

THIRD TERM SCHEME OF WORK FOR BASIC 7 BIOLOGY

WEEK	TOPICS	CONTENT
1	Living Things(habitat)	Meaning, types, examples, adaptation of living organisms.
2	Living Things 2 (uniqueness of man)	Meaning, characteristics of man in comparison to other animals e.g. in reasoning, problem solving, linguistics, observation and movement.
3	Changes in living things	Temporary and permanent changes in living things, meaning of growth and development, developmental stages in humans.
4	The Respiratory System	Definition, parts, functions, defects and control.
5	The Circulatory system	Definition, parts, functions, defects and control.
6	The Excretory system	Definition, parts, functions, defects and control.
7	Revision	
8	Examination	

Week 1

Topic: Living Things (habitat)

Specific Objectives: at the end of this lesson students should be able to:

- Define living things with examples.
- Define and describe different types of habitats.
- Describe the adaptation of living things to their habitats.

Living things refers to those things that have life. Examples of living things include; man, rabbit, grass etc. Living things can be identified by several characteristics which include, movement, respiration, nutrition, irritability, growth, excretion, reproduction, death, adaptation and competition (**MR NIGER DAC**)

HABITAT: This refers to the type of environment in which an organism or group of organisms live.

TYPES OF HABITAT

- Aquatic Habitat
- Terrestrial Habitat
- Arboreal Habitat

AQUATIC HABITAT

This refers to a body of water in which certain organisms live naturally. Such organisms are called aquatic organisms e.g. fishes, crabs, toads, water plants (water lily).



Shark



Sea turtle



Seaweed



Octopus



Starfish



Jellyfish



Crab

TYPES OF AQUATIC HABITAT

-Marine Habitat: This refers to aquatic habitats which contain salt water e.g. Oceans and open seas. Marine organisms include; Crabs, Sharks, Star fishes etc.

-Fresh water habitat : These waters contain a very low level of salt water e.g. pond, Rivers, Lakes, streams etc. Fresh water organisms include, Catfish, Mudfish, Water snail.

-Estuarine Habitat: This body of water is formed by a mixture of salt water and fresh water. The resulting water is called brackish water. Organisms of estuarine habitat include, planktons, algae, worms etc.

TERRESTRIAL HABITAT

This refers to land environment. Terrestrial organisms include, reptiles, mammals etc.

TYPES OF TERRESTRIAL HABITAT

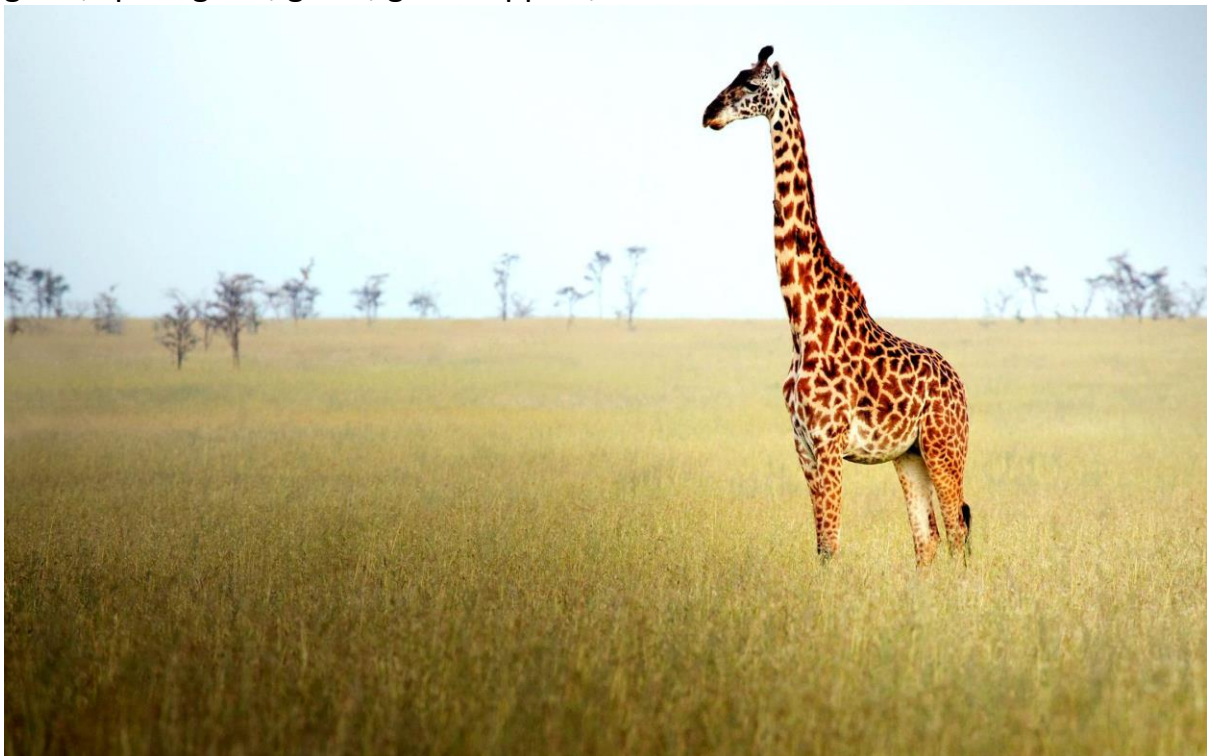
-Marsh Habitat: This refers to a lowland habitat which is usually flooded or Water-logged. Organisms found in marshes include toads, frogs, water lettuce, crocodiles etc.



