

12.4.4 – Interdependence of organisms – Review Sheet

- Symbiosis – The relationship between different species living in close association with one another.
- Parasite – An organism that obtains its nutrition at the expense of another. (+/-)
- Mutualism – Form of symbiosis in which both organisms benefit from living together. (+/+)
- Commensalism – An ecological relationship in which one organism benefits and the other neither benefits nor is harmed. (+/0)

The examples used below come from the following website:

http://www.botany.uwc.ac.za/sci_ed/grade10/ecology/symbiosis/mutual.htm

P = Parasite M = Mutualism C = Commensalism

_____ Dogs should be checked for heartworm. Mosquitoes can carry this worm in their larval stage. Then the worm will feed off the heart tissue of the dog, potentially being fatal to the dog.

_____ Clownfish live within the waving mass of tentacles of sea anemones; because most fishes avoid the poisonous tentacles, the clownfish are protected from predators. The sea anemone's tentacles quickly paralyze and seize other fishes as prey.

_____ Many ants are found in the vicinity of aphids. The ants feed on the sugary fluid released by the aphids, and the ants protect the aphids.

_____ Remora, a suckerfish, lives in close association with sharks or other larger fish. The dorsal fin of the sucker-fish is modified to form a sucker; it uses this to attach itself to the shark; The suckerfish is small and does not injure (or benefit) the shark, but relies on the shark's protection and lives on the scraps formed as the shark devours its prey.

_____ Small fish of several families, feed on small organisms and parasites on the bodies of larger fish. The larger fish are relieved of unwelcome guests on their bodies.

_____ Bees and birds visit flowers in search of pollen and nectar. In the process flowers are pollinated.

_____ Lichens are plants made up of a fungus and an alga living in close association. They are usually found on rocks and tree trunks. The fungus is attached to the substratum by fungal treads. These fungal treads help to absorb inorganic substances, which are then used by the alga during photosynthesis (when organic compounds are made). The fungus obtains organic substances manufactured by the alga.

_____ The Dodder plant is often found twined round the stems of clover plants or grasses, which it damages severely. Each Dodder plant consists of a long slender yellow or pinkish stem, with the leaves reduced to tiny scales, and roots being absent except for a short time after germination. At intervals along the twining stem small root like structures, called haustoria, link the Dodder to its host and penetrate to the host's vascular bundles. In this way the parasite obtains organic nutrients, water and mineral salts directly from the host. The Dodder is not fussy about its host. Any herbaceous plant can be infected. Woody plants are usually too hard for the haustoria to be able to penetrate. If plants are densely packed, dodder will spread rapidly to adjacent plants. It can cause a great deal of damage to wheat or lucerne fields.

_____ Epiphytes, e.g. some tropical orchids use trees or branches of trees for support without harm or benefit to the tree. The epiphyte obtains more light and air in this manner.

Photosynthesis: $6\text{H}_2\text{O} + 6\text{CO}_2 + \text{Sun Energy} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$
(Water + Carbon Dioxide + Sun \rightarrow Glucose + Oxygen)

Reactants (Raw Materials)	Products

Cell Respiration: $\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{H}_2\text{O} + 6\text{CO}_2 + \text{Energy (ATP)}$
(Glucose + Oxygen \rightarrow Water + Carbon Dioxide + Energy -ATP)

Reactants (Raw Materials)	Products

Circle One: Photosynthesis occurs in what part of the cell?

Mitochondria OR Chloroplast

Circle One: Cell Respiration occurs in what part of the cell?

Mitochondria OR Chloroplast

Autotrophs – An organism that is capable of making its own food.
Heterotrophs – An organism that is NOT capable of making its own food.

- 1. Place an “X” in the table for organisms that are:**
 - **Autotrophs or Heterotrophs**

- 2. Place an “X” in the table if the organism goes through:**
 - **Photosynthesis**
 - **Cell Respiration**

	Autotrophs	Heterotrophs	Photosynthesis	Cell Respiration
DOG				
CORN				
CARROT				
MAPLE TREE				
FROG				
HUMAN				
GRASS				