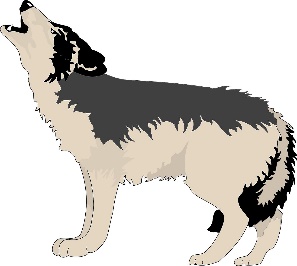
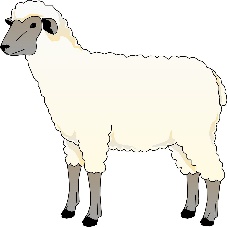
**Populations and communities**

The diagram shows a complete food chain.







grass

wolf

sheep

**Part 1**

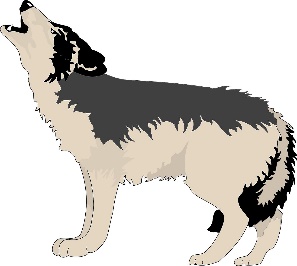
1. How many **populations** are shown in the diagram?

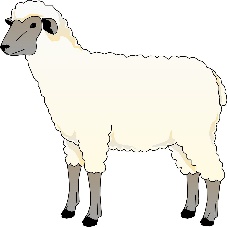
|  |  |
| --- | --- |
| **A** | None |
| **B** | One |
| **C** | Two |
| **D** | Three |

1. How would you explain your answer to question 1?

|  |  |
| --- | --- |
| **A** | Only humans can form a population. |
| **B** | All of the organisms in the food chain make up a population. |
| **C** | Only animals can form a population. |
| **D** | Each stage in the food chain is a population. |

The diagram shows a complete food chain.







sheep

wolf

grass

**Part 2**

1. How many **communities** are shown in the diagram?

|  |  |
| --- | --- |
| **A** | None |
| **B** | One |
| **C** | Two |
| **D** | Three |

1. How would you explain your answer to question 1?

|  |  |
| --- | --- |
| **A** | Only humans can form a community. |
| **B** | All of the organisms in the food chain make up a community. |
| **C** | Only animals can form a community. |
| **D** | Each stage in the food chain is a community. |

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

|  |
| --- |
| **Diagnostic question** |
| **Populations and communities** |

**Overview**

|  |  |
| --- | --- |
| Learning focus: | Feeding relationships within a community of organisms can be modelled using food chain and food web diagrams. |
| Observable learning outcome: | Recognise that the words and pictures in a food chain diagram represent populations of organisms in a community. |
| Question type: | Two-tier multiple choice |
| Key words: | food chain, population, community |

**What does the research say?**

Food chains and food webs are models – they are simplified representations of feeding relationships between populations of organisms in a community (Griffiths and Grant, 1985). They do not show how many organisms are present in the real world community – only how the populations are arranged into trophic levels.

A multinational study of students aged 16-18 identified a number of misunderstandings about food chains and food webs that are commonly held by school children, including that the words and pictures in a food chain represent individual organisms rather than populations of organisms (Barman, Griffiths and Okebukola, 1995).

Students at age 11 are likely to be more familiar with the everyday, rather than the ecological, use of terms such as ‘population’ and ‘community’. In one study, a quarter of children in a sample of secondary school students thought that a ‘community’ could only be formed by people living together, and another quarter could not distinguish between ‘population’ and ‘community’ (Adeniyi, 1985).

**Ways to use this question**

Students should complete the questions 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 questions 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**

*Part 1*

1. **D** – Three
2. **D** – Each stage in the food chain is a population.

*Part 2*

1. **B** – One
2. **B** – All of the organisms in the food chain make up a community.

**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.

**Acknowledgments**

Developed by Alistair Moore (UYSEG).

Images: grass – adapted by UYSEG from pixabay.com/OpenClipart-Vectors (151473); sheep – pixabay.com/Clker-Free-Vector-Images (48357); wolf – adapted by UYSEG from pixabay.com/Clker-Free-Vector-Images (48334)

**References**

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Barman, C. R., Griffiths, A. K. and Okebukola, P. A. O. (1995). High school students' concepts regarding food chains and food webs: a multinational study. *International Journal of Science Education,* 17(6)**,** 775-782.

Griffiths, A. K. and Grant, B. A. C. (1985). High school student's understanding of food webs: identification of a learning hierarchy and related misconceptions. *Journal of Research in Science Teaching,* 22(5)**,** 421-436.