*This is the **Higher Combined** version — includes Higher Tier content. Some Separate-only details are omitted.*

Organisms in a community interact with each other and with their abiotic environment. They are adapted to survive in their particular habitat.

- Abiotic factors: non-living physical/chemical conditions — temperature, light intensity, moisture level, soil pH, wind speed, CO■ and O■ concentrations, salinity.
- Biotic factors: living components affecting organisms — food availability, predators, competitors, disease, pathogens, mutualistic partners.
- Predator-prey cycle: prey increases → predators increase (more food) → prey decreases → predators decrease → prey recovers → repeats.
- Adaptations can be structural (physical features), behavioural (actions) or physiological (internal processes).
- Examples: polar bear has thick fur (structural), migrates seasonally (behavioural), has fat layer for insulation (physiological).
- Extremophiles: organisms adapted to extreme environments — e.g. bacteria near deep-sea hydrothermal vents (high temp, pressure, no light).
- Competition: organisms compete for the same limited resources. In any habitat, the most successful competitors dominate.
- ★ **HT** Mutualism: both species benefit (e.g. nitrogen-fixing bacteria in legume root nodules).
- ★ **HT** Parasitism: one organism (parasite) benefits at the expense of the host.

Key Terms

Abiotic factor	Non-living physical/chemical factor affecting organisms — e.g. temperature, light, pH
Biotic factor	Living factor affecting organisms — e.g. predation, competition, disease
Adaptation	An inherited characteristic improving an organism's chance of survival and reproduction in its environment
Mutualism	Relationship where both species benefit
Parasitism	Relationship where one species (parasite) benefits at the expense of the other (host)

■ **Exam Tip:** When describing an adaptation, always link the structural/physiological feature to the survival advantage it provides. E.g. "The cactus has a thick waxy cuticle (structural adaptation) which reduces water loss by evaporation in the hot desert (survival advantage)."