

- Adhesive Paper Dress Form
- Muslin Padded Dress Form
- Paper Mache or Plastic Molded Dress Forms

10.3.2.1 Adhesive Paper Dress Form
Adhesive paper dress forms are prepared for individual body measurements by pasting adhesive tapes over a correct fitting garment (Bannian) worn by the individual. The centre front, back, neck, armscye, waist and hip lines are marked. The adhesive form is cut through carefully without hurting the individual and rejoined and the edges are finished neatly with help of adhesive tapes. The dress form should be allowed to dry completely before use (Figure 10.8).

10.3.2.2 Muslin Padded Dress Form
Muslin padded dress forms are similar to adhesive paper dress forms but they are made with muslin materials. The inner side of the dress form is padded, hence its stiffer. Padding helps to increase the usage and life of the dress form. This can be placed on a stand while draping and preparing the paper patterns. Later it is covered with a neat fabric and used when needed (Figure 10.9).

10.3.2.3 Paper Mache or Plastic Molded Dress Forms
Paper mache or plastic molded dress forms are commercially made and sold for standard sizes. Even separate hand, leg dress form are available. It is costly but can be used for many years. These dress forms will not suit individual with figure irregularities (Figure 10.10).

Draping Method
The method of preparing a pattern following draping method is discussed below (Figure 10.11):
● Place the dress form on to a stand or table and ensure it is steady.

● Select the fabric, which has to be cut and stitched. Drape the fabric on the individual, look of design and colour to match the individual’s structure and complexion.

● Beginners can first drape with fabric which is of similar texture and weight to the fabric, which is to be cut and sewed.

● Drape the fabric on the dress form allow it to fall naturally. Check the grain of the fabric (lengthwise grain should match the centre front line). A number of experimental folds have to be made. Check for best design and drape. Pin the extra fabric. Do not cut.

● Ensure the design and drape once again, so as to avoid cutting on wrong size or designs.

● Draping should be done on a continuous line to give the best effect. This is possible only through practice. Hence before finalizing the design and pattern try draping in a number of ways.

● Special care should be taken in case of checks and stripes. These fabrics can be draped on cross grain also for creating design variation, especially for yoke or collar.

● To decide on fullness, try 2 to 3 styles. Example, pin tucks, box pleats and gathers can be draped on the dress form and the best can be selected.

● Once the design of the garment is finalized pin the fabric on the dress form, match the centre front, back, shoulder, chest round lines to that in the dress form. Pin along the line.

● Move the fingers slowly and make the dart and fullness needed and pin it. Care should be taken to maintain grain.

● Mark the line, cut and keep the pieces ready for sewing.

● Name the pieces to avoid confusion. Fold the piece and keep them in a neat cover, if stitching is not being done immediately.

● For identical design one side can be draped, marked and cut. The reverse of the cut patterns can be used for preparing the pattern for the other side.

● Care should be taken to use minimum or fine pins especially for delicate fabrics like silk.

● Based upon the type of design, dart can be converted to create fullness.

● Place weights or tape while draping design which requires more quantity of fabric. Examples: Wide neckline or side panels which are cut and gathered. Since
the fabric drops down, weights can be placed inside these drapes or tapes should be used.

- Trimming, buttons and other accessories can be placed on draped fabrics to check its suitability with the fabric.

In spite of the cost, the method helps one to view the look of the finished garment; hence correction can be made even before cutting the patterns. It also involves more time and practices.

**10.3.3 Commercial Patterns**

Commercial patterns were first developed in U.S.A. in 1950’s. Later patterns were developed for all age groups of both sexes. Commercial paper is made out of tissue / butter papers for standard body measurements. Generally these patterns are marked for 5 sizes and packed in an envelope. Commercial patterns are produced by companies and sold. It is very popular in foreign countries. The pattern names, number of pieces to be cut, grain, notches, cutting lines, stitching lines, darts and fullness are also marked. On the cover, a picture of the dress is shown. The size, cutting, sewing instructions are also mentioned. The body measurements are mentioned on the cover. This helps one to select the correct size. Dress modifications are given by some companies. The materials required, like buttons and accessories are also printed on the cover.

The major advantages of commercial patterns are good designs, with simple instructions. The pattern will have good fit when compared to other patterns but will need modification in case of irregular body structures. In India commercial patterns are not popular.

**10.4 ADVANTAGES OF PAPER PATTERNS**

- A correct pattern will result in good fit.
- A pattern prepared on thick paper or card board can be preserved and re-used for a long time.
- Basic patterns can be modified to produce patterns for complicated designs. (Example: the basic bodice front pattern can be modified for a bodice with yoke design).
- A paper pattern can be used to make new patterns of the same design by enlarging or reducing the size of the paper pattern. This is done by a scientific method called “grading”.
- It is easier and quicker to cut using a paper pattern than drafting straight on the fabric.
- A paper pattern enables us to cut a garment with a minimum amount fabric. One can find out the most economical way of cutting the fabric by placing the paper pattern on top and trying different ways (Layouts).
- Drafting mistakes can be corrected in the pattern itself.
- Patterns can be modified according to the recent trends in clothing.

**10.5 SUMMARY**

Patterns are the foundation for dress designing. Patterns can be made by drafting or draping methods. Commercial patterns are available. Each of these methods have their own merits and demerits but can be used for designing all types of dresses irrespective of age and sex. Mastering pattern making will make one to become a good designer.
POINTS TO REMEMBER

- Drafting is a mechanical process of making patterns using measuring and drawing tools.
- Drafting involves calculation and the three dimensional dress is represented on paper as a two dimensional structure.
- Draping is the method of making patterns on dress form or individual using muslin or selected fabrics.
- Draping involves practice and patience.
- Commercial patterns are ready to use paper patterns prepared by experts, printed and sold in markets by different companies.

ACTIVITIES FOR THE TEACHER

- Demonstrate the drafting technique and prepare a basic bodice front back, sleeve and skirt front and back patterns.
- Demonstrate the method of making a bodice front pattern using draping techniques.

ACTIVITIES FOR STUDENTS

- Prepare basic bodice front, back, skirt front, back and sleeve patterns using drafting method of pattern making.

GLOSSARY

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<tbody>
<tr>
<td>1.</td>
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<tr>
<td>Butter paper</td>
<td>Draping</td>
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<tr>
<td>Cellulose-based papers that are used in baking as a disposable non-stick surface.</td>
<td>Arrange loosely or casually on or round something.</td>
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INTERNET RESOURCES

- https://www.youtube.com/watch?v=QfMu0lCTvPw Basic Bodice Block Pattern
- https://www.youtube.com/watch?v=EdJSUd71CdI&t=68s Flat Pattern Drafting, the Bodice Block

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QUESTIONS AND ANSWERS

PART – I

I. OBJECTIVE QUESTIONS:
1. Patterns should be made larger than the body size by adding ___________ to the actual measurement.
   (a) Extra allowance  (b) Two cm  (c) Grading Measurement  (d) Ease Allowance
2. A pattern prepared on ___________ can be preserved and re-used for a long time.
   (a) Chart Paper  (b) Brown Paper  (c) Card board  (d) New Paper
3. Paper mache or plastic molded dress forms are made and sold____ for standard sizes.
   (a) by designer  (b) by Home Sewing Members  (c) Tailors  (d) Commercially
4. Matching ________ should be provided along seams to show which seams are to be joined together.
   (a) Notches  (b) Opening  (c) Lines  (d) Stitches
5. The standardised paper pattern is prepared and followed by ____________.
   (a) Tailors  (b) tailoring schools teachers.  (c) Readymade sewing units  (d) students

PART – II

II. ANSWER IN THREE (OR) FOUR POINTS:
1. What is standardised paper pattern?
2. Define Paper mache.
3. Define draping.
4. List the uses of Notches.
5. Write short note on Muslin padded dress forms.

PART – III

III. ANSWER IN A PARAGRAPH:
1. Mention the differences between drafting and draping?
2. Explain adhesive paper dress form.
3. What are the advantages of paper patterns?

PART – IV

IV. ANSWER IN ONE PAGE:
1. How will you make a pattern following draping method?
2. Explain drafting method.

Answers for Objective Questions
1. (d)  2. (c)  3. (d)  4. (a)  5. (a)
11.1 INTRODUCTION

The market is flooded with huge variety of dress materials. Each varies in the type of fibre content, colour, design and type of finish. A clear knowledge about these concepts is needed to construct a good well fitted garment. Depending upon the type of fibre, the number of processes varies. Due to which the yarns may be treated with chemicals or pressure resulting the movement of yarns. Therefore, before stitching the garment, it should get adjusted to be straight. If we stitch the fabric without preparing it, then problems will arise in fitting. Example, when sewing in a fresh fabric, fit may be good but after one wash it will shrink in size. Due to that fitness may change, yarns may be reallocated and shape of the garment may change. So, it is necessary to prepare the fabric before marking and cutting it. There are different steps in fabric preparation. It varies upon the type of fabric used. The most important steps are shrinkage and straighten of grain.

11.2 GRAIN

Grain is the direction of the yarn in a fabric. In all woven fabrics, there are two set of yarns which interlace at right angles. The yarn which runs in the lengthwise direction is called warp, and the one which runs in crosswise direction is known as the weft. The warp yarns are known as lengthwise grain and weft yarns are called as crosswise grain. Length wise yarn is more strong and stiff. It is made with of higher twist yarn unlike the crosswise yarns.

Grain plays a very important role in garment designing and drape. The bodice blocks, skirt patterns are cut along the lengthwise grain (i.e., parallel to the selvedge). This ensures good drape and fall of the garment on the wearer. Therefore
all main parts of the garments are cut in lengthwise grain. Crosswise grain gives more elasticity. Small parts of the garments like collars, pockets, and yokes can be cut on cross grain.

11.3 SHRINKAGE

Shrinkage is described as the reduction in length and width of the cloth when washed. If a garment shrinks, it will ruin the fit. Therefore all fabric should be subjected to shrinking before cutting and sewing. Shrinkage can be carried out in different methods. They also vary from fabric to fabric.

11.3.1 Shrinkage of Fabric without Water

The fabric should be placed on the table with face side lying down for the shrinkage. A wet cloth or towel should be kept between the two fabrics and iron with warm heat. While ironing, the wet cloth that is present inbetween will give air due to heat and help in the shrinking of the fabrics. Then ironing must be done in all places.

For woolen fabric the wet cloth must be kept in between the fabric for one night. After that the cloth that was kept above the wool fabric should be removed. The wool fabric should be spread on the wrong side facing upward. Ironing should be done by keeping the fabric above the wool fabric and it should be left to dry naturally. This process should be done two times.

11.3.2 Shrinkage of Fabric with Water

The fabric to shrink should be kept in the soap solutions for four hours. In case of cotton fabric hot water is needed. The fabric should be stirred from time to time. After that, it should be washed for 3-4 times and dried by hanging in the lengthwise direction. While drying the cloth avoid using steel rods and use thread ropes. Ironing must be done while the fabric is wet slightly. In case of coloured cloth they must be soaked separately and washed.

11.4 FABRIC STRAIGHTENING

Fabric undergoes tension, while weaving, knitting, dyeing or printing. During these processes the position of the yarns can change resulting imbalance of the fabric. If a garment is cut and stitched when the yarns are not straight, then the drape of the garment will not be correct. Therefore it is important to ensure the correct placement of the yarn before cutting. This

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Can you identify the fabric by seeing and feeling?

- **Cotton fabrics** are normally stiff. It will get crushed easily and the crease is left on the fabric.
- **Silk fabrics** are very smooth to touch, bright and lustrous to see. The fingers run softly over silk fabrics.
- **Woolen fabrics** are coarse to touch, with small protruding fiber hairs.
- **Polyester and rayon fabrics** are smooth to touch and lustrous to see. These fabrics do not get crushed easily.
- **Twill fabrics** show a diagonal effect and are course to feel.
- **Napped fabrics** (pile and velvet) have loops or short hairy structure. It is smooth to touch.
process of placing the misplaced yarns in the correct position is known as straightening of fabric. The yarns must interlace at right angles.

First check if the fabric is straight by placing the fabric on long table, press with your fingers and remove the creases. Fold the fabric in the lengthwise direction. If the two selvedges meet evenly with the side of the table and the raw edges come together even with the ends of the table, then the fabric is straight. If not, straighten the fabric.

Straightening of fabric can be carried out following anyone of the processes given below:

- While buying the fabric, cut a slit at one edge of the selvedge. Hold the fabric on both hand and pull evenly, in simple terms it is similar to tearing the fabric, by doing so the fabric will tear along the cut crosswise grain which in turn will maintain the grain. This is simplest method of straightening the grain. Generally all salesmen follow tearing method, hence most of the fabric is naturally straightened.
- Draw out a crosswise thread and cut the fabric along with this thread. Place this fabric on the table and pull to meet selvedges. Pull in crosswise direction. To pull this, two person may be required. Pulling must be even on both sides. Then press the material if the cloth is wrinkled. Damp a cloth and press in lengthwise directions.
- Delicate fabric can be straightened by pressing with the fingers.

11.5 MARKING THE PAPER PATTERNS

Marking is the process of transferring the paper pattern to the garment. Great care is needed and every detail in paper pattern should be put on the fabric for cutting and sewing. The most important details are side seams, front and back cutting and sewing lines, hemlines, darts, folds, placements of pockets and fullnesses, notches, placement of openings, fasteners and any other special garment details.

What is Pouncing?

Pins are use to prick pattern design at regular intervals. The pattern is then placed on the fabric and a powdered pigment (Chalk coal for light coloured fabrics and talcum powder for dark coloured fabrics) is worked through the holes in a pouncing (tapping slowly) motion using a soft fabric pad. Thus, the pattern lies are transferred to the fabric.

The different methods followed in marking are tailor chalk, dress making’s tracing wheel and carbon, pins and threads. The most commonly used methods are discussed below:

11.5.1 Tailor Chalk

Tailor chalk is a small triangular chalk which can be used to draw the outer lines of the pattern. This is cheap and commonly used. Tailors chalk is available in different colour like blue, white, yellow and red. Depending upon the colour of the fabric it can be chosen, yellow and white for dark colours and red, blue for light coloured fabrics. The main disadvantage of this method is it can’t be used
to transfer darts, sewing lines and other fine details (Figure 11.1).

**11.5.2 Dress Makers Tracing Wheel and Carbon Paper**

Dress maker’s tracing wheel is a small circular wheel with teeth attached to a wooden or plastic handle. By passing the wheel over the line, small dots are marked on the fabric indicating pattern line and other detail. Carbon paper is placed between the fabric and paper pattern. A cardboard can be placed on the table so that the carbon marking will not fall on the table. Different colour carbon papers are available in the market, like yellow, white, blue and black. Light coloured carbon paper like white and yellow are used for transferring patterns to dark colour fabric, whereas dark colour carbon papers are used on light coloured fabrics. Care must be taken to give very little pressure on the tracing wheel, so that the marking is light. Markings are done on the wrong side of the fabric. Every detail in the pattern can be marked by this method (Figures 11.2 and 11.3). Certain details like placement of pockets, buttons are to be marked on the right side of the fabric. Before removing the carbon paper check if all details are marked.

**11.6 CUTTING THE FABRIC**

Principles to be followed while cutting:

- The ends and sides of the fabric are to be kept parallel to the table edges so that it will not shift.
- Walk around the table for cutting instead of pulling the fabric. Since moving the pattern and material will shift the grain and result in uneven cutting.
- Hold the pattern with left hand and cut with right hand.
- Put the thumb in the round handle and fingers in long handles, so that the shears will not slice at angles.
* Cut with long, smooth strokes. Keep the cutting blade or shear resting on the table.
* Cut notches outward.
* Check if extra pattern details like bias binding, facing, piping are cut.

After cutting the patterns, place them carefully together. Don't fold the patterns. Try to sew the patterns together as soon as possible because delay in sewing will reduce the freshness of the garment.

11.7 PATTERN LAYOUT

The placement of pattern on the fabric, in an economical manner, that is without wasting fabric is known as pattern layout. All the patterns should be arranged properly following grain of the fabric. Example the bodice centre front will be in straight (lengthwise direction) grain.

The main points to be considered while laying patterns are:
* Press the fabric without any wrinkles before laying the patterns.
* Place the fabric on a large or a hard flat surface, which is easy for work.
* Place the larger patterns first. Place similar pattern together, with same length. Example placement of bodice front and bodices back next to each other, such that the side seams are close to each other.
* Place the smaller patterns in gaps in between the larger pattern.
* If pattern is to be cut in more number, example two sleeve patterns, place them on fold. This concept is not possible when the fabric has a one way design or when the patterns have different front and back patterns.

* Keep weight, pencil, pins ready in hand, to draw, or pin or place weights on patterns, so that it remain in correct position.

11.7.1 Types of Pattern Layouts

Based upon the placement of the patterns, the layouts are classified as
* Open layout.
* Lengthwise centre fold.
* Off-centre length wise fold.
* Crosswise outer fold.
* Off centre crosswise fold.
* Double fold or combination fold.

Open Layout

Open layout is the simplest layout. The fabric is spread on the table and the patterns are laid from left to right one after the other. This is easy for beginners. No fold is made in this method. It can be used for all patterns. This is used especially for designs with different left and right patterns.

Lengthwise Centre Fold

The fabric is folded in the lengthwise direction. The selvedges of both sides are placed one on top of the other and folded in the middle. The fabric forms a fold at the centre. All folded patterns are placed along this fold. This fold is also used for different type of frocks, shirts and blouses.

Off-Centre Lengthwise Fold

The required width needed for the patterns is taken on the fabric and folded in the lengthwise direction. This is commonly seen when many small patterns are
found in garments. The fold should be parallel to the selvedge. This is used for many garments from simple baby’s panty to integrated men’s coats.

**Crosswise Outer Fold**

Crosswise centre fold is similar to lengthwise centre fold. In this fold, the fabric is folded in crosswise direction. It is best suited, when the patterns are too narrow to be fitted in the lengthwise fold. This fold can also be used when special effects are needed like having a dress with horizontal strips using a material with lengthwise stripes.

**Off Centre Crosswise Fold**

The off centre crosswise fold is a layout when the fabric is folded in the cross grain. The fold is perpendicular to the selvedge. This fold is used when a part of garment is cut in cross wise grain for ease or special effects. Example when collars or yokes are cut on fabrics with horizontal strips or vertical strips.

**Double Fold or Combination Fold**

In combination fold the fabric is folded in lengthwise and crosswise grains together. This layout is used for sari petticoats and jablas (Figure 11.4).

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**Figure 11.4 Different Types of Layout**

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11.8 SUMMARY

One of the most important aspects in good dress designing is preparation of fabric for sewing. This includes concepts like shrinkage, fabric straightening, marking, laying the patterns and cutting. Economical layout can be obtained through trials and practice.

POINTS TO REMEMBER

- Correct preparation of fabric will help in cutting and sewing well fitted garment.
- Removal of starch is important for good stitches.
- Grain should be checked before laying the paper pattern.
- Patterns should be named and marked properly and kept ready for pattern marking.
- Patterns can be transferred on to the fabric by different tools like using tailor’s chalk, carbon paper and tracing wheel, pins and tailor’s tack based upon the type of materials.
- Even cuts with sharp scissors should be used to cut patterns.
- Economical pattern layout should be checked before cutting.

