A4.1 Evolution and speciation

What the Cell · DP Biology · worksheet · SL statements A4.1.1–7

Name _____ **Date** _____ **Total** _____ / 36

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 **Define** evolution. A4.1.1 **[1]**

2 **State** three forms of molecular or anatomical evidence for evolution. A4.1.2–4 **[3]**

3 **Define** speciation. A4.1.6 **[1]**

4 **Name** the river that separates bonobos from chimpanzees. A4.1.7 **[1]**

Section B: Understanding

13 marks

5 **Explain** why muscles developed through exercise are not an example of evolution. A4.1.1 **[2]**

6 **Explain** how selective breeding provides evidence for evolution. A4.1.3 **[3]**

7 **Distinguish** between homologous and analogous structures. A4.1.4, A4.1.5 **[3]**

Homologous	Analogous

8 **Explain** why similar structures can be misleading when classifying organisms. A4.1.5 **[2]**

9 **Explain** why geographical isolation alone does not guarantee speciation. A4.1.7 **[3]**

Section C: Working with data

11 marks

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

10 A4.1.2

The table shows the number of amino acid differences in a section of one protein, compared between pairs of species.

	Species P	Species Q	Species R
Human	1	8	31
Species P	–	9	32
Species Q	9	–	30

a **Identify** the species most closely related to humans, giving a reason. **[2]**

b **Suggest** which species split from the others first. **[1]**

c **Explain** why more differences suggest a longer time since a split. **[2]**

11 A4.1.3

Over 40 generations of selection for oil content in maize, the mean oil content rose as shown.

Generation	0	10	20	40
Mean oil content / %	4.5	7.0	9.5	13.5

a **Calculate** the mean rise in oil content per generation. **[2]**

b **Explain** how the breeders brought about this change. **[2]**

c **Explain** why this is not an example of natural selection. **[2]**

Section D: Longer answer

6 marks

12 **Explain** how one species can split into two, using a named example. A4.1.6, A4.1.7 **[6]**