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Object :- To study the structure of human heart with the help of model available in the laboratory.

Material required :- Model of heart, lens, pencil and notebook

Procedure :- Observe the model available in the lab carefully and notedown its features.

Draw it in the practical notebook and label the different parts.

Structure of Heart

The Heart

Heart is a muscular pumping organ. The adult human heart is about the size of a closed fist. It is located in the chest cavity slightly towards the left, enclosed in a double walled sac called pericardium. A pericardial fluid, is present between the heart wall and pericardium. The Heart is made of muscle cells called cardiac muscle fibres.

The heart consists of four chambers.

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The upper two chambers constitute the right and left auricles or atria (singular atrium) and the lower two chambers form the right and left ventricles. The right and left sides are separated and do not communicate. The right and left auricle opens into left ventricle by a opens into right ventricle through right auricolo-ventricular aperture.

Valves In The Heart.

Heart has four valves

1 Tricuspid valve: which guards the opening between the right auricle and the right ventricle.

2 Bicuspid valve, which guards the opening between the left auricle and the left ventricle.

3 Aortic semilunar valves, located at the opening of the right ventricle into the pulmonary artery and are three in number.

The valves permit the flow of blood in one direction only and not in the reverse direction, preventing back flow of blood.

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Blood vessels entering and leaning the heart.

A Blood vessels entering the Heart.

- Superior vena cava
- Inferior vena cava
- Coronary sinus

B Blood vessels leaving the Heart.

- Pulmonary artery
- Aorta
- Coronary arteries

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Object:- To study the structure of different organs of excretory system, of human with the help of model available in the lab.

Material required:- Model of excretory system, magnifying glass, hand lens, pencil, notebook.

Procedure:- Observe the model of the excretory system with the help of hand lens and note it down in a notebook.

Draw the diagram of excretory system and L.S of kidney.

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Aim:- To demonstrate osmosis by using a potato osmoscope.

Materials required:- A medium sized potato tuber, knife, 25% sucrose solution, distilled water, petri disk, alphin (six numbers).

Procedure

(i) Peel off the skin of a potato. Cut the bottom of the potato to make it flat and thin.
(ii) Make a cavity in the peeled potato by using a knife.
(iii) Fill the cavity of the potato tuber with 25% sucrose solution glucose.
(iv) Fill a large petri dish with water.
(v) Keep the potato cavity filled with sucrose solution in the petri dish containing water.
(vi) The water level in the petri dish should be higher that the sucrose soleution in the potato's cavity.
(vii) Insert four alpins, on the wall of the potato cavity to mark the initial level of sugar solution.
(viii) Leave the set up for about an hour.

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Observation

After an hour it is observed that the level of the sucrose solution inside the potato cavity rises. The concentration of water molecules inside the potato cavity is less compared to outside water in petri dish at beggining at the experiment. The semi-permeable membrane of the cells of potato tuber allows the water to move across them into the cavity of potato due to osmosis which results in the rise of solution level. Mark with two alpins to show the risen level of sucrose solution. Calculate the different between the two levels of sucrose solution.

Conclusion

The water from the beaker moves into the potato cavity through the potato base that acts like as a semi permeable membrane.

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Set-up 1: Fill in the inverted thistle funnel with concentrated sugar solution and immerse in a beaker containing water. Mark the level of sugar solution in the thistle funnel.

Set-up 2: Fill the inverted thistle funnel with plain water and immerse it in a beaker containing sugar solution. Mark the level of water in the thistle funnel.

Allow Set-up 1 and Set-up 2 to stand for a few hours.

Observations

(i) The level of sugar solution in the thistle funnel rises in Set-up 1

(ii) The level of water in the thistle funnel falls in Set-up 2.

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Inference

(i) In set-up 1, water from the beaker passes through the cellophane paper into the thistle funnel, resulting in rise in water level in the thistle funnel. This demonstrates the process of endosmisis.

(ii) In set-up 2, water from the thistle funnel passes out through the cellophane paper to the beaker, resulting in lowering of level of plain water in the thistle funnel. This process is called exosmosis.

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Procedure:

Take two test tubes (A) and (B) filled with water. Pull out a young leafy plant (such as balsam) from the soil with its roots intact. Insert the plant with roots into the test tube (A) soon. Put few drops of oil in the test tube (A) and (B) which has no plant.

~~Level of water in the~~

(observation):

Level of water in the test tube (A) falls but not in the test tube (B).

Inference

Water lost in test tube (A) was absorbed by the roots of the plant.

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Objective:- To demonstrate the oxygen production during photosynthesis

Materials required: Hydrilla plant, beaker, funnel, test tube and pond water.

Procedure:

(i) Place a few twigs of Hydrilla plant under an inverted funnel kept in a beaker containing water.

(ii) Fill a test tube with water and invert it over the stem of the funnel.

(iii) Keep the set up in sunlight.

Observation

Within a few minutes, streams of gas bubbles appear from the cut ends of the Hydrilla twigs and collect in the test tube.

Remove the test tube when sufficient amount of gas has been collected in it and drop a glowing splinter in the test tube. The

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splinter bursts into flame.

Inference:

Since oxygen is a supporter of combustion, the gas collected in the test tube is oxygen. This confirms that oxygen is evolved during photosynthesis.

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Objective:- To demonstrate that chrophyll is essential for photosynthesis

Materials required:- A potted plant with variegated leaves like coleus and cotton, alcohol or methaylated spirit, iodine solution, beakers, test tube and a petri dish.

