## 5.1a Communities and Ecosystems

5.1.1 Define ecology, ecosystem, population, community, species and habitat

- Ecology- study of the relationship between organisms and their environment.
- Ecosystem- a community and its abiotic environment.
- Population- a group of organisms of the same species living in the same environment at the same time who are capable of interbreeding.
- Community- a group of populations living and interacting with each other in a habitat.
- Species- a group of organisms which look alike, can interbreed and produce fertile offspring.
- Habitat- the physical environment where individuals of a certain species can be found.

## 5.1b Communities and Ecosystems

5.1.2 Distinguish between *autotroph* and *heterotroph*.

■Autotroph (producer) - synthesizes its own food.

■Heterotroph (consumer) - cannot synthesize its own food. Heterotrophs obtain their food from other sources.

**Plants are autotrophs**

5.1.3 Distinguish between consumers, *detritivores* and *saprotrophs*.

■ Consumer- obtain nutrients from other living organisms

Mushrooms are saprotrophs

■ Decomposer – obtain nutrients from dead organic matter.

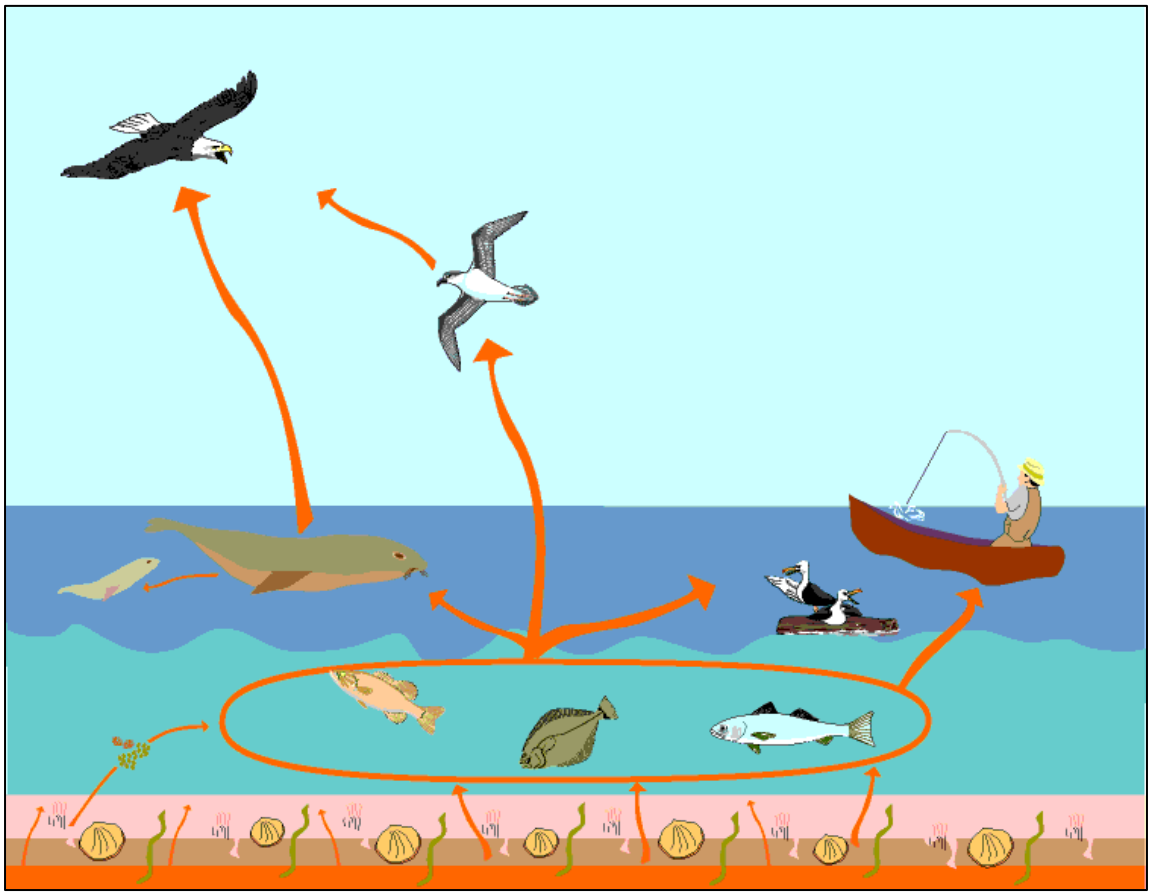
■ Detritivore- ingests organic matter and then breaks it down, eg. earthworms, vultures.

■ Saprotroph- secretes enzymes externally and then absorbs broken down products, eg. mushrooms, bacteria.

