



Dr. Bhasa Science

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Uganda East Africa
Senior one to senior six

+256 778 633682 0753 143413

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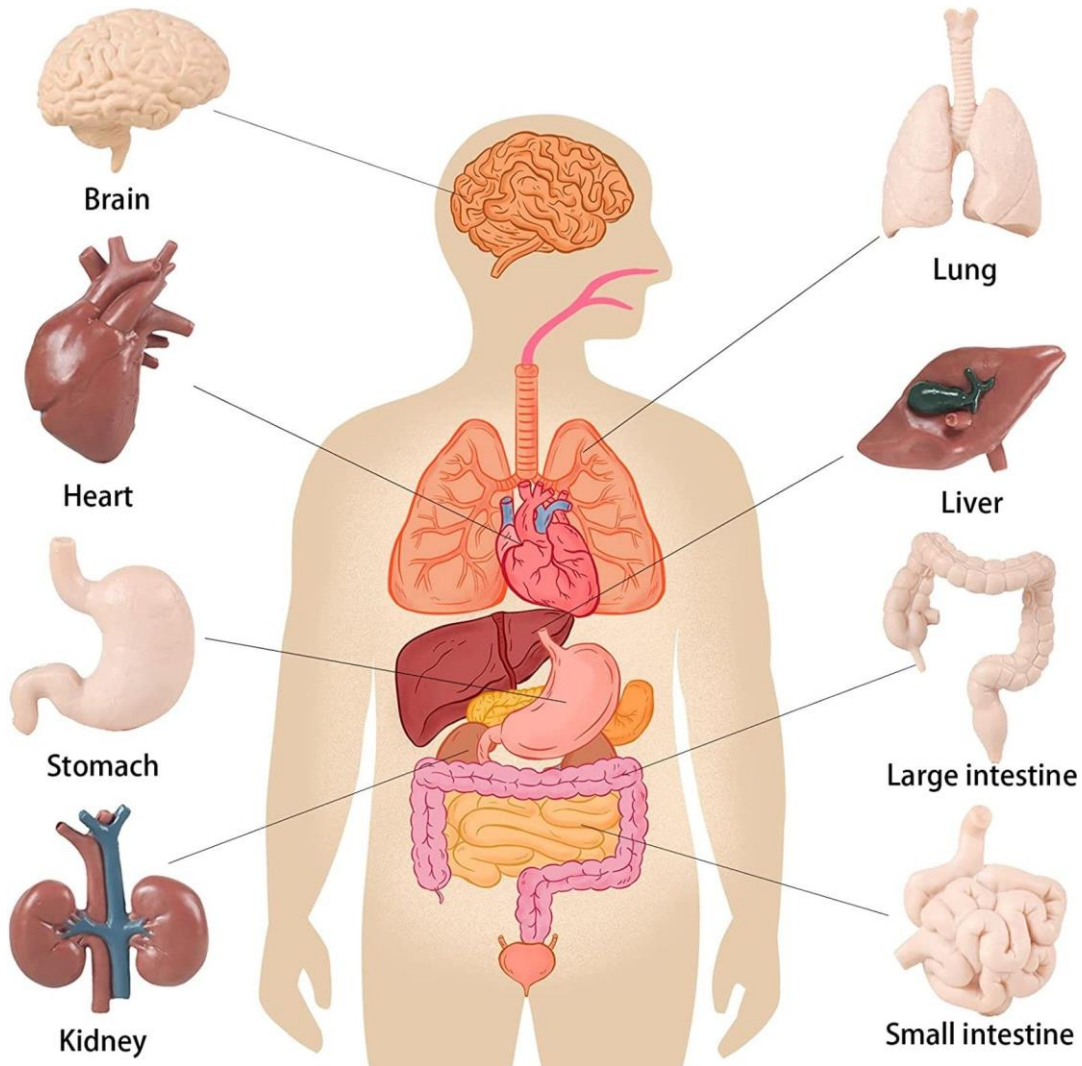
Nuture your dreams

P4 Integrated Science

term 2

THEME: Human body

Topic 2/4: Human Body Organs



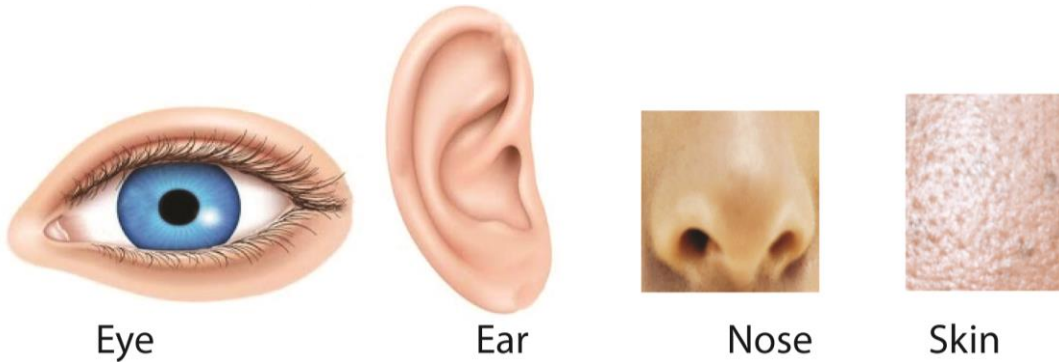
The cell

It is the smallest basic unit of the body.

