

# 2

## Human Body



Hi, I'm EeeBee

We'll cover the following key points:

- Internal Organs of The Human Body
- Respiratory System
- Deep Breathing
- Air Pollution

Do you Remember:

Fundamental concept in previous class.

In class 2<sup>nd</sup> we learnt

- Introduction of Body Parts
- Internal Parts

Still curious?  
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scanning  
the QR code.



### Learning Outcomes

By the end of this chapter, students will be able to:

- Understand the internal organs of the human body and their roles in keeping us healthy and active.
- Identify and describe the parts of the human respiratory system and how they help us breathe.
- Learn about the benefits of deep breathing for the body and mind.
- Explore the effects of air pollution on our health and understand why clean air is essential for living.

### Guidelines for Teachers

The teacher can start the chapter by introducing the concept of the Human Body as an amazing machine, focusing on its internal organs and how they work together to keep us alive. Discussions can highlight the respiratory system and its importance in breathing and keeping us energized. The teacher can also emphasize the practice of deep breathing as a way to improve health and explain how air pollution affects our lungs and overall well-being.



INSTANCES	SENSE ORGANS USED
Rita observes that her teacher is wearing a different perfume today. She is using her sense of	
Minu observes that a lump of ice is cold. She is using her sense of	
Tom observes that a torch has been turned on. He is using his sense of	
Tina observes that there is someone knocking on the door. She is using her sense of	
Arav observes that the milk he drinks is sour. He is using his sense of	

### Fun Fact



The human body is amazing! Did you know that your heart beats about 100,000 times every day to pump blood all around your body? It's like a superhero working non-stop! Also, your brain is so powerful it can send messages to the rest of your body at lightning speed—faster than a race car! And here's something cool: every single person has a unique set of fingerprints, even twins! Isn't the human body incredible?

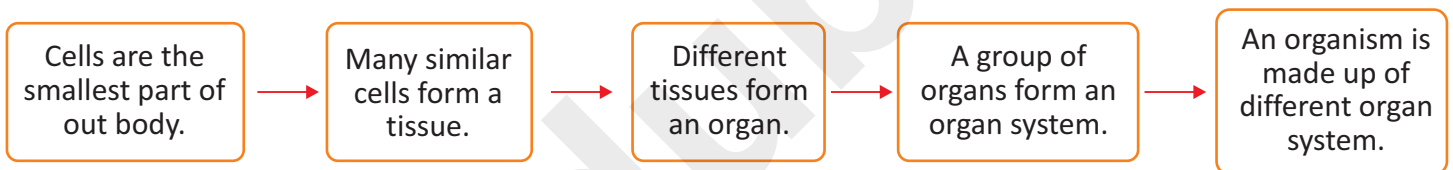
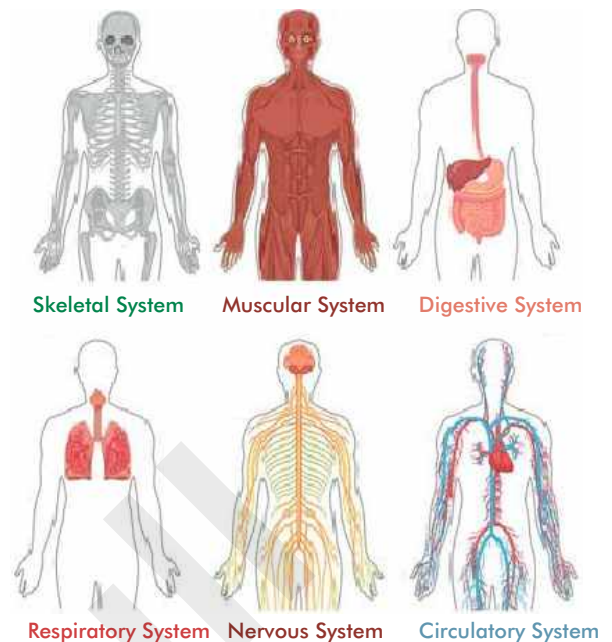
Our body is an amazing machine. Like all machines it has many parts. Various parts perform various functions. It connects us to our surroundings and helps us to respond.

