

ANATOMY OF DICOTYLEDONOUS PLANTS

- Angiosperms (flowering plants) are the most advanced group in the plant kingdom and are divided into monocotyledonous and dicotyledonous plants.

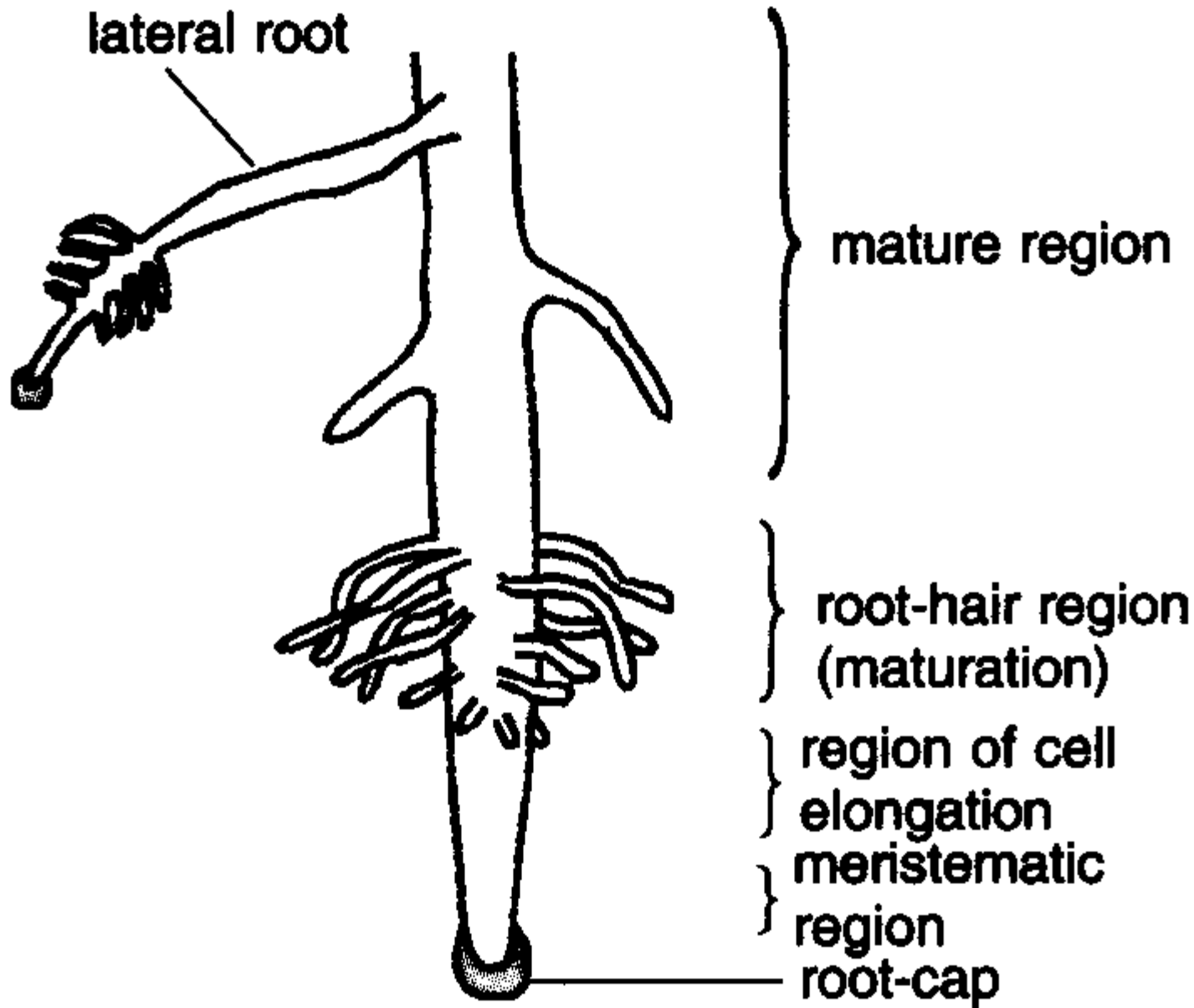
DICOTYLEDONOUS ROOT

Functions:

- absorbs water and mineral salts from the soil
- Firmly anchors the plant in the soil

