



AQA ENVIRONMENTAL SCIENCE

A LEVEL

Subject Specific Vocabulary & Command Words

NAME:

TUTOR GROUP:



ENVIRONMENTAL SCIENCE - Subject specific vocabulary

These are the definitions of key terms used in our A-level Environmental Science specification (7447). Aim to use them when answering questions.

Students should be familiar with and gain an understanding of the following terms.

Abiotic factors	Physical factors such as light, temperature and water.
Acidification	A process in which the pH drops as the conditions become more acidic.
Acidophile	An organism that thrives under acidic conditions. Many acidophiles are bacteria or archaea.
Acoustic deterrent devices	A device that deters mammals by using sound. They are used to deter small cetaceans from fishing nets, or seals from fish farms, for example.
Acoustic fatigue	Stress cracking of a material caused by repetitive vibrations induced by sound.
Acoustic monitoring	Monitoring environmental sounds eg to detect the presence of dolphins and whales or bats.
Activated carbon filter	A filter that reduces emissions of pollutants such as complex organic molecules that adsorb onto the surface of the activated carbon particles.
Activation products	Atomic nuclei that become radioactive because they have absorbed neutrons that change them into less stable nuclei that emit ionising radiation.
Active traffic management (ATM)	A method of controlling road lane usage and speed limits to smooth traffic flow and reduce congestion.
Acute	Exposure to a substance or symptoms that appear rapidly.
Adsorption	The process where a substance fixes onto a surface.
Aerobic process	A process that takes place in the presence of oxygen.

Aerodynamics	The study of airflow over surfaces to allow the design of surfaces that reduce wind resistance, turbulence, friction and noise generation.
Afforestation	Planting trees to increase the area of forest.
Albedo	A measure of the reflectivity of a surface. More reflective surfaces have high albedos. A surface that reflects all light has an albedo of 100%, while one that absorbs all light has an albedo of 0%. The albedo of an area can affect the local climate.
Anaerobic process	A process that takes place in the absence of oxygen.
Antarctic Treaty (1959)	An international agreement signed by many countries to protect and manage Antarctica. Aspects of the treaty include control of military activities, waste disposal, mineral exploitation, wildlife conservation and tourism.
Anthropogenic	Adjective describing outcomes caused by human activities.
Aphotic zone	Deeper layers of water that receive no sunlight because they are absorbed by shallower layers.
Aquaculture	The artificial production of aquatic organisms, including fish farming.
Aquifer	A rock which contains water that is abstracted by humans.
Archaea	Microorganisms similar to bacteria, including the first life-forms to develop on Earth. Archaea are the only organisms that produce methane from the decomposition of organic matter.
Artificial insemination	A form of selective breeding where semen is collected from a chosen male to be inserted artificially into the chosen female to cause her to become pregnant. It also allows semen to be stored for later use or the transport of semen without having to bring the animals together.
As low as reasonably achievable (ALARA)	An approach to control of pollution, especially ionising radiation, where levels are kept as low as is practically achievable, considering economic and technological factors.

Atmosphere	The gases surrounding the Earth. Different layers are characterised by their temperature, density, turbulence and composition.
Baffle mounds	Embankments that absorb and deflect noise, especially around mines, airports and major roads.
Bag filter	A method reducing atmospheric pollution caused by smoke and particulate matter.
Barrage	A dam built across an estuary to generate tidal power.
Barrier crops	A crop that is grown around another crop to protect the neighbouring crop, usually by producing a scent that deters the pests.
Beating tray	A method of sampling invertebrates on the branches of bushes and small trees.
Becquerel (Bq)	The Becquerel is the unit of activity of a radioactive source. 1 Bq = 1 nuclear decay per second. It is usually related to a standard mass of material.
Best available technology not entailing excessive cost (BATNEEC)	An approach to pollution control where control technology is used that achieves the lowest emission levels, without costing so much that further marginal gains would risk their financial viability.
Bioaccumulation	The increase in concentration of a substance in living tissue as it is absorbed and stored faster than it is broken down and excreted.
Biocapacity	A measure of the biological productivity of an area.
Biodegradable	A material that can be broken down by living organisms, usually bacteria.
Biodiversity	A measure of the variety and abundance of wildlife species. A common quantitative method of measuring biodiversity is Simpson's Diversity Index.
Biogeochemical cycle	A series of linked processes which use and re-use elements such as carbon, nitrogen, phosphorus, iron and sulfur, as they move between biotic and abiotic reservoirs.

