

A. Briefly answer the following questions.

1. What general events constitute the process of photosynthesis?
2. How essential is photosynthesis to life on earth? Explain.
3. Suppose you want to know how fast photosynthesis is happening in a plant. Based on the net chemical equation of photosynthesis, how do you think you can monitor photosynthesis?
4. How are photoautotrophs different from heterotrophs?

B. Do the following activities.

1. The leaf is the main photosynthetic organ of a plant. Its structure is very important to perform its function. In this activity, prepare a cross section of a leaf and closely observe its tissues and cells.

MATERIALS

- a fresh leaf specimen (preferably santan, san francisco, mango, or any thick-leaved grass)
- a very sharp razor blade
- a cutting mat or surface
- microscope glass slides
- water
- coverslips
- compound microscope

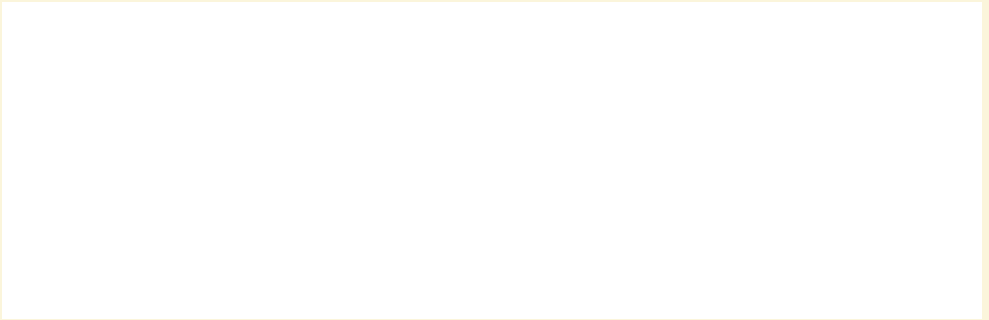
PROCEDURE

- a. Gently clean and dry the leaf specimen.
- b. Lay the leaf specimen flat on a cutting mat or surface then cut off the leaf blade (the flat expanded part of the leaf) from the midrib.

- f. Using the high-power objective of your microscope, locate the upper epidermis, lower epidermis, mesophyll cells, and vascular bundles. Observe the cells that make up each tissue or group of cells in terms of their shape and organization. Write your observations in the table below:

Tissue	Observations
upper epidermis	
lower epidermis	

g. Draw a cross section of a leaf in the space below.

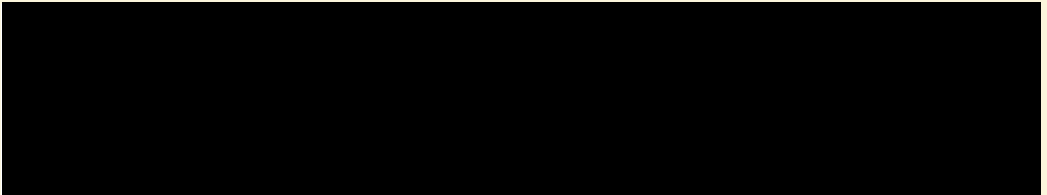


2. Photosynthesis uses carbon dioxide and gives off oxygen. To facilitate the exchange of these gases between the atmosphere and the leaf, special structures called stomates are found on the epidermis. In this activity, observe these structures up close.

MATERIALS

- a fresh leaf specimen (preferably a hard and smooth one like that of santan or gumamela leaf)
- clear nail polish
- transparent tape
- microscope glass slides
- compound microscope

PROCEDURE



- Affix the tape with the imprint on a clean microscope glass slide.
- Perform the above steps using the lower/abaxial side of the leaf. Remember to properly label your slides to avoid confusion between the two samples.
- Observe the leaf imprints under the low-power objective of a microscope. You may use the high-power objective to have a more detailed view of the cells.
- Locate the guard cells of a stomate. They appear as pairs of special bean-shaped cells among the ordinary cells of the epidermis. Make a freehand drawing of a stomate in the space provided below. Label the stomatal pore, the guard cells, and the ordinary epidermal cells.

