

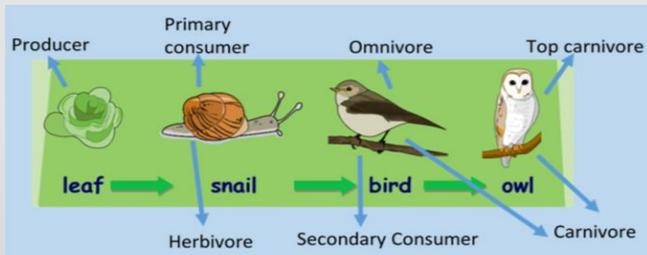
1) Food Chains

A **food chain** shows what an organism eats and the transfer of energy between organisms.

Keywords:

- **Producer** – an organism that makes it's own food by photosynthesis (usually a green plant)
- **Primary consumer** – eats the producer
- **Secondary consumer** – eats the primary consumer
- **Tertiary consumer** – eats the secondary consumer
- **Herbivore** – eats plants only
- **Carnivore** – eats animals only
- **Omnivore** – eats plants and animals
- **Predator** – hunts and kills other animals for food
- **Prey** – is hunted by another animal

Example:



2) Pyramids of Numbers

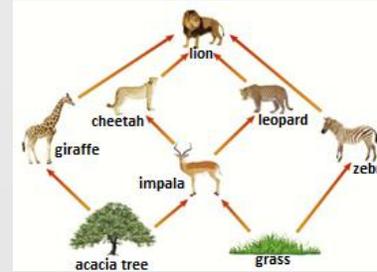
The **population** of each organism in a food chain can be shown in a pyramid of numbers. The bars are drawn to scale so the more organisms of a species, the wider the bar. The **producer** in the food chain is always at the **bottom** of the pyramid of numbers.

E.g. clover → snail → thrush → sparrowhawk



3) Food Webs and Interdependence

A **food web** is a set of food chains that are linked together. It shows the feeding relationships of organisms in an ecosystem.



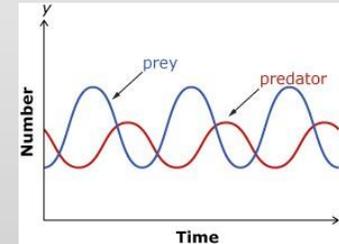
The number of a species living in a habitat is called a **population**. The populations in the community are **interdependent**. Individuals in a population **compete** for **resources** such as food, water, space and mates. For example, if the grass dies then the number of zebras will decrease as they have less food.

4) Predator-Prey Relationships

The amount of food limits the population of a species.

- If population of prey increases so does the predators
- If population of predators increase, prey decreases.

Predator-prey cycles are slightly out of phase with each other as it takes a short while for a population to respond to changes in the other. Reproduction takes a while for both species.



5) Distribution of Organisms

The distribution of living things is where organisms are found in a habitat at a particular time. It is affected by **biotic** (living) and **abiotic** (non-living) factors.

Sampling is carried out to **count the number of individuals in a species**. Different methods can be used:

- **Quadrats** – for plants and slow animals
- **Pooters** – for small insects



6) Human Impact on Ecosystems

Humans can have **negative effects** on ecosystems, e.g. **deforestation**, **acid rain**, littering and **bioaccumulation** (where toxic chemicals e.g. pesticides, accumulate in the food chain and damage the organisms in it, especially those higher in the chain).

Humans can also have **positive effects** on ecosystems, e.g. **planting trees**, **recycling**, protecting green spaces.

7) Adaptation

Living things are adapted to their habitats. This means they have **special features that help them to survive**.



- **Camel** – flat feet to stop them sinking in the sand, fur for warmth at night, closable nostrils for sand storms, long eyelash to protect from sand, humps to store fat for energy
- **Polar bear** – white fur for camouflage, long curved claws for killing prey and grip on the ice, lots of body fat and thick fur to keep them warm

8) Evolution and Natural Selection

Charles Darwin's theory of evolution states that all living things have evolved from **simple life forms** that existed more than **3 billion years ago**. Evolution happens by a process called **natural selection** ('survival of the fittest').

Natural Selection:

- Individuals in a species show **variation** (differences)
- Individuals with features **best suited to their habitat** are **more likely to survive and reproduce**
- The **genes** that allow these individuals to be successful are **passed onto their offspring**
- Over many generations more individuals will have those features

9) Selective Breeding

Humans breed animals/plants for **desirable characteristics** in offspring e.g. increased milk production, disease resistance, and increased crop yield. This **takes many generations**.