-Forest Habitat: This is a place dominated by tall trees. Organisms found in such habitat include monkey, squirrels, opepe tree, mahogany tree, iroko tree etc.



-Savanna or grassland: This is an environment dominated by grass species, scattered trees, and shrubs. Organisms found in the savanna include, elephant grass, spear grass, goats, grasshoppers, cows etc.



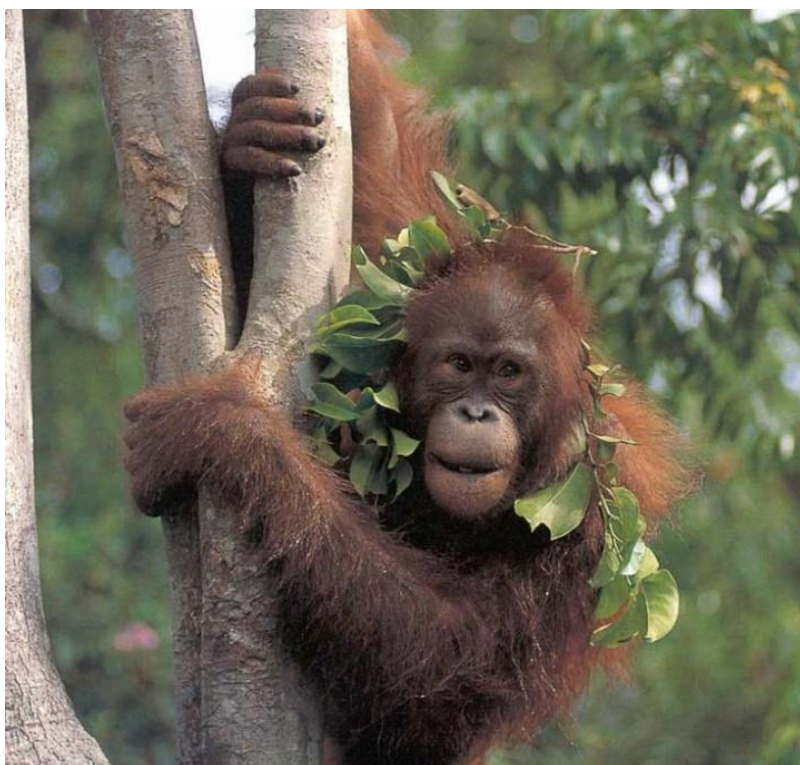
-Arid land or dessert habitat: This refers to areas of very low rainfall. Arid lands are the driest habitats. Organisms found in desserts or arid lands includ Cactus, Acacia, Camel etc.



Camel

ARBOREAL HABITAT

This refers to habitats formed by tree tops and tree branches. Organisms found in such habitats include: Monkeys, Birds, Chameleons etc.



