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TINY CHAMBERS IN OUR BODY

Have a look at your surroundings. How many types of plants! How many species of animals! Are they all alike? What special features can you notice in each of these plants? Are the different parts of the same plant all alike? How do leaves, stem, roots differ from each other? What is the reason behind these differences? Observe the different parts of a plant using a hand lens.

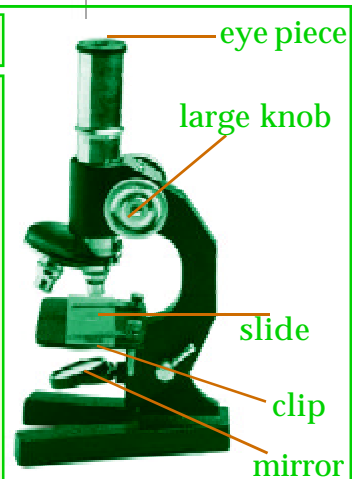


Parts of a Plant	Observation results
Root	
Stem	
Leaf	
Flower	

You have seen the parts of a plant in their magnified form. Are all minute parts in them visible to you? Let's use a microscope for a detailed observation.

While using a microscope

- Adjust the mirror of the microscope so that light rays fall on the slide.
- Adjust the shutter of the microscope to allow the required amount of light to come in.
- Place the object on a glass slide and cover it with a cover glass.
- Fix the slide in its position using the clips.
- Look through the eye piece and adjust the knobs of the microscope for getting a clear vision.



What are the different plant parts that can be observed?

Leaves and stem of Colocasia, betel leaf, shoe flower, tender roots of plantain, onion peel, bryophyllum, bamboo shoots, tender stem of Eupatorium.

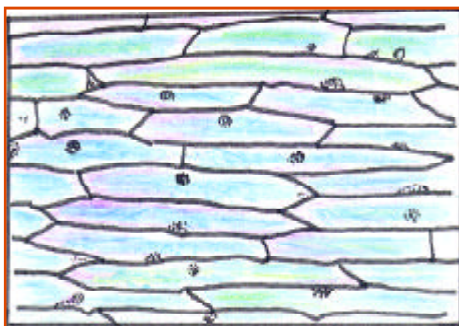
Take a thin section of them and observe under the microscope. By staining you can view them clearly.

Now, do you observe anything different from what you have seen using a hand lens? Don't they look like tiny chambers arranged closely and regularly? Examine a part of onion peel through a microscope and draw the diagram of what you have observed. Write a short note on it.

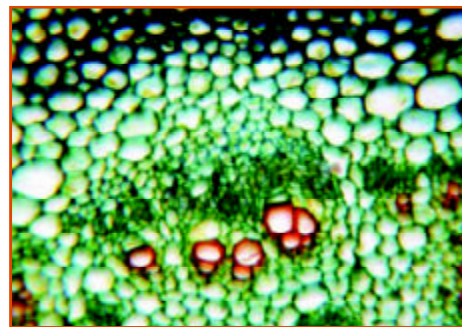
Result of Observation



Examine other parts of a plant also through the microscope. Record your observations with diagrams in your science diary. Compare the diagrams you have drawn in your science diary with those given below.



Cells of onion peel



Cells of a leaf

History of the cell

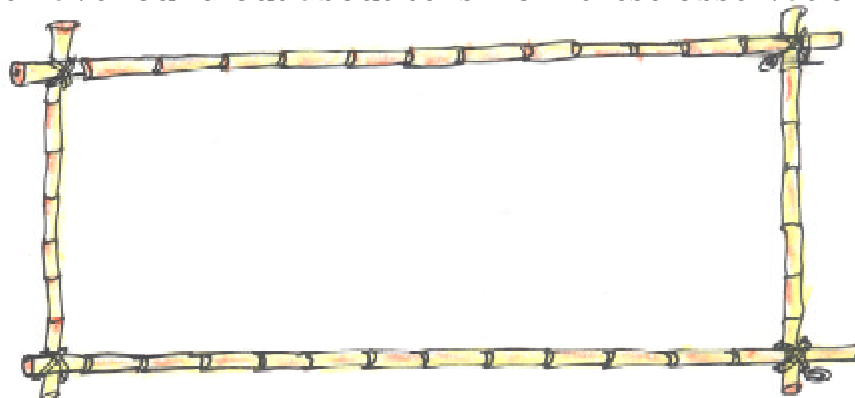
Robert Hooke was in charge of keeping the equipments in the Royal Society of London. When he observed thin slices of cork through the microscope he had developed on his own, he happened to see honey comb like structures. He called these structures 'cellulae' which means 'small chambers'. The word 'cell' originated from 'cellulae'. This happened in 1665. After twenty three years Anton Van Leeuwenhoek first discovered the living cells. For this he developed a microscope which could magnify objects 300 times. Another scientist M.J. Schleiden discovered that 'the body of plants is made of cells'. It was Theodore Schwann who discovered that the body of animals is also made up of cells. The fact that 'new cells can be originated only from the pre-existing ones' was found out by Virchow.



