**Subtopic 9.1 Transport in the Xylem of Plants**

1. Explain the process of water uptake and transport by plants.

Since water molecules are both cohesive (molecules stick together due to hydrogen bonding) and adhesive (water molecules stick to other surfaces),these factors assist in water uptake and transport. Water is lost by evaporation and transpiration and both cohesion and adhesion is pulled to the xylem due to these forces. Pits between xylem vessels allow sideways movement of water and ions.

1. What properties of water allow it to move through the xylem?

Cohesive and adhesive properties allow water to move through the xylem.

**Subtopic 9.2 Transport in the Phloem of Plants**

1. Explain how organic compounds are transported within plants.
2. Cohesive and adhesive properties allow water to move through the xylem.
3. Compare and contrast xylem and phloem.

The xylem transports water and minerals, they have no end walls between cells, is one direction, and the outer cells are not living. The phloem transports organic molecules, has end walls (sieve plates), is a two-way movement, and cells are living but require support.

1. Be able to label micrographs of plants with regard to vascular tissue. Diagram

   Description automatically generated



**Subtopic 9.3 Growth in Plants**

1. Describe the role of the shoot apex in plants.

Mitosis and cell division in the shoot apex provide cells needed for extension of the stem and development of leaves. The shoot apex gives rise to primary growth. The growth of the stem and the formation of new nodes is controlled by plant hormones released from the shoot apex.

1. Be able to label a micrograph of a plant shoot.



1. How does auxin exert its effect on plant cells?

The expression of the specific genes promoted when binded to receptors causes secretion of the H+ ions into the cell walls, loosening the connections between cellulose fibers to allows for cell expansion. Auxin is unevenly transported in plant tissues which allows for concentration gradient to occur.

1. Be able to use a graph to compare auxin concentrations and their effects on plant growth.

**Subtopic 9.4 Reproduction in Plants**

1. Be able to label a cross section of a flower and know the function of each part.
2. How is reproduction in flowering plants controlled?
3. Outline the role of pollination and seed dispersal.
4. What are the advantages of pollination by wind?
5. What is the advantage of seed production in fruits?
6. Be able to distinguish plants grown in long days vs short days based on a graph of the stages of leaf development.