

17. Selection and evolution

Starter Quiz · 课前小测

A-Level Biology

Name: _____ Score: _____

- Most features, such as height, are caused by:
 - ☐ both genetic and environmental factors
 - ☐ genetic factors only
 - ☐ environmental factors only
 - ☐ neither genes nor environment
- Natural selection acts on the variation that already exists in a population.
 - ☐ True ☐ False
- A change in the allele frequencies of a population over generations is called _____.

- Selective breeding (artificial selection) differs from natural selection because:
 - ☐ humans choose which organisms breed, rather than nature
 - ☐ no alleles are passed on
 - ☐ it never changes the population
 - ☐ it only happens in bacteria
- Evolution is best described as:
 - ☐ the gene pool of a population changing over generations, forming new species
 - ☐ an individual changing during its life
 - ☐ the loss of all genetic variation
 - ☐ a single mutation
- Continuous variation is:
 - ☐ a smooth range controlled by many genes plus the environment
 - ☐ clear separate groups controlled by one gene
 - ☐ caused only by the environment
 - ☐ the same in every individual
- In natural selection, which individuals are most likely to pass on their alleles?
 - ☐ those best adapted, which survive and reproduce
 - ☐ the largest ones only

☐ a random selection

☐ those that produce the fewest offspring

- When humans choose which organisms breed to pass on useful features, it is called _____ selection.

- Speciation is the formation of a new species, when two populations can no longer interbreed.
 - ☐ True ☐ False
- Repeated artificial selection from a few individuals can reduce the gene pool and cause inbreeding problems.
 - ☐ True ☐ False

A-Level Biology

1. **both genetic and environmental factors**

Height depends on the alleles inherited and on diet/lifestyle — a combination of genes and environment.

2. **True**

It cannot create variation; it selects from what is already there (mutation creates the new variation).

3. **evolution**

Selection and genetic drift change allele frequencies — that is evolution at the genetic level.

4. **humans choose which organisms breed, rather than nature**

In artificial selection, people choose the breeders to pass on useful features; in natural selection, the environment selects.

5. **the gene pool of a population changing over generations, forming new species**

Evolution is the change in a population's gene pool over time, which can lead to new species.

6. **a smooth range controlled by many genes plus the environment**

Continuous variation (e.g. height) is a smooth range from many genes; discontinuous is separate groups from few genes.

7. **those best adapted, which survive and reproduce**

The best-adapted individuals survive, reproduce, and pass on their helpful alleles, which spread over generations.

8. **artificial**

Artificial selection (selective breeding) is the same mechanism as natural selection — but humans, not the environment, do the selecting.

9. **True**

It can be allopatric (geographical barrier) or sympatric (same area).

10. **True**

A narrow gene pool concentrates harmful recessive alleles and lowers the population's resilience.