## 5.1c Communities and Ecosystems

5.1.4 Describe what is meant by a food chain giving three examples, each with at least three linkages (four organisms).

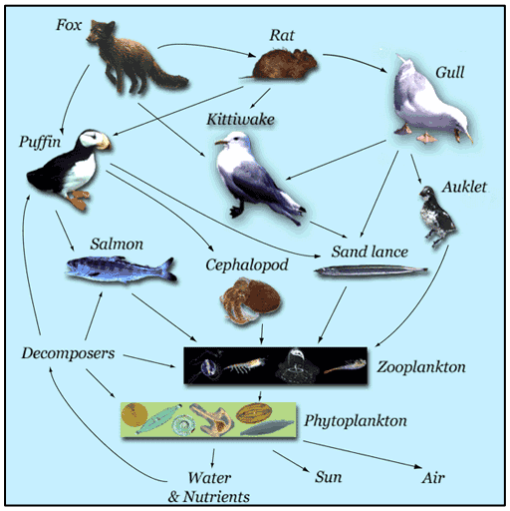
- Food chains illustrate feeding relationships between members of a community.
- One food chain in this picture is: plankton→fish→seagull→eagle
- What other food chains do you observe in this picture?



## 5.1d Communities and Ecosystems

5.1.5 Describe what is meant by a food web.

- Food webs, like food chains, show the feeding relationships between community members. Food webs are non-linear and branching.



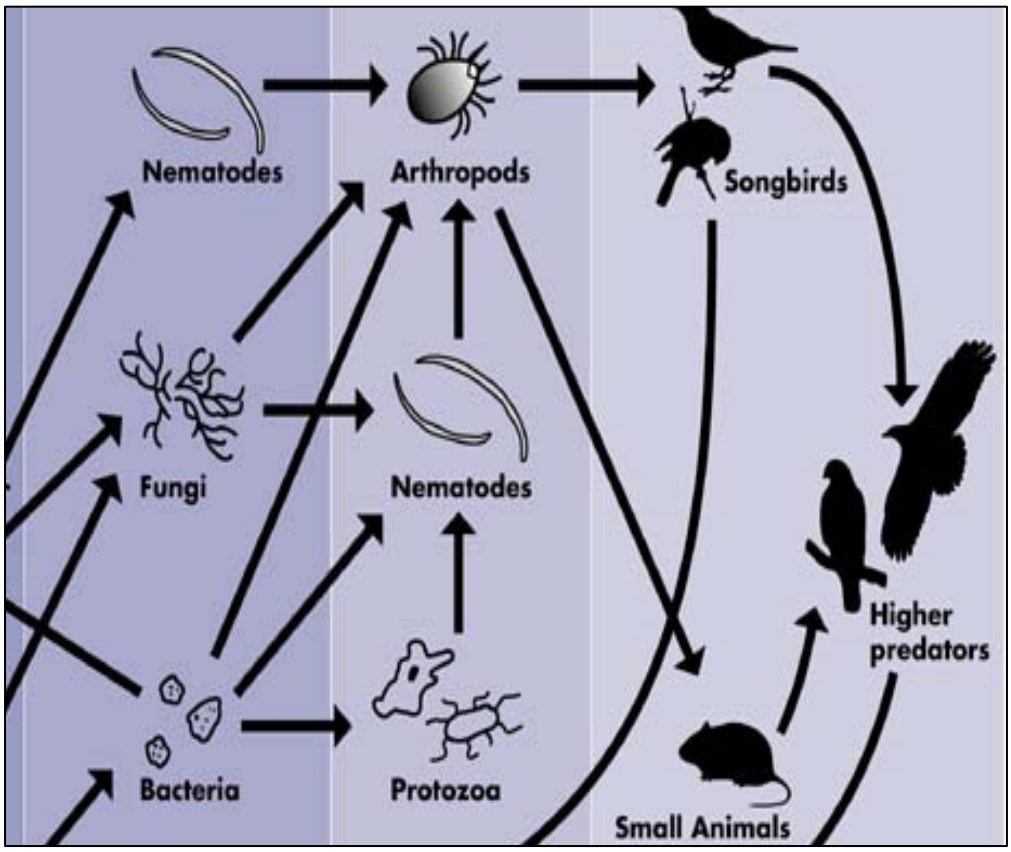

5.1.6 Define *trophic level*.

Trophic level- the level of the food chain at which an organism is found. The hierarchal levels are shown below:
producer→primary consumer→ secondary consumer→ tertiary consumer

