

**Plant requirements**

Why do plants need the following substances and where do plants get them from?

* Carbon dioxide
* Oxygen
* Organic nutrients
* Inorganic ions and water

**Use of phloem**

Name the main assimilate transported in phloem:

Define, and give examples of, the following terms:

SOURCE:

SINK:

List some ways that phloem are adapted to allow them to transport assimilates efficiently

**Label this leaf with the following phrases:** lower epidermis, upper epidermis, palisade mesophyll, stomata, air space, cuticle, spongy mesophyll, guard cell, vascular bundle, xylem, phloem.



**Label this stem with the following phrases:** xylem, phloem, cambium, lignified fibres, epidermis.



**Transport of water through the root**



What four factors can affect the rate of transpiration?

1.

2.

3.

4.

**Potometer**



Describe how this apparatus might be used to estimate transpiration rates in a leafy shoot.



**Xylem vessels**

This diagram shows some xylem vessels. List the features of xylem vessels that allow them to be adapted for the efficient transport of water.

Describe briefly the mechanism by which water is transported up xylem vessels.

**Xerophytes**

What are xerophytes?

List some ways in which xerophytes are adapted to suit their environment.



**Comparisons**

Complete this table to compare the functions of the **xylem and phloem**.

|  |  |  |
| --- | --- | --- |
|  | Xylem | Phloem |
| Substances transported |  |  |
| Is energy required? |  |  |
| Direction of flow of substances |  |  |
| Living or dead cells |  |  |
| Cell contents present |  |  |
| Composition of cell wall |  |  |

Use the space below to compare the mechanism of **translocation** with that of **transpiration.**

**Translocation**

Define the term translocation:

Describe how sucrose is actively loaded into the phloem at the source.

Describe how sucrose is removed from the phloem at the sink.

Describe how hydrostatic pressure results in the movement of assimilates along the phloem.

**Evidence for translocation**

List some evidence for the translocation mechanism. Give the evidence and what it proves.