

## **My Body**

### **Internal organs**

There are some body parts we can see such as eyes, nose, ears, hands and legs. Such parts are called **external organs**. There are some body parts such as stomach, lungs and heart that are inside our body. We are unable to see them. These body parts are called **internal organs**. Let us learn more about these parts now.

#### **Brain**

Brain is an important organ of our body and it is protected by the **skull**. It has three main parts namely:

1. Fore Brain
2. Mid brain
3. Hind Brain

Brain is the commanding centre of our body and it helps us to think and perform various actions. Every action that we do like moving our hands, sitting or walking is possible only because of our brain.

#### **Lungs**

Lungs are a pair of spongy, sac-like organs located in the chest. They help us to breathe. When we breathe in, we take in oxygen from air through the nose and pass it to the lungs. The lungs expand (become big) in the position. When we breathe out, we give out carbon dioxide from the lungs through the nose into the air. The lungs contract (become small) in the position.

#### **Stomach**

Stomach is a 'J' shaped bag found below the lungs. It breaks down food items and gives us energy. It contains special juice to break down food into energy.

#### **Heart**

Our heart is the pumping organ. It pumps blood to all parts of the body. It lies in between the lungs almost in the centre of the chest. It is made up of **muscles**. heart is the pumping organ. It pumps blood to all parts of the body. It lies in between the lungs almost in the centre of the chest. It is made up of **muscles**. The heart beats about 72 times in a minute.

#### **Kidneys**

We have two kidneys. They are bean shaped organs. The kidneys purify blood by filtering excess water and toxins.

## Bones and Muscles

Our body is made up of bones and muscles. Press your upper arms. The portion that feel hard to touch is the bone. The portion that feels soft to touch is the muscle. The bones give us shape. They are the frame for our body and allow us to jump, run or just lie down. Bones also protect the internal parts of the body. Muscles are the soft parts that cover our bones. They help us to move different parts of our body by contracting or relaxing, like a rubber band.

In order to maintain healthy bones we need to have healthy food, such as milk, cheese and eggs. For strong muscles, we need to exercise and stay active. Babies are born with 300 bones but by adulthood the number is reduced to 206. 17 muscles are functioning while smiling and 43 while frowning. So **smile and save energy**. The human body has more than 600 muscles. The longest bone is thigh bone. The smallest bone is stapes in ear. The longest muscle is in the thigh.

## Teeth and its Types

### 4. Foods for Healthy Mouth and Teeth

The teeth are the hardest parts in our body. They are helpful for cutting and chewing the food. The teeth are found inside our mouth We develop two sets of teeth in our lifetime.

**1. Milk teeth:** The first set of teeth starts to develop from the age of six months. They are called milk teeth and they are 20 in number. At the age of 6 or 7 the second set of teeth grow after milk teeth fall.

**2. Permanent Teeth:** Second set of teeth are called permanent teeth. There are four types of teeth: Incisors, Canines, Premolars and Molars. If permanent teeth fall, we cannot grow one more set of teeth. So, it is important to take care of our teeth. There are 32 permanent teeth.

## Importance of Oral Health

### Healthy Mouth

It is important to take care of our teeth and mouth. Brushing teeth, eating healthy food and regular dental checkup keep us healthy. We should brush our teeth twice a day. Take plenty of fruits, vegetables and dairy products. Drink water or milk instead of sugary juices. Eat candy, cake and ice cream as less as possible

### Taking Care of Mouth and Teeth

Change toothbrush once in every three months.

Avoid sticky food.

Brush twice a day. (After getting up and before going to bed)

Rinse your mouth with water every time after you eat

## **Neem Toothbrush**

Researchers believe that use of neem toothbrushes is the reason behind the bright smiles and healthy teeth of Indian villagers. Indians traditionally chew neem twigs to keep their gums and teeth healthy.

## **Matter and Materials**

Everything in the universe is made up of matter. We need to explore many different materials to make sense of our world. The matter from which a thing is made of is called Material. For example: Chair is made of wood, Eraser is made of rubber, Candle is made of wax.

## **Properties of Materials**

We can measure, see or feel the materials. Different types of material have different properties that make them useful for various purposes. Most materials have more than one property. They can be hard or soft, shiny or dull, smooth or rough and flexible or rigid..

## **Hard and Soft Materials**

Materials which cannot be easily compressed, cut, bent or scratched are called **hard materials**. **Example:** Brick, bone and steel.

Materials which can be easily compressed, cut, bent or scratched are called **soft materials**. **Example:** Foam, clay and skin.

## **Shiny and Dull Materials**

Materials which reflect the light well are called shiny materials. Example: Stainless steel, gold and diamond.

Materials which do not reflect the light well are called dull materials. Example : Candle, paper and jute bag

## **Rough and Smooth Materials**

Materials which have ups and downs on their surface are called **rough materials**.