ACTIVITIES FOR THE TEACHER

- Demonstrate straightening of fabrics.
- Prepare layout for different type of garments, using striped or checked materials and explain it to the students.

ACTIVITIES FOR STUDENTS

- Prepare different type of layout using the basic patterns for a frock with Peter Pan collar and puff sleeves.
1. Shrinkage  Reeducation in the width and length of a fabric.

2. Selvedges  Finished edge of the woven fabric during manufacturing, that prevents it from unraveling.

3. Notches  An indentation or incision on an edge or surface.

4. Fastener  Closures used to hold the garment in good fit.

5. Tracing  A copying a drawing, map or design.

6. Shearing  Shaving or cutting off the hair from animals (Sheep/Goat).

INTERNET RESOURCES

https://www.youtube.com/watch?v=vWXf-gPWBhU  Fabric Preparation for Sewing
https://www.youtube.com/watch?v=EdJSUd71CdI  Flat Pattern Drafting

QUESTIONS AND ANSWERS

PART – I

I. OBJECTIVE QUESTIONS:

1. Direction of the selvedge is the _______________ direction
   (a) Lengthwise  (b) Crosswise  (c) Diagonal  (d) None

2. Straightening the fabric should be carried out __________
   (a) Before stitching  (b) After stitching  (c) Before cutting  (d) After cutting

3. Notches to be marked for _______________
   (a) Fold line  (b) Dart  (c) Joint line  (d) All the above

4. Spreading method which is not used for folding the fabrics.
   (a) Combination fold  (b) Open layout  (c) Lengthwise fold  (d) None
5. Folding fabric in lengthwise and crosswise direction is called
   (a) Combination fold    (b) Off centre crosswise fold
   (c) Lengthwise layout    (d) Open layout

6. Method used for preventing the wastage of fabric is known as
   (a) Draping    (b) Grading    (c) Layout    (d) Drafting

**PART – II**

II. ANSWER IN THREE (OR) FOUR POINTS :
1. What is grain?
2. What is a fabric shrinkage?
3. Describe Tailor's chalk.
4. What are the details to be marked in the fabric before stitching?
5. List the advantages of open layout?

**PART – III**

III. ANSWER IN A PARAGRAPH :
1. Explain the method of shrinkage for cotton.
2. What are the types of layout? Explain.

**PART – IV**

IV. ANSWER IN ONE PAGE :
1. Explain the different methods of marking a silk fabric.
2. What are the points to be remembered during pattern layout?

*Answers for Objective Questions :*

1. (a)  2. (c)  3. (d)  4. (b)  5. (a)  6. (c)
INTRODUCTION

Sewing is an interesting art, which has many integrate details. It is also described as needle work or needle craft. Sewing can be done with needles by hand or machines. The stone age men used bone needles to join animal skins with twigs as thread. Today there are varieties of needles, threads and machines to join different type of fabrics. In order to make a dress one should know the basic concepts of sewing. The basic concepts of sewing includes

- Seam
- Fullness
- Necklines and collars
- Plackets and fasteners

12.1 SEAM AND SEAM FINISHES

LEARNING OBJECTIVES

- To gain knowledge about joining bits of fabric together – seams.
- To learn about finishing seams.

12.1.1 Introduction

Dress making is the art of cutting and sewing flat fabrics to suit a three dimensional human figure. The joining of the cut fabrics is known as seams. The sewing can be made for two pieces or more than two pieces together. Seams can be hand or machine made. To give a neat and wrinkle free dress, seams must be flat as possible and evenly spread. Depending upon the type of dress and material stitched seams vary. The durability of the garment also depends upon the seams.

The main factors affecting seams selection are:

- Thickness of the fabric
- Design and type of dress
- Use of the dress
- Place where the seam appears
- The age and sex of the wear
- Fashion
12.1.2 Types of Seams

There are different types of seams. The most common five types of seams are

- Plain seam
- Run and fell seam
- French seam
- Mantua maker seam
- Piped seam

12.1.2.1 Plain Seam

Plain seam is the most important and simple seam that can be used for all types of dresses. Plain seams are easy to stitch. The main advantage of this seam is it requires very little time to sew, pliable and inconspicuous. This seam can be used to stitch all types of fabric expect very light, transparent fabric or fabrics which tend to ravel off. This seam is commonly used on armholes, side seams of blouses, frocks and skirts (Figure 12.1).

Method of Sewing Plain Seam

- Take the two pieces of fabric which has to be joined together and place them facing right sides
- Check if the cut lines match
- Pin along the seam lines
- Tack along the seam line, remove pins
- Hand stitch or machine on the seam line
- Remove tacking, press open

12.1.2.2 Run and Fell Seam

Run and fell seam is commonly known as flat felt seam. As the name indicates it is very flat. It can be stitched using hand stitches or machine. The main advantage of this seam is its strength and durability. The disadvantage is time consuming and not suitable for curved edges and bulky fabrics. This seam is common on children’s dresses, sports garments and shirts (Figure 12.2).

Method of Sewing Run and Fell Seam

- Place the two pieces to be sewed together facing right sides
- Check if the cut lines match
- Pin along the seam line and machine
- Press both seam allowances to one side
- Trim the under seam allowance by 0.25 cm.
- Turn the upper seam allowance to make a smooth fold over the other
- Press down firmly.
- Tack and fold down flat to the garment.
- Machine close to the folded edge on the right side of the garment.
- Open out and press the seam.

12.1.2.3 French Seam
French seam is also known as double seam. It is a thick seam, so best suited for thin and delicate material. The main advantage of this seam is its durability and neat finish. The disadvantages are it cannot be done on curved edges or on thick fabrics. This seam is common on children’s clothing and silk or light weight dresses (Figure 12.3).

![Figure 12.3 French Seam](image)

Method of Sewing French Seam
- Place the two pieces to be sewed together facing wrong sides.
- Work a row of stitches about 0.5 cm outside the seam line nearer to the raw edges.
- Trim the allowances.
- Press the seam flat and turn to the right side.
- Pin about 0.5 cm alone the seam line
- Fold and hand tack.
- Machine along the tacked line, remove the hand tacked thread and press.

12.1.2.4 Mantua Maker’s Seam
Mantua maker’s seam is a simple seam, which is suitable for medium thick materials. It gives a simple, neat but thick look (Figure 12.4).

![Figure 12.4 Mantua Maker’s Seam](image)

Method of Sewing Mantua Maker’s Seam
- Place the two pieces to be sewed together facing right sides.
- Trim one seam edge alone the tacking line by 0.25 cm.
- Make a turn of 0.5 cm on the wider edge to fall in line with the edge of the trimmed seam.
- Machine through the thicknesses
- Remove tacking thread.
- Press the seam.

12.1.2.5 Piped Seam
Piped seam is a modification of the plain seam. It adds decoration to the dress. This seam is stitched by inserting a cord or a bias strip into the plain seam. It can be used around the neck, waist, armscye,
yoke lines, side seam. Contrast colour piped seam add interest to garments (Figure 12.5).

Figure 12.5 Piped Seam

Seams can be finished by top stitched. This adds strength and decoration. The methods followed to finish the seams are single and double top stitched seam, welt, lappet seamed and slot seams.

12.1.3 Seam Finishes

Seams have raw edges which tend to ravel out. Therefore the raw edge of seams are finished by different methods like double stitching over cast stitching, herring bone stitch, hem stitching, zig-zag stitch and bound finish.

12.1.3.1 Types of Seam Finishing

When joining two pieces of fabric with a seam its raw edges must also be taken care. They must not ravel or create a fuzzy look. Hence seam finishes play an important role in acquiring a neat completed garment. Seam can be finished by different methods (Figure 12.6). The most common methods are discussed below.

Double Stitched Seam

Double stitched seam is done by sewing another or a second row stitches about 0.25 cm away from the original stitches. This can be a straight or a zig zag stitch. This seam is done on curled material where travelling of the seam is higher. Example: Knitted Jersey.

Pinked Finish

Pinked finish is given by cutting the edges of the seams with pinking shears. This is a simple and easy method. It does not involve more time, but it is not suitable for material which tend to ravel easily. Example: Satin.

Figure 12.6 Seam Finishes
**Stitched and Pinned Seam**
Stitched and pinned seam is a simple seam. First the fabrics are joined by a row of stitches. Then the raw edges are trimmed using pinking shears. This seam finish is not suitable for seams which ravel easily.

**Herring Bone Seam Finish**
Herring bone seam finish is done by folding the raw edges flat on the dress and working a row of herring bone stitches. This finish is very neat since the raw edges are not visible. It is suitable for heavy materials. Example: Men’s coat.

**Hem Stitched Seam Finish**
Hem stitched seam finish is similar to herring bone seam finish. In this finish the raw edges are folded and pressed toward the dress and a row of hem stitch is done. This looks very neat because only small dotted line is seen on the right side.

**Overcast Seam Finish**
Overcast seam finish is a finish which is suitable for both thick and thin fabrics, which fray easily. It can be used for seam along the armseye, yoke lines and even in hem lines. A plain seam is made first. Then the raw edges are completed separately with overcast stitches.

**Edge Stitched Seam Finish**
In edge stitched seam finish, the raw edges are pressed open and folded for 0.5 cm down and a row of top stitch is done on both raw edges without attaching it to the dress. This seam gives a neat look. Due to its thickness it is not suitable for curved edges.

**Zig-zag Seam Finish**
Zig zag seam finish is done by holding both the edges of the seam together and making a row of zig zag stitch. It is best suitable for fur material.

**Bound Seam Finish**
Bound seam finish is done by stitching around the open seam on the wrong side. The stitch is made along the seam line, with wider side of the tape underneath. This seam is best suitable for finishing seams on unlined coats and sports jackets.

**Net-Bound Seam Finish**
Nylon or a netted strip of fabric is placed near the raw edges of the seam in such a manner that the nylon fabric is slightly off-center. The nylon material is firmly folded covering the seam and sewed. Net bound seam finish is best suitable for thin delicate fabrics, like velvet and chiffon.

### 12.1.4 SUMMARY
Seams are most important concept of a dress. Correct seam and seam finish should be done on dresses based upon the placement of the seam, age of the wearer, type of material and dress. The strength of seam increases the life of the dress. Seam finish adds strength and beauty.
POINTS TO REMEMBER

● Joining of two pieces of fabrics is called as seams.
● Seams can be done by hand or machine.
● Seam finish adds strength to the seams and neat look to the garment.

ACTIVITIES FOR THE TEACHER

● Demonstrate the method of sewing different type of seams and seam finishes.

ACTIVITIES FOR STUDENTS

● Prepare samples of different types of seams.

QUESTIONS AND ANSWERS

PART – I

1. OBJECTIVE QUESTIONS :

1. Run and fell seam is also known as __________
   (a) Plain seam    (b) French seam    (c) Piped seam    (d) Flat felt seam

2. _______ is used on transparent and light weight fabric
   (a) French seam    (b) Plain seam    (c) Piped seam    (d) Double seam finish

3. Over cast seam finish is more suitable for __________
   (a) Narrow seam    (b) Yoke edges    (c) Side seams    (d) Hem lines

4. A row of small dots are seen in __________
   (a) Yoke seams    (b) Hem stitched seam finish
   (c) Bound seam finish    (d) Pinked seam finish

5. Insertion of cords are used to stitch __________
   (a) Plain seam    (b) French seam    (c) Piped seam    (d) Flat felt seam
PART – II

II. ANSWER IN THREE (OR) FOUR POINTS:
1. Describe flat felt seam.
2. What is the difference between plain and piped seam?

PART – III

III. ANSWER IN A PARAGRAPH:
1. Write short notes on bound seam finish.
2. Give the construction details of plain seam.

PART – IV

IV. ANSWER IN ONE PAGE:
1. List the type of seams which cannot be used for thick fabrics and explain them.
2. Discuss in detail the different types of seam finishes.

Answers for Objective Questions:
1. (d)  2. (a)  3. (b)  4. (b)  5. (c)
12.2 FULLNESS

LEARNING OBJECTIVES

- To enable the students to know the types of fullness used in garment.
- To calculate the fabric consumption for different fullness.
- To identify the suitability of fullness.

12.2.1 Introduction

Fullness is done to shape a garment. It also aids in garment fitting. It adds interesting design details in a garment. For ease of movement and comfort fullness is introduced in garments. There are various types of fullness. Some of most common types of fullness are darts, tucks, pleats and gathers.

12.2.2 Darts

Dart is a triangular fold which acts as an essential part in dress making. It shapes a flat piece of fabric to fit into natural curves of the body in bust area, armhole, neckline and waist.

They are mostly used in women’s garment. They play a major role while designing dress and cannot be ignored. While preparing darts, stitching should start from the broad edge of the dart and move towards of the tip of the dart. Darts are normally done before a garment is stitched. It helps in making the garment more fitted.

There are two types of darts namely,

- Single pointed dart
- Double pointed dart

12.2.2.1 Single Pointed Dart

Single pointed dart is also called as standard dart (or) half dart. These darts are in triangular shape, wider at one end, and narrower on the other end (Figure 12.7).

Method of Sewing Single Pointed Dart

- Transfer points where darts are to be sewn
- Fold the fabric right side facing
- Start machining from the wide end and taper till the tip
- Pivot the end
- Fastened the threads at the tapering end

Uses:

Single point dart is used in blouse, skirts, pants, frocks and kameez.

12.2.2.2 Double Pointed Dart

Double pointed dart is also called as full dart. These darts are pointed at both the ends and are wider at the middle. While stitching / using double pointed dart on thick fabric trim the edges.
Method of Sewing Double Pointed Dart

- Transfer points where darts are to be sewn.
- Fold the fabric right sides facing.
- Start machining from the wider end to the narrow end of one tip.
- Repeat for the other end by overlapping a few stitches at centre.
- Slash at its midpoints to give a smooth fit over the curve of the body.
- Pivot the end.
- Press the dart neatly.

Uses

Double pointed dart is used in bodice of plain blouse and kameez.

12.2.3 Tucks

Tuck is a fold in a fabric which is stitched down to add fullness to the garment. They help in shaping a garment and they should be in even width. Tucks can be done on the right side or wrong side of the garment depending whether it is used for decorative (or) functional purpose. They create a decorative element which can also add fullness to a garment. In fine and delicate fabric they look more attractive. They should be evenly spaced.

The different types of tucks are namely,

- Pin tuck.
- Cross tuck.
- Piped tuck.
- Shell tuck.

12.2.3.1 Pin Tuck

Pin tucks are fine narrow fold of about 0.25 cm sewn from top to bottom. They can be stitched in single (or) in group. It is mostly used for decorative purpose hence done on specific area of the garment like the yoke of a frock (Figure 12.8).

![Figure 12.8 Pin Tucks](image)

Method of Sewing Pin Tucks

- Mark the places where pin tucks have to be sewn.
- Fold the first line and stitch near the fold leaving less than 0.25 cm.
- Repeat the same procedure for subsequent line.
- Cut / trim the extra threads.
- Care should be taken to mark the pin tucks with even spacing.

Uses

Pin tucks are usually worked on kids garments, ladies dresses, yokes and shirt for decorative purpose.

12.2.3.2 Cross Tuck

Cross tucks are similar to pin tucks which are sewed both on crosswise direction and in lengthwise direction forming a checked effect (Figure 12.9).

![Figure 12.9 Cross Tuck](image)
Method of Sewing Cross Tucks
- Mark the points where cross tucks are to sewed.
- Stitch the pin tuck in vertical direction by folding the fabric for about 0.25 cm.
- Then draw lines in horizontal direction
- Sew pin tucks in crosswise direction also
- Trim the loose threads

Uses
Cross tucks are used to decorate ladies and kids wear and household linens (curtain, table cloth). They create pleasing effect on yokes, pockets and larger areas.

12.2.3.3 Piped (or) Cord Tuck
Piped or cord tucks are tucks made by placing a cord at the edge of the fold (on the wrong side). A row of stitches are made close to the cord. The stiffness of the tucks will depend on the type of cord used. The cords used can be of any thickness (Figure 12.10).

Figure 12.10 Piped (or) Cord Tuck

Method of Sewing Piped or Cord Tuck
- Mark the places where piped tuck is necessary. They can be stitched in equal distance or can be grouped.
- Place a cord on the wrong side and stitch near the cord, overlapping the cord such that the cord is inside a tube like structure.
- Repeat the process wherever necessary
- Cut the excess thread

Uses
Shell or scalloped tucks are used in children's garments to produce stiffness.

12.2.3.4 Shell or Scalloped Tuck
Shell or scalloped tucks resemble blanket stitch and produce a scalloped effect on the garment (Figure 12.11).

Figure 12.11 Shell (or) Scalloped Tuck

Method of Sewing Shell Tucks
- Fold the edge to 0.25 cm.
- Mark and pin 0.5 cm apart to make sure that scallops are of equal width.
- Start with 2 or 3 running stitch till the pin.
- Do overcastting stitch by pulling the thread to create a scallop effect.
- Repeat the process till the end.
- Cut the excess thread

Uses
Shell or scalloped tucks are used on delicate fabric, lingerie, in children garment and in night wear, around armhole and necklines.
12.2.4 Pleats

Pleats are folds in a garment done on the waistline of skirts, yokes and sleeves at equal distance to release fullness. Pleats are done on top and fall neatly to the bottom of fabric. The material required to make a pleat is three times the size of a finished pleat. They are normally about 2.5 to 5 cm. They create eye movement and can be used as style detail. The effect of pleat varies depending on the fabric used. The depth of pleat depends on the weight of fabric and the effect required.

The different types of pleats are:

- Knife pleat.
- Box pleat.
- Inverted pleat.
- Accordion pleat.
- Sun ray pleat.
- Pinch pleat.
- Kick pleat.

The most commonly used pleats are explained below:

12.2.4.1 Knife Pleat

Knife pleat are usually about 2.5 to 3 cm width. Knife pleats are folds made by a row of stitch in same direction, generally at the top where the pleats start. They can be used continuously, grouped (5 or 6) or can be used as a single pleat. They form a sharp edge at the top and then flare out (Figure 12.12).

Method of Sewing a Knife Pleat

- Mark lines where fold has to be made.
- Fold along the marked line.
- Pin and sew along the marked line.
- Remove pin and cut the excess threads.

Uses:

Knife pleat is used in ordinary skirt, pants and frock.

12.2.4.2 Box Pleat:

Two knife pleats facing in opposite direction is termed as box pleat. The edges of the box pleat touch each other. If two set of box pleats made at the same point it is called as double box pleat (Figure 12.13).

Method of Sewing a Box Pleat

- Mark lines where box pleats has to be made.
- First make fold in right side and make the other pleat on left hand side, repeat.
- Pin and press.
- Remove pins and machine.
- Cut the excess threads.

Uses
Box pleat is used in children garment, school uniforms, skirts, center back of gent's shirt. It can be used as a design detail on pockets.

12.2.4.3 Kick Pleat
A plain pleat, knife pleat or box pleat is stitched along the fold till the desired length for freedom of movement is termed as kick pleat. It releases fullness at base (Figure 12.14).

![Figure 12.14 Kick Pleat](image)

Method of Sewing a Kick Pleat
- First mark a plain knife or box pleat as per requirement.
- Stitch near the fold of pleat till the required length.

