Glossary

abiotic	pertaining to the physical and non-living components
absorption	the uptake of substances across a boundary; in cells it is the uptake of water or nutrients from the surroundings
abundance	the number of individuals (size) of a population
acidophiles	types of bacteria (Archaea) that survive in highly acidic environments (acid-loving)
active transport	movement of any molecules through a membrane against the concentration gradient; energy is required for this process
adaptation	an alteration in structure, function or behaviour, that is hereditary, by which a species or an individual improves its condition in relation to its environment
aerobic respiration	the process of respiration carried out in the presence of oxygen
allelochemicals	the chemicals released by allelopathic organisms
allelopathic	having characteristics of allelopathy
allelopathy	the inhibition of growth in one species of plants by chemicals produced by another species
alveoli	air sacs with extremely thin walls, within the lungs
ammonia	a toxic form of nitrogenous waste, excreted in a dilute form together with large volumes of water
anaerobic	not requiring oxygen
anaerobic respiration	the process of respiration carried out without the presence of oxygen
angiosperms	flowering plants
anoxic	no free oxygen
anther	the part of the flower that houses developing male reproductive cells (pollen)
anthrax	contagious disease in cattle, caused by a bacterium
apical meristems	growing point of a plant containing cells that divide by mitosis, located at the tip of a root or the tip of a stem
appendix	a small projection from the digestive tract; remnant of the caecum
aquaporins	membrane proteins that act as pores, allowing water to move through by osmosis
aquatic environment	a water environment (e.g. freshwater, marine or estuarine)
Archaea	one of the super kingdoms of procaryotes (bacteria)
arid	areas lacking sufficient water or rainfall, and commonly high temperatures
arteries	blood vessels with thick walls that carry blood under pressure, away from the heart towards other organs of the body
assimilation	the conversion of absorbed simple substances into more complex molecules, which then become part of the structure of an organism
ATP (adenosine triphosphate)	serves as a major energy source within a cell to drive a number of biological processes
autotrophs	organisms able to synthesise their own food, by photosynthesis
Bacteria	one of the super kingdoms of procaryotes (Eubacteria)
beneficial interactions	when one or more organisms benefit from a relationship
bilayer	two layers—an outer and inner layer—of phospholipids forming the cell membrane
biodiversity	the number, relative abundance and genetic diversity of organisms on Earth
biodiversity crisis	the dramatic loss of species caused by human activity worldwide
biogeography	the study of the geographical distribution of species, both present-day and extinct
biomass pyramid	diagrammatic representation of the amount (weight) of organisms in a particular area at a particular time

biomarkers	chemicals that are produced by only one group of organisms providing evidence of their existence in the past
biome	large regional system characterised by major vegetation type (region with similar ecosystems grouped together)
biosphere	the part of the Earth and atmosphere in which living things are found
biota	the flora and fauna of a given habitat or region; the sum total of all living things on Earth
biotic	pertaining to living features (e.g. organism abundance, distribution, or interactions)
bivalent	a pair of homologous chromosomes which become apparent in the first meiotic division during crossing over
blood vessels	arteries, veins or capillaries that carry transport fluid (blood)
botanist	person who studies plants
breathing	a mechanical (physical) process involving muscles and the skeleton in animals, which enables an organism to inhale and exhale
caecum	enlarged organ at the end of the small intestine, where microbial fermentation occurs in herbivores to assist with the digestion of cellulose
cambium	meristematic tissue found in the stems of plants that divide by mitosis to allow secondary growth (increase in width)
canines	teeth that are sharp and pointed to help hold and kill prey and for tearing meat from the bones
capillaries	the smallest of blood vessels with very thin walls, which carry blood between arteries and veins
carbohydrates	a class or organic compounds made up of the elements carbon, hydrogen and oxygen, with a 2:1 ratio of hydrogen to oxygen. This class includes sugars and starches
carbon fixation	a chemical process whereby carbon dioxide is combined with hydrogen to form carbohydrates
carnassial	teeth that have sharpened cutting edges to effectively slice and shear meat, characteristic of carnivores
carnivores	organisms that eat or consume other animals (meat-eaters)
carnivorous	organisms that have the ability to consume animals only
carpel	the female reproductive organ of a flowering plant; it encloses ovules; it ripens to become a fruit
carrier protein	a small organic molecule that facilitates movement of substances with low lipid solubility, or substances moving against the concentration gradient, across a cell membrane
cell	the basic unit of all living things, made up of protoplasm (cytoplasm and a nucleus) surrounded by a cell membrane and, in plants and some organisms, a cell wall
cell cycle	the repeating sequence of growth and division through which cells pass
cell division	the process by which cells divide into two, by either keeping the chromosome number the same (mitosis) or halving their chromosome number (meiosis)
