Glossary

adaptation	The evolutionary process through which a population becomes better suited to its environment over many generations of natural selection.
adaptive trait	A heritable feature of an individual's phenotype that improves its chances of survival and reproduction in the existing environment.
adductor muscle	One of usually two large muscles (one anterior, one posterior) that contract to close the shell of a bivalve and maintain it in that condition; the position of these muscles is usually clearly marked on the shell interior as an adductor muscle scar or impression
allele	An alternative form of a gene; one of the different forms of a gene that can exist at a single locus.
allopatric speciation	Speciation in which the evolution of reproductive isolating mechanisms occurs during physical separation of the populations.
anagenesis	Change within a lineage over evolutionary time, as opposed to cladogenesis, the splitting of lineages.
analogous	Having similar function, although different in structure and origin.
anatomy	The science concerned with the shape, structure and the relationship of parts of organisms; also called morphology.
aquaculture	The science of farming organisms that live in water, such as fish, shellfish, and algae
auricles	Ear-shaped structures on the shells of scallops, one of their defining characteristics.
benthic	Occurring at the bottom of a body of water, for example, a seabed, riverbed, or lake bottom.
binomial nomenclature	The two-part scientific name – genus and species – for a plant or animal.
biodiversity	The variety and variability among living organisms and the ecological complexes in which they occur.
bioturbator	An organism that disturbs sediments by burrowing or feeding.
Bivalvia	A class of the phylum Mollusca including species with two shells hinged together, a soft body, and lamellate gills. Commonly called bivalves.
broadcast spawning	Releasing gametes — eggs and sperm — into the water for external fertilization.
byssus (adj. byssal), byssal threads	A tuft of long, tough filaments which are formed in a groove of the foot, and issue from between the valves of certain bivalve mollusks, by which they attach themselves to rocks, etc.
camouflage	Structural adaptation that enables an individual to blend with its surroundings, and that allows an individual to avoid detection by predators. cardinal teeth

character	A single attribute of an organism.
chromatogram	The pattern formed by zones of separated pigments and of colorless substance in chromatographic procedures.
clade	A group of organisms (usually species) that are more closely related to each other than any other group, implying a shared common ancestor.
cladistics	see phylogenetic analysis
cladogenesis	The splitting of lineages over time, with the consequent increase in numbers of taxa.
cladogram	A tree diagram depicting patterns of shared characteristics and relationships of organisms, generated through phylogenetic analysis.
co-evolution	Two or more unrelated species with a close ecological relationship that evolve together, such that one species adapts to the changes of the other, thereby affecting each other's evolution.
commensalism	A type of symbiosis in which two (or more) individuals of unrelated species live in close proximity to one another, in which one member is unaffected by the relationship and the other benefits from it.
comparative anatomy	The comparative study of the structure of organisms with regard to homologous organs or parts.
complexity	How the vast and varied components of an organism (genes, molecules, cells, organs) function together to create life, behaviors, species interactions, ecosystems, etc.
continuous variation	Variation measured on a continuum rather than in discrete units or categories (e.g., height in human beings, shell length in bivalves).
convergence	Evolutionary change in two or more unrelated organisms that results in the independent acquisition of similar traits.
coprolites	The fossilized feces of animals.
cryptic coloration	Coloration that allows an organism to match its background and hence become less vulnerable to predation or recognition by prey.
ctenolium	A comb-like structure along the ventral edge of the byssal notch in scallops in which the byssal threads rest.
deposit feeding	Feeding type of some bivalves during which organic particles are harvested (by either the siphons or palps) from the surface or near-surface sediments; see also suspension feeder.
developmental biology	The study of how a multicellular organism develops from its early immature forms (zygote, larva, embryo, etc.) into an adult.
dinoflagellates	Chiefly marine, planktonic, usually solitary phytoflagellates (which have many characteristics in common with algae) that include luminescent forms, forms important in marine food webs, and forms causing red tides.