Uses
Kick pleat is used in sportswear, frocks and skirts.

12.2.5 Gathers
Gathers are used for distributing fullness evenly in a given area. The material required will be twice the width or it can be varied based upon the effect required. Stiff cotton produces crisp effect, but other man-made fibre or silk gives a graceful effect.

Gathers can be done by hand, machine or by elastic.

Method of Making Gathers
- Stitch two rows of loose machine stitches.
- Gather the section by pulling the thread.
- Pin only the edges on the flat surface.
- Evenly spread gather over the fabric.
- Pin the gathers to the fabric.
- Machine horizontally, remove the pins.
- Pivot the edges.

Points to remember while sewing gathers
- Always the gathered edges should be on top (facing you).
- If length to be gathered is long then divide the length and stitch loose machine stitches.

Uses
Gather is used in neckline, sleeves, waistline and yoke.

12.2.6 Summary
Fullness helps a fabric to fit in natural curves of body, and make a garment look attractive. Darts gives shape to contour. Pleat, gather and tuck releases fullness in any part of garment. Selection of the type of fullness depends on the type of material.
POINTS TO REMEMBER
● Fullness is done to create variety.
● Fullness helps in getting proper fit and comfort.
● Pleats, tucks and gathers releases fullness.
● Darts shapes flat pattern.
● Fullness adds decoration to a garment.

ACTIVITIES FOR THE TEACHER
● Demonstrate darts, tucks, pleats and gathers.
● Show PowerPoint presentation of fullness used in garment.

ACTIVITIES FOR STUDENTS
● Draw different types of fullness.
● Collect picture for various types of fullness.
● Stitch samples for different fullness.

QUESTIONS AND ANSWERS

PART – I

I. OBJECTIVE QUESTIONS:
1. _______________ are triangular folds
   (a) Darts (b) Pleats (c) Tucks (d) Gathers
2. Double pointed dart are called as _______________
   (a) Full dart (b) Half dart (c) Standard dart (d) Curved dart
3. Cord is used in _______________
   (a) Pin tuck (b) Cross tuck (c) Piped tuck (d) Shell tuck
   (a) 2 times more (b) 3 times more (c) 4 times more (d) 5 times more
5. ____________ pleat stitch is sewed near the fold.
   (a) Knife pleat (b) Box pleat (c) Accordion pleat (d) Kick pleat
PART – II

II. ANSWER IN THREE (OR) FOUR POINTS:

1. What is single dart?
2. Write short note on cord tuck.
3. List the importance's of pleats?
4. What is a cross tuck?

PART – III

III. ANSWER IN A PARAGRAPH:

1. Write a short note on pin tuck.
2. Illustrate knife pleat and briefly explain.
3. How will you introduce gather in a garment?

PART – IV

IV. ANSWER IN ONE PAGE:

1. Give an account on darts with a diagram.
2. Explain any two types of pleats.

Answers for Objective Questions:

1. (a) 2. (a) 3. (c) 4. (b) 5. (a)
12.3 NECKLINE AND COLLARS

LEARNING OBJECTIVES

● To understand the styles of necklines and collars in dress designing.
● To acquire skills in construction of basic neckline and collars.

12.3.1 Introduction

A neckline is the part of bodice around the neck. It can be of various shapes and sizes. Neckline is a very important part of any garment. One should be very careful while selecting a neckline and also while stitching it. A neckline should not only be comfortable but should also suit to the type of fabric. Neckline can be divided as front bodice neckline and back bodice neckline. Correct neckline can help to modify the look of the wearer. Neckline can be used as decoration on dresses. The depth and width of neckline depends upon the wearer, age, sex, type of fabric used and the type of dress (Figure 12.15).

![Figure 12.15 Shapes of Necklines](image)

12.3.2 Types of Neckline

<table>
<thead>
<tr>
<th>Name of the Neckline</th>
<th>Description</th>
<th>Suitable Materials</th>
<th>Suitable Dresses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round</td>
<td>Circular Shape&lt;br&gt;Curved towards center front&lt;br&gt;Front neckline deeper than back&lt;br&gt;Piping can be added for decoration</td>
<td>All types of Fabric</td>
<td>Blouse&lt;br&gt;Midi tops&lt;br&gt;Kurta&lt;br&gt;Baby frocks</td>
</tr>
<tr>
<td>Square</td>
<td>Square shape&lt;br&gt;Have four sharp corners, two in the front and two at the back [midway from center front to side seam]&lt;br&gt;Facing can be made with contrast colour fabrics</td>
<td>All types of fabric stiff and thick fabric</td>
<td>Blouse&lt;br&gt;Kurta&lt;br&gt;Kameez&lt;br&gt;Children frocks</td>
</tr>
</tbody>
</table>
### 12.3.2 Types of Neckline: (Continued)

<table>
<thead>
<tr>
<th>Name of the Neckline</th>
<th>Description</th>
<th>Suitable Materials</th>
<th>Suitable Dresses</th>
</tr>
</thead>
</table>
| V Shaped             | ● Forms a V Shape in the front at center front line  
                        ● Back neckline is round and usually high  
                        ● Finished as fitted facing | All types of Fabric | ● Blouse  
                        |  |  | ● Kurta  
                        |  |  | ● Kameez |
| U Shaped             | ● U shaped front neckline  
                        ● Back neckline is high or stand collar can be used | All types of Fabrics | ● Blouse  
                        |  |  | ● Kurta  
                        |  |  | ● Kameez |
| Heart Shaped         | ● Front neckline deeper than back  
                        ● Back line can be round or high neck  
                        ● Front neckline shaped like a heart | All types of Fabrics | ● Blouse  
                        |  |  | ● Tops  
                        |  |  | ● Dresses  
                        |  |  | ● Kameez |
| Boat                 | ● Broad at the collar bone and shallow at the center.  
                        ● Very little and difference between front and back neckline | Light weight Fabrics netted Fabrics | ● Fancy sari blouse  
                        |  |  | ● Midi tops |
| Halter               | ● Neckline looks like a semi-circle in the front  
                        ● No back bodice patterns.  
                        ● Front is connected with a tie back cord at the back neck | Soft Fabrics, light weight fabrics (lining added) | ● Kids  
                        |  |  | ● Partywear  
                        |  |  | ● Frocks  
                        |  |  | ● Dresses |
| Scoop                | ● Low front neckline  
                        ● Pot shaped.  
                        ● Known as pot neckline | All type of Fabrics | ● Kameeze  
                        |  |  | ● Dress |
| Keyhole              | ● High neckline at the back  
                        ● Front neckline shaped like a Keyhole (2 to 3 cm wide) | All type of Fabrics | ● Kameeze  
                        |  |  | ● Dress |
| Cowl                 | ● Folds around front neckline  
                        ● One or more-fold as decoration  
                        ● Bias cut fabric is used | Light weight draped fabric or flexible fabric | ● Partywear  
                        |  |  | ● Women’s dresses |
| Wedge                | ● Wedge shaped in the front  
                        ● Close at the highest point of the shoulder  
                        ● Spread outward at the base  
                        ● Deep in the front  
                        ● High neck at back  
                        ● Lines can be curved or shaped | Any types of Fabric | ● Partywear  
                        |  |  | ● Kameeze  
                        |  |  | ● Dresses  
                        |  |  | ● Frocks |
| Draw String          | ● Insert cord or band. Pull the neckline to suit one self.  
                        ● Cord pulled to adjust at neckline | Any type of light weight or Soft Fabric. | ● Baby frocks  
                        |  |  | ● Infant dresses (jabla ) |
Determination of the Height and Width of Neckline

The height and the width of the neckline vary from person to person. It should be fixed before drafting the diagram. For a neckline, width and depth are required as explained below (Figure 12.16).

![Figure 12.16 Size of Neckline](image)

A – B = Front and back neck width
A – C = Front neck depth
B – D – C = Front neckline
A – E = Back neck depth
B – F – E = Back neckline

12.3.3 Neckline Finishing

Finishing of the neckline is of great importance. It affects the final appearance of the garment and also undergoes much strain while wearing the dress especially dresses without fasteners. Hence the neckline finish must be stronger. Neckline finish increases the durability of the garment. It should retain the shape and size. Mostly bias strips are used to finish the necklines, because of its stretchability. Most necklines are finished in one of the following three ways:

- With facings.
- With bindings.
- With a collar.

The major points to be considered while finishing the neckline are:

- Neckline edges must retain shape and must not stretch (curves & corners).
- Seam must be thin and smooth.
- Facing edges must be beneath the collar/neckline.

12.3.3.1 Bias Piece

A true bias is a diagonal line at 45° to the lengthwise or crosswise grain. It has the maximum elasticity more than any other direction in the cloth. Bias stripes can be applied as facings and bindings and especially used for finishing curved edges such as neckline, sleeveless, armholes and scallops.

Cutting Bias Strips

Fold the fabric diagonally so that the lengthwise threads of the folded part fall parallel to the crosswise threads on the rest of the material. Using a ruler, measure from the fold to desired width of bias strip (usually 2-2.5 cm) and draw parallel lines. Cut along the marked lines and trim off ends along the warp threads.

Joining of Bias Strips

Place the bias stripes with their right sides facing each other. The edges of the cut ends should coincide. Shift the top strip 0.5 cm beyond the other so that the sharp points at the ends of the strips project on either side. Stitch a 0.5 cm seam joining the points where the sides of the two stripes intersect. Press the seam open and trim the seam projection (Figure 12.17).
12.3.3.2 Facing
Facing are used to provide a neat finish to the raw edges in a garment. It also supports the shape of a neckline, armhole and collars. When the neckline is straight, the facing must be cut in one piece with the garment section. If the shape is curved, the facing must be cut in bias. Facing may appear on the right side of the garment and the colour of the facing should match with the colour of the garment fabric. Decorative facings are usually made with scalloped points or other designs along the outer edge. Bias facings can be applied on the right side of the garment for decorative effects (Figure 12.18).

12.3.3.3 Bindings
Bias binding is used to finish and strengthen raw edges and to add decorative trim to a garment. It shows both on the right and wrong side of the garment. When finished, bias binding should have uniform width (less than 0.25 cm) and should lie flat and smooth without any stitches showing on the right side of the garment. There are two kinds of bias binding, Single bias binding and French binding or piping (Figure 12.19).

12.3.4 Collar
A collar is added to a neckline to enhance its appearance. Collars are made of double layer of fabrics. It also helps to finish the raw edges of the neckline. Since collars form a background to the face they should suit the wearer. Several factors are considered while designing collars. The major factors are:

- Design of fabric – the collar design should harmonize with fabric design.
- Colour and texture of the fabric – there should be harmony between the fabric used for collar and the base garment.
- Pattern of the garment – the design of the collar should suit the pattern of the dress.
- Purpose and use of the garment – collars should be selected according to the end use of the garment.
Sex and age of the wearer – suitable collars should be selected for men, women and children.

Appearance of the wearer – facial shapes and size of the neck are important factors to be considered while designing collars.

12.3.4.1 Types of Collars

The collar edge can be round, curved, square or pointed depending upon design variation. A collar can be made close to or away from the neckline. Some of the types of collars are round collar, peter pan collar, scalloped collar, sailor collar, roll collar, shirt collar, band collar, and shawl collar (Figure 12.20).

12.3.4.1.1 Round collar or one piece Peter Pan collar

Round collar or one piece Peter Pan collar is mostly used for children’s dresses. The front collar continues to the back where it is divided with rounded ends. If this collar pattern is cut at the centre front and back to get two pattern pieces it is called two piece peter pan collar. A scalloped collar can also be created by just shaping the collar edges as scallops (Figure 12.21).

Method of Drafting a Round Collar

First duplicate the neckline area of the garment as in the figure.

Keep the front and back bodice patterns together on a paper, with neck points of shoulder lines touching with the pattern overlapping 0.25 cm near the shoulder as illustrated in the figure.

Trace the outline of the upper part of the bodice.

Label the front neckline as

- Shoulder – S.
- Back neckline – Y.
- Fold – 0.5 cm.

Join XYZ as shown in the figure (3-7 cm away from the neckline).

Make a notch at the shoulder S to indicate shoulder points.

Label collar as shown in the figure and cut the collar pattern.
This is the drafting of a flat collar or one-piece peter pan collar.

By cutting at the center front of the collar, two-piece peter pan collar can be prepared.

### 12.3.4.1.2 Sailor Collar

Sailor collar is a flat turned down collar. It has a V shape in front and square shape at the back (Figure 12.22).

#### Method of Drafting a Sailor Collar

- The pattern is made by marking as V shape at point X bodice front neckline about 7 to 8 cm below. Connect shoulder point S and X on the center front line.
- Trace on a sheet of paper the neckline area of back and modified front bodice patterns after overlapping the shoulder 0.25 cm near armhole.
- Mark the back neckline point as O. Mark points alone center back line and shoulder line measuring 5 cm.
- Extend to point P and connect at point Z
- Join all the lines of the pattern as in figure

### 12.3.4.1.3 Shirt Collar

Shirt collar, as the name indicates it is used in the men's, women's or kid's shirt. Generally, it consists of two parts commonly known as band to hold the other part which is the collar. Sometimes kid's shirt collars are designed without the stand (Figure 12.23).

#### Method of Drafting a Shirt Collar

- Draw a rectangle ABCD where CB = height of collar + 5 cm for band width and CD is ½ neckline measurements.
- Mark the following points measuring CE and DF = Band width (5 cm).
- Extend the points D to D₁ = 2 cm and A to H = 4 cm and H and G (diagonal top) = 1 cm.
- Join the points as shown in the figure.
- The stand part of the collar (without the extension) along can be used to draft band or stand collars, which is used in kurta. The edges of the collar are reduced by 2 cm to have small opening at the center front.

#### Method of Sewing Collars

- Match the neckline of the garment and collar pattern.
● Place the wrong sides facing together pin or back alone the sewing line
● Machine along the sewing line
● Remove pins or tacked stitches
● Turn to right side
● Press neatly
● For shirt collar the seam line are stitched and then the whole collar piece is turned around. The seams are not seen in the finished garment

12.3.5 Summary
Neckline is an important part of the garment. There are different types of necklines named based upon its shape like round neckline, square neckline, boat neckline etc. Finishing of necklines are done with facing, bindings and collars.

POINTS TO REMEMBER
● Neckline has to be finished neatly. It should be flat on the body to add grace to the garment. Bias strips are cut in cross grain at 45° angle.
● Neckline can be finished by binding and facing.
● Round collar/peter pan collar are usually used in kids and women’s garments.
● Sailor collar is a decorative collar. It has a square flap along the back neckline but forms V shape in the front neckline.
● Shirt collar are normally stitched with a band for men and women and without band for kids.

ACTIVITIES FOR THE TEACHER
● Give demonstration for stitching facings, bindings and collars.

ACTIVITIES FOR STUDENTS
● To collect pictures of the different types of necklines and make an album with description.
● To stitch on muslin a facing, binding and a simple round collar and prepare a record.
QUESTIONS AND ANSWER

PART – I

I. OBJECTIVE QUESTIONS :
1. Name of the neckline is given according to its
   a) Use   b) Shape   c) Width   d) Length
2. A draw string neckline has
   a) Folded edges   b) Satin ribbon   c) Stitching line   d) None of these
3. Scoop neckline resemble the shape of a
   a) Square   b) Heart   c) Pot   d) Wedge
4. Mostly ________ strips are used to finish the neckline because of its stretchability
   a) Straight   b) Curved   c) Bias   d) None
5. This is used to provide a neat finish to the raw edges in the garment
   a) Facing   b) Neckline   c) Collar   d) None

PART – II

II. ANSWER IN THREE (OR) FOUR POINTS :
1. What is a collar? What are the uses of a collar?
2. Explain round neckline and name some of its variations.
3. How will you construct a shirt collar?

PART – III

III. ANSWER IN A PARAGRAPH :
1. Give a detailed note on the construction of a one piece peter pan collar.
2. Describe the different type of neckline with diagram.

PART – IV

IV. ANSWER IN ONE PAGE :
1. Explain the method of finishing necklines using binding and facing.

Answers for Objective Questions :
1. (b)  2. (a)  3. (c)  4. (c)  5. (a)
12.4 PLACKETS AND FASTENERS

LEARNING OBJECTIVES

- To gain knowledge about various types of plackets and fasteners.
- To acquire skills in constructing plackets and fasteners.

12.4.1 Introduction

Plackets are constructed openings that enable in giving a good fit to the garment. It helps in putting on and taking off a garment. Plackets are generally attached to waist lines, necklines, wrists and other snug fitting parts of the garment. When the garment is in use these plackets are kept closed with the help of fasteners such as zips, buttons, hooks or tapes.

12.4.2 Plackets

A placket is made either in an opening left on the seam or by creating a cut in a garment which enables one to wear or remove the garment easily. The placket made on a seam is stronger and gives a better finish. The following points should be kept in mind while constructing a placket.

- A good placket should lay flat on the garment.
- A placket should not be thick and should not have gaps at the edges.
- The position of the placket should be easily accessible.
- The seams of the placket should be strengthened at the closed ends as it has to go through a certain amount of strain during wear.

- While choosing a placket the position of the placket, texture of the fabric, age and sex of the wearer along with the current fashion should be kept in mind.

12.4.2.1 Types of Plackets

12.4.2.1.1 Continuous Bound Placket

These plackets are made on a seam or a cut but should not be made on curved seams and bulky fabrics. This is also called as one-piece placket. They are suitable for children's dresses, undergarments like petticoats and sleeve openings where a cuff or band is used (Figure 12.24).

![Continuous Bound Placket](image)

Figure 12.24 Continuous Bound Placket

Method of Sewing Continuous Bound Placket

- To make a placket in a slash, cut a strip of fabric on the lengthwise grain.
- The cut should be 3 to 6 cm wide and 3 cm longer than twice the length of the openings.
- Match the centre of a long edge of the strip to the end of the slash edge, with right sides of garment and strips facing each other.
- Pull back the tip of the slash about 0.25 cm from the edge of the placket strip and pin it.
- Open the placket edges wide and attach to the strip by a line of tacking worked 0.25 cm from the edge of the strip.
● From the right side of the garment, machine over the tacking line from one end up to its midpoint.

● Keep the machine needle in the fabric, raise the pressure foot and move the fullness backward out to prevent fold created on the placket.

● Lower the presser foot and stitch along the opposite end of the opening.

● Press the seam edges towards the placket strip and fold under the free edge of the strip of 0.25 cm and crease.

● Fold the strip over the seam edge and hem it along the stitching line.

● Fold the strip under on the overlap section and tack it close to the seam.

● Tacking should be removed after fixing the fasteners.

12.4.2.2 Bound and Faced Placket or Two-Piece Placket

As the name indicates, this is done with two pieces of fabrics. This placket is commonly used skirts, petticoats and back opening dresses. The overlap and under lap sides are finished with facing and binding respectively (Figure 12.25).

Method of Sewing Bound and Faced Placket

● Cut two separate strips of fabric, measuring 8 cm width for the overlap and the other with 6 cm width for the under lap.

● The length of the strips should be 2.5 cm more than the length of the placket opening.

● The overlap and under lap sides are finished with the narrow and wide strips respectively.