**Example:** Brick, rock and tyre. Materials which do not have ups and downs on their surface are called **smooth materials**. **Example:** Mirror, Silk cloth and tiles

## **Flexible and Rigid Materials**

**flexible materials. Example:** Rubber band, electric wire and cycle tube. Materials which cannot be bent or stretched easily are known as **rigid materials. Example:** A stick, wooden scale and stone

### **Waterproof Materials**

Materials that do not allow water to pass through them are called **Waterproof Materials.**

**Example :** Raincoat and aluminium foil of tablet strip.

### **III. Transparent, Translucent and Opaque objects**

**Transparent Objects :** Transparent objects allow the light to pass through them. So, we can see other objects clearly through **Transparent Objects. Examples:** Air, glass and pure water.

**Translucent Objects :** Translucent objects allow some light to pass through them. So, we cannot see objects clearly, but we see them as blurred images through them. **Examples:** Paper soaked in oil, snow and vegetable oil

**Opaque objects :** Opaque objects do not allow light to pass through them. So, we cannot see through these objects. **Examples :** Wood, stone and metals.

### **IV. Reflection of Light:**

We see the world around us with the help of **light**. Where do we get light from? Light may come either from the Sun or from other sources like an electric lamp or a bulb. The objects that give off light are called **light sources.**

When light falls on a transparent material it passes through it. However when light falls on a polished surface of an opaque material, it does not pass through it. It bounces back. The bouncing of light by any smooth or polished surface is called reflection.

When you look into the mirror, you can see your own face on the mirror. What you see is a reflection of your face in the mirror. We also see reflections of other objects that are in front of the mirror. These reflections are formed by light and they are called **images**. Mirrors can reflect sound waves too. So they were used in the **Second World War** to detect sounds coming from enemy aircraft.

### **Work and Energy**

## I. Work:

An action in which one exerts a force to move an object is known as **work**. Two main conditions are needed for work to be done.

- A force should act on an object.
- Object should move from one place to another.

When the force acting on the object makes it move, **work** is said to be done.

**Energy** is defined as capacity of doing work.

Energy must be **transferred** to an **object** in order to do **work**.

### Types of Energy:

#### 1. Renewable Resources:

Renewable sources of energy are replaced naturally over a period of time. We can keep using these sources for a long period of time. Since the beginning of human

life, we have been using these resources. We use these resources for light, transport,

cooking, heating. Eg: Sun, Wind and Water.

#### 2. Non-renewable Resources:

The resources which are not easily replaced once used are called the non-renewable

resources. Eg: Petrol, Coal and Natural gas. The law of conservation of energy states that energy can neither be created nor destroyed. It can be converted from one form to another.

The SI unit of energy is joule. It is named after James Joule who explained about energy.

Simple machines are tools which are used to make our work easier. Some examples for simple machines are pulley, wedge, inclined plane, screw, lever, wheel and axle.

A pulley is a machine made up of a wheel with a cut around it. A rope or chain passes around the pulley. It rotates in the direction with more force. Eg: crane. An inclined plane is a flat sloping surface with one end higher than another. Eg: ramp, slide and slope for wheel chair. A wedge is a tool with a sharp edge which can be used to split materials. It is used to break wooden logs into two pieces. Eg: knife, scissors and axe. The screw is used to raise weights and to hold objects together.

Eg: pencil sharpener, screw-jack, bottle cap and windmill. Wheel and axle consist of a wheel attached to a small rod so that these two parts rotate together. Eg: bicycle wheel, door knob, grinder, axle wheel. Simple machines usually exchange a smaller force to move a heavy object. The work required is the same, but the force required is less. The idea of a simple machine originated with the Greek philosopher Archimedes around the 3rd century BC. A lever is used to multiply the force we give on an object. Eg: see saw, nut cracker and plier.

**Load** is the object on which the force is applied.

**Effort** is the force we apply on the lever.

**Fulcrum** is the point on which the lever rotates.

Lever is classified into three types according to where the load and effort are located with respect to fulcrum. When the fulcrum is between the effort and the load, it is known as Class I lever. Eg: scissors, pliers, seesaw. When the load is between the effort and the fulcrum, it is known as Class II lever. Eg: wheel barrow, lemon squeezer, nut cracker. In this lever, the effort is between the load and the fulcrum. Eg: stapler, tongs, broom stick, hockey stick.

### **Science in Everyday Life**

Milk is produced by Mammals for nourishing their young ones. Milk from many animals is used by humans. Cow's milk is used commonly. Milk is primarily obtained from mammals.

It is also obtained from other sources too. Examples: Soya milk, nut and seed based milk.

Milk contains water, sugar, protein, fat, vitamins and minerals. Based on the amount of fat present in the milk, it can be classified as Whole milk, Low fat milk and Fat free milk.

