

Evolution and speciation

Define evolution.

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Why are acquired characteristics not evolution?

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Lamarckism

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What do sequence differences between two species show?

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Why do base sequences show more differences than amino acid sequences?

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How is selective breeding evidence for evolution?

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Name crop varieties bred from wild cabbage.

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Homologous structures

They are not genetic in origin, so they are not passed to offspring.

Change in the heritable characteristics of a population.

Fewer differences in base or amino acid sequences mean more recent common ancestry.

The rejected idea that characteristics acquired during an organism's life are inherited.

Breeds and crop varieties differ greatly from wild ancestors, showing how rapidly heritable characteristics can change.

The genetic code is degenerate, so some base substitutions do not change the amino acid.

Structures with the same basic structure, inherited from a common ancestor, that may have different functions.

Cabbage, kale, broccoli, cauliflower, Brussels sprouts and kohlrabi (all *Brassica oleracea*).

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Bones of the pentadactyl forelimb

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Analogous structures

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Give an example of analogous structures.

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Speciation

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Is gradual change within one species speciation?

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Two processes needed for speciation

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What separated bonobos and common chimpanzees?

Structures with the same function but different evolutionary origins, produced by convergent evolution.

Humerus; radius and ulna; carpals; metacarpals; phalanges in five digits.

Formation of new species by splitting of a pre-existing species. It increases the number of species; extinction decreases it.

Wings of birds and insects; camera eyes of octopuses and vertebrates; fins of sharks and dolphins.

Reproductive isolation (stops gene flow) and differential selection (gene pools diverge).

No. The number of species does not increase.

The Congo River: bonobos to the south, common chimpanzees to the north.