**B16 Specification Sheet: Adaptation, interdependence, and competition**

**Communities and Interdependence**

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| An ecosystem is the interaction of a community of living organisms (biotic) with the non-living (abiotic) parts of their environment. |  |
| 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. |  |
| Students should be able to extract and interpret information from charts, graphs and tables relating to the interaction of organisms within a community. |  |
| 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. |  |

**Abiotic factors**

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| 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. |  |
| Students should be able to explain how a change in an abiotic factor would affect a given community given appropriate data or context. |  |
| Students should be able to extract and interpret information from charts, graphs and tables relating to the effect of abiotic factors on organisms within a community |  |

**Biotic factors**

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| Biotic (living) factors which can affect a community are:  • availability of food  • new predators arriving  • new pathogens  • one species outcompeting another so the numbers are no longer sufficient to breed. |  |
| Students should be able to explain how a change in a biotic factor might affect a given community given appropriate data or context. |  |
| Students should be able to extract and interpret information from charts, graphs and tables relating to the effect of biotic factors on organisms within a community. |  |

**Sampling**

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| A range of experimental methods using transects and quadrats are used by ecologists to determine the distribution and abundance of species in an ecosystem. |  |
| In relation to abundance of organisms students should be able to:  • understand the terms mean, mode and median  • calculate arithmetic means  • plot and draw appropriate graphs selecting appropriate scales for the axes. |  |

**Competition**

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| To survive and reproduce, organisms require a supply of materials from their surroundings and from the other living organisms there |  |
| 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. |  |

**Adaptations**

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| 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. |  |
| Some organisms live in environments that are very extreme, such as at high temperature, pressure, or salt concentration. These organisms are called extremophiles. |  |
| Bacteria living in deep sea vents are extremophiles. |  |
| Students should be able to explain how organisms are adapted to live in their natural environment, given appropriate information. |  |