# *Biodiversity study* **Teacher background notes**

**In this investigation, how the physical conditions of an environment affect the growth and survival of living things and biodiversity of the environment are investigated in the context of a comparative study of two local sites within a school.**

## [Australian Curriculum: Science links](http://assist.asta.edu.au/resource/3527/biodiversity-study-year-6-cle)

## Learning intentions

Students will be able to:

* identify a range of habitats
* make predictions about biodiversity of habitats in their local area/school grounds
* measure the physical factors of a habitat
* collect and record data from a habitat
* construct representations of a habitat
* analyse findings from data collection
* infer how the physical factors of a habitat affect the survival of the living things within that habitat (cause-and-effect relationships)
* make conclusions about the health of a habitat
* communicate their ideas and findings using scientific language and representations.

## Suggested time for this CLE

The time needed to complete the *Biodiversity study* CLE will depend on the depth of the prior knowledge of students, the time to perform the six investigations—including the introductory activity ‘Biodiversity assessments’ and the optional activity on ‘Trophic levels and pyramid of numbers’ and follow up with any further extension activities. Allow 7–10 hours.

## Prior conceptual knowledge

Science / Year 5 / Science Understanding / Biological sciences

Content description

*Living things have structural features and adaptations that help them to survive in their* [*environment*](http://www.australiancurriculum.edu.au/glossary/popup?a=S&t=Environment) [*(ACSSU043)*](http://www.australiancurriculum.edu.au/Curriculum/ContentDescription/ACSSU043)

The Biodiversity study CLE builds on student’s knowledge of adaptations of living things from Year 5:

*Living things have structural features and adaptations that help them to survive in their* [*environment*](http://www.australiancurriculum.edu.au/glossary/popup?a=S&t=Environment) [*(ACSSU043)*](http://www.australiancurriculum.edu.au/curriculum/contentdescription/ACSSU043)

For further background information related to adaptations of living things, refer to resource: Background information Year 5–6, unit 2: Survivalon the ASTA ScienceWeb Australia digital resource website. <http://scienceweb.asta.edu.au/verve/_resources/asta_4-2-1_bi_survival_yr5-6_v5-2.pdf>

The following PrimaryConnections units provide relevant background information and sample activities aligned with the relevant prior curriculum.

* Year 3/4

This unit focuses on students being able to distinguish between living and non-living things and how to classify living things according to their observable features.

Australian Academy of Science, PrimaryConnections 2013. ‘Fur, feathers or leaves’. Available from the Scootle website <http://www.scootle.edu.au/ec/viewing/S5686/index.html>

* Year 5/6

This unit focuses on students exploring the structural features of desert plants and animals, and has them comparing them to plants and animals in other environments.

Australian Academy of Science, PrimaryConnections 2013. ‘Desert survivors’. Available from the Scootle website. <http://www.scootle.edu.au/ec/viewing/S7164/Desert-survivors_2012/index.html>

## New concepts to be introduced

Coming from a study of the Australian Curriculum Biological Sciences sub-strand it is expected that students have an understanding that there are living and non-living things and that living things have needs that must be met for their survival. They have also explored how the structural features of plants and animals help them to survive in their environment. (*Definition*: Environment—all the surroundings, both living and non-living. Australian Curriculum: Science.)

Students will explore the concept that the physical (abiotic) factors of an environment affect the growth and survival of living things and understand that an organism's habitat is the place where it lives. Students will also explore the concept that the habitat has specific conditions and these affect the organism's survival. They deduce that organisms thrive in habitats where they are best suited to the environmental conditions.

Students may find the concept of identifying factors that affect the growth and survival of living things challenging because the focus of learning from previous year levels has been on students identifying features of living things themselves. Nevertheless, primary students are capable of exploring environmental factors through observation and investigation. Through a comparative biodiversity study, students will make observations about living things in two identified environments and will be able to identify these factors. Students may find understanding the degree/depth that abiotic factors affect living things as challenging, nevertheless they should be able to understand that there are a range of factors that influence growth and survival, such as water, light and soil.

The concept of photosynthesis is one that students find complex and difficult to understand. The concept that plants use the sun’s energy to form carbohydrates is challenging due to the fact that students are yet to learn that plants are multi-cellular organisms and have not yet fully explored chemical changes. This content is addressed in year 8. Nevertheless, primary students should be able to understand that sunlight is more vital to plant growth than just keeping plants warm.

## Possible misconceptions

During these initial explorations, teachers will encounter various student misconceptions. Purposeful teaching will help prepare students to tackle more advanced concepts as they come across them in the upper primary years and beyond.

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| **STUDENTS MAY THINK…** | **INSTEAD OF THINKING…** |
| Plants take in all substances they need to grow, through their roots OR plants get their energy from the soil through their roots. | Plants take air in through their leaves. Chlorophyll in the plant uses the sun’s energy for photosynthesis. Water and minerals are taken in through the roots. |
| Sunlight is helpful but not critical to the growth of plants, as it only helps to keep them warm. | Sunlight is essential for plant survival with chlorophyll in the plant absorbing the sun’s energy for photosynthesis. |
| Soil provides a support structure and food for plants. | Some plants are able to grow in soil-free environments. Plants take up water and dissolved minerals from the soil but not ‘food’. |
| Animals adapt to the environment, as they need to. | Populations with features and behaviours that suit the environment are best able to survive. These populations continue to survive over generations through the process of natural selection. |
| All land animals are mammals and therefore have the same needs. | Land animals are animals that live predominantly on land. Land animals include mammals, insects, birds (such as the emu and kiwi) and marsupials. Land animals therefore have differing needs according to their classification. |

## Links to further information

‘Biodiversity’, Department of the Environment (Australian Government) website, <http://www.environment.gov.au/biodiversity> (Accessed December 2015)

‘What is biodiversity? Australian Museum website, <http://australianmuseum.net.au/What-is-biodiversity> (October 2015)

‘What is biodiversity?’ World Wildlife Fund website, <http://www.wwf.org.au/our_work/saving_the_natural_world/what_is_biodiversity/> (Accessed December 2015)