

Junior Secondary Ecosystem Comprehension Activity

Core alignment to Australian Curriculum:

Year 7

Biological Sciences

- Interactions between organisms, including the effects of human activities can be represented by food chains and food webs.

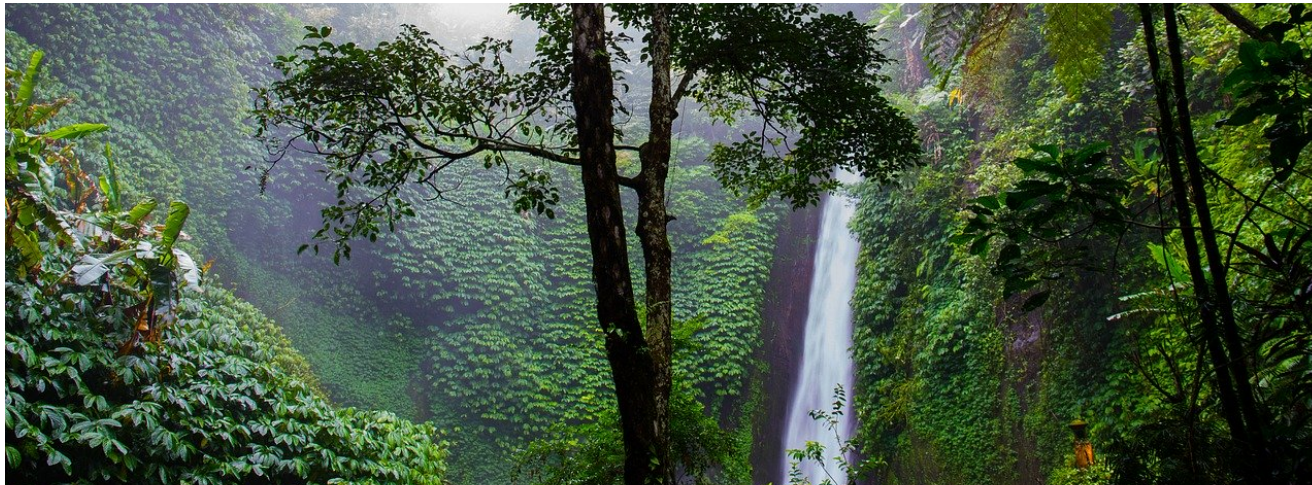
Year 9

Biological Sciences

- Ecosystems consist of communities of interdependent organisms and abiotic components of the environment; matter and energy flow through these systems.

Overview:

Within an ecosystem, all living organisms occupy certain roles based on how they access energy for survival. The relationships these organisms have with one another and the non-living parts of their environment shape and define an ecosystem. Use the following information about the roles and influence of various living (biotic) organisms and non-living (abiotic) components in an ecosystem to complete the flow chart that follows.



Reading:

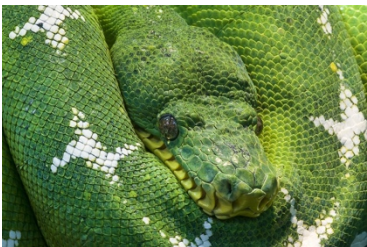


Plants

The majority of plants obtain energy from the sun through photosynthesis. Because they are able to create energy using only abiotic factors in the environment, it is said that they are producers. In addition to using solar energy, plants take up nutrients from the soil. These nutrients are products from decomposers breaking down dead animals and plants. While most plants, such as grass and ferns, receive adequate energy from these sources, some plants are consumers as well as producers.

Herbivores

After plants harness and store the sun's energy, this energy is passed on to those organisms that eat them. The majority of animals do not have the ability to directly process the sun's energy to survive. Herbivores are consumers that require a diet of plant material to get their energy. Not all herbivores eat obvious plant materials like cows with grass. Some, like aquatic snails or sea cucumbers live on algae that humans might not even be able to see.



Carnivores

While some animals can live off plants which store the sun's energy, others require a diet consisting of herbivores or other carnivores to access the energy provided by the sun. However, in the process of feeding on other animals, many organisms, like parrot fish, consume plant material as well and, therefore, are not true carnivores. Animals like penguins, cats and seals are likely to have an all-meat diet.