A tissue is a group cells performing similar functions for example muscle, blood

Organ is formed from group tissues performing similar functions

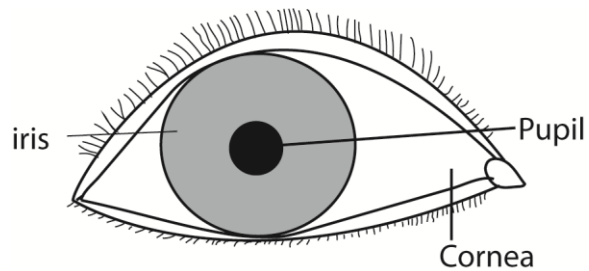
Examples of external organs and their function are



Eyes

It is an organ for seeing

The external parts of the eye are shown in figure below

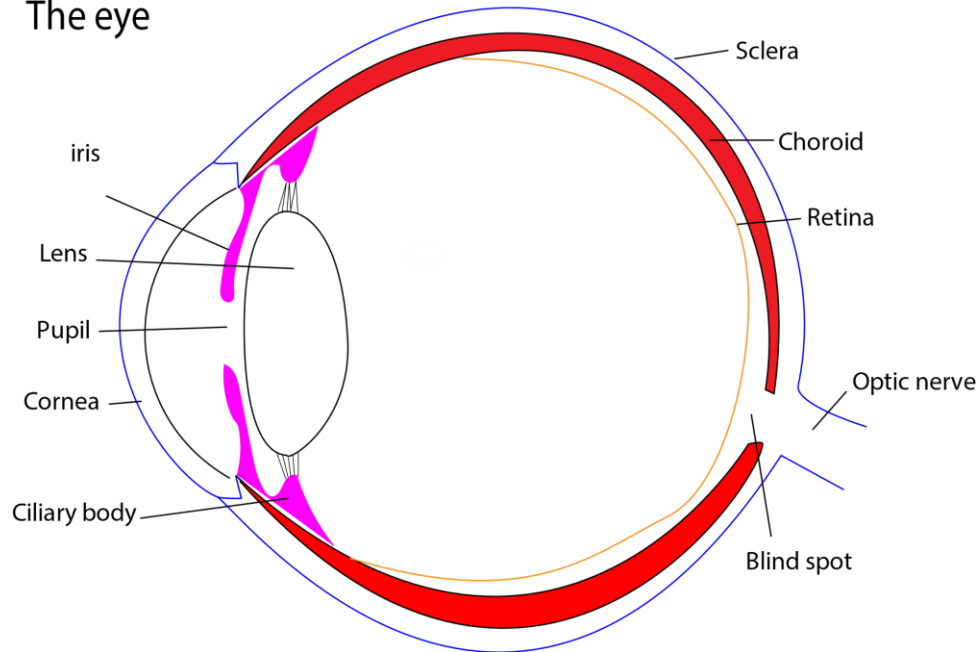


Exercise 1

Name and give one function each name five sense organ

Cross section of the eye

The eye



Functions of the parts of the eye

- (i) Eyelids are covers of the eye. They close to protect the eyes from danger.
- (ii) Lens refracts and focus light to the retina
- (iii) Iris adjust the size of the pupil and thus the amount of light that enters the eye
- (iv) Retina is where the image forms
- (v) Pupil allows light to pass through into the eye.
- (vi) Optic nerve is a sensory nerve that sends sight message from the eye to the brain for interpretation of what we see.
- (vii) Pupils allow light into the eye.

Characteristics of images formed in the eye

- They are upside down
- They are smaller than the object (diminished)
- They are real

Exercise 2

Give two characteristics of image formed on the retina

Controlling amount of light entering the eye

- The amount of light entering the eye is controlled by the iris.
- In bright light, the iris circular muscles contract and pupil constricts.
- In dim light iris radial muscles contract and the pupil widens.

Accommodation: Is the ability of the eye to see near and far objects

Eye defects

- (i) **Short sightedness** is inability to see distant objects clearly because rays from a distant object are focus in front of the retina. It is corrected by wearing **concave lens**
- (ii) **Long sightedness** is inability to see near objects clearly because rays from a near object are focused behind the retina. It corrected by wearing a **convex lens**

Color blindness: This is a condition when one is not able to differentiate between some colors.

Common diseases

(a) Conjunctivitis (red eyes)

It is a contagious disease caused by virus or bacteria

Spreading by touching the eye with infected fingers

Sign and symptoms

- (i) The white of the eye becomes pink
- (ii) Burning, itching and pain of the eye
- (iii) Tears in the eye

Control

- Isolation of a sick person
- Avoid sharing basin, towels and shaking hands with infected persons.

(b) Trachoma

It is an infectious disease caused by bacteria known as chlamydia

The disease is spread by touching the eye with infected person or by houseflies.