Bioleaching	A method of using bacteria to dissolve metals from low grade ores.
Biological control	The control of pests using living organisms, usually predators or pathogens.
Biological corridor	A habitat that links other habitats so that animals can move between them.
Biomagnification	The progressive bioaccumulation of a material along a food chain eg organochlorine insecticides, PCBs, heavy metals.
Biomass	The total mass of living, or recently living material in an area.
Biome	A large geographical region with particular climatic features, in which a characteristic, unique community of species lives eg Taiga, coral reefs, temperate grasslands, tundra, tropical rainforest. Don't confuse the terms biome and ecosystem. Biome refers to the total area where the community of species is found, whereas ecosystem refers to a particular community and its interactions. So, there are many tropical rainforest ecosystems but only one biome.
Biomimetics	The study of living organisms so the knowledge gained can be applied to engineering or other technological developments.
Bioremediation	Cleaning up a contaminated site using living organisms such as bacteria that chemically degrade the pollutants or plants that absorb the pollutants.
Biotic index	A measure of pollution based on the presence, abundance and state of health of selected living organisms eg lichens for acid rain, aquatic invertebrates for water pollution.
Blue baby syndrome / Methaemoglobinaemia	A health problem with several possible causes, where the haemoglobin in a baby's blood does not carry enough oxygen. Nitrates in drinking water can be converted to nitrites which reduce the ability of haemoglobin to carry oxygen.
Bund wall	A wall that surrounds a tank which would contain the contents if the tank leaked or burst.

Bycatch	The non-target organisms that are caught when fishing.
Captive breeding and release programmes (CBR)	A method of boosting wild populations by keeping a breeding population in captivity. Some of the offspring produced may be released to join the wild population.
Carbon capture and storage (CCS)	A method to reduce carbon dioxide emissions, by removing the gases and storing them in underground geological structures.
Carbon footprint	An estimate of the total releases of greenhouse gases caused by the actions of an individual, group of people, an organisation or activity. The amounts of all greenhouse gases are expressed as the equivalent amount of carbon dioxide.
Carbon sequestration	Any process which removes carbon dioxide from the atmosphere, such as afforestation or underground storage (carbon capture).
Carcinogen	A substance or energy form that can cause cancer.
Carrying capacity	The greatest population that can be supported sustainably in an area.
Catalytic converter	A device that reduces emissions of pollutant gases from petrol and diesel engines. Catalysts such as platinum, palladium and rhodium catalyse reactions with oxides of nitrogen, carbon monoxide and unburnt hydrocarbons.
Catch quota	A limit on the quantity of fish that can be caught.
Centre of diversity	A geographical region with a high plant biodiversity, especially of the wild relatives of crop species.
Cetaceans	Marine mammals including whales, dolphins and porpoises.
Compact fluorescent lamp (CFL)	An early design of low-energy light.
Chronic	Exposure to a substance or symptoms that appear over long periods of time.
Cirrus cloud	Thin, wispy clouds, usually found at altitudes above 6000m. Cirrus clouds can reflect infrared energy

	emitted by the Earth's surface and emit infrared produced from absorbed sunlight.
Clean Air Act (1956)	UK legislation to control smoke pollution by the establishment of Smoke Zones by making Control Orders in large urban areas.
Climax community	The relatively stable community of species present at the end of ecological succession.
Cloning	An artificial form of asexual reproduction.
Cnidarians	A taxon of animals that includes corals and jellyfish.
Colonisation media	A method of demonstrating the presence of species by providing places that they can colonise which can then be checked.
Combined heat and power station (CHP)	A power station that has a high overall energy efficiency because the heat energy from the condenser cooling water is harnessed and used, often for heating buildings.
Community of species	A community of species is made up of the populations of all the species living in a particular area.
Companion crops	These are crops that are grown together to benefit one or both crops by actions such as providing nutrients, controlling pests or attracting beneficial insects.
Concentrating solar power (CSP)	A method of increasing the intensity of solar energy by using a parabolic array of mirrors to reflect the light onto a smaller area.
Constant descent angle	A method of approaching an airport where the aircraft descends at a constant angle, usually 3°.
Contact action (pesticide)	A pesticide that kills pests by coming in contact with them after spraying. Unlike systemic pesticides, they are not absorbed and translocated around the crops.
Contamination	Pollution caused by the pollutant staying in contact or mixing with materials such as soil, atmosphere, water or living organisms.
Contour ploughing	A soil erosion control measure where land is cultivated by ploughing horizontal furrows along the contours of the land.

Convention on international trade in endangered species (CITES)	The Convention on International Trade in Endangered Species (of wild fauna and flora). CITES is an international agreement that controls the international trade in certain species of plants and animals and their products.
Cooling towers	A method of reducing the temperature of effluent water to reduce thermal pollution and deoxygenation.
Coppicing	The process of regularly cutting down tree branches close to ground level. The regrowth produces thin straight branches. It was traditionally done on a cycle of six to ten years for making fence panels and wall panels. Short-rotation willow coppice is now used as a biofuel.
Cradle to cradle design (C2C)	The concept of designing items such that all the materials used can be reused or disposed of without leaving toxic or harmful wastes. The concept is based on the natural systems that recycle elements without depleting resources or causing harmful wastes to build up.
Critical group monitoring	A method of monitoring pollutants, particularly radioactive discharges. If the members of the public that are most at risk are safe, then so is everyone else.
Critical pathway analysis (CPA)	The prediction of the routes that an effluent will take in the environment, to assess pollution risk.
Crop rotation	The practise of growing a different crop in a field on a cycle of three, four or five years.
Crop wild relatives (CWRs)	These are wild plant varieties or species that are closely related to domesticated crops. CWRs may contain genetic characteristics that can be used in crop breeding programmes.
Cryosphere	All the frozen water on Earth.
CSS	Countryside Stewardship Scheme.
Culling	Reducing the population of a species by selective killing.
Cut-off ore grade	The lowest purity of a mineral that can be exploited economically.

Cyclone separator	Equipment used to remove suspended particles from gaseous effluents.
DAFOR scale	A qualitative scale that judges the abundance of organisms. Initials stand for: Dominant, Abundant, Frequent, Occasional, Rare.
dB scale	A logarithmic scale used to measure sound levels.
Debt for nature swaps	These are agreements whereby an organisation agrees to pay part of a country's debt in return for a commitment to a wildlife conservation programme.
Decomposers	Organisms that break down dead organic matter, releasing nutrients in the process. Many bacteria and fungi are decomposers. They secrete enzymes onto the dead organic matter and absorb the products of digestion.
Deflected succession	Natural ecological succession is stopped by human actions. Long-term continuation of the actions that deflect succession will create a plagioclimax.
Deforestation	The action of removing trees, resulting in a reduction in forest area.
Degradability	A measure of the ease with which a material breaks down.
Demersal	Living on the seabed e.g. cod, plaice.
Dendrochronology	The method of determining the age of a piece of wood using the characteristic sequence of sizes of growth rings in the wood.
Desulfurisation	The removal of sulfur or compounds containing sulfur such as sulfur dioxide.
Detritivores	These are heterotrophic animals that ingest and digest dead organic matter. Examples include: earthworms, millipedes, woodlice, dung beetles and slugs. They often break up the dead organic matter into smaller pieces, providing access to decomposers.
Directional drilling	The drilling of wells for oil or gas that are not vertical.

Dolphin pingers	A type of acoustic deterrent device used to deter small cetaceans so they don't get caught in fishing nets.
Drift net	A net which hangs vertical in the water. The top is held at the surface by floats, with the bottom being held down by weights.
Dry flue-gas desulfurisation (dry FGD)	A method of removing sulfur oxides from effluent gases using a slurry of crushed lime (mainly calcium carbonate).
Dynamic equilibrium	A balance created by active processes whose impacts cancel each other out.
Ecological footprint	A method of assessing the sustainability of lifestyles by estimating the biologically productive area needed to provide the resources and services needed by an individual or group.
Ecological niche	The role that an organism plays in its habitat, including its use of resources and its inter-relationships with other species.
Ecological succession	The sequences of changes in community composition which changes as an area is colonised and develops until a climax community is eventually produced. The time period in which a species can survive depends upon the ease with which it colonises and the biotic and abiotic conditions that it is able to survive.
Ecosystem	The community of organisms living in an area, their inter-relationships and interactions with their abiotic environment eg tropical rainforest, savannah grassland, coral reef. Do not confuse the term 'ecosystem' with 'biome'.
eDNA	eDNA is DNA detected in environmental samples such as water or soil that is used to confirm the presence of the species that produced it.
Efficiency	A measure of the amount of product compared with the inputs usually expressed as a percentage.
El Niño	The name given to events when the wind and ocean currents in the equatorial Pacific Ocean slow significantly or reverse. It alters heat distribution and weather patterns around the Pacific area and