cell membrane	the boundary surrounding the protoplasm of any cell. Also termed *cytoplasmic membrane*, *plasma membrane* or *plasmalemma*
cell sap	the solution of water and dissolved contents inside the vacuole of plant cells
cell theory, the	a generally accepted scientific theory that cells are the basis of all living things and can only arise from other cells
cellulose	insoluble organic, complex polysaccharide (carbohydrate) that is the main component of cell walls in plant cells
centromere	an organelle present in animal cells, responsible for forming fibres called the spindle during cell division
channel protein	protein that spans the lipid bilayer of a cell membrane, to allow the passage of ions, water and chemicals of low lipid solubility
chemical digestion	the breaking down of food into its basic monomer compounds by the chemical action of digestive enzymes
chemical reactions	a sequence of steps by means of which substances interact and are transformed into other substances, involving an energy change
chemical respiration	see respiration

chlorophyll	green pigment found in all green plant cells, responsible for light capture in photosynthesis
chloroplasts	organelles found in green plant cells; responsible for the process of photosynthesis
chromatin material	nuclear material, made of DNA protein, which stores the hereditary information as linear sequences of genes in cells. Chromatin shortens and thickens into chromosomes at the start of cell division
chromosomes	thread-like structures made of DNA, visible in dividing cells as a result of the shortening and thickening of chromatin material at the start of cell division; a coloured (stainable) body, observed in cells that are dividing; it is made up of chromatin material and contains a linear sequence of genes
closed circulatory system	a system of blood flow where the transport fluid is pumped around the body through a series of blood vessels which divide into capillaries in the tissues; blood is eventually returned to the heart without having left the closed system of vessels at any point
colonial organisms	a colony of single-celled organisms
commensal	organisms can be involved in this type of relationship where one organism benefits and the other is unaffected
commensalism	a symbiotic interaction between two species where one benefits and the other is unaffected
community	groups of different populations in an area or habitat
companion cells	a type of phloem cell in plants, which controls the functioning of the sieve tubes
compound microscope	a microscope which passes an image through two lenses to increase magnification, forming an inverted image, but having the advantage of revealing detail that is too small to be observed clearly with the naked eye or with a simple microscope
concentration gradient	difference in the concentration of a substance in two regions (that may be separated by a membrane)
consumers	heterotrophic organisms that ingest other organisms in a food chain
continental shelf	the gently sloping undersea area surrounding continents, at depths up to 200 m, after which the continental slope drops steeply to the ocean floor
convergent evolution	the process whereby organisms that do not have recent common ancestors develop similar features or adaptations because they live in similar habitats
converging	moving towards each other
copulation	mating between sexes; associated with internal fertilisation
cosmos	the universe ordered as a whole
cristae	folds of the inner membrane of a mitochondrion, to increase its surface area for the location of groups of respiratory enzymes
cross-pollination	the pollination of a carpel by pollen from a different individual
crossing over	the mutual exchange of similar segments of chromatids which occurs between homologous chromosomes during meiosis I
cyanobacteria	a photosynthetic eubacterium
cytokinesis	the division of the cytoplasm that follows nuclear division during mitosis or meiosis
cytoplasm	all the cell contents excluding the nucleus, including the cytosol (molecules in a gel-like solution) and the organelles
daughter chromatids	two strands of chromatin, which are held together by a centromere, to form one chromosome; forming after DNA replication at the start of cell division
daughter chromosomes	two strands of chromatin that move apart during cell division, as a result of the centromere dividing
decomposer	an organism, such as fungi and bacteria, that consumes and breaks down organic matter for energy, releasing inorganic nutrients
deep ocean trench	when a continental plate collides with an oceanic plate, the oceanic plate is forced underneath, forming a deep trench in the ocean floor
degraders	organisms that feed on dead organisms and organic wastes
dependent variable	a factor which changes during an experiment (variable), as a result of the experiment. It is the observed or measured outcome that depends on other factors that have been changed in the experiment
detrimental interactions	when one or more organisms are harmed or disadvantaged from a relationship

detritivores	animals that eat organic litter or detritus (a type of degrader)
detritus	organic debris produced during the decomposition of animals and plants
dicotyledons	a class of flowering plants which generally have net-veined leaves, a tap root system and two cotyledons or seed leaves in the developing embryo
digestion	the breakdown of complex, usually insoluble food into simpler, smaller soluble molecules that can be easily absorbed
