CLASS 8 SCIENCE NCERT SOLUTIONS

NCERT Solutions for Class 8 Science Chapter 12: How Nature Works in Harmony – Curiosity

Chapter 12 of the Class 8 NCERT Curiosity textbook is titled "How Nature Works in Harmony". It introduces ecosystems, food chains and food webs, trophic levels and ecological pyramids, decomposers, and how human activity and natural events (like tsunamis) interact with ecosystems. These Class 8 Science Chapter 12 so...

Contents

Chapter 12 of the Class 8 NCERT Curiosity textbook is titled "**How Nature Works in Harmony**". It introduces ecosystems, food chains and food webs, trophic levels and ecological pyramids, decomposers, and how human activity and natural events (like tsunamis) interact with ecosystems. These Class 8 Science Chapter 12 solutions are also useful as quick revision notes before exams.

This chapter has in-text "Probe and Ponder" questions, several hands-on activities, and a 9-question "Keep the Curiosity Alive" exercise section. Original, independently verified solutions to all of them are below.

Probe and Ponder — In-Text Questions

Q1. How might the loss of forest cover and changing rainfall patterns lead elephants into farms and villages?
Solution: Losing forest cover shrinks elephants' habitat and food supply, while changed rainfall can dry up natural waterholes. With food and water scarce in their usual range, elephants move into nearby farms and villages in search of crops like bananas and sugarcane — leading to crop damage and conflict with people.

Q2. If you were a tree in a dense forest, what relationships would you have with water, sunlight, other animals, and other forest components?
Solution: The tree would absorb **water** from soil for photosynthesis and growth; use **sunlight** to produce food via photosynthesis; provide **animals** with shelter, food and oxygen, while depending on some (like birds and insects) for pollination and seed dispersal; and interact with the **soil** for nutrients and stability, helping prevent erosion and retain moisture.

Q3. Can Earth thrive without humans? Can humans survive without Earth?
Solution: Earth can thrive without humans — ecosystems run on their own natural processes (food chains, nutrient cycling) independent of human presence, as shown by self-sustaining protected wilderness areas. **Humans cannot survive without Earth**, since we depend entirely on its air, water, food and resources.

Q4. If two bird species compete for the same fruit, how might their lifestyles change over time?
Solution: Competition often leads to **niche differentiation** — over time, the two species may adapt to feed at different times, on different parts of the tree, or develop different beak shapes/feeding behaviours to reduce direct competition, rather than both continuing to compete for the exact same resource.

Q5. Can human actions cause natural disasters?
Solution: Human actions can worsen or trigger disaster-like events: deforestation destabilises soil and can worsen flooding, pollution and altered land use can intensify storm damage, and overuse of pesticides can disrupt ecosystems, indirectly contributing to broader environmental imbalances.

Keep the Curiosity Alive — Full Exercise Solutions

Q1. Based on a diagram of nested ecological levels, select the wrong statement: (i) A community is larger than a population. (ii) A community is smaller than an ecosystem. (iii) An ecosystem is part of a community.
Solution: (iii) is wrong. It's the reverse — a **community is part of an ecosystem** (an ecosystem = community of living things + their non-living environment), not the other way around.

Q2. If all decomposers suddenly disappeared from a forest ecosystem, what would happen, and why are decomposers essential?
Solution: Dead plants and animals would **pile up without breaking down**, nutrients would stop returning to the soil, and plant growth (and everything depending on it) would decline over time. **Decomposers** (fungi, bacteria) are essential because they break down dead organic matter, recycling nutrients like

nitrogen and carbon back into the soil for producers to use — without them, the nutrient cycle stops.

Q3. A village near Cuddalore, Tamil Nadu, was less affected by the 2004 tsunami than nearby villages, thanks to mangrove forests. Explain why.
Solution: Mangrove forests act as **natural coastal barriers** — their dense root systems slow down and absorb the force of incoming waves and strong winds, while stabilising soil and reducing erosion. This buffering effect reduced the tsunami's impact on the protected village compared to villages without mangrove cover.

Q4. In the food chain Grass → Grasshopper → Frog → Snake, what happens to grasshoppers and snakes if frogs disappear?
Solution: Grasshoppers would likely increase in number, since their main predator (frogs) is gone and predation pressure drops. **Snakes would likely decrease**, since frogs are their food source and would no longer be available. Removing a middle trophic level disrupts both the level below (less predation) and the level above (less food) simultaneously.

Q5. Students noticed fewer butterflies in the school garden this season. What could cause this, and what can students do to attract more?
Solution: Possible causes: **pesticide use** killing caterpillars/larvae, **loss of nectar-rich flowering plants**, increased predators, or reduced plant diversity (monoculture). Steps to help: plant a variety of nectar-rich flowers, avoid pesticides, create sheltered spots, and provide water sources to attract and support butterflies.

