

Exercise walk-through

Artificial Selection ■ 7.3

eXercise

You must be able to

- describe **artificial selection** 人工选择 (selective breeding by humans)
- contrast it with natural selection
- give examples (crops, dogs)

Method — Artificial selection

In **artificial selection**, **humans** choose which individuals reproduce, based on traits they want. Over generations the chosen traits become more common.

Method — Contrast with natural selection

- **Natural** — the **environment** selects; traits that aid survival/reproduction spread.
- **Artificial** — **humans** select; traits humans prefer spread (even if not survival-useful).

Both work on **heritable variation**, but the selecting agent differs.

Method — Examples

Crops bred for larger fruit; dogs bred from wolves into many breeds; cows bred for more milk. All show rapid change from human choice.

Method — Evidence for evolution

Artificial selection's fast, visible changes show that selection on heritable variation can reshape a population — supporting how natural selection works over longer times.

Practice 2.1 ■ 1 mark

Who does the selecting in artificial selection?

Solution 2.1

Method: Contrast with natural selection

Worked steps

Humans **B1**.

Practice 2.2 ■ 1 mark

Give one example of artificial selection.

Solution 2.2

Worked steps

Any one: crops for larger fruit, dog breeds, high-milk cows **B1**.

Practice 2.3 ■ 1 mark

What do artificial and natural selection have in common?

Solution 2.3

Worked steps

Both act on heritable variation, increasing chosen/favored traits over generations **B1**.

Exam-style 3.1 ■ 1 mark

In artificial selection, traits become common because they

- A** aid survival in the wild
- B** are chosen by humans for breeding
- C** appear randomly
- D** are never inherited

Solution 3.1

Method: Artificial selection

- A aid survival in the wild
- B are chosen by humans for breeding**
- C appear randomly
- D are never inherited



Worked steps

B — chosen by humans for breeding.

Exam-style 3.2 ■ 1 mark

A farmer breeds only the cows that produce the most milk.

- (a) Name the process.
- (b) Explain how milk yield increases over generations.

Solution 3.2

Method: Examples

Worked steps

(a) Artificial selection (selective breeding) **B1**. (b) Only the highest-yielding cows reproduce, passing on their milk-yield alleles; over generations the average yield rises **M1** **A1**.

Exam-style 3.3 ■ 3 marks

Explain the key difference between natural and artificial selection, and one similarity.

Solution 3.3

Worked steps

Difference: the selecting agent — the environment (natural) vs humans (artificial) **M1** **A1**; similarity: both act on heritable variation to change the population **B1**.