differentiate	develop by a process of specialising in structure; refers to the maturation of a cell so that it can perform a particular function
diffusion	passive movement of any molecules along a concentration gradient, until equilibrium is reached
diploid	having two sets of chromosomes
disaccharides	sugar molecules (e.g. sucrose, maltose and lactose) made up of two similar monosaccharide units
distribution	where a species occurs
diverging	moving away from each other (moving apart)
divergent evolution	evolving (changing in structure) to become different from another organism or a common ancestor
DNA (deoxyribose nucleic acid)	a nucleic acid that is the hereditary material of an organism
dorsiventral	tissue arrangement in a leaf, where the upper (dorsal) surface has a different arrangement to that of the lower (ventral) surface
double membrane	two unit membranes (two lipid bilayers) that surround some organelles (e.g. nucleus and chloroplasts)
ecology	the study of the relationships that living organisms have with each other and their environment
ecosystem	community together with its environment; any environment containing organisms interacting with each other and the non-living parts of the environment (e.g. rainforest ecosystem)
ectoparasites	parasites that live on the surface of their host
egestion	the elimination of undigested food from an organism
egg cells	female gametes or sex cells that have half the original chromosome number of that organism
electron micrographs	photographs of images seen under an electron microscope
electron microscope	a microscope that uses the wave properties of electrons to magnify an image more than 200 times larger than that of a light microscope, allowing the viewing of the ultrastructure of things
embryonic cells	immature, undifferentiated cells that have the ability to divide and become any other cell type
endemic	a species that is unique to a specific geographic region; it is assumed to have evolved there
endoparasites	parasites that live internally in their host
endoplasmic reticulum (ER)	cell organelle made up of a system of flattened membranes, functioning in transport within a cell
environment	both living and non-living surroundings of an organism
epidermis	outermost layer of cells, usually protective in function
epiphytes	plants that grow on another plant for support (not parasitic)
equilibrium	a balanced or stable state or equal distribution of particles
estuarine environment	a water environment (usually at the mouth of a river to the sea) that fluctuates between freshwater from the river and saltwater from the sea
estuary	where the mouth of a river meets the sea
eucaryotic cells	cells with a membrane-bound ('true') nucleus and other membrane-bound organelles
evolution	the change in a population over a period of time. It implies that organisms were not created independently of each other, but may have arisen from a common form which changed over time
excretion	the elimination of wastes produced during metabolism (e.g. nitrogenous wastes and carbon dioxide)
extant	still presently living
external fertilisation	fertilisation, or the union of gametes, occurring outside the organism's body
extinct	no remaining members of the species (species has died out)

extinction	when a species or group of organisms has died out, or been wiped out of existence
extremophiles	organisms adapted to living in extreme conditions (e.g. extreme temperature, pressure or chemical concentration, such as high acidity or salinity)
facilitated diffusion	movement of molecules across a cell membrane along a concentration gradient, assisted by carrier proteins in the membrane
fermentation	a change brought about by micro-organisms such as yeast, which convert grape sugar into ethyl alcohol
flaccid	the limp state of a plant cell when its contents have shrunk as a result of water loss (plasmolysis)
fluid mosaic model	current generalised model for the structure of all cell membranes
food chains	sequences of organisms from producers to consumers along which energy flows in an ecosystem; usually with three or four trophic levels
food web	a number of interacting food chains in an ecosystem
fore-gut fermentation	microbial breakdown of food which occurs in the stomach of some herbivores, resulting in cellulose digestion before the food reaches the intestines
fossils	the preserved remains of organisms or traces of organisms (e.g. footprints)
gametes	haploid sex cells such as egg cells and sperm cells which fuse during fertilisation
gaseous exchange	the exchange oxygen and carbon dioxide with the external environment in plants and animals
gene pool	the range of genes (and their variations) present in a population
genetic variation	differences in various traits or features that are genetically determined amongst members of a population
geological timescale	information from fossil evidence to provide a timescale illustrating the different periods of time that different organisms existed
geology	the scientific study of the origin, history and structure of the Earth as recorded in rocks
glycogen	the main storage form of polysaccharide carbohydrates in animal cells
granum	a group or stack of photosynthetic membranes (lamellae), containing chlorophyll, in chloroplasts of plant cells
grassland	habitat where the dominant vegetation is grass, very few shrubs and trees, typically a low or sporadic rainfall area
growth	increase in the size and/or complexity of an organism as a result of cell division and/or cell enlargement
guard cells	bean shaped epidermal cells in leaves that surround a stomate or pore and control the opening and closing of that pore
