

# 3

## Human Body: Digestive and Excretory Systems



Human beings take in food through the mouth. They bite and chew their food using their teeth. The digestive system breaks down the food further into simpler forms to release nutrients that are used by the body.

### Learn about

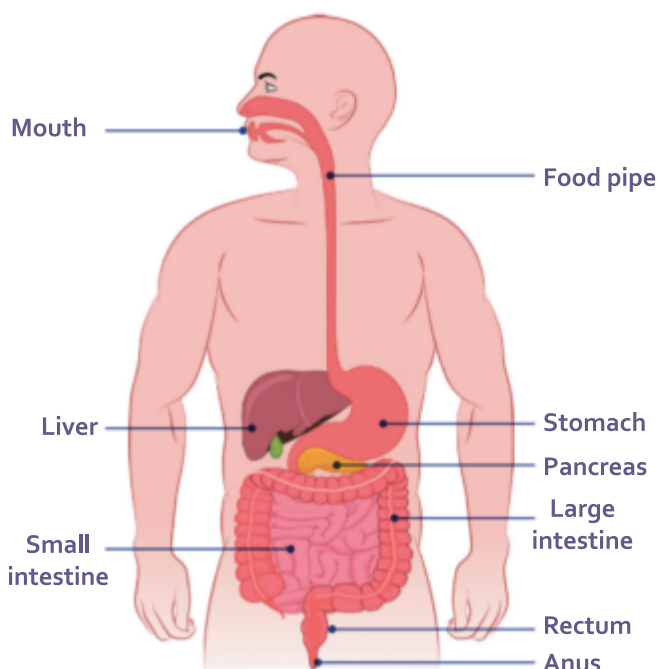
- Digestive system
- Excretory system
- Healthy habits related to
  - digestion
  - excretion

### ► Digestive System

The process by which food is broken down into a simpler form so that it can be easily taken in or absorbed by our body is called **digestion**. Many organs<sup>1</sup> work together and help in the process of digestion. The mouth, food pipe, stomach, small and large intestines, liver, pancreas, rectum, and anus are the main organs of the digestive system. Let us learn about the role of each organ in the process of digestion.

**Mouth** Digestion starts in the mouth. The teeth help to break down and chew food. The chewed food then mixes with a liquid, called **saliva**, produced by the **salivary glands** present in our mouth. Saliva makes the food softer and easier to swallow. The **tongue** helps in the proper mixing of saliva with the food.

**Food pipe** Through the food pipe (oesophagus), the food passes from the mouth to the stomach.



Diagrammatic representation of the human digestive system

<sup>1</sup>organ: a part of the body that carries out a specific function

**Stomach** Inside the stomach, the food is broken down further into smaller pieces by churning<sup>2</sup> and with the help of chemicals called **digestive juices**.

**Liver and Pancreas** The liver and pancreas produce digestive juices which enter the small intestine, and help in further digestion of food.

#### Fact File

The muscles of the food pipe contract and relax to create a wave called **peristalsis** that pushes the food down the pipe.

**Small intestine** From the stomach, the food passes into the small intestine. The small intestine is a long and hollow tube-like structure that produces digestive juices. Digestion is completed in the small intestine and the useful nutrients from the food are absorbed into the blood. Blood then carries these nutrients to different parts of the body.

**Large intestine** From the small intestine, the undigested food passes into the large intestine. The large intestine is a shorter but wider, tube-like structure, which collects the indigestible food from the small intestine. The large intestine absorbs water from this undigested food and forms waste products called **faeces**.

**Rectum** Rectum is the final part of the large intestine. Faeces are stored in the rectum for a short time before being passed out through the anus.

**Anus** Faeces are removed from the body through the anus.

### Need for Chewing Food Well

We must eat our food slowly and chew it well. Chewing breaks down the food into smaller particles. Digestion of carbohydrate starts in the mouth, where smaller particles of food mix with **saliva**. Saliva contains enzymes that help in digestion. Mixing of food with saliva in the mouth also liquefies it partially, so that it becomes easier to digest it.