For example, when a running vehicle approaches us, our eyes see it; our ears hear its sound and the information immediately goes to the brain. The brain now decides what to do and sends information to our limbs to move back. In this way, all our activities are the outcome of the work of different body parts.

## Let us now learn about our organ system.

Our body is made up of a large number of cells. A group of cells is called tissue. Different types of tissues join to form organs or body parts. Our body has five sense organs and many other organs. These organs work in groups. A group of organs working together is known as an organ system. An Organ System consists of a group of organs that work together to do the same work. These organ systems work together in our body for it to function properly.

Some of the large internal organs of our body are heart, lungs, stomach, and kidneys. The Skeletal System, Digestive System, Excretory System, Respiratory System, Circulatory System, and Reproductive System are major organ systems of our body.

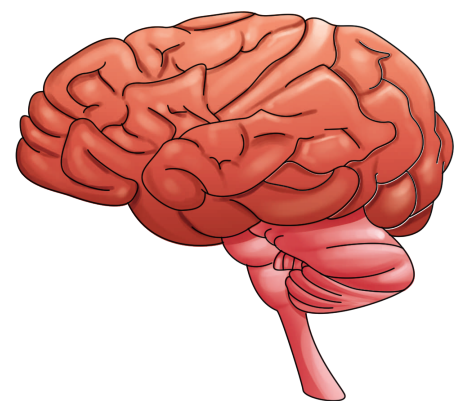


## Internal Organs of The Human Body

The internal organs play an important role in our survival. They are located at specific places in our body. The functions of these organs are as follows:

### Brain

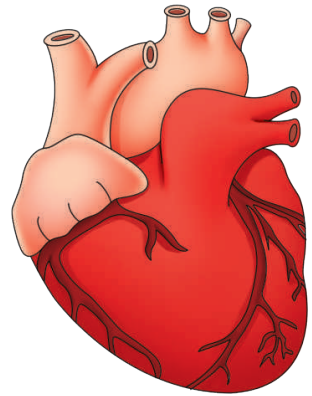
Our brain is very delicate and is protected by our skull from outside. The brain controls the entire function of our body. It receives signals from our sense organs and sends information to other part of the body. It stores information and helps to think and learn new things. It controls functions such as breathing, digestion, muscle control, emotions, heartbeat etc.



Brain

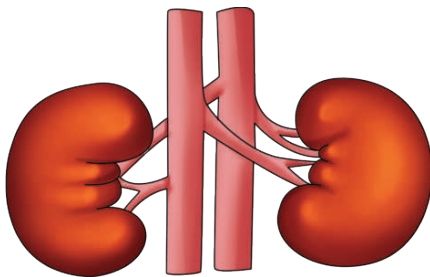
## Heart

Our heart is a very important organ of our body. It works day and night. We can feel our heart beat by placing our hand or ear on the left side of our chest. Our heart beats about 72 times in a minute. Its function is to circulate blood throughout our body through blood vessels (arteries and veins). The heart is a red brown coloured muscular organ. It is located in a slanting position in the centre of chest.



Heart

## Kidneys



Kidneys

Kidneys are two **bean shaped** organs in our body. The kidneys are located at both sides of our backbone just under the ribcage. The entire blood in our body passes through the kidneys many times a day. Kidneys filter water and salts from our blood. The waste get collected in the urinary bladder and is thrown out of body as urine.

## Liver

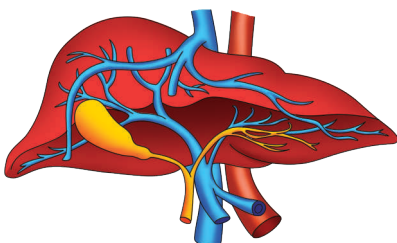
Liver lies on the right side of the stomach. It is the largest gland in our body. It secretes and sends bile juice to the small intestine which helps in digestion of food. The liver breaks down fats, filters toxins (harmful substances) and controls blood sugar of our body.