gymnosperms	conifers
habitat	a place where an organism lives
Hadean eon	period of time approximately 4.5 to 3.8 billion years ago
haemolymph	the transport fluid in an open circulatory system such as that of insects (equivalent to blood)
halophiles	bacteria (Archaea) that survive in high saline environments (salt-loving)
haploid	the condition in a cell of having only one set of chromosomes which are unpaired; half the usual number of chromosomes (e.g. gametes are haploid)
heart	muscular, rhythmically contracting pump that forms part of the circulatory system in animals; responsible for circulating blood
herbivores	organisms that eat or consume plants only
herbivorous	organisms that have the ability to consume plants
heredity	similarity between parents and offspring, as a result of the inheritance of genes, carried on DNA molecules, by offspring from their parents
heterotrophs	an organism that cannot make its own food and so must consume other living organisms to obtain organic nutrients
hindgut fermentation	microbial breakdown of food which occurs in the caecum of some herbivores, resulting in cellulose digestion in this enlarged organ at the end of the small intestine

homologous pair	two similar chromosomes in a cell, one paternal and one maternal in origin, that carry alleles of the same genes in the same sequence and that pair up during meiosis
hydrothermal vents	cracks in the Earth's surface that release water at high temperatures, caused by magma under the crust
hypothesis	a possible solution to a scientific problem, based on accumulated scientific information, suggesting a general principal that can be tested experimentally
incisors	teeth used for biting or gnawing; well developed in herbivores
independent variable	a factor in an experiment that is changed by the experimenter and affects the final outcome of the experiment
ingestion	the intake of food into a digestive tract (multicellular organisms) or into a cell (unicellular organisms)
inorganic	molecules or compounds that do not contain carbon
inorganic compounds	chemical compounds that are part of the inanimate, non-living world, and are not produced by living organisms and do not contain hydrocarbon chains (the combined elements of carbon with hydrogen)
interference competition	where organisms harm each other while obtaining a resource, even if that resource is not in limited supply
internal fertilisation	fertilisation, or the union of gametes, occurring inside the organism's body
internal gills	organs of gaseous exchange inside the body of aquatic animals, such as fish
interphase	the stage preceding mitosis or meiosis, during which the replication of DNA occurs
interspecific competition	individuals of different species striving for the same resource that is in limited supply
interstitial fluid	(also known as tissue fluid) a fluid that lies in the spaces between cells, bathing them
intraspecific competition	individuals of one species striving for the same resource that is in limited supply
isobilateral	arrangement in a leaf, where the upper (dorsal) surface has a similar arrangement to the lower (ventral) surface
isolation	the effects of separation that prevent individuals from interbreeding
isotonic	describes solutions that have the same concentration of dissolved substances and therefore the same osmotic pressure
kidneys	main organ of excretion of nitrogenous wastes and maintenance of body fluid composition
large intestine	(colon) the last part of the digestive tract where absorption of water and minerals typically occurs
lenses	for a microscope—a transparent, biconcave structure that produces a magnified image of an object
lenticels	small raised pores present in the outer cork layers of woody stems
lignin	chemical substance associated with some plant cell walls (e.g. xylem tissue), making them stronger and impermeable to water
light	radiation in the visible spectrum
light-independent phase	second stage of photosynthesis where the products of the first stage are combined with carbon dioxide to make sugars
light phase (photolysis)	first stage of photosynthesis where light energy is used to split water
lipids	a group of long chain chemical compounds that are high in energy, insoluble in water and form the main component of the bilayer of cell membranes
macromolecules	large complex molecules made up of smaller respeating subunits
macroscopic	large enough to be seen with the naked eye
magnification	the ability of a lens or microscope to enlarge an image
malaria	a widespread disease caused by a parasite in the blood cells, transmitted by the female *Anopheles* mosquito
marine environments	saltwater environments (e.g. ocean or sea)
mass extinctions	extinctions that have occurred on a large scale (e.g. dinosaurs)
maternal	derived from the mother (female parent)

matrix	the internal, fluid-filled space in mitochondria, containing enzymes for the final chemical reactions of chemical respiration
megafauna	extremely large animals, most of which are extinct today
meiosis	a process of cell division that is considered to be a reduction division because it halves the number of chromosomes in the resulting gametes (egg and sperm cells) that it produces
meristem	localised region of cells that are actively dividing (undergoing mitosis) in plants
mesophyll	tissue found in the middle layer of a leaf, made up of palisade cells and spongy cells
metamorphosis	a rapid and distinct change in form during the life cycle of an organism, where the larva changes into an adult
