B3.2 Transport in plants

What the Cell · DP Biology · worksheet · plant statements B3.2.7–10

Name _____ **Date** _____ **Total** _____ / 33

About 35 minutes, or one section at a time. The number of marks shows how many separate points to make.

Section A: Recall

6 marks

1 **State** the polymer that strengthens xylem walls. B3.2.8 **[1]**

2 **Distinguish** between cohesion and adhesion. B3.2.7 **[2]**

3 **State** the function of pits in xylem vessels. B3.2.8 **[1]**

4 **State** where the xylem is found in a cross-section of a dicot root, and of a dicot stem. B3.2.9, 10 **[2]**

Section B: Understanding

13 marks

5 **Explain** how transpiration causes water to move up the stem. B3.2.7 **[4]**

6 **Explain** how the structure of xylem vessels suits them to transport water. B3.2.8 **[3]**

7 **Draw** a labelled plan diagram of a cross-section of a dicot stem, and annotate the function of two tissues. B3.2.9 **[4]**

8 A student wrote: "The roots pump water up the stem using ATP." **Explain** why this is not the main mechanism. B3.2.7 **[2]**

Section C: Working with data

14 marks

All data in this section are invented for practice. The patterns are realistic.

9 B3.2.7

The diameter of a tree trunk and the rate of transpiration were measured over one day.

Time of day	06:00	10:00	14:00	18:00	22:00
Trunk diameter / mm	204.0	203.4	203.0	203.4	203.9
Transpiration / arbitrary units	5	40	70	30	4

a **Describe** the relationship between the transpiration rate and trunk diameter. **[1]**

b **Calculate** the percentage decrease in diameter from 06:00 to 14:00. **[2]**

c **Explain** how these data support the cohesion-tension theory. **[3]**

10 B3.2.7, B3.2.9

A leafy celery stalk stood in dye for 2 hours. It was cut at intervals, and the highest point reached by the dye was recorded.

Condition	Distance moved by dye / mm
Leaves present	96
Leaves removed	24
Leaves coated in petroleum jelly	30

a **Calculate** the mean rate of dye movement with leaves present, in mm per minute. **[1]**

b **Explain** the effect of removing the leaves. **[2]**

c **Explain** the effect of coating the leaves in petroleum jelly. **[2]**

d **Predict** where the dye would be seen in a cross-section of the stalk. **[1]**

e **Suggest** two improvements to this method. **[2]**