### Did you know ?

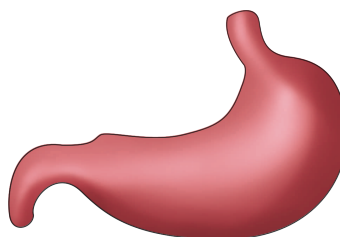
The largest organ inside our body is the liver.

## Stomach

Our stomach is the internal organ where most of the digestion takes place. It is a muscular, elastic, pear shaped bag under the ribs. From upper end, it connects to the food pipe (oesophagus) and lower part leads into the small intestine. Stomach secretes gastric juices which help in the digestion of food.



Liver



Stomach



Take a Task

Watch Remedial

## Bones

All the bones in the human body together are called the skeletal system. The skeletal system provides strength and **rigidity** to our body. We have 206 bones in our body. Each bone has a function. Some bones offer protection to softer parts of the body. For example, the skull protects the brain and the rib cage protects our heart and lungs. Other bones, like bones in our legs and arms, help us to move around by providing support to our muscles.

### Did you know ?

Your funny bone isn't really a bone at all – it's a nerve at your elbow, which is why you feel all tingly when you accidentally hit it.

### Check 'N' Mate

**Write 'T' for true and 'F' for false statements.**

1. Brain controls the entire function of our body.
2. Our heart beats about 30 times in a minute.
3. Liver lies on the right side of the stomach.
4. We have 206 bones in our body.
5. Stomach connects to food pipe.

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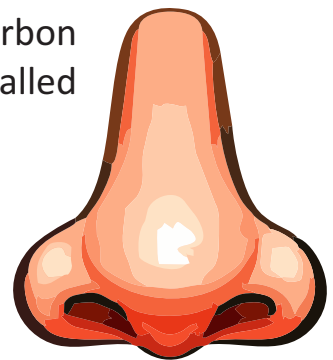
## Respiratory System

The respiratory system is the group of tissues and organs in our body that allow us to breathe. This system includes nose, windpipe and lungs. The main function of the respiratory system is to supply oxygen to all the parts of our body. It does this through breathing.

**1. Nose:** We inhale oxygen-rich air and exhale air filled with carbon dioxide, which is a waste gas. The process of breathing in is called inhalation.

Nose consists of fine hair and a sticky substance called mucus inside it. The nasal hair and mucus traps dust particles and germs preventing its entry into the lungs.

**2. Trachea:** Commonly known as the windpipe, the trachea is an air passage that carries air from the nose to the lungs.

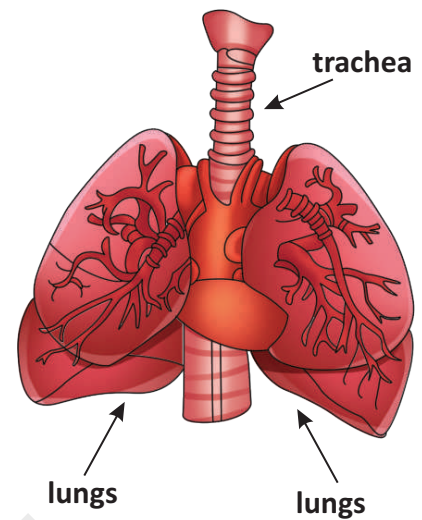


**3. Lungs:** We have two lungs, which together form one of the largest organs in our body.

The lung on the left is a bit smaller than the lung on the right because it has to make room for the heart to fit in the chest. The lungs and the heart need to be close together because they work together.

The rib cage goes around the lungs and heart to protect them from damage. The ribs also move when we breathe in and out.

Below the lungs is the diaphragm (say dye-a-fram). This is a big muscle that works with the lungs to get air in (inhale) and out (exhale).



