

# NCERT CBSE Solutions for Class 10 Science Chapter 15

## Our Environment

### Back of Chapter questions

1. Which of the following groups contain only biodegradable items?
  - (A) Grass, flowers, and leather
  - (B) Grass, wood, and plastic
  - (C) Fruit-peels, cake, and lime juice
  - (D) Cake, wood, and grass

**Solution:** (A), (C) and (D)

The biodegradable substances are those which can be broken down by biological processes, such as plant and animal matter. The items A, C and D in the groups are all derived from plants or animals and hence are broken down by biological agents. Thus, these are biodegradable substances. Group B contains plastics which are non-biodegradable.

2. Which of the following constitute a food-chain?
  - (A) Grass, wheat, and mango
  - (B) Grass, goat, and human
  - (C) Goat, cow, and elephant
  - (D) Grass, fish, and goat

**Solution:** (B)

A food chain should have producers, herbivores, and carnivores. The grass is a producer (makes food for itself), a goat is a herbivore (feeds on grass) and humans can act as carnivores by feeding on the goat. Hence, all of these can form a single food chain. Rest of the groups have at least one of these members (producers, herbivores, and carnivores) missing, hence they cannot constitute a food chain.

3. Which of the following are environmentally-friendly practices?
  - (A) Carrying cloth-bags to put purchases while shopping
  - (B) Switching off unnecessary lights and fans
  - (C) Walking to school instead of getting your mother to drop you on her scooter

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(D) All of the above

**Solution:** (D)

All of the above practices described help the environment. Use of cloth bags will reduce the non-biodegradable waste. Saving of electricity and walking saves energy and hence reduces the pollution.

4. What will happen if we kill all the organisms at one trophic level?

**Solution:**

Loss of organism of any trophic level will impact the other trophic levels, indirectly or directly. It will lead to an imbalance in the ecosystem.

Let us consider the following food chain with three trophic levels:

Grass → Deer → Tiger

Here,

First Trophic Level is occupied by 'Producers' that is grass.

Second Trophic Level is occupied by 'Primary Consumer' that is deer.

Third Trophic Level is occupied by 'Secondary Consumer' that is a tiger.

**Case-I-**

If all producers die (Producer missing)

If there is no grass, deer will die of hunger. If all deer die, all tigers will also die due to the unavailability of their food (deer).

**Case-II-**

If the primary consumers are missing

If the herbivore is missing, it will affect the population of both carnivores and producers. The tiger population will decrease as their food, that is, deer is no longer available. The population of producers or grass will increase as it will not be eaten up by deer (herbivore).

**Case-III-**

If the secondary consumers are missing

If there are no tigers, the population of deer or primary consumers will rapidly increase, causing a reduction in grass or producer population.

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5. Will the impact of removing all the organisms in a trophic level be different for different trophic levels? Can the organisms of any trophic level be removed without causing any damage to the ecosystem?

**Solution:**

True, the impact of removing the organisms from a trophic level varies for different trophic levels. For example, removing all producers would put all consumers population at risk. However, removing all primary consumers positively impacts the producer population and negatively impacts the secondary consumer population.

Removing all organisms of a trophic level creates an imbalance in the ecosystem. Hence, organisms of a trophic level cannot be removed as it will be damaging to the ecosystem.

6. What is the biological magnification? Will the levels of this magnification be different at different levels of the ecosystem?

**Solution:**

“Biological magnification” or biomagnification is the process of increase in the amount of some toxic, nonbiodegradable substances such as pesticides in successive trophic levels of a food chain. It results in accumulation of these toxins in topmost trophic level. The pesticides can enter into various food chains and eventually enter our bodies. The maximum concentration of these chemicals gets accumulated in human bodies as we form the topmost trophic level.

Thus, the level of biological magnification differs at different trophic levels. The concentration of pesticides increases as it moves along the food chain, from one trophic level to another. The concentration of the pesticide at the topmost trophic level is maximum.

7. What are the problems caused by the non-biodegradable wastes that we generate?

**Solution:**

The non-biodegradable wastes cannot be degraded by the action of biological agents such as microorganisms. They create environmental issues in the following ways-

- a. They persist in the environment and cause pollution.
- b. They can harm and even kill organisms if consumed.
- c. They enter the food chain and cause biomagnification.

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8. If all the waste we generate is biodegradable, will this have no impact on the environment?

