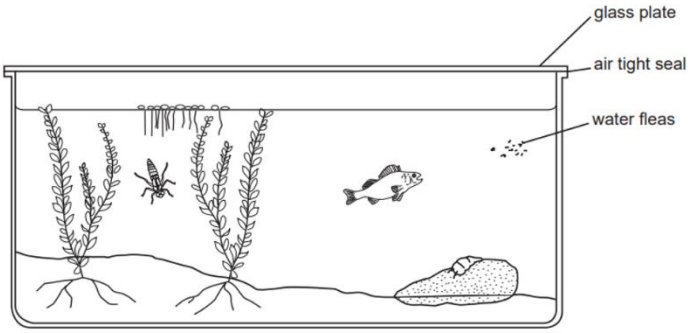
INDIAN SCHOOL AL WADI AL KABIR		
CLASS: VIII	**DEPARTMENT: SCIENCE 2025-26**	**DATE: 27-01-2026**
WORKSHEET NO: 12	**TOPIC: HOW NATURE WORKS IN HARMONY**	**NOTE: A4 FILE FORMAT**
CLASS & SEC:	**NAME OF THE STUDENT:**	**ROLL NO.**

I. OBJECTIVE-TYPE QUESTIONS

1. A population is best defined as:
(a) all living and non-living things in an area
(b) different species living together
(c) members of the same species in a given area and time
(d) all plants in a given habitat

2. Which pair correctly shows biotic and abiotic components?
(a) Soil(biotic) fish (abiotic)
(b) Sunlight(biotic) bacteria(abiotic)
(c) Tree(biotic) sunlight(abiotic)
(d) Frog(abiotic) air(biotic)

3. The given diagram shows a sealed aquarium with aquatic plants and animals. What must be supplied to keep the organisms alive for the longest possible time?



(a) carbon dioxide
(b) light energy
(c) nitrates
(d) oxygen

4. Pond water level drops, and many aquatic plants die from pollution. Which change is most likely next within that ecosystem?

(a) Oxygen in water increases, and fish thrive.
(b) Oxygen in water decreases, and the fish population drops.
(c) Soil moisture rises around the pond.
(d) Decomposers do not disintegrate the waste anymore.

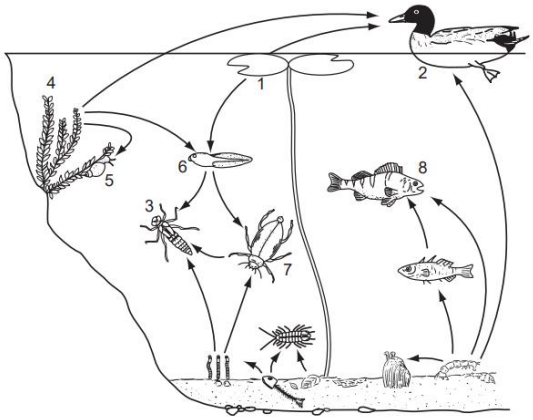
5. In a food chain, which trophic level is occupied by herbivores?

(a) First
(b) Second
(c) Third
(d) Fourth

6. Which farming practice is most aligned with sustaining soil health and ecosystem balance?
(a) Continuous monoculture with heavy synthetic inputs
(b) Diverse crops, organic composts and natural pest control
(c) Increasing pesticide doses to overcome resistance
(d) Maximised irrigation and repeated ploughing

7. The diagram shows a food web in a pond. Choose the option with the numbers that denote the producer, herbivore and the carnivore correctly.

	Producer	Herbivore	Carnivore
(a)	1	8	3
(b)	1	6	7
(c)	4	3	8
(d)	4	2	5



For question numbers 8-10, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below -

(i) Both A and R are true, and R is the correct explanation of the assertion.
(ii) Both A and R are true, but R is not the correct explanation of the assertion.
(iii) A is true but R is false.
(iv) A is false but R is true.

8. **Assertion (A):** An ecosystem stays in balance when interactions among organisms and their environment keeps populations and resources stable.
Reason (R): Organisms in an ecosystem compete for common resources like food, water, physical space or sunlight.

9. **Assertion (A):** Heavy irrigation and repeated ploughing can affect the environment.
Reason (R): It can disturb soil organisms like earthworms and snails, which are important for maintaining ecological balance.

