Ecology

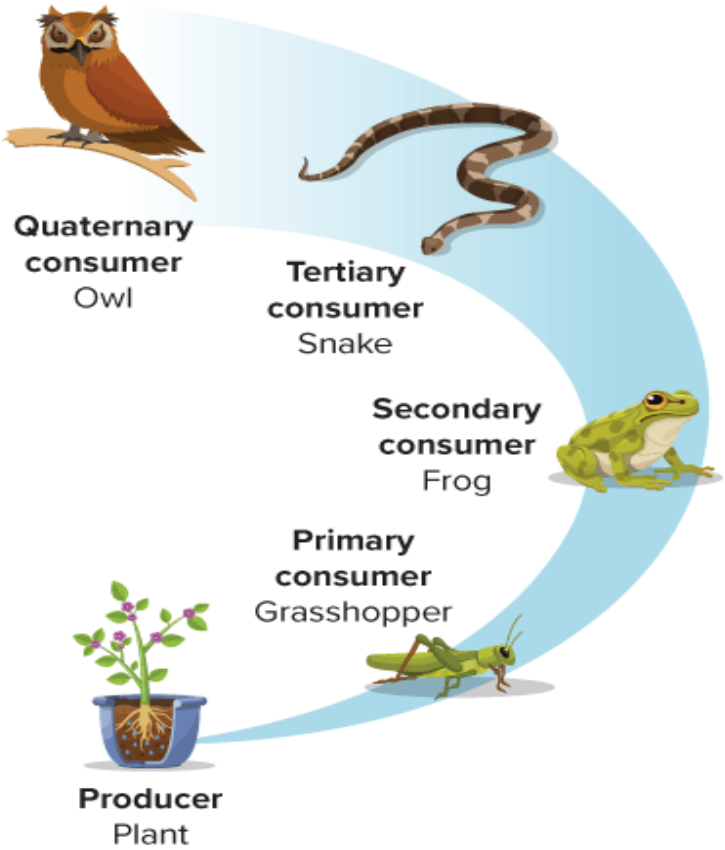
Basic Concept:

1. **Biodiversity:** is a measure of the variety of living organisms within a particular habitat, ecosystem, biome, or all over Earth.
2. **Habitat: it** is an area where one or more organisms live. For example, a fish could have a pond as its habitat.
3. **Population: it** is all of the organisms of the same species in a certain area at the same time.
4. **Community: it** refers to all of the populations present inside a single habitat. For example, a pond might have populations of birds, toads, fish and insects.
5. **Ecosystem: it** is the interaction of the community with all of the abiotic and biotic features in the environment.
6. **Abiotic factors: they** are non-living factors like air, water etc
7. **Botic factors: they** are living factors.

Trophic Levels

- There are different levels of organisation in an organism. Different types of organisms fit into the ecosystem in different ways.
- **top to bottom:** There is a food chain in ecosystems. This consists of **producers, primary consumers, secondary consumers** and **tertiary consumers.** These are known as **trophic levels**.

    1. **Producers:** Producers provide energy to the ecosystem by photosynthesising to produce food. They are general algae and plants.
    2. **Primary consumers:** Primary consumers are herbivores. These are organisms that eat only plants. Examples include deer and cows.
    3. **Secondary consumers:** Secondary consumers get their energy from primary consumers. Therefore, organisms at this level of organisation are called carnivores. These types of organisms eat only animals.
    4. **Tertiary consumers:** Tertiary consumers eat the secondary consumers. Organisms at this trophic level are also carnivores.
    5. **Decomposers:** they eat all of the above and break down organic matter after death. They do this by secreting enzymes into the environment. Soluble food molecule then diffuse into the decomposer organism.Bacteria are an example of decomposers.