	elsewhere in the world. El Niño events are caused by natural processes, but may be made more frequent by human activities. It is also called ENSO: El Niño Southern Oscillation.
Electrostatic precipitator	Equipment used to remove suspended particles from gaseous effluents by attracting them to electrically charged wires or plates.
Embodied energy	The amount of energy that was used to make and install an item.
Embryo transfer	The transfer of fertilised eggs or embryos from one female to another, such as from a rare species into a female of a closely related species that is more common. This enables more young to be produced than could be achieved through normal breeding. It is also used in livestock breeding.
Encapsulation	The sealing of waste in a solid material such as glass, cement or plastic to prevent its escape.
Endemic	An endemic species is indigenous ('native') to a particular area and is not naturally found elsewhere. (It is also used in disease epidemiology to mean a disease that is normally present).
Energy density	The amount of energy in a particular mass of fuel or that can be harnessed by a particular mass of equipment.
Eradication	The reduction of the population of a species by removal or culling.
Escape panels	A spring-loaded part of a fishing net through which large by-catch organisms can escape eg turtles.
European Union Common Fisheries Policy (EU CFP)	This is a set of regulations intended to ensure the sustainable management of fish stocks within the EU.
Eutrophication	The process by which nutrient levels in a water body increase to excessive levels such that the growth and subsequent die-off of plants and algae cause deoxygenation.

Evolutionarily distinct and globally endangered (EDGE) species	These are species that are threatened with extinction and have few relatives that are genetically similar. This genetic uniqueness means they should be a high priority for conservation.
Exoskeleton	A skeleton on the outside of an organism, as found in insects and crustaceans.
Exposure	In ionising radiation control, this refers to an object or person receiving radiation, but not necessarily coming in contact with the source.
Ex-situ conservation	The conservation of a species in an area which is not its natural habitat.
Extensive agriculture/aquaculture	Agriculture/aquaculture where the yield is achieved with low levels of inputs, often over a large area. Productivity is usually low (yield per unit area) but efficiency is usually high (yield per unit input).
Feedback mechanisms	A process where an action has consequences which affect the original process. Positive feedback mechanisms increase the rate of the original action while negative feedback mechanisms reduce it.
Flagship species	High-profile species that can be used to raise support for the conservation of their habitat and all the other species that live there
Flue gas desulfurisation (FGD)	Processes that remove oxides of sulphur from gaseous effluents.
Food conversion ratios (FCRs)	A measure of the efficiency with which an organism converts its food into its own increasing biomass. $FCR = \text{mass of food needed to produce one unit of new tissue}$.
Fuel cell	An electrochemical device that produces electricity from the chemical reaction between two substances (usually hydrogen or an alcohol) and oxygen.
Genetic engineering/genetic modification (GM)	The method of altering an organism's genetic makeup by artificially introducing genes from another organism, often of another species.

Ghost fishing	The capture and death of organisms that get caught in lost or discarded fishing gear.
Gibberelins	A group of plant hormones.
Gonadic	Relating to ovaries and testes.
Gravimetry	A geological exploration technique that detects changes in the force of gravity.
Grays	A unit of energy absorbed from ionising radiation.
Greenhouse gas (GHG)	A gas that absorbs infra-red radiation emitted by the Earth's surface and causes atmospheric heating. Carbon dioxide and water vapour are the main naturally occurring greenhouse gases. Anthropogenic greenhouse gases include carbon dioxide, methane, NO _x , CFCs and tropospheric ozone.
Haber Process	The industrial process that combines nitrogen from air with hydrogen from natural gas to produce ammonia.
Habitat	The place where an organism, species or population lives.
Haemoglobin	The protein in red blood cells that carries oxygen.
Half life	The time taken for half of a material to be lost or broken down.
Halophyte	An organism that thrives in conditions with a high salt concentration.
Hard release	The release of animals from captivity where they are not provided with post-release support such as food.
Homeostasis	The maintenance of a state of equilibrium.
Horizontal axis wind turbines (HAWT)	Wind turbines where the blades rotate around a generator that has a horizontal axis of rotation.
Hydraulic fracturing	A method using high pressure fluids to open cracks in fine-grained shales to allow trapped oil and gas to flow so it can be extracted.
Hydroelectric power	A method of generating electricity using the downhill flow of water to turn turbines and generators.

Hydrodynamics	The study of the flow of water, often in relation to ship design to reduce resistance to movement to reduce fuel use.
Hydrogen economy	The proposal that hydrogen produced by electrolysing water could be used as the main fuel to meet a country's energy demands.
Hydrology	The study and understanding of the movement, distribution and properties of water in the environment.
Hydrosphere	All the water on Earth, found in solid, liquid or gaseous form in a variety of reservoirs, including the oceans, ice caps, rivers and lakes, soil, groundwater, atmosphere and living organisms.
Hydrothermal deposition	The deposition of mineral deposits from hot mineral-rich solutions.
Incineration	The breakdown of a waste by burning it.
In-situ conservation	The conservation of a species in its natural environment.
Insolation	Sunlight that reaches a particular location.
In-stream turbines	Tidal turbines that are rotated by marine currents, but without having a barrage to focus the water flow.
Intensive agriculture/aquaculture	Agriculture/aquaculture where the yield is achieved with high levels of inputs. Productivity is usually high (yield per unit area) but efficiency is usually low (yield per unit input).
International tropical timber organisation (ITTO)	An intergovernmental organisation which promotes the conservation and sustainable management, use and trade of tropical forest resources.
International union for conservation of nature (IUCN)	This is an organisation of 1300 government and non-governmental organisations that provides information on the status of the natural world and the measures needed to safeguard it. Meetings every four years drive their global agenda and have produced major agreements such as CITES and the Ramsar convention.

International whaling commission (IWC)	The IWC is an international organisation which aims to ensure the sustainable exploitation of whales.
Keystone species	A species that has much more important ecological functions within their ecosystem than their abundance might suggest. Such roles may include the control of the populations of other species, the provision of food or species that control structural habitat features, such as beavers creating dams.
Kick sampling	A method of sampling aquatic invertebrates by disturbing the substrate.
Kinetic energy recovery system (KERS)	A method of slowing a vehicle by using the kinetic energy of the vehicle to turn a flywheel or charge batteries. The stored energy is used for acceleration which reduces the amount of fuel that needs to be used.
K-selected species	Species that have a relatively low breeding capacity: they often mature at a later age and have few young.
La Niña	The name given to events when the wind and ocean currents in the equatorial Pacific Ocean increase in strength. Also, see El Niño.
Laser fusion	A developmental nuclear fusion technique that uses a laser beam to cause fusion in beads of frozen hydrogen.
Lasky's principle	The theoretical model stating that, as the purity of available mineral deposits declines in a linear fashion, there is a logarithmic increase in the amount of the material present.
Leachate	Drainage water that carries other substances, either in solution or as suspended solids.
LED (Light emitting diode)	These are very energy-efficient lights.
Legumes	Plants with symbiotic nitrogen fixing bacteria in root nodules eg peas and beans.
Light traps	A method of sampling populations of night-flying organisms that are attracted to lights, especially moths.

Limecrete	An alternative to concrete that has a much lower embodied energy because it uses calcium hydroxide rather than cement.
Lincoln index	A catch, mark, release, recapture method of estimating animal populations.
Liposolubility	A measure of how easily a substance dissolves in fats and oils.
Lithosphere	The relatively hard outer layer of the Earth comprising the crust and upper layer of the mantle. It is the source of mineral resources such as metal ores and affects soil formation and properties.
Local nature reserve (LNR)	LNRs are designated under the National Parks and Access to the Countryside Act (1949) for their local importance for wildlife, geology, education or public enjoyment. They are controlled or owned by local authorities.
Long lining	A fishing method with many hooks attached to a main fishing line that is trailed behind the fishing boat. They can be used to catch pelagic or demersal fish.
Magnetometry	A method of detecting mineral deposits based on their magnetism.
Magnetosphere (of Earth)	The magnetic field around Earth which deflects charged particles travelling from the Sun.
Marine conservation zone (MCZ)	MCZs are designated under UK law to protect a range of nationally important marine wildlife, habitats, geology and geomorphology, and can be designated anywhere in English and Welsh territorial and offshore waters.
Marine nature reserve (MNR)	MNRs were designated under the Wildlife and Countryside Act (1981) by Natural England (or CCW). Lundy Island and Skomer Island were MNRs. They have been re-designated as Marine Conservation Zones.
Marine protected area (MPA)	A general name for marine areas that are legally protected for their wildlife, historical and cultural features. The legal protection is provided by the laws of the country involved.

Maximum sustainable yield (MSY)	The greatest amount that can be harvested sustainably.
Metamorphic processes	Geological processes that change the form of a rock with heat and/or pressure, but without melting it.
Methane hydrate	A solid compound of methane trapped in ice crystals, often found in marine sediments.
Monoculture	The growth of a single type of crop, usually over a large area.
Montreal protocol	The international agreement that controlled the manufactured and use of CFCs and other ozone depleting substances.
Mulch	Material placed on the soil surface to reduce evaporation losses and reduce weed growth.
Multicropping	A form of polyculture where two or more different crops are grown in an area at the same time.
Mutagen	A material that can cause changes in DNA structure.
National nature reserve (NNR)	They are designated under UK law by the National Parks and Access to the Countryside Act (1949). They include important habitats with complete communities of species. They are designated by Natural England (or CCW).
Natura 2000	A network of protected sites in the EU that combine the SPAs and SACs set up under the EU birds and habitats directives.
Neonicotinoids	A widely used group of insecticides. They have been linked with the deaths of bees, especially when they act synergistically with some fungicides.
Neurotoxin	A poison that affects the nervous system.
No take zone	An area in which harvesting or fishing is prohibited.
Nuclear fission	Nuclear power that involves the splitting of the nuclei of large atoms such as uranium 235 and plutonium 239.