Procedure:

(i) Destrach the plant by keeping it in dark for 1 or 2 days

(ii) Place the plant in sunlight for a few hours

(iii) Detach a leaf from the plant and on a dis paper make its sketch. Carefully mark the distribution of cholorophyll in the leaf.

(iv) Test the leaf for the presence of starch.

Observation

Green portions of the leaf turn blue-black indicating the presence of starch while the non green portions of the leaf turn

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brown indicating that starch has not been formed.

Inference

Since only green portions of the plant show blue-black color. It is inferred that chlorophyll is essential for photosynthesis.

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Objective :- To show transpiration in plants

Materials required :- One potted plant, one pot with soil, polythene sheet and rubber bands.

Procedure :-

(i) Take a well-watered potted plant. Cover the pot with a polythene bag and tie the mouth of the bag tightly to prevent water vapour from escaping from the bag. Observe after some time.

(ii) For control, set up a similar experiment without the plant. Observe after some time.

Observation :

Drops of water appear on the inner surface of the polythene bag in (A), while no change is seen in (B).

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Objective:- To study the structure of eye with the help of model available in Lab.

Materials required:- Model of the eye, magnifiy glass, Notebook and pen.

Eyes are situated in deep bony cavities called the orbits on the front side of the head.

Each eyes consists of an eyeball and allesory structures comprising the eyelids eyelashes, lachimal glands and the eyebrows.

(a) Eyelids: They are ~~protect~~ protective in nature as they shade the eyes during sleep, protect the eyes from excessive light and foreign particles, and their blinking spreads lubricating secretions over the eyeballs.

(b) Eyelashes: Each gland is located at the upper, outer end of the eyeball, of beneath the eyelid. Their secretion, called tears, are spread as lubricant and also washes away dust particles. Tears also have

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antiseptic property as they contain a bacterial enzyme, lysozyme. Lysozyme helps in killing germs.

(d) Eyebrows → Eyebrows are the strip of coarse hairs growing on the ridge above a person's eye socket. As they are on the ridge above a person's eye prevent sweat, water and other debris from falling down into eyes. They are also important to human communication and facial expression.

(e) Conjunctiva: It is a thin membrane covering the entire front part of the eye. It is continous with the inner lining of the eyelids. Over the cornea it is reduced to a single layer of transperant epithelium.

Structure of the Eyeball

Each eyeball is embedded in a bony socket and is attached to the bones by six muscles. Only the front one-sixth portion of the eyeball is exposed.

The eyeball is divided in three layers.

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outer fibrous sclera, middle vascular choroid and inner nervous coat retina. Out of these only the fibrous coat is complete, others are incomplete.

(1) Sclera: Sclera or fibrous coat is thick, white non-elastic coat surrounding the eyeball, except its anteriormost portion- the iris. Its posterior surface is pierced by the optic nerve. The sclera bulges is in front as a non-vascular, transparent, fibrous coat, covering the coloured part of the eye. This part is called the cornea.

(2) Choroid :- This middle coat of eye is soft, vascular and thin. Rich blood supply is there to provide nourishment to the organ. Choroid completely encloses the eye except in front where there is a circular window called pupil lying in the centre of the cornea. Iris is the portion around the pupil. Color of eye refers to the color of iris. The iris contains and circular muscules, which by the contraction widen the amount of

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light entering the eyes the choroid layer itself contains a black segment which prevents light rays from reflecting and scattering inside the eye.

Citary body: considering of ciliary processes and ciliary muscles, is the thickest portion of the choroid arising from a point just behind the junction of the sclera and the cornea.

Lens:- Lens is a transported biconvex crystalline body located immediatly behind the pupil. It is held in position by fibres collectively called the suspensory ligament, which attaches it to the ciliary muscles change the shape of the the lens for viewing objects at different at different distances.

Lens divide the inner cavity of the eyeball in the two chambers:

(a) aqeous chamber: Present between lens and the cornea and is filled with clear watery fluid called aqueous

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humour watery fluid aqeous humour. Aqueous humour supplies oxygen and nutrients and removes metabolic waste. It keeps the lens moist and protects it from physical shocks.

(b) Vitreous chamber:- It lies behind the lens and is filled with a jelly like vitreous humour; which contains water and salt. It helps in maintaining the shape of the eyeball and protects the retina and its nerve endings

(c) Retina: It is the innermost thin layer, in which photoreceptor cells rods and cones are concentrated. Rods are sensitive to dim light and are important for night vision. They do not respond to color and form black and white images. They contain a pigment called rhodopsin. Cones are sensitive to bright light and white images. They contain a pigment called iodopsin.

(i) In nocturnal animals like bat and owl, photo receptors have mainly rods whereas in others, cones are more than rods.

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(ii) The functional differences between rods and cones can be related to daily experiences. For example, when we enter a cinema hall from bright sunlight, the hall seems very dark in the begging but gradually objects become visible.

Vitamin A deficiency causes night blindness because rhodospin, which helps to see in dim light is synthesised from vitamin A.

Blind spot:- It is the spot of eye which does not have any sensory cells. Hence, no image is formed here and so it is called blind spot. At this point, the nerve fibres converge and bundle together to leave the eyeball in the form of the optic nerve. Blind spot is the area of no vision.

Yellow spot:- It contains maximum number of cones. It is the region of brightest vision, especially color vision. It is extremely sensitive to light and is associated with magnified image. Yellow spot is also called Macula or Fovea centralis. The

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rest of the retina has fewer cones and more rods. Yellow spot is also the place of best vision of the normal eye. This is the reason why we move our eyes from word to word as we read a line through a printed page. Yellow spot is the area of best vision.

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