

These notes explain the **why** behind every concept, not just the what. They include **analogies**, **real-life examples**, and explanations of **common mistakes**. Use these alongside your revision notes for full understanding.

B4 Communities — How Everything Fits Together

No organism exists in isolation. Every species interacts with many others — as prey, predator, competitor, parasite, or mutualistic partner. These interactions determine which species survive in an ecosystem, and in what numbers.

Predator-Prey Cycles — Why Populations Oscillate

Predator and prey populations are linked in a cycle. When prey is abundant, predators have plenty of food so their numbers rise. As predator numbers increase, they eat more prey, so prey numbers fall. With less prey, predators struggle for food and their numbers fall. With fewer predators, prey numbers recover — and the cycle repeats.

■ **Think of it like this:** *The predator-prey relationship is like a seesaw. When one side goes up, the other eventually follows — but with a time delay, because population changes take time to occur.*

Why Carbon Cycling Matters for Climate

Carbon naturally cycles between the atmosphere, living organisms, soil and oceans. The problem with burning fossil fuels is that it releases carbon that has been locked underground for 300 million years, far faster than natural cycles can reabsorb it. CO₂ in the atmosphere traps heat (the greenhouse effect), causing global warming.

■ **Real-life example:** The current atmospheric CO₂ concentration (around 420 ppm) is higher than at any point in the last 800,000 years, based on ice core data. The last time CO₂ was this high, global temperatures were 2-3°C warmer and sea levels were several metres higher than today.

Food web	Interconnected food chains showing all feeding relationships in a community
Decomposer	Organism breaking down dead matter — essential for nutrient cycling
Carbon cycle	The movement of carbon through atmosphere, organisms, soil and oceans
Greenhouse effect	Trapping of heat by CO ₂ and other gases in the atmosphere
Biodiversity	The variety of species, genes and ecosystems