

YOUNG WORLD LEARNING CENTRE-MUKONO
PRIMARY FIVE SCIENCE HOME LEARNING PACK-By Tr. Asuman

Message for Children

- As you are all aware, schools are closed for a good cause – to stop the spread of the Corona virus, which is making a lot of people around the world very sick and can spread when people get too close to each other
- However, during this period, children need to keep safe and continue learning at home – so their minds stay active and they can do well in class when schools reopen again - and parents and caregivers have a role to support this.
- This pack is based on what you were supposed to cover for term one. It also includes activities you can practice on your own .Please copy in your exercise book. For new topics, you can read on your own and ask for support from your parents/guardians or sibling for help. When schools open teachers will continue supporting you building on what you have learnt your self.
- There also a number of lessons delivered on radio and TVs which relates to the information in this pack
- **Please remember to stay home, wash your hands always and stay safe and continue learning**

THE DIGESTIVE SYSTEM

The digestive system of human being is made up of tissues and organs which take part in the digestion of food,

It is a system that deals with the breaking of food and its use in the body.

The long muscular tube runs through the body from the mouth to the anus is a part of digestive system called the Alimentary canal which is 10metres long. It is where digestion of food takes place.

DIGESTION

This is a process by which food is broken down into soluble particles which can be absorbed into blood stream

The process by which food is taken into the body is called **ingestion**

Digestion begins in the mouth and ends in the ileum

There are two types of digestion in the alimentary canal namely:

-Mechanical digestion/ physical digestion

- Chemical digestion

Mechanical digestion: This is the breaking down of large molecules of food into simpler molecules by the help of the teeth.

Mechanical digestion is called a physical change because the physical nature of food remains unchanged

Chemical digestion: This is the breaking down of large food molecules into soluble substances by the help of enzymes

Enzymes

Enzymes are biological catalysts that speed up the rate of chemical digestion

Characteristics of enzymes

- Enzymes work best under suitable temperature range
- They are normally destroyed by heat
- Each enzyme digests only one class of food.
- Enzymes work best under suitable conditions

Conditions under which enzymes work

Alkaline conditions (PH)

Acidic conditions (PH)

N.B Enzymes in the mouth, duodenum and the ileum work under alkaline conditions

2. Enzymes in the stomach work under acidic conditions

Role of enzymes

To speed up (increase) the rate of chemical digestion

The alimentary canal

This is a long muscular tube along which food moves from the mouth to the anus.

How does food move in the alimentary canal?

Food moves along the alimentary canal through **peristalsis**

Peristalsis is the wave like movement of food through the alimentary canal

Parts of the alimentary canal (tube)

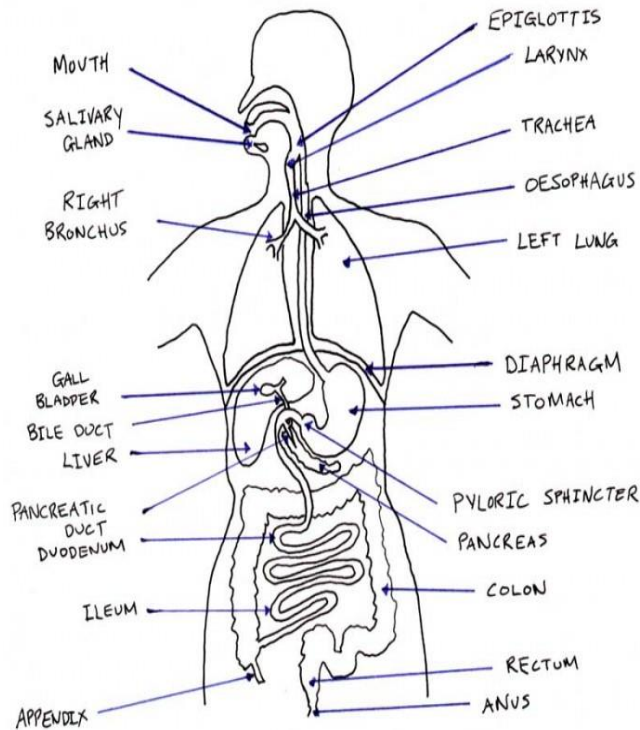
- mouth
- Gullet (oesophagus)
- stomach
- duodenum
- ileum
- colon
- rectum
- anus

The structure of a human digestive system consists of the following parts namely:

- mouth
- gullet (oesophagus)
- liver
- stomach
- spleen
- pancreas

- gall bladder
- bile duct
- Duodenum
- small intestine (ileum)
- large intestine (colon)
- appendix
- rectum
- Anus

The structure of a human digestive system



Activity

1. What is digestion?
2. Where does digestion of food
 - a. Begin?
 - b. End
3. Name the two types of digestion in the alimentary canal
4. What is mechanical digestion of food?
5. Name the muscular tube of digestive system that runs through the body from the mouth to the Anus.
6. Name the chemical compound that spreads the digestion of food.

Digestion of food in the mouth

- food is broken down by the teeth in the mouth
- saliva softens or lubricates food for easy swallowing
- chewed food is rolled into a bolus by the tongue
- The small ball of food is called a bolus.

