D4.3 Climate change (HL)

What the Cell · DP Biology · worksheet · HL statements D4.3.9–12

Name _____ **Date** _____ **Total** _____ / 30

About 30 minutes, or one section at a time. The number of marks shows how many separate points to make.

Section A: Recall

6 marks

1 **Define** phenology. D4.3.9 **[1]**

2 **State** two variables that influence the timing of biological events. D4.3.9 **[2]**

3 **State** one phenological event in a deciduous tree. D4.3.9 **[1]**

4 **Name** an insect that has more generations per year because of warming. D4.3.11 **[1]**

5 **State** which colour of tawny owl has become more common in Finland. D4.3.12 **[1]**

Section B: Understanding

11 marks

6 **Explain** how climate change can cause great tit chicks to hatch at the wrong time. D4.3.10 **[3]**

7 **Explain** how an increase in bark beetle generations threatens spruce forests. D4.3.11 **[3]**

8 **Outline** how warming affects reindeer through their food plants. D4.3.10 **[2]**

9 **Explain** how reduced snow cover has changed the frequency of colour variants in tawny owls. D4.3.12 **[3]**

Section C: Working with evidence

9 marks

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

10 D4.3.10

In a forest, the dates of two events were recorded. Dates are given as days of the year.

Year	1980	1990	2000	2010	2020
Peak number of caterpillars	150	146	141	137	132
Peak food demand of great tit chicks	150	148	146	144	142

a **Calculate** the mean change per decade in the date of peak caterpillar numbers. **[2]**

b **Calculate** the mismatch between the two events in 2020. **[1]**

c **Suggest** why the dates of the two events did not change equally. **[2]**

d **Predict** the effect of this mismatch on the great tit population. **[2]**

e **Explain** how natural selection could reduce the mismatch. **[2]**

Section D: Longer answer

4 marks

11 **Explain** how a longer growing season could cause the date of bud set in Scots pine to evolve. D4.3.12 **[4]**