Symptoms

- Mild redness, Painful itching of eyes
- Eye turns reddish with tears
- Discharge from the eye containing pus after sleeping

- Eyelid swelling
- scarring

Control

- Isolation of a sick person
- Avoid sharing basin, towels and shaking hands with infected persons.
- Properly wash the eye with water and soap.
- Proper hygiene

Treatment: tetracycline ointment

(c) River blindness

It is caused by a protozoa (*Onchocerca vilvus*). The disease is transmitted by black flies also called Jinja flies. The flies live on the banks of fast flowing rivers.

If untreated it leads to blindness.

Symptoms

- Swelling on the skin
- Itching skin
- Skin rash
- Damaged iris

Control

- Keeping away from black flies infected river banks
- Clearing the bushes around the house
- Spraying the black flies with insecticide
- Antibiotics

(d) Cataracts

In this condition, the lens of the eye become grey and opaque. A person with cataract does not see clearly.

It is corrected by an operation where the grey layer is removed.

(e) Night blindness

It is caused by lack of vitamin A in one's diet.

The affected person cannot see well especially in the evening and at night

It is corrected by eating food with vitamin A such as carrots, mangoes, pawpaw, liver and onions.

(f) Sty

It is a small swelling which forms on the eyelid

It looks like a small boil. It is caused by bacterium.

Control

Proper hygiene

Care for the eye

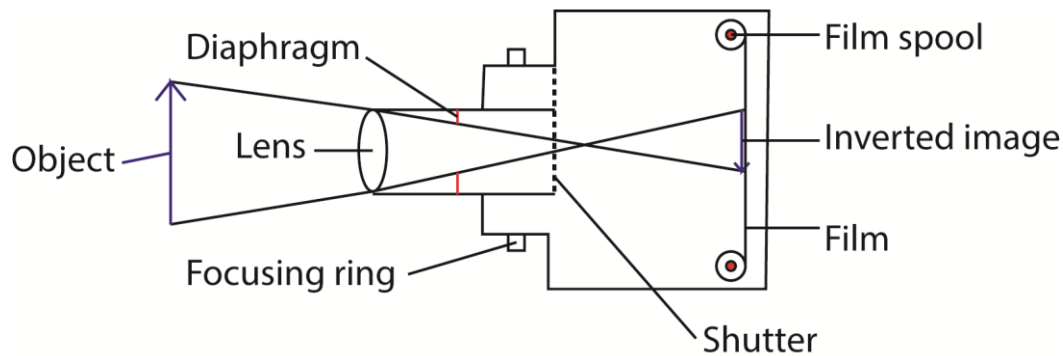
- Avoid looking directly at the sun or blight light.
- Wash your eyes regularly
- Avoid reading too bright or too dim light because both spoil the eye.
- Eat food containing vitamin A.
- Avoid sharing handkerchiefs, eye glasses and face towel
- Wear sunglasses in bright light.

Exercise 3

(a) Name any two eye diseases.

(b) Name any two eye infection

The lens camera



Parts of a lens camera

1. The **lens** focuses light from the object to the film
2. **Diaphragm** is a hole of adjustable size and controls the amount of light entering a camera
3. The **photographic film** has a light sensitive chemical on which the image is formed
4. **Focusing ring** adjusts the position of the lens to focus light on the film
5. **Shutter** opens to allow in light.

After taking the photographs and the film is filled up, the film is removed and developed in some chemicals in the darkness to form a negative. From the **negative**, photographs are printed.

Characteristic of images formed in a lens camera

1. they are upside down or inverted.
2. They are real
3. they are diminished

Comparison between the mammalian eye and a lens camera

Similarity

1. Images formed are upside down or inverted.
2. Images formed are real
3. Images formed are diminished
4. Both contain focusing convex lens

Differences

Eye	Lens camera
1. The pupil admits in the light	The shutter admits in light
2. Images forms on the retina	Image form on film
3. Eye covered with eyelids	Shutter protects the light from the camera
4. Lens focuses by change of shape	Lens focuses by change of distance from the camera.