Nuclear fusion	Nuclear power that involves the joining of the nuclei of small atoms such as hydrogen 2 (deuterium) and hydrogen 3 (tritium).
ODS	Ozone depleting substance.
Oil shales	Fine sedimentary rock that contains kerogen: a solid form of crude oil.
Organochlorines	Hydrocarbon-based compounds that include chlorine. They include pesticides such as DDT and industrial chemicals such as PCBs. Their use is now banned or restricted.
Organophosphate pesticide	Insecticide group eg parathion, malathion. They are not persistent but have high mammalian toxicity.
Overburden	The soil and rock above a mineral deposit that must be removed to provide access.
Overfishing	Fishing above the Maximum Sustainable Yield of a population.
Pantograph	The electricity pick-up on the roof of a locomotive that allows the use of electricity from overhead cables.
Pathogens	Organisms that cause disease.
Peak shaving	The process of storing surplus energy to satisfy later peaks in demand.
Peat bog	A wetland area with an accumulation of dead plant material, especially moss.
Pelagic	Living near the water surface eg herring, tuna.
Permaculture	An agricultural system that incorporates the principles of natural ecosystems.
Permafrost	A layer of soil in which the water is permanently frozen, often trapping bubbles of gases such as methane.
Persistence	A measure of the rate at which a material breaks down and therefore the length of time it remains.

Pheremone trap	A trap that attracts organisms using the scent of pheromones. They can be used to try to catch all the members of one gender of a species to stop breeding but are usually used to show the presence of a pest species.
Pheromone	A chemical released by an organism that changes the behaviour of other members of the same species, especially to attract a mate.
Photic layer	The water layer into which light can penetrate.
Photoautotroph	An organism that produces high-energy food substances using sunlight in photosynthesis.
Photochemical smogs	Atmospheric pollution events in which pollutants such as hydrocarbons, NO _x and tropospheric ozone interact to produce more toxic pollutants such as PANs (peroxy acetyl nitrates).
Photothermal	A system that converts light into heat.
Photovoltaic (PV)	A system that converts light into electricity.
Phytomining	A method used to extract metals that have been absorbed and concentrated by plants. It can be used as a method to exploit low purity metal deposits or decontaminate polluted areas.
Phytoremediation	A method of decontaminating a polluted site by growing plants that absorb the toxic materials.
Pioneer species	One of the first species to colonise an area at the start of ecological succession. They are usually well adapted to extreme abiotic factors.
Pitfall trap	A method of sampling populations of mobile animals that live on the soil surface, by collecting individuals that fall into traps set into the ground.
Plagioclimax	A community of species that does not develop to a natural climatic climax community, but is maintained by external influences which prevent this, including human activities such as burning, grazing or ploughing.
Ploughing	The cultivation of the soil by turning over the surface layer.

Plutonium reactors	Nuclear fission reactors that use plutonium as the fissile fuel.
Polar vortex winds	Winds that blow around the north and south poles in a circular manner which reduce the mixing of polar air masses with the rest of the atmosphere.
Pollarding	The process of regularly cutting down tree branches above ground level, usually to prevent the regrowth being eaten by animals such as livestock or deer. It is usually done on a cycle of 5 to 30 years.
Pollen analysis	The use of the pollen present in environmental samples. This can be used to deduce the climate when historic sediments were deposited.
Polyculture	An agriculture/aquaculture system involving the growth of more than one species in the same area at the same time.
Population	All the individuals of a species living in a particular area.
Power to gas systems (P2G)	A method of using surplus electricity which would be wasted to produce methane gas.
Primary oil recovery	The extraction of crude oil where the oil is forced to the surface by the pressure of water beneath the oil or natural gas above or dissolved in the oil.
Productivity	A measure of the yield of a system, often expressed as the yield per unit area, time or input.
Proterozoic marine sediments	These include the iron oxide deposits produced by the reaction of dissolved iron minerals with the oxygen produced by photosynthesis. This occurred in the early Proterozoic era and delayed the build-up of oxygen in the atmosphere.
Proxy data	The use of data that can be collected to predict the values of a related factor that cannot be measured, eg data on tree rings, pollen, coral growth and plankton in marine sediments can be used to determine historic climates.