## 5.1e Communities and Ecosystems

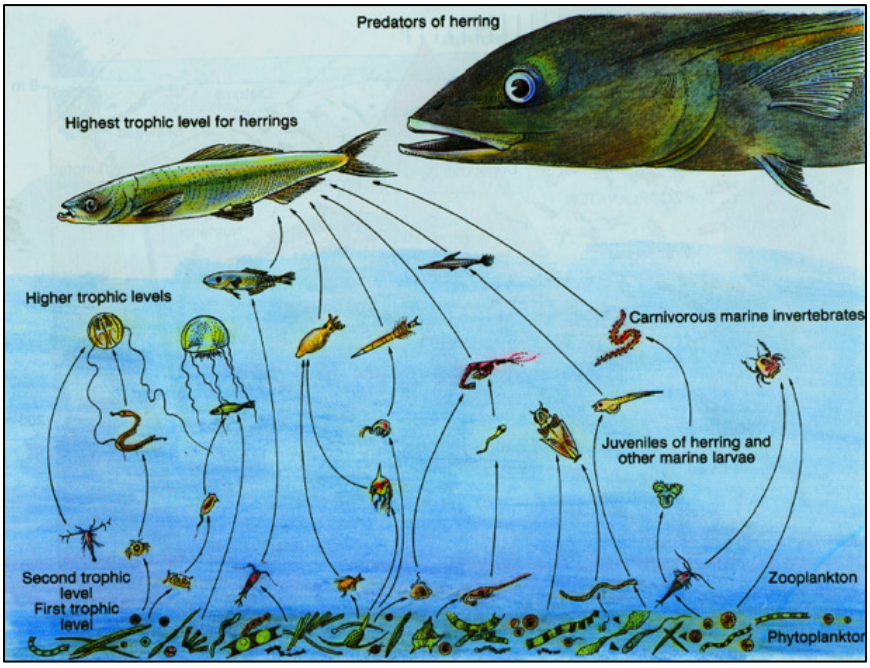
5.1.7 Deduce the trophic level of organisms in a food chain and a food web.

- Photosynthetic organisms are always producers. With each arrow, consumers move one generation away from the producer, eg. primary consumer, secondary consumer, tertiary consumer. When consumers (and producers) die they are decomposed, and their nutrients recycled.

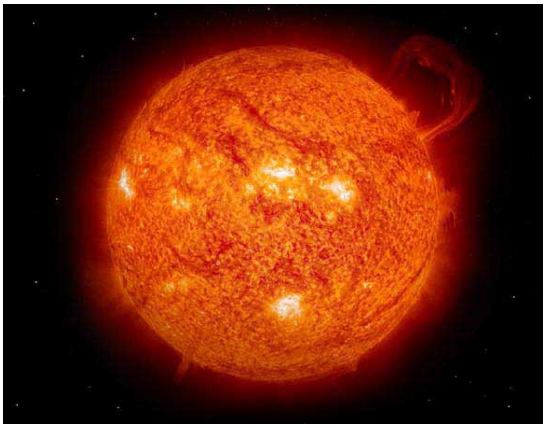


## 5.1f Communities and Ecosystems

5.1.8 Construct a food web containing up to 10 organisms, given appropriate information.



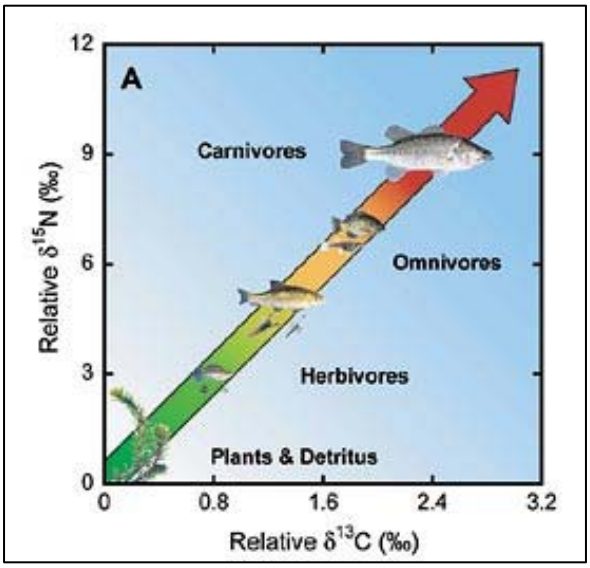

5.1.9 State that light is the initial energy source for almost all communities.



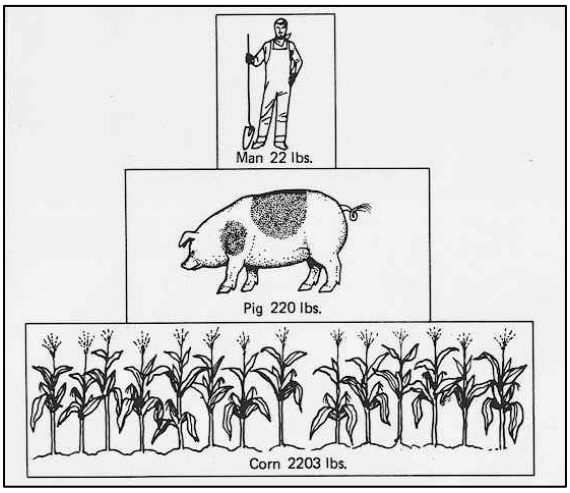
## 5.1g Communities and Ecosystems

5.1.10 Explain the energy flow in a food chain.

- Energy losses between trophic levels include material not consumed or material not assimilated, and heat loss through cell respiration.




