

## Honors Biology

### *Layers of a Leaf Lab*

Like the layers of our skin, leaves of plants are composed of many different layers. Each layer performs a specific function for the plant. Leaves are the major sites of photosynthesis in the plant. They usually consist of vascular tissue (like our blood vessels), and a thin, clear epidermis (like our skin) that is covered by a waxy cuticle. Between the top and bottom epidermis are the palisade and spongy mesophyll layers. Stomata allow the exchange of gases between the leaf tissues and the atmosphere. In this lab, you will use a microscope and prepared slides of leaves to identify, draw, and label the different layers of plant leaves.

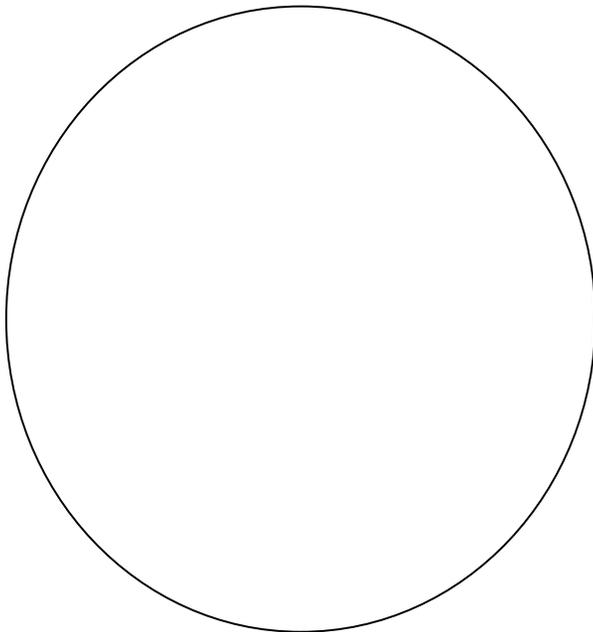
**MATERIALS:**

- microscope
- prepared slide of leaf
- prepared slide of leaf epidermis
- pencil (colored pencils are nice)

**PART A: MICROSCOPE:**

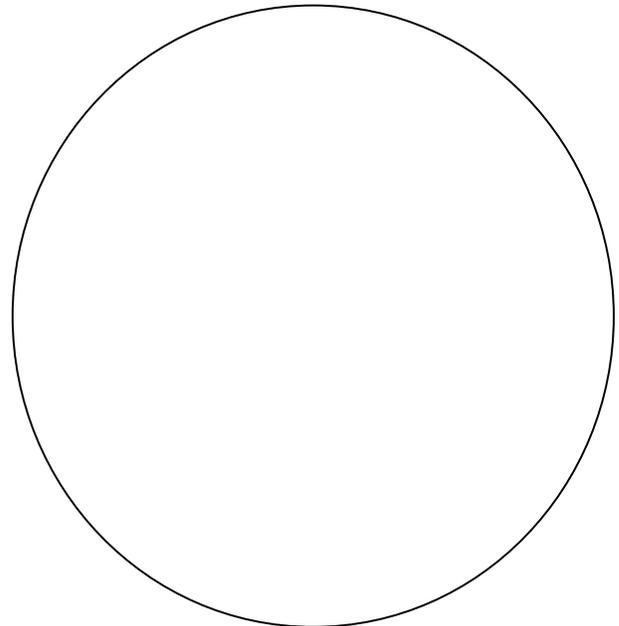
1. Obtain a microscope and slide "Typical Monocot and Dicot Leaf".
2. Place the slide on the stage and observe it at MEDIUM (100X) power. There are two slices of leaf on this slide. Choose one slice to focus on. Draw what you see below.
3. Label your drawing with the following terms: upper epidermis, lower epidermis, cuticle, palisade mesophyll, and spongy mesophyll.
4. Obtain a slide of "Lily Leaf Epidermis".
5. Observe the slide at MEDIUM (100X) power. Draw what you see (as you did for the first slide in step 3).
6. Label both of your drawings with the following parts: stomata, cell wall, nucleus.

Typical Monocot and Dicot Leaf



Magnification Power \_\_\_\_\_

Lily Leaf Epidermis



Magnification Power \_\_\_\_\_

## **PART B: QUESTIONS**

1. Where in the leaf is the palisade layer located? Why is most beneficial there?
2. Did you see any vascular tissue (xylem and phloem) in the leaf? Describe what you saw.
3. Why do you think stomata are only in the lower epidermis?
4. What do you think would happen to the leaf if there was no cuticle? Why?
5. What would happen to the leaf if there were no stomata? Why?
6. Why are there different types of cells in the leaf? Would it be more beneficial to have cells that could do all functions needed by the plant? Why?
7. Where is the spongy mesophyll in the leaf, and what function does it serve?
8. What purpose do the air spaces in the spongy mesophyll serve?
9. What is transpiration?
10. What would happen to a plant if its stomata were open all the time? Why?