Death

Some carnivores aren't able to receive enough nutrition from hunting prey, especially since the act of hunting uses up a lot of energy. Therefore, many animals, like cockroaches, hyenas and vultures scavenge to find dead animals for food. Scavengers like maggots and crows help to break down dead organisms. However, only decomposers like fungi and bacteria can break down organisms into such simple substances that they can dissolve in water, soak into the soil and be released as gasses into the air.



Water, Soil, Air

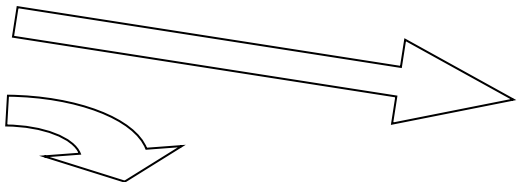
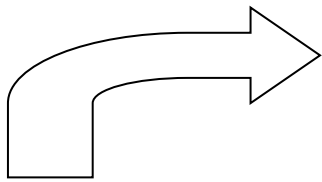
When animals are broken down by decomposers, gasses like carbon dioxide are released. Additionally, very basic substances such as nutrients are the end products of the work of decomposers. These nutrients disperse through a system by dissolving in water and soaking into the soil. All organisms on Earth are carbon based, which means everything consists of carbon molecules and requires them for survival. The main substances that organisms need to function that contain carbon are carbohydrates, fats and proteins.

Bacteria and Fungi

Bacteria and fungi both play critical roles in the ecosystem since they receive their energy by decomposing all dead organic matter. Decomposers recycle nutrients back into the ecosystem. Not all decomposers are beneficial for other organisms though. Tetanus, food poisoning and pneumonia are all caused by bacteria. While fungi is readily observable with the naked eye, bacteria are microscopic and can be from 0.02 mm in size to as small as 0.0009 mm. Such tiny organisms consist only of a single cell and therefore have no reproductive organs. They reproduce by splitting in 2.



Activity:



PLANTS

- 1 From which source do green plants get energy? _____

- 2 Is grass a producer or consumer? _____
- 3 How do plants 'use' the bodies of dead animals and plants?

HERBIVORES

- 1 How do grass eating animals get energy? _____

- 2 Define herbivore _____

- 3 What do snails in an aquarium eat? _____
- 4 List four examples of herbivores

DEATH

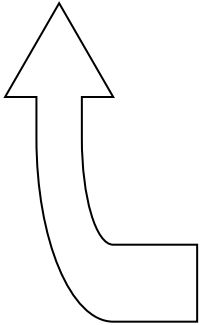
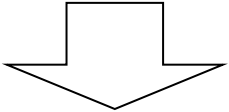
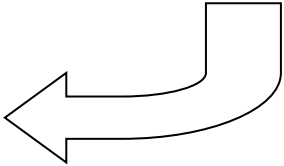
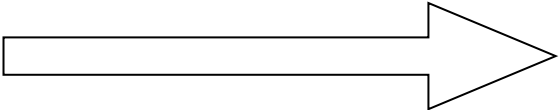
- 1 Name four scavengers?

- 2 When an animal dies, its body gradually 'disappears'. Where does it go? _____

CARNIVORES

- 1 How do carnivores get their energy? _____

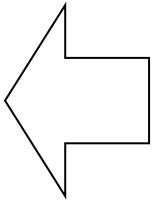
- 2 Give three examples of true carnivores? _____



WATER, SOIL, AIR

- 1 What is the main gas given off when animals decompose? _____
- 2 How do simple substances produced by decomposers move through the soil? _____

- 3 In which types of substances is carbon found in the bodies of both animals and plants? _____



BACTERIA AND FUNGI

- 1 Write a definition for decomposers. _____

- 2 What is the size range for bacteria?
From _____ to _____
- 3 How do most bacteria reproduce? _____

- 4 Name a possibly fatal disease caused by bacteria.



Extension:

In addition to predator/prey relationships, there are many other relationships that can exist within an ecosystem. Conduct research to define each of the following types of relationships and provide an example for each.

Parasitism:

Commensalism:

Pollination:

Mutualism:

Competition:

Disease:

