

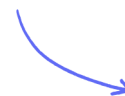
## Structured Questions

# Stability & Change

Stability in Ecosystems / Ecosystem Stability: Skills / Keystone Species / Sustainability in Ecosystems & Agriculture / Eutrophication / The Effects of Pollution / Restoring Ecosystems

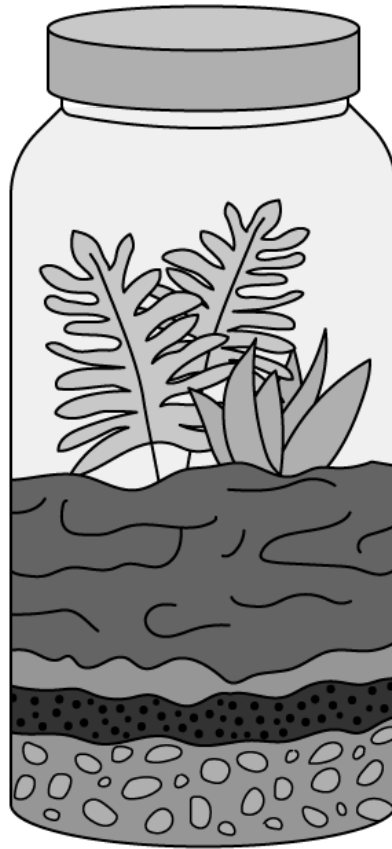
Easy (1 question)	/6
Medium (1 question)	/3
Hard (2 questions)	/15
<b>Total Marks</b>	<b>/24</b>

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# Easy Questions

- 1 (a) Abiotic factors can be controlled in order to study the response of a naturally occurring ecosystem using the set up below.



What is the name given to the set up shown in the image which allows the study of ecosystems?

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(1 mark)

- (b) Suggest why the experiment set up in part **b**) should include the following features:

- A transparent container
  - A lid to seal the container
  - Minimal primary consumers and no secondary consumers
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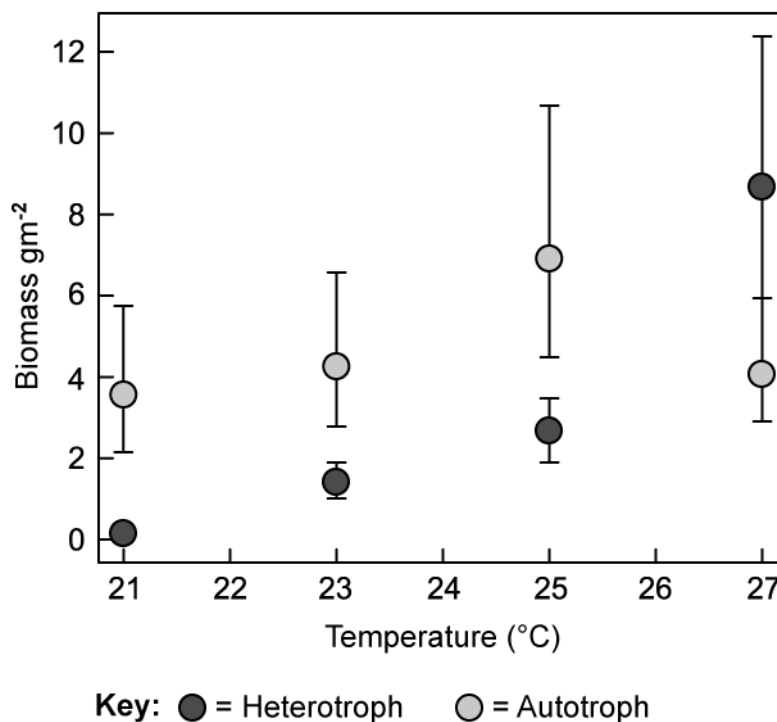
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(3 marks)

- (c) A mesocosm was set up to study the effect of increasing global temperatures on the biomass of aquatic autotrophs and heterotrophs.

The graph shows the data collected.



Describe what happened to the biomass of heterotrophs and autotrophs as temperatures increased from 21 °C to 27 °C.

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(2 marks)

# Medium Questions

- 1 Evaluate the benefit of mesocosm experiments in understanding interactions between organisms in their natural environment.

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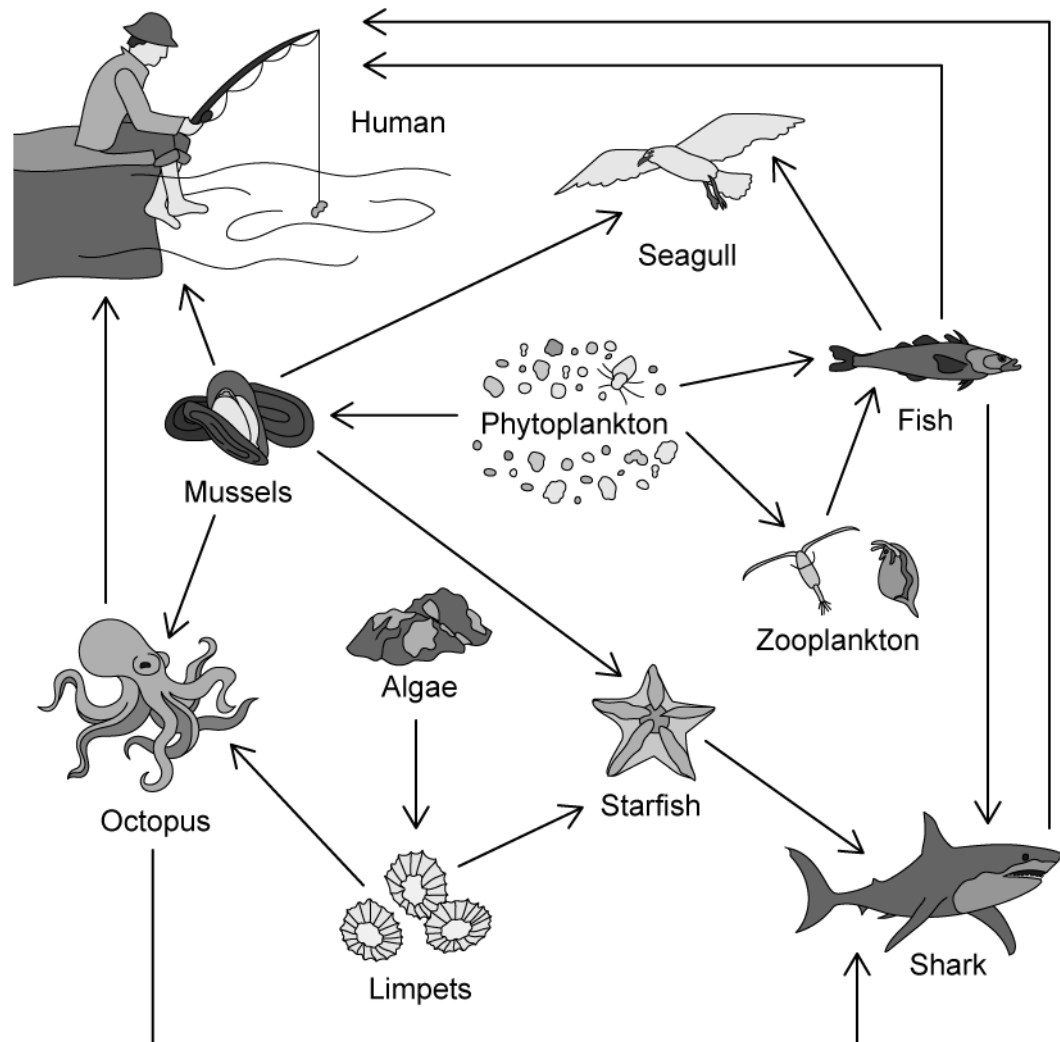
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**(3 marks)**

# Hard Questions

1 (a) A basic food web for a large marine ecosystem can be seen below.



Nutrient-rich sewage from coastal settlements results in rapid growth of algae (algal blooms), which leads to a reduction in light intensity on the ocean floor.

Suggest the general effects this may have on a community in a marine ecosystem.

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**(4 marks)**

- (b)** Since 2013, numbers of starfish in the large marine ecosystems have been seen to dramatically reduce by up to 80% in some regions.

Starfish act as detritivores in the marine ecosystems, feeding on dead and decaying organic matter, as well as preying on organisms such as mussels and limpets.

Some scientists have suggested that a decline in starfish numbers may have a positive impact on the marine ecosystem.

Evaluate this statement.

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**(4 marks)**

**2 (a)** *One mark is available for clarity of communication in this question.*

Outline how scientists may simulate a naturally occurring ecosystem to establish how the sustainability of that ecosystem may be influenced by global warming.

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**(4 marks)**

**(b)** Explain the use of the chi-squared test to analyse data collected from the simulated ecosystem.

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**(3 marks)**