Robert Hooke



What we have found out about cells from these observations?



Respiration in plants

We have seen that the body of plants is made up of different kinds of cells. What are these different cells for?

Green plants prepare food in their leaves, don't they?

Plants receive carbon dioxide for the preparation of food (photo synthesis) and oxygen for

respiration mainly through stomata on the leaves. Let's see how stomata help in the exchange of these gases.

Guard Cells

Try out this experiment.

Peel off a thin layer from the lower side of a betel leaf and place it on a glass slide. Put a drop of water on it. Place a cover glass on it and observe it through the microscope. What do you see?

Don't you see the cells and the pores in between them as in the figure?

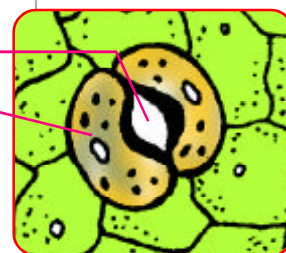
Are all the pores seen open?

Draw the guard cells and stomata as you have seen through the microscope.

Different kinds of cells

The body of animals and plants is made up of cells. Cells differ in their size, shape and structure. The structure of cells in a leaf is suited for the preparation of food. Stem contains cells which can transport water and minerals to different parts of a plant.

stomata
guard cells



Stomata

In plants exchange of gases takes place through minute pores on leaves called stomata. Water evaporates from plants through stomata. Guard cells on either side of the stomata control the opening and closing of them. Guard cells are seen either in the shape of a bean or a dumbbell. Closing and opening of the stomata is due to the contraction and dilation of guard cells.

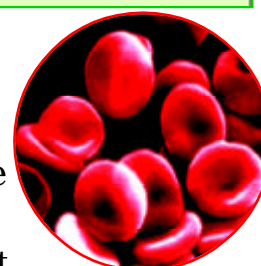


Dumbbell

In the body of animals too

We have learnt that the cells in different parts of a plant have different shape, structure and function. Are the cells in different parts of an animal also like this? How can we find it out?

With the help of your teacher, observe the cells present in blood and those in your cheeks. Do the cells look alike?



Red blood cells

Record your observation results

You have understood that different types of cells are present in the body of plants and animals we have observed.

Do all living beings have so many cells?

Cell itself is the body

Are there plants and animals having only a single cell? Can we see them?

Take some dirty water from a pond or a ditch in a beaker. Using a hand lens observe the water. Do you see any kind of living being in it?

Now, let's try out this experiment too.

Put a handful of hay in water and boil it for some time. Let it cool. Then pour some pond water to it. You may use bio-waste (leaves or compost) instead of hay. Cover the vessel with black paper and keep it in a dark room. After two or three days take a drop of clear water from it in a glass slide and examine it through a microscope.



Do you see any kind of living organisms in it? Draw them.

The organisms we have seen

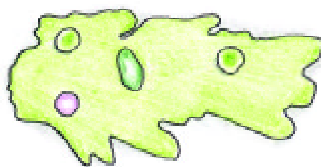


Unicellular Organisms

Organisms which have only one cell in their body are called unicellular organisms. This single cell performs all the life activities viz. movement, food capturing, respiration etc.



Paramecium



Amoeba



Yeast



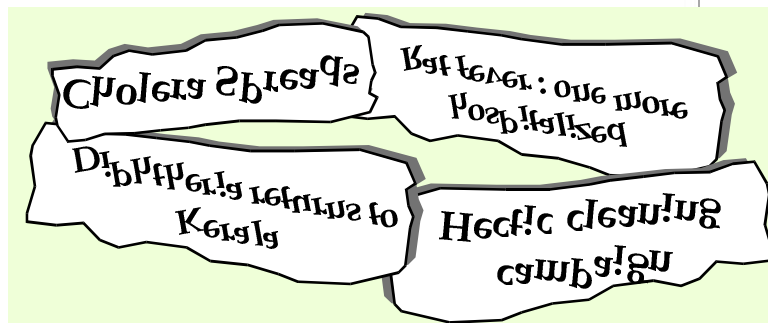
Chlamydomonas



Euglena

Though they are small

Even though unicellular organisms have only one cell in their body they are not too simple to be neglected. Fermentation of dough and curdling of milk etc. are some of their services to us. Some of them are harmful too.



You have noticed the newspaper headlines, haven't you?
What are the different ways through which diseases spread?

