

Activity-58: Let us see microscopic organisms:

Welcome to the world that we do not see.

Introduction:

Are all living being of the same size?

What is the smallest living being?

Are there living being on your skin? If so, why can't you see them?

Are there living being in the milk you drink or yogurt you eat? If so, why can't you see them?

What is the smallest thing you can see? What is your eye limit?

How do we see thing that are beyond our limit?

What is a microscope? Who build the first microscope?

Students should collect the following samples:

1. Scrapping from their mouth.
2. Water from a nearby pond (which has greenish appearance).
3. Scrapings from the toilet floor.

Requirements:

1. A compound microscope that has a magnification of 400x.
2. A clean, sterilized and scratch-free glass slide.
3. Cover slips (square type is preferred).
4. Some cotton.
5. Alcohol.
6. Gloves.
7. A white fluorescent light source. Do not use incandescent bulbs for light source.

Experiment:

1. Observe the sample first with the un-aided human eye by holding it against the light source. Do not overlook this step.
2. Take a small sample on a glass slide and place a cover slip on it.
3. Focus the microscope.
4. Observe.

Observation:

1. What do you observe?
2. Do you observe life?
3. Did you see them when you observed them with the un-aided eye previously? If not, where did they come from? Or were they present there always? Why weren't you able to see them previously?
4. Do you observe anything moving, wriggling, twisting, turning, becoming two?

These are called as MICROORGANISMS.

They are living beings JUST like us.

They do all the things that we do. They take in water and food, get rid of wastes, they make copies of themselves, they respond to light, heat, and cold.

The only difference between them and us is that they are made up of ONLY ONE CELL and we are made up of TRILLIONS OF CELLS.

What is a cell?

CELL is the smallest plant that lives.

CELL is the smallest animal that lives.

CELL is the smallest fungus that lives.

CELL is the smallest LIFE.

Diatom



Blue Green Algae



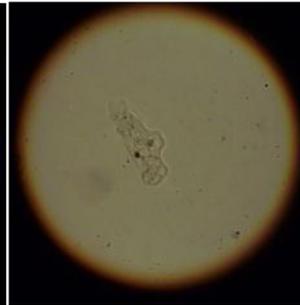
Green Algae



Euglena



Amoeba



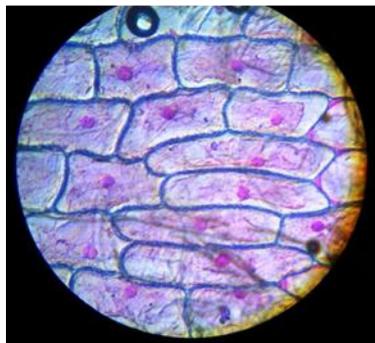
Paramecium



Fungi



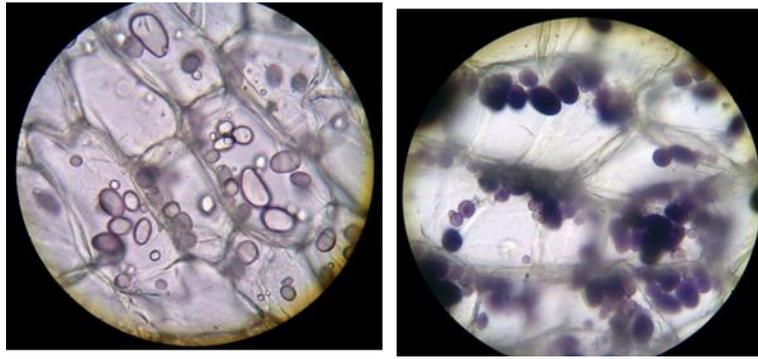
Onion Peel Cells



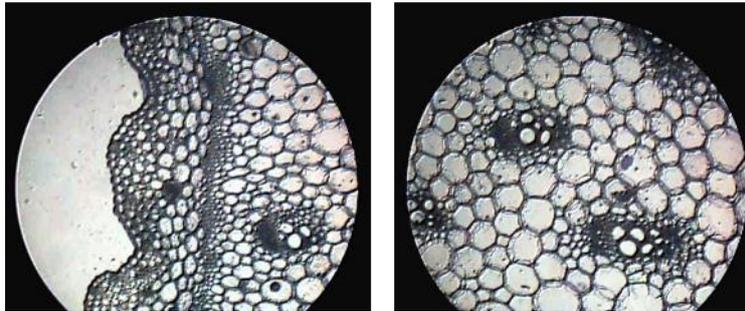
Human Cheek Cells



Starch granules in Potato



Cross section of Amaranth Stem



Activity: Stomata observation

Introduction: What are stomata?

