

Unit 3 Key Area 1 Ecosystems

Definitions of ecological terms:

- Species:** Organisms which **INTERBREED** to produce **FERTILE** offspring belong to the **SAME SPECIES**.
- Biodiversity:** Biodiversity refers to the **RANGE of DIFFERENT SPECIES** present in an ecosystem. Where there is good biodiversity, there will be a large range of different species present.
- Population:** A population is a group of organisms of the same species.
- Producer:** A producer is an organism which can **make its own food** through the process of **photosynthesis**. All **GREEN PLANTS** are producers. Producers are found at the start of a food chain.
- Consumer:** A consumer is an organism which must **EAT** to obtain food. The **primary consumer** is the first animal in a food chain and it **eats the producer**.
- Herbivore:** A herbivore is an animal which **ONLY EATS PLANTS**. e.g. sheep
- Carnivore:** A carnivore is an animal which **ONLY EATS MEAT/OTHER ANIMALS**. E.g. Lion
- Omnivore:** An omnivore is an animal which **EATS BOTH PLANTS AND ANIMALS**. E.g. Pig / Human
- Predator:** A predator is an animal which **HUNTS**, kills and eats other animals.
- Prey:** Prey refers to an animal which is **HUNTED**, killed and eaten by a predator

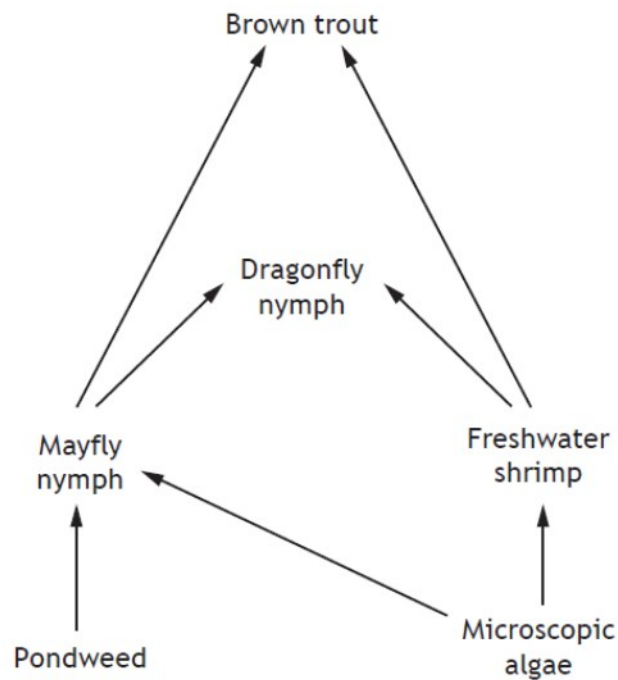
Food Chain: This is a diagram which illustrates a feeding relationship. A producer (green plant) is always found at the start, followed by primary consumer then secondary consumer.

e.g. Oak Tree → Caterpillar → Blue tit → Owl

In this example, the oak tree is the producer, the caterpillar is the primary consumer and both the blue tit and owl can be referred to as secondary consumers.

Food Web: This is a more complex diagram in which several food chains are linked. It illustrates a variety of predator and prey relationships.

e.g



In the above example:

Producers : Pondweed and Microscopic Algae

Primary Consumers: Mayfly nymph and Freshwater shrimp

Secondary Consumers: Dragonfly nymph and Brown Trout

The **arrows** in a food chain or food web show the **direction in which energy flows**.

When **one organism is removed** from a food web, it **will affect other organisms**.

In the above example:

If pollution leads to the **death of the freshwater shrimp**:

Numbers of microscopic algae will **increase** since there is **no freshwater shrimp eating them**.

Numbers of mayfly nymph could **increase** since there is **more food** for them or **numbers of mayfly nymph** could **decrease** since **more would be eaten** by dragonfly nymph and brown trout since they no longer have freshwater shrimp to eat.

Explanation is important to gain marks.

Competition

Competition in ecosystems occurs when resources are in short supply.

Resources that organisms might **compete** for are;

- 1. Food**
- 2. Habitat/Territory/Space**
- 3. Mates**
- 4. Water**
- 5. Light (plants)**

Interspecific Competition occurs amongst individuals of **different species** for one or a few of the resources they require. E.g. The Brown Trout and Dragonfly in the example above are different species but they are in **competition** since they both eat mayfly nymph and freshwater shrimp.

Intraspecific competition is between members of the same of the **same species** and is for **all resources required** as members of the same species will require **exactly** the same resources. Intraspecific competition is therefore more intense than Interspecific competition.

Ecosystem: An ecosystem consists of all the organisms (the community) living in a particular habitat and the non-living components with which the organisms interact.

E.g During the investigation the students found four different species of periwinkles at different positions on the rocky shore.



The highest position that the sea water reaches on the shore is called the high tide level.

The bars in the table below represent the positions on the shore where each species of periwinkle was found.

Position on shore	Species of periwinkle			
	Small	Edible	Rough	Flat
High tide level ↓ Low tide level	█	█	█	█

(i) State which species of periwinkle is least likely to compete with the small periwinkle.

Explain your answer.

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Species _____

Explanation _____

(ii) Using the information given, explain why the competition between these periwinkles is described as interspecific.

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In part (i) the Species least likely to compete with the small periwinkle is the **Flat** periwinkle. The explanation here is that they **live on a different position on the shore** (use the information provided in your answer).

In part (ii), the competition can be described as **interspecific** because it involves competition between individuals of **different species**.