



- Biosphere:** Includes all places on the planet where living organisms can survive. The Biosphere is referred to as a layer of life.
- Ecology:** The scientific study of the interactions between organisms and their environment
- Paradigm:** The way that humans view the world
- Paradigm shift:** Changes in paradigms.
Examples:
Humans no longer regard the Earth as the centre of the universe.
Humans now recognize that the Earth is a sphere rather than flat.
- Sustainability:** The ability to maintain without changing or losing the ability to survive. This represents a new paradigm shift.

e.g. As humans, we hope that the earth and world can maintain what we need so that both the present and future generations on this earth will be able to survive.
- Ecosystem:** refers the network of interactions that links the living and the non-living things in an environment.

An Ecosystem can be studied by breaking it into two parts:

- 1) Biotic factors:** refers to living or dead parts of the environment.
Examples: plants, animals, and micro-organisms
- 2) Abiotic factors:** refers to the non-living parts of the environment.
Examples. air, water, soil, sunlight, temperature and landscape.
- Symbiosis** refers to a relationship between two species that may benefit one or both partners. They depend on the other for:
- 1) Food 2) Shelter 3) Protection 4) Transportation

There are three different types of symbiotic relationship:

- 1) **Commensalism** is a relationship in which one species benefits and the other neither benefits nor is harmed. (free loader).
- 2) **Mutualism** is a relationship between two organisms in which both benefit is called Mutualism (The equity relationship)
- 3) **Parasitism** is a relationship in which one species benefits and the other is harmed, although not usually killed. The partner that benefits is called the parasite, and the other partner is called the host.

Predator: is an animal that hunts and seizes other animals for food

Prey: is an organism that is hunted and eaten by the predator

1. Which branch of biology studies the interactions among organisms and their environment?
 - (A) Botany
 - (B) Ecology
 - (C) Genetics
 - (D) Meteorology

2. Which of the following refers to “a way of viewing or thinking about the world and how it works”?
 - (A) Abiotic
 - (B) Biotic
 - (C) Ecology
 - (D) Paradigm

3. Which of the following is an example of a paradigm shift for the Newfoundland Fishery?
 - (A) There is unlimited number of fish in the ocean.
 - (B) Fish is a resource that can be used by human without consequence.
 - (C) There are a limited amount of fish in the ocean and it need to be managed for future generations.
 - (D) There should be no quotes on fish stocks and everybody has a right to fish.

4. Which best describes sustainability?
 - (A) Maximum use of a resource, without using too much
 - (B) Using a resource such that the use equals the replacement
 - (C) Not using any non-renewable resources
 - (D) Using resources until they are exhausted

5. Which of the following is not characteristic of a sustainable society?
 - (A) Relies heavily on fossil fuels
 - (B) Recycles whenever possible
 - (C) Protects biological species from extinction
 - (D) Practices resource conservation

6. Which statement best describes a closed system?
 - (A) Energy is being constantly being recycled.
 - (B) No new resources are added, except for energy from the sun.
 - (C) There is a balance between resources added to the system and resources leaving the system.
 - (D) It is important to conserve resources, as they are constantly being lost from the system.

7. Which of the following is the source of all the energy used by living things?
 - (A) Biosphere
 - (B) Ground
 - (C) Sun
 - (D) Ecosystem

8. The interaction of all living things with the non-living factors in a given area powered by a flow of energy is called
 - (A) Sustainability
 - (B) Ecosystem
 - (C) Abiotic factors
 - (D) Biodiversity

9. Which of the following is an example of a natural ecosystem?
- (A) Agricultural Crop
 - (B) Forest
 - (C) Prairies
 - (D) Both b and c
10. The non-living factors in an ecosystem are called
- (A) Biotic factors
 - (B) Abiotic factors
 - (C) Biodiversity
 - (D) Limiting factors
11. Which is an example of a biotic factor that affects the size of a population in a specific ecosystem?
- (A) Average temperature
 - (B) Amount and kinds of soil minerals
 - (C) Concentration of oxygen
 - (D) Number and kinds of predators
12. Which is the best example of a biotic interaction?
- (A) Plants grow more slowly in winter than in summer.
 - (B) Fish move to deeper, cooler water during summer.
 - (C) Sea birds often compete for nesting space.
 - (D) Wind often causes trees to grow very short.
13. Which of the following statements is true?
- (A) Symbiosis refers to different organisms living together.
 - (B) Members of a symbiotic relationship cannot live without each other.
 - (C) Symbiosis refers to different organisms living together benefiting from each other.
 - (D) A parasite is not in a symbiosis with its host.
14. Which relationship is an example of commensalism?
- (A) Bacteria in the human intestine break down cellulose and gain food and shelter.
 - (B) Old man's beard is growing on and weakening fir and spruce trees.
 - (C) The bumble bee obtains nectar from the clover flower which in turn is cross-pollinated.
 - (D) The small remora rides on the back of a shark and eats the leftovers from the shark's meal.
15. Flowers provide insects with nectar whereas insects help flowers to reproduce sexually. This relationship is an example of ...
- (A) Parasitism
 - (B) Mutualism
 - (C) Commensalism
 - (D) Predation
16. A symbiotic relationship in which one organism benefits and the other is unaffected is called:
- (A) Commensalism
 - (B) Mutualism
 - (C) Parasitism
 - (D) Predation

17. In Newfoundland waters there is a close ecological relationship between cod and capelin. This relationship is best described as..
- (A) Intraspecific competition
 - (B) Predator-prey relationship
 - (C) Symbiotic relationship
 - (D) Abiotic relationship
18. Leeches often attach to human swimmers. They work their way through the skin to feed on the person's body fluids. A leech will stay attached to a person as long as it possibly can. This is an example of
- (A) Commensalism
 - (B) Mutualism
 - (C) Parasitism
 - (D) Predation
19. A bird eats a worm. Which of the following is the predator?
- (A) The worm
 - (B) The bird
 - (C) Both the bird and the worm
 - (D) Neither the bird nor the worm
20. Which of the following is NOT an example of a symbiotic relationship?
- (A) Mother bear caring for her cub
 - (B) Worm living in a cow's intestine
 - (C) Crocodile gets a teeth cleaning by letting a bird eat from its mouth
 - (D) A lichen is a combination of fungus and algae that lives on the sides of trees
21. The harmed species in a parasitic relationship is called:
- (A) Host
 - (B) Parasite
 - (C) Prey
 - (D) Predator

1. **A.** What is a paradigm shift?

B. Use a resource in Newfoundland to provide an example of a paradigm shift?

2. What is Sustainable development?

3. Explain why each of the following is or is not a sustainable practice.

A. Taking oil from the grand banks of Newfoundland.

B. Establishing an open pit diamond mine in the far north (tundra).

C. Replanting trees in a forest clear-cut.

D. Catching more fish each year than are reproduced.

4. **A.** Distinguish between the terms biotic and abiotic.

B. List four biotic and abiotic factor in a lake ecosystem

5. Name symbiotic relationship in each of the situations given below. Explain your answer.

A. Protozoans digest the wood that termites eat while the termites provide them with food.

B. A tape worm lives inside and absorbing nutrients from a dog.

C. The remora is a sucker-fish that attaches itself to sharks or other larger fish. The sucker-fish is small and does not injure the shark, but uses the shark for protection and lives on the scraps of the shark's prey