Exercise 3

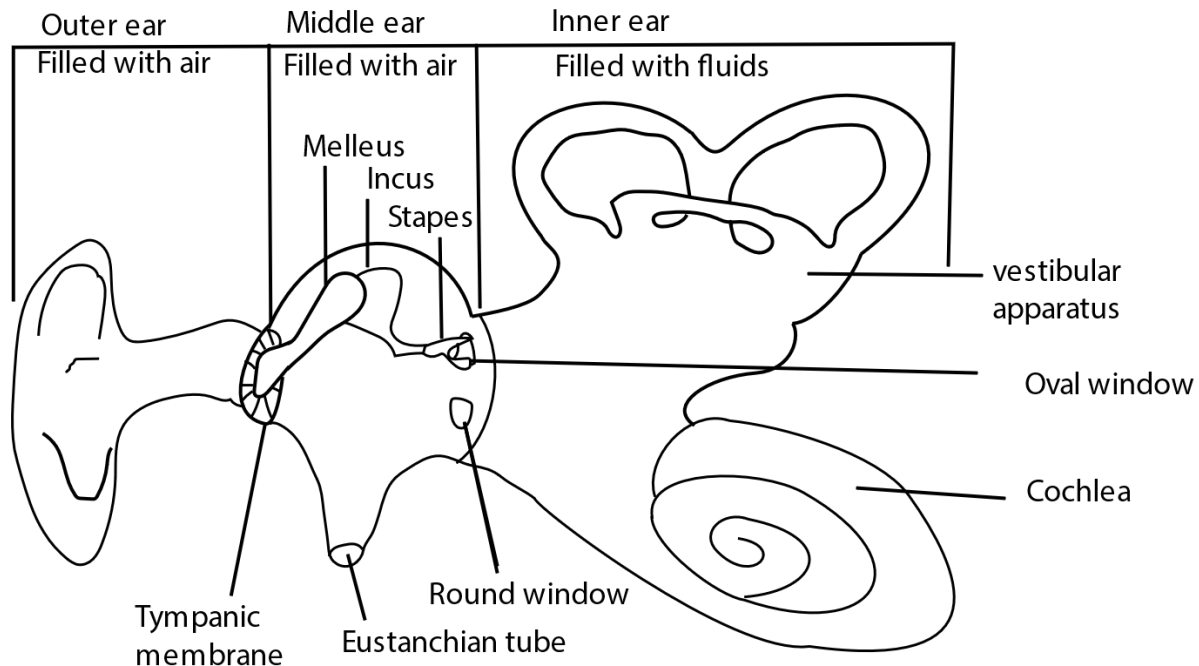
- (i) Give two similarities between the eye and two differences between the eyes and the lens camera.

The human Ear

The mammalian ear has three major functions

- Detecting sound through the cochlea
- Maintenance of body balance by the semicircular canal
- Equalize pressure in the head through Eustachian tube

Structure of mammalian ear



The has three main parts

- (a) Outer ear
- (b) Middle ear
- (c) Inner ear

Hearing

- (i) Sound waves move into the ear canal and cause the eardrum to vibrate.
- (ii) Vibration of the eardrum are transmitted through the ossicles to the cochlea.
- (iii) The vibration of the fluid of cochlea and its contents generate and send messages to brain for interpretation

Eustachian tube equalizes pressure in the ear with atmospheric pressure.

Semicircular canals/vestibular apparatus is used for balancing

A person who cannot hear is said to be **deaf**.

Importance of wax in the ear

- (i) **Protection against dust and dirt:** Ear wax traps small particles like dust, preventing them from reaching the inner ear.
- (ii) Prevents **infections:** It has antibacterial properties that protect the ear canal from harmful germs.
- (iii) **Lubrication:** Keeps the ear canal moist, preventing dryness and itching.
- (iv) **Barrier against insects:** Its sticky nature can trap small insects that might enter the ear.

Caring for the ear

The ear should be cleaned regularly.

Some ways of taking care of the ear include:

- i) Never insert sharp objects in the ear because they can pierce the eardrum.
- ii) Insects, and foreign bodies in the ear should be removed by specialized person/doctor.
- iii) Avoid loud noises or sound which can burst the ear drum and lead to deafness.
- iv) All ear infection should be treated immediately.

Exercise 4

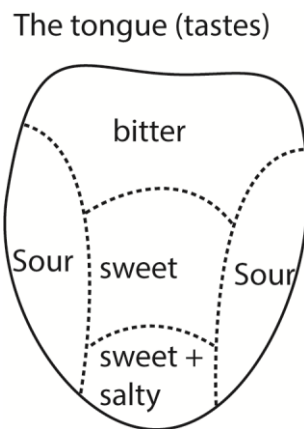
- (i) Name the outer part outer part of the ear.
- (ii) What is the importance of wax in the ear
- (iii) Name the part of the ear the equalizes pressure with atmospheric pressure.

Tongue

This is the sense organ for tasting. The parts of the tongue that sense the taste of food are called taste buds.

There are different tastes:

1. Sweet – the sweet taste is detected by taste buds at the tip of the tongue. Anything that is sweet has a sugar taste, and contains sugar. An example is ripe bananas
2. Salty the salty taste is also felt at the top of the tongue. anything salty contains salts
3. Sour the taste is felt at the sides of the tongue. A sour taste is sharp and is acidic. An example is the taste of lemon or vinegar.
4. Bitter- the bitter taste is detected by taste buds at the back of the tongue. Bitter taste is sharp and unpleasant for example the taste of the peels of a lemon or the peels of oranges.



Caring for the tongue.

This is done by brushing it using a soft brush to remove the remaining of food particles. Cleaning the tongue ensures that the taste bud remains fresh and the tongue produce fresh breath.

Exercise 5

- (i) Suggest one way of caring for the tongue.

(ii) Give one use of the tongue.

Nose

The nose is the sense organ that detects **smell**. This helps to discriminate between good and bad food and also to detect predators.

The inside of the nose has a sensitive moist Lining that sense chemicals in gaseous form.

The hairy lining cleans the air breathed in before reaching the lungs.