directional selection	A type of selection that removes individuals from one end of a phenotypic distribution and thus causes a shift in the distribution.
discrete variation	Variation within a limited number of categories (e.g., gender – male or female).
disruptive selection	A type of selection that removes individuals from the center of a phenotypic distribution and thus causes the distribution to become bimodal.
diversity	The variety of species in a sample, community, or area.
ecology	The relationships of living things to one another and their environment, or the study of such relationships.
edentate	Lacking hinge teeth.
effective population size (Ne)	The number of individuals in a popualtion that can actively contribute to the gene pool of the next generation.
electron microscopy	A form of microscopy in which the interactions of electrons (instead of light) with a specimen are used to provide detailed information about structure.
embryology	Individual development from egg to a free-living juvenile.
epibenthic	Living on the surface of the sediment, most usualy at the bottom of a body of waer.
epibiont	An organism that lives on the surface of another living organism.
epifaunal	Living on top of the sediment, i.e., unburied; also called epibenthic.
evidence	Information accumulated through observations of phenomena that occur in the natural world, or which are created as experiments in a laboratory. Scientific evidence usually goes toward supporting or rejecting a hypothesis.
evolution	Inheritable change within a lineage, or the change that occurs between generations within one population of a species. This refers of course to change expressed from one individual to another, but we are usually most interested in the changes so great that the later generation is considered a different species.
evolutionary biology	The study of how evolution occurs.
fact	An objective and verifiable observation; in contrast with a hypothesis or theory, which are intended to explain or interpret facts.
filter feeding	Feeding type involving the filtering of organic particles from water by the gills, after which appropriately sized particles are transported to the mouth.
fitness	The relative probability of survival and reproduction for a genotype.

fossil	The recognizable remains of past life on Earth, e.g., bones, shells, or leaves, or the traces of such life, e.g., tracks, burrows, or impressions.
fossil record	The totality of fossilized artifacts and their placement within the Earth's rock strata, which provides information about the history of life on Earth, e.g., what organisms looked like, where and when they lived, how they evolved, etc.
fossilization	Process by which an organism becomes preserved in layers of the Earth, usually involving burial and/or lithification.
fouling community	Community of organisms found attached to hard substrata, most usually human-made, e.g., on the sides of docks, marinas, harbors, or vessels.
Founder Effect	Genetic drift observed in a population that was founded by a small non-representative sample of a larger population; also called the "bottleneck effect."
free-living	Living independently of another organism; not part of a parasitic or symbiotic relationship; or moving independently, i.e., not sessile.
geminate species pair	Two little-differentiated species evolved from a close common ancestor.
gene frequency	The number of occurrences of an allele in a gene pool.
gene pool	The complete set of unique alleles in a species or population.
generation	A single step or stage in the succession of natural descent.
genetic drift	Change in the gene pool that occurs when the frequency of an allele changes over generations due to random chance.
genotype (adj. genotypic)	The genetic makeup of an organism or group of organisms with reference to a single trait, set of traits, or an entire complex of traits.
glochidium (pl. glochidia)	The specialized larval form of freshwater pearl mussels that usually has hooks that enable it to attach itself to a host (e.g., to the gills of a fish) for a period of time before it detaches and falls to the bottom and takes on the typical form of a juvenile mussel.
gradualism	The process of gradual evolutionary change over time.
gross anatomy	Anatomy of organs and their arrangements, usually studied without the use of high magnification.
Hardy-Weinberg Equilibrium	The principle that states that when Ne = N, in the absence of selection or mutation, gene frequencies will acheive equilibrium after one generation; also called Principle of Law.
heredity (adj. heritable)	The biological similarity of offspring and parents.

