



Abstract

Students scavenge a large area of the rocky shore for the wealth of organisms hiding in rock-pools to quantify the energy flowing to the top carnivores

Aim

- To quantify the flow of energy between trophic level in a rocky shore ecosystem

Learning Objectives:

(The Aims of the day are...)

- To grasp the importance of photosynthesis as the main route by which energy enters an ecosystem
- To become familiar with the usage and meaning of the common terms: producer, consumer, decomposer, trophic level, trophic efficiency, dissipation
- To relate the abiotic conditions of the sea to the needs of each trophic level
- To record the percentage cover of producers using open quadrats
- To experience catching and weighing of consumers to establish biomass
- To hand draw a pyramid of energy to scale using primary data
- To calculate the efficiency of energy transfer between trophic levels

Learning Outcomes:

- To define the ecological terms used in an energetics study
- To identify the adaptations for respiration possessed by marine organisms
- To describe the use of a bomb calorimeter to establish the kilojoules of energy at each trophic level
- To evaluate the use of Cranedale secondary data for the energy values of each species, in place of using a bomb calorimeter
- To suggest mechanisms by which energy is dissipated from a marine ecosystem
- To set out the necessary steps in fieldwork to meet the aim of the investigation
- To recognise the hazards associated with coastal fieldwork and explain how to minimise their likelihood of occurrence
- To evaluate the use of percentage cover as a measure of producer abundance
- To distinguish species at each trophic level using a dichotomous key
- To explain why trophic efficiency may differ at each trophic level
- To interpret the trends in primary data
- To assess the validity of the calculated trophic efficiency in relation to Lindemann's Law of conservation of energy
- Where appropriate, to explain unpredicted trends in the data
- To evaluate the limitations in equipment and sampling techniques used in data collection
- To evaluate the use of Cranedale secondary data for the energy values of each species