Plants are living being like us. We need to breathe in air (which has oxygen) to live. And we give out carbon dioxide. We do this using a pair of organs called Lungs. Plants do not have lungs like us? So how do they breathe?

Plants breathe in air through small openings on the surface of the leaves called Stomata.

The stomata are so small that they cannot be viewed with the un-aided eye.

Requirements:

- A compound microscope which magnifies 150 times.
- A clean glass slide.
- A razor blade.
- A white light source.
- A leaf.
- Some distilled water.
- Solution of salt in distilled water.

Procedure:

Take the leaf and try to scrap the bottom surface of it using the razor blade. Now place the scrapping immediately on a slide with a drop of plain distilled water. Repeat this with the salt solution.

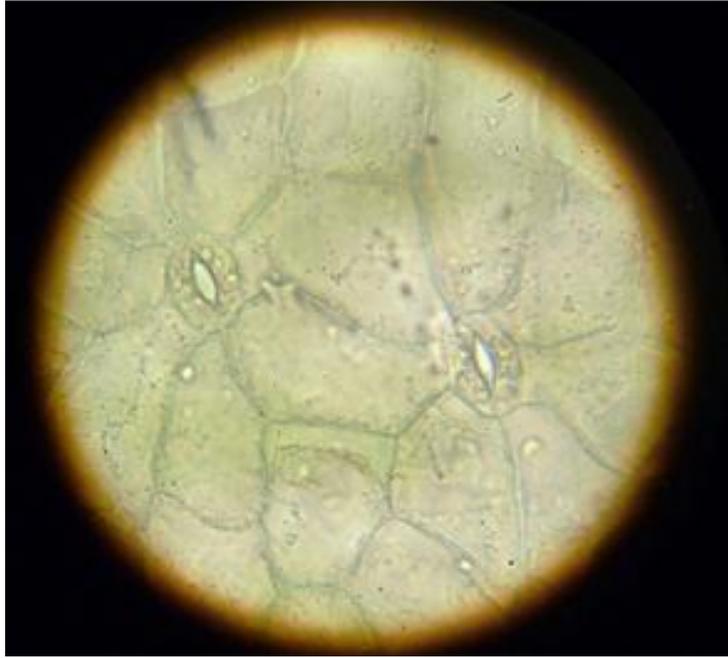
Observe under the microscope. You will see pores or holes surrounded by two kidney shaped cells called Guard cell. The pore is called stomata. It is sometimes guarded by hair like structures.

How many stomata do you see?

Do you see the same number of stomata on both the surface of the leaves?

What is the size of the stomata and guard cells in the slide with plain distilled water and in the slide with salt solution? Why? What is Osmosis?

Stomata



Activity: Budding in Baker's Yeast

Requirements:

Everything you use in this experiment must be pressure-cooker sterilized. If must be performed in a clean environment.

1. Yeast granules (available in a Bakery). It is also called Baker's Yeast.
2. Bottled water.
3. A container.
4. A warm place.
5. Table sugar.
6. A lemon.
7. A microscope that can magnify more than 400 times.
8. A glass slide.
9. Lacto Phenol Plus Cotton Blue stain (if available).

Procedure:

Heat around 250 ml of water till it Luke warms. Dissolve a spoon of yeast in it with 2-3 spoons of table sugar. Add 2 drops of lemon into it. Close it with a secure lid. Make sure your solution is till the brim and there is not much air gap left.

Now place it in a warm place for 2-6 hours in darkness.

Take a drop of it onto to a clean glass slide and observe it under a microscope.

Observation:

Do you observe oval shaped or roughly circular shaped cells forming chains?

Do they move on their own?

How does the solution smell?

Do you observe any froth or bubbles?

Does the solution become more or less opaque (turbid)?