## Differentiation, Dedifferentiation and Redifferentiation.

Undifferentiated cells (Shoot and root apical meristem) Primary Meristem

↓ Differentiation -Maturation of Primary Meristem cell to perform specific function.

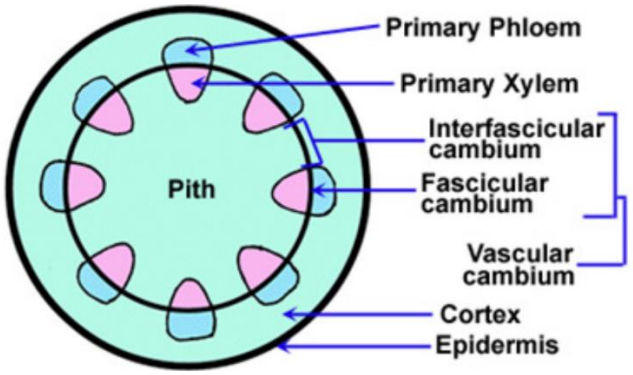
Differentiated cells (division ability loss) — Parenchyma, collenchyma, Scleranechyma, Primary xylem & Pholem — Primary Permanent Tissue

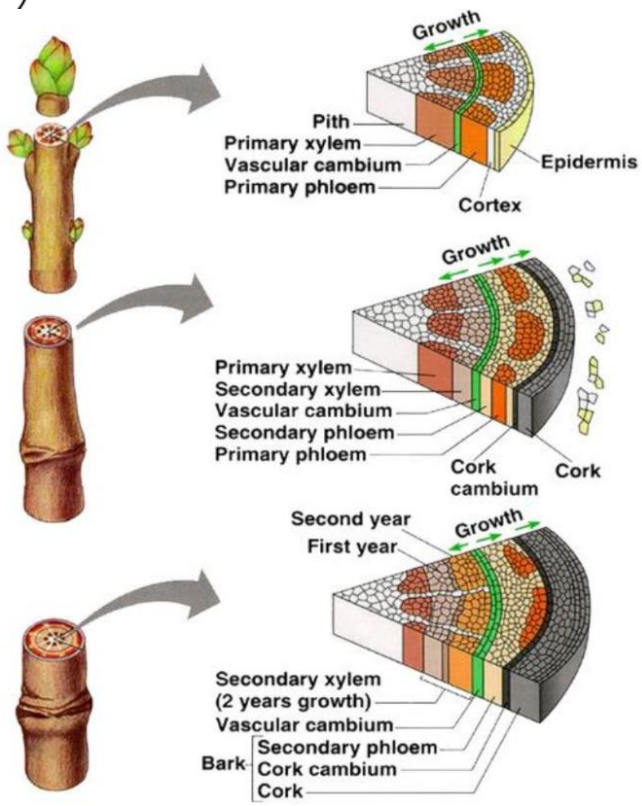
↓ Dedifferentiation -Living differentiated cells regain the capacity of division.

Dedifferentiated cells (division ability regain) — Interfascicular Cambium, Cork Cambium — Secondary Meristem

↓ Redifferentiation -Dedifferentiated cell lost the capacity of division.

Redifferentiated cells (division ability Permanently lost) — Secondary xylem & Pholem, cork, Secondarycortex — Secondary Permanent Tissue



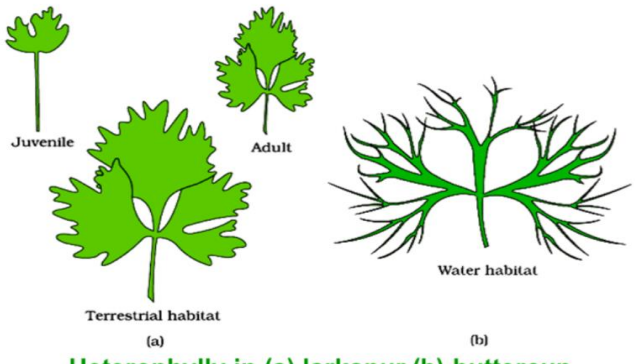




**During Differentiation:** Cells undergo structural changes both in their cell walls and protoplasm.
It may develop a very strong, elastic, lignocellulosic secondary cell walls, to carry water to long distances even under extreme tension

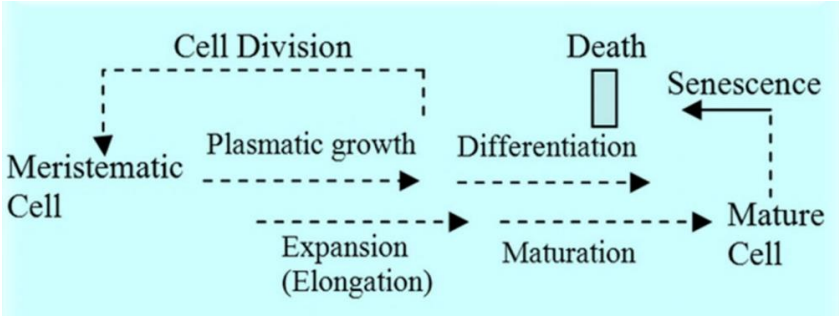
The growth in plants is open, i.e., it can be indeterminate (ex: No. of leaves on a tree) or determinate (ex: leaf size).

