# D4.1 Natural selection: data-based questions

What the Cell · DP Biology · data-based questions

**Name** _____ **Date** _____ **Total** _____ / 14

**Read the data carefully before you answer.** The number of marks shows how many separate points to make. Show your working in calculations.

## 1 Mate choice in guppies

8 marks



Image: 5snake5, CC0, Wikimedia Commons.

Male guppies (*Poecilia reticulata*) in Trinidad vary in colour and in behaviour. Males were sorted as bright or dull, and as bold (approaching a predator fish) or timid (swimming away). Forty females were each allowed to choose between males, with and without a predator fish visible in a nearby tank.

| Males chosen | No predator | Predator present |
|---|---|---|
| **Bright and bold** | 14 | 15 |
| **Bright and timid** | 13 | 5 |
| **Dull and bold** | 7 | 14 |
| **Dull and timid** | 6 | 6 |

a **State** how many females chose dull males when the predator was present. **[1]**

b **Calculate** the difference in the number of bright, timid males chosen with and without the predator. **[1]**

c **Compare** the choices made by females with and without the predator. **[2]**

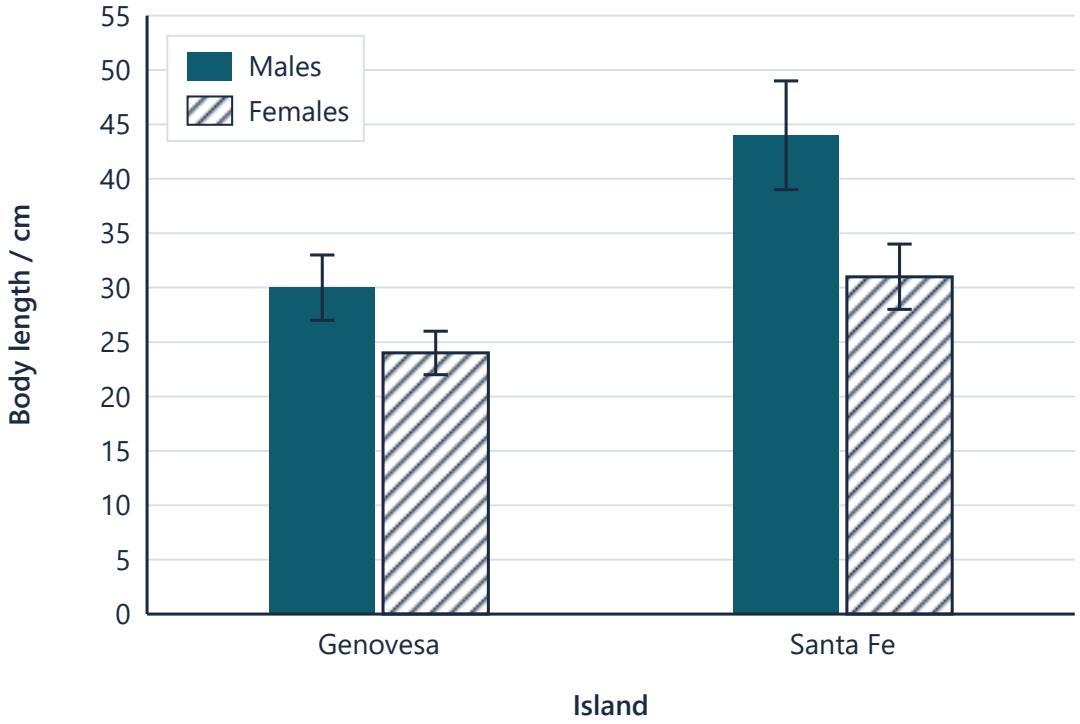
d **Suggest** reasons for this pattern of mate choice. **[2]**

e **Evaluate** the hypothesis that boldness is more important than colour when females choose mates. **[2]**

## 2 Body size in marine iguanas

6 marks

Marine iguanas feed on algae on rocky shores of the Galapagos Islands. Males defend territories where females come to mate. The body length (snout to vent) of adults was measured on two islands. On Genovesa there is much less algae than on Santa Fe. Error bars show ± 1 SD.




a **Compare** the body length of males and females. **[2]**

b **Calculate** how much longer, as a percentage, males on Santa Fe are than males on Genovesa. **[1]**

c **Suggest** why males are larger than females. **[2]**

d **Suggest** why both sexes are smaller on Genovesa. **[1]**

What the Cell. Original questions written for this course, with data based on published patterns.