If we do not chew our food properly, large food particles will reach our stomach, and take a longer time to digest. Hence, digestion may not occur properly and nutrients from the food may not be released completely for absorption into the body.

Well-chewed food and a healthy digestive system help in the formation of proper faeces. This leads to a regular bowel movement by which our body gets rid of toxins and waste materials that are inside. Regular bowel movement prevents digestive disorders and helps us stay healthy.

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<sup>2</sup>churning: a strong spinning movement

## Need for Water

Drinking water is vital for life. We should drink nearly eight glasses of water every day. It is especially important for our digestive system. If we do not drink enough water, absorption of food and nutrients in the intestine will not be proper and the digested food material will dry up in the intestine. As a result, there will be irregular bowel movement, which will lead to constipation and discomfort. We should eat lots of fruits and vegetables. They are rich in fibre which is necessary for proper bowel movement.

## ► Excretory System

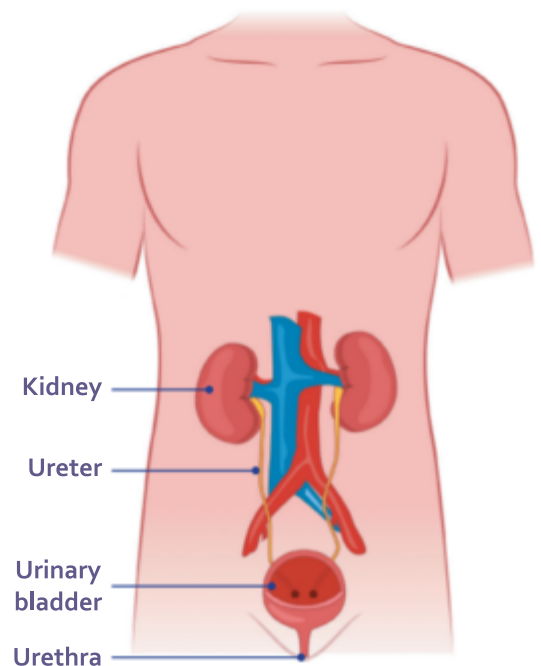
The excretory system helps in removing wastes from our body. *The process by which wastes get removed from our body is called **excretion**.* The excretory system is made up of a pair of kidneys, a pair of ureters, a urinary bladder, and a urethra.

**Kidneys** Urine is formed inside the kidneys. It contains harmful substances that are formed inside our body and need to be excreted out.

**Ureters** Urine is transported from the kidneys to the urinary bladder through a pair of thin tubes called ureters.

**Urinary bladder** Urine is stored inside the urinary bladder.

**Urethra** Urine is released from our body through urethra.



Human excretory system



Our skin, lungs, and liver are also considered as excretory organs.

## ► Healthy Habits Related to Digestion



Healthy eating habits lead to proper digestion of food. This makes us healthy and strong. We must follow the healthy habits as listed below.

- We must wash our hands properly before and after eating food.
- Always eat from a clean plate.
- Eat a balanced diet. Avoid eating junk food.
- Do not drink a lot of water while eating.

- Eat food rich in fibre, such as fruits and vegetables.
- Avoid refined white flour. Eat chapattis made from whole-wheat flour.
- Include multigrain bread in our diet.
- Eat sprouted mung or gram seeds. They are rich in nutrients and help in good bowel movement.

## ► Healthy Habits Related to Excretion



We should follow certain healthy habits so that waste material does not remain in our body for a long time.

- Drinking plenty of water will help in the proper removal of waste from our body. We should drink at least 7–8 glasses of water every day.
- We should never withhold urination for a long time because that might make us fall sick. Liquid waste materials should be removed from our body at regular intervals, through urine.

### Know Your SDGs



#### SDG 3: Good Health and Well Being

*(Ensure healthy lives and promote well-being for all at all ages)*

We can ensure good health and well-being by eating a balanced diet and taking care of our hygiene and sanitation. What steps you can take to ensure proper sanitation of your surroundings?