Q6. Why can't an ecosystem exist with only producers and no consumers or decomposers?
Solution: Without **consumers**, producer (plant) populations would grow unchecked, leading to overcrowding and die-offs from competition for light, space and nutrients. Without **decomposers**, dead matter would never break down, and nutrients would never cycle back to the soil — the whole system would eventually collapse without both groups doing their jobs.

Q7. Observe two nearby places (e.g. a park and a roadside), list their living and non-living components, and compare the two ecosystems.
Solution: A **park** typically has living components like trees, birds, squirrels and grass, and non-living components like soil, water and sunlight — a relatively rich, designed ecosystem. A **roadside** typically has fewer living things (weeds, some insects) and more disturbed non-living elements (asphalt, dust, exhaust). The key difference: the park supports greater biodiversity with less pollution, while the roadside is a human-altered, more disturbed environment with fewer species.

Q8. Comment on: "Human-made ecosystems like agricultural fields are necessary, but they must be made sustainable."
Solution: This is a reasonable position. Agricultural fields are essential for food production, but common practices like heavy synthetic fertiliser/pesticide use and monoculture (growing a single crop repeatedly) can degrade soil health and reduce biodiversity over time. Sustainable practices — such as organic farming, crop rotation, and reduced chemical inputs — help maintain long-term soil productivity and ecological health while still meeting food needs.

Q9. If the Indian hare population drops due to disease, how would it affect other organisms in the food web?
Solution: Predators of the hare (such as foxes and eagles) would likely see their populations **decrease** due to reduced prey availability. Plants the hare grazed on might initially **increase** in the short term (less grazing pressure), though this could shift the habitat's balance over time. Other organisms not directly connected to the hare in the food web (e.g. deer, if not preyed on by the same predators) would be largely **unaffected** directly. This illustrates how a change at one trophic level ripples both upward (predators) and downward (plants) through a food web.

Hands-On Activities

Activity: Exploring Habitats. Identify two habitats nearby (e.g. a pond and a forest patch) and list their living and non-living components.
Example findings: A **pond** habitat might show fish, aquatic plants and water as key components. A **forest** patch might show trees, grass, birds and soil as key components — each habitat supports a different mix of species suited to its specific conditions.

Activity: Recording Population Counts. Mark a 1m × 1m area in a garden, identify 4 organisms, and count their numbers.
Example table: Grass — 20 individuals; Marigold — 5 individuals; Ants — 10 individuals; Ladybugs — 3 individuals. (Actual counts will vary by location and season — the point of the activity is the counting method, not these specific numbers.)

Activity: Fish, Dragonflies and Pollinators. A pond with fish has more flowering plants nearby than a similar pond without fish. Explain why.
Solution: Fish eat dragonfly larvae, so a pond *with* fish has **fewer adult dragonflies**. Since dragonflies prey on bees and butterflies, fewer dragonflies mean **more surviving pollinators**, which in turn pollinate more flowers, leading to more seed production and more flowering plants nearby. Without fish, dragonfly larvae thrive unchecked, more dragonflies prey on pollinators, and fewer flowers get pollinated — a clear example of an **indirect food-web effect** connecting fish to plant reproduction.

Activity: Classifying Forest Organisms by Diet. Classify organisms in a forest scene as herbivore, carnivore, omnivore, or decomposer.
Example classification: Deer and Horse — **herbivores** (eat grass/leaves). Vulture — **carnivore**/scavenger (eats dead animals). Bengal Fox — **omnivore** (eats both plants and small animals). Shikra (a bird of prey) — **carnivore**. Squirrel — mainly **herbivore** (nuts, seeds). Mouse — **omnivore** (seeds and insects). Mushroom — **decomposer** (breaks down dead matter). Tree — **producer** (makes its own food via photosynthesis).

Activity: Building an Ecological Pyramid. Count millets, mice and eagles in a crop field scene and arrange the counts as a pyramid.
Example data: Millets (producers) — 100; Mice (herbivores) — 20; Eagles (top carnivores) — 2. Arranged with the most abundant at the base and least abundant at the top, this forms a **pyramid shape**: producers are always most numerous, herbivores fewer, and top carnivores fewest — each level in a food chain is called a **trophic level** (from Greek “troph” = food).

Why This Chapter Matters

Understanding food chains, food webs and trophic levels explains why removing even one species from an ecosystem (through disease, hunting, habitat loss, or pesticide use) can cause ripple effects across many other species — a concept that reappears throughout Class 9-10 biology and environmental science, and underlies real conservation and agricultural decisions.

Class 8 Science Chapter 12 – Notes and Extra Questions

Along with these NCERT Solutions, students can also use the Class 8 Science Chapter 12 Extra Questions and Class 8 Science Chapter 12 Revision Notes for quick revision and extra practice.