**Solution:**

Even biodegradable wastes, if generated in large quantities, can impact the environment. The biodegradation of substances is a slow process and thus requires time to clean up the waste. Hence, we must limit the amount of waste that we generate and encourage recycling and reuse.

9. Why is damage to the ozone layer a cause for concern? What steps are being taken to limit this damage?

**Solution:**

Ozone layer protects the atmosphere from harmful *UV* radiation from the sun. Ozone depletion has created ozone holes through which *UV* radiation (in the range of 290 – 320 *nm*) can easily pass through and reach the earth's atmosphere. The increased *UV* radiation has increased the threat of skin cancer. Chlorofluorocarbon (CFC), a synthetic chemical, is responsible for ozone depletion. CFCs were used as refrigerants during the 1980s and in fire extinguishers. In an attempt to protect the ozone layer, in 1987, under the United Nations Environment Programme (UNEP), CFC production and use were banned globally.

*In between questions*

1. What are trophic levels? Give an example of a food chain and state the different trophic levels in it.

**Solution:**

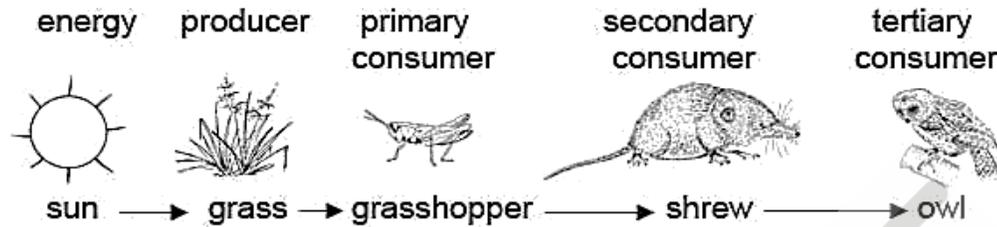
Various links or steps in a food chain at which the transfer of food and energy takes place are called “trophic levels”.

The producers are the first trophic level as they manufacture food.

The primary consumers feeding on producers are the second trophic level.

The secondary consumers form the third, and the tertiary consumers form the fourth trophic level.

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**Figure:** Trophic levels in a food chain

In the above figure, grass is the producer which is eaten by the grasshopper known as primary consumer. Then the grasshopper is eaten by shrew, secondary consumer and lastly shrew eaten up by owl, tertiary consumer.

2. What is the role of decomposers in the ecosystem?

**Solution:**

Role of decomposers in the ecosystem:

- (i) They clean the environment.
- (ii) They decompose biodegradable substances into useful substances.
- (iii) They release nutrients into the soil by decomposing dead and decaying matter, thus making the soil fertile.
- (iv) They maintain the nutrient pool by returning back the nutrients in the pool.

3. Why are some substances biodegradable and non-biodegradable?

**Solution:**

All the substances are classified as biodegradable and non-biodegradable as some substances can be decomposed by microorganisms and some cannot.

Substances that are broken down into simple soluble forms are called biodegradable substances and the substances that are not decomposed by microorganisms into harmless substances are called nonbiodegradable substances.

4. Give any two ways in which biodegradable substances would affect the environment.

**Solution:**

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The biodegradable substances would also affect the environment:

- (i) They may produce foul smell during the decomposition process.
- (ii) They may produce harmful gases such as ammonia, methane, carbon dioxide.

5. Give any two ways in which non-biodegradable substances would affect the environment.

**Solution:**

The non-biodegradable substances can affect the environment in the following ways:

- (i) Substances like DDT, BHC enter the food chain and cause biomagnification.
- (ii) They cause pollution.
- (iii) They also kill useful microorganisms.

6. What is ozone and how does it affect any ecosystem?

**Solution:**

Ozone ( $O_3$ ) is a triatomic molecule, made up of three atoms of oxygen.

Ozone ( $O_3$ ) forms a layer in the upper atmosphere. It is very essential for this planet as it shields the surface of the earth from ultraviolet radiation (*UV*) coming from the sun. These radiations are very harmful causing skin cancer and cataracts in humans. It also causes harm to the crops.

7. How can you help in reducing the problem of waste disposal? Give any two methods.

**Solution:**

The following measures should be taken to reduce the waste disposal:

- (i) By separating the biodegradable substances from non-biodegradable substances.
- (ii) By reducing, reusing and recycling the non-biodegradable substances.