Interdependence

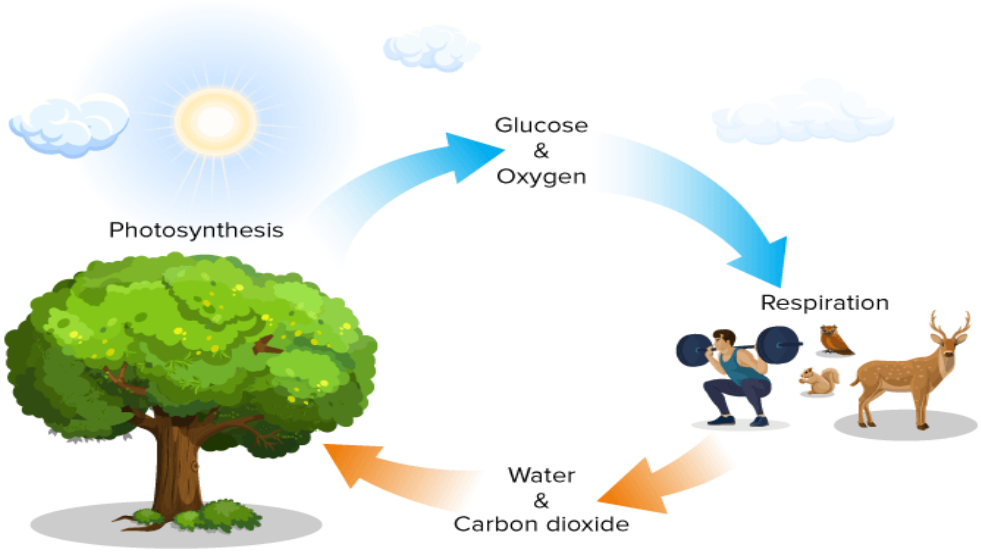
- All organisms interact with one another in various ways. The rise or fall in the population of one organism will affect other organisms in the ecosystem. For example

Grass → Grasshopper → Bird

- The grasshopper interacts with both the grass it consumes and the bird that preys on it.

- If the population of birds that prey on the grasshopper declines, this will increase the population of grasshoppers. As a result, the quantity of grass will decrease, because more grasshoppers consume it.

- However, in reality, these relationships are more complicated. The grasshopper will likely have other predators and more sources of food. This complexity means that a change in the ecosystem can be difficult to predict. However, even small changes to an ecosystem can lead to significant consequences. Species within a community rely on each other, a relationship known as **interdependence as shown in diagram**



- It may be 2 types of interdependence

1. Mutualism

2. Parasitism

1. **Mutualism: it** is the relationship between 2 organisms where both are gaining something. For example, flowers and bees have a mutualistic relationship as bees can get food whilst helping flowers reproduce by spreading their pollen.
2. **Parasitism: it** involves only parasites gaining something – the hosts don't gain anything. For example, flees can feed on animals' blood but they don't give the animal anything in return.

Competition

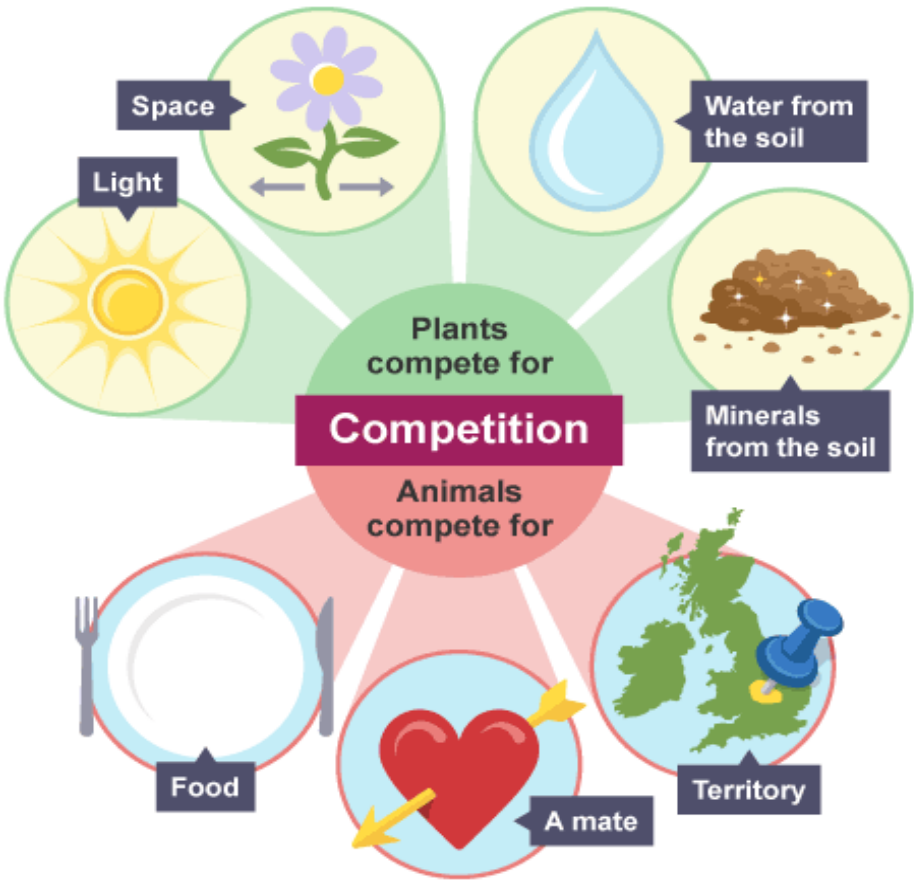
- Competition is one of the most important processes in an ecosystem. To survive and reproduce, there are certain resources organisms need to compete for. For animals, this includes food, water, mates and territory. In contrast, plants compete for light, water, space and mineral ions.