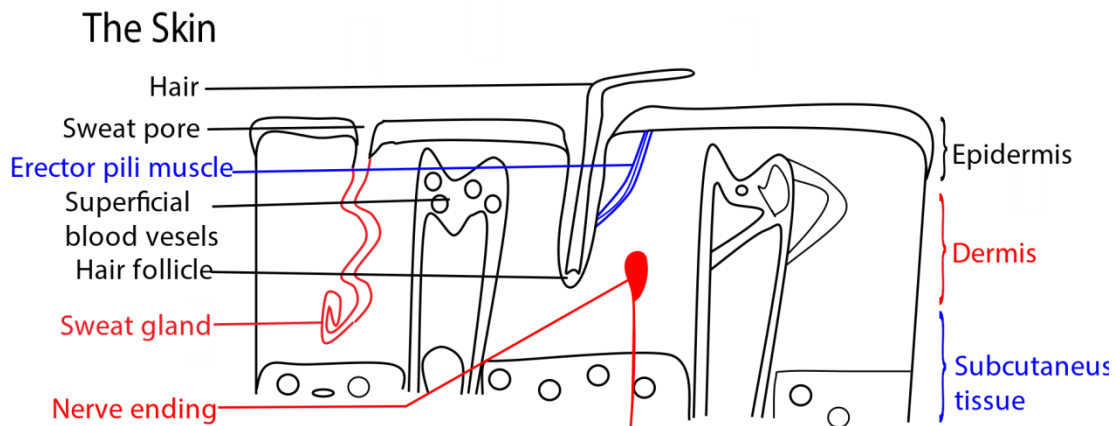
Caring for the nose

The nose should be cleaned regularly of the

Rough objects should not be used to the nose as they may injure the delicate inner lining and this could lead to nose infections.

Exercise 6

What is the use of the hair in the nose



The skin is the outer most covering of the body

Functions of the skin

- (i) Protects inner parts of the body
- (ii) Regulates body temperature

- (iii) Manufactures vitamin D in presence of sunlight
- (iv) Removes waste products from the body such as urea and ammonia

Exercise 7

Give two functions of the skin.

Regulation of body temperature by the skin

Response to cold

1. Erector pili muscle contract raising the hair. Air gets trapped in the spaces between the hairs and insulates the body
2. The arterioles leading to the superficial capillaries contract. As a result, the blood flow is diverted from the surface cutting down the heat loss.
3. Metabolic rate increases, heating up the body.

Responses to hot conditions

1. The hair is lowered by relaxation of the erector pili muscle and removing air insulation
2. The arterioles leading to superficial capillaries dilate and as a result of blood flow to the surface is increased leading to increased heat loss
3. Sweating (panting in dogs) occurs and evaporation of water cools the body
4. Metabolic rate decreases reducing heat production.

Causes of overheating of the body

- Vigorous exercises
- Diseases
- Taking hot foods and drinks

The first aid for fever is applying a wet warm cloth (Tepid sponging)

Overcooling of the body

Causes

- Diseases
- Cold weather
- Frustration

- Shocking news

First aid for lower fever is to cover the victim with thick blanket to become warm

Skin diseases

1. Scurvy

It is a non-communicable disease caused by lack of vitamin C in the diet.

A person with scurvy develops slow healing wound, swollen and bleeding gums

Prevented by eating fruits

2. Leprosy

It is caused by a bacteria

Spread by contact

It causes paralysis or inability of body parts to move, feel or function well. Fingers and toes may break off.



3. Scabies

It is caused by itchy mites that cause itching and watery sores on the skin.

Spread by shearing clothes and beddings and by contact.

It is controlled by antiseptics, isolation of the victim and not sharing clothes



4. Ringworms

It is caused by a fungi

It is spread by contact, sharing clothes, washing sponges

Causes development of white and round patches on the skin and head

Treated with antifungal drugs

Prevented by keeping personal hygiene

5. Athlete's foot

6. German measles

Exercise 7

Name any two skin diseases and their causes.

Skin disorders

1. Cuts and wounds

Treated by dressing and antibiotics to prevent pus

2. Burn and scalds

A burn is an injury on the skin caused by dry heat while a scald is caused by hot liquid

First Aid for burn and scald

Pouring cold water on an affected part to cool the part and minimize further damage to the skin

Caring for the skin

- Regular bathing with soap and water
- Eat well balanced food with fruits
- Avoid strong chemicals on the skin
- Treat diseases

Table showing the functions of the internal organs

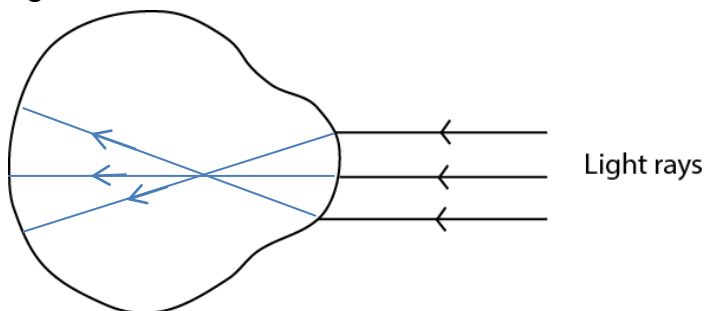
Organs	Functions
Brain	Controls all activities of the body
Lungs	Allows gaseous exchange between the blood and air
Heart	Pumps blood around the body
Liver	<ul style="list-style-type: none">- regulates blood sugar- stores vitamin A and D- produces bile
Stomach	<ul style="list-style-type: none">- digests proteins

Revision questions on the eye

1. Name one body organ in man that makes use of light energy from the sun.
Eye
2. In the table below, some of the diseases are given below with their symptoms and prevention/controls. Study it and answer the missing information.

