9.2 – Transport in the Phloem of Plants

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

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|  | **Statement** | **Guidance** |
| 9.2 U.1 | Plants transport organic compounds from sources to sinks |  |
| 9.2 U.2 | Incompressibility of water allows transport along hydrostatic pressure gradients |  |
| 9.2 U.3 | Active transport is used to load organic compounds into phloem sieve tubes at the source |  |
| 9.2 U.4 | High concentrations of solutes in the phloem at the source lead to water uptake by osmosis. |  |
| 9.2 U.5 | Raised hydrostatic pressure causes the contents of the phloem to flow towards sinks. |  |
| 9.2 A.1 | Structure–function relationships of phloem sieve tubes |  |
| 9.2 S.1  | Identification of xylem and phloem in microscope images of stem and root |  |
| 9.2 S.2 | Analysis of data from experiments measuring phloem transport rates using aphid stylets and radioactively-labelled carbon dioxide |  |

**9.2 A.1 Structure–function relationships of phloem sieve tubes**

1. Label the cross section diagram of phloem



**9.2 U.1** **Plants transport organic compounds from sources to sinks**

1. The movement of materials in a plant is called
2. The movement of material down from the leaves occurs in
3. Distinguish between source and sink in terms of molecules in plants.

**9.2 U.2 Incompressibility of water allows transport along hydrostatic pressure gradients**

1. Describe the effect of hydrostatic pressure.
2. Explain hydrostatic pressure gradients helps move sucrose.

**9.2 U.3 Active transport is used to load organic compounds into phloem sieve tubes at the source**

1. Explain the flow sucrose occurs from the storage cell, to the companion cells and then into the phloem.

**9.2 U.4 High concentrations of solutes in the phloem at the source lead to water uptake by osmosis**

1. Why is it necessary for the veins (which contain xylem and phloem) to be relatively close together in plants?
2. Describe how transpiration and osmosis help movement of sucrose in a plant.

**9.2 U.5 Raised hydrostatic pressure causes the contents of the phloem to flow towards sinks.**

1. Explain the mechanism for movement of sucrose during translocation

**9.2 S.2 Analysis of data from experiments measuring phloem transport rates using aphid stylets and radioactively-labelled carbon dioxide**

1. Describe how aphids feed
2. Explain how data from radioactively-labeled carbon dioxide can be used to measure rates of phloem transport.