

B16 Adaptations, interdependence and competition

Lessons TBAT	Key Knowledge	Practical	Assessment
<p>TBAT: Describe what is meant by an ecosystem and a community</p> <p>TBAT: Discuss how abiotic and biotic factors affect distribution</p> <p>TBAT: Measure the distribution of a given species</p> <p>TBAT: Describe the resources animals compete for and explain how they compete</p> <p>TBAT: : Describe the resources plants compete for and explain how they compete</p> <p>TBAT: Describe how certain</p>	<p>Students should be able to describe: • different levels of organisation in an ecosystem from individual organisms to the whole ecosystem • the importance of interdependence and competition in a community. Students should be able to, when provided with appropriate information: • suggest the factors for which organisms are competing in a given habitat • suggest how organisms are adapted to the conditions in which they live. An ecosystem is the interaction of a community of living organisms (biotic) with the non-living (abiotic) parts of their environment. To survive and reproduce, organisms require a supply of materials from their surroundings and from the other living organisms there.</p> <p>Plants in a community or habitat often compete with each other for light and space, and for water and mineral ions from the soil. Animals often compete with each other for food, mates and territory. Within a community each species depends on other species for food, shelter, pollination, seed dispersal etc. If one species is removed it can affect the whole community. This is called interdependence. A stable community is one where all the species and environmental factors are in balance so that population sizes remain fairly constant.</p> <p>Students should be able to explain how a change in an abiotic factor would affect a given community given appropriate data or context. Abiotic (non-living) factors which can affect a community are: • light intensity • temperature • moisture levels • soil pH and mineral content • wind intensity and direction • carbon dioxide levels for plants • oxygen levels for aquatic animals.</p> <p>Students should be able to explain how a change in a biotic factor might affect a given community given appropriate data or context. Biotic (living) factors which can affect a community are: •</p>	<p>Required practical activity 7: measure the population size of a common species in a habitat. Use sampling techniques to investigate the effect of a factor on the distribution of this species.</p>	<p>Planning a practical to look at abundance and analysing the results</p> <hr/> <p>Maths focus</p> <p>Students should be able to extract and interpret information from charts, graphs and tables relating to the interaction of organisms within a community.</p> <p>Students should be able to extract and interpret information from charts, graphs and tables relating to the effect of abiotic and biotic factors on organisms within a community.</p> <p>In relation to abundance of organisms students should be able to: • understand the terms mean, mode and median • calculate arithmetic means • plot and draw</p>

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<p>adaptations can improve survival chances</p> <p>TBAT: Give examples of animal adaptations</p> <p>TBAT: Give examples of plant adaptations</p>	<p>availability of food • new predators arriving • new pathogens • one species outcompeting another so the numbers are no longer sufficient to breed.</p> <p>Students should be able to explain how organisms are adapted to live in their natural environment, given appropriate information. Organisms have features (adaptations) that enable them to survive in the conditions in which they normally live. These adaptations may be structural, behavioural or functional.</p> <p>Some organisms live in environments that are very extreme, such as at high temperature, pressure, or salt concentration. These</p>		<p>appropriate graphs selecting appropriate scales for the axes.</p>
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	<p>organisms are called extremophiles. Bacteria living in deep sea vents are extremophiles.</p>	<p>Key stage 3</p> <p>Relationships in an ecosystem ♣ the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops ♣ the importance of plant reproduction through insect pollination in human food security ♣ how organisms affect, and are affected by, their environment, including the accumulation of toxic materials.</p> <p>Genetics and evolution Inheritance, chromosomes, DNA and genes ♣ heredity as the process by which genetic information is transmitted from one generation to the next ♣ a simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model ♣ differences between species ♣ the variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation ♣ the variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection ♣ changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction ♣ the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.</p>
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