

Cellulose, coal, natural  
→ polymerisation / fossils as  
Aerosol substance also with petroleum

### Activity 3.2

Take two cloth pieces of the same size, roughly half a metre square each. One of these should be from natural fibre. The other could be a synthetic fibre. You can take help of your parents in selecting these pieces. Soak the pieces in different mugs each containing the same amount of water. Take the pieces out of the containers after five minutes and spread them in the sun for a few minutes. Compare the volume of the water remaining in each container.

Do synthetic fabrics soak less/more water than the natural fabrics? Do they take less/more time to dry?

What does this activity tell you about the characteristics of the synthetic fabrics?

Find out from your parents about the durability, cost and maintenance of these fabrics, compared to the natural fabrics.

### 3.4 Plastics

You must be familiar with many plastic articles used everyday. Make a list of such items and their uses.

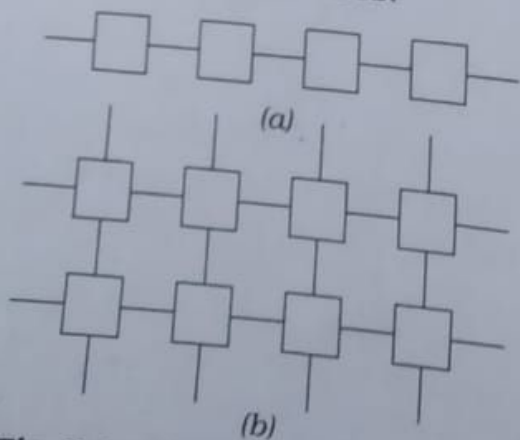


Fig. 3.6 : (a) Linear (b) Cross-linked arrangements

Plastic is also a polymer like synthetic fibre. All plastics do not have the same type of arrangement of units. In some it is linear, whereas in others it is cross-linked. (Fig. 3.6) Plastic articles are available in a wide variety of possible shapes and sizes as you can see in Fig. 3.7. Have you ever wondered how this is possible? The fact is that plastic is easily moulded, i.e. can be shaped in any form. Plastic can be recycled, reused, coloured, melted, rolled into sheets or made into wires. That is why it finds such a variety of uses.



Fig. 3.7 : Various articles made of plastic

**Polythene** (Poly+ethene) is an example of a plastic. It is used for making commonly used polythene bags.

Now, try to bend a piece of polythene yourself. Can all the plastic articles bend easily?

You will observe that some plastic articles can bend easily while others break when forced to bend.

3.5 Plastic

(1) PVC  
(ii) Raw materials  
in Plastic  
(iii) Poisonous has

add hot water to a plastic bottle, it gets deformed. Such plastic which gets deformed easily on heating and can be bent easily are known as **thermoplastics**. Polythene and PVC are some of the examples of thermoplastics. These are used for manufacturing toys, combs and various types of containers.

On the other hand, there are some plastics which when moulded once, can not be softened by heating. These are called **thermosetting plastics**. Two examples are bakelite and melamine. Bakelite is a poor conductor of heat and electricity. It is used for making electrical switches, handles of various utensils, etc. Melamine is a versatile material. It resists fire and can tolerate heat better than other plastics. It is used for making floor tiles, kitchenware and fabrics which resist fire. Fig. 3.8 shows the various uses of thermoplastics and thermosetting plastics.

### 3.5 Plastics as Materials of Choice

Today if we think of storing a food item, water, milk, pickles, dry food etc., plastic containers seem most convenient. This is because of their light weight, lower price, good strength and easy handling. Being lighter as compared to metals, plastics are used in cars, aircrafts and spacecrafts, too. The list is endless if we start counting articles like slippers, furniture, decoration pieces, etc.

Now, let us discuss the characteristic properties of plastics.

#### Plastic is Non-reactive

You know that metals like iron get rusted when left exposed to moisture and air. But plastics do not react with water and air. They are not corroded easily. That is why they are used to store various kinds of material, including many chemicals.

#### Plastic is Light, Strong and Durable

Talk to your parents or grandparents about the types of buckets that were used in the past. What is the material of the buckets or mugs you are using today? What are the advantages of using a plastic container? Since plastic is very light, strong, durable and can be moulded into different shapes and sizes, it is used for various purposes. Plastics are generally cheaper than metals. They are widely used in industry and for household articles. Make a list of different kinds of plastic containers that you use in daily life.



Articles made of thermosetting plastics



Articles made of thermoplastics

Fig. 3.8 : Some articles made of plastic



### Plastics are Poor Conductors

You have learnt above that plastics are poor conductors of heat and electricity. That is why electrical wires have plastic covering, and handles of screw drivers are made of plastic. As mentioned above, handles of frying pans are also made of plastic.

#### Did You Know?

- Plastics find extensive use in the healthcare industry. Some examples of their use are the packaging of tablets, threads used for stitching wounds, syringes, doctors' gloves and a number of medical instruments.
- Special plastic cookware is used in microwave ovens for cooking food. In microwave ovens, the heat cooks the food but does not affect the plastic vessel.
- Teflon is a special plastic on which oil and water do not stick. It is used for non-stick coating on cookwares.

- Fire-proof plastics: Although synthetic fibre catches fire easily it is interesting to know that the uniforms of firemen have coating of melamine plastic to make them flame resistant.

### 3.6 Plastics and the Environment

When we go to the market, we usually get things wrapped in plastic or packed in polythene bags. That is one reason why plastic waste keeps getting accumulated in our homes. Ultimately plastic finds its way to the garbage. Disposal of plastic is a major problem. Why?

A material which gets decomposed through natural processes, such as action by bacteria, is called **biodegradable**. A material which is not easily decomposed by natural processes is termed **non-biodegradable**.

Look at Table 3.3.

Table 3.3

Type of Waste	Approximate Time taken to Degenerate	Nature of Material
Peels of vegetable and fruits, leftover foodstuff, etc.	1 to 2 weeks	Biodegradable
Paper	10 to 30 days	Biodegradable
Cotton cloth	2 to 5 months	Biodegradable
Wood	10 to 15 years	Biodegradable
Woollen clothes	About a year	Biodegradable
Tin, aluminium, and other metal cans	100 to 500 years	Non-biodegradable
Plastic bags	Several years	Non-biodegradable

• Source: <http://edugreen.teri.res.in/explore/solwaste/types.htm>



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SUB-SCIENCE

CLASS- VIII

CHAPTER-3

\* Write Q/A in #/c.

Q9. Give difference b/w thermoplastic & thermosetting plastic with eg.

Ans. Try - yourself.

Q10. What are biodegradable and non-biodegradable materials. Give eg.

Ans. Try - yourself.

Q11. Write down qualities and uses of bakelite & melamine plastic.

Ans. Bakelite plastic

Qualities  $\rightarrow$  It is a poor conductor of heat and electricity.

Uses  $\rightarrow$  It is used for making electrical switches, handles of various utensils etc.

Melamine Plastic

Qualities  $\rightarrow$  (i) It is a versatile plastic.  
(ii) It resist fire and can tolerate heat better than other plastics.

Uses  $\Rightarrow$  It is used for making floor-tiles, kitchenware and fabrics which resist fire.

Q12 Write down some uses of plastic in health care industry.

Ans (i) Plastic is used in packing of tablets.

(ii) It is used in making injections.

(iii) It is used in making threads for stitching of wounds.

(iv) It is used in making glucose bottles.

(v) It is used in making tool-box in operation theatre.