

INKBIOLOGY FLASHCARDS

Evolution and speciation

Unit B19 · 22 cards · fronts and backs

Print double-sided, flipping on the long edge, and each answer lands behind its question. Cut along the card borders.

Definitions in mark-scheme wording, and the misconceptions that lose marks. These cards and each lesson's whole-lesson check run on the website with spaced-repetition scheduling, at inkphysics.co.uk/biology/flashcards.

DEFINITION

Define: Mutation.

NATURAL SELECTION: VARIATION, SELECTION AND ALLELE FREQUENCY

DEFINITION

Define: Genetic variation.

NATURAL SELECTION: VARIATION, SELECTION AND ALLELE FREQUENCY

DEFINITION

Define: Environmental variation.

NATURAL SELECTION: VARIATION, SELECTION AND ALLELE FREQUENCY

DEFINITION

Define: Gene pool.

NATURAL SELECTION: VARIATION, SELECTION AND ALLELE FREQUENCY

DEFINITION

Define: Selection pressure.

NATURAL SELECTION: VARIATION, SELECTION AND ALLELE FREQUENCY

DEFINITION

Define: Fitness.

NATURAL SELECTION: VARIATION, SELECTION AND ALLELE FREQUENCY

DEFINITION

Define: Adaptation.

NATURAL SELECTION: VARIATION, SELECTION AND ALLELE FREQUENCY

DEFINITION

Define: Natural selection.

NATURAL SELECTION: VARIATION, SELECTION AND ALLELE FREQUENCY

DEFINITION

Differences between individuals in a population that are caused by differences in their alleles, and can therefore be inherited.

NATURAL SELECTION: VARIATION, SELECTION AND ALLELE FREQUENCY

DEFINITION

A change in the base sequence of DNA. The only source of new alleles.

NATURAL SELECTION: VARIATION, SELECTION AND ALLELE FREQUENCY

DEFINITION

All the alleles of all the genes in a population at a given time.

NATURAL SELECTION: VARIATION, SELECTION AND ALLELE FREQUENCY

DEFINITION

Differences between individuals caused by the conditions they have experienced, which are not passed to offspring.

NATURAL SELECTION: VARIATION, SELECTION AND ALLELE FREQUENCY

DEFINITION

The contribution an individual makes to the gene pool of the next generation, relative to other individuals in the population, usually counted as offspring that themselves survive to reproduce.

NATURAL SELECTION: VARIATION, SELECTION AND ALLELE FREQUENCY

DEFINITION

An environmental factor that causes individuals with certain phenotypes to survive and reproduce more successfully than others.

NATURAL SELECTION: VARIATION, SELECTION AND ALLELE FREQUENCY

DEFINITION

The process by which individuals with phenotypes better suited to the environment reproduce more successfully, so the alleles responsible become more frequent.

NATURAL SELECTION: VARIATION, SELECTION AND ALLELE FREQUENCY

DEFINITION

A characteristic that increases an organism's chance of surviving and reproducing in its environment. Adaptations may be anatomical, physiological or behavioural.

NATURAL SELECTION: VARIATION, SELECTION AND ALLELE FREQUENCY

SPOT THE ERROR

Say what is wrong with this claim:

Evolution is survival of the fittest, and the fittest are the strongest, fastest and biggest.

NATURAL SELECTION: VARIATION, SELECTION AND ALLELE FREQUENCIES

DEFINITION

Define: Antibiotic.

RESISTANCE, DRIFT AND THE EVIDENCE: SELECTION WHERE YOU CAN

DEFINITION

Define: Antibiotic resistance.

RESISTANCE, DRIFT AND THE EVIDENCE: SELECTION WHERE YOU CAN

DEFINITION

Define: Vertical gene transfer.

RESISTANCE, DRIFT AND THE EVIDENCE: SELECTION WHERE YOU CAN

DEFINITION

Define: Horizontal gene transfer.

RESISTANCE, DRIFT AND THE EVIDENCE: SELECTION WHERE YOU CAN

DEFINITION

Define: Genetic drift.

RESISTANCE, DRIFT AND THE EVIDENCE: SELECTION WHERE YOU CAN

DEFINITION

Define: Genetic bottleneck.

RESISTANCE, DRIFT AND THE EVIDENCE: SELECTION WHERE YOU CAN

DEFINITION

Define: Founder effect.

RESISTANCE, DRIFT AND THE EVIDENCE: SELECTION WHERE YOU CAN

DEFINITION

A substance produced by a microorganism, or a synthetic derivative of one, that kills or inhibits the growth of bacteria.

RESISTANCE, DRIFT AND THE EVIDENCE: SELECTION WHERE YOU CAN WATCH SELECTION IN VARIATION, SELECTION AND ALLELE FREQUENCY

SPOT THE ERROR

Fitness in biology is not athletic. It is the number of offspring an individual leaves that themselves survive to breed, relative to everyone else. A small unimpressive organism raising eleven surviving young is fitter than a magnificent one raising none.

DEFINITION

Passing genes from a parent cell to its daughter cells by binary fission.

