

Selection: practice questions

7 questions • 23 marks • mark scheme at the back

For Cambridge IGCSE Biology 0610 (and 0970, which has the same content). **Supplement** is Extended content, only examined on Papers 2 and 4.

Name

Total / 23

1 Which is a step in natural selection? [1 mark]

- A. ☐ Humans choose the organisms that breed
- B. ☐ Better adapted individuals are more likely to reproduce
- C. ☐ All offspring survive
- D. ☐ Mutations occur because the environment needs them

2 A population of mice lives in woodland. The fur colour varies from light brown to dark brown. A new bird of prey that hunts by sight arrives, and the soil in the woodland is dark. Describe how natural selection could cause most mice in the population to have dark fur. [5 marks]

3 A farmer wants to breed cattle that produce more milk. Outline how the farmer can do this by selective breeding. [4 marks]

- 4** A herd of cows had a mean milk yield of 4000 dm^3 per year. After many generations of selective breeding, the mean yield is 5200 dm^3 per year. Calculate the percentage increase in milk yield. **[3 marks]**

Answer =

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- 5** **Supplement** [2 marks]
Define the term adaptation.

[illegible]

- 6 Supplement** [5 marks]

Doctors treat a bacterial infection with an antibiotic. Over several years a strain of the bacteria that is resistant to the antibiotic becomes common. Explain, using the idea of natural selection, how this happens.

[illegible]

- 7** **Supplement** **[3 marks]**

Outline three differences between natural selection and artificial selection.

[illegible]

Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [1]

B B (1)

2. [5]

- variation in fur colour / alleles for fur colour (1)
- mice produce many offspring (1)
- struggle for survival / competition / predation (1)
- dark mice are better adapted / harder to see so more likely to survive and reproduce (1)
- they pass on their alleles for dark fur to the next generation (1)
- proportion of dark mice increases over generations (1)
- Max 5

3. [4]

- select cows with the highest milk yield (and a bull from a high-yielding line) (1)
- cross / breed them together (1)
- select offspring that produce the most milk (1)
- repeat for many generations (1)

4. [3]

- increase = $5200 - 4000 = 1200$ (1)
- $(1200 \div 4000) \times 100$ (1)
- 30% (1) correct answer with no working scores 3

5. [2] **Supplement**

- the process, resulting from natural selection (1)
- by which populations become more suited to their environment over many generations (1)

6. [5] **Supplement**

- mutation (in a bacterium) produces a resistance allele (1)
- antibiotic kills non-resistant bacteria (1)
- resistant bacteria survive (1)
- resistant bacteria reproduce (1)
- and pass on the resistance allele to the next generation (1)
- proportion of resistant bacteria increases (1)
- Max 5

7. [3] **Supplement**

- natural: the environment selects; artificial: humans select (1)
- natural: features that help survival and reproduction; artificial: features wanted by humans (1)
- natural: organisms become better adapted to the environment; artificial: improves crops / domesticated animals for human use (1)
- natural is usually slower / artificial is usually faster (1)
- Max 3