



Primary 7 Integrated Science

Term 3

Theme: Environment

Topic 1/2 – Interdependence of things in the Environment

Learning Outcomes: The learner:

- develops an understanding of the interdependence of things in the environment.
- appreciates the co-existence of things in the environment.

Components of the Environment

The environment is everything that surrounds us.

It is made up of **living things** (plants, animals) and **non-living things** (water, air, soil).

All these components depend on each other to survive.

Importance of components of the Environment

- Plants** – Provide food, oxygen, and shelter.
- Animals** – Provide food, manure, and help in pollination.
- Water bodies** – Supply water for drinking, farming, and home use.
- Air** – Provides oxygen for breathing and carbon dioxide for plants.
- Soils** – Provide nutrients for plants and a home for many animals.

Exercise 1

Name any four components of environment.

Interdependence of Plants and Animals

Plants and animals **cannot live alone**. They depend on each other for **food, air, shelter, pollination, and soil fertility**. This shows the **interdependence of living things in the environment**.

1. Animals depend on plants

- (i) Animals eat plants for food (grass, fruits, leaves).
- (ii) Plants provide oxygen which animals need for breathing.
- (iii) Plants give shelter (trees, bushes) to many animals.

2. Animals depend on other animals

- (i) Some animals eat other animals for food (lion eats zebra, hen eats worms).
- (ii) Animals also depend on others for protection or companionship (e.g., herds).
- (iii) Some bird e.g. egret remove parasites from cow and other grazing animals

3. Plants depend on animals

- (i) Animals provide manure (from droppings) which makes soil fertile for plants.
- (ii) Bees, butterflies, and birds help in pollination so plants can produce seeds.
- (iii) Animals breathe out carbon dioxide which plants use to make food/photosynthesis.

4. Plants depend on other plants

- (i) Tall plants provide shade and protection for smaller plants.
- (ii) Some plants enrich the soil with nutrients (like beans adding nitrogen) which helps other plants grow.
- (iii) Plants growing together can protect each other from wind and soil erosion.
- (iv) Trees provide support for climbing plants

Exercise 2

Give one example of each of the following dependences

- (i) animal on animal
- (ii) plant on animal
- (iii) plant on plants
- (iv) animal on plant

Interdependence of Living and Non-Living Things

Living things (plants and animals) **depend on air, water, and soil** to survive. In return, **non-living things are improved by living things**—for example, plants clean the air, animals enrich the soil, and together they keep the environment balanced.

1. Animals depend on non-living things

- (i) **Air** – Animals breathe in oxygen from the air.
- (ii) **Water** – Animals drink water to stay alive.
- (iii) **Soil** – Provides minerals and a home for animals like worms, burrowing animals and ants.

2. Plants depend on non-living things

- (i) **Air** – Plants take in carbon dioxide to make food (photosynthesis).
- (ii) **Water** – Plants absorb water from the soil to grow.
- (iii) **Soil** – Provides nutrients and support for roots.

3. Non-living things benefit from living things

- (i) **Air** – Plants release oxygen into the air, making it fresh for animals and humans.
- (ii) **Water** – Plants and animals help keep water clean by filtering or cycling it.
- (iii) **Soil** – Animals and plants add organic matter (humus) to the soil, making it fertile.

Exercise 3

Give one example of each of the following dependences

- (v) animal on nonliving things
- (vi) plant on nonliving things
- (vii) nonliving things on plants
- (viii) nonliving things on animals

Food Chain

A **food chain** is the order in which living things feed on each other.

It shows how energy passes from one living thing to another.

Example: **Grass → Grasshopper → Hen → Human**

Exercise 4

Write any food chain with at least three animals starting with grasshopper.

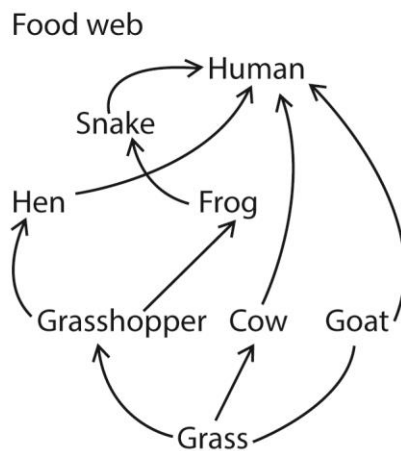
Food Web

A **food web** is made up of many food chains linked together.

It shows how different animals and plants are connected in feeding.