## Deep Breathing

- ✦ When we breathe in through our nose, the air moves down through the windpipe and reaches the two lungs.
- ✦ In the lungs, the oxygen gets absorbed and enters our blood. The carbon dioxide a waste product of our body is thrown out through the wind pipe and nose.
- ✦ The blood carries the oxygen to the heart. The heart pumps all the oxygen-carrying blood to every cell in our body.
- ✦ So, breathing makes our blood pure.

### Did you know ?

Your heart beats over 1,00,000 times a day!

## Activity

### Creative Learning

1. Put one hand on your chest and the other on the upper part of your tummy.
2. Now breathe in deeply. You will feel your chest and your tummy get bigger as the air goes into your lungs.
3. When the diaphragm contracts (gets tighter) it pushes some of the organs in your tummy down so that there is more space in your chest.



## Deep Breathing

Deep breathing is a simple breathing exercise that helps in exchange of gases. It is a type of pranayama and is practised during yoga to relax the body and mind.

### Simple Process of Deep Breathing

- ✦ Find a comfortable, quiet place to sit or lie down. If sitting, keep your back straight and your feet flat on the floor. Close your eyes.
- ✦ Take a deep breath slowly through your nose. Your stomach will swell and expand a little.
- ✦ Hold your breath for a few seconds and slowly breathe out through your mouth. Your stomach will go in when you breathe out.
- ✦ Repeat the process several times to relax your body and mind.

## Air Pollution

Air pollution occurs when gases, dust particles, smoke or odour are added into the atmosphere in a way that makes it harmful to humans, animals and plants. This makes the air dirty. The harmful substances that make the environment dirty are called pollutants. It makes the air impure and unsafe for breathing.



### Causes of Air Pollution

- ✦ Some sources of air pollution come from nature. These include eruptions of volcanoes, dust storms, and forest fires.
- ✦ Human air pollution is caused by things such as factories, power plants, cars, airplanes, chemicals, fumes from spray cans, and methane gas from **landfills**.
- ✦ When we burn fossil fuels such as coal, oil and natural gas, they release all sorts of gases into the air causing air pollution such as smog.

## Effects of Air Pollution

- ✦ The effects of air pollution are alarming. It causes respiratory diseases such as asthma, chest pain, lung cancer and heart diseases.
- ✦ Burning of fossil fuels leads to acid rain and can cause great damage to human beings, animals, crops and monuments.
- ✦ Ozone exists in the Earth's stratosphere and is responsible for protecting human beings from harmful ultraviolet (UV) rays. Air pollution can cause holes in this ozone layer.



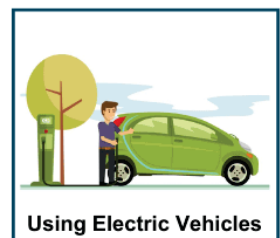
Air Pollution

## Ways to Reduce Air Pollution

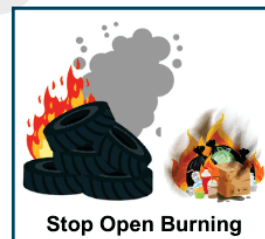
- ✦ Plant more trees to increase the oxygen level in the air.
- ✦ Use more public transport than private vehicles and also try to make use of car-pooling to save energy.
- ✦ Use CNG fuel for vehicles and get the pollution checks done regularly.
- ✦ Switch off the lights and fans when not in use.
- ✦ Avoid burning polythene bags, wood, leaves and coal.
- ✦ Recycle plastic, paper and other waste materials.
- ✦ Make the people aware about the different ways of reducing pollution.



Planting Trees



Using Electric Vehicles



Stop Open Burning



Use Alternative Energy

Ways to reduce Air Pollution

## Check 'N' Mate

## Critical Thinking

### Fill in the blanks with correct words.

1. The lung on the left is a bit \_\_\_\_\_ (smaller/larger) than the lung on the right.
2. The blood carries the \_\_\_\_\_ (carbon dioxide/oxygen) to the heart.
3. The harmful substances that make environment dirty are called \_\_\_\_\_.
4. Plant more trees to \_\_\_\_\_ (decrease/increase) the oxygen level in the air.