### **Health Benefits of milk**

- 1. It strengthens bones and teeth.**
- 2. It maintains blood pressure.**
- 3. It reduces the risk of heart disease.**
- 4. It is a source of energy.**

**What is food?** Food is one of the basic needs of our life. Food provides energy. It is usually made by cooking plants or animals. It contains essential nutrients to keep our body healthy.

Food can be classified into two types:

**1. Raw Food** - Raw food is the food that does not have to be cooked to eat.

Examples: Fruits, carrot, ground nut seeds.

**2. Cooked food** - Cooked food is the food, that has been cooked to eat.

Examples: Rice, vegetable curry, bread.

Cooking is important. It makes food suitable for consumption.

**Methods of Cooking** :Boiling, Steaming, Frying, Deep frying, Roasting, Grilling.

Baking is a method of cooking. We use dry heat to bake. Bread, biscuit and cake are

some examples of baked food items. Bread is a common food item prepared by baking the dough. It is an important source of energy for sick people. It is also one of the ancient foods made by humans. Bread is a low fat food. Bread has the nutrients required for normal

development and good health. To make bread we need wheat flour, yeast, water, sugar and salt. Biscuit is a small, flour – based baked food. It is generally made of wheat flour or oats and sweetened with sugar. The main ingredients of biscuit are flour, sugar, butter, water, milk, baking powder and flavours. Biscuits are salty or sweet. Some biscuits have cream in between.

Cake is a baked dessert. It is like a sweet bread. There are many varieties of cake with specific ingredients. We use cake during celebrations. The common ingredients of the cake are flour, sugar, eggs, oil, baking powder and flavouring agent.

A gadget is a small electronic machine or device which does something useful.

Number of gadgets have changed our lives. They make our life enjoyable.

Examples:

Laptop

Phone

Camera

Pen drive

## Speaker

Smart Phones apart from communication, smart phones have the ability to access the internet and store files, take photos, track location and much more. Portable music player stores and plays thousands of songs. We can listen to songs anywhere, anytime. Tablets are people use tablets to read books play games and watch videos. Pen drive is a small gadget used for storing and transferring any type of file in and from a computer. electric torch portable hand held electric light. Torch is used to provide light in the dark places when it switched on.

## Food

Food is one of the basic needs of life. We get energy for all our activities from food. Food obtained from the nature provides all the nutrients to our body. But seeing the advertisement, we are attracted towards junk food. In this lesson, we will study about food items that are good for our health, cooking methods and the importance of not wasting food. In our daily life, we depend on plants and animals for our food. Some can be eaten raw but most of them need to be cooked. Let's see what food can be eaten raw and which one needs cooking. Food that we eat directly without cooking is called **raw food**. We eat fruits, some vegetables, tubers and nuts in the raw form. Some pulses and cereals are also eaten as raw food. All raw food must be washed with clean water before eating. Some of the raw food items are given below.

We cannot eat all the food items in raw form. Food that needs to be processed using heat before it can be eaten is called **cooked food**.

Why should we cook food?

- Cooked food is digested easily.
- Cooking softens the food materials.
- Cooking kills germs.
- Cooking adds taste and flavour to food

Some of the commonly used cooking methods are



given below.

**Boiling:** It is a method of cooking food by immersing it in boiling water. So that the food becomes soft. *Example:* Rice, Egg.

**Steaming:** It is a method of cooking food in steam by immersing the vessel in a container with boiling water. *Example:* Idli, Idiyappam.

**Pressure cooking:** It is a method of cooking food in a pressure cooker. *Example:* Rice, Dhal.

**Roasting:** It is a method of cooking food by heating on a tawa or frying pan without covering

it. *Example:* Groundnuts, Cashewnut.

**Frying:** It is a method of cooking food in hot oil. *Example:* Chips, Poori.

Utensils are in different shapes and sizes. We use specific utensils for each cooking method. Clay pots were used earlier. Stainless steel and aluminum vessels are now generally used for cooking.

Clay pots are well-suited for all types of cooking. Cooking in clay pots improves the quality and taste of food and also retains the nutrients. The natural insulation properties of clay cause heat and moisture to balance and circulate throughout the

pot and keep the nutrients unharmed and prevent the dish from burning.

**Benefits of claypot cooking are,**

- Easy to digest.
- Preserves the nutrients.
- Needs less oil for cooking.
- Adds flavour to the dish.
- Keeps the food warm for a long time.
- Keeps the food from becoming stale soon.
- Alkaline property in the pot neutralizes the acidic property in the food.

Meal-time hygiene includes ways to make sure that we do not get sick because of

the way we eat or make food. Some of the hygienic ways of taking food are given below:

- Always cover food to protect them from dust and insects.

