

4-7 Ecology – Biology

1.0 Figure 1 shows a fennec fox.

Figure 1



Drew Avery Creative Commons 2.0

Fennec foxes live in the desert.

1.1 Draw **one** line from each adaptation of the fennec fox to the advantage of the adaptation.

[3 marks]

Adaptation	Advantage
Omnivorous	To help it to find food in places there is a lack of food
Able to get water from food	To reflect the sun's rays
Large ears	To keep it warm in cold nights
	To allow it to cool down blood quickly
	To keep it hydrated

1.2 Fennec foxes mate for life.
What type of adaptation is this?

[1 mark]

Tick **one** box.

- Behavioural
- Emotional
- Functional
- Structural

1.3 Animals, such as fennec foxes, compete with each other.

Give **two** biotic factors that animals compete for.

Choose from the words in the box.

[2 marks]

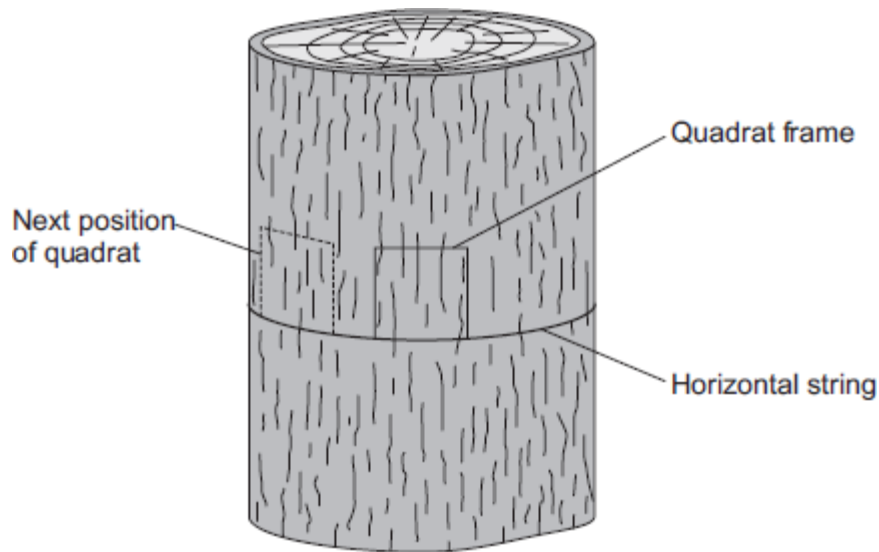
Carbon dioxide	Mates	Light
Heat	Territory	Oxygen

1.4 Factors that affect communities are biotic factors and abiotic factors.

Name **two** abiotic factors that affect communities.

[2 marks]

2.0 Students investigated the distribution of a green alga on a tree trunk.

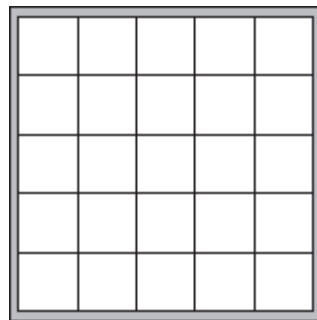


The students:

- tied a piece of string horizontally round a tree
- put a quadrat on the string so that the quadrat faced south
- estimated the percentage of the area in the quadrat covered with the green alga
- repeated the observation with the quadrat facing south west, west, north west, north, north east, east and south east.

Figure 2 shows the quadrat the students used.

