Leaving Certificate Biology

# Unit 1

# Advanced Ecology

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## Ecological Relationships

- Every organisms must obtain a good supply of food in order to survive.
- In their quest to find food they will encounter other organisms.
- Some will benefit them, others will harm them!
- There are four major types of interaction:
- Competition, Parasitism, Symbiosis and Predation.

## Competition

- Competition is the struggle between individuals for essential resources.
- Adult numbers tend to remain the same within a population despite there being new offspring produced.
- There are a number of types of competition
- These are Contest Competition and Scramble Competition.
- Animals and Plants will try to avoid competition by adapting to their environments, which leads to evolution.

## Types of Competition

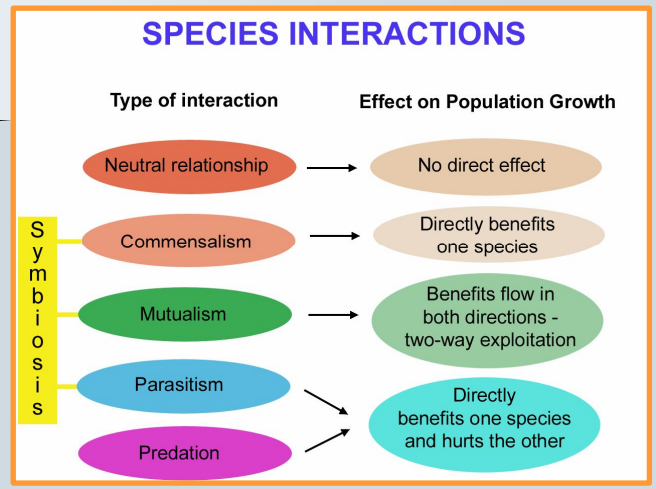
- Contest competition is the active interference by one individual to limit the supply of another.
- This can be observed by competition between species (for food) or within species (for mates)
- Scramble competition is non-confrontational behaviour which leads to all competing members of a community getting an equal share.
- In times of plenty population soars, but drops in harse times.

## Parasitism

- A parasite is an organism that lives with and feeds off another organism causing it harm.
- There can be endoparasites and ectoparasites.
- Examples:
- Lice on hawks, sparrows or humans!
- Greenfly on plants.
- Barnacle on crabs.
- Liver fluke in sheep or cattle.
- Tape worms in humans.

## Symbiosis

- Symbiosis is an intimate relationship between two organisms of different species living together and mutually benefiting.
- Commensalism is an example of symbiosis where one organisms benefits but the other is not harmed. (Like a parasite but not harmed)
- Lichens, mosses or ferns growing on tree bark is an example.
- Lichens themselves are a symbiotic relationship between a blue – green algae (cyanobacteria) and a fungus.




## Predation

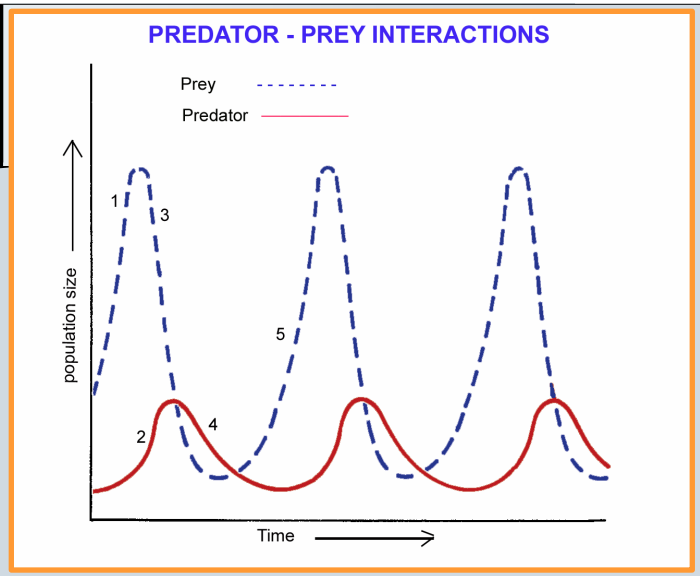
- A predator is an animal that hunts and kills another animal for food.
- Predation is the killing of one animal by another.
- Predation is an essential element in a balanced ecosystem.
- It also plays a significant role in evolution.
- Examples of predators include a wolf, lion or a hawk.

## Adaptations

- In order to survive competition animals adapt to their environment.
- Predators adapt by:
  - Changing fur colour for camouflage (foxes)
  - Hawks have long distance eye sight.
  - Hedgehogs have excellent night vision.
- Prey adapts by:
  - Developing spines to protect itself (hedgehogs)
  - Colour camouflage in caterpillars.
  - Rabbits live in burrows, away from predators.

## Population Dynamics

- Population dynamics is a study involved in the change of population over time.
- One aspect we study is the relationship between predator and prey.
- If we consider that predator numbers increased, then prey numbers should fall.
- If prey numbers fall too low this will affect the predator numbers.
- But when the predator number decline, this can again lead to an increase in prey numbers.
- So the population numbers don't remain constant, they flow up and down.




## Population Dynamics

- Other factors that affect population numbers are:
- Food availability.
- Concealment (behaviour patterns)
- Migration of prey.
- Human interaction.

# Human Population

- Human population is approx 6 billion today.
- Every day it increases by 2 million people!!!
- At present rates of increase, in 600 years there will only be standing room on earth!
- Factors that affect human population are:
- War
- Famine
- Contrception
- Disease
- Progression in Medical Science