

Unit : Handout :
2 : 10*Lesson 2: Leaf Structures*

Purpose: Observe and draw a stomatal unit from the epidermis of a lettuce leaf; explain how the structure of a leaf helps control the water flow in plants.

NGSS Practices: Developing and using models. Analyzing and interpreting data. Obtaining, evaluating, and communicating information.

Background

During our Fast Plant investigation we kept track of the amount of nutrient solution used by the plant. A question can be asked as to how the plant was using the nutrient solution. From our research we knew the water was being used for photosynthesis and the nutrients were used for necessary life functions for the plant. However, we also learned during cellular respiration, water is formed. Is all the water taken in and created by a plant kept by the plant? What happens when there is too much water? How does the plant eliminate excess water? In this investigation, we will find out the answers to these question!

Procedure

1. Divide and conquer:
 - 1.1. Have one group member setup the microscope.
 - 1.2. Have the other obtain the following supplies: slide, pipette, a piece of lettuce, a dissecting needle, and a cover slip.
2. Follow the instructions on pp. 133 of the SDR0 textbook on how to make your slide.
3. Focus on the epidermis with your microscope on lower power (40X). Locate a stomatal unit, which will look like a small, bright "eye" among the larger epidermal cells of the membrane. Center this unit in the field of view then switch to medium (100X) and then high power (400X).
4. Draw and label the stoma, guard cells, and nuclei on your drawing sheet. Use figure 8.2 on p. 134 and the reading on pp. 140-143 to help you identify the parts.
5. Title your drawing "Stomatal Unit."
6. Discard the lettuce membrane and rinse your slide and coverslip.
7. Obtain a *Lemna* plant from the culture container in the front of the room.
8. Place the plant on the slide with the roots facing down. Add a coverslip.
9. Focus on the upper epidermis of the leaf under low power; then switch to medium and high power. Move the slide to locate the stomata.
 - 9.1. Most leaves, including those of the Fast Plants, have the majority of their stomata on the lower epidermis. Discuss with your group why a *Lemna* leaf has most of its stomata on the upper epidermis.
10. Return the *Lemna* plant to the culture container. Rinse and dry your slide. Throw away your coverslip. Return all materials to the correct place on the front table.

Name Period Date

Data.

Take a picture of your Stomatal Unit drawing and insert it in the space below.

Reflecting.

1. What does the word epidermis mean? Look up it's meaning using the online etymological dictionary (etymonline.com).

Epidermis means: _____

Epi: _____ Derm: _____

2. Describe the appearance of the lower epidermis from the lettuce.
3. Look at the leaf diagram on p. 140 of the SDRO textbook. Take a picture of the diagram and insert it into the space below. On the diagram, label the function of each part (or write a short description of what each part does). The functions/ descriptions can be found on p. 140.

4. Summarize (use Mr. Senne's method!) the first paragraph on p. 141.

