Primary growth	Apical meristem
Secondary growth	Lateral meristem
Meristematic phase	Cells are rich in protoplasm, large conspicuous nucleus, thin cellulosic cell wall, abundant plasmodesmatal connections

Elongation phase	New cell wall deposition, cell enlargement and increased vacuolation
Maturation phase	Maximal cell wall thickening and protoplasmic modifications
Arithmetic growth	Linear growth E.g. root elongation

Geometrical growth	Sigmoid curve E.g. Cell culture, tree showing seasonal activities
Differentiation	Cells mature to perform specific function, e.g. apical meristem and cambium cells differentiate
Dedifferentiation	Regaining the capacity to divide after differentiation, e.g. parenchyma cells dedifferentiate to form interfascicular cambium, cork

Redifferentiation	Dedifferentiated cells again lose the capacity to divide and mature to perform specific functions, e.g. secondary xylem, phloem, etc.
Plasticity	Different kinds of plant structures in different phases of life or environmental conditions, e.g. heterophylly in larkspur and buttercup
Auxin	Indole compounds Natural- IAA, IBA Synthetic- NAA, 2,4-D Isolated by F.W. Went from coleoptile of oat seedlings First isolated from human urine Produced by growing root and shoot apices

Auxin functions	Apical dominance Root initiation in stem cuttings, xylem differentiation and cell division Promotes flowering in pineapple, parthenocarpy in tomatoes
Cytokinins	Adenine derivatives Natural- Zeatin Synthetic- Kinetin Skoog and Miller identified and crystallised for the first time Natural source is yeast extract, DNA, coconut milk
Cytokinin functions	Promotes lateral and adventitious shoot growth Delay of leaf senescence Chloroplast formation

Gibberellins	Terpenes E. Kurosawa identified and discovered gibberellic acid in rice seedlings infected by fungus *Gibberella fujikuroi* causing foolish seedling disease
Gibberellin functions	Promotes stem elongation in sugarcane, grapes and elongation of fruits like apple Early seed production in conifers Bolting or internode elongation in beet, cabbage, etc.
Ethylene	Gaseous hormone Reported by Cousins as a volatile substance in ripened oranges

Ethylene functions	Induces fruit ripening, increases respiration rate Breaks seed and bud dormancy, initiates seed germination in peanuts and sprouting in potato tubers Promotes senescence and abscission of flowers and leaves
Abscisic acid	Carotenoids Plant growth inhibitor, stress hormone E.g. inhibitor-B, abscission II and dormin Antagonist to GAs
Abscisic acid functions	Regulates abscission and dormancy Inhibits seed germination and stimulates stomatal closure Help plant withstand desiccation and tolerate various stress conditions