**Leaf Structure and Function Questions**

Stomata

* Outline the role of stomata

Somata are the pores in the epidermis that control the flow of gases into and out of the leaf. When stomata are open, oxygen (required for respiration), carbon dioxide (for photosynthesis), as well as water vapour, can pass freely into and out of the leaf.

* Explain what would happen if the stomata were kept open all of the time.

Stomata close during dry conditions to preserve water content, meaning if stomata were kept open the water would dry up during dry conditions.

Guard Cells

* Outline the conditions in which guard cells are open.

Guard cells are normally open during the day so that a plant can take in CO2 for photosynthesis.

* Outline the role of guard cells.

The two guard cells of each stoma (individual stomata) function to control the opening and closing.

* Using your knowledge of osmosis, explain the mechanism that results in the opening and closing of guard cells.

The guard cells function through the absorption and release of water, swelling with high water content (opening the stomata) and softening with lower water content (closing the stomata).

Cuticle and Epidermis

* Outline the role of the cuticle.

The cuticle is the outer layer of the leaf that prevents water loss and protects the leaf from contamination by dirt or microorganisms.

* Contrast the upper and lower epidermis.

The upper epidermis does not usually contain stomata in order to prevent water loss, whereas the lower epidermis is covered in stomata.

Mesophyll

* Contrast palisade and spongy mesophyll.

Palisade mesophyll is composed of column-shaped cells containing chloroplast, and spongy mesophyll is composed of irregular-shaped cells surrounded by air spaces.

* Outline the role of air spaces in the mesophyll.

The air spaces of the spongy mesophyll allow for gases to move freely throughout the leaf without having to pass through cells.