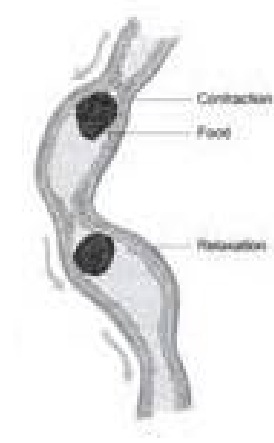
- Digestion of cooked starch by enzymes called salivary amylase or ptyalin starts from the mouth
- cooked starch is then changed to maltose

N.B ***Chemical digestion of carbohydrates begins in the mouth***

Food in the gullet oesophagus

- The food moves from the mouth to the stomach through a tube called Gullet or Oesophagus by peristalsis

Simple diagrams to illustrate (Peristalsis in the Oesophagus)



Food in the stomach

The stomach is a muscular bag where food is temporarily stored (It stays in the stomach for about 3 hours)

Food is churned by the stomach turning it into **chyme**

The food in the stomach which has been mixed with digestive juices is called chyme.

The stomach walls produce gastric juice

Components of gastric juice

Pepsin and rennin

Hydrochloric acid

Pepsin changes proteins to peptides

Rennin clots milk proteins

N.B Rennin is found in babies

Function of hydrochloric acid

To kill germs that escape with food to the stomach

To provide acidic PH for pepsin to digest proteins

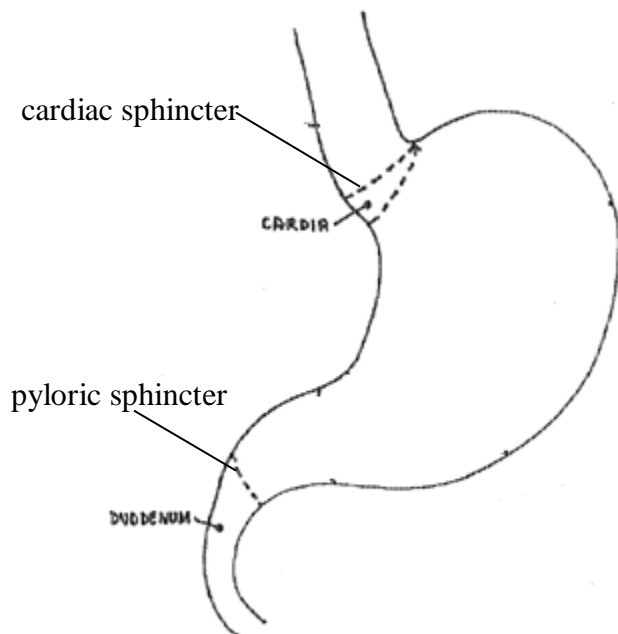
To set un favourable conditions for amylase

The lower end of the stomach is kept closed by a circular muscle called the **pyloric sphincter** which allows a little chyme at time to pass the duodenum

NB 1. Absorption of alcohol, simple sugars, common salt and medicine takes place in the stomach.

2. Chemical digestion of proteins begins in the stomach

Simple diagram to illustrate (The stomach)



Food in the duodenum

- The duodenum is a U – shaped and 25cm long.
- The duodenum contains two glands
The liver and the pancreas

The liver

This produces bile juice

Bile juice is stored in the gall bladder

Bile juice is then directed to the duodenum by the bile duct

Bile juice helps to emulsify fats or break down fats for easy digestion

N.B Bile juice contains no enzyme

The pancreas produces pancreatic juice.

Pancreatic juice

This contains three enzymes

-lipase

-trypsin

-amylase

Amylase completes the digestion of carbohydrates (starch) which began in the mouth

Lipase acts on fats and turns them into fatty acids and glycerol

Trypsin acts on peptides and remaining proteins turning them into amino acids

N.B 1. No absorption of food in the body takes place in the duodenum

2. Chemical digestion of fats begins in the duodenum

Food in the ileum

Digestion of food ends in the ileum

The ileum is about 6 metres long

Absorption of food takes place in the ileum

Absorption is a process by which digested food is taken into the blood stream.

It uses the villi to absorb food nutrients

The villi are finger-like structures covering the wall of the ileum

Adaptations of the ileum to absorbing digested food

It has villi that absorb digested food

It has thin walls for easy diffusion of digested food

It has a network of blood capillaries

It is long and coiled increasing a surface area for food absorption

The digestive juice produced in the ileum

Succus entericus

Enzymes contained in succus entericus

- maltase
- lactase
- sucrase
- lipase
- peptidase (erepsin)

Maltase turns maltose to glucose

Lactase turns lactose to glucose

Sucrase turns sucrose to glucose

Lipase turns lipids into fatty acids and glycerol

Peptidase (erepsin) turns peptides to amino acids

Summary

<u>Class of food</u>	<u>End product of digestion</u>
Proteins	amino acids
Carbohydrates	glucose
Fats and oils (lipids)	fatty acids and glycerol

Note: The end product in the digestion of protein is amino acids, digestion of fats is fatty acids and glycerol and in the digestion of carbohydrates.