Trachoma	<u>Mild redness and itching of the eyes, pus in eyes after sleep, scarring</u>	Washing of eyes, avoid sharing articles with sick person, e.g. basin, towel, medical treatment
<u>River blindness</u>	Swelling on the skin, Itching skin, Skin rash, Damaged iris	Keeping away from black flies infected river banks, Clearing the bushes around the house, Spraying the black flies with insecticide

3. Complete the rays of light in the diagram below to show a condition of short-sightedness.



4. Why is a concave lens used to correct short sightedness?
Concave lens.
5. Which part of the eye function like a film in a camera?
Retina
6. State one way is the retina of human eye similar to the film of a pinhole camera.
It is where the image is formed
7. Musa is long –sighted. Draw the type of lens he should use to correct his eye problem.



Convex lens

8. Give any one use of wearing sun glasses.

Prevent direct sunrays that may damage the eye

9. Give the difference between river blindness and night blindness

River blindness is caused by Onchocera volvulus while night blindness is caused by lack of vitamin A.

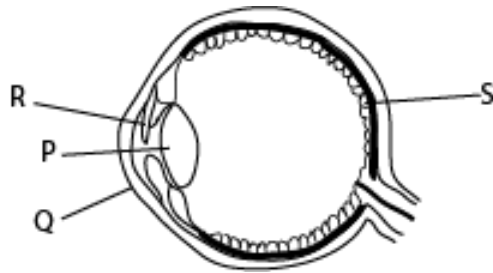
10. In the space provided below, draw a lens used to correct short sightless.



11. Apart from trachoma, name one other eye disease.

- **Conjunctivitis (pink eyes) which cause the conjunctiva to swell**
- **Sty appears like a small boil on the eyelid which is sign of anemia or diabetes.**
- **Night blindness due to lack of vitamin A**
- **River blindness caused by small worms called Onchocera**
- **Syphilis**
- **Gonorrhoea**
- **Cataract which causes the eye lens to appear opaque**
- **Corneal ulcer caused by an injury on the cornea.**
- **The diagram below shows a human eye.**

12. Below is a diagram of an eye. Study it and use it to answer question that follow.



(a) Name the part marked:

- (i) **P: Lens.**
- (ii) **Q: cornea**

(b) What is the function of the part marked R?

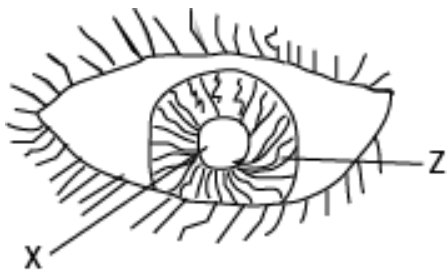
Controls light entering the eye

(c) Which letter on the diagram shows where images are formed?

S.

The diagram below is of a human eye.

Use it to answer question 13 and 14



13. Name the part marked with letter X

Pupil

14. Give the use of the part marked with letter Z.

Controls amount of light entering the eye

15. (a) Which part of the body is affected by each of the following diseases

(i) Scabies: **skin**

(ii) Trachoma: **eye**

16. Name the type of lens used to correct long sightedness

Convex lens

17. The table below, shows source of food, the food nutrients in it and the related deficiency disease. Complete it correctly.

Source of food	The food nutrient	Related deficiency
Carrots, fish, liver, eggs	Vitamin A	Night blindness

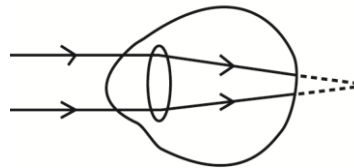
18. The table below shows diseases, the vectors that spread them and disease-causing germs. Study and complete it correctly.

Disease	The vector that spread them	<i>Disease-causing germ</i>
River blindness	Blackflies	<u><i>Worm/filarial worm</i></u>

19. The table below shows some common infection, organisms that cause it and the body part affected. Study and complete it correctly.

Common infections	Organism that cause it	Body parts affected
Trachoma	Chlamydia	Eyes

20. The diagram shows a defect of the human eye. Study and use it to answer the questions that follow



(a) Name the eye defect above

Long sightedness

(b) State two causes of of the eye defect shown above

(i) Short eyeball

(ii) Weak lens

(c) What type of lens is used to correct the above defect?

Convex lens

21. The table below shows some common infections, organism that cause it and the body parts infected. Study and complete it correctly

Common infection	Organism that cause it	Body parts infected
Trachoma	<u>chlamydia</u>	eye
River blindness	onchocerca volvulus/worm	<u>eye</u>

22. Give two similarities and differences between the eye and a lens camera

(a) Similarities

(i) Each has a lens

(ii) Each form inverted image

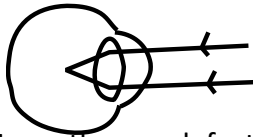
(b) Differences

- (i) Focusing of an image in the eye is due changes in the shape of the lens while that of the lens camera is by changing the distance between the lens and the film
- (ii) Eye forms temporary image, lens camera forms permanent image

23. Give the functions of the following parts of the eyes

- (a) Lens focused the image on the retina
- (b) Iris controls the amount of light entering the eye
- (c) Retina is where the image forms
- (d) Pupil allows light to enter the eye

24. Below is a diagram showing an eye defect.



- (a) Name the eye defect shown in the diagram above.

