**Topic 9.3 (AHL) – Plant Growth**

**Understandings, Applications and Skills** (This is what you will be assessed on)

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|  | **Statement** | **Guidance** |
| 9.3.U1 | Undifferentiated cells in the meristems of plants allow indeterminate growth. |  |
| 9.3.U2 | Mitosis and cell division in the shoot apex provide cells needed for extension of the stem and development of leaves. |  |
| 9.3.U3 | Plant hormones control growth in the shoot apex. | Auxin is the only named hormone that is expected. |
| 9.3.U4 | Plant shoots respond to the environment by tropisms. |  |
| 9.3.U5 | Auxin efflux pumps can set up concentration gradients of auxin in plant tissue. |  |
| 9.3.U6 | Auxin influences cell growth rates by changing the pattern of gene expression. |  |
| 9.3.A1 | Micropropagation of plants using tissue from the shoot apex, nutrient agar gels and growth hormones. |  |
| 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. |  |

**Recommended resources:**

Mrs. Tyler’s Website

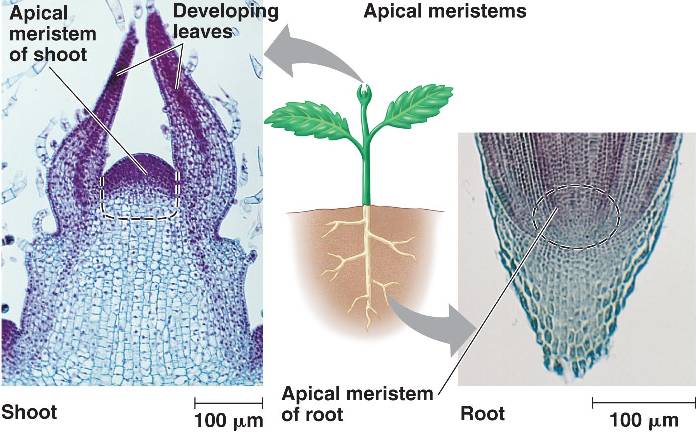
Bioninja

Allott, Andrew. *Biology: Course Companion.* S.l.: Oxford UP, 2014. Print.

1. Define meristem.
2. Outline the function of the two major types of meristems:

a. apical meristems –

b. lateral meristems –



1. Outline the difference between primary and secondary growth.
2. What two processes lead to growth in a multicellular organism?
3. Outline the difference between an axillary bud, node, and the apical meristem.
4. What hormone is primarily responsible for plant growth, and where is it produced in the plant?
5. Describe the concept of apical dominance.
6. Outline how the concentration of auxin affects plant growth. How does auxin travel between cells?
7. Outline how auxin affects gene patterns in both shoots and roots in plants.
8. Explain the mechanism of H+ ions in gene expression changes due to auxin efflux in a cell.
9. Define tropism. What is the difference between positive and negative tropisms?
10. What is each of the following tropisms in response to?

a. phototropism –

b. gravitropism –

c. thigmotropism –

1. Outline how auxin concentrations influence phototropisms.
2. Outline how auxin concentrations influence gravitropisms.
3. What is micropropogation, and what makes this process feasible?
4. Briefly outline the process of micropropogation.
5. Explain three uses of micropropogation.