C3.1 Integration (HL)

What the Cell · DP Biology · worksheet · HL statements C3.1.17–23

Name _____ **Date** _____ **Total** _____ / 40

About 40 minutes, or one section at a time. The number of marks shows how many separate points to make.

Section A: Recall

7 marks

1 **Define** tropism. C3.1.18 **[1]**

2 **Name** the receptor that detects light in a shoot tip. C3.1.18 **[1]**

3 **State** where most auxin is made in a plant. C3.1.20 **[1]**

4 **Name** the phytohormone that stimulates fruit ripening. C3.1.19 **[1]**

5 **State** one effect of cytokinin. C3.1.19 **[1]**

6 **State** two variables to keep constant when investigating phototropism in seedlings. C3.1.17 **[2]**

Section B: Understanding

16 marks

7 **Explain** how a shoot grows towards light that comes from one side. C3.1.18 **[4]**

8 **Explain** how auxin efflux carriers produce a concentration gradient of auxin. C3.1.20 **[3]**

9 **Explain** how auxin promotes cell elongation. C3.1.21 [3]

10 **Explain** how auxin and cytokinin keep root and shoot growth in balance. C3.1.22 [3]

11 **Explain** the benefit of positive feedback in fruit ripening. C3.1.23 [3]

Section C: Working with evidence

11 marks

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

12 C3.1.17, C3.1.18

Oat seedlings were treated as shown and lit from the left for 12 hours, except group E, which was kept in the dark. 20 seedlings were used per group.

Group	Treatment	Mean angle / degrees	Direction
A	Untreated	41	Towards light
B	Tip covered with a foil cap	2	None
C	Tip removed	0	None
D	Base covered, tip exposed	38	Towards light
E	Tip removed; agar block with auxin placed on the left half of the cut surface; dark	25	To the right

a **Deduce** from groups A and B where light is detected. **[2]**

b **Explain** the result for group D. **[2]**

c **Explain** the result for group E. **[3]**

d **State** the independent variable in groups A to D. **[1]**

e **Suggest** why 20 seedlings were used per group. **[1]**

f **Outline** how you could test whether the difference between A and D is significant. **[2]**

Section D: Longer answer

6 marks

13 **Outline** how phytohormones control growth, development and responses in plants, using three named phytohormones. C3.1.19 **[6]**

What the Cell. Original questions written for this course.