12.4.2.3 Miter Placket

Miter placket is mainly used in men's shirts, sleeve opening and on neck openings for children's garments where strength is the major requirement. It is also called as tailored placket (Figure 12.26).

Method of Sewing Miter Placket

● Prepare a strip on straight grain measuring 7 cm wide and exact length of
the slit which is normally 12-15 cm for the under lap.

- Place the strip right side facing to match the end of the slit and with right side facing, sew about 5 cm to join the strip.
- Fold and machine along the stitching line over the folded edge (0.25 cm) along the strip.
- Point the strip to about 2.5 cm wide.
- A strip measuring 5.5 cm wide and 3 cm longer than slit is cut for the overlap and this is placed on the seam line about 0.25 cm.
- Keep the right sides of the strip facing the wrong side of garment and tack the short side of the strip to the free side of the placket opening on the seam line.
- Machine stitch and bring the overlap on the right side of the garment.
- Turn under the seam allowance and adjust the position of the strip so that overlap and under lap are together, sew it.

- Make a rows of top stitch on the strips and garment together turn around the point and downward till the opening.
- Then sew twice keeping the overlap and under lap in position on the garment to form a square shape.

12.4.2.4 Zipper Placket

Zippers are plastic or metal rows with teeth like structures, which can be looped or unlooped by a runner. This is used to open or close the garment. It is attached on the placket. The market is filled with different types of zippers which can be matched based upon the side of placket opening and colour of the garment. Zippers are available in different colour and length (Figure 12.27).

Figure 12.26 Miter Placket

Figure 12.27 Zipper Placket

Method of Sewing Zipper Plackets

- Cut the opening in the garment where the zipper has to be attached.
- Select the zipper according to the opening size.
- Towards the end of the cut make a short slit 0.25 cm wide diagonally on both sides (an inverted ‘V’ shape).
- Turn all the three raw edges to the wrong side and tack them.
● Sew a square piece of tape at the raw edge.

● Place the zipper on the sewn lap and stitch through the edges holding the fabric edge.

● Cover the zipper edges with a small square piece of tape, tack it first and then sew it.

● Hem the raw edges neatly to finish the zip.

12.4.2.5 Faced Placket Open

It is one of the simplest methods of finishing a neckline. It is mostly used for infants, children and night dresses.

Method of Sewing Faced Placket Open:

● Cut a placket open for the required length at the centre back or front

● Place the facing piece right sides on the garment and make row of stitches

● Turn the facing to the wrong side and then top stitch

● Hem neatly to finish the facing

12.4.3 Fastener

Fasteners are the items which are used to close a garment opening. They are decorative as well as functional. Care should be taken while selecting a fastener as they must be rust free and withstand laundering. They can be selected to match the colour, design and texture of the garment. Decorative fasteners are sewn to add beauty to the garment. Example: cartoon shaped button on the centre front line of baby’s frock with back opening. Functional buttons sewn as closure to the garment, it helps in fitting the garment very close to the body. Example: Shirt buttons sewn in the centre front line of a men’s shirt. Fasteners should be always sewn on two layers of fabric to ensure strength. Fasteners can be conspicuous or inconspicuous. Example: Shirt buttons on the shirt centre front line and hook in women’s blouses respectively. Generally, fasteners are sewn in garments to create a left lap overlap the right for women and vice-verse for men’s garment.

12.4.3.1 Types of Fasteners

12.4.3.1.1 Press Button

Press buttons are available in different sizes and weights and are used to hold edges that will not have much strain when the garment is worn. It has two sections: a stud and a socket. The stud is attached on the wrong side of the overlap and the socket comes over its impression on the underside of the placket. The press buttons have four holes into which buttonhole stitches are made to hold them firmly to the garment. This is best suited for kids garments (Figure 12.28).

12.4.3.1.2 Hook and Eyes/Loops

Hook and Eye / loops are generally used in plackets. The hook is placed about 0.5 cm inside the finished edge on the wrong side of the overlap and the eye or loop comes...
on the underside of the placket. Hooks and eyes are used mostly in close fitting garments like blouse. They also available in different size, but circular in shape and is made out of metals. Hooks are metals with curved structure at the top with two parallel lines and finished with two circles at the bottom. Button hole stitches are made at the circles placing the hook on the garment to fix the hook onto the garment (Figure 12.29).

There are two types of eyes, namely metal and thread loops. The metal loops are sub divided as straight and “U” shaped. Both have circles at the end which is used as a mode to sew the eye to the garment with button hole stitches.

The loop eyes are also of two types, namely thread loops and fabric loops. Thread loops are made by sewing four to five straight stitches across the under lap to match the hook, using same colour thread as the garment. Button hole stitch is made on these strands. Fabric loops are made of strips of fabric matching the garment. These strips are made into tube like structure, turned to push the seams inside, to give a neat loop. This strip is cut and placed on the required area and machined.

They form a loop on the placket open to extend outside to hold the button on the opposite side of the garment. The size and width of the placket varies depending upon the garment and size of the button. These loops can be used for decoration also (Figure 12.30).

Figure 12.29 Press Button, Hook and Eye

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They form a loop on the placket open to extend outside to hold the button on the opposite side of the garment. The size and width of the placket varies depending upon the garment and size of the button. These loops can be used for decoration also (Figure 12.30).

When was button first made?

Earliest buttons were used by the people of the Indus Valley. These were mostly made out of stones, shell or metals like copper or Iron. Buttons were used like brooches or pins, to fasten loose and flowing clothes like a toga, by the Romans. Functional buttons with buttonholes for fastening or closing clothes appeared first in Germany in the 13th century.
12.4.3.1.3 Buttons and Button Holes:
Buttons are both functional as well as decorative. They should be selected with care to suit the colour, design and texture of the fabric and style of the garment. Decorative buttons vary in the form of glass, metal and plastic. Buttons have two or four holes. Mark the area where the button has to be sewn. Place the button and make a crosswise or vertical stitch connecting the four holes in the buttons. If the button is with a single hole in the wrong side of the button, insert the needle from back side, through the garment and then pass the thread into the hole in the back side of the button and then pick the needle back into the garment. This is repeated 3 to 4 times to fix the button. Buttonholes are slits cut in the garment to hold the buttons in place. It can be made vertically or horizontally with the button sitting exactly at the centre of the front line. The raw edges of the slit are finished with buttonhole stitch (Figure 12.31).

12.4.3.1.4 Zippers
Zippers come in a wide variety of colours, length and types. All zippers consists either a chain of metal or plastic teeth or a synthetic coil joined to a fabric tape made of cotton or cotton polyester blend. It has stoppers at the top or bottom which keep the sliders from running off the zipper. There are three basic types of zippers available in the market. They are (Figure 12.32).

(i) **Conventional Zipper:** These are zippers with exposed teeth or chain and open at the top but are held together at the bottom.

(ii) **Separating Zipper:** They are open at both the top and the bottom and permit the zipper opening to separate completely as in jackets with opened fronts.

(iii) **Invisible Zipper:** They are the newest zippers and as the name implies they are not visible in the front as they disappear into the seam. They are mostly used in skirts and in dresses.

Other types of zippers include two way zipper, trouser zipper and decorative zipper.

12.4.3.1.5 Elastics
Elastics are used in areas where stretching is desired. There are different types of elastics available in the market and should be selected carefully according to the end use.
of the garment. It can be used as a casing or be stitched directly on the garment. Some of the common types of elastic are-

(i) **Braided Elastic**: This elastic narrows when stretched and so used for casing.

(ii) **Woven Elastic**: The width of the elastic remains same even when stretched and so can be stitched directly to the garment or for casing.

(iii) **Elastic Thread**: It is also called Bobbin Elastic. It is very thin elastic covered with thread all around and is mostly used in bobbins for giving shirring effect.

(iv) **Special Purpose Elastic**: Special elastics are available for pajamas, lungies and swim-wear.

12.4.3.1.6 Tapes and Cords

Different types of tapes and cords are available which are both functional as well as decorative. They come in a variety of types, widths and colours and its selection should depend mainly on its end use. Some of the common tapes available are-

(i) **Seam Tape**: Seam tapes are woven or lace tapes. They are used to finish hem and facing edges.

(ii) **Binding Tape**: Binding tapes are used for binding curved or straight edges and for casings.

(iii) **Twill Tape**: Twill tapes are mostly used for reinforcing seams.

(iv) **Piping**: Piping tapes are narrow bias strip of fabrics that can be inserted into a seam for decorative purpose.

(v) **Hem Facing**: Hem facing tapes are wide bias tape or lace which is used on facing hems and binding edges.

(vi) **Ribbon Tape**: Ribbon tapes are knitted bands which are stretchable and can be used to finish necklines, arm holes, sleeve, leg or waistline.

12.4.3.1.7 Velcro

Velcro is the commercial name for loop and hook fasteners. Velcro is a set of two tapes one with a looped napped surface and other with a hooked napped surface. When both the surfaces are pressed together they grip and remain locked until pulled apart. They are usually made of nylon and are available in meters. They are used on cuffs, plackets, mosquito nets and other such items. Velcro is popular in infant garments.

12.4.3.1.8 Buckles

Buckles are one of the most interesting types of fasteners. Buckles are available in plastic, iron, brass, steel and other such materials. The market is filled with a wide
variety of shapes and sizes. There are two types of buckles – one with prongs which need eyelets to be attached with it and the other without prongs which do not need any eyelets. Eyelets can be ready-made, made out of metals or stitched made out of fabrics (Figure 12.33).

**12.4.4 Summary**

Plackets are an important part of a garment. It helps to hold the garment and give a neat fit. Plackets are usually worked on two layers of fabric, to withstand tear and wear. Plackets are supported with fasteners like hooks and eyes, buttons, zippers, buckles and Velcro tapes. The market has wide variety of fasteners to suit different types of garment. Both plackets and fasteners go hand in hand in supporting the use of garments.

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**POINTS TO REMEMBER**

- Plackets are used on open edges of the garment to enable the garment to stay fit onto the person.
- Plackets help in easy wearing and removing the garments.
- Plackets are classified as continuous bound placket, bound faced placket, miter placket and zipper plackets.
- Fasteners are small items which are fixed on the plackets to support wearer to wear and remove the garment comfortably.
- Press buttons, shirt buttons, tapes, cords, zippers, velcro, buckles are few types of fasteners.

**ACTIVITIES FOR THE TEACHER**

- Demonstrate the sewing of different types of plackets and fasteners.
- Download the procedure for making plackets in you-tube and show it to the students.

**ACTIVITIES FOR STUDENTS**

- Prepare samples and make an album.
- Collect pictures with different type of fasteners.
1. **Darts**
   Triangular fold that gives shape and fit to garment.

2. **Single pointed dart**
   Dart narrow at one end and wide on the other end.

3. **Double pointed dart**
   Dart wide in middle and pointed at ends.

4. **Tuck**
   Stitched fold in a garment.

5. **Pleat**
   Fold in a garment held by stitching on top.

6. **Baste**
   To stitch with long stitches for holding two pieces of fabric temporarily.

7. **Seam**
   Row of stitches that join cut fabrics.

8. **Seam Finishing**
   Covering the raw edges of the seams.

9. **Neckline**
   Part of bodice pattern around the neck.

10. **True Bias**
    Strip of fabric cut diagonal line at 45° to the lengthwise or crosswise grain and joined to finish curved lines of a garment.

11. **Bias Binding**
    Strip of fabric used to finish and strengthen raw edges of a garment.

12. **Plackets**
    Constructed openings that give good fit to the garment.

### QUESTIONS AND ANSWERS

#### PART – I

**I. OBJECTIVE QUESTIONS :**

1. A good placket should be as ________ as possible
   (a) Bulky  (b) Flat  (c) Curved  (d) Loose

2. Continuous bound placket is also called as __________
   (a) Tailored placket  (b) Round placket  (c) Miter placket  (d) One-piece placket

3. Bound and faced placket is also called as __________
   (a) One-piece placket  (b) Two-piece placket  (c) Miter placket  (d) Tailored placket
4. __________ are used to close a garment opening.
   (a) Plackets  (b) Fasteners  (c) Frills  (d) Appliqué

5. ______________ zipper are not visible in the front.
   (a) Conventional  (b) Separating  (c) Invisible  (d) Two-way

PART – II

II. ANSWER IN THREE (OR) FOUR POINTS:
1. What are plackets?
2. Describe fasteners.
3. Explain zippers.
4. List the uses of Velcro.

PART – III

III. ANSWER IN A PARAGRAPH:
1. Write a short note on continuous bound placket.
2. Explain miter placket.
3. Briefly describe tapes and cords.

PART – IV

IV. ANSWER IN ONE PAGE:
1. Describe any 5 types of fasteners.

Answers for Objective Questions
1. (b)  2. (d)  3. (b)  4. (b)  5. (c)
INTRODUCTION

Garment is a piece of cloth which is stitched to suit a human figure. It is also called as dress or apparel. Garment has two main parts, namely front bodies and back bodies. The bodices front and back can make a complete upper garment. By extending their hem lines it can be made as a garment to cover the upper and lower part of the body. But to create variations in garments and to cover body parts like hands other details should be added to garment. The most important garment details are sleeves, skirts, pockets and yokes.

13.1 SLEEVES

13.1.1 Introduction

Sleeve is a part of the upper garment. It is attached to bodice at the armhole. Sleeves add grace and beauty to any garment. Sleeves can be modified to suit wearers figure. There are different types of sleeves. Some are close fitting and others are stitched with fullness. The length of sleeve can be changed to create short, elbow sleeve, three forth sleeve and full sleeves. Colour, texture, shape and size of sleeves can also be changed to create sleeve variations. Sleeves are generally cut along straight grain, but to create variation, it can be cut on cross grain also (Figure 13.1.).

13.1.2 Types of Sleeves

Sleeves vary depending upon type of garment, the fabric used, one’s preferences and needs. The length of the sleeve and fullness in sleeves can be altered, to create new designs.
13.1.2.1 Plain Sleeve

This is also known as basic sleeve. It is used in all garments and more popular in sari blouses. It is plain without any fullness and fits correctly around the armsece and falls over the upper arm. The length of the sleeve varies depending upon the designer's taste (Figure 13.2).

13.1.2.2 Gathered Sleeves

Gathered Sleeves is a type of sleeve which is also called puff sleeve. It is mostly used in dresses and women's blouses. It has fullness either at the top edge or at both, the top and bottom of sleeve part. The drafting pattern for sleeves with gathers at the top is prepared using the basic sleeve pattern. The top of the sleeve is slashed almost till the bottom hem line. The pattern is
placed over another sheet of paper with the slashed parts spread open according to the amount of gathers required with 3 to 5 cm. extra on top for puffing. The outline is drawn on the new sheet and the pattern is cut (Figure 13.3). The process is reversed for puff at bottom.

For sleeves with gathers at both the top and the bottom, the basic sleeve pattern is slashed till the bottom edge of the sleeve. The four parts of the sleeves are spread apart on a new sheet with the sleeve cap in line. The patterns are placed with 3 to 5 cm extra at top and at the bottom for puffing. Sometimes, the bottom is not gathered and left loose for fullness (Figure 13.4).

13.1.2.3 Bell Sleeves
Bell sleeve is also prepared with the pattern of the basic sleeve. The pattern is slashed from the bottom edge (and spread) from the bottom edge to the maximum, for extra fullness. The pattern is drawn on a new sheet and cut. The lower edge is left loose for fullness (Figure 13.5).

13.1.2.4 Leg-0-mutton Sleeve
Leg-0-mutton sleeve is puffed at the top and the bottom is tight fitted with gathers. It is also prepared with the basic sleeve pattern. The pattern is cut at the middle of the sleeve horizontally; then a vertical slash is made on the top edge and spread apart. This is kept on a new sheet and a new pattern is drawn and cut (Figure 13.6).

13.1.2.5 Raglan Sleeve
Raglan sleeve is mostly used for sports-wear, kids wear, T-shirt. It does not have any armhole seam and shoulder seam. Raglan sleeve is also prepared with the basic sleeve and extension are added to the bodies from and back patterns to draft the final raglan sleeve pattern.

Mark point D, 2.5cm above the under arm and A, 2.5cm away from the shoulder point. A and D are joined with a curve as in the figure. The same procedure is followed to draw the curve EFH on bodies back. The top pattern of the bodice is along the curves ABD and EFH. Drawn patterns are placed on a new sheet.
with the basic sleeve pattern at the bottom, matching the centre point of the pattern. Mark the shoulder points as $S$ and $S'$ on the bodice front and back. Match them to center of the sleeve point $'L'$. Draw the outline for raglan sleeve pattern. This sleeve is stitched with seam that runs from the neck line to the armhole line (Figure 13.7).

13.1.2.6 Kimono Sleeve
Kimono sleeves are mostly used in garments where more comfort is needed. It is used mostly for sportswear, kids wear, dance costume and ladies tops. In kimono sleeve there is no seam either at the armhole or in the shoulder. The pattern of the sleeves is cut together with the bodice. Thus the sleeves run from the side seam of sleeve to the side seam of the bodice (Figure 13.8).

13.1.2.7 Magyar Sleeve
Magyar sleeve is also like kimono sleeve where the bodice pattern is extended from the shoulder line approximately 5 cm outside from the highest point of the shoulder. Lower arm circumference is drawn perpendicular to the bodice pattern and attached at the edge of the pattern (Figure 13.9).

13.1.2.8 Full Sleeve
A full sleeve pattern is an extension of the basic sleeve pattern but the length of the sleeve is extended till the wrist. The circumference of the sleeve is changed accordingly. Full sleeves are used mostly in women’s wear, kurtas and men’s shirt. In men’s shirt, these sleeves are finished with a cuff at the lower edges (Figure 13.10).
The basic sleeve pattern is cut horizontally and spread to get the required length.

13.1.2.9 Sleeves Till Elbow / ¾ Sleeves
Three fourth sleeve is also an extension of the plain sleeve where the lower edge of the sleeve is extended till the length of the elbow of the wearer. The circumference is changed according to the wearer's taste. Three fourth sleeves are sometimes gathered at the lower edge or left loose. These sleeves are used mainly in women's wears, kameez tops and kids wear, (Figure 13.11).

13.1.3 Types of Sleeve Finishes
For the perfect completion of a sleeve, different finishes are used on the sleeve edge. The selection of the finish usually depends upon the pattern of the sleeve. The different types of sleeve finishes are as follows:

- Self-hemmed edge – It is a simple sleeve finish. A facing may be used in it.
- Double binding edge – It gives a decorative finish to the sleeve. It can also be made with contrasting fabric for interest creation in the garment.
- Casing – It is sewn at the edge of the sleeve. It can either be self faced or can be separately applied.
- Cuff – it is stitched at the edge of the sleeve. It can be with a placket opening or can be loose without opening (Figure 13.12).
13.1.3.1 Cuff:
A cuff is a sleeve finish given at the sleeve edge. A cuff can be straight, gathered or pleated according to the design of the garment.

Cuff with Plackets:
Cuff with placket is generally attached to a long sleeve with a placket opening made at the sleeve edge. Thus cuff comes tight around the wrist, with a placket. There are three types of plackets which are commonly used.

- Faced placket – The edges of the placket meet at the opening.
- Continuous bound placket – It is finished with a single fabric strip to create a narrow lap.
- Tailored or shirt placket – It is finished with two separate pieces to create a wider lap (Figure 13.13).