10. **Assertion (A)**: In a food chain, large carnivores (like tigers or vultures) occupy the first

trophic level.

Reason (R): Different organisms living in the same habitat may use the resources in different ways.

II. VERY SHORT ANSWER TYPE QUESTIONS (2M):

1. How is a food chain different from a food web?

[Hint: The interactions between biotic components based on feeding relationships can be represented in the form of a linear chain. This simple sequence showing 'who eats whom' in an ecosystem is called a food chain. A food web is a network of interconnected food chains that demonstrate complex feeding relationships in an ecosystem.]

2. Mention the factors that can cause threats to an ecosystem.

[Hint: Problems like deforestation, overuse of natural resources, the spread of invasive species, unsustainable land use, and pollution are damaging ecosystems in forests, rivers, scrublands, wetlands, grasslands, and coastal areas.]

3. Though synthetic fertilisers have played a vital role in improving crop production, mention their disadvantages.

[Hint: Overuse of synthetic fertilisers may reduce soil fertility by decreasing friendly microorganisms in soil and lowering organic matter (humus), which helps bind soil particles. Without enough humus, soil becomes prone to erosion. Also, it reduces the population of natural predators which ultimately increase the population of pests.]

4. Why are human-made ecosystems made? How are they different from natural ones?

[Hint: Humans have created artificial ecosystems like fish ponds, farms and parks to meet their needs. When well designed, these can help reduce pollution, support biodiversity, and provide recreational spaces for people. Unlike natural ecosystems, these need human care and management.]

5. What is the difference between a population and a community?

[Hint: A population is a group of the same type of organisms in a habitat at a given time, while a community comprises different populations sharing the same habitat. The biotic components of a habitat, such as the plants, animals, and microorganisms, together form the community.]

III. SHORT ANSWER TYPE QUESTIONS (3M):

1. How does the population of fish in a pond affect the seed production in nearby plants?

[Hint: Fish eat dragonfly larvae, so ponds with fish have fewer dragonflies. Dragonflies usually eat flies, bees and butterflies. With fewer dragonflies, more bees, flies, and butterflies were found. These insects help pollinate flowers from nearby areas, moving pollen from one flower to another, which helps plants produce seeds. So, flowers near ponds with fish may produce more seeds than those near ponds without fish.]

2. Decomposers play an important role in recycling nutrients. Explain.
[Hint: Microorganisms like fungi and bacteria break down complex substances in dead plants and animals into simpler ones. This process returns important nutrients to the soil. We can also find tiny insects, such as beetles and flies, on animal droppings like elephant dung, as they help break it down and recycle nutrients back into the environment. This process is called decomposition, and the organisms carrying out the process are called decomposers or saprotrophs. Plants grow in soil, and many of the nutrients in soil come from the decomposition process.]

3. The consequences of polluting a pond may emerge in the form of other environmental issues. How?
[Hint: Many plants in a pond may start dying because of pollution. With fewer plants, less oxygen will be produced in the water, which will lead to a drop in the fish population in that water body. Reduction in fish population will have cascading effects, and there will be less number of consumers in the pond. As a result, insects will increase in number. These insects will spread to nearby farmlands. Then the farmers will be compelled to use pesticides to grow their crops, which may again adversely affect the environment.]

4. Explain the terms mutualism, commensalism and parasitism with examples.
[Hint: Mutualism: The type of symbiotic relationship where two different species interact and both organisms benefit. For example: Honeybees and flowers- Flowers get pollinated, and bees get nectar.

Commensalism: An association between two organisms in which one benefits while the other is not affected. For example: Orchids on trees- Orchids get nutrition, and the tree branch is unaffected.

Parasitism: A relationship between two species of plants or animals in which one organism benefits while the other is harmed. For example: Ticks on the body of dogs- The tick feeds on dog blood, and the dog gets skin irritation.]

5. Give suitable examples for the interaction of biotic and abiotic components in a habitat.

[Hint: Interactions between biotic and abiotic components:
(i) Earthworms live in moist soil.
(ii) Many microbes are present in the pond.

(iii) A fish lays eggs in water

Interaction between two abiotic components:

(i) The day temperature is high due to the bright sunlight.

(ii) Water is evaporating fast due to the sunlight.

(iii)Air current is blowing slowly on the water surface, creating gentle waves.

Interaction among the biotic components:

(i) A frog eats insects.