meteorite	a meteor (stony or metallic mass) that survives the intense heat of atmospheric friction and reaches the Earth's surface
methanogens	type of bacteria that uses hydrogen gas and carbon dioxide to generate energy and make sugars
microbial fermentation	the breakdown of food by the action of bacteria
microfossils	fossils of single-celled anaerobic procaryotes
microscopic	too small to be seen with the unaided eye; visible with a microscope
microvilli	microscopic finger-like projections on the surface of a cell, to increase its surface area for the uptake of nutrients, particularly epithelial cells in animals that are involved in absorption
mid-ocean ridges	ridges along plate margins in the ocean crust that slowly release magma
midrib	the main vein of a leaf
mimicry	where individuals of one species have characteristics (e.g. visual or behavioural) that resemble those of another species
mitochondria	(singular: mitochondrion) an organelle in all eucaryotic cells, responsible for cellular respiration and therefore energy production in a cell
mitosis	the process of cell division whereby somatic (body) cells undergo a single nuclear division, giving rise to two genetically identical daughter cells
molars	teeth used for chewing, well developed in herbivores
molecular technologies	techniques used in the branch of genetics that deals with hereditary transmission and variation at the molecular level (e.g DNA sequencing)
monocotyledons	class of flowering plants which generally have parallel veined leaves, a fibrous root system and one cotyledon or seed leaf in the developing embryo
monomers	small unit molecules forming the basis of larger, more complex polymer molecules
monosaccharides	simple sugars, with molecules either containing five carbon atoms (ribose and deoxyribose) or six carbon atoms (glucose, fructose and galactose)
multicellular	made of many cells
mutualism	the symbiotic interaction between two species where both benefit from the association (e.g. lichen)
mutualistic	to be in a relationship where both species benefit
nanobacteria	see nanobes
nanobes	filament-type structures found in rocks; they are able to withstand radiation, cold and acidic conditions
natural selection	the process by which certain members of a population that are more suited to prevailing environmental conditions survive and reproduce (their chances of survival are influenced by how successfully their genetic make-up enables them to withstand changes in the environment)
niche	place of a species within a community, involving relationships with other species
nuclear envelope (nuclear membrane)	the boundary that separates the nucleus from the cytoplasm, consisting of two phospholipid bilayers, forming a double membrane
nuclear sap	the semi-liquid, slightly viscous background material of the nucleus in which chromatin material is found. Also known as nucleoplasm
nucleolus	a dark-staining round or oval body inside the nucleus of a cell, responsible for the formation of ribosome sub-units

nucleoplasm	see nuclear sap
nucleotides	a monomer or subunit of nucleic acids that has a distinct structure made up of sugar, a phosphate and a nitrogenous base
nucleus	an organelle that contains the genetic information of the cell (chromosomes) and controls most of the cell's functioning
oesophagus	long tubular structure in the digestive tract, carrying food from the mouth to the stomach
oil-immersion lenses	high power objective lenses on light microscopes that are designed to give clearer resolution when a drop of oil is placed on top of the coverslip of the specimen being viewed
omnivores	organisms that consume both plants and animals
open circulatory system	a transport system in small invertebrates where the transport fluid is pumped out of blood vessels into the surrounding tissues, where it bathes the cells directly, before flowing back into vessels and returning to the tubular heart
organ	a body structure composed of a variety of different tissues that work together to perform a function as part of a system
organic	carbon-containing molecules or compounds
organic compounds	chemical substances that are synthesised in living organisms and contain atoms of the elements of carbon and hydrogen
organism	a thing that is or once was alive and can carry out most of the functions that characterise being alive. Plants, animals, microbes and fungi are all organisms
osmosis	the movement of water molecules from a region of high water concentration to a region of low water concentration through a selectively permeable membrane
osmotic pressure	a measure of the solute concentration in a solution, that in turn results in water moving into a solution by the process of osmosis, increasing its pressure; as the concentration of the solute rises, the osmotic pressure rises
ostia	pores in the tubular heart of an organism with an open circulatory system
outgassing	emission of gases
ovary	the female reproductive organ where eggs are produced and which in flowers, contains ovules
oviparous	releases eggs that are fertilised externally
ovules	contained in the ovary of flowers and develop into fruit after fertilisation
oxic	having oxygen
'oxidising' atmosphere	an atmosphere that doesn't contain free hydrogen
palaeontology	the scientific study of fossils and all aspects of extinct life
palisade cells	elongate plant cells that contain chlorophyll; main photosynthetic cells in plants
Pangaea	the single land mass that existed more than 250 million years ago, made up of all the continents joined together, surrounded by one huge ocean