Attempt the task below:

(BECE 2015)

The following are types of terrestrial habitat except: a. Arid Land b. Forest c. Marine e. Savanna

ADAPTATION

This is the possession of characters, traits, and structures which enable organisms adjust to change and live successfully in their habitats.

Animal adaptation	Plant adaptation
(Aquatic Habitat) <ul style="list-style-type: none"> - Possession of fins streamlined bodies and swim bladder for floatation and easy movement in water e.g. Tilapia Fish. - Possession of gills for gaseous exchange. - Possession of webbed feet, and sticky undersurface for 	(Aquatic Habitat) <ul style="list-style-type: none"> - Possession of long stems to raise leaf above water for photosynthesis. - Very little waxy cuticle on leaf and large leaf size to aid water loss from leaves (transpiration) - Possession of breathing roots to aid oxygen supply to

paddling and attachments e.g. snail, toads.	underground tissues of plants e.g. White and red Mangroves
(Terrestrial Habitat) <ul style="list-style-type: none"> - Possession of powerful limbs, lungs, sweat glands, and skeletal system. - 	(Terrestrial Habitat) <ul style="list-style-type: none"> -Possession of large roots and succulent stem for absorption and storage of soil water. -possession of waxy cuticles on leaves or spiny leaves to prevent water loss e.g. arid plants like cactus
(Arboreal Habitat) <ul style="list-style-type: none"> - Possession of long and powerful limbs and tails for holding on to broad branches e.g. Monkeys. - Light bones and wings for flight e.g. birds 	(Arboreal Habitat) <ul style="list-style-type: none"> -possession of long flexible stems for creeping and climbing tree branches and stems e.g. dodder

Attempt the task below:

Discuss one adaptive feature each that enables each of the following organisms to survive in their habitats: Frogs. Chameleons, Birds.

BECE 2019: Which of the following features enable birds to fly ? a. cilia b. fins c. flagella d. tentacles e. wings

Week 2

Topic: Living Things (uniqueness of man)

Specific Objectives: at the end of this lesson students should be able to:

-define primates.

-state the characteristics of man that make man unique in comparison to other animals.

Primate is a sub-group of mammals that

- Have nails on their hand and feet
- Have eyes in the front of their head
- Can stand upright
- Can grasp things with their hands e.g. Monkey, Chimpanzee, Gorilla and man.

Uniqueness of man in comparison to other primates

- Humans have an "S" curved backbone which enable them to move around in an upright position. This is difficult for other primates.
- Humans have a large and highly modified brain which enable thinking, planning, problem solving and intelligence.
- Humans are capable of speech and language.

Attempt the task below

- Are all primates' mammals? Are all mammals' primates? state your reasons.
- Briefly enumerate the characteristics of man that differentiates man from other primates.

WEEK 3

Topic: Changes in living things 1

Specific Objectives: At the end of this lesson, students should be able to:

- Differentiate temporary changes from permanent changes
- Outline and define some changes in living things e.g. growth and development
- Identify developmental stages.

Matter in general undergoes changes either physically or chemically. These changes can be temporary when it is reversible, and the chemical composition is not changed. These changes can also be permanent when its irreversible and the chemical composition of matter is altered. It is important to note that living matter i.e. living things undergo changes throughout their lifetime, these changes include growth, development and maturity.

Growth and development:

Growth refers to an irreversible increase in size, mass and complexity of a living organism resulting from an increase in cell number. Development refers to increase in capacity, skill and function. Growth and development occur together, growth continues from birth until one is fully grown or mature. Maturity happens at puberty in humans when organs that have been present become fully developed to carry out their function. **Growth and development can be affected by several factors which include; food/nutrition, heredity, health, exercise and rest, hormones etc.**

Developmental stages in Humans



Developmental stages in humans	Age
Infancy	From birth – 2 years
Childhood	2 years - 12 years
Adolescence	12 years – 18 years (pubertal stage)
Adulthood	18 years and above

Attempt the questions below:

- BECE 2015; Puberty stage in girls indicate:
a. conception b. courtship c. lactation d. maturity e. menopause
- BECE 2016; Factors that affect growth include the following except:
a. disease b. exercise c. food d. heredity e. skill

WEEK 4

Topic: The Respiratory System

Specific Objectives: at the end of this lesson, students should be able to:

- define the respiratory system stating the functions of the various parts.**
- describe the defects of the respiratory system and their control measures**

Respiration is the process through which our body cells derive energy from digested food. The process can occur in the presence of oxygen (aerobic respiration) or in the absence of oxygen (anaerobic respiration). Anyways more energy is derived in the presence of oxygen.

