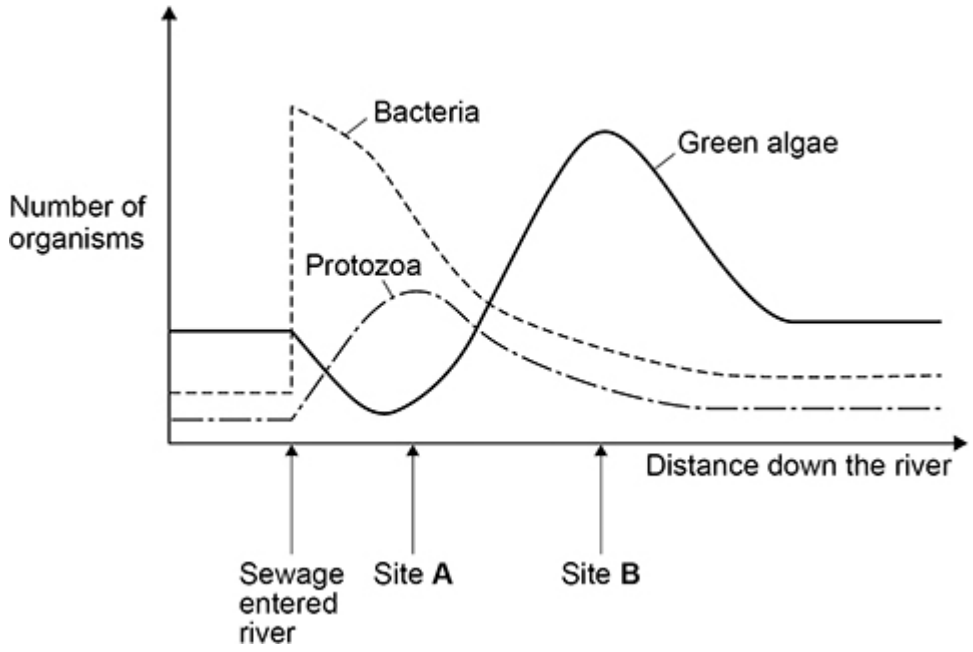
Questions are for both separate science and combined science students

Q1.

Rivers are sometimes polluted with untreated sewage.

Figure 1 shows some changes that occurred when untreated sewage entered a river.

Figure 1



(a) Which type of organism had the most rapid increase in numbers when sewage entered the river?

Tick (✓) **one** box.

Bacteria ☐

Green algae ☐

Protozoa ☐

(1)

(b) Protozoa are single-celled organisms.

Describe **two** ways **Figure 1** shows that the protozoa in the river feed on bacteria.

1 _____

_____

2 _____

_____

(2)

(c) When sewage enters a river, the concentration of dissolved oxygen decreases.

The decrease in oxygen concentration is caused by organisms in the water.

What process in living organisms uses oxygen?

_____

(1)

(d) As the numbers of green algae in the river increase, the concentration of dissolved oxygen increases.

Explain why the concentration of dissolved oxygen increases.

_____

_____

_____

_____

(2)

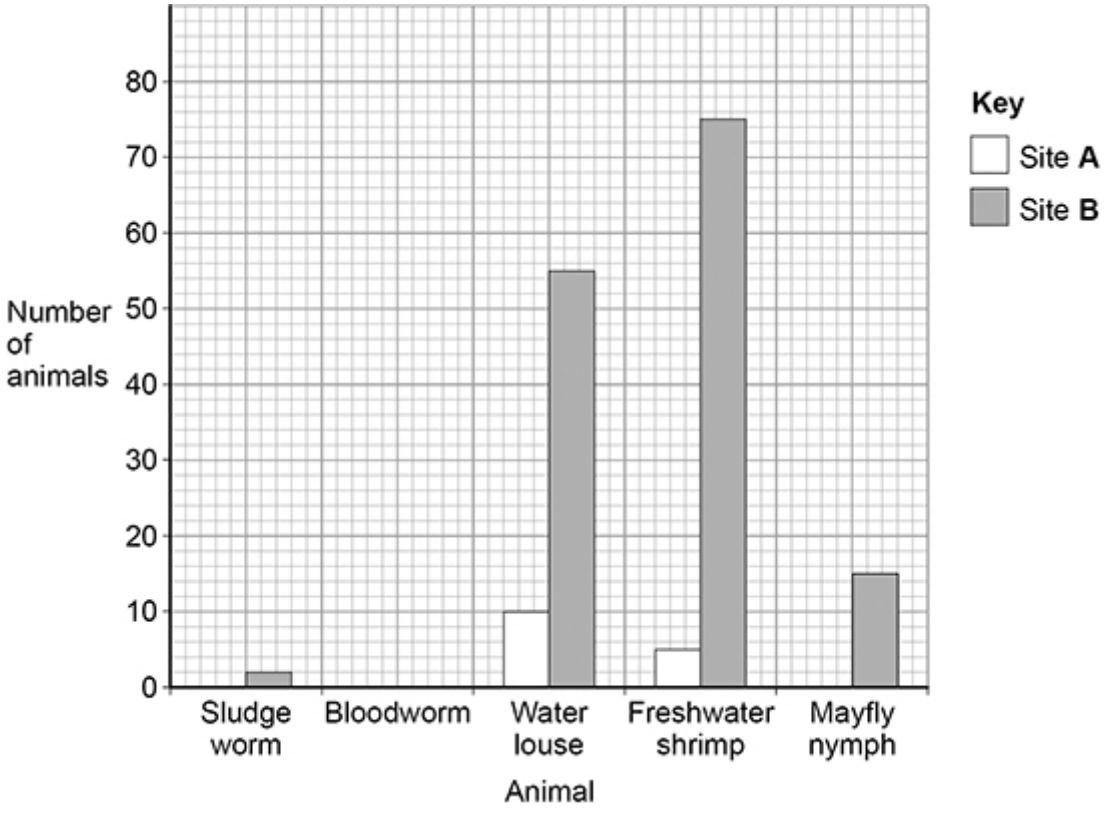
Scientists counted the numbers of five different animals in the river at sites **A** and **B**, shown in **Figure 1** above.

The table below shows the results.

Animal	Number of animals	
	Site A	Site B
Sludge worm	80	2
Bloodworm	36	8
Water louse	10	55
Freshwater shrimp	5	75
Mayfly nymph	0	15

Figure 2 shows some of the data from above table.

Figure 2



(e) Complete **Figure 2**.

You should use data from above table for the sludge worm and the bloodworm.

(2)

(f) The concentration of oxygen in the water at site **A** is much lower than at site **B**.

- Sludge worms live in places which have a low concentration of oxygen.
- Mayfly nymphs need a high concentration of oxygen.

Give evidence from the table above for the difference in oxygen concentration at sites **A** and **B**.

Refer to sludge worms and to mayfly nymphs in your answer.

_____

_____

_____

_____

_____

(2)

(Total 10 marks)