parasite	an organism that lives and feeds on or in another organism, the host, which is usually larger than the parasite
parasitic	characteristic of a parasite
parasitism	the symbiotic relationship between two species where one benefits (parasite) and the other is unharmed (host)
parfocal	refers to the microscope objective lenses that are designed to keep an image in focus when changing from low to high power: if an image is in focus with one objective lens, when the eyepiece is rotated it will remain in focus eliminating the need to adjust the coarse focus knob or lower the slide during changeover
passive movement	movement of molecules along a concentration gradient (from high to low concentration), requiring no energy input
pasteurisation	method of partial sterilisation (of wine or milk) by heating it to a temperature just below its boiling point, discovered by Louis Pasteur
paternal	derived from the father (male parent)

penicillin	a chemical compound produced by the mould penicillium; an antibiotic used to reduce bacterial infections
peptide bonds	a chemical bond (force of attraction) that occurs between amino acids in a polypeptide chain
pericycle	a special layer of meristematic tissue in plant roots which is responsible for the development of branch roots
permeability	see permeable
permeable	a term used to describe a membrane or other barrier that allows molecular substances to pass through it
phagocytosis	cell eating; a type of endocytosis whereby solid particles are engulfed by a cell by invagination of the cell membrane, forming a vacuole
phase contrast microscope	a microscope that takes advantage of the fact that light changes phase when it passes through structures of different densities, enhancing the contrast necessary to view a specimen
phloem	the vascular tissue in plants that transports organic nutrients (food) from where they are manufactured, up and down the plant
phospholipids	lipid molecules that have a polar (charged) phosphate end; this is the main type of lipid molecule forming the bilayer of membranes in cells
photosynthesis	food-making chemical process in plants that uses carbon dioxide, water and the energy of light, in the presence of chlorophyll, to manufacture organic molecules (mainly sugars) with oxygen as a by-product
physiological	to do with the functioning of an organism
pinocytosis	cell drinking; a type of endocytosis whereby liquid particles are engulfed by a cell by invagination of the cell membrane, forming a vacuole
plan sketch	a scientific diagram using single, solid lines to show the distribution of something (e.g. cells in an organ or plants and animals in their habitat)
plasmolysis	a condition in plant cells where the cell contents shrink as a result of water loss, causing the cell membrane to pull away from the cell wall and the cell to become flaccid
pollen	the collective term for pollen grains
pollen grains	small, granular male reproductive structures produced by anthers in seed-bearing plants
pollination	the process in which pollen of flowering plants is transferred to the stigma for fertilisation
polymers	very large molecules made up of a chain of similar smaller molecular subunits (monomers) joined together
polypeptide	a molecule consisting of a single chain of many amino acids joined together by peptide bonds. Polymers are the chains of which proteins are made
polysaccharides	a complex carbohydrate consisting of many monosaccharide (single sugars) units joined together
population	groups of organisms of the same species living in the same area at a particular time
pores	openings or breathing holes on the surface of a plant or animal body, through which gases or liquids can pass
potometer	apparatus used to measure the rate of transpiration in plants
predator	an organism that catches and kills another organism for food
predator–prey relationship	the relationship between a predator and its prey
premolars	cheek teeth for chewing
prey	something that is hunted or caught for food
primary consumers	organisms first in the food chain to consume other organisms (herbivores)
procaryotic autotrophic organisms	unicellular organisms with cells lacking membrane-bound nuclei, that carry out photosynthesis (e.g. cyanobacteria)
procaryotic cells	cells that do not have their DNA enclosed by a membrane or form a proper nucleus; they have no membrane-bound organelles within the cell; procaryotic organisms are usually unicellular (e.g. bacteria)

procaryotic heterotrophic organisms	unicellular organisms with cells lacking membrane-bound nuclei that obtain their energy from organic molecules in their environment (e.g. bacteria)
procaryotic organisms	bacteria; small cells that lack membrane-bound organelles such as a nucleus, mitochondria or chloroplasts
producers	plants that make their own food through the process of photosynthesis (autotroph); constitutes the first trophic level in a food chain
profile sketch	drawing illustrating a side-on view of an area, showing the distribution of organisms along a line
protein	a complex macromolecule consisting of polypeptide chains of amino acids, containing the element nitrogen as well as other elements commonly found in organic molecules
protoplasm	the entire contents of a cell including the cytoplasm and nucleus
pyramid of numbers	diagrammatic representation of the numbers of organisms at each level of the food chain
pyramids of energy	the diagrammatic representation of the energy flow through a food chain
quadrats	square frames (usually 1 m × 1 m) used in estimating abundance in plants or slow-moving animals
