All questions are for both separate science and combined science students

1 The passage describes the study of organisms and their ecosystems.

Complete the passage by writing a suitable word in each of the spaces.

(8)

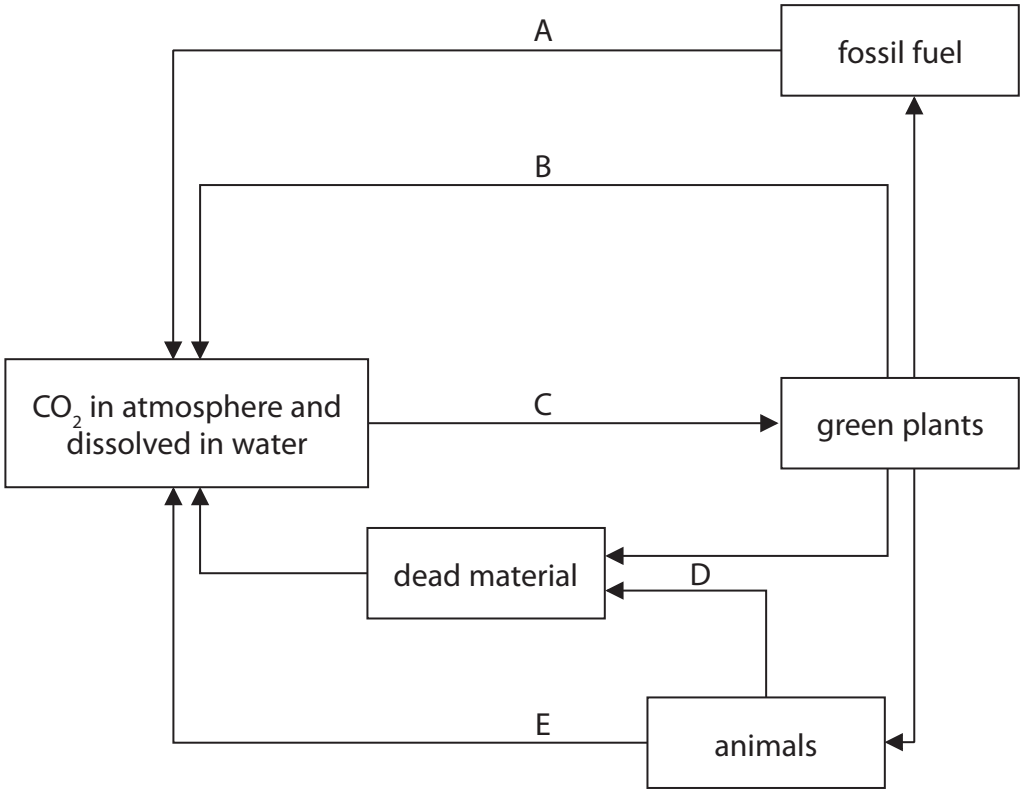
Ecology is the study of the interaction of the organisms in an ecosystem with their ..... . This is made up of biotic or living factors and abiotic or non-living factors.

In an ecosystem a group of organisms of the same species living in one place is a ..... . Different groups of species living in the same place or habitat is called a ..... .

To study the number and distribution of plants in an area, a wooden or metal frame is used. This is called a ..... . To compare numbers of organisms in two areas several frames need to be placed at ..... places in each area. The numbers in each frame are combined and then divided by the total number of frames. This is done to calculate the ..... for each area. By using several frames we improve the ..... of the data and make it easier to detect any ..... results.

(Total for Question = 8 marks)

2 The diagram shows the carbon cycle.



(a) (i) Identify the processes labelled A, B, C, D and E.

(5)

A .....

B .....

C .....

D .....

E .....

(ii) Give the letter of the process that reduces the carbon dioxide in the atmosphere.

(1)

(b) An increase in the level of carbon dioxide in the atmosphere can lead to an enhanced greenhouse effect.

Describe the possible consequences of an enhanced greenhouse effect.

(4)

(c) Suggest two ways to reduce the build up of greenhouse gases in the atmosphere.