What happens during aerobic respiration can be represented by this equation:

Carbohydrate(glucose) + oxygen = water + carbon dioxide + energy(ATP)

For anaerobic respiration:

Carbohydrate = carbon dioxide + lactic acid (in plants alcohol is produced) + energy (ATP)

The respiratory system includes all the structures and organs of living organisms responsible for breathing (inspiration/inhalation (taking in of air) and expiration/exhalation (breathing out)).

PARTS OF THE RESPIRATORY SYSTEM

1) Nostrils: This is the opening of the nose that allows passage of air into the trachea/windpipe. It has tiny hair follicles for preventing dust particles from entering the trachea.

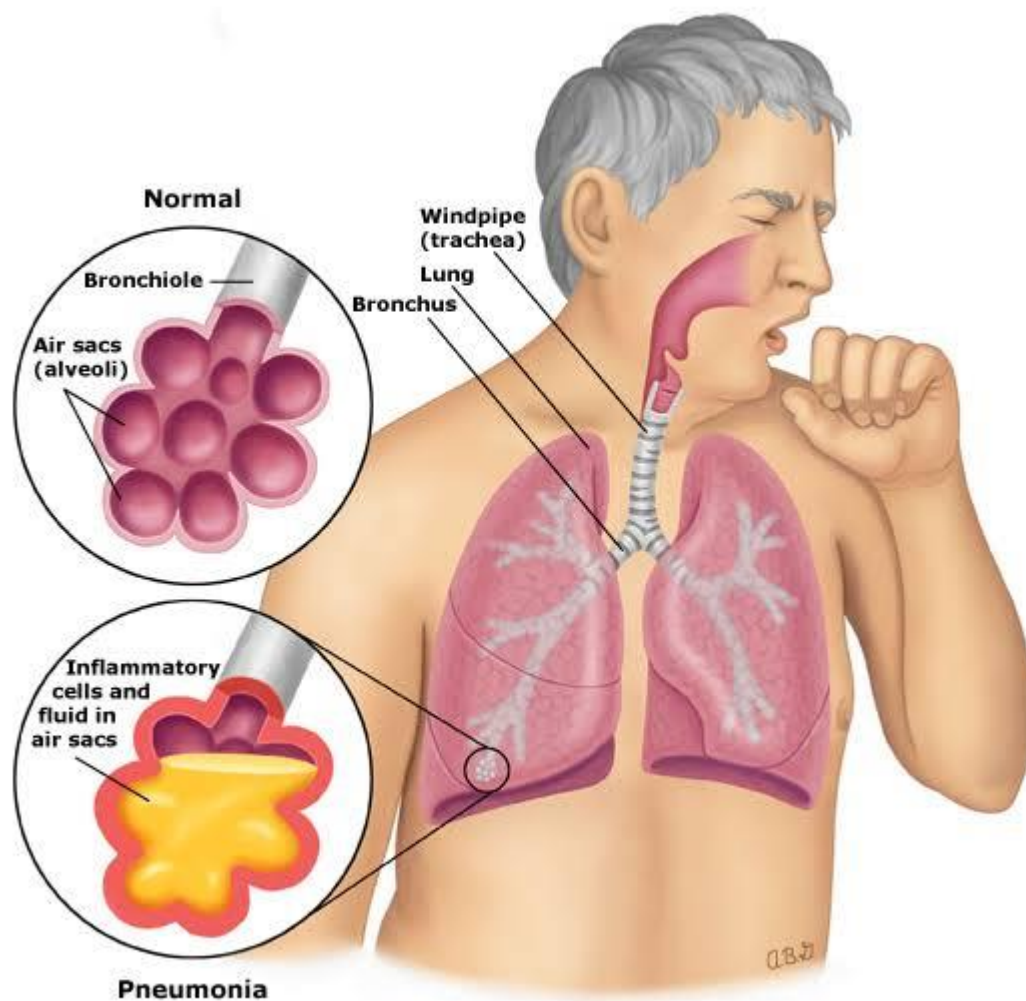
2) Trachea: this duct connects the nostrils to the bronchi. It is made of cartilage that prevents it from collapsing when air pressure is low.

