B3.1 Gas exchange in plants

What the Cell · DP Biology · worksheet · plant statements B3.1.7–10

Name _____ **Date** _____ **Total** _____ / 35

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

Section A: Recall

7 marks

1 **State** the function of the waxy cuticle. B3.1.7 **[1]**

2 **Distinguish** between a stoma and a guard cell. B3.1.7 **[2]**

3 **Define** transpiration. B3.1.9 **[1]**

4 **State** the effect on the rate of transpiration of an increase in humidity and an increase in wind. B3.1.9 **[2]**

5 **Define** stomatal density. B3.1.10 **[1]**

Section B: Understanding

10 marks

6 **Explain** how the spongy mesophyll and air spaces help gas exchange. B3.1.7 **[2]**

7 **Explain** why gas exchange in a leaf leads to water loss. B3.1.9 **[3]**

8 **Draw** a labelled plan diagram of a transverse section of a dicot leaf, showing four tissues. B3.1.8 **[4]**

9 **State** why individual cells should not be drawn in a plan diagram. B3.1.8 **[1]**

Section C: Working with data

18 marks

All data in this section are invented for practice.

10 B3.1.9

A student used a potometer. The air bubble moved along a capillary tube with these results.

Condition	Distance moved in 5 minutes / mm	Rate / mm min^{-1}
Still air	20	
Moving air (fan)	65	
Plastic bag over shoot	5	

a **Calculate** the three missing rates. **[2]**

b **Explain** the result with moving air. **[2]**

c **Explain** the result with the plastic bag. **[2]**

d **State** two variables that should be kept constant. **[2]**

e **Outline** why a potometer does not directly measure transpiration. **[2]**

11 B3.1.10

Leaf casts were made from the lower surface of leaves from two plant species. The field of view had a diameter of 0.50 mm.

Species	Field 1	Field 2	Field 3
X (woodland)	12	10	14
Y (full sun)	30	26	28

a **Calculate** the area of the field of view. **[1]**

b **Calculate** the stomatal density of species Y. **[2]**

c **Suggest** one advantage to species Y of its higher density. **[1]**

d **Suggest** two ways to improve the reliability of this investigation. **[2]**

e **Suggest** a disadvantage of a high stomatal density in a dry habitat. **[2]**