- An organism that has more resources is more likely to survive and reproduce.

- Plants will compete with other plants for **nutrients, space, light, water** and **minerals** at the producer level. Animals will compete for **territory**, **mates** and **food**.

- **The best adapted organisms will outcompete the others.** Organisms with better adaptations will **outcompete** the others, therefore will survive and have more offspring.

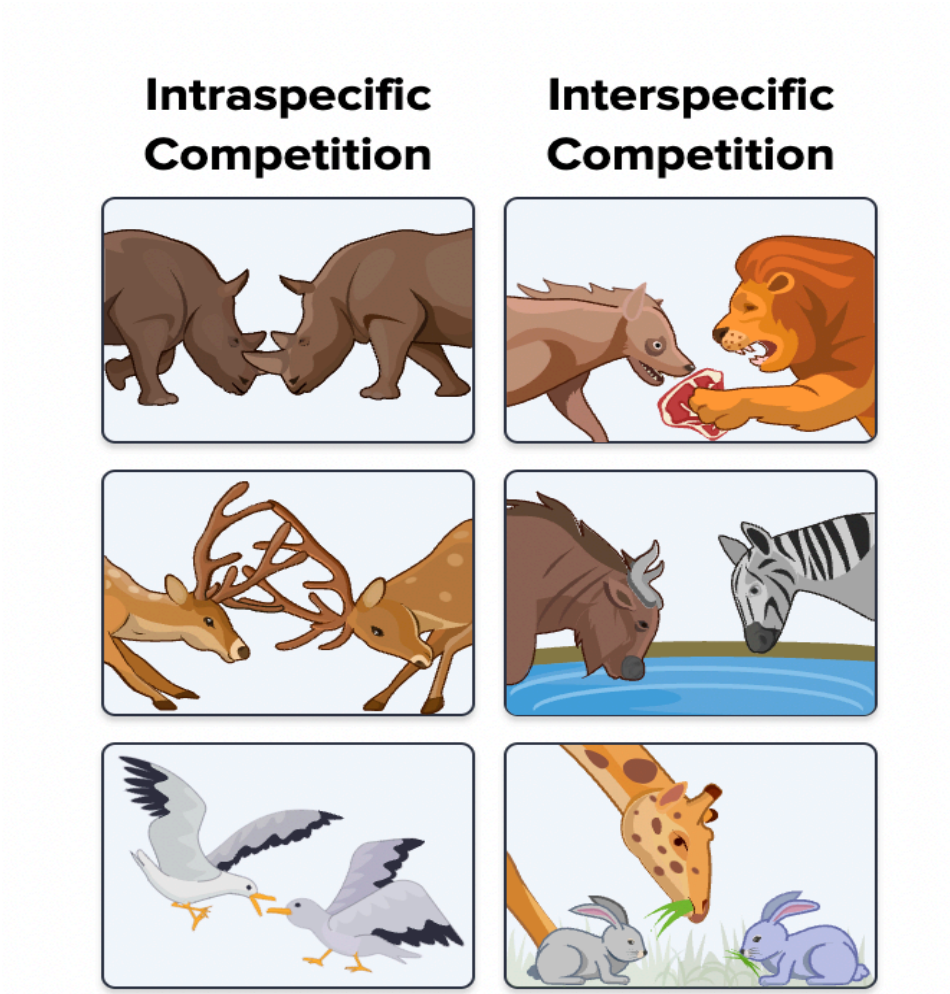
- **Stable communities are the peak of an ecosystem.** In stable ecosystems, the size of the community stays **constant** at all times. This occurs in the above describe ecosystem of the fruits, bats and eagles. In such ecosystems, even the environmental factors, such as light and minerals are **balanced**.



- There are two types of competition:

  - **Interspecific competition** – The competition between individuals of different species.

  - **Intraspecific competition** – The competition between individuals from the same species.


Intraspecific Competition
Interspecific Competition