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

Subject: Biology **Year/Level:** 11

Week 11

Strand	1 Structure and Life Processes
Sub Strand	1.5 Structure And Functions In Plants
Content Learning Outcome	Differentiate between herbaceous and woody stem

Stem Type

Two types:

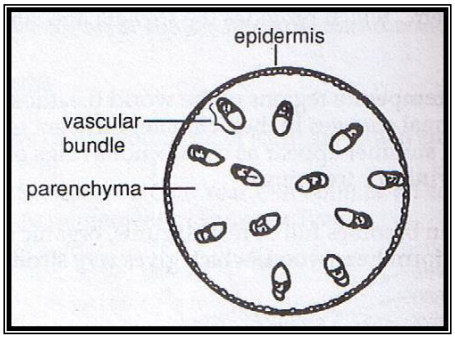
(i) Herbaceous stem
(ii) Woody stem

(i)Herbaceous Stem

- Thin, soft and flexible
- Protective epidermis layer present
- Supportive cortex and pith tissue present
- Vascular column also present
- Includes all monocots and some dicots
- Eg. Tomato stem

Monocot Stems

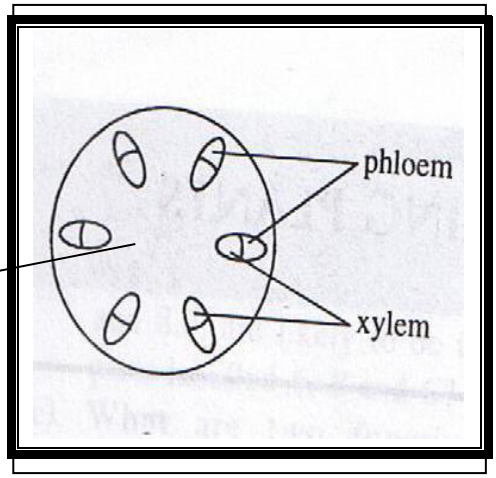
- Vascular bundles are scattered randomly throughout the stem
- Vascular bundles are composed of xylem and phloem and supportive tissue in between



Dicot Stems

- Vascular bundles are arranged in a ring
- Vascular bundles compose of xylem, phloem and **cambium** in between

Cambium - layer of cells inside a plant's stem that helps in cell division and allows stems to grow thicker

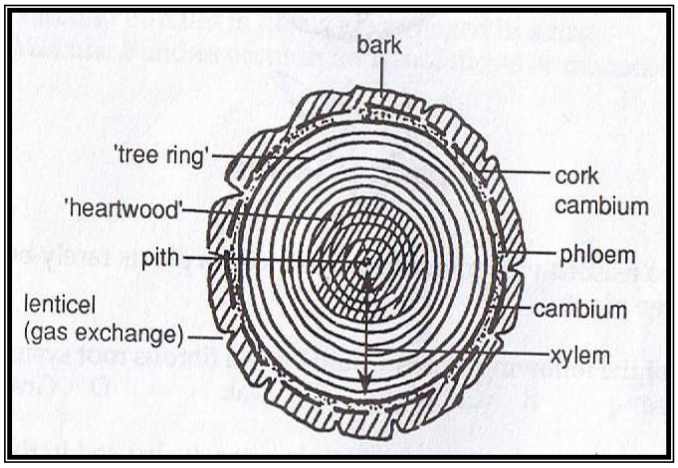


(ii) Woody Stems

- Strong, hard and sturdy tissue.
- **Heart wood** –the oldest xylem ring in the centre of the stem that no longer transports water and which is full of hardened sap.

- **Lignin**- a hard, strong carbohydrate that further strengthens the cell wall of the stem and root cells in woody plants.
- **Bark** – is the tough outer skin of a woody stem.
- **Cork cambium** – is a layer of soft, spongy tissue that produces cock cells which combine with dead phloem to form the bark.
- **Cambium**- produces new xylem and phloem tissues.
- **Lenticels**- openings in the bark which allow gas exchange in woody stems.

Cross-section of a woody stem



Note:

Every year a new xylem ring is formed.

Activity

1. Describe two differences between monocot and dicot stem.

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2. Explain how the presence of cambium cells affect growth in a plant.

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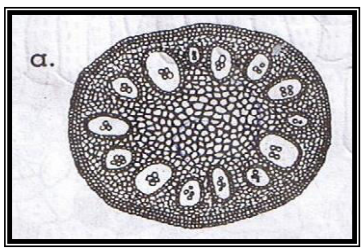
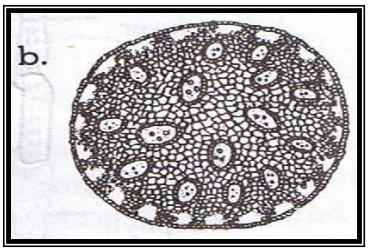
3. Diagram of two stem cross section are shown below. State which is from a monocot and which is from a dicot? How can you tell?





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4. Describe three differences between herbaceous and woody stems

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   _____

5. Why would a plant have herbaceous stem rather than a woody stem?

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