Chapter 3

Nature of Things

3.1 Grouping of things :

We observe many different things in our class, room, home, market and ground which we use in our daily life. Like Books, wool, utensils, jewellery, clothes, toys, rubber, chair, water, bullock cart, bicycle, ball, pen, wire etc. Among them some are found in nature and some are human made. Is the shape, size, colour and properties of these things same? No, these things are different from each other. Some are very shiny some have no shine, some are hard and some are soft, some are soluble in water and some are not. Those things which are similar in properties grouped in one. Why we have to make group of things? We will find our answer in this chapter. We group things according to our utility and comfort that they do not mix with each other.

Figure 3.1 : Objects around us

Activity1:

Collect few things from your class and few from outside. Things collected can be toys, pencil, notebook, rubber, chair, table, Newspaper, wool, mango, cotton, switches etc. Differentiate the things made of paper, wood, iron, rubber, and plastic Table.

Table 3.1: Grouping of things according to substances

S. N.	Substances	Things
1.	Paper	Notebook, book, Newspaper
2.	Plastic	
3.	Wood	
4.	Iron (metal)	

Above table clarify that few things are made up of one substance, some are made up of more than one thing. The sources of these things are different from each other.

3.2 Classification of things – On the basis of sources:

Those things which we get from nature (plant & animals) are called **Natural things** and which are man made are called **Artificial or man made things**.

Activity 2

In picture 3.2 few things are natural and few are manmade. Find and tabulate it in Table 3.2.

Figure 3.2 : Natural and man made things

Table 3.2 : Classification of things on the basis of source –

S. N.	Name of thing	Man made or natural
1.	Mango	Natural
2.	Chair	Man made
3.	Cotton	
4.	Plough	
5.	Pomegranate	
6.	Toys	
7.	Wool	

3.3 Properties of Things :

We use utensils made of soil, metal and plastic for storage of water at our home. Have you ever thought that why we do not use glasses made of cloth for storage of water? Or why things made of paper is not use to fill water.

This is clear that things are according to their properties. Which are these important properties of things? Let us discuss.

(i) Shine/Lustre

Activity 3

Observe a steel plate and a wooden block in sunshine. Which one is shiny in both? Likewise list of some couple of thing is given in table 3.3 Classify them on the basis of their Shine.

Figure 3.3 : Shiny and ductile things

Table 3.3 Classification on the basis of shine:-

S.No.	Pair of Things	Shiny	Ductile
1.	Jewellery / Cloth		
2.	Coal/ steel utensils		
3.	Cardboard / Aluminium sheet		
4.	Steel tumbler/ comb		

From the above table and picture we conclude that things made of metals have shine. Like jewellery, utensils, aluminium sheet etc.

(I) Hardness :

Activity 4 :

We observes few things are compressed when pressed and few things do not. List few things by classifying them as hard and soft in table3.4

Figure 3.4 : Hard and soft things

Table 3.4 : Classification of things on the basis of Compression

S.NO.	Name of thing	Hard or soft
1.	Wooden table	Hard
2.	Iron window	Hard
3.	Cotton	Soft
4.	Sponge	
5.	Piece of stone	
6.	Candle	
7.	Paneer / cottage cheese	
8.	Steel utensil	

Those things which are not compressed easily are hard while those things which can be easily compressed are soft.

(i) Magnetic and non-magnetic:

You would have seen pin and keys made up of iron get attracted towards magnet. While if we bring pieces of stones, pencil, plastic pens etc near to magnet do not attract towards it. Why this happens?

According to magnetic properties things are of 2 types:

Things which get attracted towards magnets are Magnetic, like the things made from iron while which do not attract towards it are non magnetic – like- plastic or wooden made things.

Activity 5:

Take pins and wooden dust in a glass bowl. Now bring magnet near the bowl. What you have observe. You observe that pins get attracted towards magnet while wooden dust does not. Therefore we can say that pins are magnetic and wooden dust is non-magnetic.
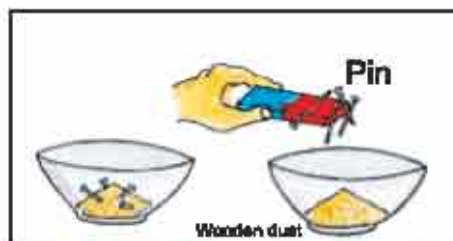

Figure 3.5 : Magnetic attraction

(ii) Solubility and Insolubility:

Activity 6:

Take four beaker of glass. Mark A,B,C,D on them put one spoon chalk powder, sugar, soil and sand in beaker A,B,C,D respectively what you will observe ? You will observe that in Beaker B and C sugar and salt completely dissolve in water and a clear solution is seen while in beaker A and D sand and chalk powder can be seen at the bottom of beaker.
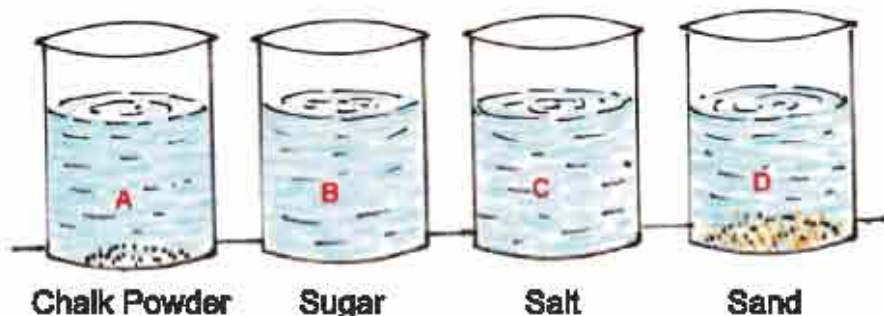

Chalk Powder   Sugar   Salt   Sand

Figure 3.6 : Solubility of things in water

Hence, this is clear that something are soluble in water are called **Soluble** like salt, sugar etc. while things which are not soluble in water are called **Insoluble things**. Example: chalk powder, sand etc.

Some liquids, like lemon juice is completely miscible in water while some like kerosene, mustard oil etc do not completely mix in water. Likewise, oxygen gas is partially soluble in water while few gases fully mix in it.

Carbon-dioxide gas is completely soluble in water and hence used in soft drink.

(iii) Transparency :

You all have seen your face in mirror. Is object is visible through mirror?

Through which objects we can clearly see. You have observed that some food items like chocolates, biscuits etc are kept in glass or plastic containers so that they can be seen clearly. Therefore, those things through which we can see are called **Transparent objects**. Example – glass & pour water are transparent.

Opposite to this those things through which we cannot see clearly are **Opaque objects**. Like – wood, notebook, objects made of metals are all opaque objects.

Figure 3.7 : Transparent Object   **Figure 3.8 : Opaque Object**

Activity 7 :

Take a plastic bucket and a torch. Switch on the torch keeping the top of it inside the bucket. Now look at the bucket from outside. Is light of torch visible from outside?

Figure 3.9 : Translucent Object

You see that light is not clearly visible from outside. Therefore few things are like this through which we can see but not clearly means partial vision these are called translucent things.

(iv) Density :
Activity 8 :

Do you know that few thing float on water and few other sink. You all played with paper boats in floating on water. Wood straw of plants, leaves etc are light weight and float on water, but iron nail, spoon and other sink in water.

Observe things by dropping in water which one float and which one sinks. List them differently.

Generally those things which have density lower than water floats on it whereas those things with higher density than water sink in it. This is because of density of things.

What is density? Let us find-
Activity 9 :

Take two containers of equal sizes and fill one with cotton and other with sand completely. Let's lift these containers which one is heavier? Containers of equal volume filled with cotton and sand, sand container heavier one. Therefore we say that density of sand is more than cotton. **Density of a substance is its mass per unit volume.**

The thing which has more mass in a fixed volume is highly dense.

In this way we group different objects in different groups. Grouping of materials is convenient in many ways. Storage by grouping things makes easier to find them. Like in grocery store the shopkeeper group materials on the basis of priority in use, which make it easy to explore.

What have you learnt

- Objects around us are made up of large variety of material.
- Different materials have different properties.
- We form group on the basis of similarities in materials.
- Something has shiny lustre and some do not.
- On the basis of sources we classify materials into natural and manmade.
- Some materials are hard and some are soft.
- Magnetic materials attract towards magnet.
- Some materials are soluble in water whereas some others are insoluble.
- Some materials are transparent and some are opaque and translucent.
- The materials which have high mass in fixed volume have high density.

Exercises

Choose the correct option of the following:-

1. Which material has lustre?
    (a)   Wood   (b)   Chalk powder
    (C)   Kerosene   (d)   Gold   (   )
2. Which one from the following is soluble in water?
    (a)   Wooden dust   (b)   Chalk powder
    (c)   Glucose powder   (d)   Iron dust   (   )
3. Which one has magnetic properties from the following?
    (a)   Wood   (b)   Iron
    (c)   Glass   (d)   Plastic   (   )
4. Which one floats on water?
    (a)   Wooden blog   (b)   Pebbles
    (c)   Iron nail   (d)   Gold ring   (   )

Fill in the blanks:-

1. Those things which get attracted towards magnets are called_____.
2. Cotton has_____density than iron.
3. Through_____object we can clearly see.
4. Those things which cannot be compressed easily are called_____.

Short answer type questions:

1. Classify following things on the basis of their compressibility into hard or soft. Sponge, hammer, marble, cotton, rubber, chair, gulabjamun.
2. Write names of three natural things?
3. What do you mean by a magnetic objects?
4. Which property of carbon dioxide made it useful to be used in soft drinks.

Long answer type questions:-

1. Define transparent, Translucent, and opaque objects. Explain with examples.
2. Bronze mug loses it shine when kept in open environment. Why?
3. Explain the magnetic proprieties of a substance with example.
4. Iron nail sink in water while paper boat floats on water. Why? Explain.

◆ ◆ ◆