### Case Study



Yamuna is one of the major rivers in northern India. Many industries and houses are built near the bank of the river. Due to a lack of awareness, it is now considered one of the most polluted rivers in the country. Consuming polluted water can have harmful effects on humans, like diarrhoea, nausea, vomiting, typhoid, etc. To avoid polluting water bodies, waste should not be directly discarded in them; the use of household chemicals and detergents should be controlled and more. To control water pollution in Yamuna, the government is taking steps such as building new sewer treatment plants, and repairing the existing sewer treatment plans.

Based on the above information, answer the following questions:

- What is the impact of polluted water on humans' digestive and excretory systems?
- What measures is the government of India taking to reduce water pollution?
- What steps can we, as individuals, take to avoid water pollution?





## Questions

**Names of organs of the digestive and excretory systems are given below. Write 'DS' for the organs of the digestive system and 'ES' for organs of the excretory system.**

- |                          |                  |
|--------------------------|------------------|
| 1. Kidneys .....         | 2. Rectum .....  |
| 3. Small intestine ..... | 4. Liver .....   |
| 5. Ureters .....         | 6. Anus .....    |
| 7. Stomach .....         | 8. Urethra ..... |
| 9. Urinary bladder ..... | 10. Mouth .....  |

## Wrap Up

- The process by which food is broken down into a simpler form so that it can be easily taken in or absorbed by our body is called digestion.
- The organs of the digestive system are the mouth, food pipe, stomach, liver, pancreas, small and large intestines, rectum, and anus.
- The excretory system is made up of a pair of kidneys, a pair of ureters, a urinary bladder, and a urethra.
- Healthy eating habits lead to good digestion of food and proper excretion. This makes us healthy and strong.

## Exercises

### SECTION I

**A Choose the correct option.**

1. In which of the following organs does digestion start in the human body?  
a. Small intestine   b. Blood vessels   c. Stomach   d. Mouth
2. Which of the following organs helps in the absorption of nutrients in the body?  
a. Small intestine   b. Stomach   c. Liver   d. Urethra
3. Which of the following organs helps in the absorption of water?  
a. Large intestine   b. Stomach   c. Urethra   d. Oesophagus
4. Which of the following organs store urine?  
a. Urethra   b. Kidneys   c. Ureter   d. Urinary bladder



5. Which of the following is required for good bowel movement?  
a. Saliva                      b. Fibre                      c. Nutrient                      d. Enzyme

**B** **Assertion and Reasoning questions.**

1. **Assertion (A):** Faeces are stored in the rectum for a short time.  
**Reason (R):** Rectum is the last organ of the digestive system.  
a. Both A and R are True                      b. Both A and R are False  
c. A is True and R is False                      d. A is False and R is True
2. **Assertion (A):** Urine is formed inside the kidneys.  
**Reason (R):** It contains useful substances that are formed inside our body.  
a. Both A and R are True                      b. Both A and R are False  
c. A is True and R is False                      d. A is False and R is True

**C** **Choose the correct word to fill in the blank.**

1. From the mouth, the chewed food reaches the stomach via the ..... (oesophagus/kidneys).  
2. The liver secretes .....(saliva/digestive juices) that helps in the digestion of food.  
3. The ..... (excretory/circulatory) system helps in removing wastes from our body.  
4. Waste from our body is removed by the ..... (kidneys/stomach).  
5. Urine is formed inside the ..... (kidneys/ureters).

