

**PENANG SANGAM HIGH SCHOOL**  
**P.O.BOX 44, RAKIRAKI**

**LESSON NOTES**

**Subject:** Biology

**Year/Level:** 11

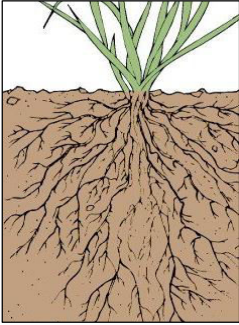
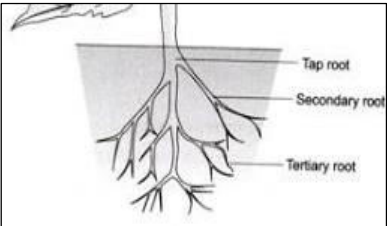
**Week 8**

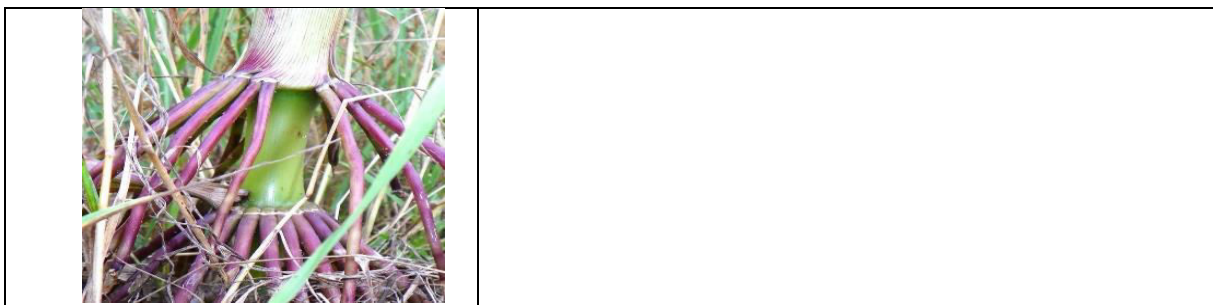
<b>Strand</b>	1 Structure and Life Processes
<b>Sub Strand</b>	1.5 Structure And Functions In Plants
<b>Content Learning Outcome</b>	Investigate and illustrate the different types of roots and explain their functions and adaptations.

Root growth

- Roots grow through **cell division**.
- The tip of the root is known as **apical meristem** which consist of **meristemic cells** that divide through **mitosis**.
- Since the top part of the root is firmly attached, it's the apical meristem that grows sideways and downwards
- The **zone of elongation** leads to the lengthening of the cells that have divided which results in the growth of roots downwards
- The **apical meristem** is very sensitive and thus it is protected by a **root cap**

Types of root system

Type of root	Description
1. Fibrous root e.g. grass, coconut, palm 	<ul style="list-style-type: none"> <li>- Seve</li> <li>- ral roots grow from a germinating seed at the same time; lateral roots may grow from these</li> <li>- are many roots that appear from the stem</li> <li>- Roots are thin and fairly short in length</li> <li>- Appear as a web or network of fibres</li> <li>- There is no recognizable main root</li> <li>- Are found in most <b>monocotyledonous</b> plants</li> <li>- <b>Spreads and absorbs water and minerals from a large area in the soil</b></li> <li>- <b>Binds the soil thus prevents soil erosion</b></li> </ul>
2. Tap root e.g. bean 	<ul style="list-style-type: none"> <li>- a single root grows vertically down from a germinating seed</li> <li>- there is no main root recognizable from the stem</li> <li>- main root is larger and stronger than the others</li> <li>- smaller lateral roots grow from the main root</li> <li>- are found in most <b>dicotyledonous</b> plants</li> <li>- <b>able to get water and minerals from deep into the soil.</b></li> </ul>
3. Adventitious root e.g.mangroves,sugarcane, corn	<ul style="list-style-type: none"> <li>- Arises form any part of the plant</li> <li>- Usually grow downwards into the soil from the stem</li> <li>- <b>Gives additional support to the plant</b></li> </ul>

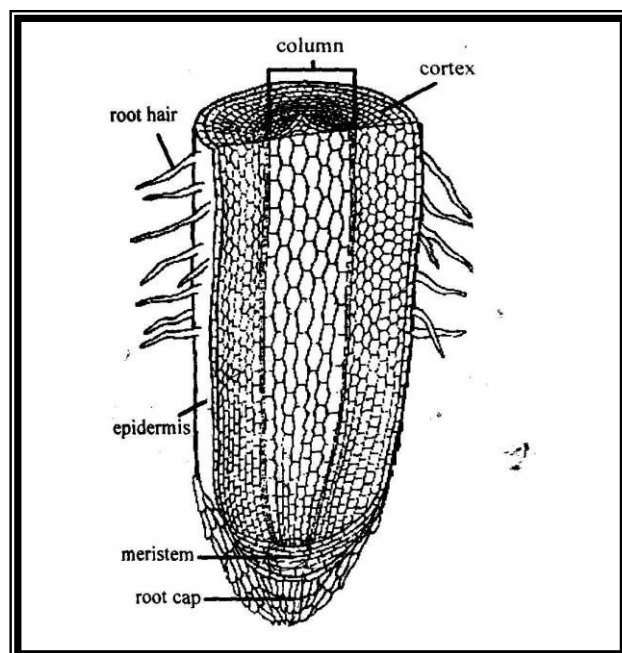
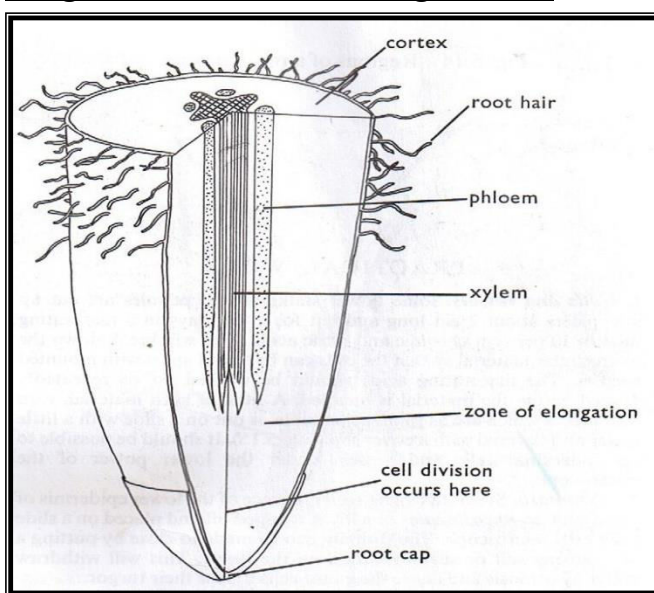


### Root structure

The 5 main parts of the roots are:

1. Root epidermis
2. Meristem
3. Root cap
4. Vascular column
5. Cortex

### Longitudinal section through a root



### Activity

1. What is the adaptive value of a tap root system over a fibrous root system?

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2. Dune grasses have been planted on the Sigatoka sand dunes to help keep them from washing away. How do the grasses reduce erosion of the dunes?

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3. State two ways in which roots grow longer. \_\_\_\_\_

4. Name the tissue in which cell division for plant growth occurs. \_\_\_\_\_