Cuffs without Plackets:
Cuffs without plackets have no openings and hence the sleeve openings are loose for the hands to come out easily. There are three basic types of cuffs without plackets.

- Straight band Cuff – It is a simple cuff with a straight band of fabric attached at the bottom of the sleeve.
- Straight turn back Cuff – It is made by turning up the hem of the sleeve. Sometimes, a separate extension piece is added at the bottom of the sleeve and turned.
- Shaped turn-back Cuff – This cuff is first constructed separately with a shape and then the same is stitched to the edge of the sleeve with a facing (Figure 13.14).

13.1.4 Summary:
Sleeves are attached to the bodice at the armhole. They can be modified to various shapes and sizes. The basic types of sleeve are plain sleeves, gathered sleeves, bell sleeves, leg-o-mutton sleeve and raglan sleeve. Different types of finishes can be given to the sleeve edges like hemmed edge, double binding edge, casing and cuff. Cuff can be attached with or without plackets.
POINTS TO REMEMBER:
- Sleeve is a part of the garment which is draped over the upper arm of a person.
- Different types of sleeves can be drafted by increasing or decreasing the length and width of the sleeves and also by adding fullness.
- Based upon the method of construction sleeves are grouped as set-in sleeve and open construction sleeve.
- Sleeve can be finished with binding, facing, casing or cuffs.

ACTIVITIES FOR THE TEACHER:
- Show the different types of sleeves to the students.
- Draft the method of basic sleeve pattern and demonstrate cuff attachment to the sleeve.
- Demonstrate the stitching of different types of sleeves.

ACTIVITIES FOR STUDENTS:
- Collect pictures of different types of sleeves to prepare an album.
- Prepare paper patterns for all the sleeve types, cut and stitch the same to prepare an album.

QUESTIONS AND ANSWERS

PART – I

I. OBJECTIVE QUESTIONS:
1. Sleeve is attached to the bodice at ______________
   a) Side   b) Armhole   c) Shoulder   d) Neck

2. A plain sleeve is also known as ________________
   a) Basic sleeve   b) Gathered sleeve   c) Round sleeve   d) Kimono sleeve

3. Gathered sleeve is mostly used in ________________
   a) Kurta   b) Shirts   c) Dresses   d) Sports wear

4. This sleeve has no seam at the armhole or at the shoulder
   a) Kimono   b) Gathered   c) Bell   d) Plain

5. Cuffs without plackets are ______________
   a) Tight   b) Buttoned   c) Open   d) Loose
PART – II

II. ANSWER IN THREE (OR) FOUR POINTS:
1. List the functions of sleeves.
2. What is a bell sleeve?
3. How will you draft a magyar sleeve?

PART – III

III. ANSWER IN A PARAGRAPH:
1. Explain the different types of gathered sleeves.
2. Brief on the construction methods of leg-o-mutton sleeve.
3. What is a kimono sleeve? Explain.
4. Write a short note on double binding edge finish.

PART – IV

IV. ANSWER IN ONE PAGE:
1. Explain the different type of sleeve finishes?
2. What is a cuff? Explain the different types of cuffs.

Answers for Objective Questions
1. (b)  2. (a)  3. (c)  4. (a)  5. (d)
13.2 SKIRTS

LEARNING OBJECTIVES

✍ To understand the basic skirt pattern and its parts.
✍ To gain knowledge about the skirt types.
✍ To acquire skills in skirt construction.

13.2.1 Introduction

Skirts are incredible part of a women's wardrobe. Skirts are lower garment used by both girls and women. It is draped around the waist to fall over the hip to desired length. Skirt length varies according to the wish of the wearer and sometimes it is named based upon the length. Example the skirt which falls up to the floor is known as full skirts. Skirts can be enhanced using fullness or by addition of trimmings and decorations. It can also be made simple in structure or intricate like plain skirt or three layered skirts.

The major parts of a skirt are waist line, hip line, hem line, center front side seam, waist darts, opening and belt. The Figure 13.15 below shows the parts of skirt pattern.

13.2.2 Types of the Skirt

Skirts are classified in many ways. Some of them are mentioned below:

- Types of skirt based on height or length of the skirt (Figure 13.16).
  - Mini skirt – Height of skirt is from waist to mid thigh.
  - Half skirt – Height of skirt is from waist to knee.
  - Three fourth skirt – Height of skirt is from waist to 10 cm below the knee.
  - Midi skirt – Height of the skirt is from waist to ankle.

Figure 13.15 Parts of a Skirt

Figure 13.16 Types of Skirts Based on Length
Full skirt – Height of skirt is from waist to the floor

- Types of skirt based upon the width of the skirt.

- Straight skirt – Width of the skirt varies from 15 to 30 cm more than waist round measurement at the hemline. This skirt falls close to the body of the wearer.

- Flared skirt – Width of skirt varies from 30 cm to required flare of the wearer. This gives a circular look at the hem line. When the flare is maximum it is called as circular skirt or umbrella skirt (Figure 13.17).

Gathered / pleated skirts – The width of the skirt is three times more than waist line. The width measurement is same at waist line and hem line. The entire width is gathered or pleated (knife, box, inverted box) at the waist line.

- Types of skirts based upon the modification of the basic skirt pattern.

- Yoke skirt – The skirt has a minimum flare of 15 – 20 cm more at hem line to help in movement. The skirt yoke is cut across the hip line, horizontally. It can also be shaped. The width of the lower part of skirt can be increased and gathered or given a slight flare and attached (Figure 13.18).

Panel skirt – These skirt are generally used for sari petticoats. The hem line has a width of 15 to 30 cm more than the waist line. The waist line is divided in 4, 6, 8 equal parts and cut from waist line to hem and attached together. They are also known as gore skirts.

- Panel skirt – These skirt are generally used for sari petticoats. The hem line has a width of 15 to 30 cm more than the waist line. The waist line is divided in 4, 6, 8 equal parts and cut from waist line to hem and attached together. They are also known as gore skirts.

What is a Hobble Skirt?

A Hobble skirt is a skirt with a narrow hem to significantly impede the wearer’s stride. It was a short-lived fashion trend that peaked between 1908 and 1914.
13.2.3 Drafting and Construction of a Basic Skirt Pattern

The basic skirt is also called plain or straight skirt.

Draw a rectangle ABCD,

\[ \text{AB} = \text{CD} = \frac{1}{4} \text{ hip round} + 5 \text{ cm for ease or required measurement for flare} \]

\[ \text{BC} = \text{AD} = \text{skirt length (add required hem allowances of 5-8 cm.)} \]

Mark AG = BF = Waist to hip (15 to 20 cm)

Join GF

\[ \text{AE} = \frac{1}{4} \text{ waist} + 2.5 \text{ cm for dart and 1 cm for ease} \]

Dart = 1.25 cm

Curve line to E.

Mark \( \frac{1}{4} \text{ seat} + 1.25 \text{ cm for ease on line GF} \)

Mark \( \text{CC}_1 = 1 \text{ cm.} \)

Mark points (1.2 cm) on either side of O. Connect them to P (Figure 13.19).

Method of Sewing a Basic Skirt

- Join the side seams
- Finish one side with 15 cm long-one piece placket
- Join waist band
- Finish hem line
- Attach fasteners and iron

13.2.4 Drafting and Construction of a Panel Skirt / Four Gore Skirt

Draw a rectangle ABCD

\[ \text{AB} = \text{DC} = \frac{1}{2} \text{ waist round} + 2.5 \text{ cm} \]

\[ \text{AD} = \text{BC} = \text{Skirt length} + \text{hem allowance (8 to 10 cm)} - \text{Band or belt width (10 cm)} \]

Band is cut separately and attached after the sides are attached

AE and CF = 1/8 waist + 1.25 cm for ease

Join EF

Mark points below A and C along the lines AD and BC as shown in the figure = 2.5 cm

Mark points below E and F as shown in the figure = 3.5 cm

Curve the lines as shown in the figure

Number of pieces cut will be 4 side panel and 2 central panels (Figure 13.20).

Method of Sewing a Panel Skirt

- Join the two side panels on either side of the center panels.
- Join the side seams
  - Finish one side with 15 cms one piece placket.
  - Join waist band.
  - Finish hem line.
  - Attach fasteners and iron.
13.2.5 Drafting and Construction of a Circular and Umbrella Skirt

Draw a rectangle ABCD

\[ AB = BC = CD = DA = \text{Length of the skirt} + \frac{1}{6} \text{waist} + 2 \text{ cm for hem allowance} \]

\[ BE = BF = \frac{1}{6} \text{waist} \]

\[ EA = FC = \text{Skirt length} \]

Join BD, EF, and APC as curved lines (Figure 13.21).

Method of Constructing a Circular / Umbrella Skirt

- The patterns are cut on fold.
- Finish the hem line. Care should be taken to finish it with a very small fold (0.5 cm)
- The waist line is finished with a facing belt.
- Insert elastic or make a one piece placket with fasteners.
- Iron the garment.

13.2.6 Summary

Skirts are a very important part of a garment. Great interest can be created in the garment using variations in skirt height and width. Different types of decorations like frills, appliqués can be added to skirts. Skirts can also be cut along cross grain to create different line effects which can be used to modify the look of a person.

Who named the short skirts above the knee level as Mini Skirt?

Mary Quant, a London-based designer has been reported to have named the short skirt above the knee level as Mini Skirt after her favorite make of car, the Mini.
POINTS TO REMEMBER

● Skirts are garments used in the lower part of the body.
● Skirts can be narrow, straight or flared.
● A wide range of skirts can be designed with a change in the skirt length.
● The waist line of skirts should be finished with a belt which helps to hold the skirt.

ACTIVITIES FOR THE TEACHER

● Demonstrate drafting and construction of different types of skirts.

ACTIVITIES FOR STUDENTS

● Prepare draft and samples for
  ❍ Basic Skirt.
  ❍ Circular Skirt.
  ❍ Pleated Skirt.
  ❍ Gathered Skirts.

QUESTIONS AND ANSWERS

PART – I

I. OBJECTIVE QUESTIONS:

1. A skirt which falls up to the floor is known as ________.
   (a) Midi Skirt  (b) Full Skirt  (c) Half Skirt  (d) ¾ Skirt

2. When the circular flare of the skirt is maximum, it is called a __________.
   (a) Midi Skirt  (b) Full Skirt  (c) Umbrella Skirt  (d) Gathered Skirt

3. In gathered skirt the width of the fabric is _________ more than the waistline.
   (a) Two times  (b) Three times  (c) Equal  (d) Not

4. In the yoke skirt the yoke is cut across ____________.
   (a) Hip line  (b) Hem line  (c) Length  (d) None

5. ________ skirts are generally used for sari petticoat.
   (a) Yoke Skirt  (b) Panel Skirt  (c) Gathered Skirt  (d) Narrow Skirt
PART – II

II. ANSWER IN THREE (OR) FOUR POINTS:
1. What is a yoke skirt?
2. Describe a panel skirt?
3. Classify the types of skirts based upon their length?
4. What is a flared skirt?

PART – III

III. ANSWER IN A PARAGRAPH:
1. Differentiate between flared skirt and pleated skirt.
2. Write the procedure for stitching a basic skirt.
3. What are the different types of skirts based upon its width?

PART – IV

IV. ANSWER IN ONE PAGE:
1. Explain the drafting and stitching procedure for making a panel skirt.
2. What are the steps followed in sewing an umbrella skirt?

Answers for Objective Questions:
1. (b) 2. (c) 3. (b) 4. (a) 5. (b)
13.3 POCKETS

LEARNING OBJECTIVES

✍ ✍ To gain knowledge of garment shapes and types of pockets.
✍ ✍ To prepare and sew pockets.
✍ ✍ To know about the decorative purpose of the pockets.

13.3.1 Introduction

The word pocket is derived from French word “Poque”. It means a bag which is stitched on clothing. Pockets can be functional or decorative. Functional pockets are used to hold small item or valuable things. Decorative pockets add beauty to apparel. There are various types of pockets used in girls, boys, men and women garments. A pocket can be stitched like a patch, attached in a seam or made by altering a slit on a garment and sewn (Figure 13.22).

13.3.2 Types of Pockets

Pockets can be divided into three types namely patch pockets, inseam pockets and slash pockets.

13.3.2.1 Patch Pocket

Patch pocket is a simple pocket and it is sewn like a patch on to a garment. Patch pocket has an opening on the top. This pocket is very common on men’s shirts. For kids garment, the pocket can be stitched in shapes of square or triangle or as cartoon motifs. Laces, piping, embroidery can also be used for decorative purposes. It can be stitched with lining cloth or without lining. It can also be made with decorative fabrics. A lining is needed for fabrics that stretch or sag. Fabrics that are firm enough to hold their shape can be stitched without a lining (Figure 13.23).

Method of Sewing a Patch Pocket:

- Turn under top edge of pocket hem line on the right side of the fabric and stitch.
- Stay stitch around the pocket on seam line, beginning at fold line of the hem.

Figure 13.22 Pockets

Figure 13.23 Patch Pocket
Trim the extra material, turn hem right side out and press.

Fold in seam allowances along stitching and press. Square corners must be mitered, rounded corners must be notched.

Stitch the edge of the hem to the pocket by hand or top stitch from right side using machine.

Pin the pocket to the garment, slip stitch around the pocket by hand or top stitch edges in place. Reinforce corners by back stitching or by stitching a small triangle or square. Both the top corners of the pockets must be reinforced properly to add strength.

Stitch pocket pieces to front and back opening, right sides together. Press seam allowances toward pocket pieces.

Pin the garment front and the garment back, matching at seam line and pocket.

Stitch directionally along seam and around pocket in one step. Use reinforcement stitches. Press seam allowance flat.

Turn the pocket toward the front of the garment. Piping material would be effective. Buttons may be fixed in groups to create design interest.

Seams can be finished if necessary.

13.3.2.2 Inseam Pocket

In seam pockets are sewn along the side seams of the garment. These pockets are made on the left side of the garment. These pockets are generally stitched in boy’s shorts, girl’s pant, pajama and kurtas. It can be cut as part of the garment front and back or it can be cut from a separate pattern piece and stitched to the seam. If the outer fabric is bulky or heavy, the pocket pieces can be cut from lining fabric (Figure 13.24).

![Figure 13.24 Inseam Pocket](image)

Method of Sewing Inseam Pockets

- Take two pairs of pocket pieces in the main fabric or plain fabric.
- Finish all the edges of pocket pieces.

13.3.2.3 Slash Pocket

Slash pocket is a pocket suspended on the wrong side of the garment. A finished slit is seen on the right of the garment. It serves as pocket opening. There are three types of slash pockets namely, bound pocket, welt pocket and flap pocket.

- In bound pocket the edges are slashed and finished with binding. This is even in width.
- In case of welt pocket the binding are wider at the front, extending above the pocket opening.
- There is a flap attached over the bound or welt pocket. This is called flap pocket (Figure 13.25).

![Figure 13.25 Slash Pocket](image)
Why small pocket are constructed in jean pants?

Today a jean is a unisex twill woven pant used across the globe. In the 1800s, it was a work pant for cowboys. They used to wear their watches in their chains, which was likely to break, hence small pockets were developed. With this reference Levis introduced small pockets in the jean pants to keep watches.

Method of Sewing a Slash Pocket

- Cut along line on the front garment pattern.
- Cut fabric pieces as per slash pocket.
- Alter front piece of the garment as per the pocket slant.
- Place the right side of the pocket on the right side of the garment.

- Stitch along a seam line and press seam allowance.
- Fold pocket facing the wrong sides, finish the bottom hem line with a row of stitching.
- Flip the pocket back to bring the right side of the pocket out.
- Stitch pocket to front panel of the garment.
- Press neatly.

13.3.3 Summary

Pockets are one part of the garment which is functional and decorative. It adds interest to the garment especially in children dresses. The different type of pockets is patch, inseam and slash pockets. Slash pockets are further sub divided into bound, welt and flap pockets. Pockets can also be used to hide some defects in the garment. Most of the formal wears are designed with functional pockets.

POINTS TO REMEMBER

- Pockets are sewn separately and then stitched to the garment.
- Pockets are constructed on kids, ladies and men’s garments.
- Pockets are used for functional and decorative purposes.
- Pockets vary in size, shape, and design. They can be constructed using printed or contrast coloured materials to bring variations in children’s garments.
- The different types of pockets are patch, inseam and slash pockets.

ACTIVITIES FOR THE TEACHER

- To show different types of pocket.
- To show different design and decoration of pockets using power point.

ACTIVITIES FOR STUDENTS

- To draw pocket styles and prepare patterns.
- To stitch different styles of pockets.
QUESTIONS AND ANSWERS

PART – I

I. OBJECTIVE QUESTIONS:

1. A simple pocket is also called a ________ pocket.
   (a) Slash  (b) Inseam  (c) Patch  (d) Bound

2. Pockets sewn along the side seams of the garment are called ________ pocket.
   (a) Slash  (b) Inseam  (c) Patch  (d) Bound

3. The pocket which is suspended on the wrong side of the garment.
   (a) Slash  (b) Inseam  (c) Patch  (d) Bound

4. Which one of these is not a slash pocket.
   (a) Bound  (b) Welt  (c) Flap  (d) Patch

5. Which pockets are generally stitched in boy’s shorts, girl’s pant, pajamas and kurtas.
   (a) Slash  (b) Inseam  (c) Patch  (d) Bound

PART – II

II. ANSWER IN THREE (OR) FOUR POINTS:

1. What are the uses of pockets in a garment?
2. Describe Patch pocket?
3. Mention the features of inseam pocket?
4. Give the difference between slash pocket and patch pocket?

PART – III

III. ANSWER IN ONE PAGE:

1. Explain the construction of Patch pockets.
2. What are the uses of Inseam pockets? Explain the construction of Inseam pockets with the help of suitable diagram.

PART – IV

IV. ANSWER IN A PARAGRAPH:

1. Explain the three types of slash pockets.
2. Write about the construction of inseam pockets.

Answers for Objective Questions

1. (c)  2. (b)  3. (a)  4. (d)  5. (b)
13.4 YOKES

LEARNING OBJECTIVES

✍ To understand the different types of yoke.
✍ To enable the students to select yoke suitable for various garments.

13.4.1 Introduction

Yoke is one segment of the garment that can be constructed on the garment. It can be seen in the garment of children, men and women. It is introduced in a garment based on the need and to hold the gathers. For decorative purpose, it is sewn at shoulder, upper and lower part of the hip. Yokes can be constructed with different structures, variations like ‘V’ shape, oval shape or with different colour according to the taste and need of person.

13.4.2 Types of Yokes

Yokes are classified based upon the pattern made and decorations as plain or basic yoke and decorative yoke.

13.4.2.1 Plain / Basic Yoke

Plain or basic yoke has got simple structure. It can be placed on front and back part of men’s shirt. According to the shape of garment, use of garment, age of person, yokes are suitably cut and joined. This yoke is a part of the garment which is cut and joined with a piping or seam. Example: Bodice block of a body front cut half way through to add with gathers to the rest of the garment.

For drafting yokes take a bodice pattern and mark from the shoulder to the center of the front bodice. This technique can be used to construct ‘V’ shaped and circular shaped yoke. To construct a straight yoke, marking should be made according to the length of yoke from arm scye to center front, (Figure 13.26).