## In a Nutshell

- † Our body is made up of cells, tissues, organs and organ system.
- † Our body consists of internal organs and external organs.
- † Internal organ are : brain, heart, lungs, liver, stomach and kidneys.
- † A human body has several organ systems that work together to keep it functioning.
- † The parts of the respiratory system are nose, windpipe and lungs.
- † Deep breathing keeps the body and mind relaxed.
- † Air pollution makes the air unclean and unsafe for breathing, causing several diseases in humans.



## Key Words

## Improving Vocabulary

Bean shaped : Shape like a bean

Rigidity : Not able to be changed

Landfills : The disposal of waste material by burying it, especially as a method of filling in pits.

Car-pooling : Refers to the people travelling together in a single car.



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# EXERCISE

That turn curiosity into confidence—let's begin!



## A. Objective Type Questions:

1. During exercise, our body needs more oxygen. Which system ensures that all parts of the body receive enough oxygen?

P Respiratory system.

Q Digestive system.

R Blood circulatory system.

(A) P only      (b) Q only      (c) P and R only      (d) Q and R only

2. Match the organ with which it works.

- |            |           |
|------------|-----------|
| 1. Kidneys | A. Air    |
| 2. Heart   | B. Food   |
| 3. Lungs   | C. Blood  |
| 4. Stomach | D. Wastes |

(A) 1 - B, 2 - C, 3 - A, 4 - D

(B) 1 - A, 2 - C, 3 - D, 4 - B

(C) 1 - D, 2 - C, 3 - A, 4 - B

(D) 1 - C, 2 - D, 3 - A, 4 - B

3. When we inhale, we breathe in air into the lungs. What do we breathe out when we exhale?

(A) Only oxygen gas

(B) Air that has more oxygen than inhaled air

(C) Only carbon dioxide gas

(D) Air that has more carbon dioxide than inhaled air

4. The function of hair inside our nose is \_\_\_\_\_.

(A) To make it beautiful

(B) To keep the lungs cold

(C) To not to let too much air go inside

(D) To not to let dirt particles enter our lungs

## B. Fill in the Blanks:

1. When we \_\_\_\_\_ air enters the body through the nose and mouth.
2. \_\_\_\_\_ and mucus work to trap dirt and germs before we inhale.
3. The \_\_\_\_\_ helps draw air into the lungs.
4. The \_\_\_\_\_ controls the rate of breathing.
5. The harmful substances that make environment dirty are called \_\_\_\_\_.

## C. Very Short Answer Questions:

**Name the Following:**

1. It controls the entire function of our body. \_\_\_\_\_
2. It circulates blood throughout our body. \_\_\_\_\_
3. It is the largest gland in our body. \_\_\_\_\_
4. They are bean-shaped organs in our body. \_\_\_\_\_
5. It provides strength and rigidity to our body. \_\_\_\_\_

## D. Short Answer Questions:

1. What is an organ system?
2. Name the major organ systems of our body.
3. What are the different functions of brain?
4. Write the functions of:- a) Heart   b) Kidneys   c) Liver   d) Stomach
5. What is deep breathing?

