

7.3 Artificial Selection

Name: _____ Class: _____ Date: _____

Total: 10 marks

KEY WORDS artificial selection 人工选择 • natural selection 自然选择 • variation 变异
• evolution 进化

Objective

Build the skills to answer exam questions on **artificial selection**.

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)

1 Worked examples

Study these first. Each one shows the method for a question type used later — follow the steps and you can do the Practice and Exam-style questions yourself.

■ Artificial selection

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

■ 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.

■ 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.

■ 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.

2 Practice

Now apply the methods above.

2.1 Who does the selecting in artificial selection? [1]

2.2 Give one example of artificial selection. [1]

2.3 What do artificial and natural selection have in common? [1]

3 Exam-style questions

3.1 In artificial selection, traits become common because they [1]

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

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

(a) Name the process. [1]

(b) Explain how milk yield increases over generations. [2]

3.3 Explain the key difference between natural and artificial selection, and one similarity. [3]

Solutions

2.1 Humans.

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

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

3.1 B — chosen by humans for breeding.

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

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