

CLASS 8

SCIENCE

EXTRA QUESTIONS

Extra Questions for Class 8 Science Chapter 12: How Nature Works in Harmony

Original extra practice questions for Class 8 Science Chapter 12 (How Nature Works in Harmony), going beyond the textbook exercise with fresh scenarios. Full explanations included.

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Q1 (Food web reasoning). In a food web, hawks eat both snakes and rabbits; snakes eat rabbits and mice; rabbits and mice eat grass. If the rabbit population crashes due to disease, what's the most likely effect on snakes and hawks?

Solution: Since hawks have an alternative food source (snakes and mice, indirectly) and snakes can still eat mice, the ecosystem is **more resilient** than a simple straight-line food chain — hawks and snakes can shift more of their diet toward mice, cushioning the impact of the rabbit decline, though both may still be somewhat affected. This illustrates why **food webs are more stable than simple food chains**.

Q2 (Ecological pyramid, numeric). In a grassland, there are 10,000 kg of grass, 1,000 kg of grasshoppers, and 100 kg of frogs (by total mass, moving up the food chain). What pattern does this show, and roughly what fraction of energy transfers between levels?

Solution: Each level has about **10% of the mass/energy** of the level below it ($1000/10000 = 10\%$; $100/1000 = 10\%$) — this matches the general ecological rule of thumb that only about 10% of energy is transferred from one trophic level to the next (the “ten percent law”), with the rest lost as heat and used for the organisms’ own life processes.

Q3 (Assertion–Reason). Assertion (A): Removing top predators from an ecosystem always benefits herbivores. Reason (R): Top predators control herbivore populations by predation.

Solution: The Reason is **true** — top predators do control herbivore numbers. But the Assertion is **false as an absolute claim**: while herbivore numbers may rise short-term, unchecked herbivore population growth can overgraze and destroy their own food supply (plants), ultimately harming the herbivores themselves — so it's not a simple, guaranteed “benefit.” **A is false; R is true.**

Q4 (Applied reasoning, decomposers). Explain, using decomposers, why a fallen leaf disappears from the forest floor within a few months, but a plastic bag in the same spot does not.

Solution: Decomposers (fungi, bacteria) have enzymes that can break down natural organic material like leaves (made of cellulose and other biodegradable compounds) into simpler substances. Plastic is a synthetic material that most decomposers cannot break down at all, or only extremely slowly, so it persists in the environment for a very long time instead of being recycled back into the ecosystem.

Q5 (Classification). Classify each as producer, herbivore, carnivore, omnivore, or decomposer: (i) earthworm (breaks down dead leaves) (ii) tiger (iii) grasshopper (iv) bear (eats berries and fish) (v) grass.

Solution: (i) Earthworm — **decomposer** (breaks down organic matter). (ii) Tiger — **carnivore**. (iii) Grasshopper — **herbivore**. (iv) Bear — **omnivore** (eats both plant and animal matter). (v) Grass — **producer**.

Q6 (Multi-step food web disruption). In a pond ecosystem: algae → small fish → large fish → herons. If a pollutant kills most of the small fish, predict the effect on algae and herons, and explain why.

Solution: With fewer small fish grazing on it, **algae would likely increase** (less consumption). With less food, **large fish numbers would decrease**, and with fewer large fish to eat, **heron numbers would also likely decrease** — the effect cascades both up and down the chain from the disrupted middle level.

Q7 (Applied, mangroves). Besides tsunami protection, name two other ecological benefits mangrove forests provide, and explain one of them.

Solution: Mangroves also serve as **breeding/nursery habitats for fish and shellfish** (their tangled roots offer shelter for young marine life, supporting local fisheries) and act as **natural water filters and carbon stores**, trapping sediment and pollutants from land runoff before it reaches the open sea, while

also absorbing significant amounts of atmospheric carbon dioxide.

Q8 (Spot the error). A student says: “An ecosystem is the same thing as a community, just a different word for it.” Correct this statement.

Solution: Incorrect. A **community** is all the living organisms (populations of different species) interacting in an area. An **ecosystem** is broader — it includes that community *plus* the non-living (abiotic) environment they interact with, such as soil, water, air and sunlight.

Q9 (Sustainable agriculture reasoning). Explain how crop rotation helps make an agricultural ecosystem more sustainable.

Solution: Growing the same crop repeatedly (monoculture) depletes specific soil nutrients each season and lets crop-specific pests/diseases build up. **Crop rotation** — alternating different crops each season — helps because different crops use and replenish different soil nutrients (e.g. legumes add nitrogen back to soil), and rotating disrupts the life cycles of pests and diseases that specialise in one crop, reducing the need for chemical inputs over time.

Q10 (Pyramid shape reasoning). Why does an ecological pyramid of numbers or biomass usually get narrower at each higher trophic level?

Solution: At each step up the food chain, only a fraction of the energy and biomass from the level below is actually transferred (much is lost as heat, or used for the organisms’ own growth, movement and reproduction) — so each successive trophic level can only support a smaller total population/biomass than the one below it, producing the narrowing pyramid shape.