Example:

- Grass can be eaten by a grasshopper, cow, or goat.
- The grasshopper can be eaten by a hen or frog.
- The hen can be eaten by a human, while the frog can be eaten by a snake.
- A snake is eaten by human
- All these links form a **web**.



c) Importance of Food Chains and Food Webs

- Show how energy flows in the environment.
- Help maintain balance in nature.
- Show interdependence of plants and animals.

Conclusion

- A **food chain** shows one path of feeding.
- A **food web** shows many feeding paths linked together.
- Both explain how living things depend on each other for survival.

Producers and Consumers

(a) Producers

Producers are **plants** that make their own food using sunlight, air (carbon dioxide), water, and soil nutrients.

They are the **starting point** of all food chains.

Example: Grass, maize, beans, banana plants.

(b) Consumers

Consumers are **animals and humans** that cannot make their own food.

They depend on plants or other animals for food.

Types of consumers:

- **Herbivores** – eat plants (e.g., goats, cows, rabbits).
- **Carnivores** – eat other animals (e.g., lions, snakes).
- **Omnivores** – eat both plants and animals (e.g., humans, pigs).

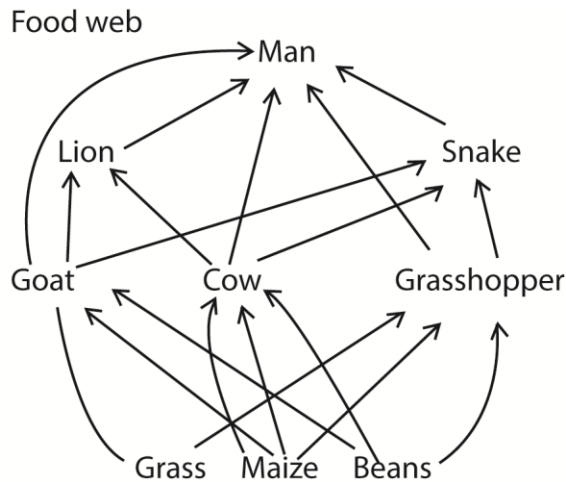
(c) Producers and Consumers in Food Chains

Example: **Grass (Producer) → Grasshopper (Consumer – herbivore) → Hen (Consumer – omnivore) → Human (Consumer – omnivore)**

(d) Producers and Consumers in Food Webs

In a food web, **many producers** (plants) provide food for **many consumers** (herbivores, carnivores, omnivores).

- Example: Grass, maize, and beans (producers) feed goats, cows, and grasshoppers (consumers). These are then eaten by lions, snakes, and humans (consumers).



Conclusion

- (i) Producers are **plants that make food**.
- (ii) Consumers are **animals and humans that eat plants or other animals**.
- (iii) Both are important in food chains and food webs to keep the environment balanced.

Agro-forestry

Agro-forestry is the practice of **growing crops, trees, and rearing animals together on the same piece of land**.

Forms of Agro-forestry

- (i) **Growing crops and trees together** – e.g., maize with banana trees.
- (ii) **Rearing animals and growing crops on the same farm** – e.g., cows grazing while crops are grown nearby.
- (iii) **Rearing animals, growing crops, and trees together** – a mixed system where all three are kept on one farm.

Importance of Agro-forestry

- (i) Provides food (crops, fruits, meat, milk).
- (ii) Provides fuel (firewood) and timber.
- (iii) Improves soil fertility (trees add humus, animals provide manure).
- (iv) Prevents soil erosion (tree roots hold soil).
- (v) Provides shade and shelter for animals and crops.
- (vi) Increases farmers' income.

Care for Trees in Agro-forestry

- (i) Watering young trees.
- (ii) Protecting trees from animals.
- (iii) Removing weeds around trees.
- (iv) Replacing dead trees with new ones.

Proper Harvesting of Trees

- (i) **Pollarding** – cutting branches high above the ground so animals cannot destroy new shoots.
- (ii) **Coppicing** – cutting trees near the ground to allow new shoots to grow from the stump.
- (iii) **Lopping** – cutting off side branches for fodder or firewood without killing the tree.

Conclusion

- (i) Agro-forestry means **growing crops, trees, and rearing animals together**.
- (ii) It is important because it provides food, fuel, timber, manure, and protects the soil.
- (iii) Trees must be cared for and harvested properly to keep the farm productive.

Activity

- (i) Pupils draw a simple farm with crops, trees, and animals.
- (ii) Label the parts and explain how they depend on each other.

Exercise 5

- (i) What is agroforestry?
- (ii) State any two importance of agroforestry.
- (iii) List any two care for agroforestry.

