

## Science V9/S4: Symbiotic Relationships

All life on earth develops through interactions with other living and nonliving things. Symbiotic relationships occur when multiple species live together in one ecosystem.

Symbiotic relationships exist between two individuals that usually benefit from each other. Two individuals in a symbiotic relationship are called symbionts. If one is much larger than the other, the largest is called the host and the smallest a symbiont. Usually, life for both organisms is improved from these relationships.

However, not all symbiotic relations are beneficial for both the host and symbiont. Symbiotic relationships can be classified into 3 groups: mutualism, commensalism, and parasitism. Mutualistic relationships are helpful for both species. Commensalistic relationships are helpful for one species while not harming the other. Parasitism is used to describe relationships where one species benefits and the other suffers.

When a symbiont lives inside of the host's cells, it is called endosymbiosis. When the symbiont exists on the outside of the host's cells, it is called ectosymbiosis.

These relationships can further be classified as optional or mandatory. If a symbiont needs the relationship in order to survive, it is mandatory. If neither symbiont needs the relationship to survive, it is optional.

### Symbiotic Relationships



Relationships of different species that live together.

### Mutualism



Bees take nectar.  
Flowers are pollinated.

### Commensalism



Barnacles travel on whales.  
Whales are unharmed.

### Parasitism



Head lice live on the host's scalp, eating skin cells.

**Mutualism** - Relationships that are helpful for both species.



**Host:** Crocodile

**Symbiont:** Egyptian Plover

**Relationship:** The Egyptian Plover cleans the crocodile's teeth by eating the food stuck in between each tooth.

**Benefits:** The crocodile avoids tooth infections, and the plover receives an easy meal.

**Harms:** None

**Commensalism** - Relationships that are helpful for one species but don't harm the other.



**Host:** Shark

**Symbiont:** Remora

**Relationship:** Remora fish attach themselves to the shark's body. The fish eat bacteria off the sharks and benefit from their natural protection.

**Benefits:** The remora fish travel, are protected and eat.

**Harms:** None

**Parasitism** - Relationships that benefit one species while the other suffers.



**Host:** Grasses

**Symbiont:** Love Vine

**Relationship:** The love vine is a parasitic plant that attacks grasses. It has projections that attach to the grass. The love vine can suck nutrients and hydration from the plant, eventually killing it.

**Benefits:** Love vine survives from what the grasses give it.

**Harms:** The grasses die.