qualitative (results)	results that are made by observation and recorded as a description
quantitative (results)	results that are measured and recorded as numbers (quantities)
rabies	contagious viral infection that enters the body through an animal bite
radioactive	unstable, emitting particles (known as radioactive decay)
radioisotopes	unstable forms of a molecule which emit radioactive particles
radiometric dating	a method of estimating the age of objects or material using the decay rates of radioactive components
rainforests	a type of ecosystem characterised by a dense canopy of trees, ferns and other plants in enormous variety; found in a high rainfall area
'reducing' atmosphere	an atmosphere that contains free hydrogen
reliability	increased by using a variety of secondary sources when gathering information; occurs when the same experimental method yields the same or similar results when repeated by other people
resolution	the ability of a lens (or microscope) to distinguish between two very closely positioned structures as distinct and separate images
resource competition	where organisms utilise a resource that is in short supply
respiration	chemical reaction in the mitochondria of cells, whereby energy is released from organic compounds (especially carbohydrates)
respiratory surface	a body surface that is in contact with the external environment and has become specialised for the exchange of oxygen and carbon dioxide
saline	containing salt
salinity	the amount or concentration of dissolved salt
sampling technique	an ecological technique used to estimate species populations by the collection and/or counting samples of the population
scavengers	animals feeding on dead organisms
scientific method	the procedure for carrying out a valid scientific experiment, sometimes referred to as 'fair test'
scientific theory	a scientist's explanation of observed behaviour in terms of a model that has familiar properties. It cannot be proved or disproved experimentally; it can only be supported or refuted by evidence
sea floor spreading zones	zones where continents drift apart, releasing magma up to the surface, solidifying and forming a new crust, hence spreading the sea floor
secondary or tertiary consumers	organisms second or third in the food chain to consume other organisms (carnivores or omnivores)
selective pressure	a change, usually in the environment, that causes some organisms with a particular variation to survive and reproduce and those without it to decrease in number
selectively permeable	describes a membrane or other barrier that allows only certain substances to pass through
self-pollination	when pollen from a flower's anther pollinates the same flower's stigma (or the stigmas of flowers of the same individual plant)

semi-permeable	see selectively permeable
sexual reproduction	a method of producing offspring that involves the fusion of male and female gametes (sex cells) to form a zygote, containing a combination of genetic material from both parents
sieve plates	perforated end wall of a sieve tube element of phloem tissue, with pores that allow strands of cytoplasm to pass through
sieve tube elements	elongate, main cellular components of phloem tissue which are responsible for transporting food
simple microscope	a microscope that magnifies an image through only one lens, not a series of lenses, where the resulting image is not inverted (e.g. a stereo dissecting microscope)
sinuses	cavities
small intestine	organ of the digestive tract where most chemical digestion and absorption of digested food occurs
smallpox	an infectious disease caused by a virus
solvent	liquid basis of a solution which allows another substance (solid, liquid or gas) to dissolve in it
somatic	a body cell or any diploid cell that is not involved in sexual reproduction and cannot form gametes
speciation	how new species arise; the formation of new species
species	a group of organisms of similar appearance within a population; the members of which can interbreed to produce fertile offspring
spiracles	external openings on insect bodies, often containing valves, to regulate intake and outlet of air in tracheal tubes
spongy cells	irregularly shaped cells in the mesophyll of leaves for gaseous exchange and photosynthesis
spontaneous generation	a view that life can arise from non-living things, independent of any parent being present
stamen	the male reproductive organ of a flower comprising the anther and filament
starch	a complex, insoluble polysaccharide that is not sweet to the taste and is one of the commonest forms of energy storage in plant cells
stem cells	undifferentiated cells, either embryonic or adult, that can divide and give rise to other cells
stigma	the female part of the flower that receives pollen grains, leading to fertilisation
stomach	organ of the digestive tract where food is stored, physically digested by churning and some chemical digestion of protein occurs
stomata or **stomates**	(singular: stoma) an opening or pore located in the epidermis of plant parts (usually leaves and green stems) through which gases such as water vapour, oxygen and carbon dioxide can enter and leave
stroma	colourless fluid cavity of the chloroplast in which grana are embedded and starch may be stored
stromatolites	a concentrically layered rock, the layers being formed by the successive growth of thin mats of cyanobacteria
style	the pathway for pollen tubes between the stigma and ovary in flowering plants when pollen grains are received on the stigma
subduction	the sliding of one crustal plate beneath another when crustal plates converge and meet