**D** **Match the following.**

**Column A**

1. Churning  
2. Saliva  
3. Food pipe  
4. Kidney  
5. Fibre

**Column B**

- a. Enzyme  
b. Stomach  
c. Roughage  
d. Oesophagus  
e. Urine

**SECTION II**

**E** **Short answer questions.**

1. Define digestion.  
2. What is the role of tongue in the digestive process?  
3. What happens to the undigested food?



4. Define excretion.
5. Name two waste products of our body.

**F**

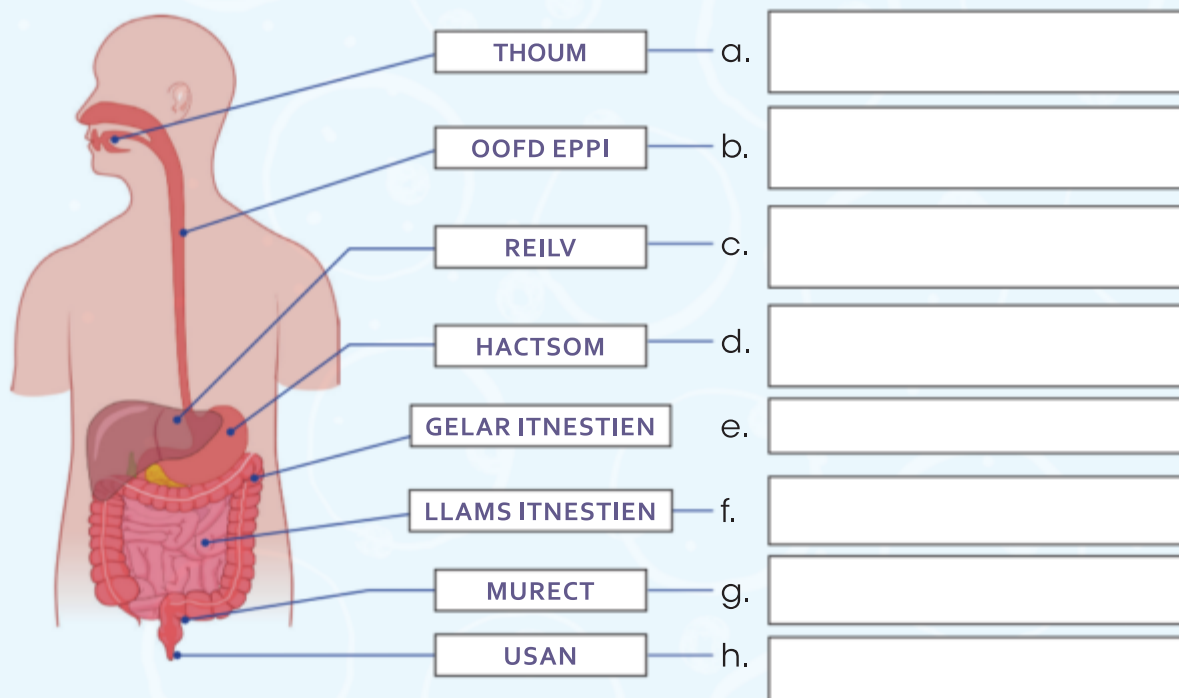
### Long answer questions.

1. Abhishek's teacher takes their class to the science lab and they see a model of human body there. The teacher asked Abhishek to identify the various parts of the digestive system and explain their functions. Help Abhishek in finding the answer.
2. Arpit is curious about how his body works. He learnt in his class that the human body has a system to remove waste from the body, but he forgot the correct order. Help Arpit by naming the organs of the excretory system in sequence and explaining their function.
3. Swati was asked to give a class presentation on 'Healthy Habits for Digestion'. She wants to ensure that she covers all the points. Help Swati by writing a short note on the topic.

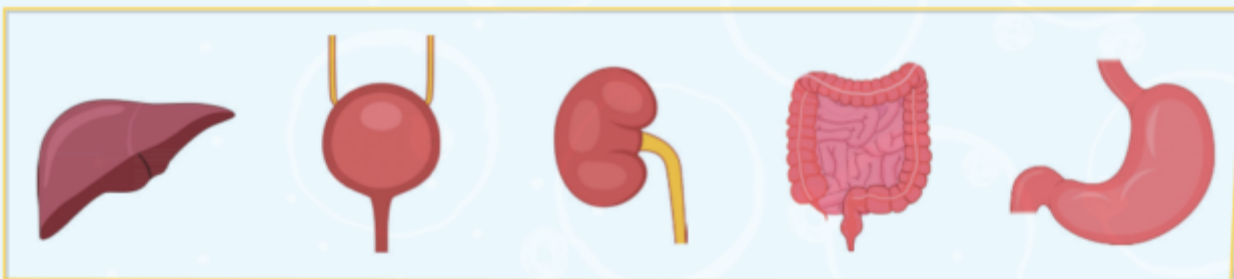
### Picture Study



- 1 The figure of the human digestive system with jumbled up labels are given below. Unjumble and write the correct labels in the boxes given alongside.



