

Topic 9.3 Growth in Plants

Define the below vocabulary words and address the below questions in a separate document.

Vocabulary:

Embryonic period	IAA	Phototropism	Callus
Totipotent	Axillary buds	Gravitropism	Cryopreservation
Meristems	Apical dominance	Phototropins	Microarray
Apical meristems	Cytokinins	PIN3 proteins	
Dicotyledenous	Gibberellins	Micropropagation	
Auxin	Tropisms	Explants	

9.3.U1: Undifferentiated cells in the meristems of plants allow indeterminate growth

1. Define indeterminate growth and totipotent.
2. Describe why it is important that most plants have indeterminate growth and have totipotent cells.
3. Define meristem.
4. Compare apical and lateral meristems.

9.3.U2: Mitosis and cell division in the shoot apex provide cells needed for extension of the stem and development of leaves

5. Outline role of mitosis in the growth of stem and leaves while maintaining a meristem.

9.3.U3: Plant hormones control growth in the shoot apex

6. State the genetic function of plant hormones.
7. State three roles of the hormone auxin.
8. Outline how auxin concentrations regulate plant growth.
9. Outline the role of auxin in apical dominance.
10. Complete the DBQ: The acid growth hypothesis on pg 424 and 425

9.3.U4: Plant shoots response to the environment by tropisms

11. State two external factors that control the growth of roots and stems.
12. Define tropism, phototropism and gravitropism.

9.3.U5: Auxin efflux pumps can set up concentration gradients of auxin in plants tissue

13. Outline how PIN-transport proteins can direct direction of auxin flow.
14. Explain how auxin concentrations allow for phototropism.
15. Explain how auxin concentrations allow for gravitropism.

9.3.U6: Auxin influences of cell growth rates by changing the pattern of gene expression

16. State that auxin influences cell growth rates by changing gene expression

9.3.A1: Micropropagation of plants using tissue from the shoot apex nutrient agar gels and growth hormones

17. Define micropropagation.
18. Outline how changing auxin and cytokinin ratios can lead to development of roots or shoots from the same explant tissue.

9.3.A2: Use of micropropagation for rapid bulking up of new varieties, production of virus-free strains of existing varieties and propagation of orchids and other rare species

19. Outline three roles of micropropagation of plant species.

9.3.NOS: Developments in scientific research follow improvements in analysis and education-improvements in analytical techniques allowing the detection of trace amounts of substances has led to advances in the understanding of plant hormones and their effect on gene expression.

20. Outline role of microarrays in understanding role of plant hormones.