## E. Answer the Following Questions:

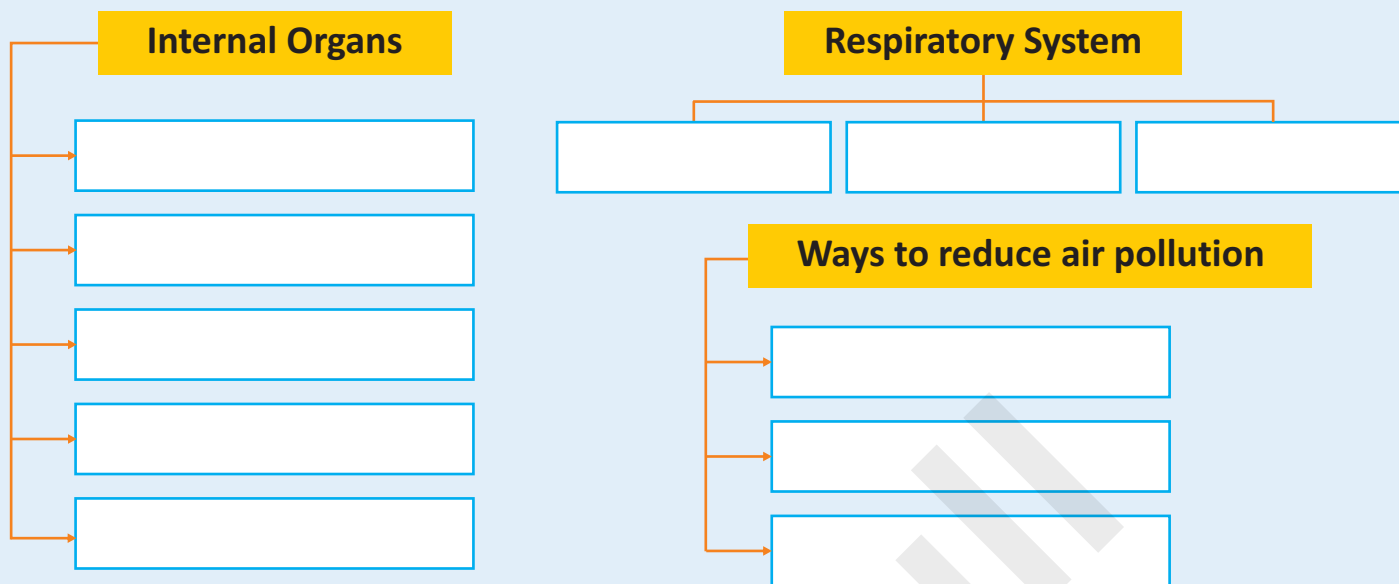
1. How does the respiratory system help us to breathe?
2. Discuss the function of lungs with the help of a neat labelled diagram.
3. Write the difference between inhalation and exhalation.
4. Explain the process of breathing.
5. What is air pollution? What are the causes of air pollution?
6. Write three effects of air pollution.
7. Write three ways to reduce air pollution.



## Time to Recall

Remembering and Analysing

Recall and complete the concept map given below.



## Time to Apply

Applying and Creating

Mr Dixit has the habit of burning all the old newspapers whereas his neighbour sells them off to the scrap dealer. Who do you think is doing the correct thing and why?

## Time to Discuss

Pondering and Communicating

Why do we need more oxygen after a heavy exercise?



## Time to Observe

Observing, Critical Thinking, Analysing

Observe the picture and answer the questions that follow:

- Why is the policeman covering his mouth and nose?
- What do you think about the air quality of the place?



### YOU'LL NEED

- ✦ A plastic bottle
- ✦ An elastic band
- ✦ 2 balloons
- ✦ A straw
- ✦ Scissors
- ✦ Play dough

### INSTRUCTIONS :

1. Carefully cut your bottle to about half the size.
2. Tie a knot in one end of one balloon and cut off the fat end.
3. Stretch the balloon around the bottom of your plastic bottle.
4. Put a straw in the neck of the other balloon and secure tightly with the elastic band but not so much that you crush the straw. The air must flow through, so test it with a little blow through the straw to see if the balloon inflates.
5. Put the straw and the balloon into the neck of the bottle and secure with the play dough to make a seal around the bottle – make sure that again, you don't crush the straw.

Hold the bottle and pull the knot of the balloon at the bottom. What happens?

You should find that the balloon inside the bottle inflates, and as you let go the balloon deflates.



### WHY DOES THIS HAPPEN?

As the knotted balloon is pulled it creates more space inside the bottle. Air then comes down the straw and fills the balloon with some air to fill the space! When you let go of the knot the space no longer exists, so the air from the balloon is expelled making it deflate.

Inside the lungs are a network of tubes which allow air to pass through. Air is warmed, moistened and filtered as it travels through the mouth and nasal passages. It then passes through a network of tubes, eventually reaching tiny sacs called alveoli which are where gas exchange occurs.