3) Bronchi: This consist of two ducts formed from the trachea, each connected to the right and left lungs respectively. Within the lungs the bronchi form smaller ducts called bronchioles.

4) Lungs: this is a sac like structure containing the bronchioles and air sacs(alveoli). It is highly vascularized (contains many blood vessels).

5) Bronchioles: These are smaller ducts within the lungs that form the alveoli sac.

6) Alveoli sac: This is a small sac like structure formed at the end of a bronchiole, it is covered with capillaries. It is the part of the respiratory system where gaseous exchange occurs.



Above is an example of the human respiratory system. From the image above you would notice two air sacs (a normal one and an abnormal one), the abnormal one indicates signs of a respiratory defect.

Respiratory defects refer to damages within the respiratory system that alter the breathing process. It can be caused by an infection or a physiological damage. Some include;

1) Asthma: This is a disease of the bronchi and bronchioles that is marked by wheezing, breathlessness and coughs. It occurs as a result of inflammation and irritation of the airway. Victims are usually allergic (sensitive in a bad way) to particles of dust, pollen, smoke etc.

2) Pneumonia: This is viral or bacterial infection of the lungs in which the bronchi and alveoli are filled with a thick fluid(mucus) which makes gaseous exchange difficult. This leads to headache, chest pain and fever.

3) Pulmonary Tuberculosis: This is caused by bacteria. The bacteria cause the inelasticity of the lungs, thereby making breathing difficult. Accompanied by coughs.

4) Silicosis: This is a long-term effect of dust particles on the lungs. It leads to impairment of lung function.

5) Bronchitis: This is the inflammation of the mucus membrane of the bronchi due to infection. It leads to the production of watery mucus.

NB: Inflammation refers to abnormal changes (rash, irritation, secretion of fluids) in a tissue resulting from an injury or infection.

WAYS TO CONTROL AND PREVENT RESPIRATORY DEFECTS

- 1) Avoid smoking and exposure to dust particles.
- 2) Eat vegetables and fruits as they help clean the respiratory tract.
- 3) Always keep your house and working space ventilated.
- 4) Avoid exposing your self to extremely cold environment which favor bacterial and viral infection.
- 5) Antibiotics can be used to treat bacterial infections of the respiratory tract.

Attempt the questions below

(BECE 2010):

-The structure in the respiratory system of humans where gaseous exchange occurs is a. alveolus b. bronchus c. nostril d. trachea

- The gas produced when glucose is oxidized during internal respiration is a. carbon (ii) oxide b. carbon (iv) oxide c. hydrogen d. nitrogen

-(BECE 2016): The breakdown of food substances to release energy is referred to as a. excretion b. irritability c. nutrition d. reproduction e. respiration

WEEK 5

Topic: The Circulatory system

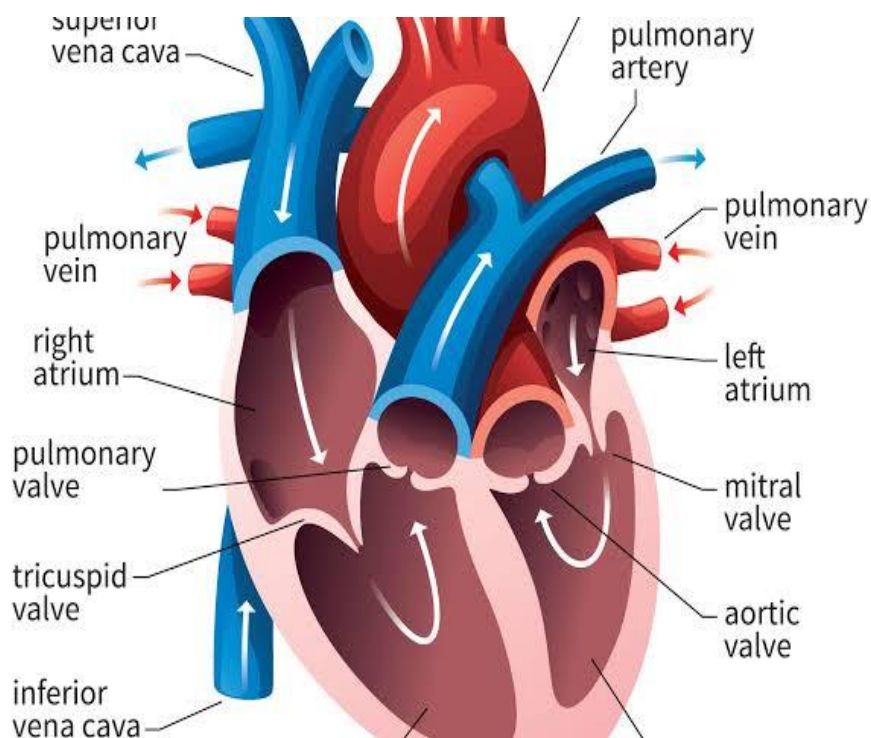
Specific Objectives: at the end of this lesson, students should be able to:

- define the circulatory system stating the functions of the various parts.
- describe the defects of the circulatory system and their control measures.

Previously we learnt about the respiratory system, from which we observed that the lungs consist of alveoli sacs which are highly vascularized with blood vessels. This means the oxygen from air diffuses into the blood which transports it to body cells for respiration (breakdown of digested food substances to release energy). Hence, it is important that blood moves round the body to enable oxygen as well as food nutrients from digestion to get to body cells. The blood also collects waste from body cells for excretion.

The circulatory system refers to organs and structures responsible for moving blood around the body. This system consists of two main parts:

- The blood vessels:** these ducts carry blood round the body (they include the veins, arteries and capillaries)
- The Heart:** This organ pumps blood through the blood vessels and this causes blood to flow round the body.



COMPOSITION OF BLOOD

Blood is the liquid tissue that serves as the transport medium of the body and it consists of blood cells and a watery liquid containing food molecules called plasma.

There are three blood cells namely and each performs functions beyond transportation, they include:

1) Red blood cells: These cells bind to oxygen and carbon dioxide; this facilitates the transport of these molecules. They contain a chemical substance called haemoglobin which is the binding molecule.

2) White blood cells: These cells defend the body from infection and toxins, they form the immune or defense system of the body. They defend by producing molecules called antibodies that bind to the toxins for destruction.

3) Platelets: These cells aid blood clotting when an injury occurs.

THE HEART, BLOOD VESSELS AND CIRCULATION

The heart is a muscular organ which has four chambers. The two upper ones are called the right and left auricles and the lower ones are called the right and left ventricles. Every time the heart beats it pumps blood round the body. The number of beats per minute determines a person's pulse rate. Blood moves around the body through ducts called blood vessels which perform different functions; the arteries carry oxygenated blood away from the heart to the body tissue (except the pulmonary artery which carries deoxygenated blood to the lungs), the veins carry deoxygenated blood from body tissues to the heart (except the pulmonary vein which carries oxygenated blood to the heart).

DEFECTS OF THE CIRCULATORY SYSTEM

This refers to damages, infection and diseases that alter the function of the circulatory system;

1) Anaemia: This is the inability of red blood cells to bind efficiently to oxygen leading to insufficient supply of oxygen to body cells leading to fatigue. This can be as a result of iron deficiency, loss of blood or a genetic defect (this is from birth and is termed sickle cell anemia).

2) Blood cancer: this is an abnormal production of blood cells such that it affects transportation of materials. It is also called leukemia.

3) Heart attack (myocardial infarction): this is a process whereby the blood vessels around the heart are blocked overtime, causing increase in blood pressure and difficulty in pumping blood. It eventually destroys the heart if not treated.

4) HIV/AIDS: this is an infection caused by the retro virus which destroys the white blood cell, hence exposing the body system to all kinds of infection and disease.

WAYS TO CONTROL AND PREVENT THE DEFECTS OF THE CIRCULATORY SYSTEM.

- 1) Blood tests should be taken to determine genotype prior to marriage to avoid cases of sickle cell anemia.
- 2) Foods with low density cholesterol should be avoided as they narrow ducts and lead to heart attack.
- 3) regular exercise
- 4) Weight management should be strictly adhered to as obesity contributes largely to heart attack and high blood pressure.
- 5) Regular checkup with health centers for early awareness of underlying defects.

Attempt the questions below (Nigerian Basic Science Project Pupil's textbook 2):

- What is the composition of blood? Describe each component.
- Explain the following terms a. Haemoglobin b. capillaries c. antibodies d. pulse rate

TASK: draw the structure of the human heart and label the parts.

WEEK 6

Topic: The Excretory System

Specific Objectives : at the end of this lesson, students should be able to:

- define the excretory system stating the functions of the various parts.
- describe the defects of the excretory system and their control measures.

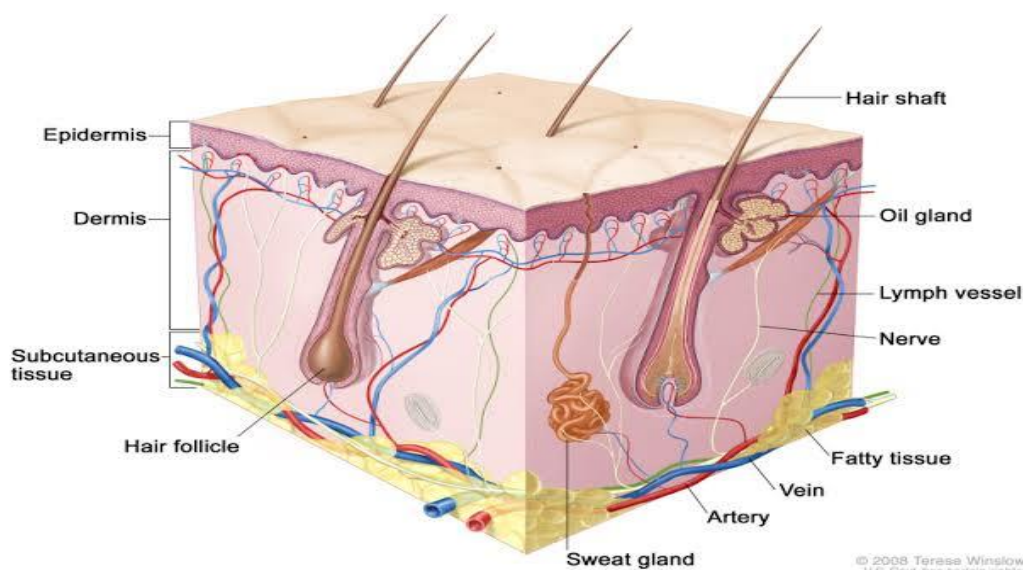
Excretion is the process by which harmful waste materials produced in cells of the body are removed from the body. Organs and tissues involved in the process of excretion is called the excretory system. It is important to note that "egestion" differs from "excretion", egestion is the removal of undigested fecal waste from the anus.

Examples of some waste materials removed from the human body includes;

- 1) Nitrogenous waste from the use of protein in the body in form of urea.
- 2) Excess salt, sugar and water that are not needed by the body.
- 3) Carbon dioxide and water as waste products of respiration.