(ii) Frogs and fish may compete for small insect larvae.

(iii) A fish lays eggs in water near vegetation to protect them from other fish or frogs.]

IV. LONG ANSWER TYPE QUESTIONS (5M):

1. What is an ecosystem? Describe the various interactions of components in an ecosystem. Mention the various benefits of an ecosystem.

[Hint: The biotic components (plants, animals, and microorganisms) and the abiotic components (air, water, soil, sunlight, and temperature) in a habitat interact with each other to form an ecosystem.

Biotic components depend on abiotic components: Sunlight, carbon dioxide, and water are essential for producing food in plants, soil provides medium and essential nutrients for plant growth, air provides oxygen for respiration in plants as well as animals, and water is essential for all living organisms.

Abiotic components depend on biotic components: Plants release oxygen during photosynthesis, roots hold soil in place and prevent erosion, and plants retain soil moisture and help cool the atmosphere.

Humans also benefit from ecosystems. Forests provide fresh air, fertile soil, food, fibres, timber, and medicines. Similarly, aquatic ecosystems provide water and food. Ecosystems also offer aesthetic and recreational value. These benefits and supports our well-being and show how closely nature and humans are connected.]

2. Give an example of a threatened ecosystem. State its importance. What are the various human activities that disrupt the natural ecosystems there?

[Hint: The Sundarbans, located where the Ganges and Brahmaputra Rivers meet between India and Bangladesh, are an example of a threatened ecosystem. The United Nations Educational, Scientific and Cultural Organisation (UNESCO) declared the Sundarbans a World Heritage Site in 1987. The Sundarbans' forests and rivers are home to various flora and fauna, many of which are endangered. The Sundarbans have the largest mangrove forests in the world. The Sundarbans protect us by slowing down strong winds and waves during storms and floods. The trees also absorb carbon dioxide from the air and release oxygen. However, the Sundarbans are under a serious threat. Mangrove trees are being cut for fuelwood and farming. Illegal hunting and overuse of forest resources are a threat to the wildlife living there. Pollution from industrial waste and untreated sewage in rivers is also damaging the water and habitat. These human activities disrupt the natural way ecosystems work.]

V. CASE STUDY- BASED QUESTIONS/PASSAGE-BASED QUESTIONS:

1. The Green Revolution was a period during which technology transfer initiatives resulted in a significant increase in crop yields. In the mid-20th century, the use of tractors, machines, synthetic fertilisers and pesticides helped increase food production. Major milestones in this undertaking were the development of a high-yielding variety of wheat seeds, rice and rust-resistant strains of wheat. However, many of the farming methods adopted then are now considered unsustainable because of the overuse of synthetic chemicals, excessive groundwater extraction, and growing only one type of crop for commercial gain. Overusing pesticides and growing the same type of crop repeatedly on the same land leads to soil degradation. To make farming more sustainable, some farmers are exploring organic and natural farming methods. These aim to reduce the use of synthetic fertilisers and support sustainable farming, with minimal interference in natural ecosystems.

(i)What is monoculture? What are its disadvantages?

(ii) The farming practices adopted during green revolution are now considered unsustainable. Why?

(iii) Mention some of the common sustainable farming practices.

[Hint: (i) Monoculture is the practice of growing one crop species in a field at a time. It can reduce crop diversity and affect pollinators, which are crucial for food production. Growing the same crop year after year reduces the availability of certain nutrients in the soil.
(ii) The overuse of synthetic chemicals, excessive groundwater extraction, and growing only one type of crop for commercial gain affect both the environment and human health.
(iii) Crop rotation, crop diversification, organic farming, agroforestry (growing trees among crops), biological pest control, waste recycling and composting are some of the common sustainable farming practices.]

ANSWERS FOR OBJECTIVE TYPE QUESTIONS 1 - 10

1. (c) members of the same species in a given area and time.

2. (c) Tree(biotic) sunlight(abiotic)

3. (b) light energy

4. (b) Oxygen in water decreases, and the fish population drops.

5. (b) Second

6. (b) Diverse crops, organic composts and natural pest control

7.

(b)	**1**	**6**	**7**

8. (ii) Both A and R are true, but R is not the correct explanation of the assertion.

9. (i) Both A and R are true, and R is the correct explanation of the assertion.

10. (iv) A is false, but R is true.

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