sugars	sweet-tasting carbohydrate molecules that may be monosaccharides or disaccharides
survival of the fittest	the relative ability of an individual organism to live long enough to produce fertile offspring and pass their genes on to the next generation
sweat	watery secretion of mammalian skin in which salts and some nitrogenous wastes are lost, dissolved in water, to cool the body
symbiosis	interactions in which two organisms live together in a close relationship that is beneficial to at least one of them
symbiotic interactions	see symbiosis
system	integrated group of organs that work together to perform a common function
taxonomy	the classification of organisms in an ordered system that indicates natural relationships
terrestrial environment	an environment existing on land
tetrad	a group of four cells that are formed as a result of the meiotic division of one cell

theory of plate tectonics	the theory that continents are carried on large crustal plates positioned on top of the semi-molten interior of the Earth, but beneath the ocean
thermoacidophiles	organisms that grow best in high temperatures and highly acidic environments
thermophiles	organisms that grow best in hot conditions between 30°C and 50°C (high temperature-loving)
thylakoids	chlorophyll—containing flattened membranes in chloroplasts
timeline	a linear representation of important events in the sequence in which they occurred, whereby each event is drawn on the line to a scale, reflecting the time that has elapsed between each event
tissues	groups of cells that have a similar structure and perform a common function in multicellular organisms
tracheae	windpipe that transports air between the throat and lungs in vertebrates
tracheal tubes	air-conducting tubes in the respiratory system of insects
tracheoles	the smallest branches of air-conducting tubes in the respiratory system of insects, carrying air directly to and from the cells of the insect's body
transects	a narrow strip that crosses an entire area when studying the distribution of a species
transform boundary	where two plates are sliding past each other
translocation	mechanism of transport of food (organic nutrients) in the phloem of plants
transpiration	evaporation of water vapour from a plant through the stomates/stomata of leaves
transpiration stream	mechanism of transport of water and dissolved nutrients in the xylem of plants
transport medium	the fluid in which substances are carried within a living organism
transport system	a system of vessels arranged to carry substances from one part of a body to another
trophic	involving the feeding habits of different organisms in a food chain
trophic (feeding) levels	the position of an organism in a food chain (e.g. primary producer or secondary consumer)
tropical	areas of hot and humid climate
turgid	state of a plant cell in which the contents are swollen with an increased volume of fluid in the vacuole, causing the cell wall to stretch and become rigid, giving mechanical support in plant tissues
turgor	firm state of a plant cell where the cell wall is stretched by an increased volume of water in the vacuole and protoplasm
unicellular	made of one cell only
urea	water soluble nitrogenous waste product most commonly excreted in terrestrial animals as part of urine
uric acid	almost insoluble nitrogenous waste product excreted as a white sludge by animals which are adapted to habitats where water is scarce
urine	fluid containing excretory wastes such as urea; expelled from vertebrates
vaccine	serum or plasma that is administered to people or other animals to produce and immune reaction to disease-causing organisms
vacuoles	fluid-filled structures within a cell, separated from the surrounding cytoplasm by a single membrane; more commonly found in plant cells
validity	improved by the use of scientific journals when gathering information from secondary sources
variation	physical or physiological, or behavioural difference between individuals in a population which may or may not make them more suited to prevailing environmental conditions
vascular tissue	tissue which is organised into vessels (such as xylem and phloem in plants) to function in transport
vectors	organisms that carry parasites and transmit them from one host to another
veins	blood vessels that carry blood towards the heart, from other organs of the body
viviparous	when offspring produced by sexual reproduction develop inside the maternal body and are released as live young or eggs; in plants seeds germinate while still attached to the plant (e.g. in mangroves)
volcanic aquifers	an underground layer of water that interacts with volcanic activity
wall pressure	an inward force exerted by the wall of a plant cell on the protoplasm (cell contents) to counteract the turgor pressure that it exerts

water balance	any mechanism regulating the concentration of water and dissolved substances within the cells or body fluids of an organism
WHO	World Health Organization
woodlands	a habitat with a sparse canopy of trees, usually with less rainfall than that of a rainforest
xylem	vascular tissue in plants that transports water and dissolved inorganic minerals upwards as ascending sap
xylem tracheids	non-living xylem elements formed from a single cell, with tapering ends and pitted walls thickened with lignin
xylem vessels	non-living xylem elements made up of a series of hollow cells placed end-to-end, with no cross walls separating them
zoologist	person who studies animals
zygote	a diploid cell resulting from the fusion of the male and female gametes