Figure 2

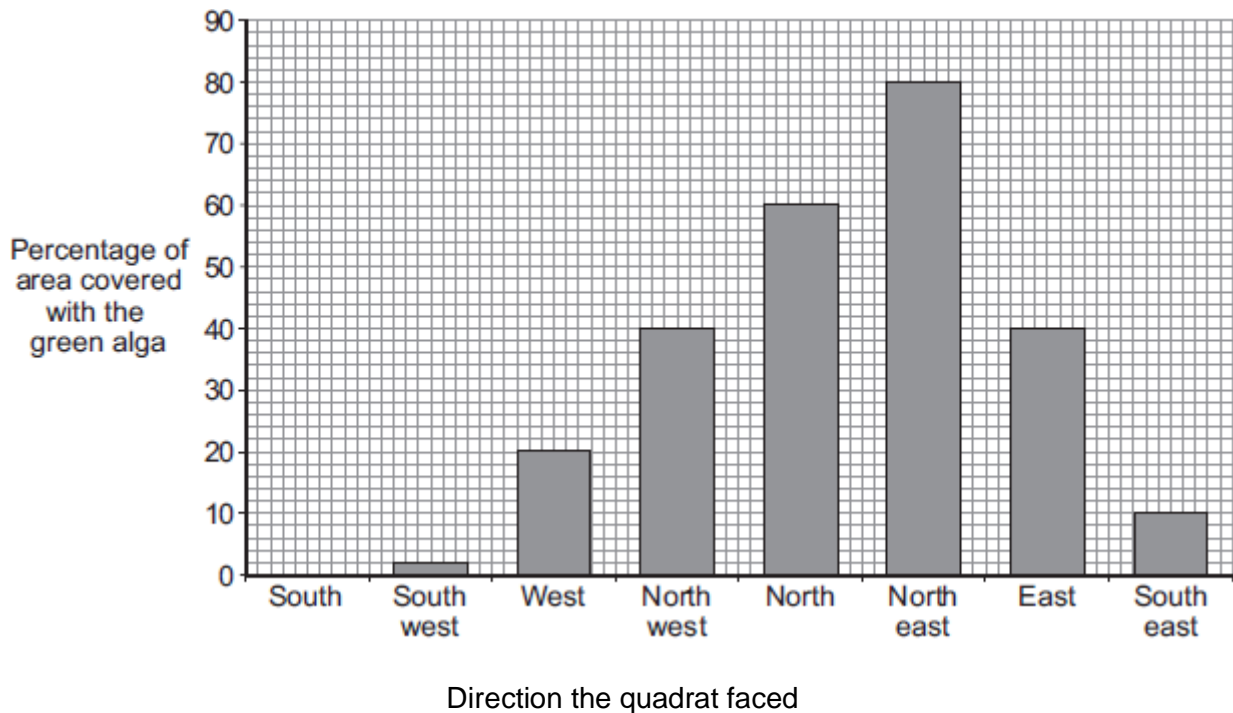


2.1 Describe how you would estimate the percentage of the area covered with the green alga in one quadrat.

[2 marks]

2.2 Figure 3 shows the students' results.

Figure 3



Describe how the direction that the quadrat faced affected the percentage of area covered with the green alga.

[2 marks]

2.3 What was the median of the percentage area covered with the green alga?

[2 marks]

Show your working.

Median = _____ %

3.0 Each year more crops are being grown. Large areas of rain forest are being cleared and burnt in many parts of the world. The cleared land is being used to grow crops. The cleared land will often produce crops for only a few years.

3.1 Explain why more crops are being grown each year.

[2 marks]

3.2 Explain why burning rain forests is not seen as a sustainable answer to increasing crop production.

Include in your answer **both** local and global effects.

[6 marks]

4.0 The future of the human species on Earth relies on us maintaining a good level of biodiversity.

4.1 State what is meant by the term biodiversity.

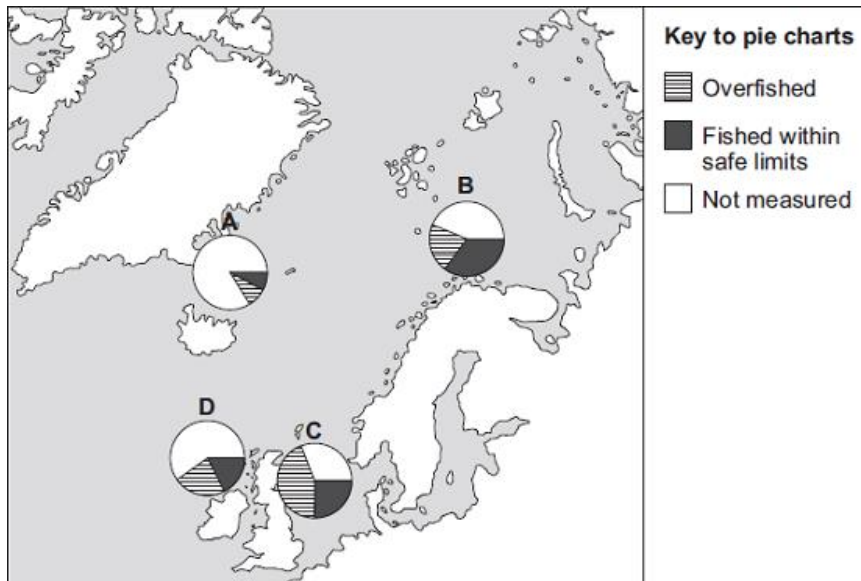
[1 mark]

4.2 Give **three** examples of ways in which scientists and other people have tried to maintain biodiversity in different environments.