Pumped storage HEP	An energy storage system where surplus electricity is used to pump water from a lower reservoir to a higher one. The energy stored as gravitational potential energy is allowed to flow downhill to generate electricity during periods of high electricity demand.
Purse seining	A fishing method where a net is used to encircle a shoal of pelagic fish.
Pyrethroids	Synthetic insecticide pesticides, based on the natural chemicals originally extracted from chrysanthemum flowers (pyrethrins). They are not persistent and have low mammalian toxicity.
Quadrat	An area, usually square or circular, in which samples are taken. The size of the quadrats depends upon the organisms being studied.
Rammed earth	A wall construction method where materials such as clay, soil, straw and sand are compacted. Because no cement is used it has a low embodied energy.
Ramsar site	A wetland site designated to protect its biodiversity under an international agreement: The Ramsar Convention on Wetlands (1971), especially as a habitat for water birds. They are designated in the UK by DEFRA.
Range of tolerance	The range of conditions within which a species can survive.
Relative biological effectiveness (RBE)	This is a measure based on the amount of energy absorbed from ionising radiation which takes into account the damaging effects of the type of radiation.
Remote sensing	Any method of monitoring the features of a location from another location, normally used to describe surveys from satellites or high-flying aircraft.
Resistivity	A method of predicting the mineral composition of mineral deposits underground using the ease with which they conduct electricity.
Reverse thrusters	A method used on most aircraft to slow down after landing.

Re-wilding	The process of creating habitats that are similar to the conditions present before the natural habitat was changed by human actions.
Risk:benefit analysis	A method to inform decision making by comparing the risks of carrying out an activity with the benefits of doing so.
r-selected species	Species that have a relatively high breeding capacity: they often mature at a young age and have large numbers of young.
Salinity	A measure of the salt concentration of a solution.
Satellite imagery	The collection of images using satellites: visible light, infra-red, microwaves etc.
Secondary fuel	An energy source that is produced by the conversion of a primary fuel.
Secondary oil recovery	The extraction of crude oil where pressure is maintained by pumping water or natural gas into the oil reservoir.
Secondary succession	Ecological succession that takes place in an area where the existing climax community has been disturbed or destroyed.
Seismic surveys	These use sound waves produced at the surface that reflect off underground geological structures to determine the depth and shape of the rock structures. The reflected sound waves are detected by geophones at the surface.
Sere	A stage in ecological succession in the changes that occur, eventually producing the climax community.
Shellfish	All the aquatic animals that are caught or grown to be eaten that have shells or an exoskeleton eg crustaceans and molluscs.
Sievert	A unit of absorption of ionising radiation absorption that considers the amount of energy absorbed and the Relative Biological Effectiveness of the type of radiation.

Simpson's index of biodiversity	A quantitative measure of the number of species and the abundance of each in an area.
Sites of special scientific interest (SSSI)	SSSIs are designated by Natural England (or CCW) under UK law by The Wildlife and Countryside Act (1981) because of their importance for plants, animals, geological features or land forms.
Smart motorways	A method of relieving traffic congestion which allows driving on the hard shoulder and reduces the speed limit during periods of heavy traffic flows.
Smog	Atmospheric pollution event involving smoke and fog (see also photochemical smog).
Soft release	The release of animals from captivity where they are provided with post-release support such as food.
Somatic	An issue related to general body cells, but not the gonads (ovaries and testes).
Sonograms	A graph showing the volumes of sounds at different frequencies.
Special area of conservation (SAC)	SACs are designated by Natural England (or CCW) under the EU Habitats Directive to protect internationally important habitats for rare and vulnerable species.
Special protection area (SPA)	SPAs are designated by Natural England (or CCW) under the EU Birds Directive to protect areas for rare and vulnerable bird species.
Species	A group of organisms that resemble each other more than other organisms and naturally interbreed to produce fertile offspring.
Sterile male techniques	A method of insect pest control that uses the release of males that have been sterilised. If they mate, no offspring will be produced.
Strip cropping	The growth of more than one crop in alternating narrow strips, so that different sowing and harvesting times reduce soil erosion because the whole field is never all bare at the same time.

Surber sampler	A method of sampling aquatic invertebrates by disturbing the substrate that produces more reliable quantitative data than kick sampling.
Sweep nets	A method of sampling populations of flying insects and invertebrates among vegetation.
Synergism	The process where the presence of two materials produces a greater effect than the sum of their individual effects.
Systemic	A substance that is absorbed and transported throughout an organism eg by sap in plants.
Tar sands	Very viscous crude oil found in sand.
Taxon	A group of organisms based on their biological similarities eg domain, kingdom, phylum, class, order, family, genus, species.
Temperature inversion	A situation in the troposphere where the temperature is lower than normal so that relatively warm air lies above cold air.
Teratogen	A substance that interferes with gene function in a growing embryo so that a non-inherited birth abnormality is produced.
Terracing	The replacement of a sloping landscape by the creation of a series of narrow horizontal stepped strips, often used to reduce soil erosion.
Tertiary oil recovery	The extraction of crude oil where the viscosity of the oil is reduced using methods such as the injection of steam, solvents or bacteria.
Thermal mass	A measure of the ability of a material or structure to absorb and store heat.
Thermal stratification	The changing temperatures in different layers of the atmosphere.
Thermohaline circulation	The movement of ocean currents caused by changes in temperature, salinity and density.