- 2** Look at the picture box, with organs related to the digestive or the excretory system. Identify them, and write their names and the system to which they belong, in the boxes given below. (Write 'DS' for digestive system and 'ES' for excretory system.)



a.

b.

c.

d.

e.

### My Learning Corner



#### **A** Think about

Rakesh is suffering from constipation. His doctor advised him to eat lots of fruits and vegetables, along with at least eight glasses of water every day. Why did the doctor say so? Discuss.



#### **B** Try out

1. Make a model of digestive or excretory system by using various items like clay, Plaster-of-Paris, cotton, and cardboard.
2. Divide the whole class into groups and discuss about the healthy food habits related to digestion and excretion. (Before conducting the discussion in the classroom, discuss with elders, make necessary preparations like searching the Internet and making a list of important points at home.)
3. Make a poster on the topic "How does water help us in digestion and excretion?" (Take help from the Internet, if required).
4. Proper digestion of food and removal of waste during excretion is vital for your health and physical well-being. Elaborate.





## Self-Assessment

Now that you have completed the chapter, score each of the following tasks from 1 to 5 to indicate how well you can do them.

Score 5 = I can definitely do this.

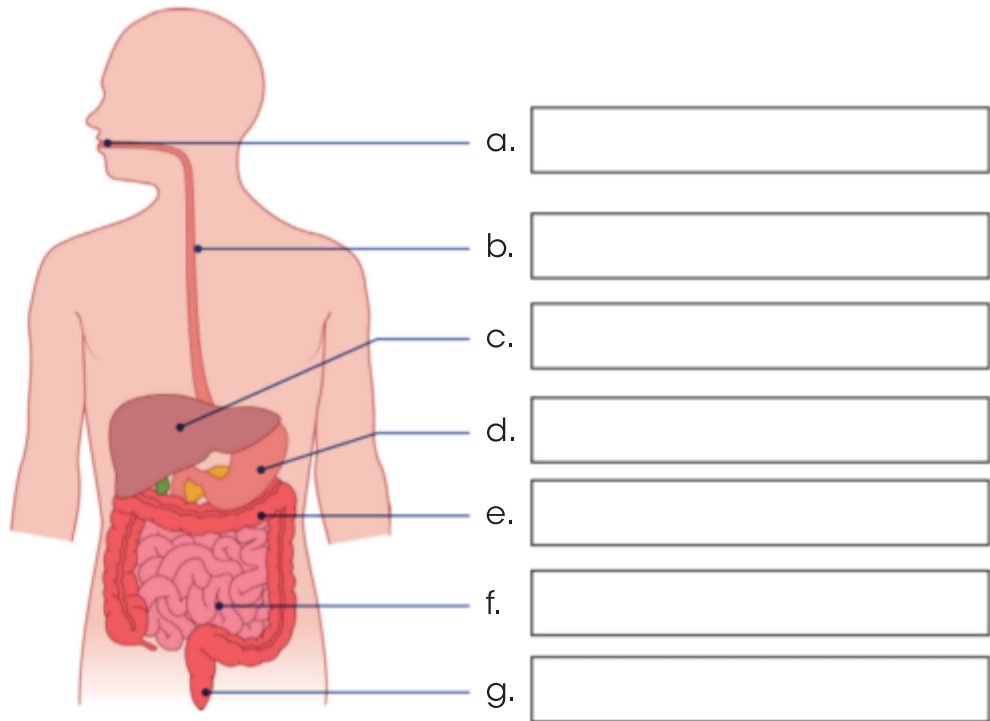
Score 1 = I cannot do this yet.

I can...	My score
• explain the process of digestive system.	
• draw diagram of the human digestive system and its different organs.	
• explain the process of excretory system.	
• draw diagram of the human excretory system and its different organs.	
• list the healthy habits related to digestion and excretion.	

# Worksheet

Identify the diagrams of the human organ systems and write the names of the parts that are labelled in the boxes alongside.

1.



2.

