**Inside an ecosystem**



Some ecosystems are small, but others cover very large areas.

Which of the following is true in a **large** ecosystem?

|  |  |
| --- | --- |
| **A** | The abiotic conditions will be the same in all parts of the ecosystem. |
| **B** | The abiotic conditions may be different in different parts of the ecosystem. |
| **C** | Animals living in different parts of the ecosystem will **not** interact. |
| **D** | All animals and plants will be found in all parts of the ecosystem. |

*Biology > Big idea BOE: Organisms and their environments > Topic BOE2: Organisms in their environments > Key concept BOE2.1: Ecosystem components and dynamics*

|  |
| --- |
| **Diagnostic question** |
| **Inside an ecosystem** |

**Overview**

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| --- | --- |
| Learning focus: | The environmental conditions in different ecosystems, and in different parts of an ecosystem, affect and are affected by the organisms that live there. |
| Observable learning outcome: | Recognise that there are different environmental conditions within ecosystems, and this affects what lives there. |
| Question type: | Simple multiple choice |
| Key words: | ecosystem, abiotic, habitat |

**What does the research say?**

A study of 16-17-year olds found that the terms ‘ecosystem’ and ‘community’ were considered synonyms in the context of habitats. Students considered ecosystems as a larger region, and size was used as a decisive factor in discriminating between areas (Sander, Jelemenska and Kattmann, 2006).

Yücel and Özkan (2015) identified common misunderstandings related to habitats, including that habitats are only forests, or that habitats are places where only fish and other animals live. They also found that students confused the concept of ‘ecosystem’ with ‘habitat’, a confusion also observed by Adeniyi (1985) and Sander et al. (2006).

An assessment of middle school student understanding of ecological concepts found that when asked ‘What is an ecosystem?’ most students understood that an ecosystem was “a habitat” or a place where an organism lives; very few students elaborated on this with only 24% giving more sophisticated responses. Most students did not demonstrate an understanding of the interaction of multiple living and non-living parts or “a sense that these parts have varying levels of speciality” (Jordan et al., 2009).

**Ways to use this question**

Students should complete the question individually. This could be a pencil and paper exercise, or you could use the presentation with an electronic voting system or mini white boards.

*Differentiation*

You may choose to read the question to the class, so that everyone can focus on the science. In some situations it may be more appropriate for a teaching assistant to read for one or two students.

**Expected answers**

The correct answer is **B** - The abiotic factors may be different in different parts of the ecosystem.

Students that identify **A** or **D** as correct may not understand that the environmental conditions are a result of the abiotic (and biotic) factors and that these will differ in different parts of the ecosystem. This in turn will affect the distribution of species and they will inhabit different parts of the ecosystem, those parts that are best suited to them – this is their habitat.

Students identifying **C** as correct may not appreciate that species will move into different areas of the ecosystem, often temporarily to seek resources, such as food.

**How to respond - what next?**

If there is a range of answers, you may choose to respond through structured class discussion. Ask one student to explain why they gave the answer they did; ask another student to explain why they agree with them; ask another to explain why they disagree, and so on. This sort of discussion gives students the opportunity to explore their thinking and for you to really understand their learning needs. Responses often work best when the activities involve paired or small group discussions, which encourage social construction of new ideas (meaning making) through dialogue.

If students have misunderstandings about the differing environmental conditions found within different areas of an ecosystem, or that such areas are habitats for species the following BEST ‘response activities’ could be used in follow-up to this diagnostic question:

* Response activity: From floor to canopy

**Acknowledgments**

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Images: pixabay.com/Free-Photos (1030737)

**References**

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