- Eat fresh food always.
- Avoid taking food that is too cold or too hot.
- Avoid fast food and fried food.
- Always wash your hands with soap before and after eating.

When we are sick, we should avoid food items that are fried in oil. We should take

energy-giving, easily digestible food. Some of them are given below:

- Porridge of rice or cereals.
- Fruit juice, tender coconut.
- Steamed foods like idly.

We should not waste food. Food that is not eaten is called leftover food. That is discarded as waste. Following are the simple ways to avoid food wastage.

- Take what you'll eat and eat what you take.
- Share the excess food.
- Give the excess food to hungry animals.

Make small paper rolls, each having a food item's name. Put all of them on a table. Make two big circles on the floor. Name one circle '**MUST AVOID**

### **DURING**

**ILLNESS'** and another circle '**MUST TAKE DURING ILLNESS'**. Ask children to take one roll each and stand in the correct circle after reading the name on the roll.

We can preserve the food for long time by using the following methods. Food Preservation Refrigerating - Keeping food in the refrigerators (fridge) to preserve them for a short time. Example-Fruits, Vegetables Drying - Removing the water content of the food. Example- Fish, Red chillies Canning - Storing food in air tight containers. Example-Jam

## **Water**

Water is the most abundant and precious resource on the Earth. It is found in

oceans, seas, rivers, streams, lakes, ponds and even under the ground. All living things

need water to live and to do many other activities. We have already learnt about this in

the previous classes. Let us learn more about water in this lesson. Water occurs naturally in three forms: ice, water and water vapour. These forms are also called states of water. Ice is in solid form, water is in liquid form and watervapour is in gaseous form. These states occur naturally because of temperature changes.

Water becomes ice in cold regions, remains as water in oceans/rivers and becomes water vapour due to the heat of the Sun. Human body consists of 75% of water.

**SOLID STATE (Ice)** Ice is a solid form of water. At temperature below 00 C water becomes ice. This

process is called freezing. Cooling Water Ice below 00C. **LIQUID STATE (Water)**

Water in liquid state is available in water bodies such as oceans, river, waterfalls etc. **GASEOUS STATE (Water vapour)**

Water becomes water vapour as the temperature increases due to heat. Heating forms a white mist of extremely small water droplets in the air known as water vapour. Heating Water Water vapour 1000C. In nature, water keeps changing its state. Let us see how this happens. Due to the Sun's heat, water in oceans and rivers changes into water vapour and rises up. Water becoming water vapour on heating is called **evaporation**. The water vapour, when comes into contact with cool air, becomes water droplets. This is called **condensation**. The water droplets combine to form clouds. The water droplets continue to combine, and they become big and heavy. These water droplets then fall down as rain. This is called **precipitation**. In colder places, combined water droplets come down as snow, sleet or hail. This continuous change of water from one state to another in nature is called water cycle. The continuous cycle through which water is circulated by different processes like evaporation, condensation and precipitation is called water.

**Importance of water cycle**

- To improve the availability of ground water.

- To control the Earth's temperature.
- To provide water to plants and animals especially humans.
- To recycle the Earth's supply of water constantly.

73% of our brain's mass consists of water. The Antarctic region has about 70% of the

world's fresh water. Rainwater harvesting process of collecting and storing rainwater for future use. Rainwater can be collected in natural reservoirs or artificial tanks. Roof top harvesting is also a type of rainwater harvesting. The rainwater on the top of the building is collected and passed into the ground through pipes. Water passing through the pipes enters the pit which consists of gravels and Coarse sand. As it passes impurities are filtered and stored as ground water. 1 inch of rainfall on a 2,000 sq.ft. roof is equal to 4,800 litres of water.

#### **Benefits of rainwater harvesting**

- It increases the ground water level
- It can be used for agriculture
- It increases the availability of water for living things.

The rain water harvesting was launched in the year 2001 by the Tamil Nadu government.

- Tamil Nadu is the first Indian state which made rainwater harvesting as mandatory.

#### **Plants**

All living things eat food. Food helps them grow and perform daily activities.

We have seen animals eating their food. But, have you ever wondered how plants get

their food? Plants produce their own food with the help of chlorophyll, a pigment

present in leaves. Humans and animals depend on plants for their food either directly

or indirectly. Let us learn more about plants in this lesson.

Leaves are of different shapes and sizes and have different parts. However, there are some basic parts that are common in most of the leaves.

Blade : The broad flat part of the leaf

(Lamina).

Apex : The tip of the leaf.

Midrib : The midrib runs along the centre of the leaf.

Veins : Veins are branch out from the midrib. They are the framework of hollow tubes that carry water and minerals.

Petiole : This part joins the leaf to the main stem.