![Basic Yoke](image)

13.4.2.2 Decorative Yoke

Contrast colour materials can be used for making yoke. Use of various tucks, pleats and frills add interest to the garment. According to the wish of wearer, piping or frills can be stitched at the edges of the yoke.

Yoke can be joined using plain fabric or by adding one or more layers for stiffness. For skirts, yoke is cut to the shape of the waist line. Then the skirt part is gathered and attached to the yoke. The bottom of the yoke should match to the size of the gathering in the skirt.

To construct yokes with curved edges on panel skirt, lapped seam can be used. These kinds of yoke can be used on the bodice part of kid’s front, upper part of night dresses and on the waist bands of skirts. Yokes of desired shape can be cut and stitched and decorations using embroideries can be added to the garment. (Figure 13.27).
13.4.3 Summary

Yokes are shaped pieces of fabrics used as a part of a garment. Shapes add decoration to garments. It can be used to create fullness or be a part of the garment from where fullness can be provided. Yokes can create interest and variation in garments. Yokes are often seen on men’s shirts. They can be used in women’s tops, skirts and baby frocks also.

Figure 13.27 Decorative Yoke

POINTS TO REMEMBER

- Yokes are separate part of a garment.
- Variations in garments can be created using yokes.
- Proper placement of yoke is very important.
- Yokes are of two types, namely yokes without fullness (basic yoke) and yokes with fullness. (decorative yoke)
- Yokes can be introduced in a garment to release fullness and for ease of movement.

ACTIVITIES FOR THE TEACHER

- Draw or collect yoke variations and display in the class notice board to create interest in dress designing.

ACTIVITIES FOR STUDENTS

- Prepare a paper pattern for a yoke without fullness (basic yoke) and with fullness (decorative yoke) using a basic bodice front pattern.
### Glossary

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### Internet Resources

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<td>How to add yoke to neckline</td>
</tr>
</tbody>
</table>
QUESTIONS AND ANSWERS

PART – I

I. OBJECTIVE QUESTIONS :
1. Yokes are a ________ part of the garment.
   (a) Inside   (b) Inbuilt   (c) Separate   (d) None
2. Yokes can be used as a base to release _____________.
   (a) Folds   (b) Seams   (c) Body Structure   (d) Fullness
3. For skirts, the yoke is cut to shape of the ________.
   (a) Neck line   (b) Waist line   (c) Shoulder Line   (d) Sleeves
4. A simple yoke is also called a _____________.
   (a) Basic Yoke   (b) Decorative Yoke   (c) V-shaped Yoke   (d) Oval Yoke
5. Decorative yokes adds ________ to the garment.
   (a) Ease   (b) Fit   (c) Comfort   (d) Beauty

PART – II

II. ANSWER IN THREE (OR) FOUR POINTS :
1. What are basic yokes?
2. What is a decorative yoke?
3. Draw 3 types of yokes?
4. How are yokes joined to the garment?

PART – III

III. ANSWER IN A PARAGRAPH :
1. Explain three types of Decorative yokes.
2. What things are to be taken care of while stitching a yoke?
3. What are the uses of yokes?

PART – IV

IV. ANSWER IN ONE PAGE :
1. Explain two types of yokes with diagrams.

Answers for Objective Questions :
1. (b)    2. (d)    3. (b)    4. (a)    5. (d)

Textiles and Dress Designing
14.1 INTRODUCTION

Decoration and trimmings add enrichment to any type of clothing. Decoration increase beauty to garments and trimmings give a special touch to a costume. Based on the use of the garment decoration and trimmings vary. Decorations can create an interesting effect even to a plain garment. Decoration helps to create variety in a garment. It is important to choose a suitable decoration based on design of the fabric and style of the garment. Decorative items can also be termed as trims.

14.2 PRINCIPLES TO BE FOLLOWED WHILE PLANNING A DECORATION OR TRIMMING

- It should be stitched in structural point to strengthen the shape of the garment.
- Decoration and trimmings should cover the entire garment evenly, to create balance in the garment.
- It must suit the fabric and colour of the garment.
- There must be enough background space.
The decorations or trimmings used should give dignity to the garment.

The life of the decoration and trimming should be ensured.

Stylized designs add interest to the garment when compared to a naturalistic design.

14.3 CLASSIFICATION OF DECORATIONS AND TRIMMINGS

Decoration and trimmings are classified based on the raw materials used and type of work done.

What is Tombac Buttons?

Tombac is a brass alloy with 5-20% of copper and zinc content used for ornament and as decorative buttons. Tin and lead can be added to get colorful buttons.
14.3.1 Fabric Decorations

Fabric decorations are items made out of textile materials and attached to the garment. They are stitched at the edges or specific areas of the garments to enhance its look.

Some of the common fabric decorations are discussed below:

14.3.1.1 Ric Rac

It is a zig zag narrow trimming used for adornment. It is available in different colour and it is cost efficient. It can be used as a motif or can be sewn flat on a garment. They are made of different material like cotton, nylon and polyester (Figure 14.1).

14.3.1.2 Ruffles and Frills

Ruffles are a piece of fabric pleated or gathered at one edge to release fullness. It can be used for decoration as well as for finishing raw edges. Ruffles can beautify a plain garment and can also emphasize a section of a garment.

Frills can be added along the hem of a garment or inserted in seam or any section. The fineness of the fabric and the amount of drape are always related to create frills. If cut in circular fabric, frills, flares at hemline and smooth where it is attached. It can be used around the neckline, collar and sleeve. It gives flowing movement to a garment. They are used in lingerie, children garment and nightwear (Figure 14.2).

14.3.1.3 Scallops

Scallops are one of the easiest ways to decorate a garment. They should be spaced evenly. These are mostly done on straight edge. They form rhythmi-cal edging on a plain garment. Scallops can be done on necklines and edges of a garment to add beauty to a garment. (Figure 14.3).
14.3.1.4 Patch Work
A piece of fabric with or without embellishment is attached on garment for decorative purposes are called as patches. These can be done by hand or machine. For hand patch work, loop stitch can be used. In machine patch work running or satin stitches are used. Normally soft and lustrous fabrics are used for patch work. This gives a rich look.

Patch work is used in clothes, table cover, sofa cover and in children garments. Patch used should be of same weight of fabric on to which it is done. If the patch used is heavy the garment will lose it shapes. They can be used to mend hole. Closely woven fabric cannot be used for patch as it will be difficult to sew (Figure 14.4).

14.3.1.5 Appliqué
Appliqué is the method of attaching a contrasting material on a large background. Appliqué can be trimmed after stitching. Appliqué may vary in pattern, colour and texture. It can be done by hand or machine. Now-a-days sew on or stitch on appliqués are readily available.

In beach wear, simple and bold designs are used. The material used for appliqué can be leather, felt fabric, lace and net. Many other techniques such as
quilting, beading and machine embroidery can be combined to create variety (Figure 14.5).

**14.3.1.6 Quilting**

Quilting is technique of giving a textured look to the garment. It adds weight and warmth. Generally geometrically designs like circles, diamond shapes and square are done in quilting. Quilting is done on running fabric before cutting the patterns.

Foam is placed in between the garment fabric and the lining fabric. Lines are stitched to create the required effect. Later patterns are placed on this fabric and cut and used for the garment making. Quilting can be done for specific areas like yokes. Contrast colour threads or embroidery threads can be used in the bobbin to create interest in quilting work (Figure 14.6).

**14.3.1.7 Belts**

Belt is an important fashion accessory. It can be used as a design feature or it can act as a main focal point in a design. It can give the whole design a delicate effect.

The different types of fasteners used with belts are hooks, buckles, claps, ties, studs. We can create variety by using different materials, fasteners, leather or a combination of above material (Figure 14.7).

**14.3.1.8 Bows**

Bows are used as fasteners or it can also be used as decorative feature in a garment. Bows made from taffeta, cotton, linen produce a sharp and crisp look. Soft bows can be made from soft fabric that drapes well. A bow can be stitched at neckline, waist line or it can be tied at the back to give an interesting effect. When bows are cut in bias, they drape well (Figure 14.8).
14.3.1.9 Smocking
Smocking is a trim in which embroidery is done over a gathered edge for both functional and decorative purpose. It is used in children garment, yokes, sleeves, waistline and neckline of a garment. We can create variety in smocking. Smocking can be done on light weight fabric. Smocking gives textured effect (Figure 14.9).

14.3.1.10 Laces
Laces can be used at edge, to increase length or to decorate a garment. Decorative lace can be made by hand, machine, crochet needle and tatting. Laces made from crochet needle can be attached on the edge of the garments. Decorative laces are used in frocks, hoods, saris, shawls and skirts. They are available in many colours, size and shape. These are readily available in markets (Figure 14.10).

14.3.2 Applied Trimmings
Applied trimming is a decoration in which the garment fabric is modified or used as a base to work the required decoration. Some of the common types of applied trimmings are explained below:

14.3.2.1 Felting
Felt is a non woven fabric. It is made by compressing fibres together by application of heat till they form a solid fabric. Wool, synthetic and cotton fibre can be compressed to form felt fibre. Special kind of needles is used for felting. Felt can be shaped in any form. They are available in variety of colours and fibres. This looks like an extra layer of material on the garment (Figure 14.11).

When was the first Lace made by machine?
The first lace net was made by machine in 1768. In 1809 bobbin net was introduced.

What Is “Hundred- Families Robe?”
Hundred Families robe is sewing scraps of fabrics to form an art design. This technique is still used for making silk and cotton patches which are combined to form a garment or a roll of running material. This is also known as Chinese Patch Work.
14.3.2.2 Satin Ribbon
Satin ribbons are long thin strips of woven fabrics. It is used to develop beautiful motifs. It gives a classic look when used for special events. They are available in single sided and double sided styles. They are available in bright colours which gives the designer an opportunity to use his creativeness. They can be used for wedding gowns as well as for craft work. When used with other decorative items such as beads, sequins, fasteners they give a rich look (Figure 14.12).

14.3.2.3 Ari and Zardosi Work
Ari work or ari embroidery is embroidery done along with the help of a hook. Generally chain stitches are made along with beads and muthia. Silk thread and metal wires are used. Zardosi embroidery is a decorative metallic embroidery work done by using thin wire threads with circular and spiral shaped metallic pieces. Gold and silver colours threads are used (Figure 14.13).

14.3.2.4 3D Foam
3D foam embroidery is a special technique, with digitalizing process. Foam is introduced in specific areas. Example a letter or flower motif in a design. It is then stitched by machine. The stitches enter the foam and lock the foam into the required fabric (Example: Logo designs).

14.3.3 Decorative Trimmings
Decorative trimmings are small items which are placed on the garment and stitched. They include the following:

14.3.3.1 Sequins and Beads
Sequins are flat circular objects made to reflect light and can be arranged in different ways depending upon the effect desired. These can be used in borders or can be scattered all over the garment. For rich effect sequins are overlapped with each other. They can be combined with other decoration also. Sequins and beads can be stitched or glued to fabric.

   Beads are used to add beauty to a fabric. Beads are made of metal, plastic or wood. They are available in different shapes and sizes. They have a hole in the centre to sew it to the garment (Figure 14.14).
14.3.3.2 Mirrors
Mirrors are available as small metals, similar to real looking glasses. The metal mirrors have small holes at the edges which enable them to stitch to the garment. Whereas the glass mirrors are first fixed using long stitches to hold them to the fabric. Then it is finished with blanket stitches. Mirrors vary in shape and size.

14.3.3.3 Rhinestones
Rhinestones are flat diamond like sparkling beads from rock crystal found on the river side. They come in different shapes, colour and size. They can be easily sewed or glued to the fabric. They can enhance the appearance of a plain outfit (Figure 14.15).

14.3.3.4 Heat Transfers (Stickers)
Heat transfers are commonly known as stickers. To prepare heat transfers, the design to be added as decoration is first created on a special paper. This paper is placed on the garment, where the decoration is needed and pressed with hot iron. The heat from the iron box transfers the design to the garment. The most common heat transfer designs are numbers and names. Cartoon motifs are also used for children's wear.

14.3.4 Decorative Fasteners
Decorative fasteners increase the look, convenience and comfort of a garment when selected properly. There are a large variety of decorative fasteners to select from press buttons to zip. They can be used for decorative purpose as well for functional purpose. They are made with metal, wood, plain fabric or leather. Decorative fasteners enhance the appearance of any garment. They can be placed in vertical or horizontal lines or it is grouped. Buttons, stud, snaps, hook and eye, zippers, buckles, velcro, frogs grommets, magnet brooches are the common type of decorative fasteners used. Some of decorative fasteners are described below.

14.3.4.1 Bias Binding
Bias bindings are strips cut on bias in contrasting materials or any material to finish raw edge in any garment. These can be used in place of bias facing while making decorative edges.

14.3.4.2 Fabric Loops
Fabric loops are cylindrical strips of fabric. Generally they are stitched to match the garment. These are used as straps for shoulder and can also be used as loops for
fastening button in a garment instead of zip opening. They give a fashionable finish.

14.3.4.3 Decorative Buttons
The market is filled with various types of decorative buttons. They vary in size, shape, colour and raw materials used. Depending upon the type of garments they should be selected. They are mainly used as decoration and do not have the common function of fastening the garment (Figure 14.16).

14.3.4.4 Macramé
Macramé is a method of tying cords into knots to form different shapes. It produces a textured effect. It is used as tassels and fringes. Beads can be added at the end. The thickness of cord can be varied to create embossed effect. Variations can be created by using different colour. They can be easily made and are affordable. Half knot and square knot are the common knots used for macramé. They are mainly attached at the edges of the garment to hold them together. Belts and garment strips are made in this method. (Figure 14.17).

14.4 SUMMARY
Decoration when arranged properly adds interest to garment. They can enhance any garment. Great care should be taken while choosing a decoration because decorations are integral part of a garment. The various decorations that can be used are ric rac, embroidery, ruffles, frills, beads, sequins, macramé, etc. A combination of two or three types of decorations can also be added to single dress. This gives rise to ones creativity.
POINTS TO REMEMBER

- Decorative items are also called trims.
- They enhance the appearance of a garment.
- Decoration may vary depending on the type of garment, age and sex of the wearer, type of usage and individuals preference.

ACTIVITIES FOR THE TEACHER

- To present power point of different decoration.
- To demonstrate the use of different decoration.
- To download and show the construction of decoration through YouTube.

ACTIVITIES FOR STUDENTS

- To collect different decoration items such as buttons, laces, ribbons, bows, ric rac, laces, embroidered laces, printed laces, plain laces, crochet laces and embroidered panels and prepare an album ‘TRIM ALBUM’.
- Draw two garments with any type of decoration on it.

GLOSSARY

<table>
<thead>
<tr>
<th>No.</th>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Ric rac</td>
<td>Zig zag ribbon used for decorating a garment.</td>
</tr>
<tr>
<td>2.</td>
<td>Appliqué</td>
<td>Ornamental needle work in which a small piece of fabric is sewn or stuck onto a large background to form a pattern.</td>
</tr>
<tr>
<td>4.</td>
<td>Scallops</td>
<td>Continuous curves along the edges of a fabric.</td>
</tr>
<tr>
<td>5.</td>
<td>Lingerie</td>
<td>Women’s innerwear and night clothes.</td>
</tr>
<tr>
<td>7.</td>
<td>Rhinestones</td>
<td>An imitation diamond used for decoration.</td>
</tr>
</tbody>
</table>

INTERNET RESOURCES

<table>
<thead>
<tr>
<th>Link</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="https://www.youtube.com/watch?v=rPp6Nn4mmYk">https://www.youtube.com/watch?v=rPp6Nn4mmYk</a></td>
<td>How to sew Shirring?</td>
</tr>
<tr>
<td><a href="https://www.youtube.com/watch?v=0VwYHenyvhs">https://www.youtube.com/watch?v=0VwYHenyvhs</a></td>
<td>How to Gather Fabric?</td>
</tr>
</tbody>
</table>
QUESTIONS AND ANSWERS

PART – I

I. OBJECTIVE QUESTIONS:

1. Embroidering over gathers edge is called
   (a) Smocking          (b) Lace         (c) Applique         (d) Ric Rac
2. ________ form rhythmical edge on a plain fabric
   (a) Scallops          (b) Rhinestone   (c) Macrame          (d) Bows
3. Rhinestones are crystals found near
   (a) River             (b) Mountain     (c) Sea             (d) Forest
4. __________ are flat and reflect light.
   (a) Bows              (b) Sequins      (c) Ruffles          (d) Applique
5. _____________ is used in place of bias tubing.
   (a) Sequins           (b) Bows         (c) Rhinestone       (d) Bias trimming

PART – II

II. ANSWER IN THREE (OR) FOUR POINTS:

1. What is ric rac?
2. Describe smocking?
3. Explain decorative fasteners.
4. List the uses of felting?
5. What is macramé?

PART – III

III. ANSWER IN A PARAGRAPH:

1. Write a short note on ruffles and frills.
2. Explain patchwork.

PART – IV

IV. ANSWER IN DETAIL:

1. Explain any five decoration in detail.

Answers for Objective Questions

1. (a)  2. (a)  3. (a)  4. (b)  5. (d)
15.1 INTRODUCTION

The term fashion is a buzzing word across the world. Every individual irrespective of age and sex want to look fashionable. Fashion can be described as an art since it requires creativity. It includes all types of clothing, hair styling and accessories. In fashion industry different terminologies are used to differentiate various styles and functions. Knowledge about these terms will help one to understand the concepts of fashion. Fashion is both arts and science. Unlike many other industries fashion is based on innovation, creative ideas and thinking ahead. Fashion can be described as private because it is the reflection of one’s physical, psychological and social status. On the other hand it can also be described as public because once a style is introduced everyone starts using this style.

What is House of Worth?
The House of Worth was a French house of high fashion that specialized in haute couture, ready-to-wear clothes, and perfumes. The historic house was founded in 1858 by designer Charles Frederick Worth.

15.2 TERMINOLOGIES OF FASHION

Silhouette

The silhouette is an outline or contour of a garment. Shape of the Silhouettes will vary when there is a change in fashion. There are three three basic forms of silhouettes;

- Tubular
- Bell
- Back fullness
**Haute Couture**

It means high fashion making. Fashion houses with designers create original designs

**Fad**

Short lived fashion

---

**Who is the father of Haute couture?**

Charles Frederick Worth was an English fashion designer who founded the House of Worth, one of the foremost fashion houses of the 19th and early 20th centuries. He is considered by many fashion historians to be the father of haute couture.

---

**What is haute couture?**

Haute couture is creation of exclusive custom-fitted clothing. Haute couture is high-end fashion that is constructed by hand from start to finish, made from high-quality, expensive, often unusual fabric and sewn with extreme attention to detail and finished by the most experienced and capable sewers, often using time-consuming, hand-executed techniques.

---

**Couturier**

It is the French term denotes male designer. Female designer is termed as Couturiere.

Designers will have their own fashion house. For each season, the designers introduce fashion garments which he assumes to suit that particular season.

---

**Avant-Garde**

This term indicates the wild designs. These styles attract everyone because of bold designs and colour.

---

**Mass fashion**

These styles are accepted by majority of the people. They are available in all price ranges and styles.