## Development

- All changes in life cycle of an organism from seed germination to senescence.
- Sum total of growth and differentiation.

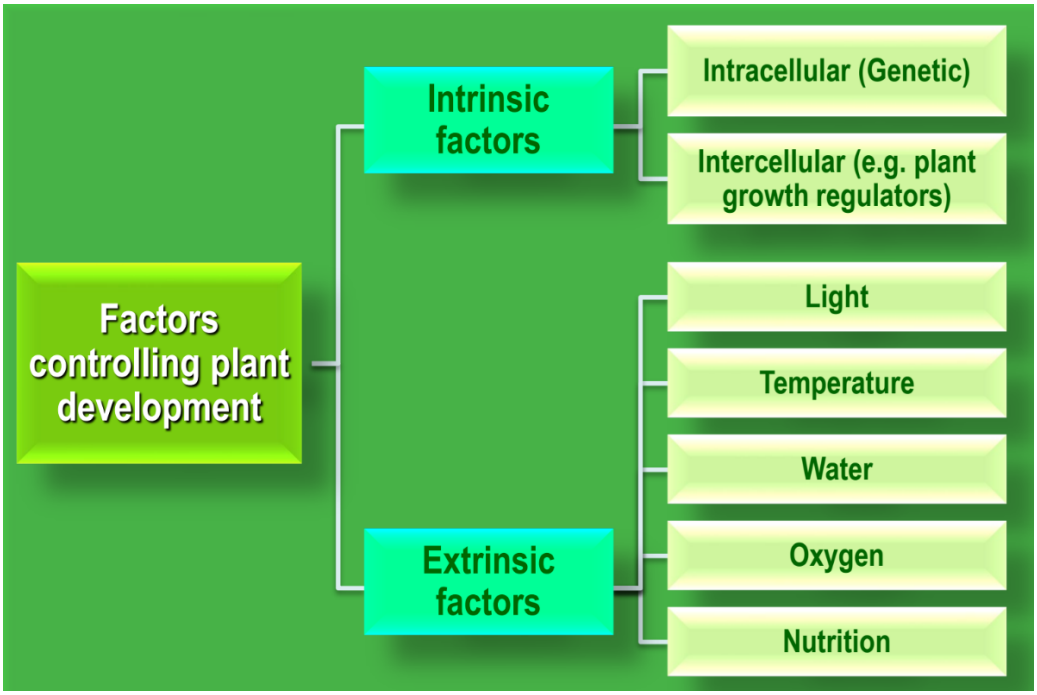


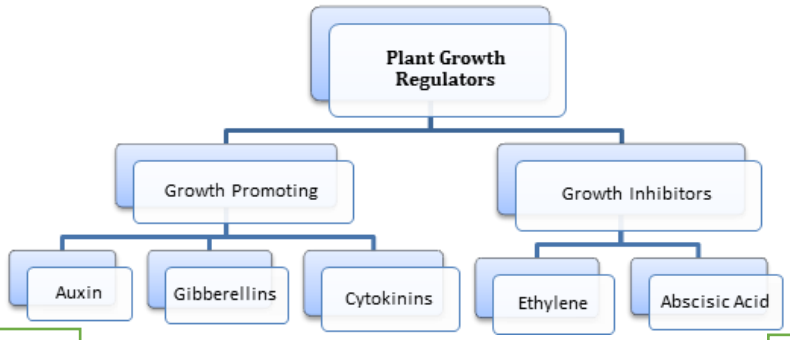

Heterophylly in (a) larkspur (b) buttercup




**Plasticity:** Different pathway followed by plant to change its structure in response to environment or phases of life.
Ex: Heterophylly in cotton, coriander and larkspur (different leaves in different phases of life).
Buttercup (Environment-different shape in air and in water)

.




Promote cell division, enlargement, flowering, fruiting & seed formation etc.

Induce dormancy & abscission. Respond to wound & stress of biotic & abiotic origin.