HUMAN DIGESTIVE SYSTEM

Explain ingestion, absorption, assimilation, and excretion.
S8LTIva-13

DIGESTIVE SYSTEM

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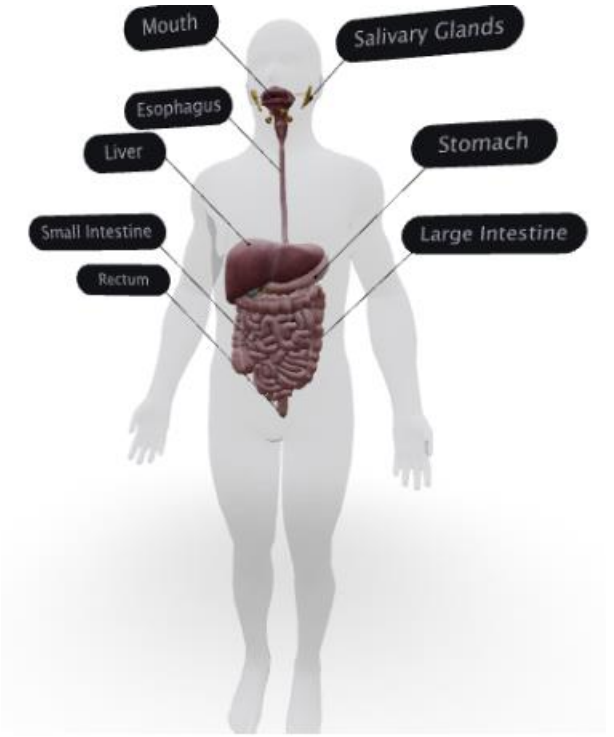
LESSON 1: STRUCTURES AND FUNCTIONS IN HUMAN FOCUS ON THE DIGESTIVE SYSTEM

The food that we eat plays a central role in the survival of species. It provides energy that enables us to carry out many activities that we do each day such as breathing, walking, studying, and cooking. Food must be broken down into a form that these microscopic cells can use. The body changes food into usable form using a group of organs referred to as the digestive system. Food must be broken down into a form that these microscopic cells can use. The body changes food into usable form using a group of organs referred to as the digestive system.

In humans, the digestive system is composed of the gastrointestinal tract (GI), also known as the alimentary canal and the accessory organs for digestion. The gastrointestinal tract starts at the mouth, continues to the esophagus, stomach, small intestines, large intestine (colon), and rectum, and ends at the anus. Accessory organs that play very important roles in the digestive process are the liver, gallbladder, and pancreas.

The chief function of the digestive system is digestion, the breakdown of organic compounds into their simple forms for use by the cells. It breaks down food mechanically and chemically.



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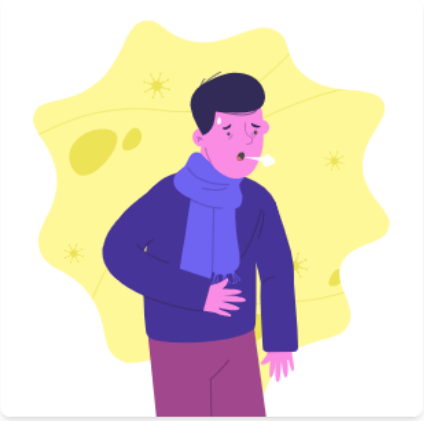
INGESTION, DIGESTION, ABSORPTION, ASSIMILATION, AND EGESTION

DIGESTION

Marks the beginning of the digestive process. It involves the intake of food or substances into the body through the mouth. This step is essential as it sets the stage for the breakdown and absorption of nutrients.

INDIGESTION



A. Indigestion marks the beginning of the digestive process. It involves the intake of food or substances into the body through the mouth. This step is essential as it sets the stage for the breakdown and absorption of nutrients. The process starts with chewing, where food is mechanically broken down into smaller pieces, making it easier for the digestive system to process.

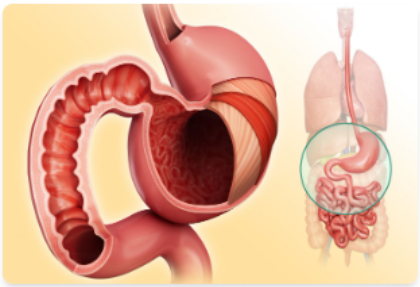
DIGESTION

B. Digestion is the second process involved in the digestive system. It involves the breakdown of large food molecules into smaller molecules for easy absorption by the cells. Both chemical and mechanical digestion begin immediately in the mouth.

