

Ecological niches

Ecological niche

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Obligate anaerobe

Ecological niches

**Facultative anaerobe vs obligate
aerobe**

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**Which organisms use photosynthesis
as their mode of nutrition?**

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Mixotroph

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Obligate vs facultative mixotroph

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Four stages of holozoic nutrition

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Saprotroph

An organism that cannot survive in the presence of oxygen, e.g. Clostridium.

The role of a species in an ecosystem, including biotic and abiotic interactions affecting growth, survival and reproduction, and how it obtains food.

Plants, algae and several groups of photosynthetic prokaryotes, such as cyanobacteria.

Facultative anaerobe: lives with or without oxygen (e.g. yeast). Obligate aerobe: cannot survive without oxygen.

Obligate: needs both modes to grow.
Facultative: can survive using either mode alone.

An organism that is both autotrophic and heterotrophic, e.g. Euglena.

A fungus or bacterium that secretes enzymes onto dead organic matter, digests it externally and absorbs the products; a decomposer.

Ingestion, digestion (internal), absorption, assimilation.

Ecological niches Energy sources used by archaea for ATP production	Ecological niches Dentition of Paranthropus robustus and its diet
Ecological niches Dentition of Homo sapiens and its diet	Ecological niches How can the diet of an extinct hominid be deduced?
Ecological niches Two types of mouthparts in leaf-eating insects	Ecological niches How do plants resist herbivory?
Ecological niches Chemical, physical and behavioural adaptations of predators	Ecological niches Chemical, physical and behavioural adaptations of prey

Very large flat molars and premolars, thick enamel, sagittal crest: herbivorous, grinding tough plant food.

Light, oxidation of inorganic chemicals, or oxidation of carbon compounds. Archaea are one of the three domains.

From theories relating dentition to diet in living mammals, applied to skull and tooth features of fossils.

Small incisors and canines, moderate molars, smaller jaw, no sagittal crest: omnivorous.

Thorns and other physical structures, and toxic secondary compounds in seeds and leaves.

Chewing mandibles (e.g. caterpillars) and piercing stylets (e.g. aphids feeding on phloem sap).

Chemical: toxins, sprays. Physical: camouflage, spines, shells. Behavioural: herding, alarm calls, fleeing.

Chemical: venom. Physical: sharp teeth, claws, speed. Behavioural: pack hunting, ambush.

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Liana

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Epiphyte vs strangler epiphyte

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**How are shade-tolerant herbs
adapted to the forest floor?**

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Fundamental niche vs realized niche

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Competitive exclusion principle

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**Two possible outcomes of competition
between two species**

Epiphyte grows on branches for light without soil roots. Strangler epiphyte later sends roots to soil that enclose the host.

A woody climbing plant rooted in the soil that uses other trees for support to reach canopy light.

Fundamental: potential niche from adaptations and tolerance limits. Realized: actual niche when in competition with other species.

Large, thin leaves rich in chlorophyll for their mass and a low light compensation point let them photosynthesise in dim light.

Elimination of one species, or restriction of both to part of their fundamental niche.

Two species with the same niche cannot coexist indefinitely; so each ecological niche is unique.