heterodont	Having more than one kind of hinge teeth.
hinge	Collective term for the dorsal border of the articulated valves, including the ligament, hinge teeth, and other structures that function to permanently unite the two valves.
histology	The study of cells and tissues at the microscopic level.
holoplanktonic	Living as plankton through all stages of a life cycle.
homologous	Having the same structure and origin, although current function might differ.
hypothesis (pl. hypotheses)	An "educated guess," based on evidence, concerning how or why a phenomenon occurs; see also theory, law.
infaunal	Living buried within sediment.
inherited	Derived from a preformed genetic code present in an ancestor.
intelligent design	The assertion or belief that physical and biological systems observed in the universe result from purposeful design by an intelligent being rather than from chance or undirected natural processes.
kin selection	A type of selection that involves altruistic behavior, e.g., the protection of offspring, in which a parent acts to preserve the gene pool of offspring at the expense of itself.
lateral teeth	Hinge teeth located far away from the umbo in a heterodont hinge.
law	An established principle thought to be universal and invariable; see also hypothesis, theory.
ligament	Elastic uncalcified structure that connects the two bivalve shells at the hinge line and functions as a spring to open the valves when the adductor muscles relax.
lineage	Line of descent from an ancestor.
macroevolution	Evolution happening on a large scale, i.e., at or above the level of species, over geologic time resulting in the formation of new taxa.
mantle	The external fold, or folds, of the soft, exterior membrane of the body of a bivalve, that secretes the shell and usually forms a cavity enclosing the gills and other organs.
metamorphosis (pl. metamorphoses)	A change in body form and often habits of an animal following the embryonic stage during normal development.
microevolution	Evolution involving small-scale changes, i.e., within the species level, occurring over a short period of time that results in the formation of new taxa.
microscopic anatomy	The branch of anatomy in which the structure of cells, tissues, and organs is studied with a light or electron microscope.

mimicry	A phenomenon in which an individual gains some sort of survival advantage by looking like an individual of another (ofen more harmful) species.
Modern Synthesis	The union of ideas from several biological specialties that formed a sound account of evolutionary theory. This synthesis has been generally accepted by most working biologists. The Synthesis was produced over approximately one decade (1936–1947), stimulated by the development of population genetics (1918–1932). This showed that Mendelian genetics was consistent with natural selection and gradual evolution. The Synthesis is still, to a large extent, the current paradigm in evolutionary biology.
molecular clock	A technique in the field of molecular biology that calculates the time of species divergence from the number of molecular differences present in the species' DNA sequences or proteins.
Mollusca	The phylum of the animal kingdom, including the classes Cephalopoda, Gastropoda, Bivalvia, Scaphopoda, Polyplacophora, Monoplacophora, Caudofoveata, and Solenogastres. These animals have an unsegmented bilateral body, with most of the organs and parts paired, but not repeated serially. Mollusks are defined by a tissue called the mantle, which forms the shell and encloses most organs. Most molusks possess a calcareous shell, which can be univalve, bivalve, or multivalve.
mollusk	A member of the phylum Mollusca; also spelled mollusc (most especially in the United Kingdom).
mutation	A change in the nucleotide sequence of genetic material whether by subsitution, duplication, insertion, deletion, or inversion.
mutualism	An interaction between members of two species which benefits both; in strict terms, obligatory mutualism occurs when neither species can survive under natural conditions without the other.
mytiliform	Mussel-shaped.
natural selection	The process by which living forms with traits that better enable them to adapt to specific environmental pressures, e.g., predators, changes in climate, or competition for food or mates, will tend to survive and reproduce in greater numbers than others of their kind, thus ensuring the perpetuation of those favorable traits in succeeding generations.
neo-Darwinism	The merger of classical Darwinian evolution with population genetics.
niche	The specific ecological role that an organism inhabits.
ontogeny	Individual development from egg to death, including all stages of aging.

