Leaf Structure

Microscope Observations of Cell Structure

Field Activity Details:

- Pencil, rubber, clipboard, and magnifying glass.
- Groups of three students.
- Each group member is to carefully collect one grass leaf, plant leaf or tree leaf.
- Complete worksheet.

1. What type of plant is your leaf from?

2. Hold your leaf up to the light. (not against the sun) What structures can you see inside the leaf? Write your answer in the space below.

Leaves create a wide surface area for plants to collect sunlight energy. The special substance called **chlorophyll** contained in leaves is used to convert the sunlight energy to food energy (carbohydrates) for the plants.

3. Describe the topside of the leaf compared to the underside. Use a magnifier for close inspections. Sycamore would be a good example.

Topside – draw a close up section and describe the features of the leaf.

Underside – draw a close up section and describe the features of the leaf.

4. Keep your leaf, compare your findings with your group members and return to the laboratory.

Leaf Structure

Sc1 Scientific Enquiry

Sc2 Life Processes and Living Things

Section	Objective
1	**What are living organisms made from?**
2	**How can using a microscope give us information about structure?**

1. What type of plant is your leaf from?

2. Hold your leaf up to the light. What structures can you see inside the leaf? Write your answer in the space below.

Leaf veins should be easy to see carrying water and minerals to the leaves from the soil, and taking sunlight energy down to the plant. Students could draw and label what they can see.

Leaves create a wide surface area for plants to collect sunlight energy, because of the special substance called chlorophyll contained in leaves they convert the sunlight to make carbohydrates for the plants.

3. Describe the topside of the leaf compared to the underside. Use a magnifier for close inspections. Sycamore would be a good example.

Use a magnifying glass to help students study the leaf close up. Often leaf topsides have a waxy coating that appears shiny, this can help to reduce evapotranspiration from the leaf. It can help to feel the leaf and describe the texture.

Small holes called stoma, can be observed on the underside, through which the plant takes in carbon dioxide, water can be lost through these holes. Leaves often have a slightly hairy underside to help prevent water loss to the plant from respiration and evapotranspiration. The hairs help trap the air that is leaving the leaf stoma; this air often has higher water content than the air around the leaf. The hairs on the leaf underside help to trap and hold the escaping water vapour around the guard cells, protecting the leaf from excessive water loss through osmosis to the air outside.

4. Keep your leaf, compare your findings with your group members, and return to the laboratory.

Microscope Observations of Cell Structure

Laboratory Activity Details:

- Pencil, rubber, microscopes, slides, coverslips, forceps, scalpels, pipettes, stain, prepared leaf sections, leaf.
- Observe sectioning demonstration.
- Groups of three students attempt sectioning with best leaf sample.

1. Draw a diagram of your leaf section from what you observe down the microscope.

2. Draw one plant cell in detail and label the parts you can see.

3. Summarise your main findings about the structure of a leaf.

Leaf Structure

Sc1 Scientific Enquiry

Sc2 Life Processes and Living Things

Section	Objective
2	**How can using a microscope give us information about structure?**
3	**What are cells like?**

Carefully use scalpels to cut a fine section from the leaf and lay on a slide, add a drop of solution and cover with a plastic slip.

If it proves difficult for students to create effective leaf section they could use the fine layers between onion skins.

1. Draw a diagram of your leaf section from what you observe down the microscope.

You should be able to see cell walls, stoma and guard cells

2. Draw one plant cell in detail and label the parts you can see.

Students should identify the cell wall, nucleus, vacuole, cytoplasm, chloroplasts.

3. Summarise your main findings about the structure of the leaf.

Key Ideas based on National Curriculum requirements:

- Plants and animals contain organs
- Plant and animal organs are made up of cells working together
- Cells are similar in some respects but have significant differences
- Cells are structurally designed for their function