Exercise walk-through

Selection ▪ 18.3

eXercise

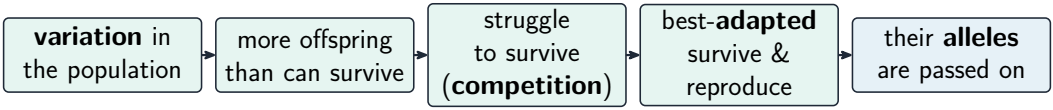
You must be able to

- describe the steps of natural selection
- explain antibiotic resistance as natural selection
- describe selective breeding and contrast it with natural selection

Method — Natural and artificial selection

- key difference: the **environment** selects (natural) vs **humans** select (artificial).

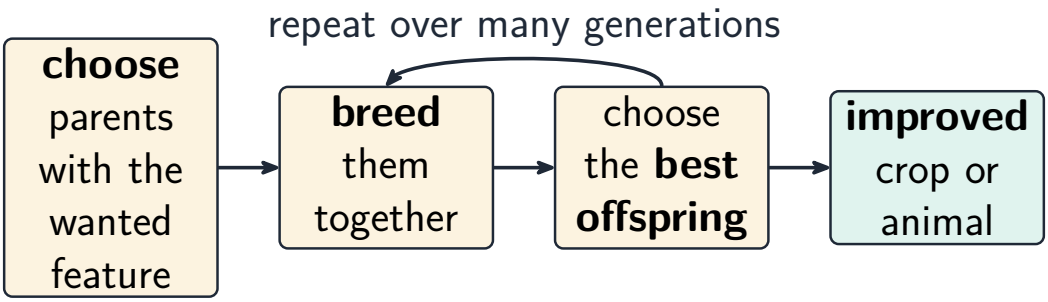
Method — Natural and artificial selection



over many generations the population becomes better adapted

A flow chart of natural selection

Method — Natural and artificial selection



humans choose which breed (not the environment)

A flow chart of selective breeding

Practice 2.1 ▪ 1 mark

State what is meant by natural selection.

Solution 2.1

Method: Natural and artificial selection

Worked steps

the process by which the best-adapted organisms survive, reproduce and pass on their alleles B1.

Practice 2.2 ▪ 1 mark

State who or what “selects” in selective breeding.

Solution 2.2

Method: Natural and artificial selection

Worked steps

humans B1.

Exam-style 3.1 ▪ 1 mark

In natural selection, the individuals most likely to survive and reproduce are those that are:

A the largest

B best adapted to the environment

C chosen by humans

D identical to each other

Solution 3.1

Method: Natural and artificial selection

A the largest

B best adapted to the environment ✓

C chosen by humans

D identical to each other

Worked steps

B. The best-adapted individuals are most likely to survive and reproduce.

Exam-style 3.2 ▪ 3 marks

Some bacteria become resistant to an antibiotic.
(a) Explain how antibiotic resistance spreads, using natural selection.
(b) State the main difference between natural selection and selective breeding.

Solution 3.2

Method: Natural and artificial selection

Worked steps

(a) a few bacteria carry a resistant allele (by mutation) M1; the antibiotic kills the non-resistant ones, so the resistant survive M1; they reproduce and pass on the resistance allele, so the population becomes resistant A1.
(b) in natural selection the environment selects; in selective breeding humans select B1.