Starting and Managing a Woodlot Project

A woodlot is a **small forest or plantation of trees** grown on a farm, school, or home compound for fuel, timber, shade, and environmental protection.

Starting a Woodlot Project

- (i) **Choose land** – Select a suitable piece of land.
- (ii) **Prepare the land** – Clear weeds and dig holes.
- (iii) **Select tree species** – Choose fast-growing and useful trees (e.g., eucalyptus, avocado, Jack fruit, and mango).

- (iv) **Plant seedlings** – Plant during the rainy season for easy growth.
- (v) **Spacing** – Plant trees at proper distances to avoid overcrowding.

Managing a Woodlot

- (i) **Watering young trees** during dry seasons.
- (ii) **Weeding** around trees to reduce competition.
- (iii) **Protecting trees** from animals and bushfires.
- (iv) **Replacing dead seedlings** with new ones.

Importance of Woodlots

- (i) Provide firewood and timber.
- (ii) Improve soil fertility and prevent erosion.
- (iii) Provide shade and windbreaks.
- (iv) Beautify the environment.
- (v) Source of income when trees are sold.

Conclusion

- (i) A woodlot is a **small forest planted at home or school**.
- (ii) It provides fuel, timber, shade, and income.
- (iii) Trees must be **cared for and harvested properly** to keep the woodlot sustainable.

Exercise 6

- (i) Mention any two activities done when managing a Woodlot.
- (ii) State any two importance of a woodlot.

Record Keeping

Record keeping is the practice of **writing down and storing information** for future use.

Types of Records

- (i) **School records** – registers, report cards, fee books.
- (ii) **Home records** – shopping lists, receipts, family budgets.
- (iii) **Farm records** – crop yields, animal health records, sales of produce.

Importance of Record Keeping

- (i) Helps us **remember important information**.

- (ii) Helps in **planning and decision-making**.
- (iii) Shows **progress and performance** (e.g., in school or farming).
- (iv) Prevents **loss of information**.
- (v) Helps in **accountability and transparency**.

How to Keep Records Properly

- (i) Use **books, files, or computers**.
- (ii) Keep records **neatly and safely**.
- (iii) Update records **regularly**.
- (iv) Store records where they cannot be destroyed by water, fire, or pests.

Conclusion

- (i) Record keeping means **writing down and storing information**.
- (ii) It is important for **remembering, planning, accountability, and progress**.
- (iii) Records must be kept **neatly and safely**.

Exercise 7

- (a) Name any two items recorded on a farm.
- (b) Suggest any two importance of keeping farm records.

Revision questions

1. State any one way in which planting of trees alongside other crops improves the quality of soil.
 - (i) **Leaves rot into humus** → adds nutrients to soil.
 - (ii) **Roots hold soil** → prevent erosion.
 - (iii) **Shade reduces evaporation** → keeps soil moist.
 - (iv) **Deep roots recycle nutrients** → bring minerals up.
 - (v) **Leguminous trees fix nitrogen** → fertilize soil naturally.

2. A farmer has an apiary, a goat unit and a coffee plantation on the same piece of land.
 - (a) State the benefit of the;
 - (i) Apiary to coffee plantation: bees pollinate coffee flowers
 - (ii) A goat unit to coffee plantation: supplies composite manure

 - (b) Mention any one danger of the apiary to the goat unit.

Bees may sting the goats

 - (c) Give any one way in which the farmer can control goats from disturbing the apiary.
 - (i) **Fence the apiary** with strong wire or thorn bushes.
 - (ii) **Tether goats** away from the beehives.
 - (iii) **Provide enough pasture** so goats don't wander near the apiary.
 - (iv) **Use guards or herders** to keep goats away.

3. State any one reason why pruning of trees is important in agroforestry.
 - (i) **Removes weak or diseased branches** → keeps trees healthy.
 - (ii) **Allows more sunlight** → helps crops grow better.
 - (iii) **Reduces competition** → trees and crops share nutrients fairly.
 - (iv) **Improves tree shape and growth** → stronger and more productive trees.

4. (a) Give the meaning of the following terms:

- (i) **Agroforestry:** growing of trees and crops on the same piece of land.
- (ii) **Mixed crops:** is the **growing of two or more different crops on the same piece of land at the same time**. Example: planting **maize and beans together**.

(b) State **two** characteristics of trees suitable for agroforestry.