**Stomata** : Stomata are tiny openings or pores mostly found at the base of the leaves. Air enters and leaves the plant through these openings. Stomata helps the plants to breathe. Stomata are used to **exchange gases**. Plants need food but they never depend on people or animals to provide them. Most of the plants are able to make their own food through a process called

**photosynthesis**. Photosynthesis = Photo (light) + synthesis (make)

**Photosynthesis** is a process by which plants make their food using chlorophyll water, carbon dioxide in the presence of sunlight. Let us see how this process is organized with in the plants.

**Water:** Water is absorbed by the roots and is passed to the leaves through the tubes.

**Carbon dioxide:** Carbon dioxide in the air passes through small pores in the leaves.

**Sunlight:** A green pigment in the leaves help them to trap sunlight. This pigment is called **chlorophyll**. Most leaves are green in colour because of this green pigment. Through photosynthesis plants produce the food and release oxygen into the air. Sun light Water + Carbon dioxide Food + Oxygen

Chlorophyll As plants prepare food for themselves and also for other living things, they are

called **primary producers**. Without primary producers, living things that are not capable of producing their own food and will

not be able to live. Plants are classified in many ways based on stems, life span, seeds, flower and colour. In this session we will study about the classification of plants based on the flower and colour (pigment). Flower is the most important part of many plants, because it is involved in reproduction. But some of the plants are not having flower. These plants are also reproduce in different modes. Based on this plants, can be classified into two types.

Flowering plants

Non-flowering plants.

### **Flowering plants**

Plants bearing flowers are called flowering plants. It reproduce by sex cells or gametes and produce seeds. Seeds produce new plants. Eg – Mango, Neem, groundnut,

paddy. **Non-flowering plants**

Plants without flower that can reproduce are called non-flowering plants. These plants do not produce seeds. They reproduce by a special structure called spores. E.g. Algae, Fungi, ferns. The most important pigment present in plants are called chlorophyll. Based on the colour present in the plant, they are divided into two groups such as Green and Nongreen plants. **Green plants**

Plants containing green pigments are called green plants. It looks green in colour.

They prepare their own food with the help of them. It depends atmosphere, light and pigment for food preparation. Green plants are commonly called autotrophs. E.g. Grass, Paddy, Algae. Non-green plants Plant that lacks chlorophyll pigment and looks not green are called non-green plants. They cannot prepare their food. These plants depend on other organism for their food and living place. These are commonly called heterotrophs. The four visible parts of a flower are explained below.

**Sepal:** Sepals are leaves that protect the flower while it is still a bud. Sepals are usually green in colour.

**Petal:** Petals are often bright coloured. Their main job is to attract insects such as bees or butterflies, to the flower. The insects help the flowers in the transfer of pollen grains.

**Stamen:** Stamen can be seen at the centre of a flower. They contain pollen grains that help the plants to multiply. It is the male part of a flower.

**Pistil:** Pistil is also seen at the centre of the flower. The pistil uses the pollen to help the flower become the fruit. It is the female part of a flower.

The change in climate that occurs periodically is called **seasons**.

There are four general seasons - **Spring, Summer, Autumn** and **Winter**.

Most flowers bloom in a specific season. Hence, they are called **seasonal flowers**.

### **Flowers that bloom in winter**

December, Winter Jasmine, Tuberose

### **Flowers that bloom in summer**

Jasmine, Sunflower, Rose

### **Flowers that bloom in autumn and spring**

Dahlia (Autumn), Saffron (Autumn), Tulip (Spring),

The plants that are growing outside its native area either purposefully or accidentally are called exotic plants. Most of these plants are brought to new areas for decoration purposes. Some of them are given below. Sago palm (Cycas), Fern, Crotons, Travelers palm, Boat lily, Aloe vera. **Parthenium** plant accidentally grows in a new native. This plant expands its range and disturbs the cultivation areas. The pollen of this plant is allergic in nature. So, **don't touch this plant**.

Humans and other animals often use plants as food. Plants we eat are edible.

Edible

parts of some plants include leaves, stems and roots. We also eat fruits produced by plants.

## **Edible parts of plants**

All the parts of different plants are edible, that is, we can eat them as food.

### **Roots as food**

Many plants store excess food in their roots. They have thick and swollen roots.

These roots are used as food. Some of them are given below. Carrot, beetroot, tapioca

### **Stems as food**

In some plants the stem stores the excess food in it. Potato, onion, ginger are underground stems that we eat. Some of them are given below.

Onion Turmeric Sugarcane

### **Leaves as food**

Leaves of some plants are used as food. In some plants extra food is stored in leaves. We eat the leaves of plants like cabbage. Some of the leaves used as food are

given below.

Coriander Cabbage Moringa

### **Flowers as food**

Flowers are the most attractive part of the plant. Many flowers are used as food.

Some of them are given below.

Banana flower Cauliflower Clove

### **Fruits as food**

Many fruits are used as food. Fruits are rich in vitamins and minerals. They keep us



healthy. All fruits can be eaten raw.

