

Demonstrate understanding of evolutionary processes leading to speciation

Glossary

Adaptive radiation	The evolution of several different species of plant or animal from one ancestral species, e.g. Darwin's Galapagos finches.
Allopatric speciation	Speciation occurring where organisms are initially capable of interbreeding but cannot because they are geographically separated.
Allopolyploidy	A type of polyploidy in which the chromosome complement consists of more than two copies, of chromosomes derived from different species (but closely related). It occurs when two species mate to produce a hybrid species.
Analogous structures	Structures that are superficially similar but have evolved in different ways, eg. the wings of birds, bats and insects.
Autopolyploidy	A type of polyploidy where the multiple sets of chromosomes are all derived from the same species.
Biogeography	Biogeography is the study of the distribution of species and ecosystems in geographic space and through geological time.
Cline	A gradual variation in the characteristics of a species or population over its geographical range.
Coevolution	Coevolution occurs when two or more species reciprocally affect each other's evolution. Charles Darwin mentioned evolutionary interactions between flowering plants and insects.
Convergent evolution	The development of superficially similar structures (analogous structures) in unrelated organisms, usually because the organisms live in the same kind of environment.
Deme	Is a population of organisms within which the exchange of genes is completely random; i.e., all mating combinations between individuals of opposite sexes have the same probability of occurrence.
Divergent evolution	An accumulation of changes in the gene pools of two (or more) populations, leading to the formation of races, sub-species, species etc.
Evolution	The gradual process by which the present diversity of plants and animals arose from the earliest and most primitive organisms.
Fossil record	History of life as documented by fossils, the remains or imprints of the organisms from earlier geological periods preserved in sedimentary rock. Can be used to show evolution.

Founder effect	When a new population is established by a very small number of individuals that have become reproductively isolated from a larger population.
Gene pool	Refers to the total number of genes of every individual in a population.
Gene flow	The movement and exchange of genes or alleles from one population of species to another.
Genetic drift	Is the change in the frequency of an existing gene variant (allele) in a population due to random chance alone and not natural selection.
Geographical isolation	Is a term that refers to a population's organisms that are physically separated from exchanging genetic material with other organisms of the same species.
Geological record	Fossils preserved in sedimentary rock layers that can be used to trace the evolutionary history of a species.
Gradualism	The view that evolution proceeds by imperceptibly small, cumulative steps over long periods of time rather than by abrupt, major changes.
Homologous structures	Structures that have a similar evolutionary history but have developed to suit different functions, e.g. Wings of a bat, flippers of dolphins and arms of humans have all evolved from paired pectoral fins of an ancestral fish.
Hybrid	The offspring of a mating where the parents differ in at least one characteristic. The term is usually applied to offspring of widely different parents, e.g. different varieties/species.
Hybridisation	Is the offspring resulting from combining the qualities of two organisms of different breeds, varieties, species or genera through sexual reproduction.
Instant speciation	The formation of a new species through autopolyploidy or allopolyploidy. Because the chromosome numbers of the new 'instant' species do not match that of the original species they cannot interbreed.
Macro-evolution	The formation of a completely new species, genera, etc.
Micro-evolution	The accumulation of (through mutation) of new characteristics in a species.
mtDNA	Is the DNA located in mitochondria, mtDNA is inherited from the mother (maternally inherited), as the mitochondria in sperm are usually destroyed by the egg cell after fertilization. This can be used to trace maternal lineage far back in time. It has a relatively slow mutation rates making it useful for studying the evolutionary relationships.
Mutation	A permanent change in the bases on the DNA. It is the only way of creating new alleles.

Natural selection	The process that brings about new species by eliminating individuals that are less well adapted to their current environment from a population showing variation, allowing mainly individuals with advantageous adaptations to survive and reproduce.
Nondisjunction	Is the failure of homologous chromosomes or sister chromatids to separate properly during cell division resulting in cells with more than two copies of each chromosome e.g. 3n, 4n not the normal 2n.
Parallel evolution	The development of related organisms along similar evolutionary paths due to strong selection pressures acting on all of them in the same way.
Polyploidy	The polyploid cell or organism has three or more times the haploid chromosome number. Polyploidy arises as the result of total nondisjunction of chromosomes during mitosis or meiosis.
Population bottleneck	Is an event that drastically reduces the size of a population, may be caused by various events, such as an environmental disaster. The population bottleneck produces a decrease in the gene pool of the population because many alleles, or gene variants, that were present in the original population are lost.
Postzygotic isolating mechanism	Reproductive isolation is a mechanism that keeps species from mating with others. Postzygotic isolation prevents the formation of fertile offspring. ... Postzygotic mechanisms include hybrid inviability, hybrid sterility and hybrid "breakdown."
Prezygotic isolating mechanism	Reproductive isolation is a mechanism that keeps species from mating with others. Prezygotic isolation prevents the fertilization of eggs e.g. spatial isolation, temporal isolation, mechanical isolation, gametic isolation and behavioural isolation.
Punctuated equilibrium	Punctuated equilibrium is a theory that states that evolution occurs primarily through short bursts of intense speciation followed by lengthy periods of being in stasis or little change / equilibrium.
Reproductive isolation	A barrier to breeding that exists due to differences in mating season or mating organs, e.g. flowers flowering at different times of year.
Ring species	Two apparently distinct species that are connected by a series of intermediate geographical and structural subspecies between which interbreeding can occur.
Sexual selection	Sexual selection is a "special case" of natural selection. Sexual selection acts on an organism's ability to obtain or successfully copulate with a mate. Sexual selection is often powerful enough to produce features that are harmful to the individual's survival. For example, extravagant and colourful tail feathers or fins are likely to attract predators as well as interested members of the opposite sex.

Selection pressure	The extent to which organisms possessing a particular characteristic are either eliminated or favoured by environmental demands.
Speciation	The development of one or more species from an existing species. It occurs when sympatric or allopatric populations diverge so much from the parent population that interbreeding cannot occur.
Species	A category used in the classification of organisms that consists of a group of organisms that can usually breed together and produce fertile offspring.
Sub-species	A group of individuals within a species that breed more freely among themselves than with other members of the species and resemble each other in more characteristics.
Sympatric speciation	Speciation occurring where organisms living within the same area are theoretically capable of interbreeding, but cannot because of difference in behaviour, flowering time etc.
Sympatry	Describes groups of organisms that live in the same geographical area.
Temporal isolation	One prezygotic reproductive barrier is temporal isolation. Temporal isolation means 'isolated in time,' so this is a mechanism that prevents species from mating because they breed at different times. These differences can be time of day, season, or even different years.
Vestigial organ	Any part of an organism that has diminished in size during its evolution because the function it serves has decreased in importance, e.g. the appendix in humans.
Vestigial structures	A structure in an organism that has lost all or most of its original function in the course of evolution, such as human appendixes.
Y Chromosomes	The Y chromosome is one of two sex chromosomes (allosomes) in mammals. The Y chromosome is passed only from father to son and can be used to demonstrate relatedness