**Where do you live?**

** **

The cards you have been given describe adaptations of two animals, a lizard and a seal.

Each of these animals is adapted to the environmental conditions of two very different ecosystems.

**To do in your pair**

Sort the cards into two groups based on the adaptations you would expect each animal to have.

**To talk about in your pair**

1. Each species has adaptations that allow it to live in a particular environment. Which abiotic factors do you think each animal is adapted to cope with?
2. Look closely at the adaptations that each animal has. Describe the type of ecosystem that you think each species lives in.

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

|  |
| --- |
| **Response activity** |
| **Where do you live?** |

**Overview**

|  |  |
| --- | --- |
| 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 in different ecosystems, and this affects what lives there. |
| Activity type: | Discussion, card sort |
| Key words: | adaptations, ecosystem |

This activity can help develop students’ understanding by addressing the sticking-points revealed by the following diagnostic question:

* Diagnostic question: Ecosystems

**What does the research say?**

A number of authors have noted the importance of learning about the interdependence (or “connectedness”) of organisms within ecosystems. As Allen (2014) has pointed out, “Anyone who is not able to fully appreciate the far-reaching impacts of changes to a single population may trivialize a media report about an endangered species, only believing that species alone is under threat, when the likelihood is that many members of an ecosystem will be adversely affected”. Many researchers have recognised the difficulties that school children have in reaching this kind of understanding, which seems to be due to misunderstandings of key ideas including how the biotic and abiotic components of ecosystems are organised, that they interact, and that they are interdependent/connected (e.g. Grotzer and Bell Basca, 2003; Sander, Jelemenska and Kattmann, 2006).

**Ways to use this activity**

Students should complete this activity in pairs. The focus of the activity should be on discussion to sort through the cards and decide which cards describe the adaptations of the two animals (seal and lizard). Students should then use the adaptations to describe the type of abiotic factors that the adaptations allow the animals to deal with, they can then use this information to describe the type of ecosystem that they would expect each animal to live in.

It is through the discussions that students can check their understanding and develop their explanations. Listening in to the conversations of each pair will often give you insights into how your students are thinking. The quality of the discussions can be improved with a careful selection of pairs, or by allocating specific roles to students in each pair. For example, you may choose to select a student with strong prior knowledge as a scribe, and forbid them from contributing any of their own answers; they may question the others and only write down what they have been told. This strategy encourages contributions from more members of each group.

After their discussions, each pair should be prepared to report the key points of their discussion to another pair, or to the class.

**Equipment**

For each pair/group:

* cards, printed and cut out from the end of this document

**Expected answers**

|  |  |
| --- | --- |
| Animal 1 - Lizard | Animal 2 - Seal |
| Have scales on their hind feet to allow them to move quickly. | Pups are born with a layer of fur on the skins surface. |
| Can adjust body colour. They turn dark when it is cold and light when it is hot. | They have a layer of fat for buouyancy. |
| They are able to redirect blood flow to prevent heat loss. | Fat helps insulate and is an energy store. |
| Skin on their ears is fringed to help stop sand getting in. | A membrane covers their eyes to help protect them against sea water. |
| Nose is adapted to allow them to breathe in sand. |  |
| The head is shaped to allow them to burrow into sand. |  |

1. Lizard – high temperatures, lack of water.

Seal – salty water, cold temperatures.

1. Lizard – lives in the desert, where it is hot, there is little rainfall, and little cover to hide from predators.

Seal – lives in the artic, it is cold, the water contains salts and they hunt for food in cold water.

**Acknowledgments**

Developed by Elizabeth Lupton (UYSEG).

Images: lizard – pixabay.com/PCExotics (3981836); seal – pixabay.com/Alexas\_Fotos (3306089)

**References**

Allen, M. (2014). *Misconceptions in Primary Science, 2nd* ednBerkshire, UK: Open University Press.

Grotzer, T. and Bell Basca, B. (2003). How does grasping the underlying causual structures of ecosystems impact students' understanding? *Journal of Biological Education,* 38(1)**,** 16-29.

Sander, E., Jelemenska, P. and Kattmann, U. (2006). Towards a better understanding of ecology. *Journal of Biological Education,* 40(3)**,** 119-123.

**Print and cut out cards for card-sort activity**

✁

|  |  |
| --- | --- |
| Have scales on their hind feet to allow them to move quickly. | Pups are born with a layer of fur on the skins surface. |
| They have a layer of fat for buouyancy. | Can adjust body colour. They turn dark when it is cold and light when it is hot. |
| They are able to redirect blood flow to prevent heat loss. | Fat helps insulate and is an energy store. |
| Skin on their ears is fringed to help stop sand getting in. | Nose is adapted to allow them to breathe in sand. |
| A membrane covers their eyes to help protect them against sea water. | The head is shaped to allow them to burrow into sand. |