Banana Mango Jack fruit

### **Grains as food**

Grains of pulses, cereals and pods are the commonly eaten seeds. They are rich sources of carbohydrates and proteins.

Rice Pulses Fenugreek

## GREEN ENVIRONMENT Unit 1

Nature provides us a lot of useful things. But human beings exploit the natural resources and create more trash. These unwanted materials thrown away are called

wastes. They can be solid, liquid and gas. They are produced from households, industries,

hospitals etc., These unwanted materials pollute our environment.

1. **Separation of Waste:** This is a very important step in waste management. It means to sort or divide the waste into different waste bins. Each bin should have different type of wastes. It is good to separate waste in three different bins. Green for biodegradable waste, Blue for recyclable waste and Red for nonrecyclable waste. Non-biodegradable waste can be classified as recyclable and nonrecyclable.

2. **Waste collection and transportation:** Once we separate our waste in our homes and schools, it is important to keep it ready to be picked up by our municipality or corporation. Picking up the waste is called Waste collection. Moving the waste from one place to another is called Transportation.

3. **Waste recycling and composting:** Biodegradable waste is taken to a place where it

can be converted into compost. Compost makes the soil fertile. Non-biodegradable

waste that can be turned into something new (recyclable waste) and valuable is

taken to recycling factory.

**4 Waste disposal:** The waste that cannot be recycled (non-recyclable waste) needs

to be sent for final disposal. This waste is sent to an open dump or landfill.

**Reduce** is to make or use less materials. This is to make, buy and use things that

create less waste. It is the best thing to do first and it is easy to ask yourself – How

can I make less waste? Some examples are given below.

1. You can buy a refill pen and change the refill only when the ink is used up.
2. While shopping with your parents, you can carry a cloth bag.

In this way you can avoid buying plastic carry bags.

3. Turn off lights and fans when you leave a room.
4. Close the tap while you are brushing your teeth.

**Reuse** is using a thing repeatedly for the same or for another purpose.

By reusing, we throw away less waste and do not dispose it in a dump.

Reuse saves money, energy and time. Here are some examples of how you can reuse materials at home.

1. You can reuse old clothes as a rag to clean your home or even wash your cycle.
2. You can reuse jam and pickle jars to store things.
3. You can donate old clothes that still look good to poor and needy children.
4. You can reuse waste and make something new. E.g. You can reuse a plastic bottle as a pen stand or a bird feeder.

**Recycle** is to take materials from things you throw away and make new products by

using them. Recycling takes energy and time but saves the amount of 'new' resources

we need to make things. E.g. water, minerals, wood.

Here are some examples of how certain materials are recycled.

1. Old newspapers, note books and magazines are separated and sold to a scrap dealer. They will be made into new papers.
2. PET bottles are recycled into plastic threads and then used to make sports T-shirts.
3. Old glass bottles and broken glass pieces are melted to make new glass.
4. Broken metal items like tiffin boxes and plates are melted and made into new

metal products like toys.

Waste at home should be separated into biodegradable, recyclable and non-recyclable waste. Waste like left over food, vegetable waste which are broken down naturally should be collected in a separate litter box. Materials which cannot be decomposed should be placed in separate dustbin. Paper waste, glass waste and aluminium waste which can be recycled into new useful products should be kept in separate box.

Tamil Nadu is leading the way in India by banning some one-time use plastic items.

List of items banned in Tamil Nadu are given below.

Animals eat **plastic bags** by accident and their food passage is choked.

**Plastic plates** stay in the environment for over 1000 years.

**Water pouches** litter the land and are difficult to recycle.

**Plastic straws** are difficult to recycle and end up polluting the ocean.

Chemicals from **plastic sheets** leak into food.

Things that can be decomposed or broken down by microorganisms are biodegradable. They can return to the soil and enrich the soil. Materials which are beneficial to the environment and do not cause harm are called eco-friendly materials. For example, banana leaves are used as plates. They are fully biodegradable and do not contain chemicals like thermocol plastic or coated paper plates. Bamboo is used to make many things such as bags, dustbins and even toothbrushes. **Stainless steel water bottle and snack box** are some examples of eco-friendly

materials. Stainless steel does not leak chemicals into your food or water. So it is safer

than plastic. These can be reused for a longer period of time. Litter in our environment is unsightly and spoils our experience of nature. It is also

dangerous to animals that ingest it. Cleaning up loose waste is one of the best ways to

keep our community and the environment green. By removing litter from environment,

we are ensuring that it does not end up in our oceans.

### **National Green Corps (NGC)**

It is a national programme initiated by the Government of India. The motto of NGC is

“Where there is Green, there is Prosperity” It involves NGC school students in protecting and

promoting the conservation of natural resources. They participate in activities like biodiversity conservation and waste management.