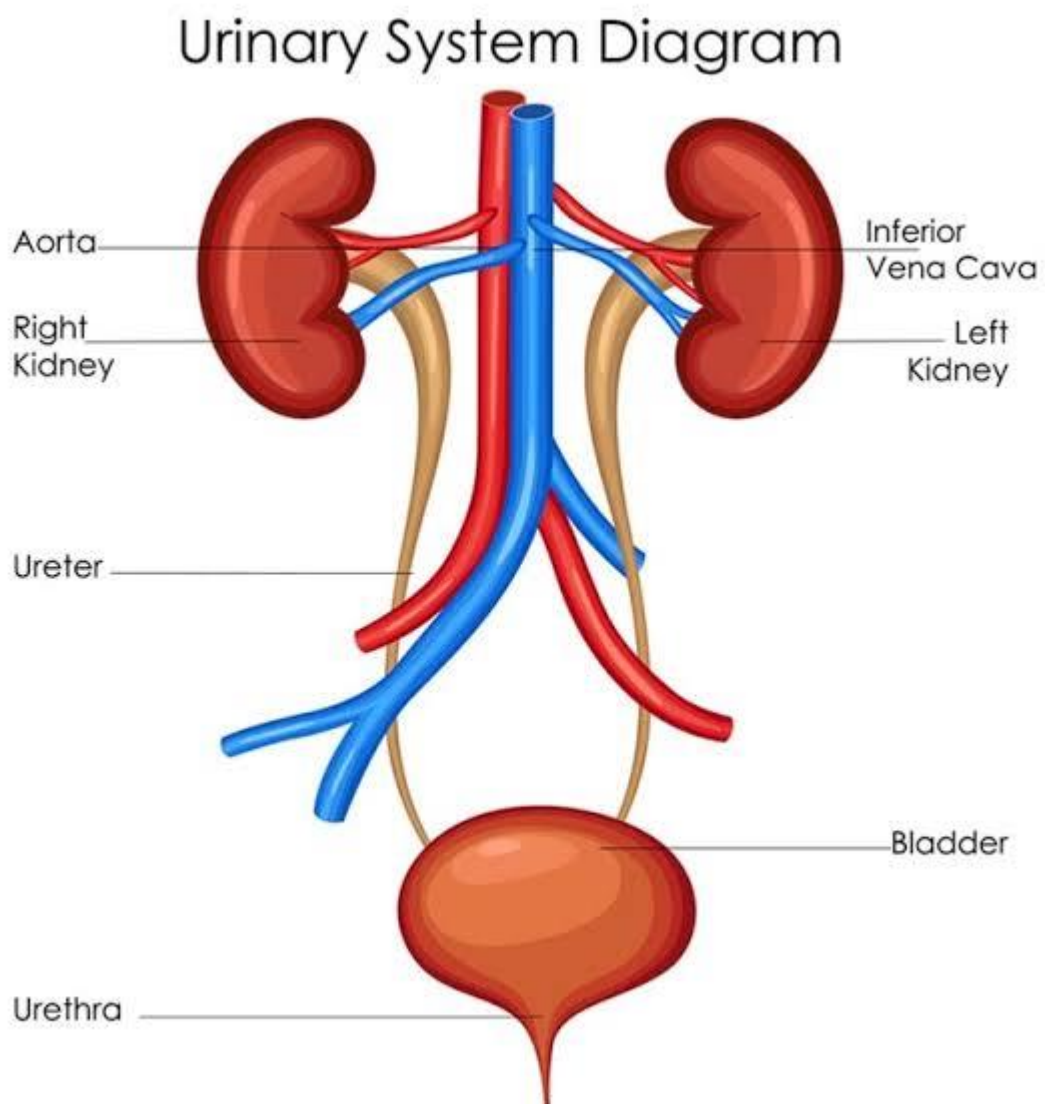
The major excretory organs in the human body include the skin (excrete sweat (contains water, salt and urea), lungs (exhale water vapour and carbon dioxide) and kidney (filters the blood from excess sugar, urea, water and other waste materials to form urine).

THE SKIN : this excretes sweat.



THE URINARY SYSTEM

The urinary system is made up of the kidney, ureter, bladder, urethra. This system is responsible for the formation and removal of urine.



DEFECTS OF THE EXCRETORY SYSTEM AND THEIR CONTROL MEASURES

1) Kidney stone: blockage of the ureter that prevent urine passage.

-Control: proper intake of water.

2) Nephritis: bacteria infection of the kidney that leads to the release of useful materials into urine.

-Control: use of antibiotics

3) Dropsy or Oedema: inability of the kidney to remove water from the blood. This leads to swollen body parts.

-Control: kidney transplant, kidney dialysis.

NB: This is the use of an external device to perform the function of the kidney.

4) Kidney failure: This is the inability of the kidney to function due to multiple damage to its tubules.

-Control: kidney transplant, kidney dialysis.

NB: generally avoiding excessive intake of alcohol can help prevent kidney damages which are mostly caused by alcohol intoxication.

Attempt the questions below (SSCE NOV. 1998)

1.a. Explain how urine is formed.

1.b. Name two excretory organs and outline the waste product each excretes.

1.c. Name the substances contained in urine.

BECE 2016: The passing out of undigested food through the anus is known as

a. egestion b. excretion c. nutrition d. reproduction e. respiration