

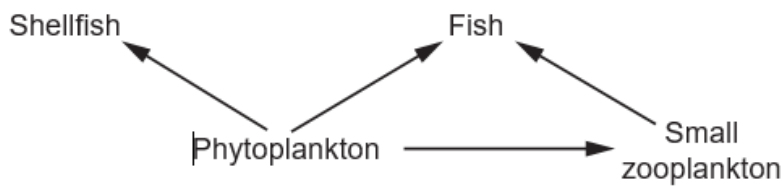
GCSE Biology B (Twenty First Century Science)
J257/04 Depth in biology (Higher Tier)

Question Set 8

1

Plastic pollution in the sea is a big problem.

Look at the food web from the North Sea.



(a) What does the word “Fish” represent in the food web?

Tick (✓) **one** box.

An individual organism

A population

A producer


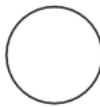
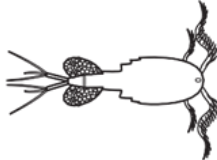
A species

[1]

(b) Explain the difference between a community and an ecosystem using examples from the food web.

A community is 2 or more populations of organisms. An ecosystem is the interaction between a community of organisms and their environment. E.g. the whole food web represents a community in the North Sea. [2]

The table gives information about phytoplankton, microplastics and small zooplankton.

	Phytoplankton	Microplastics	Small zooplankton
			
Size	Up to 0.2 mm	Up to 5 mm	Up to 20 mm
Can be digested by fish?	Yes	No	Yes

Fish can eat anything that is less than or equal to 20 mm in size.

(c) Explain why plastic litter in the sea could cause a decrease in the numbers of fish.

Plastic litter breaks up into microplastics which are small enough to be swallowed by fish. This builds up inside fish as they cannot digest it so they die so there are less fish. [3]

(d) Scientists have discovered some bacteria in a rubbish dump. These bacteria can break down plastic litter very quickly.

(i) Some people think we should put the bacteria in the North Sea to break down plastic litter.

Suggest and explain how this could put the North Sea ecosystem at even greater risk.

A mutation may have occurred in a bacterium's DNA so those with this advantageous allele survive. Thus the number of bacteria that can break down plastic increases overtime.

[4]

(ii) Bacteria gaining the ability to break down plastic is an example of evolution.

Explain what changes must have taken place in the bacteria cells to give them the ability to break down plastic.

If the bacteria breaks down the plastic into even smaller size (smaller than microplastic), then small sea creatures would be able to swallow the plastic as well (eg. zooplankton). The plastic would build up inside and cause more death because they can not digest plastic.

Total Marks for Question Set 8: 12

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