[3 marks]

5.0 The map in **Figure 4** shows pie charts, **A**, **B**, **C** and **D**, that give information about fisheries in some of the seas around Europe.

Figure 4



© European Environment Agency

5.1 Why is it difficult to tell from this diagram which area has the most amount of overfishing?

[1 mark]

5.2 It is important to maintain fish stocks high enough for breeding to continue. Give the reason why.

[1 mark]

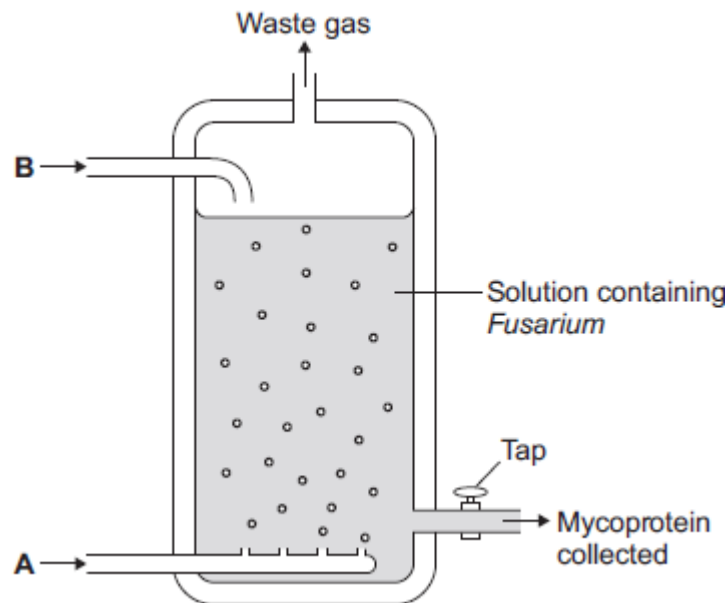
5.3 Give **two** ways fish stocks can be conserved.

[2 marks]

6.0 The world population is increasing and the need for food is increasing. Mycoprotein is a high-protein food made in fermenters using a fungus called *Fusarium*. The process takes only a few weeks to produce a large amount of food.

Figure 5 shows a fermenter used in mycoprotein production.

Figure 5



6.1 Suggest which substance the solution contains that the *Fusarium* grows on.

[1 mark]

6.2 *Fusarium* makes mycoprotein. *Fusarium* respire aerobically.

Suggest which gas is added to the fermenter at point A.

[1 mark]

6.3 Ammonia is also added to the fermenter.

Why is ammonia needed?

[1 mark]

6.4 People need to eat protein to grow and to be healthy.

Some people think that it would be an advantage to get more food from mycoprotein and less from farming animals.

Suggest **two** reasons some people may disagree with eating mycoprotein as a source of protein.

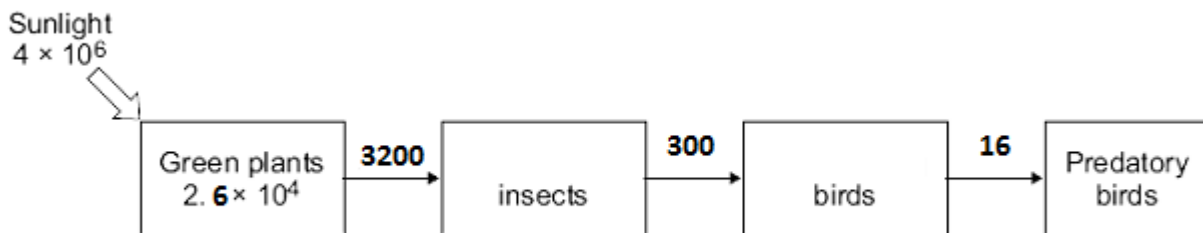
[2 marks]

1 _____

2 _____

7.0 The diagram shows the annual flow of energy through a habitat.

The figures are in kJ m^{-2} .



7.1 Calculate the percentage of the energy in sunlight that was transferred into energy in the green plants.

[2 marks]

Answer = _____ %

7.2 Suggest reasons why the percentage energy transfer you calculated in part 7.1 was so low.

[2 marks]

7.3 Compare the amount of energy transferred to the insect-eating birds with the amount transferred to the predatory birds.

Suggest explanations for the difference in the amount of energy transferred to the two types of bird.

[3 marks]