Uses of digested food by our bodies

- The maltose, glucose (from carbohydrates) fatty acids and glycerol (from fats) provide energy to the body
- Amino acids (from proteins) assist in the proper growth and repair of the body tissues.

The colon

- The function of the large intestine (colon) is to absorb water and some salts are removed from their fluid wastes are absorbed into the blood stream.
- The rest of the fluid waste and undigested solid food particles are sent to rectum.

Rectum

- The rectum stores undigested food as waste matter (faeces)
- The rectum also stores worn out cells from the digestive tract.

Anus

- Passes out faeces

N.B the process by which un digested food is passed out the body is called **egestion**

Importance of roughage

It prevents constipation

It stimulates peristalsis

It reduces the risk of getting bowel cancer.

Activity

1. Explain the term absorption of food?
2. Where does absorption of food take place?
3. How is the ileum adapted to food absorption?
4. Where does absorption of the following foods take place?
 - a. Alcohol
 - b. Water
5. Where does digestion of fats take place in the mouth?
6. Write down things that happen to food in the mouth?
7. By what process does food move down the gullet?
8. Identify the two enzymes produced in the stomach.
9. State the major function of the following parts of digestive system.
 - a. Gall bladder
 - b. liver
10. Name the enzyme that breaks down carbohydrates into maltose
11. What is the major role of bile produced by the liver in the digestive process?
12. Identify the major function of a spleen.

13. Identify the digestive juice produced by

- a. pancreas
- b. stomach

Summary table of digestive processes

Organ	Gland	Digestive juice	Enzymes	Food changes
Mouth	Salivary glands	saliva	Ptyalin or salivary amylase	Starch to maltose
Stomach	Gastric glands	Gastric juice	pepsin	Proteins to peptides
			Rennin	clot milk in babies
Duodenum	liver	bile	No enzyme	Emulsifies the fats
	pancreas	Pancreatic juice	Trypsin	Proteins and peptides to amino – acids
			Amylase	Starch to maltose
			Lipase	fats to fatty acids and glycerol
Ileum		Intestinal juice or succus entericus	Lactase	Lactose to glucose
			Maltase	Maltose to glucose
			Sucrase	Sucrose to glucose
			Lipase	Fats to fatty acids and glycerol
			peptidase	Peptides to amino - acids
colon				Absorption of water
Rectum				Storage of faeces

Digestive disorders (disturbance to alimentary canal and make it fail to function properly)

Constipation

- This is a condition where by a person finds it difficult to pass out faeces. The faeces are very hard and dry and do not come out easily

Causes

- lack of roughages in one's diet
- having irregular meals
- drinking too little water
- lack of exercise to the body

Indigestion

- This happens when food is not properly digested
- A person feels stomach pains, heart burn (burning in the chest) and tiredness.

Causes

- No chewing food properly
- Eating so hurriedly
- Too much drinking of alcohol

Intestinal obstruction

- Caused when intestines twist or fold themselves causes vomiting, thirst and death if not reported immediately to the doctor.

Vomiting

This is the expulsion of undigested food through the mouth

- This is a sign of very many diseases.
- It disturbs the digestive system and forces the cardiac sphincter to open and the food in the stomach to be ejected through the mouth.

Diseases of the digestive system

The diseases associated with the alimentary canal include;

- Appendicitis
- cholera
- Diarrhoea
- Peptic ulcers
- Typhoid

Appendicitis

- This is the inflammation of the appendix.
- This may be due to stones or other indigestible solids that get trapped in the appendix.
- See the doctor for medical attention.

Peptic ulcers

- These are sores in the stomach wall caused by too much acid.
- The victim experiences a chronic sharp pain in the stomach and frequent heart burn.

Dysentery

- It is caused by a bacterium or Amoeba got by eating uncooked food or dirty food or water.
- The victim visits the toilet very frequently, passing out watery stool with some blood.

Typhoid

- Caused by bacteria which cause inflammation of the intestine and easily lead to death.
- It is spread through drinking contaminated water

Ways through which food is made dirty

- Handling food with dirt hands.
- House flies landing on food with their hairy bodies.
- Use of dirty containers to keep food.
- Leaving food uncovered.
- Preparing food in dirty places.

Good eating habits

- Washing hands before serving or eating food..
- Chewing food properly before swallowing.
- Avoid talking while eating food
- Washing fruits/vegetables before eating them (germs).

How to improve on the working condition of digestive system.

- Have daily physical exercises.
- Avoid eating stale or rotten food.
- Having a balanced diet.
- Avoid drinking too much alcohol..
- Have regular meals.
- Always eat the right quantity of food.
- Avoid eating while talking.
- Drink safe clean water

Activity

1. Write down three diseases and three disorders of digestive system.
 - a. diseases
 - b. disorders
2. Suggest any two ways through which food we eat gets contaminated.
3. Write down at least two examples of food eating habits.
4. Why should food be covered immediately after being oared?
5. How are house flies adapted to spreading of diseases?