---

**Custommade**

It refers to garments which are stitched to order. It fits an individual well. The garments are stitched very carefully.

---

**Knock – Off**

This refers to the copied version of high fashion designs that is produced in a cheaper rate. They are produced with lower quality materials and cheaper workmanship.

---

**Seconds**

These are factory rejected items and are priced lower.

---

**Design**

A design in terms of fashion in garment making is described as a unique version of style. In simple terms it is an extraordinary pattern which is not seen commonly in the market when introduced newly.
15.3 FASHION CYCLES

Any new product which comes to the market will find its way slowly and if liked by all then its production will increase and sales will boost up and finally the use of this product will slowly decline. This is true in the fashion industry also. This growth and fall in a fashion product is called the fashion cycle.

The fashion cycle is depicted in five stages (Figure 15.1).
- Introduction.
- Rise.
- Peak.
- Decline.
- Rejection or obsolescence.

Introduction
- This is the first stage of fashion cycle.
- New styles are introduced.
- Shape, colour, and texture are changed to create styles.

- Garments are produced in limited quantity.
- They are expensive.

Rise
- This is the second stage of fashion cycle.
- Style is accepted by more number of people.
- It attracts the attention of buyers.
- Demand for the style is more.
- Orders for accepted style increases.

Peak
- This is the third stage of fashion cycle.
- Demand for the style is higher.
- Manufactures produce more garments.
- Styles will be available in all price ranges.
- Sometimes this style will settle as classic.

Decline
- Demand is decreased.
- Consumers will look for new designs.
- Styles will be available in discount sales.
- Manufactures stop producing the particular style.
- Styles are sold at very low price.

Figure 15.1 Fashion Cycle
Rejection or Obsolescence
- This is the last stage of the fashion cycle.
- Consumers reject the style.
- Style is referred as out of fashion.
- Products will be sold at very lower price ranges.
- Retail stores clear the stocks completely.

Who is Wendell Rodricks?
Wendell Rodricks is an Indian Fashion designer who was awarded India’s fourth highest civilian honour, the Padma Shri by The President of India, Pranab Mukherjee for Art (Fashion Design).

15.4 THEORIES OF FASHION
Fashion theories indicates the process of fashion ideas. The theories explain the fashion trend. It also tells about how fashion moves from one stage to other stage. There are three theories of fashion (Figure 15.2).

- Trickle down theory
- Horizontal-flow theory
- Trickle up theory.

15.4.1 Trickle Down Theory
- This is the oldest theory of fashion
- It indicates the true fashion
- It starts from top social level people to low social level people.
- Royal families introduced the fashion in olden days.
- Gradually upper class people copy them and then by the lower class of people.
- Fashion pass from fashion leaders to the lower class people also.
- Example- Jeans, Asymmetrical tops.

15.4.2 Horizontal-Flow Theory
- This is also called as Trickle Across Theory.
- In 20th century fashion became similar to all levels of people at the same time.
- Fashion is not created by any section of people.
- Celebrities give an identity to fashion.
- Various designers introduce new fashions in affordable prices.
High priced garment styles are copied and produced in mass.
Examples - jogging suits, bell bottom and kurta style tops.

**15.4.3 Trickle Up Theory**
- This theory is a newer theory.
- It is purely an idea of youngsters.
- Fashions pass from youth to the aged people.
- This is also called street fashion.
- Youth create new mix and match styles.
- Fashion gradually moves from lower class people to fashion leaders.
- Example- Denim, glitter tops, T shirts, metal shine garments.

**15.5 SUMMARY**
Fashion is the term that attracts everyone. It keeps changing now and then. It emerges as new for each and every season. Fashion consists of many styles. Therefore the terminologies are used to identify the styles and their features. Fashion happens in a cyclic manner. Fashion is introduced into the market and it gains popularity. After a period of time, popularity of fashion is declined. Fashion cycle has five stages such as introduction, rise, peak, decline and rejection or obsolescence. People can be identified with the stages of fashion cycle. Adoption of fashion by people varies based on certain factors like acceptance, price and motivation. There are three theories related to fashion adoption. They are Trickle down theory, Horizontal-flow theory and Trickle up theory. Fashion may shift from high category of people to lower. Some street fashion styles may reappear as high fashion garment.

**POINTS TO REMEMBER**
- Fashion is both arts and science
- Fashion terms help to understand the concepts of fashion.
- Fashion cycle has five stages such as introduction, rise, peak, decline and rejection or obsolescence.

**ACTIVITIES FOR THE TEACHER**
- Display - colourful magazines.
- Quoting examples - movie costumes and brands.

**ACTIVITIES FOR STUDENTS**
- Preparing picture album for types of fashion.
1. Silhouette The silhouette is an outline or contour of a garment.

2. Haute Couture It means high fashion making. Fashion houses with designer create original designs.

3. Fashion cycle The growth and decline of fashion.

4. Avant-garde This term indicates the wild designs.

5. Trickle-up-theory This theory is a new theory. It is purely an idea of youngsters. Eg. Denim, T-Shirts.

6. Trickle-down-theory This is the oldest theory of fashion. It indicates the true fashion. Eg. Jeans.

INTERNET RESOURCES

https://www.youtube.com/watch?v=7S0yjUYuwlg How to create your own fashion collection

QUESTIONS AND ANSWERS

PART – I

I. OBJECTIVE QUESTIONS :

1. Most popular style at given time.
   (a) Fad (b) Fashion (c) Taste (d) Designer Label

2. Short lived fashion.
   (a) Fad (b) Mass (c) Limited (d) Knock-Offs

3. A copy of a higher priced style.
   (a) Mass Style (b) Limited Fashion (c) Fad (d) Knock-Offs

4. Out fashioned garments are sold in _______ stage.
   (a) Introduction (b) Rise (c) Decline (d) Obsolescence.

5. An example for Trickle up theory.
   (a) High fashion (b) Mass fashion (c) Street fashion (d) Celebrity fashion
PART – II

ANSWER IN THREE OR FOUR POINTS
1. Differentiate between custommade and mass fashion.
2. What do you mean by the term Knock off?
3. Explain trickle up theory good example

PART – III

ANSWER IN PARAGRAPH :
1. Write about the fashion cycle with example?
2. Describe theories of fashion adoption.
3. Explain silhouette.

PART – IV

ANSWER IN ONE PAGE :
1. Explain about theories of fashion.
2. Elaborate on fashion cycle.

Answers for Objective Questions
1. (b) 2. (a) 3. (d) 4. (d) 5. (a)
Payal Suresh
Fashion Designer

After my 10th boards my parents wanted me to take up science and become a doctor since I got 96 in science. I had to fight battles to go against and take up ‘Dress Designing and Home Science’ in CSI Bain Matriculation Higher Secondary School, Kilpauk, Chennai 10 because that’s what I wanted to do. Designing clothes and styling people is what brought happiness to my heart even as a very young girl.

So after my 11th and 12th of ‘Dress Designing and Home Science’, I took up B.Sc Fashion Design in National College of Design, Chennai. College was a place where you basically have to be independent, with more of self study and lot of assignments to work daily. I noticed my fellow mates struggling to get the work done whereas I could go about doing it without much hassle due to the strong foundation laid during my higher secondary education in ‘Dress Designing’. It is very important in designing that the foundation is set right and strong to know step by step procedures to go about making a garment.

All practical and theoretical knowledge helped me come across all battles in college all thanks to my teachers in school. In college I was really glad that I was a step ahead from the rest because my 11th and 12th dress designing covered 90% of my college course in pattern making and stitching. Later post college I displayed my first collection in ‘Chennai Fashion Week’ in 2015 - The high profile Banjaras, which resulted in boosting my self-confidence.

I joined Evoluzione as a Stylist and worked with them for two and half years. My working career had just started
and I got hands of experience in the retail field and came across a lot of top designers of India like Manish Malhotra, Rahul Mishra, Nachiket Barve, Rohit Gandhi and Rahul Khanna. Towards August 2017 I was offered to join Kora as Head Designer and I thought this post was too exciting to decline. I took it up and today I am the In-House Designer for the Kora Chennai store.

I have come to believe that two main factors determine success. First of all it’s the persons own determination and the will to succeed. Without strong internal motivation, it is nearly impossible to be successful.

Today what I am, I can proudly say it is because of my school CSI Bain Higher Secondary School, Chennai and secondly because I started off my career making the right choice and took Dress designing course in my 11th grade and because of the support of my parents.
I studied the Vocational program Textiles and Dress Designing in higher secondary in the C.G. Higher Secondary School, M.H Road, Perambur, Chennai, in the year 2003-2005. Due to financial crises and family background I was unable to continue my higher studies. I wanted to support my mother in running the family but how was a question. My school teachers encourage me to stitch simple garments and sell. This was the turning point in my life. I started stitching blouses for my friends and relatives with minimum profit. My education in garment decorations helped me to add value to the garment I made. This increased my popularity and started working as freelancer. Later in 2010 I started a small shop named Sugana Fashion (License Number A062670019). I have two employers who help in stitching. Understanding the nature of the clients I have extended my shop with sales of accessories and a beauty parlor. I am very grateful to my school and staff members who encouraged me and helped me to develop myself. I feel very proud to see my growth.
I choose Textile & Dress Designing as the subject to be learnt as my higher secondary course in Nirmala Girls Higher Secondary School- Madurai-625009. This course helped me to acquire skills in advance cutting and sewing on one hand and clear cut knowledge about different type of fabrics and their applications in the dress making. The course also added the concept of looking upon the irregularities of figures and means of giving a face lift to their looks through designing suitable dresses. I started a small tailoring unit to sew for the neighborhood but today it has grown in to small boutique named Dewberries Fashion. I am able to handle large number of orders with three employers to help. I also take classes on dress making and designing.

This course has given an employment and above all a person who can give employment. The most important aspect is that I am financially sound and confident to handle tough situations. It gives me job security and to stand independent which is very important to every women. I am very happy that I choose this course and I am thankful to my teachers and the school, the foundation of my development.

K.U. Archana
Entrepreneur
After my 10th, I took up Textile And Dress Designing as my Higher Secondary course at T.E.L.C Girls Higher Secondary school, Uslampatti, Madurai District due to my in born interest in designing clothes. Later in order to fulfill my passion, I completed a two years diploma in Costumes Dress Designing and Making in Tamil Nadu Polytechnic College, Madurai. My curiosity in designing increased and I was also interesting in imparting this knowledge especially to the young minds of my little village and help them to be in trend with the upcoming fashion. Considering my passion I completed my Technical Teacher Course in 2000 and started working as a sewing teacher in my alma mater since 2011.

The right decision made by me in my higher secondary course namely Textiles And Dress Designing has enhanced by the knowledge (both technical and practical) and has placed me as respectable teacher.
Textiles and Dress Designing – Theory

MODEL QUESTION PAPER

STD: XI

MARKS: 90

PART-I

Choose the correct answer

1. Covering the body in a proper way is considered as
   a) Identification  b) Uniform  c) Modesty  d) Insignias

2. Pick out the natural fiber.
   a) Rayon  b) Nylon  c) Silk  d) Acetate

3. _______ is the first synthetic fibre made in 1928.
   a) Nylon  b) Rayon  c) Acetate  d) Triacetate

4. _______ are directly twisted from fibres.
   a) Ply  b) Single  c) Cord  d) Spun

5. The lengthwise edge of fabric is called
   a) Warp  b) Weft  c) Selvedges  d) Filling

6. _______ is used to insert tapes through casings.
   a) Thimble  b) Loop turner  c) French curve  d) Bodkin

7. _______ is substituted for machine stitch.
   a) Running stitch  b) Hem stitch  c) Back stitch  d) Whipping stitch

8. _____ helps the movement of the machine.
   a) Fly wheel  b) Slide plate  c) Clutch  d) Tension disc

9. Human body can be divided into
   a) 6 heads  b) 8 heads  c) 9 heads  d) 5 heads

10. Matching _______ should be provided along seams to show which seams are to be joined together.
    a) Notches  b) Lines  c) Opening  d) Stitches
11. ______ fabrics are course to touch.
   a) Cotton        b) Silk        c) Woolen       d) Rayon

12. Run and fell seam is commonly known as
   a) French seam   b) Piped seam  c) Mantua maker seam  d) Flat felt seam

13. Magyar sleeve is an extension of the ______
   a) Shoulder line  b) Armhole     c) Bodice front and back  d) Neck line

14. ______ is a simple technique of giving a textured look to the garment.
   a) Appliquéd     b) Quilting    c) Scallops     d) Bows

15. ______ means high fashion making.
   a) Couturier     b) Haute couture c) Avant-garde   d) Knock – off

**PART-II**

**Answer any ten question (question no.27 is compulsory)**  
10 × 3 = 30

16. Explain clothing based upon the area of occupation.

17. Give some uses of natural fibers.

18. Name the common finishes given to acetate fabrics.

19. What is yarn twist?

20. List the major parts of a loom.

21. What are the uses of tailors tacking?

22. Explain top threading

23. How will you take elbow and wrist round measurement?

24. What is graded paper pattern?

25. What is grain?

26. What are the uses of yokes in a garment?

27. What is macramé?

28. Explain Trickle up theory.
PART-III

Answer any five question (question no.34 is compulsory) 5 × 5=25

29. How wool is manufactured?

30. Give any 5 difference between woven and non-woven fabrics.

31. Draw a simple motif showing 2 embroidery stitches and explain the method of making it.

32. What are the reasons and rectification for needle breaking?

33. What are the advantages of paper patterns?

34. What are the different types of skirts based upon its length?

35. What are the principles to be followed while planning a decoration?

PART-IV

Answer in detail 2 × 10=20

36. Describe on the need for clothing with suitable examples.
   Or
   Explain the basic tools used in cutting and marking patterns.

37. Account for the types of seams and with suitable diagrams.
   Or
   Elaborate on fashion cycle and quote an example.


TEXTILES AND DRESS DESIGNING
PRACTICAL

Vocational Education
Higher Secondary – First Year

TAMILNADU TEXTBOOK AND
EDUCATIONAL SERVICES CORPORATION
LEARNING OBJECTIVES

✍ To acquire skills in stitching a jabla and panty.
✍ To gain knowledge about the type of material, trimming which can be used for designing jabla and panty.

INTRODUCTION
Jabla and panty are commonly used for infant and new born. Great care should be taken while deciding on the material, design, trimming because it is worn by infant with delicate skin. Lace, ribbon embroidery, bow, bias trimming, motif and embroidery can be used to decorate jabla, but these decorations should also be thin and soft.

BODY MEASUREMENT

<table>
<thead>
<tr>
<th>Age</th>
<th>1 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest</td>
<td>50 cm</td>
</tr>
<tr>
<td>Bodice length</td>
<td>22 cm</td>
</tr>
<tr>
<td>Hip</td>
<td>60 cm</td>
</tr>
<tr>
<td>Panty length</td>
<td>20 cm</td>
</tr>
</tbody>
</table>

SUITABLE MATERIAL
Mild coloured, dainty printed cotton, cambric, viol lawn, glasco mul cotton.

TOOLS REQUIRED

<table>
<thead>
<tr>
<th>Measuring tools</th>
<th>Inch tape, ruler.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drafting tools</td>
<td>Brown paper, bell pins, table</td>
</tr>
<tr>
<td>Marking tools</td>
<td>Marking chalk, pencil</td>
</tr>
</tbody>
</table>

FABRIC REQUIRED
Twice the length.

DRAFTING METHOD

**Jabla** :

\[
\begin{align*}
AB &= \text{Length} + 5 \text{ cm} \\
BC &= \frac{1}{4} \text{ Chest} + 8 \text{ cm} \\
AE &= \frac{1}{4} \text{ Chest} \\
AF &= 4 \text{ cm} \\
DH &= GI = 6 \text{ cm} \\
DG &= 10 \text{ cm} \\
J &= \frac{1}{2} \text{ GC} \\
JK &= 1.5 \text{ cm} \\
\mathbb{II}_1 &= 2 \text{ cm}
\end{align*}
\]
**Panty:**

\[
\begin{align*}
AB &= CD = \text{Length} + 5 \text{ cm} \\
AD &= BC = \frac{1}{3} \text{ Hip} \\
DE &= \frac{\text{Hip}}{24} \\
BF &= \frac{\text{Hip} + 3 \text{ cm}}{12} \\
DG &= \frac{1}{2} \text{ DC}
\end{align*}
\]

**LAYOUT**

The fabric is folded in combination fold.

**MARKING AND CUTTING**

Place the pattern over the fabric and cut the fabric leaving seam allowance.

**STITCHING METHOD (JABLA)**

1. Finish neckline and sleeve hem and bottom hemline with facing.
2. Finish side seam of the bodice.
3. Cut and stitch eyelet holes in neck facing and insert cord.
4. Do embroidery in bodice.

**Finishing**

2. Press and fold the garment.

**STITCHING METHOD (PANTY)**

1. Finish leg curve with a thin facing / piping.
2. Join side seam with flat fell seam.
3. Finish waist line as casing for elastic insertion.
4. Insert tape.

**Finishing**

1. Remove all thread.
2. Press and fold the garment.

**CUTTING LINES**

*Jabla:*

Front and back = FEHIJKCB

*Panty:*

AEGF

**NUMBER OF PATTERN**

Jabla: Front – 1; Back – 1
Panty: Front – 1; Back – 1

[If cut on fold one pattern for both front and back]
VARIATION OF JABLA

Figure 1.1

Figure 1.2

Figure 1.3

Figures 1.1, 1.2, 1.3  Variation of Jabla

VARIATION IN PANTY:

Figure 1.4

Figure 1.5

Figure 1.6

Figures 1.4, 1.5, 1.6  Variation of Panty
LEARNING OBJECTIVES

✍ To acquire skills in stitching a petticoat.
✍ To gain knowledge about the type of material, trimming which can be used for designing petticoat.

INTRODUCTION

This is used as inner wear and it is used for children and girl. This can be used as casual wear in summer. Gathers, pleats can be done on skirt. Ruffles, bias, flounces can be used for decoration.

BODY MEASUREMENT

<table>
<thead>
<tr>
<th>Age</th>
<th>3 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest</td>
<td>60 cm</td>
</tr>
<tr>
<td>Bodice length</td>
<td>23 cm</td>
</tr>
<tr>
<td>Shoulder width</td>
<td>24 cm</td>
</tr>
<tr>
<td>Full length</td>
<td>46 cm</td>
</tr>
</tbody>
</table>

TOOLS REQUIRED

| Measuring tools | Inch tape, ruler |
| Drafting tools  | Brown paper, bell pins, table |
| Marking tools   | Marking chalk, tracing wheel, tailors carbon |
| Cutting tools   | Shears, seam ripper, scissors |
| Stitching tools | Thread, hand needle, sewing machine |
| Pressing tools  | Ironing table, iron box |
| Decoration / Fasteners | Hook and eye, embroidery |

SUITABLE MATERIAL

Mild coloured cotton, poplin, voile, mull crape, cambric can be used. The material used should be sweat absorbing.

FABRIC REQUIRED

The fabric required to stitch petticoat is one meter of 90 cm width (36 inches).