Short sightedness

- (b) Give reasons for your answer in (a) above

Images of distant image forms in front of the lens

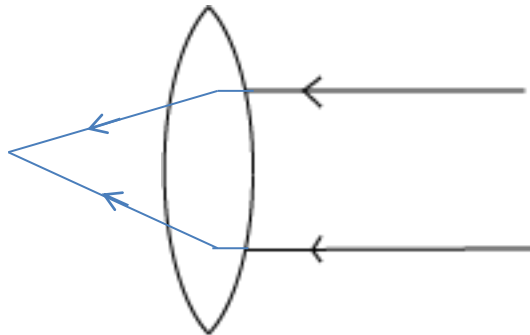
- (c) How can this eye defect for your answer in (a) above corrected?

Using concave lens

25. Why is a concave lens used to correct short sightedness?

Short sightedness

The diagram below shows parallel rays striking a comes lens. study it and answer question 6 and 27.



26. Complete the diagram to show the path of the rays after passing through the lens
 27. What eyes defect does this type of lens correct?

Long sightedness

28. The table below shows part of human eye in A and that of a lens camera in B.

A	B
Iris	Shutter
Pupil	Film
Eye lid	Diaphragm
Retina	Aperture

For each of the parts of the human eye, write the part of the lens camera from B which performs a similar function.

- (i) Iris
- (ii) Pupil
- (iii) Eye lid
- (iv) Retina
29. State the eye disease which is spread by houseflies
 trachoma
30. State any one characteristic of images formed on the retina
 Real, inverted, diminished

Revision questions on the Ear

1. When a drum is hit, you hear sound.

(a) How does the eardrum help you to hear sound?

It vibrates and the vibration transmitted to the inner ear for interpretation

(b) There is wax in the outer ear. What is the function of wax?

Traps foreign bodies from entering the ear

(c) What is the effect of too much wax in one's ear?

Prevents proper hearing

2. What part of the ear is likely to be damaged if you clean your ear with a sharp object?

Eardrum

3. Give one of the functions of the human ear.

Hearing

Posture

Equalize pressure in the head

4. Which organ in your body helps you to find out whether something is sweet or bitter?

Tongue



5. Name the sense organ for hearing.

Ear, lateral line, feelers, antennae

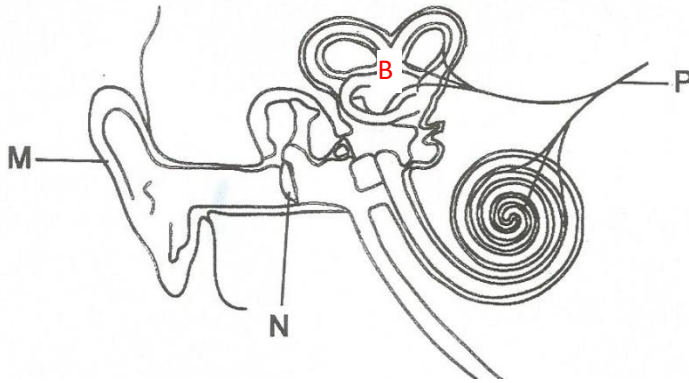
6. Which part of the human ear equalizes pressure in and outside the ear?

Eustachian tube

7. Name the body organ which helps a person to know whether there is enough sugar in tea or not

Tongue

8. Study the diagram of the human ear below and use it to answer the questions that follow.



- (a) Name the parts marked M and N

- (i) M: **pinna**
- (ii) N: **eardrum**

- (b) Give the function of the part marked P.

Send impulses to the brain

- (c) Use letter B to show the part of the ear responsible for balancing the body

9. Which part of a fish performs a similar function as the human ear?

Lateral line

10. How can you assist a person who has a foreign body in the ear?

Rushing a person to hospital

11. When a drum is hit, you hear sound.

- (a) How does the eardrum help you to hear sound?

It vibrates sending signals to the inner ear.

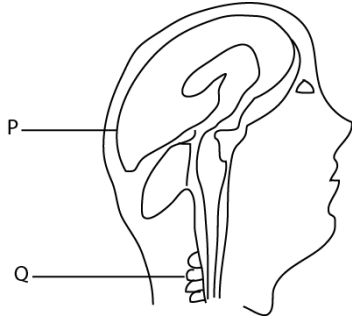
- (b) There is wax in the outer ear. What is the function of wax?

To trap dust and foreign matter.

(c) What is the effect of too much wax in one's ear?

Blocks the ear canal leading loss of hearing

12. Use the diagram below to answer the question which follow.



(a) What name is given to the part labelled P

cerebrum

(b) Give the function of the part marked Q.

To protect the spinal cord.