### **LIFE OF ANIMALS**

Have you ever wondered why a dog drools on seeing food? Why cuckoo sings only

during summer? Why baby birds open their mouths when the mother returns to the nest?

Each animal has some unique behaviour. Animal behaviour includes the activities of an animal and its interaction with other organisms. E.g. Blinking, eating, walking and flying. Animals gain a lot of benefits from spending time together with other members of the same species. This is called group behaviour. Animals like tiger, bear etc live in solitary (alone). Some animals live in small groups (E.g. Pride of a few lions) and some live as larger herd (E.g. Herd of thousands of wilde beest). Group behaviour is also called social behaviour. Members of the group work together to find food, defend themselves and look after the young ones. E.g. All the fish in a school move together, following their leader in the front. Staying in a group helps the small fish appear big. The main purpose of group behaviour is to help animals survive in nature.

#### **Group behaviour in Bees**

When insects live together, they often follow a hierarchy. E.g. Bees have one queen bee in every hive. There are a few male bees called drones. There are hundreds of female bees, which are the worker bees.

## **Nesting Behaviour in Birds**

Birds are very different from each other. They live in different places, eat different foods and have different life styles. Some birds permanently live in groups while others come together only during the breeding season. Birds also live in groups and each bird's group has a different name. E.g. Flock of parrots, Stare of cranes. Not all the bird species build nests. Some of them lay their eggs on the ground or in gap between rocks. Most of the birds build their own nests carefully like engineers. They build nests for their young ones. Some weave leaves, some use twigs, some build with thorns then pad it with soft materials.

## **Group behaviour in Elephants**

Elephant group is called Herd or Parade. For each group there is a female head, which leads the group towards the availability of food, water and safety. The leader

fi ghts for their group. All animals in a group obey the command of their leader.

Older

animals teach manners and life skills to young ones.

Adaptation is the most essential factor of all living beings. The changes in an animal's

behaviour to adjust with its habitat is called adaptation. If an organism fails to adapt to the

particular environment, its survival is difficult. All animals have special body parts to

live in a particular place at a particular time. E.g. Giraffes have developed very long necks

because of their environmental demands.

There are three basic types of adaptations seen in animals. They are,

### **1. Structural adaptations**

Changes in the physical features of the animal are called structural adaptations.

E.g. **Polar bears** living in cold climate have physical adaptations, such as thick fur and

short ears to reduce heat loss.

### **2. Physiological adaptations**

Changes in the functions of the animal's body are called physiological adaptations.

E.g. **Dog** shivers to generate more heat when it is cold and pants when it is hot.

### **3. Behavioural adaptations**

Changes in the activities of the animal are behavioural adaptations.

E.g. **Birds** migrate to avoid adverse conditions.

Insects have three main body regions. They are; Head, thorax, and the abdomen. All parts of the insect are inside an exoskeleton.

- **Head** The main visible parts on the head are the large compound eyes, the antennae (feelers) and the mouth parts.

- **Thorax** The thorax is the middle region of the body. It bears three pairs of legs and two pairs of wings.

- **Abdomen** The abdomen is the last part of the insect body. Abdomen of most of the insects have clear segmentation.

Insects have differences in structures like wings, legs, antennae and mouthparts. The legs are modified for walking, jumping, digging or swimming.

Most of the insects have wings which can be folded flat over their body. E.g. Bug

There are some insects which cannot fold their wings. E.g. Dragonfly. Some insects are

wingless. E.g. Silverfish. Some animals have well developed special senses. These special senses help the animals experience the world around them.

#### **Ants**

Ants have sense of sight, smell, taste and touch. Ants have organs of smell and taste in their antennae. They feel the vibrations in the ground through their feet. Ants

have a good sense of smell.

#### **Bats**

Bats have a good sense of hearing. They use sound navigation. They produce ultrasonic sound which helps the bats find their way at night and find out the

objects on their path. This is called "Echolocation". Vampire bats feed on the blood of their prey. Vampire bats have heat-detecting noses which allow them to find their prey. Some animals sleep in the day time and are very active at night. A good example is cat at your home. Not only small animals but also some birds are active at night. Such animals are called Nocturnal animals. E.g. Owl.

Efforts taken by the adult to take care of their young ones is called Parental care. Parental care increases the survival rate and improves the quality of young one. It also increases the reproductive success of animals.

Kangaroo

Kangaroo is best known for parental care. Female kangaroo carries its baby in its pouch. The pouch provides a safe place for the young ones to stay until they grow large enough to survive outside on their own.

Cow

Cow gives milk and protects its calf from the enemies. Mother and calf communicate with each other through a sound. Calves respond to the calls from their own mother by calling back.

