

Aims and objectives

To learn that adaptations allow organisms to survive and reproduce in their natural environments.

Learning outcomes

To be able to:

- describe some examples of how organisms are adapted to their environment,
- explain why organisms succeed best in their own natural environments,
- explain how the theory of evolution by natural selection provides a model to describe how adaptation takes place.

Outline of Learning Route 1: Adaptation

Starter session (minimum 15 minutes)

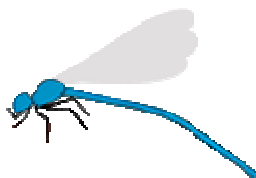
Using a 3-D animation of a Venus flytrap, the teacher poses the question 'How does adaptation enable living organisms to survive and reproduce in their natural environments?' and generates an initial discussion with and between students.

Main session (minimum 50 minutes' research, 50 minutes' preparation)

Individuals or groups of students are tasked with researching and writing a science article to convince the general reader that organisms are adapted to their natural environment and that the theory of evolution by natural selection is a model that can explain how this occurs. Material on the site includes: Darwin, the voyage of the Beagle, Galapagos tortoises and finches and Richard Dawkins' 'Weasel' simulation, with information, structured questions and internet links to support their research.

Plenary session (minimum 50 minutes, including presentations)

The teacher brings the students together to share the outcomes of their research. Following a short movie showing an evolutionary time-travel journey, a quote from Stephen Jay Gould is used to stimulate the students to use what they've learnt about adaptation in a new context.



Aims and objectives

To learn that energy is transferred between organisms in food chains; that organisms and resources in an environment are closely linked.

Learning outcomes

To be able to:

- describe how energy from sunlight is transferred through an environment,
- explain how the abundance and distribution of organisms relate to the resources available within the environment.

Outline of Learning Route 2: Energy Transfer

Starter session (minimum 50 minutes)

There are four linked stimulus activities, intended to be teacher-mediated, to encourage discussion and questioning:

- an interactive model of a taiga food web,
- a pyramid of biomass,
- a pyramid of energy,
- Energy Optimisation – a simulation game that models the feeding relationship between the lynx and snowshoe hare in terms of the energy efficiency of the predator.

Main session (minimum 50 minutes' research, 50 minutes' presentation)

Individuals or groups of students are given the 'in role' task of presenting a case to manage the conservation of animal populations in a habitat. Materials on the site include an interactive case study, information, structured questions and internet links to support their research.

Plenary session (minimum 50 minutes)

The teacher brings the students back together to share the outcomes of their research. Using an interactive population graph, s/he guides the students as they use what they have learned to make hypotheses about how changing environmental and biological factors will affect the shape of the graph. These hypotheses can then be tested using Predator-Prey, an interactive 'Game of Life' simulation that models interdependent animal populations.