



Leaf Adaptations Lab # _____



Aim: What are some anatomical structures of a leaf?

Objectives- Upon completion of this laboratory lesson, you should be able to:

- Prepare a wet-mount and identify parts of the lettuce epidermis
- Identify cells of the lower epidermis that carry on photosynthesis
- Compare a lettuce leaf layer with a leaf cross-section
- Describe the location of major photosynthetic areas in a leaf

Procedure (Record all answers in the appropriate spaces in the Observations & Conclusions Section):

Part 1. Prepared leaf cross section

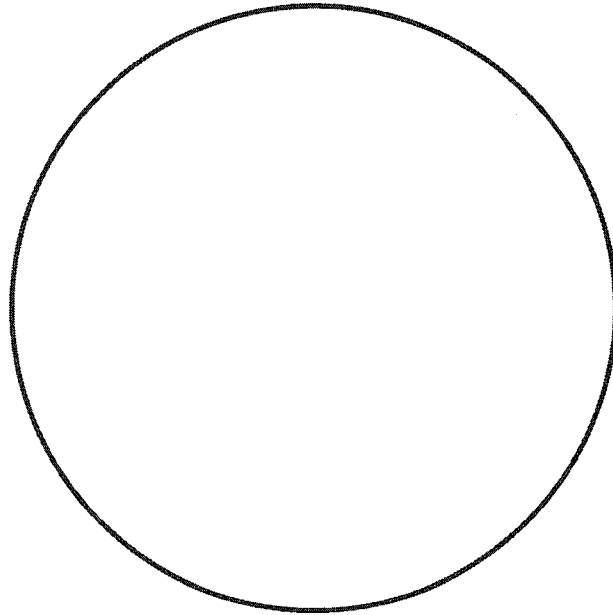
1. Place the slide of the prepared leaf cross-section on the microscope and focus on the slide under LOW POWER = _____x.
2. Observe the slide and make a complete, fully labeled diagram taking care to label the:
 - a. Upper epidermis
 - b. Palisades layer
 - c. Spongy layer
 - d. Air spaces
 - e. Stomata
 - f. Guard cells
 - g. Lower epidermis
3. Locate a pair of guard cells (red cells found in pairs along the clear epidermal cells), and switch to HIGH POWER = _____x. Draw a few cells of the lower epidermis along with the guard cells and stomata. Be sure to label these in your diagram, then remove the slide and return to your teacher.

Part 2. Wet-mount lettuce leaf epidermis

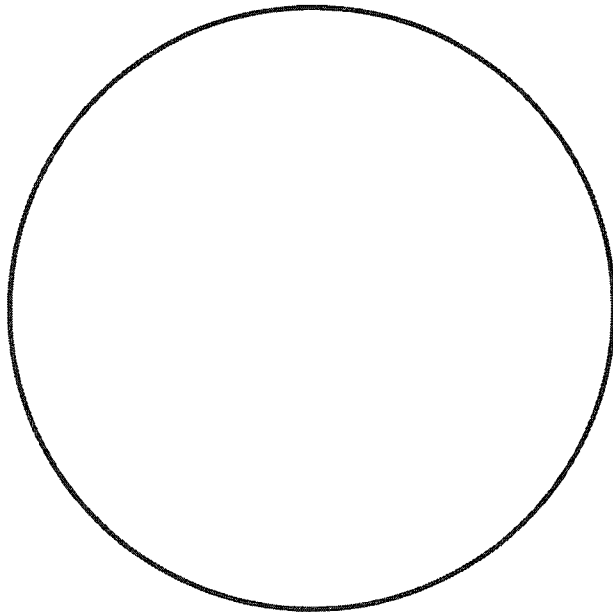
1. Strip off a small piece of the lower epidermis of a lettuce leaf (similar to the onion, snap the piece of lettuce at the rib almost completely through and gently tear the two pieces in opposite directions to obtain a small, transparent piece of epidermis).
2. Place epidermis on a clean slide using forceps, place a few drops of iodine onto the specimen and place a coverslip on without pressing down.
3. Focus under LOW POWER and locate a pair of guard cells (they appear as pairs of dark brown, kidney-shaped cells, smaller than the somewhat larger, transparent and somewhat rectangular epidermal cells).
4. Switch to HIGH POWER and focus on the guard cells and a few surrounding epidermal cells. Draw what you see and be sure to label:
 - a. Guard cells
 - b. Stomate
 - c. Epidermal cells

Observations:

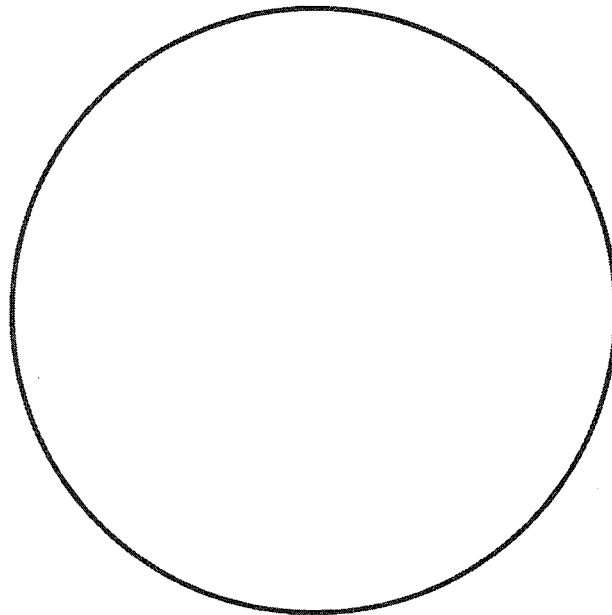
Part 1. #2: Cross-section of a leaf- Low Power (100x)



Part 1. #3: Leaf Cross-section- Guard cells, stomate and lower epidermal cells- High Power (400x)



Part 2.#4: Lettuce Leaf Epidermis Wet-mount, top view-Guard cells, stomate, epidermal cells- High Power (400x)



Conclusions:

1. Describe how the preparation of the two slides was different (include type of slide and the part of the leaf examined).

2. Which of the slides that you used today could be used again in a week? Explain.

3. In which layer of the leaf does the most photosynthesis take place? Explain how you know this.

4. Where are guard cells and stomata located and explain why this is ideal based on their function.