RESISTANCE, DRIFT AND THE EVIDENCE: SELECTION WHERE YOU CAN WATCH SELECTION IN VARIATION, SELECTION AND ALLELE FREQUENCY

DEFINITION

The ability of a bacterium to survive and reproduce in a concentration of an antibiotic that would kill or inhibit others of its species.

DEFINITION

A change in allele frequencies from one generation to the next caused by chance sampling of gametes, rather than by selection. Its effect is greatest in small populations.

RESISTANCE, DRIFT AND THE EVIDENCE: SELECTION WHERE YOU CAN WATCH SELECTION IN VARIATION, SELECTION AND ALLELE FREQUENCY

DEFINITION

Passing genes between bacteria that are not parent and offspring, most often on a plasmid transferred by conjugation.

DEFINITION

The reduced and unrepresentative genetic diversity of a population established by a small number of individuals separated from a larger population.

RESISTANCE, DRIFT AND THE EVIDENCE: SELECTION WHERE YOU CAN WATCH SELECTION IN VARIATION, SELECTION AND ALLELE FREQUENCY

DEFINITION

A sharp reduction in population size that leaves the survivors carrying only a fraction of the original genetic diversity.

SPOT THE ERROR

Say what is wrong with this claim:

Bacteria become resistant because the antibiotic makes them mutate.

RESISTANCE, DRIFT AND THE EVIDENCE: SELECTION WHERE YOU CAN'T CHOOSE WHICH ALLELES TO KEEP. SPECIATION: HOW ONE GENE POOL BECOMES TWO, AND WHY THE LINE BETWEEN THEM DOESN'T ALWAYS HOLD.

DEFINITION

Define: Species.

RESISTANCE, DRIFT AND THE EVIDENCE: SELECTION WHERE YOU CAN'T CHOOSE WHICH ALLELES TO KEEP. SPECIATION: HOW ONE GENE POOL BECOMES TWO, AND WHY THE LINE BETWEEN THEM DOESN'T ALWAYS HOLD.

DEFINITION

Define: Gene flow.

SPECIATION: HOW ONE GENE POOL BECOMES TWO, AND WHY THE LINE BETWEEN THEM DOESN'T ALWAYS HOLD. SPECIATION: HOW ONE GENE POOL BECOMES TWO, AND WHY THE LINE BETWEEN THEM DOESN'T ALWAYS HOLD.

DEFINITION

Define: Reproductive isolation.

SPECIATION: HOW ONE GENE POOL BECOMES TWO, AND WHY THE LINE BETWEEN THEM DOESN'T ALWAYS HOLD. SPECIATION: HOW ONE GENE POOL BECOMES TWO, AND WHY THE LINE BETWEEN THEM DOESN'T ALWAYS HOLD.

DEFINITION

Define: Speciation.

SPECIATION: HOW ONE GENE POOL BECOMES TWO, AND WHY THE LINE BETWEEN THEM DOESN'T ALWAYS HOLD. SPECIATION: HOW ONE GENE POOL BECOMES TWO, AND WHY THE LINE BETWEEN THEM DOESN'T ALWAYS HOLD.

SPOT THE ERROR

Say what is wrong with this claim:

Two organisms belong to different species if they look different enough.

SPECIATION: HOW ONE GENE POOL BECOMES TWO, AND WHY THE LINE BETWEEN THEM DOESN'T ALWAYS HOLD. SPECIATION: HOW ONE GENE POOL BECOMES TWO, AND WHY THE LINE BETWEEN THEM DOESN'T ALWAYS HOLD.

DEFINITION

A group of organisms with similar characteristics that can interbreed to produce fertile offspring, and which are reproductively isolated from other such groups.

SPECIATION: HOW ONE GENE POOL BECOMES TWO, AND WHY THE REVERSAL IS DIFFICULT BY THE EVIDENCE: SELECTION WHERE YOU CAN

SPOT THE ERROR

The mutation was already there, in a few cells out of billions, and it arose while nothing was threatening them. The antibiotic kills everything that lacks it, so the population that grows back descends from the survivors. No cell changed its genotype in response.

DEFINITION

The state in which gene flow between two populations has stopped, because of some feature of the organisms or of where and when they breed.

SPECIATION: HOW ONE GENE POOL BECOMES TWO, AND WHY THE REVERSAL IS DIFFICULT BY THE EVIDENCE: SELECTION WHERE YOU CAN

DEFINITION

The movement of alleles between populations, by migration of individuals or of gametes, which keeps their gene pools similar.

SPOT THE ERROR

Appearance is evidence about a boundary, not the boundary. Male and female eclectus parrots were described as separate species for a century and are one; some pairs of gulls are near-identical and never interbreed. What matters is whether the gene pools are still connected.

SPECIATION: HOW ONE GENE POOL BECOMES TWO, AND WHY THE REVERSAL IS DIFFICULT BY THE EVIDENCE: SELECTION WHERE YOU CAN

DEFINITION

The formation of a new species from an existing one, through reproductive isolation followed by genetic divergence of the isolated populations.