Thorium reactor	A reactor that uses thorium 232 as a fertile fuel. Neutron bombardment converts the thorium 232 into uranium 233 which is fissile and releases energy.
Tidal barrage	A tidal power scheme where a dam-like barrage is built across a bay or estuary so that all flowing water flows through the sluice tunnels in the barrage causing the turbines and generators to turn.
Tidal lagoon	A tidal power scheme where a section of a bay or estuary is impounded by a seawall which has sluice tunnels and turbines like a tidal barrage. The environmental impacts are lower than those of a barrage as it only covers part of the bay or estuary.
Tidal power	A method of generating electricity using the tidal water flow caused by the gravitational forces between the Moon and Earth.
Tied ridging	A method of reducing soil erosion by creating a grid of raised ridges that cause rainfall to collect, increasing infiltration and reducing runoff.
Tillage	The cultivation by turning the soil e.g. by ploughing.
Tipping point	A tipping point is reached when the changes caused by human activities cause further changes such that the human activities are no longer needed to maintain the changes.
Topography	The 3D shape of the land surface.
Toroidal reactor	A nuclear fusion reactor in which hydrogen plasma is held in a torus: a ring-shaped tube.
Toxicity	A measure of how poisonous a substance is, usually caused by its ability to cause enzyme inhibition.
Transect	A line or belt of sampling sites across an area.
Transgenics	The process of artificially transferring genetic material from one organism into an individual of another species.
Tüllgren funnel	A piece of equipment used to extract invertebrates from soil or leaf litter.

Turbidity	A measure of the level of suspended solids in water which affects the ability of light to penetrate the water.
Universal soil loss equation (USLE)	A formula that can be used to calculate rates of soil erosion.
Urea spray	A method of reducing NO _x emissions eg from coal-fired powered power stations.
Vavilov centre	An area of the world, identified by the Russian zoologist Nikolai Vavilov, where crop plants were first domesticated and where wild varieties are still found.
Vegetative propagation	Asexual reproduction.
Vehicle to grid systems (V2G)	An energy storage method in which the batteries in vehicles are connected to the local electricity grid. If there is a shortage of electricity from other sources, a proportion of the energy from the batteries can be used to maintain supplies.
Vertical axis wind turbines (VAWT)	Wind turbines where the blades rotate around a generator that has a vertical axis of rotation.
Wave power	A method of generating electricity using the movement of water caused by winds blowing over the water surface.
Wet FGD	A method of removing sulfur oxides from effluent gases by dissolving them in a solution such as a spray of sodium sulphite solution.
Wildlife and Countryside Act (1981)	A UK law that provides protection for many wildlife species and designated protected areas such as SSSIs. Most birds and many mammals are protected.
Windbreaks	Hedgerows and rows of trees that reduce wind velocity to reduce soil erosion.

Command words

Analyse	Separate information into components and identify their characteristics
Annotate	Add notation or labelling to a graph, diagram or other drawing
Apply	Put into effect in a recognised way
Argue	Present a reasoned case
Assess	Make an informed judgement
Calculate	Work out the value of something
Comment	Present an informed opinion
Compare	Identify similarities and/ or differences
Complete	Finish a task by adding to given information
Consider	Review and respond to given information
Contrast	Identify differences
Criticise	Assess worth against explicit expectations
Debate	Present different perspectives on an issue
Deduce	Draw conclusions from information provided
Define	Specify meaning
Describe	Give an account of
Design	Set out how something will be done
Determine	Use given data or information to obtain an answer
Develop	Take forward or build upon given information
Discuss	Present key points
Distinguish	List the differences between different items

Draw	Produce a diagram
Estimate	Assign an approximate value
Evaluate	Judge from available evidence
Explain	Give reasons
Explore	Investigate without preconceptions about the outcome
Give	Produce an answer from recall or from given information
Identify	Name or otherwise characterise
Justify	Support a case with evidence
Label	Provide appropriate names on a diagram
List	List a number of features or points without further elaboration
Name	Identify using a recognised technical term
Outline / Summarise	Set out main characteristics
Predict	Give a plausible outcome
Relate	Give a technical term or its equivalent
Show	Provide structured evidence to reach a conclusion
Sketch	Draw approximately
State	Express in clear terms
Suggest	Present a possible case