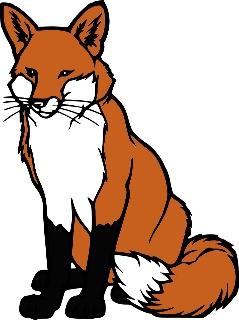
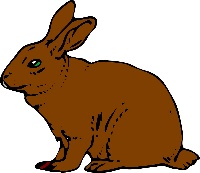
**Bottom of the food chain**

The diagram shows a complete food chain.







grass

foxes

rabbits

Which statement **best** explains why the grass is as the start of the food chain?

|  |  |
| --- | --- |
| **A** | It is there to feed the rabbits. |
| **B** | It is a producer. |
| **C** | It is the smallest. |
| **D** | It cannot defend itself from being eaten. |

*Biology> Big idea BOE: Organisms and their environments > Topic BOE1: Interdependence of organisms > Key concept BOE1.1: Food chains and food webs*

|  |
| --- |
| **Diagnostic question** |
| **Bottom of the food chain** |

**Overview**

|  |  |
| --- | --- |
| Learning focus: | Feeding relationships within a community of organisms can be modelled using food chain and food web diagrams. |
| Observable learning outcome: | Explain the order of organisms in a given food chain, using ideas about producers, consumers, predators and prey. |
| Question type: | Simple multiple choice |
| Key words: | food chain, producer |

|  |  |
| --- | --- |
| **P** | **PRIOR UNDERSTANDING**  This diagnostic question probes understanding of ideas that are usually taught at age 5-11, to aid transition from earlier stages of learning. |

**What does the research say?**

In a multinational study of students aged 16-18 (Barman, Griffiths and Okebukola, 1995), the majority of students described a food chain as showing ‘what eats what’ (i.e. feeding relationships); however, only approximately 10% of students used the terms ‘producer’ and ‘consumer’ when asked to explain what is shown by a food chain. Leach et al. (1992) found that many students aged 5-16 used teleological reasoning to explain feeding relationships, i.e. that producers of prey existed in order to feed consumers or predators.

In another study of 506 children aged 9-10 years old, it was found that many of the children used their perceptions of an organism’s relative size and ferocity when making conclusions about predator-prey relationships, and when deciding which animals were likely to be herbivores and which were likely to be carnivores (Gallegos, Jerezano and Flores, 1994). It was found that some children did not consider a plant to be a producer, but placed it correctly at the beginning of a food chain because it was the smallest, could not defend itself, and could not eat an animal.

**Ways to use this question**

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

*Differentiation*

You may choose to read the question and answers 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**

**B** – It is a producer.

**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.

A number of authors have suggested challenging students to construct their own food chains, including for meals they have eaten themselves, to increase engagement and help develop understanding (Barker and Slingsby, 2011; Grumbine, 2012). Accordingly, the following BEST ‘response activities’ can be used in response to this diagnostic question to help build understanding through model-making and small group discussion:

* Response activity: Build a food chain
* Response activity: Breakfast food chains

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Images: grass – adapted by UYSEG from pixabay.com/OpenClipart-Vectors (151473); rabbit – pixabay.com/Clker-Free-Vector-Images (297212); fox – pixabay.com/Stampf (2530031)

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