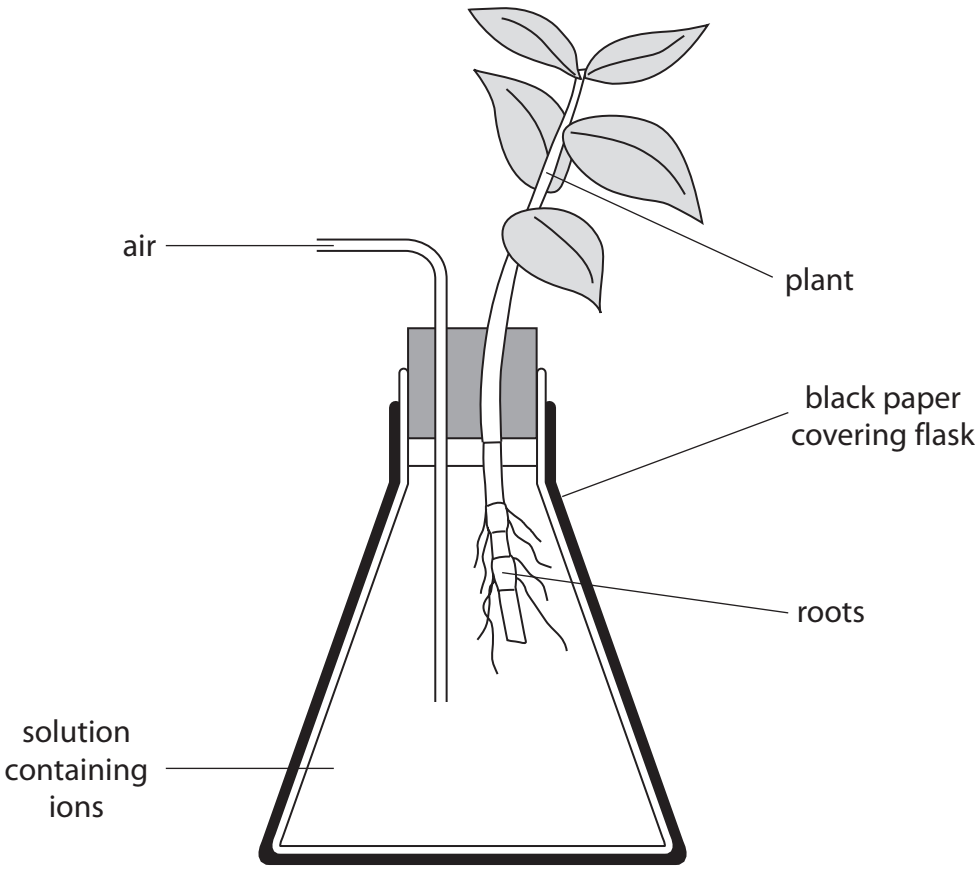
(2)

1

2

(Total for Question = 12 marks)

3 A student used this apparatus to find out if nitrate ions helped plants to grow.



A young plant was grown in a solution that contained all the ions needed for growth.
A different young plant was grown in a solution that also contained all the ions needed for growth except nitrate.

(a) (i) Suggest why the solutions have air bubbled into them.

(2)

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(ii) Suggest why the apparatus was covered in black paper.

(2)

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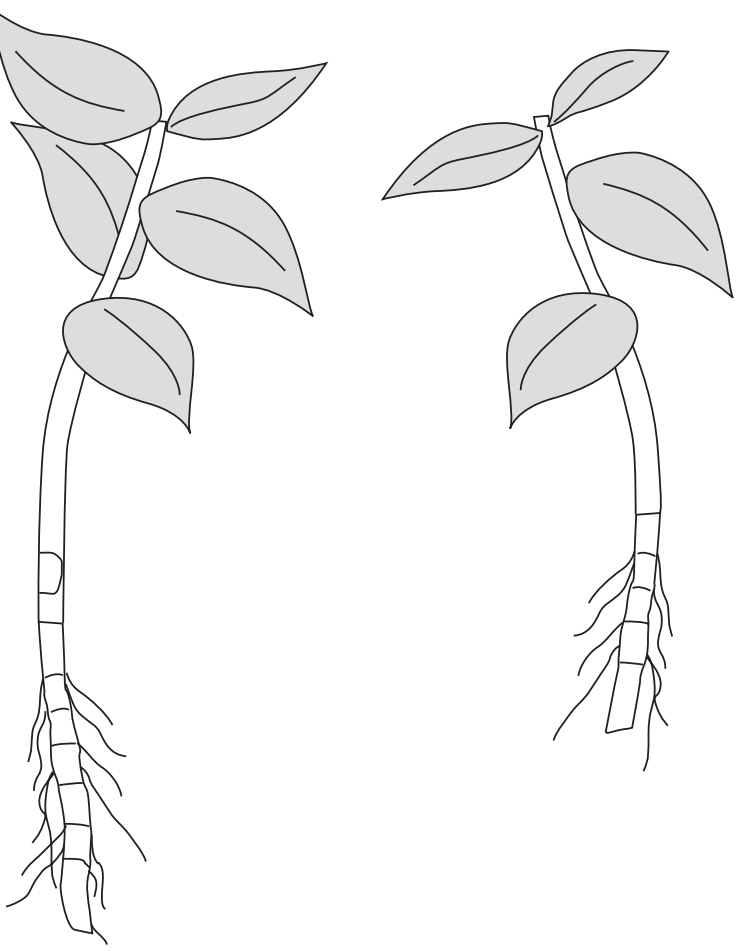
(b) The diagram shows the young plants after 55 days of growth.



(i) Measure the length of the plants in mm and write your answers below.

(2)

plant grown in the solution containing all the ions ..... mm

plant grown in the solution without nitrate ions ..... mm

(ii) Suggest how the student could make the results of the investigation more reliable.

(1)

.....

.....

(iii) Suggest **two** factors, not seen in the diagram, that the student should keep the same for both plants while they are growing.

(2)

1 .....

2 .....

(c) Explain the consequences of fertiliser containing nitrates polluting a river.

(6)

(Total for Question = 15 marks)