- The liver produces bile, a green fluid that emulsifies large fat droplets into smaller ones, stored in the gall bladder for later use.
- The pancreas releases enzymes through the pancreatic duct to aid in digestion:
  - **Amylase:** Breaks down carbohydrates into sugars.
  - **Peptidase:** Breaks down proteins into amino acids.
  - **Lipase:** Breaks down fats into fatty acids.

After about four hours, the stomach pushes partially digested food into the small intestine for further breakdown and absorption.

ABSORPTION



C. Absorption occurs mostly in the small intestine where several digestive juices, pancreatic juice, and bile aid in the chemical digestion of food.

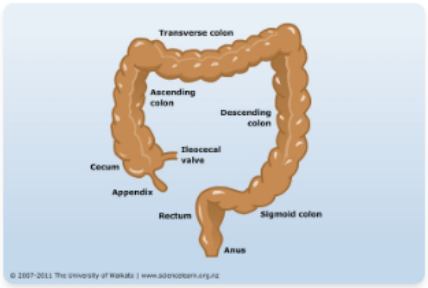
Absorption is the process of passing the soluble food molecules in the wall of the small intestine through the villi – tiny finger-like projections. Each villus contains blood capillaries that absorb water, glucose, amino acids, vitamins, minerals, and fatty acids, increasing the surface area available for nutrient absorption.

ASSIMILATION

D. Assimilation occurs mostly in the small intestine where several digestive juices, pancreatic juice, and bile aid in the chemical digestion of food.

Absorption is the process of passing the soluble food molecules in the wall of the small intestine through the villi – tiny finger-like projections. Each villus contains blood capillaries that absorb water, glucose, amino acids, vitamins, minerals, and fatty acids, increasing the surface area available for nutrient absorption.

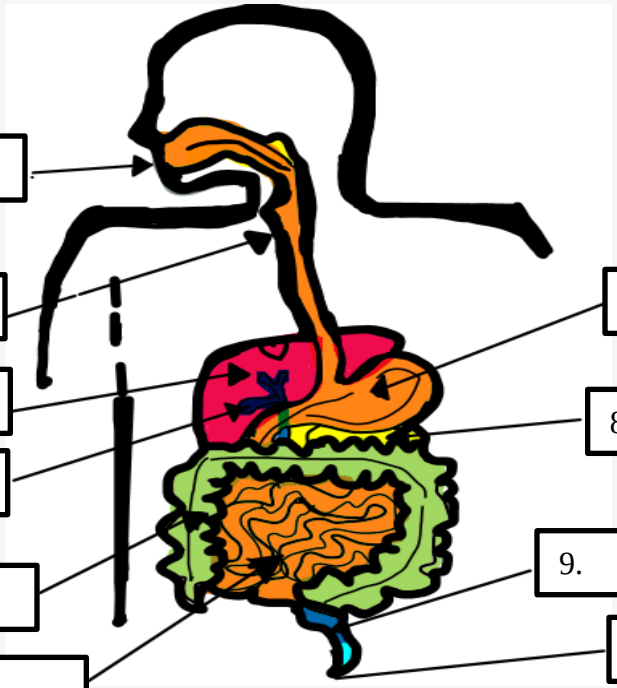
EGESTION



D. Egestion is the last process that occurs in the digestive system. It is the release of undigested food collected in the rectum called feces and pushed out of the body through the anus by defecation

Work Sheet 1: Fill me up

A. Directions: Below is the image of the Digestive System. Write the of the organs from the box below.



1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____

B. Direction Read the sentences below, then write the number of events in the digestion process. Write numbers 1-8 before the sentence

☐ The food is mixed with the acids and stays in the stomach for 1 or 2 hours.

☐ The useful substances pass through the walls of the intestines into the blood

☐ The unusual substances pass on to the large intestine, where some water and leftovers pass back into the blood.

☐ The food enters your mouth and is then chewed and broken down into smaller pieces by the teeth.

☐ The rectum muscles help to remove the waste out of the body.

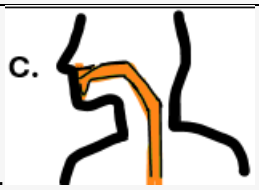
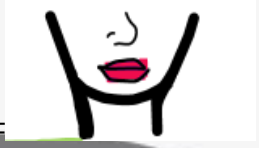
☐ The food goes down the alimentary canal: the walls of the esophagus push down the bolus into the stomach.

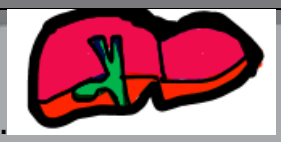
☐ The food goes into the small intestine, where it is mixed with juices produced by the liver, the gallbladder, and the pancreas.