- (i) **Fast-growing** – provide benefits quickly.
- (ii) **Deep-rooted** – reduce competition with crops.
- (iii) **Nitrogen-fixing** – improve soil fertility (e.g., leguminous trees).
- (iv) **Provide useful products** – timber, firewood, fruits, fodder.
- (v) **Resistant to pests and diseases** – survive longer.
- (vi) **Non-shading or light shade** – allow crops to get enough sunlight.

5. Apart from getting food, give any one other ways in which rabbits benefit from plants.

- (i) **Shelter** – plants provide shade and hiding places.
- (ii) **Protection** – bushes and trees help rabbits hide from predators.

6. How do carnivorous animals get energy from plants?

By eating herbivores that feed directly from plants

7. (a) State the two ways in which animals depend on other animals.

- (i) **Food** – carnivores eat herbivores, and some animals eat smaller ones.
- (ii) **Protection** – some animals live in groups to guard each other.
- (iii) **Cleaning** – birds like ox-peckers remove ticks from cows.
- (iv) **Transport/Help** – some animals carry or guide others (e.g., humans use donkeys, dogs).

(b) Give any two ways in which plants depend on other plants

- (i) **Shade** – tall plants protect smaller ones from strong sun.
- (ii) **Support** – climbing plants use bigger/strong plants for support.
- (iii) **Moisture** – plants growing together help keep soil moist.
- (iv) **Protection** – some plants shield others from wind or heavy rain.
- (v) **Nutrients** – when plants shed leaves, they decompose and enrich the soil for other plants.

8. How are plants important in a food chain?

Produce food

9. (a) Use the living things below to complete the given food chain

Lion. Goat, grass

Grass → Goat → lion

(b) Which one of the living things in the chain is a produce

Plant

(c) What is the source of energy for the producer in the food chain above>

Sunlight

10. Which method of harvesting trees allows shoot to grow from stump?

Coppicing

11. (a) What name is given to a practice of growing crops and trees together on the same piece of land?

Agroforestry

(b) State any two ways in which crops benefit from trees when they grow together.

(i) **Trees provide shades**

(ii) **trees act as weed breaker**

(iii) **leaves from trees form manure**

(iv) **Trees provide support to climbing crops**

(c) Give any one proper method of harvesting trees in the practice named in (a) above

Pollarding/ cropping/selective felling

12. Give any one advantage of pruning trees.

- eases weeding
- reduce competition for light
- Reduces spread of diseases
- for better yield

13. a) Name two natural resources in the environment that enable green plants to make their food.

(i) **Water**

(ii) **Carbon dioxide**

(b) What is the name of the process in (a) above?

Photosynthesis

(c) Which gas is given off during this process?

Oxygen

14. Apart from getting food, give any one other way in which birds benefit from plants.

Building materials

Shelter

15. (a) Give two benefits of planting trees in your school compound

(i) **work as wind breaks**

(ii) **for timber, for fruits, shade, fence, beauty, herbal medicine, study purpose**

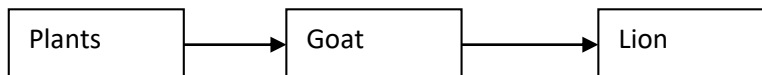
(b) What two things can you do to protect plants in your school compound?

Fencing, watering, mulching, pruning, manuring, spraying, staking, pegging

16. Arrange the following organisms in the correct order of the food chain.

Leaves → Caterpillar → bird → dog

17. The diagram below is of a food chain. Study it and answer the questions that follow.



(a) Name the producer

Plant

(b) Which living organism in the diagram is herbivorous?

Goat

(c) Why is the organism in (b) above herbivorous?

Feeds on plants

18. (a) Name any two part of a plant which provide human beings with food.

(i) **Fruits e.g. mangoes**

(ii) **roots e.g. cassava, carrot**

(iii) **Stem e.g. sugar cane**

- (iv) **Leaves e.g. cabbage**
- (b) Give any two ways in which plants benefits from animals.
- (i) **get carbon dioxide**
 - (ii) **nitrogen from excreta**
 - (iii) **When the animal die add to plant manure**
19. Give any one reason why people plant trees around their houses.
- Trees act as wind breakers**
 - Trees produce fruits**
 - Trees are used for beauty**
 - Trees provide firewood**
 - Trees provide medicine**
20. (a) In the list of objects: rabbit bacteria, sun, pig and plant.
- (i) Name a producer: **plant**
 - (ii) Name a primary consumer. **rabbit**
 - (i) What is the role of bacteria from the above list?
They are decomposers
- (a) What is the difference between a primary consumer and a secondary consumer?
Primary consumer feed directly on plants while secondary consumer feed on primary consumers

Thank You

Dr. Bbosa Science