DRAFTING METHOD

Petticoat :

\[
\begin{align*}
AB &= \text{Full length} + 7.5 \text{ cm} \\
AI &= \text{DE} = \text{Bodice length} \\
AD &= \text{IE} = \frac{1}{4} \text{ chest} \\
AA_1 &= 6 \text{ cm} \\
AA_2 &= 6 \text{ cm} \\
AA_3 &= 8 \text{ cm} \\
IG &= \text{BC} = \frac{1}{4} \text{ chest x 3} \\
EH &= 1 \text{ cm} \\
DD_1 &= \frac{1}{4} \text{ chest} \\
AF &= \frac{1}{2} \text{ shoulder width} \\
FF_1 &= 1 \text{ cm}
\end{align*}
\]
CUTTING LINES
Front Bodice = A₂ A₁ F₁ D₁ H I
Back Bodice = A₂ A₁ F₁ D₁ H I
Skirt = I G C B

NUMBER OF PATTERN
Front bodice = 1
Back bodice = 2
Skirt = 2

LAYOUT
The fabric is folded in lengthwise fold.

MARKING AND CUTTING
Place the pattern over the fabric and cut the fabric leaving seam allowance.

STITCHING METHOD
1. Join shoulder seam.
2. Finish two piece plackets at back.
3. Join side seams.
4. Finish neckline and armhole with facing (or) piping.
5. Join skirts side seams and gather on top.
6. Attach skirt to bodice
7. Finish lower hem with machine or hand hemming.

FINISHING
1. Attach hook and eye
2. Cut all hanging threads.
3. Press and fold the garment neatly.

Variation of Petticoats

Figure 2.1

Figures 2.1, 2.2, 2.3 Variation of Petticoats
LEARNING OBJECTIVES

- To acquire skills in constructing romper.
- To gain knowledge about creating variation in romper.

INTRODUCTION

This garment is normally used by pre-school boys. It is a one piece garment. Appliquéd, piping and binding can be used to decorate romper.

BODY MEASUREMENT

<table>
<thead>
<tr>
<th>Age</th>
<th>1 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>35 cm</td>
</tr>
<tr>
<td>Chest</td>
<td>55 cm</td>
</tr>
<tr>
<td>Back waist length</td>
<td>20 cm</td>
</tr>
<tr>
<td>Shoulder width</td>
<td>20 cm</td>
</tr>
<tr>
<td>Hip</td>
<td>60 cm</td>
</tr>
</tbody>
</table>

TOOLS REQUIRED

- Measuring tools: Inch tape, ruler.
- Drafting tools: Brown paper, bell pins, table.
- Marking tools: Marking chalk, Tracing wheel, tailors carbon.
- Cutting tools: Shears, seam ripper, scissors.
- Stitching tools: Thread, hand needle, sewing machine.
- Pressing tools: Ironing table, iron box.
- Decoration / Fasteners: Elastic, bias strips, appliquéd or embroidery.

SUITABLE MATERIAL

Long cloth, poplin, cotton, satin.

FABRIC REQUIRED

The fabric required for romper is 1½ meter.

DRAFTING METHOD

Romper:

- AB = Full length
- AG = ¼ chest
- AC = GG₁ = ½ shoulder width
- AH = Back waist length
- GD = HE = ¼ chest + 3 cm
- BI = 1/6 hip
- IJ = 1/3 hip
- BB₁ = 1/12 chest
- AA₁ = 5 cm
- AA₂ = 8 cm
- AA₃ = 5 cm
- CC₁ = 1 cm
**CUTTING LINE**

Front - A_2 A_3 C_1 D E J B_1  
Back - A_2 A_3 C_1 D E J B_1

**NUMBER OF PATTERN**

Front piece - 1  
Back piece - 1

**LAYOUT**

The fabric is folded in lengthwise fold.

**MARKING AND CUTTING**

Place pattern over the fabric and cut leaving seam allowance wherever necessary.

**STITCHING METHOD**

1. Match shoulder seam and machine it.
2. Join front and back side seam.
3. Finish front opening with continuous or miter placket.
4. Finish armcyce and leg seam with piping or binding.
5. Finish neckline with piping or binding.

**Finishing**

1. Attach button and button hole in placket.
2. Cut all threads
3. Press and fold the garment neatly.

**VARIATION OF ROMPER**

Figure 3.1 Romper
LEARNING OBJECTIVES

✍ To acquire skills in stitching a baby frock.
✍ To gain knowledge about the type of material, trimming which can be used for designing petticoat.
✍ To create variety by using different fullness and decoration.

INTRODUCTION

Baby frock is normally used by children of 1 to 5 years. Puff sleeve, frills (or) ruffles can be attached in arm hole. The top part is called as bodice and the bottom part is called as skirt. While joining skirt with bodice, pleats or gathers can be attached. Binding, frill, smoking, lace, motif, appliqué and embroidery are used for decorating baby frock. Collars and yokes can be attached to enrich the look of the frock.

BODY MEASUREMENT

<table>
<thead>
<tr>
<th>Age</th>
<th>3 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest</td>
<td>60 cm</td>
</tr>
<tr>
<td>Yoke length</td>
<td>11 cm</td>
</tr>
<tr>
<td>Shoulder width</td>
<td>24 cm</td>
</tr>
<tr>
<td>Sleeve length</td>
<td>11 cm</td>
</tr>
<tr>
<td>Full length</td>
<td>54 cm</td>
</tr>
</tbody>
</table>

TOOLS REQUIRED

<table>
<thead>
<tr>
<th>Measuring tools</th>
<th>Inch tape, ruler</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drafting tools</td>
<td>Brown paper, bell pins, table</td>
</tr>
<tr>
<td>Marking tools</td>
<td>Marking chalk, tracing wheel, tailors carbon</td>
</tr>
</tbody>
</table>

SUITABLE MATERIAL

Cotton, satin, blended fabric, silk, and denim can be used for stitching baby frock. For collars and yoke plain contrasting material with printed skirt can be used or vice versa.

FABRIC REQUIRED

For yoke – ¼ metre (Plain material)
For skirt – 1 ½ metre (Printed and sleeve material)

DRAFTING METHOD

* Bodice:
  
  | AB = | Full length + 5 cm |
  | AE = | ½ shoulder width |
  | AG = | EF = Yoke length |
  | AA_1 = | 5 cm |
  | AA_2 = | 4 cm |
  | AA_3 = | 6 cm |
  | GD = | ½ chest circumference |
  | DD_1 = | DD_2 = 2 cm |
  | EE_1 = | 1 cm |
NUMBER OF PATTERN
Front bodice - 1
Back bodice - 2
Skirt - 2
Sleeve - 2

LAYOUT
The fabric is folded in lengthwise fold.

MARKING AND CUTTING
Place the pattern over the fabric and cut it leaving seam allowance wherever necessary.

STITCHING METHOD
1. Join shoulder seam.
2. Attach two piece plackets and finish neckline with binding.
3. Finish the sleeve edge by binding and join side seams.
4. Join the side seams of the bodice front and back together.
5. Gather the cap of sleeve and attach to arm hole.
6. Do side seam of skirt and gather on top edge.
7. Attach skirt to bodice.
8. Hem the bottom of skirt with machine or hand hemming.

Finishing
1. Attach hook and eye.
2. Cut all threads
3. Press and fold the garment neatly.
Figure 4.1

Figure 4.2

Figure 4.3

Figures 4.1, 4.2, 4.3 Variation of Baby Frock
LEARNING OBJECTIVES

✍ To acquire skills in constructing a plain blouse.
✍ To create variation by adding color, fullness, sleeves and trimmings.

INTRODUCTION
Plain blouse is used by girls of all ages. Fashion has changed it considerably. Variation can be created by changing sleeve pattern, neck line. Fullness can also be added in the sleeve pattern and hemlines.

BODY MEASUREMENT

<table>
<thead>
<tr>
<th>Age</th>
<th>3 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>34 cm</td>
</tr>
<tr>
<td>Chest</td>
<td>60 cm</td>
</tr>
<tr>
<td>Shoulder width</td>
<td>24 cm</td>
</tr>
<tr>
<td>Sleeve length</td>
<td>11 cm</td>
</tr>
</tbody>
</table>

TOOLS REQUIRED

| Measuring tools | Inch tape, ruler |
| Drafting tools  | Brown paper, bell pins, table |
| Marking tools   | Marking chalk, tracing wheel, tailors carbon |
| Cutting tools   | Shears, seam ripper, scissors |
| Stitching tools | Thread, hand needle, sewing machine |
| Pressing tools  | Ironing table, iron box |
| Decoration / Fasteners | Hook and eye, embroidery |

SUITABLE MATERIAL
Cotton, silk, artificial silk, polyester, organdy.

FABRIC REQUIRED
The fabric required to stitch plain blouse is 1 meter.

DRAFTING METHOD

**Bodice**:

- \( AB = \) Length + 5 cm
- \( BB_1 = \) \( DD_1 = 5 \) cm
- \( AC = \frac{1}{4} \) Chest + 2
- \( AA_1 = 6 \) cm
- \( AA_2 = 5 \) cm
- \( AA_3 = 8 \) cm
- \( AE = \frac{1}{2} \) shoulder width
- \( CF = \frac{1}{4} \) chest + 2
- \( EE_1 = 1 \) cm
- \( G = \frac{1}{2} FD_1 \)
- \( GG_1 = 1 \) cm
- \( II_1 = II_2 = 6 \) cm
- \( II_3 = II_4 = 2 \) cm
**Sleeve:**
- **AB** = Sleeve length + 5 cm
- **AC** = **BD** = \( \frac{1}{4} \) Chest + 1 cm
- **CE** = 1/12 Chest
- **BB_1** = **DD_1** = 5 cm
- **D_1D_2** = 2 cm

**CUTTING LINES**
- Front Bodice: A_3, A_1, E_1, F, G_1, D_1, D, B
- Back Bodice: A_2, A_1, E_1, F, G_1, D_1, D, B
- Sleeve: AE, D_2, DB

**NUMBER OF PATTERN**
- Front Bodice: 2
- Back Bodice: 1
- Sleeve: 2

**LAYOUT**
The fabric is folded in lengthwise fold.

**MARKING AND CUTTING**
Place the pattern over the fabric and cut it leaving seam allowance.

**STITCHING METHOD**
1. Join shoulder seam.
2. Do darts in front and back.
3. In the front opening do facing on right hand side and binding on left hand side.
4. Join side seam.
5. Finish lower hem of bodice by hand / machine stitch.
6. Finish neckline with thin double binding.
7. Finish hem of sleeve and join side seam
8. Attach sleeve cap to the arm hole of bodice.

**Finishing**
1. Attach hook and eye.
2. Cut all threads.
3. Press and fold the garment neatly.

**VARIATION OF PLAIN BLOUSE**

*Figures 5.1, 5.2, 5.3  Variation of Plain Blouse*
LEARNING OBJECTIVES

✍ To acquire skills in constructing shorts.
✍ To gain knowledge about creating variety in shorts.

INTRODUCTION

Shorts are a lower garment worn by boys. It starts from waist and covers the thigh. Pockets are also attached. The waist line can be finished with fly opening or elastic. Variations can be created by introducing pleats and decoration in the pocket.

BODY MEASUREMENT

<table>
<thead>
<tr>
<th>Age</th>
<th>3 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>30 cm</td>
</tr>
<tr>
<td>Hip</td>
<td>67 cm</td>
</tr>
</tbody>
</table>

TOOLS REQUIRED

<table>
<thead>
<tr>
<th>Measuring tools</th>
<th>Inch tape, ruler.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drafting tools</td>
<td>Brown paper, bell pins, table</td>
</tr>
<tr>
<td>Marking tools</td>
<td>Marking chalk</td>
</tr>
<tr>
<td>Cutting tools</td>
<td>Shears, seam ripper, scissors</td>
</tr>
<tr>
<td>Stitching tools</td>
<td>Thread, hand needle, sewing machine</td>
</tr>
<tr>
<td>Pressing tools</td>
<td>Ironing table, iron box</td>
</tr>
<tr>
<td>Decoration / Fasteners</td>
<td>Elastic, bias, strips, appliqué or embroidery</td>
</tr>
</tbody>
</table>

SUITABLE MATERIAL

Denim, thick material, terry cotton, blended fabric, khaki woven. Shorts can be made out of luster fabric with suitable lining.

FABRIC REQUIRED

The fabric required to stitch shorts in twice the length of shorts + 10 cm.

DRAFTING METHOD

Shorts with Elastic

\[ AB = \text{Length} + 5 \text{ cm} \]
\[ BB_1 = DD_1 = 5 \text{ cm} \]
\[ AC = \frac{1}{3} \text{ hip} \]
\[ CC_1 = 5 \text{ cm} \]
\[ CE = \frac{1}{3} \text{ hip} \]
\[ D_1D_2 = 2 \text{ cm} \]
CUTTING LINES
Right leg - A C₁ E D₂ DB
left leg - A C₁ E D₂ DB

NUMBER OF PATTERN
Right leg pattern - 1
Left leg pattern - 1

LAYOUT
The fabric is folded in lengthwise direction.

MARKING AND CUTTING
Place the pattern over the fabric and cut the pattern by leaving seam allowances wherever necessary.

STITCHING METHOD
1. Stitch the inside leg seam.
2. Finish crotch seam.
3. Finish waistline as casing.
4. Finish hemline with machine stitch / hand hemming
5. Insert elastic.

Finishing
1. Cut all threads.
2. Press and fold the garment neatly.

VARIATION OF SHORTS

Figure 6.1
Figure 6.2
Figure 6.3

Figures 6.1, 6.2, 6.3 Variation of Shorts
LEARNING OBJECTIVES

- To acquire skills in stitching one piece shirt.
- To gain knowledge about the type of material used for making one piece shirt.

INTRODUCTION

Shirt is an upper garment worn by men and boys. It can be stitched with or without collar. Mitre collar is done in front opening. The hemline of sleeve can be self hemmed or can be finished with binding. Yokes and full sleeves are incorporated in men's formal shirts.

BODY MEASUREMENT

<table>
<thead>
<tr>
<th>Age</th>
<th>3 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>23 cm</td>
</tr>
<tr>
<td>Chest</td>
<td>60 cm</td>
</tr>
<tr>
<td>Shoulder width</td>
<td>24 cm</td>
</tr>
<tr>
<td>Sleeve length</td>
<td>6 cm</td>
</tr>
<tr>
<td>Neck</td>
<td>26 cm</td>
</tr>
</tbody>
</table>

TOOLS REQUIRED

<table>
<thead>
<tr>
<th>Measuring tools</th>
<th>Inch tape, ruler</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drafting tools</td>
<td>Brown paper, bell pins, table</td>
</tr>
<tr>
<td>Marking tools</td>
<td>Marking chalk, tracing wheel, tailors carbon</td>
</tr>
<tr>
<td>Cutting tools</td>
<td>Shears, seam ripper, scissors</td>
</tr>
<tr>
<td>Stitching tools</td>
<td>Thread, hand needle, sewing machine</td>
</tr>
</tbody>
</table>

Pressing tools: Ironing table, iron box
Decoration / Fasteners: Button, interfacing

SUITABLE MATERIAL

Polyester, cotton, terry cotton, silk, casement, blended fabric.

FABRIC REQUIRED

The fabric required to stitch one piece shirt is 1 meter.

DRAFTING METHOD

One Piece Shirt (Bodice):

- AB = CD = Full length + 3 cm
- AC = BD = ¼ Chest + 4 cm
- AA₁ = 4 cm
- AA₂ = 4 cm
- AA₃ = 6 cm
- CE = GF = Sleeve length
- EF = CG = 1/6 Chest
- FF₁ = 2 cm
**Collar**:  
AB = CD = 8  
AC = BD = ½ neck + 3 cm  
DD1 = 1 cm

**CUTTING LINE**  
Bodice: Front - A3 A1 C E F1 D B  
Bodice: Back - A2 A1 C E F1 D B  
Collar - ACD1B

**NUMBER OF PATTERN**  
Front & Back bodices - 1  
[cut on fold]  
Collar - 2

**MARKING AND CUTTING**  
The fabric is folded in combination fold.  
Place pattern over the fabric and cut leaving seam allowance wherever necessary.

**STITCHING METHOD**  
1. Finish opening using mitre placket.  
2. Attach collar to the neckline  
3. Finish sleeve hem  
4. Join side seam and extend it to the finished edge of the sleeve hem.  
5. Finish lower hem by hand hemming or with machine.

**Finishing**  
1. Attach button and buttonhole on the placket.  
2. Cut all threads.  
3. Press and fold the garment

**VARIATION OF ONE PIECE SHIRT**

Figures 7.1, 7.2, 7.3 Variation of One Piece Shirt
Any one of the projects can be assigned to the students.

A period of 30 days can be given to complete the project.

1. Draft and prepare the instructions, and construct a Jabla or Romper, with minimum two variations.

2. Take body measurements of 25 classmates either girls or boys and prepare body measurement chart.
1. Visit tailoring or boutique shops and conduct a survey and collect information about the following:

- Name and address of the tailor shop /boutique
- Name of the tailor/boutique owner
- Type of Boutique shop (stand alone or Chain boutique)
- Number of persons working
- Types of jobs carried out by the workers
  - Drafting
  - Pattern making
  - Cutting
  - Sewing (simple sewing machine or electric)
  - Stitching hemline/ buttons / hooks.
  - Any decoration or embroidery work.
- What are the items available in the boutique?
STD. XI PRACTICAL

1. Jabla and Panty (1 year)
   a. Write the instruction for drafting jabla and panty with suitable figures
   b. Draft and cut the paper pattern
   c. Stitch the jabla and panty
      (i) Finish the panty leg opening
      (ii) Finish neckline, hemline and sleeve with piping (or) facing

2. Petticoat (3 years)
   a. Write the instruction for drafting petticoat with suitable figure
   b. Draft and cut the paper portion
   c. Stitch the petticoat
      (i) Finish neckline and armhole with facing
      (ii) Do facing and binding in back open and attach hook and eye

3. Romper (1 years)
   a. Write the instruction for drafting for romper with suitable figures
   b. Draft and cut the paper pattern
   c. Stitch romper
      (i) Attach miter placket at the neck opening
      (ii) Finish neckline, armcyce and leg opening with facing / binding

4. Baby Frock (3 years)
   a. Write the instruction for drafting a baby frock with suitable figure
   b. Draft and cut the paper pattern
   c. Stitch baby frock
      (i) Finish armhole with puff sleeve
      (ii) Do continuous opening at back and attach hook and eye
5. **Plain blouse (3 years)**
   a. Write the instruction for drafting for plain blouse with suitable figures
   b. Draft and cut the paper pattern
   c. Stitch the plain blouse
   - (i) Do two piece placket in front opening and attach hook and eye
   - (ii) Finish neckline with piping (or) binding

6. **Shorts with elastic (3 years)**
   a. Write the instruction for drafting shorts with elastic
   b. Draft and cut the paper pattern
   c. Stitch shorts with elastic
   - (i) Finish waistline with elastic
   - (ii) Finish hemline with hand hemming.

7. **One piece shirt (3 years)**
   a. Write the instruction for drafting one piece shirt with suitable figures
   b. Draft and cut the paper pattern
   c. Stitch one piece shirt
   - (i) Finish neckline with miter open
   - (ii) Finish neckline with collar
Higher Secondary – Class XI – Textiles and Dress Designing
List of Authors and Reviewers

Chair Person
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