Key Area 4—Energy in Ecosystems

(a) In transfers from one level to the next in a **food chain**, the majority of the **energy is lost** as:

HEAT

MOVEMENT

UNDIGESTED MATERIAL

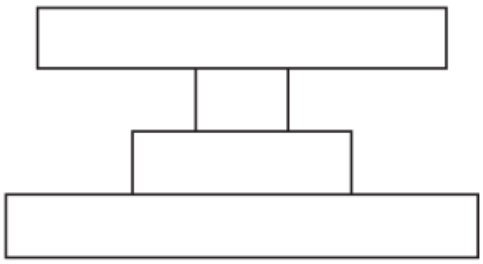
Only a very small quantity is used for growth and is therefore available at the next level in a food chain.

(b) Pyramids of Numbers and Pyramids of Energy

A pyramid of **NUMBERS** represents the **NUMBER of ORGANISMS** present at each **trophic level** in **a food chain**.

Example 1 :

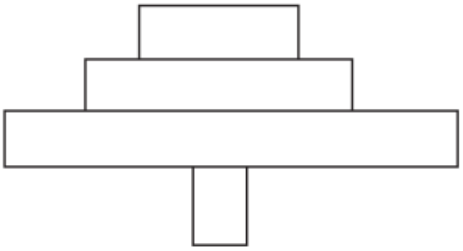
Grass ⟶ zebra ⟶ lion ⟶ flea



In this example where a parasite feeds on the largest predator, an unusual pyramid of numbers (top heavy) is produced since each lion supports a large number of fleas feeding on the blood of the lion.

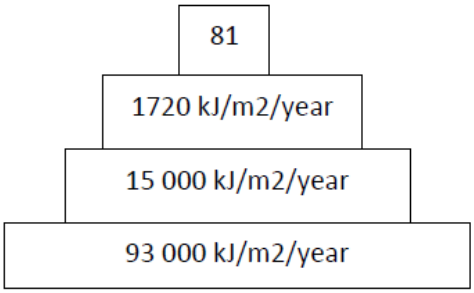
Example 2:

Oak tree ⟶ Wood mouse ⟶ Weasel ⟶ Owl



In this example, an unusual shaped pyramid is produced since **the producer is very large** (**a tree**) and can support bigger population of primary consumers.

A pyramid of **ENERGY** represents the **ENERGY CONTENT** at each **trophic level** in a **food chain**.



This is a more reliable comparison between the organisms found at different trophic levels in a food chain and provides a true shaped pyramid since energy is lost at each trophic level and so energy content decreases at each trophic level.