paleontology	The study of life in past geologic time.
pallial sinus	An embayment in the posterior part of the pallial line that indicates the attachment of siphonal retractor muscles and demarcates that part of the mantle cavity into which the siphons can retract in bivalves.
parapatric speciation	Speciation in which the evolution of reproductive isolating mechanisms occurs when a population enters a new niche or habitat within the range of the parent species.
parasitism	A form of symbiosis in which one organism (the parasite) benefits at the expense of another organism of different species (the host). The association can also lead to the injury of the host.
peripatric speciation	Process by which a new species evolves in a subpopulation that colonized a new habitat or niche within the same geographical area of the ancestral species.
phenotype (adj. phenotypic)	The observable physical or biochemical characteristics of an organism, as determined by both genetic makeup and environmental influences; what an organism "looks like."
phylogenetic analysis	Analytical method used to find a hypothesis of relationships among species, by coding the various states of homologous characters; also called cladistics.
phylogeny	Sequence of ancestors of a particular lineage.
phytoplankton	Freely floating photosynthetic organisms in the oceans.
ploidy	The number of sets of chromosomes in a cell or organism.
polymorphism (adj polymorphic)	Existing in several different forms.
polychromism (adj. polychromic)	Polymorphism expressed as existing in several different colors.
polyploidy (adj. polyploid)	More than two sets of chromosomes in a cell or organism.
population	A group of organisms, all of the same species, which occupies a particular area.
population size (N)	The number of individuals sharing a gene pool; a complete set of alleles.
punctuated equilibrium	The evolutionary process involving long periods without change (stasis) punctuated by short periods of rapid speciation.
resilifer	Hinge structure supporting an internal ligament.
scientific method	The process of scientific inquiry for investigating phenomena, acquiring new knowledge, and correcting and integrating previous knowledge. To be called scientific, a method must be based on observable, measurable evidence collected by observation and/or experimentation.

sexual dimorphism	The two sexes of a species having different shapes, sizes, etc., from each other.
sexual selection	A type of selection in which the forces determined by mate choice act to cause one genotype to mate more frequently than another genotype.
siphons (adj. siphonal)	Posterior extensions (usually two) of the mantle through which water is directed in and out of the body, along with waste products and gametes of bivalves.
speciation	The process in which one species evolves over time into a different species (anagenesis) or in which one species diverges to become two or more species (cladogenesis); see also allopatric speciation, parapatric speciation, peripatric speciation, sympatric speciation.
species	A group of organisms formally recognized as distinct from other groups; the taxon rank in the hierarchy of biological classification below genus; the basic unit of biological classification, defined by the reproductive isolation of the group from all other groups of organisms.
species richness	The total number of species, or biodiversity, in a given geographical area.
stabilizing selection	A type of selection that removes individuals from both ends of a phenotypic distribution, thus maintaining the same distribution mean.
suspension feeding	Feeding type of most bivalves during which organic particles are harvested from the water column.
symbiosis	A long relationship between two different species; see also mutualism, commensalism, parasitism.
sympatric speciation	Speciation in which the evolution of reproductive isolating mechanisms occurs within the range and habitat of the parent species.
taxodont	Having many, small, similarly-shaped hinge teeth.
taxon (pl. taxa)	An organism or group of organisms of the same rank, e.g., members of an order, family, genus, or species.
theory	A hypothesis that has become “widely accepted” after rigorous testing; see also hypothesis, law.
transformation	The theory suggesting that traits of an organism are produced and inherited by direct influence of the physical environment, by effort, or by use or disuse of body parts.
Tree of Life	A depiction of the relationships of life on Earth in an evolutionary context. The Tree of Life is often depicted as a detailed cladogram, and illustrates the idea that all life on Earth is related.
umbo	Rounded or pointed extremity of a bivalve shell, often projecting above the hinge line, that reflects the early growth stage (= oldest part of the shell) and includes the prodissoconch (larval shell) and adjacent convex area; also called the “beak.”

variation	The differences among individuals in a population.
veliger	Planktonic larval type characteristic of most mollusks (including bivalves), characterized by a ciliated locomotory organ (velum) which is either discarded or resorbed at metamorphosis.
vestigialization	The evolutionary process of losing nonfunctional traits, usually expressed by a reduction in size or function.
zooplankton	Freely floating animals in the oceans, including protozoans, small crustaceans, and the larval stages of larger organisms.

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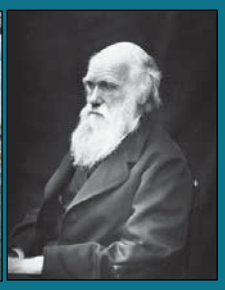

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