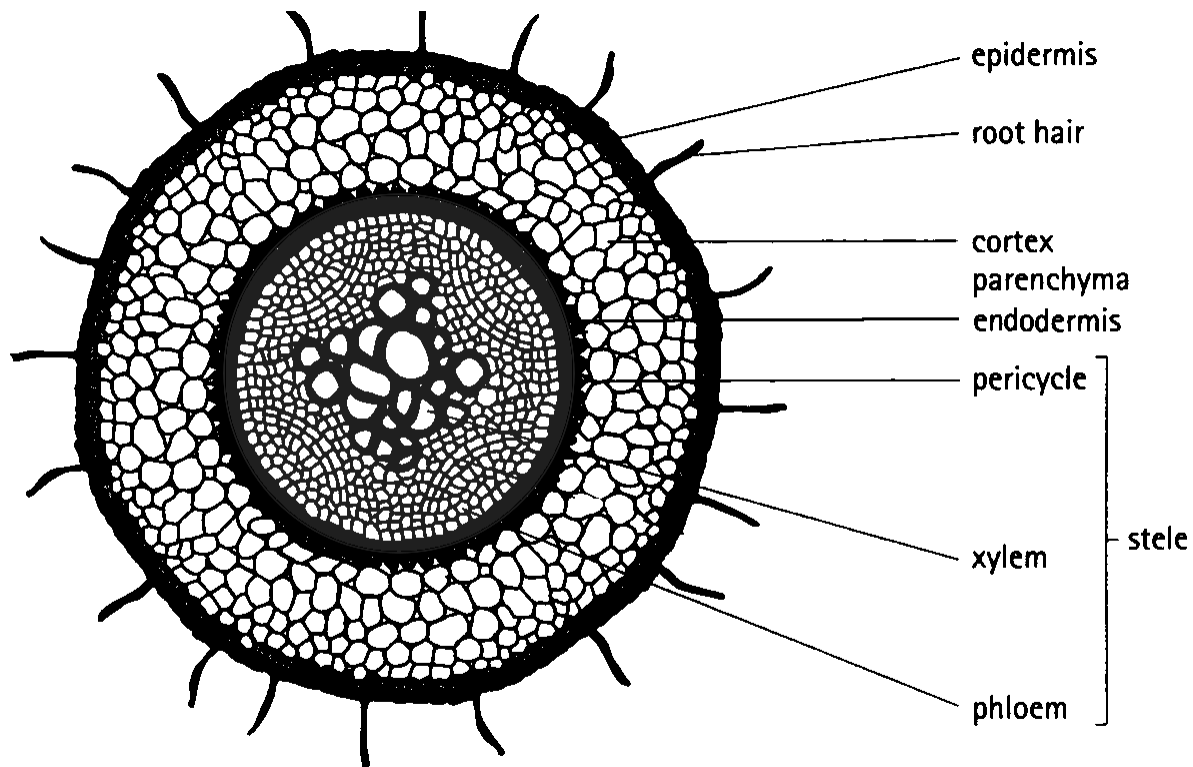
External structure:

- **root caps** - surrounds and protects the growing point
- **meristematic region** - continuously forms new cells
- **region of elongation** - new cells elongate
- **root hair region** - unicellular epidermal outgrowths
- **mature region** - where lateral roots develop and branch off

