

PENANG SANGAM HIGH SCHOOL
P.O.BOX 44, RAKIRAKI
LESSON NOTES

Subject: Biology
Week 12

Year/Level: 11

Strand	1 Structure and Life Processes
Sub Strand	1.5 Structure And Functions In Plants
Content Learning Outcome	Compare primary and secondary growth in stems, discuss the leaf structures and functions

Growth in Stems

1. Primary Growth

- Cell division in the meristematic region- in the shoot tips.
- Elongation of the new cells.
- Increase in height/length.
- Occurs in monocots as well as dicots which develop soft stems.
- Occurs in plants that live for a year mostly- annuals

2. Secondary Growth

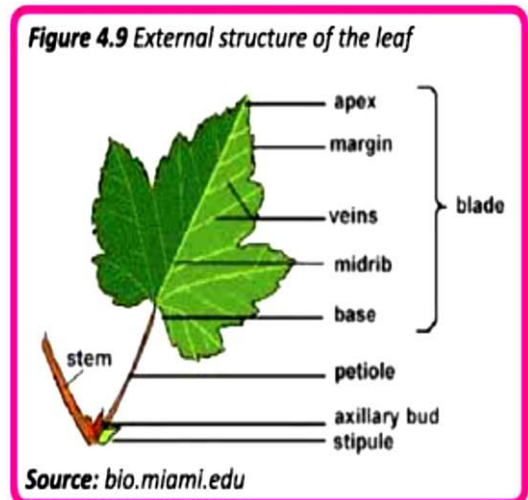
- Widens stems (increase in girth) of plants.
- Occurs in vascular cambium which contains meristematic cells that divide to form phloem and xylem.
- Only occurs in dicots that have a life cycle of two or more years.
- Only occurs in dicots which turn to develop strong and hard woody stems.
- Monocots have no vascular cambium therefore no secondary growth (cannot grow wider).

3. Leaves

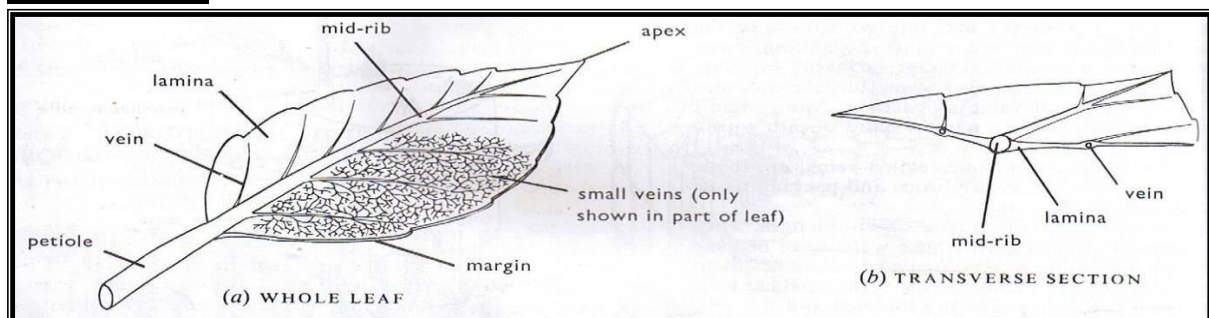
- Part where photosynthesis occurs.
- A leaf consists of a flat, broad, leaf blade (lamina) attached to the stem by a leaf stalk (petiole).
- The leaf is supported by a system of branching veins.

Functions

1. Site for photosynthesis i.e. makes food for the plant.
2. Site for transpiration i.e. cools the plant by losing water.
3. Allows gas exchange through stomata.

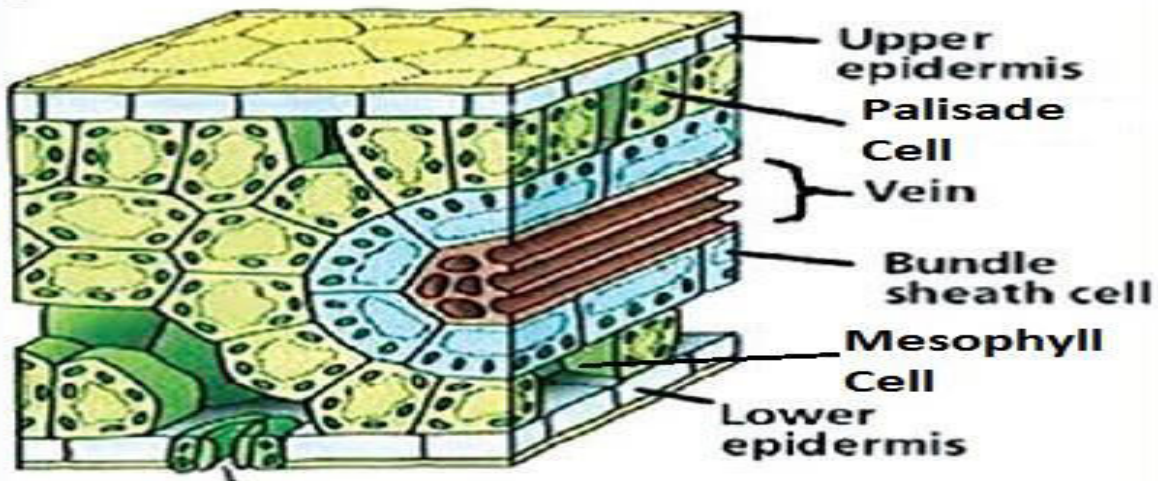


Leaf Structure



Cross Section of a Leaf

Figure 4.11: Cross Section of a leaf



Source: tea.state.tx.us

Internal Structure

<u>Leaf tissue</u>	<u>Characteristics</u>
Cuticle	Waxy top layer that reduces water loss
Epidermis	Cells that protect the inner tissues
Palisade layer	Cells that perform photosynthesis, packed with chloroplasts and close to the leaf surface for sunlight absorption.
Spongy mesophyll	Cells with plenty of air spaces between them so gases can diffuse more easily to and from the palisade layer
Veins	Contains xylem and phloem for water and food transport
Stomata	Small holes in the lower epidermis to allow gas exchange
Guard cells	Cells which close stomata to reduce water loss when necessary

Activity

1. Describe the difference between primary and secondary growth. Under what circumstances do plants invest in secondary growth?

2. Why don't monocots show secondary growth?

3. State two importance of a leaf.

4. Name the leaf tissue that contains chloroplast. _____