☐ The food is mixed with the saliva produced by the salivary glands, which makes the food easy to swallow (we call it bolus)

Work Sheet 2: Who am I

Direction: On column A is the image/picture of the organs of digestion and column B is the function of each organ.

Column A: Picture of Organs	Answer	Column B: Description
A. 		1. I am an organ that is a j-shaped organ found at the end of the esophagus on the upper left side of the abdomen or abdominal cavity that produces gastric juices and acids.
B. 		2. I am and where food is mixed with intestinal juices containing enzymes that help digestion. It is where the final digestion and absorption of nutrients happen.
= C. 		3. I am an organ where liquid, electrolytes, and some vitamins are reabsorbed from undigested food. It secretes mucus to aid in the formation of feces and maintains alkaline conditions. This is the last segment of the gastrointestinal tract that completes absorption and compacts waste.
D. 		4. I am an organ where food is mechanically broken down by chewing chewed pulp and the tongue helps in pushing the bits, broken into small pieces for easier digestion. Here, the saliva softens the food into the pharynx.
E. 		5. I am an organ where waste or remaining materials become more solid known as feces will be temporarily stored and eliminated.
F 		6. I am a tube that connects the mouth and stomach. It carries the food down to the stomach for temporary storage and further digestion
G. 		7. I am the biggest organ that produces bile for the emulsification of fats into droplets.

H. 		8. I am an organ that makes three diverse kinds of enzymes namely amylase, peptidase, and lipase released through a pancreatic duct that aids in the digestion of all three organic compounds such as carbohydrates, proteins, and fats, respectively. The process takes about half of a liter of digestive juices each day

Work Sheet 3: It's time to check

From the given information above, answer briefly the questions about digestion.

1. Define "digestion" and explain its significance in the human body.
2. What are the four main processes of the digestive system? Briefly describe each
3. Explain the role of the small intestine in the digestive process.
4. What is egestion, and how does it differ from digestion?
5. Describe the process of absorption in the context of the digestive system.
6. Identify the enzymes involved in carbohydrate digestion and state their specific functions.
7. What is the primary function of the large intestine in the digestive system?
8. Discuss the importance of ingestion in the overall digestive process.
9. Name the organs involved in the digestive system and describe the function of each.
10. Explain how the liver contributes to digestion and metabolism.

WRITTEN WORKS: EVALUATION

Direction: Read and understand each question, then choose the correct answer. Encircle the correct Answer

1. In what process do animals take in food that provides energy and nutrients?

A. assimilation B. digestion C. excretion D. ingestion

2. What organ system is responsible for breaking down large molecules into smaller molecules and absorbing organic compounds needed by the body?

A. circulatory system C. digestive system

B. Nervous system D. Respiratory system

3. Which of the following breaks down food into tinier pieces to begin mechanical digestion?

A. esophagus B. stomach C. teeth D. tongue

4. How does saliva help in the digestion process?

A. It reabsorbs nutrients from the food we eat.

B. It contains the enzyme amylase that helps in the digestion of starch.

C. It absorbs nutrients and distributes them in the bloodstream.

D. It is necessary for the egestion process.

5. What is the most essential function of the intestinal villi?

A. pushes the fecal matter into the rectum.

B. increases surface area for nutrient absorption

C. secretes serous fluid to decrease friction among the organs.

D. secretes mucous to facilitate the movement of chime via the alimentary canal.

6. The following are the reasons why digested food should be assimilated into the cell EXCEPT _.

A. they are converted into protoplasm.

B. they are needed to store fats.

C. they provide the energy needed in cell activities.

D. they are converted to build cell membranes.

7. A student has a hamburger, fries, and soda for lunch. Which sequence represents the correct order of events in the nutritional processing of this food?

A. ingestion → digestion → absorption → egestion

B. digestion → absorption → ingestion → egestion

C. digestion → egestion → ingestion → absorption

D. ingestion → absorption → digestion → egestion

8. The digestion system processes food into usable and unusable materials. The usable materials are sent to the body's cells as food. What happens to unusable materials?

A. It goes to the pancreas to await disposal.

B. It goes to the right ventricle to await disposal.

C. It goes to the large intestine to await disposal.

D. It goes to the small intestine to await disposal.

9. What happens when food reaches the stomach?

A. Mechanical digestion starts in the stomach

B. The food moves quickly into the small intestine.

C. Juices mix with the food and stomach muscles squeeze it.

D. The food is completely digested and is absorbed by tiny blood vessels in the walls of the stomach.

10. The choices below are tips for maintaining a healthy digestive system. Which of these should be followed?

I. Stay hydrated

II. Avoid overeating.

III. Smoking after eating

IV. Sleep at least 7-8 hours per night

A. I, II, III, IV B. I, II, IV C. I, III D. II, IV