

7 Populations, speciation, and evidence

– Part 2

Name: _____ Class: _____ Date: _____

Vocabulary

Write each word three times.

English	Write it 3 times (English)
allele frequency	_____
gene flow	_____
genetic drift	_____
Speciation	_____
reproductively isolated	_____

Recall

In Part A you met natural selection. Now see it acting on whole populations:

- Bacteria can become resistant to antibiotics.
- Over long times, populations can split into new species.
- Fossils and DNA give evidence for evolution.

Each idea has a short worked example before the Practice.

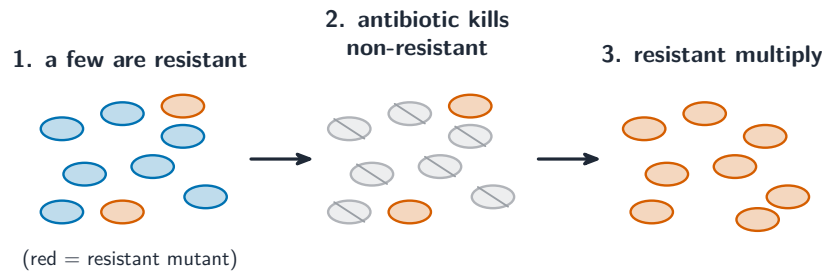
New ideas

■ 1 Evolution changes allele frequencies

A population's gene pool holds many **alleles**. Evolution is a change in how common each allele is – its **allele frequency**. Besides natural selection, this changes through mutation, **gene flow** (migration), and **genetic drift** (random change, strongest in small populations).

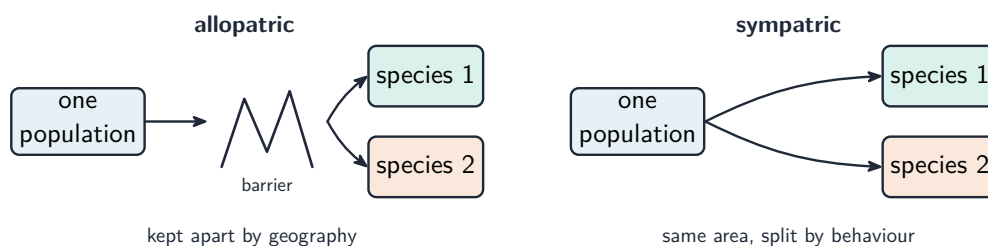
■ 2 Antibiotic resistance

Antibiotic resistance is natural selection in fast-forward: a few bacteria happen to survive the drug, then reproduce, so the whole population becomes resistant.



■ 3 Speciation

Speciation is the origin of a new species. It usually happens when populations become **reproductively isolated** (often by a geographic barrier) and slowly diverge until they can no longer interbreed.



■ 4 Evidence for evolution

Many independent lines support evolution: the fossil record, shared anatomy between related species, and matching DNA sequences.

Watch out: individuals do **not** evolve – **populations** do. A single bacterium doesn't "become resistant"; rather, resistant ones survive and multiply, shifting the whole population.

Practice

Try these in order. The methods are all above.

2.1 State what evolution is, in terms of alleles in a population.

[2]

2.2 Explain how a population of bacteria becomes resistant to an antibiotic. [3]

2.3 State what usually must happen for two populations to become separate species. [2]

2.4 Give two kinds of evidence that support evolution. [2]

2.5 Explain why it is wrong to say a single individual “evolves”. [2]
