

THE DIGESTIVE SYSTEM

The digestive system has 3 main functions. First, it **breaks down food** into smaller nutrients that the body can use. Secondly, these nutrients **are absorbed into the blood**. Thirdly, **waste products are eliminated** from the body.

The process where the body breaks down food into smaller nutrient molecules is called **digestion**. There are 2 types of digestion: mechanical and chemical digestion. In **mechanical digestion**, food is physically broken down into smaller pieces by tearing, slicing, churning and mixing. In **chemical digestion**, chemicals produced by the body break down food into very small pieces.

The process of digestion is as follows.

1. The Mouth



The **mouth** breaks down food by both mechanical and chemical digestion. Your teeth carry out mechanical digestion. The fluid in your mouth is called **saliva**. Saliva plays an important role in chemical digestion. As the teeth break food into smaller pieces, saliva mixes with the food. Chemicals called enzymes, found in saliva, break down food into smaller pieces.

2. Epiglottis and Esophagus

When you swallow, muscles in your throat move the food downward. As this happens, a small flap of tissue called the **epiglottis** closes off your windpipe so that food doesn't enter your lungs, which would cause you to choke.



The epiglottis directs the food into the **esophagus**, a muscular tube that connects the mouth to the stomach. The esophagus is lined with mucus. **Mucus** is a thick, slippery substance that makes food easier to swallow. Food stays in the esophagus for only about 10 seconds. The muscles surrounding the esophagus contract to push food toward the stomach in waves. These waves of muscle contractions are called **peristalsis**.

3. The Stomach



Food leaves the esophagus and enters the **stomach**. The stomach is a J-shaped muscular pouch located in the middle of the abdomen. Most mechanical and some chemical digestion occur in the stomach. Mechanical digestion occurs as layers of muscle in the stomach lining contract to produce a mixing and churning motion. Chemical digestion is carried out by stomach juices that contain enzymes and **hydrochloric acid**. When the food has been turned into liquid form, it moves onto the small intestine.

4. The Small Intestine

The **small intestine** (also called the gut) is the part of the digestive system where most chemical digestion takes place. Almost all the digestion and absorption of nutrients occurs here. Enzymes produced by the small intestine, liver and pancreas contribute to the chemical digestion of food.



5. The Liver, Gall Bladder and Pancreas



The **liver** is the largest organ inside the body. The role of the liver in the digestive system is to produce bile. Bile is a special substance that breaks down fat molecules. Bile is produced by the liver and is stored in small pouch below the organ called the gall bladder. After you eat something, bile passes from the gall bladder into the small intestine. The bile mixes with fats in food and breaks them into small fat droplets.

The **pancreas** is a triangular organ that lies between the stomach and the upper part of the small intestine. Like the liver, the pancreas produces enzymes that flow into the small intestine and help break down carbohydrates, proteins and fats.



After the food is completely digested, it must be absorbed by the body. **Absorption** is the process where nutrient molecules pass from the small intestine into the blood. The lining of the small intestine is covered with millions of tiny finger-shaped structures called **villi** (singular *villus*). The villi absorb nutrient molecules. The nutrients pass from the villi into blood vessels directly below them. The blood then carries the nutrients to all of the body's cells for energy.

6. The Large Intestine and Rectum



The **large intestine** (also called the colon) is the largest part of the digestive system. The material entering the large intestine contains mostly water and undigested food. The two jobs of the large intestine are to reabsorb the water and to package the rest of the material into **waste**.

The large intestine ends in a short tube called the rectum. Here, the waste is compressed into solid form. The solid waste is then eliminated from the body through the anus, a muscular opening at the end of the rectum.

REVIEW QUESTIONS - THE DIGESTIVE SYSTEM

1. What does digestion mean?

2. What are the two types of digestion?

a. _____	b. _____
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3. True or false? In chemical digestion, foods are physically torn into smaller pieces by chewing. _____

4. The fluid that is released when your mouth waters is called _____.

5. Circle the letter of the object that carries out mechanical digestion in the mouth.

a. saliva

c. enzymes

b. teeth

d. mucus

Match each term with its correct description.

_____ 6. epiglottis

a. A thick, slippery liquid that makes food easier to swallow.

_____ 7. esophagus

b. A flap of tissue that blocks the windpipe, preventing food from entering the lungs.

_____ 8. mucus

c. A muscular tube that connects the mouth to the stomach.

_____ 9. peristalsis

d. Waves of muscle contraction that pushes food down toward the stomach

10. Circle the letter of EACH sentence that is true about the stomach.

a. The stomach is a J-shaped muscular pouch.

b. Mechanical digestion does NOT occur in the stomach.

c. Stomach juices contain enzymes and hydrochloric acid.

d. The stomach releases the food in liquid form into the LARGE intestine.

11. What takes place in the small intestine?

12. List 3 organs that produce chemicals used in the small intestine.

a.	b.	c.
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13. The substance made by the liver that breaks up fat particles is called _____.

14. What is the role of the gall bladder?

15. The tiny finger-shaped structures that cover the inside of the small intestine are called _____.

16. What are the two jobs of the large intestine?

17. The short tube at the end of the large intestine, where waste material is compressed into solid form is called the _____.

Final Review

Match each organ with its correct function

- | | |
|-----------------------|---|
| _____ 18. liver | a. stores bile produced in the liver |
| _____ 19. gallbladder | b. tiny, finger-shaped structures that absorb nutrient molecules into the blood |
| _____ 20. pancreas | c. solid wastes exit the body through this opening |
| _____ 21. rectum | d. largest organ in the body, produces bile |
| _____ 22. anus | e. structure where waste material is produced into solid form before exiting the body |
| _____ 23. bile | f. produces enzymes that flow into the small intestine |
| _____ 24. villi | d. a chemical that breaks up fat molecules into smaller droplets |