Chapter 3 – Synthetic fibers and plastics.

By www.netexplanations.com Teachers

- Fibers: Fibers are thin, long strands which can be spun into yans and woven into fabrics
  Classification: They are of two Types

1. **Natural fibers:**
   Fibers obtained from plant or animal source e.g.: cotton, silk, wool etc.

- **Examples of natural fibers**

1) Silk
   - ✓ Silk is a natural fiber obtained from silkworms.
   - ✓ The process was first obtained in China.
   - ✓ It is very expensive and has good texture and used to make sarees etc.

2. **Synthetic fibers:**
   Manmade fibers or fibers synthesized by humans in industries are called synthetic fibers. E.g., rayon, nylon etc.
   Synthetic fibers are obtained bychemical processing of petrochemicals
   - ✓ Polymers: A synthetic fiber made up of many small repeating subunits. It is derived from Greek word 'poly' meaning many and 'Mer' meaning unit

- **Examples of synthetic fibers**

1) Rayon
   - ✓ It is obtained by chemical treatment of wood pulp.
   - ✓ It is known as Artificial silk.
   - ✓ It is cheaper than silk
   - ✓ It can also be mixed with cotton and wool
2) Nylon
   - ✓ Nylon is strong, elastic, light, lustrous, easy to wash.
   - ✓ It is the first completely synthetic fiber composed from coal, air and water
   - ✓ It has number of applications in synthesis of ropes, tents, parachutes ropes, belts, bags, curtains etc.
3) Polyester
   - ✓ Polyester is a wrinkle free fibric, easy to wash fibric. E.g., Terylene
   - ✓ It is a polymer made out of repeating unit of esters.
   - ✓ It can be mixed with wool to make polywool, with cotton to make polycot etc.
   - ✓ PET also known as polyethylene terephthalate has a number of applications in making bottles, films, wires etc.
4) Acrylic
   - ✓ It is an alternative fiber to wool which is quite expensive.
   - ✓ Acrylic is cheaper, can be easily dyed and sturdy than natural wool.

- **Advantages of synthetic fibers**

i. They are less expensive
ii. They are readily available, durable, dries up quickly etc.

- **Plastics:**

- It is a synthetic fiber composed of large chains of carbon. The carbon chain can hane two possible arrangement:
  i. Linear or
  ii. Cross-linked arrangement.
- Plastics are available in different colors, sizes, can be easily remolded and reused
- One common example is polythene used to make bags.

- **Two types of plastics**

1) Thermoplastics:
   These plastics get easily bent or deformed when heated. E.g., PVC, Polythene used for making toys, combs and containers
2) Thermosetting plastics:
   Once molded these plastics, cannot be reused again by heating. E.g., Bakelite and Melamine

- **Advantages of using plastic**

1.) It is non-reactive
2.) It is light,strong and durable
3.) Plastics are poor conductors of heat and electricity.

- **Plastic and the environment:**

1.) Plastic is non-biodegradable and takes a number of years for degradation.
2.) It causes environmental problems as burning process is quite slow and releasees fumes in the atmosphere
3.) It is very important to use plastics responsibly
4.) One should keep the 5 Rs in mind when using plastic- Reduce, Reuse,Recycle, Recover and Refuse.