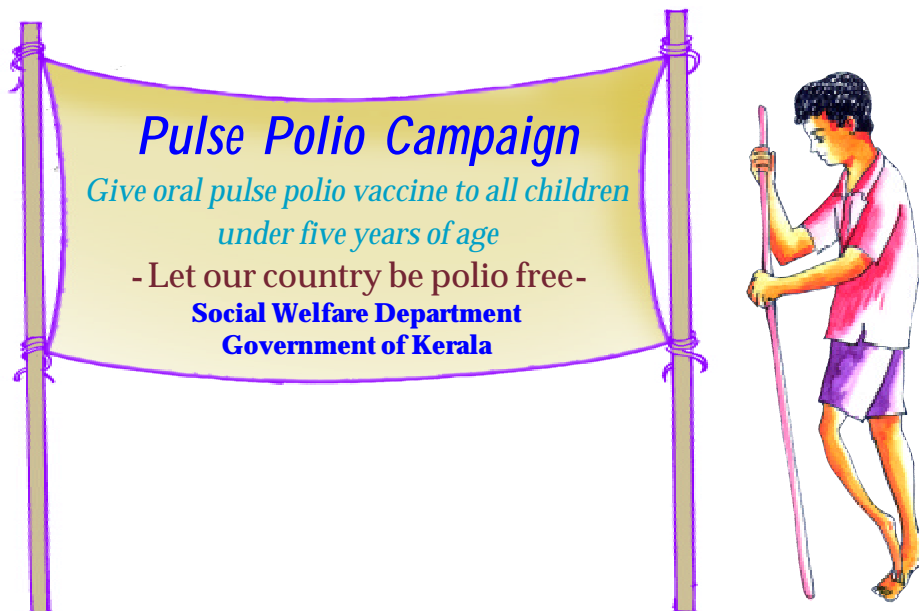


Communicable diseases

Some diseases are caused by the infection of microbes. Microorganisms like amoeba, bacteria, fungus and virus are some of them. Disease causing germs are transmitted from an affected person to a healthy person through air, water, food and by contact. Germs are also transmitted by insects, flies, mosquitoes etc. Such diseases are called communicable diseases. Won't diseases like common cold and conjunctivitis, if affected to a person, be spread to others in the family? All these are communicable disease. Cholera, dysentery, typhoid, chickenpox, diphtheria, tetanus, whooping cough, German measles, mumps etc. are the common communicable diseases. AIDS, dengue fever, Japanese encephalitis, avian flu etc. are the communicable diseases of the modern times. Intensive efforts are on to eradicate diseases like polio, tuberculosis, leprosy, filariasis etc. We have already eradicated deadly communicable disease like small pox.

What are the measures we can adopt to prevent the spread of communicable diseases?

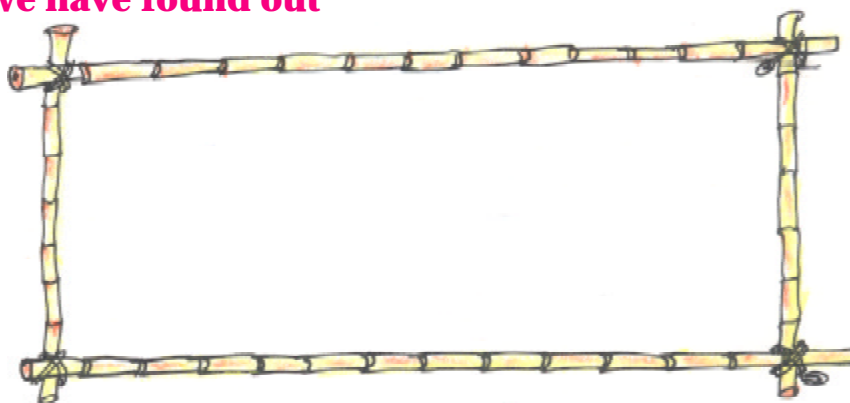
- Keep personal hygiene.
- Keep the surroundings clean.
-



Have you noticed what is written on the banner?
Why is Oral Polio Vaccine given to all children?

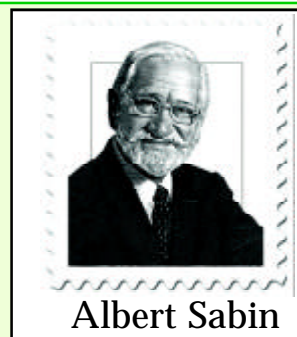


What we have found out



Polio

The polio virus which causes polio enters the human body through contaminated food and water. When infected it causes continuous fever, headache and pain on legs. This may eventually lead to paralysis of limbs and body and then to permanent deformity. Sometimes this may lead to the death of the victim. It was Jonas Salk who first invented a vaccine to resist the disease. The oral drops given to children is this vaccine. The oral polio vaccine was first invented by Albert Sabin.



Albert Sabin

Immunization

In India, many children die every day due to communicable diseases. Physical deformities are caused in many. Most of these communicable diseases can be prevented by immunization.

What measures are to be adopted to curtail communicable diseases? Collect detailed information on this from health workers or a doctor.

What are the details to be collected?

- About causative germs
-
-

Diseases

Human body has its own natural defensive mechanism to destroy germs or to prevent their action. Diseases occur when the body fails to prevent the action of those microbes which enter the body or when it fails to destroy them.



Tabulate the collected data.

Disease	Vaccination	Other preventive measures

Kerala is far ahead of other Indian states in matters of health and hygiene. Yet new epidemics are on the rise in the recent times. We can prevent many of these diseases by immunization programmes.

Plan a programme of action as part of Science Club activities to make the public aware of various immunization programmes.