5.1.11 State that energy transformations are never 100% efficient.

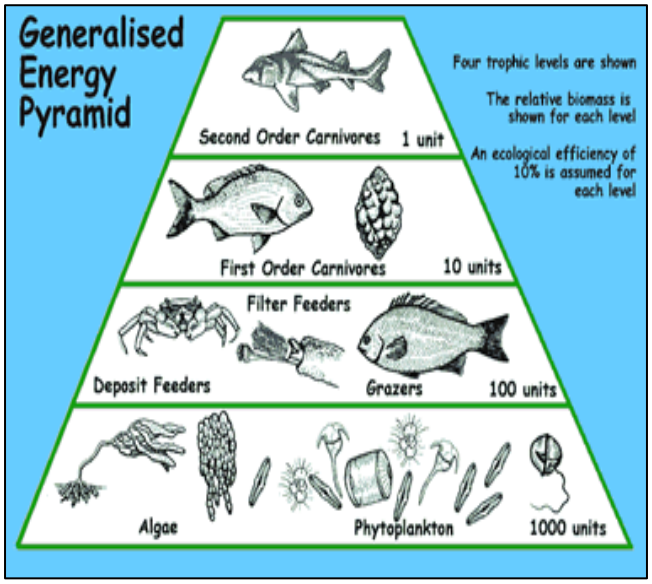



- When energy transformations take place, including those in living organisms, the process is never 100% efficient. Commonly, it is between 10-20%.

## 5.1h Communities and Ecosystems

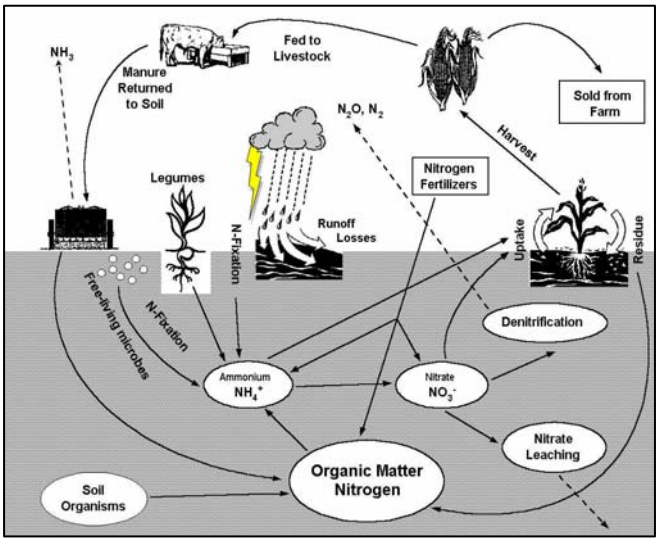
5.1.12 Explain what is meant by a pyramid of energy and the reasons for its shape.

- A pyramid of energy shows the flow of energy from one trophic level to the next in a community. The units of pyramids of energy are therefore energy per unit area per unit time, eg: Jm-2yr-1



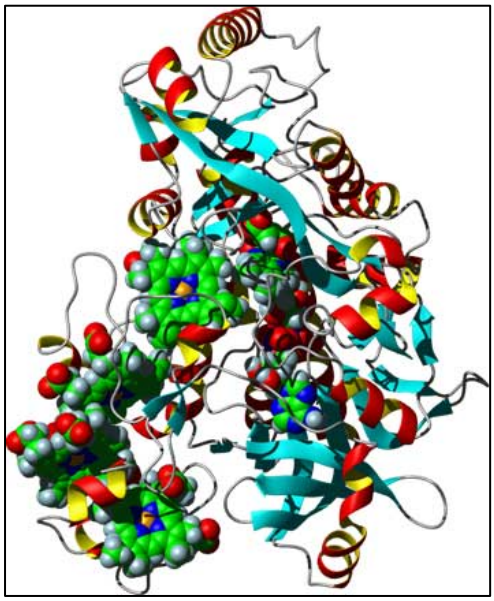

Courtesy of Marine Education Society of Australasia

5.1.13 Explain that energy can enter and leave an ecosystem, but that nutrients must be recycled.



## 5.1i Communities and Ecosystems

5.1.14 State that saprotrophic bacteria and fungi (decomposers) recycle nutrients.



During metabolism, living organisms build organic macromolecules in the form or polymers. Saprotrophs break down these polymers into monomers, so that they can be customized into new, specific polymers beneficial to the next organism which ingests them.