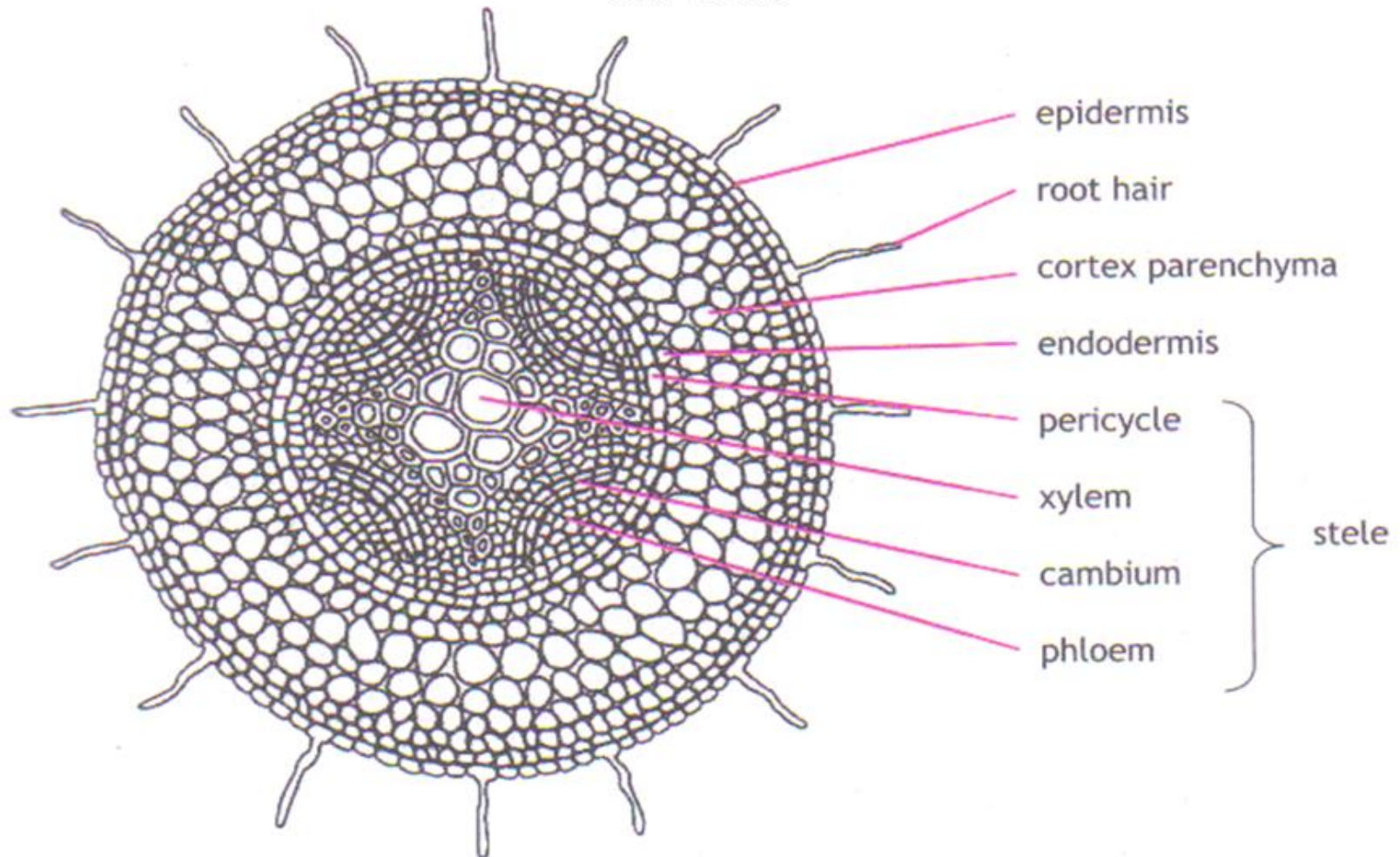


INTERNAL STRUCTURE

- Epidermis
- Cortex
- Central cylinder



Transverse section of a young dicot root in detail



T/S of a young dicotyledonous root, in detail

⦿ Epidermis

- Forms outer layer of the stem and consists of a single layer of thin walled brick shaped cells
- Cuticle absent
- Root hairs occur in the root hair region

⦿ Cortex

- Broad band directly under epidermis that consists of a layer of parenchyma cells
- Inner most layer consists of endodermis
- Radial and transverse walls contain thickened cork strips - Caspian strips

⦿ Central cylinder

- All tissues enclosed by endodermis
- Layers of thin walled cells called pericycle
- Xylem and phloem
- Xylem arranged in form of a cross, phloem between arms of the cross
- Rest of cylinder consists of parenchyma cells

Functions:

- Root hairs: increase the absorption surface for uptake of water & mineral salts
- Epidermis: protects underlying tissues
- Parenchyma: allows water and mineral salts to pass through to xylem and stores starch
- Endodermis: regulates passage of water from cortex to xylem
- Pericycle: forms lateral roots
- Xylem: transports water and mineral salts from roots to plant
- Phloem: transports manufactured organic substances from the photosynthesising parts to the rest of the plant

CLASS ACTIVITY - DICOTYLEDONOUS ROOT

1. Name the five regions of the external structure of the dicotyledonous root.
2. Label the external structure of the dicotyledonous root. ----->
3. Name the characteristics of dicotyledonous roots that will help you identify a microscope slide of a cross section through a root