(c) Name two sense organs shown in the diagram above, by which someone can tell that there is something burning?

Nose

Eye

Questions on the skin

1. State the sense organ for feeling in the human body.

Skin

2. Which communicable disease in human affects both the skins and the skeletal system?

Leprosy

3. Why should cold water be poured on the part of the body which has been scalded or burnt?

To cool the affected part and minimize further damage to the skin

4. Name the human body system to which the lungs, kidney and skin belong.

Excretory system

5. Betty's home is near a pond.

(a) State any two diseases members of Betty's family are likely to suffer from.

(i) **Bilharzia**

(ii) **Malaria**

(iii) **Cholera**

(iv) **Typhoid**

- (v) **Yellow fever**
- (vi) **bilharzia**

(b) Suggest one thing that Betty can do to avoid one of the disease mentioned.

- (i) **Avoid playing in dirty water**
- (ii) **Drink boiled water**
- (iii) **Sleep in mosquito net**
- (iv) **Pouring oil on the pond to reduce mosquito breeding**
- (v) **Draining the pond to remove mosquito breed place**
- (vi) **To add small fish in the pond to eat mosquito larvae.**

(c) How is scabies spread?

Through contact with infected person

By sharing clothes with infected person

6. How does leprosy spread?

Through body contact with infected person

Through nasal secretion for infected person

7. In which way is the function of kidneys similar to that of the skins in a human body?

They are both organs of excretions

8. (a) Name one practice which increases the spread of bilharzia.

Swimming

Urinate in water

Defecate in water

(b) Which vector is important in the spread of bilharzia?

Snail

(c) Give any two ways of preventing the spread of bilharzia.

Avoid swimming in river and ponds

Proper disposal of wastes

Treatment of infected persons

Clearing stagnant water

9. (a) Why is it a bad practice to apply soil or cow dung on any burnt area of our skin?

They may contain germs

They do not reduce the heat from the burn

(b) Suggest any two reasons why the injured part with a burn or scald is dipped into cold water.

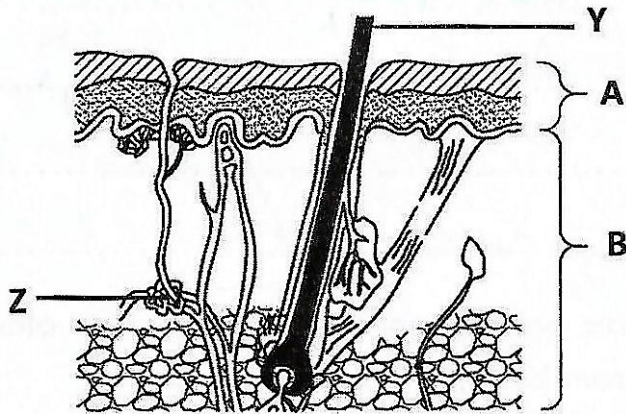
To cool the burnt place

To minimize the effect of the burn

(c) Give any one way of avoiding burns while lifting hot objects.

Use pieces of paper or cloth

10. The diagram below of a human skin. Use it to answer questions that follow



(a) Name the layers A and B

(i) A- **Epidermis**

(ii) B- **Dermis**

(b) Give the function of the part labeled Y and Z

(i) Y- **insulate the body**

(ii) Z – **secrete sweat**

11. State any **one** way in which the spread of scabies can be prevented.

- **Avoid body contact with infected person**
- **Avoid sharing clothes and comb**
- **Early treatment with calamine or benzylbenzoate**

12. (a) Name the outermost layer of the skin

Corneified layer

(b) State any one waste product removed by the skin

Urea, ammonia

(c) Apart from removing wastes, mention two other functions of the human skin

- (i) **Protects inner part of the body**
- (ii) **Produce vitamin A**
- (iii) **Regulates body temperature**

13. How does the skin of a person maintain its body temperature on a hot day?

- **It forms sweat which when evaporates cools the body**
- **Hair lowers leading to increase heat loss**
- **Blood capillaries on the skin dilate, and increase blood supply to the skin leads to increased heat loss**

14. Which First Aid would you give to a person who has a burn by fire?

Pour cold water to burnt area to reduce the effect of burn

15. Name the main food you would eat to prevent scurvy?

Fruits like oranges, lemon

16. Whenever Bbosa runs on a sunny day, he sweats. What is the importance of sweating to his body?

Evaporation of sweat cools the body

17. A child suddenly removed the cover of a saucepan full of boiling water. One arm of the child was burnt with steam.

(a) What kind of burn did the child get?

Scald

(b) What First AID would you give to the child

Pour cold water on the scald

(c) Give the possible ways by which such accidents could be avoided?

Keep small children away from hot objects

Construct fire guard around fire places.

Children should be taught dangers of fire and hot objects.

47. Match items of group A with those of group B by completing the table below

A	B
Heart	Sensory organ
Kidney	memory
Skin	carbon dioxide

Lungs

circulation

Brain

urine

Complete the table below

	A	B
a	heart	Circulation
b	Skin	Sensory organ
c	Brain	Memory
d	Lung	Carbon dioxide

Thank You

Dr. Bbosa Science