### **Human beings**

Humans promote and support the physical, emotional, social and intellectual development of their child. The human infant or baby is completely helpless at birth. Mother takes good care of the baby by feeding, helping to sleep and making comfortable with clothes etc. Through proper parenting the child is taught whatever needed to live successfully in the society.

### **AIR WE BREATHE**

Our earth is made of land, water, and air. All three components are very much important for

the survival of all living creatures. Air is present all around us and is very important for our lives. It is very important to cause rain and for the growth of crops. It is needed for the respiration of plants and animals.

### **Importance of Air in Our Daily Life**

1. Oxygen present in air is needed for respiration.
2. We can speak and hear the sound only when there is air around.



3. Air helps in the dispersal of seeds for plant reproduction.
4. Monsoon and rain occurs due to the wind action.
5. Air regulates the atmospheric temperature

The air we breathe consists of a mixture of gases. It contains solid and liquid particles too. Air can be separated into its constituents such as oxygen, nitrogen etc. Water vapour mixes with air and becomes a part of it. Air also contains dust and smoke. Air shows the properties of all the gases present in it. E.g. Air supports combustion because of oxygen present in it. While cooking using firewood, fanning air helps in burning of fire wood. The composition of air is not constant. It varies from place to place and over time. Air is not a single element; it is made up of different substances. **Nitrogen** The amount of Nitrogen present in air is about 78%. It is used to fill up food packages to extend their shelf life. Liquid nitrogen is used to store living cells. Plants need nitrogen for their growth. We can see root nodules containing nitrogen in some plants. Nowadays people use nitrogen gas to fill the tyres of their vehicles. Some compounds of nitrogen are used as explosives also.

### **Oxygen**

It is one of the main components of air. The amount of Oxygen present in air is about 21%. All the creatures cannot live without oxygen. It can be tested with a piece of glowing splint, which relights in oxygen.

Uses of oxygen

1. All living things use oxygen for breathing.
2. Oxygen is essential for burning.
3. Oxygen cylinders are used in hospitals to enable the patients to breathe when they cannot breathe normally.
4. Oxygen is used in gas welding.

### **Carbon dioxide**

The amount of carbon dioxide present in air is only 0.03%. Though it is less in percentage its uses are more and essential. It can be tested with lime water. The lime water changes from colourless to milky.

Uses of carbon dioxide:

1. Carbon dioxide helps plants in photosynthesis.
2. It is used in fire extinguishers.
3. It is used in refrigerators as dry ice for cooling purposes.
4. It is used to make plastics and polymers.

Air has other gases like hydrogen, helium, argon etc. in small proportion. Air also contains water vapour which varies according to the environment. When we breathe, we take oxygen from air and release carbon dioxide and water vapour to air.

The atmospheric balance is disturbed by human activities. This leads to environmental problems like air contamination and global warming. The air carries soot, smoke, and other particles from car exhaust and power plants. These are the major contributors to air pollution.

### **Adverse effects of air pollution**

#### **Global warming**

This changes the climatic conditions of different regions of the world. It also causes disturbances in agriculture and food production. Melting of snow caps and increase in sea levels are the consequences of global warming

#### **Formation of smog**

When dust particles and smoke combine with fog in the presence of sunlight, smog is formed. It reduces the visibility. It also causes many respiratory disorders and allergies.

#### **Formation of acid rain**

Sulphur dioxide and nitrogen oxides react with water in the atmosphere producing sulphuric acid and nitric acid. These acids come down along with the rain. This is called acid rain.

Acid rain

- causes respiratory and skin disorders
- damages the leaves and affects the productivity of plants
- enters the ground and river waters causing harm to the aquatic life
- erodes marble and damages monuments like Taj Mahal.

### **Aerosol formation**

When liquid or solid particles are dispersed in air, it is called aerosol. Aerosols are deposited on the leaves affecting photosynthesis.

### **Depletion of Ozone**

The hydrocarbons such as the Chloro Fluoro Carbons (CFCs) destroy the ozone layer. Ozone holes allow the UV rays to reach the earth's surface. UV radiation harms wildlife, damages plants and causes skin cancer in humans

### **Effects of air pollution on human beings**

Air pollution has bad impact on human health. When the pollutants increase in air, they cause irritation in the eyes, nose and throat. Air pollution can also produce wheezing, coughing and breathing problems in humans. Some of the major effects of air pollution on human beings are:

1. Respiratory diseases. E.g. Flu, Tuberculosis
2. Cardiovascular damage.
3. Fatigue, headaches and anxiety.

### **Steps to check air pollution**

Air pollution can be reduced by the following steps.

1. Alternative source of energy (E.g. Solar energy) should be used.
2. Air filters should be used to prevent harmful gases mixing with air.
3. Smoke emission test and certification of motor vehicles must be enforced.
4. More trees should be planted to absorb carbon dioxide.
4. Nervous system damage.