

Plant Diseases and Infection

Q:1 Plants need mineral ions for healthy growth.

(a) Which part of a plant takes in mineral ions? Tick (☑) one box.

Flower

Leaf

Root

(1 mark)

(b) Leaves are usually green.

(b)(i) What is the green substance in leaves?

Draw a ring around your answer.

chlorophyll glucose starch

(1 mark)

(b)(ii) The green substance in leaves is important to plants.

Explain why.

(2 marks)

(c) A shortage of mineral ions can affect a plant.

Draw one line from each mineral ion to the effect of its shortage.

Mineral ion	Effect of its shortage
Magnesium	Yellow leaves
Nitrate	Stunted growth
	White flowers

(2 marks)

Q:2 A gardener grows tomato plants.

The tomato plants develop yellow leaves.

(a) What would be the best way of improving the growth of these plants?

Tick (☑) one box.

Add mineral ions to the soil

Water the plants more

Add glucose to the soil

(1 mark)

(b) Most tomatoes are grown in greenhouses.



Tomato growers alter the conditions in greenhouses to make tomato plants grow faster.

Which changes in conditions will make tomato plants grow faster?

Tick (☑) two boxes.

Increasing the temperature

Increasing the oxygen concentration in the air

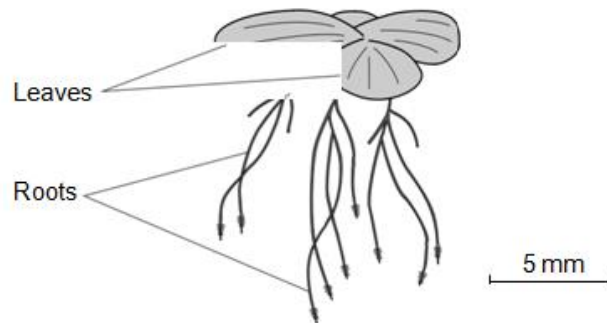
Increasing the nitrogen concentration in the air

Turning lights on at night

(2 marks)

Q:3 Duckweed is a plant. Duckweed grows in ponds. The leaves of duckweed float on the surface of the water and its roots hang down in the water.

The drawing shows a duckweed plant.



(a) Duckweed roots absorb nitrate ions from the water.

The nitrate ions help the duckweed to grow.

Draw a ring around the correct answer to complete the sentence.

Duckweed needs nitrate ions to make

carbohydrate.

fat.

protein.

(1 mark)

(b) Some students grew duckweed plants in three different solutions of mineral ions, A, B and C, and in distilled water (D).

Table 1 shows the concentrations of mineral ions in each of A, B, C and D at the start of the investigation.

Table 1

Mineral ion	Concentration of mineral ions in mg per dm ³ at the start of the investigation			
	A	B	C	D
Nitrate	1000	4	4	0
Phosphate	300	0	0	0
Magnesium	200	84	24	0

The students counted the number of duckweed leaves in A, B, C and D at the start of the investigation and after 28 days.

Table 2 shows their results.

Table 2

	A	B	C	D
Number of leaves at start	4	4	4	4
Number of leaves after 28 days	50	27	14	6

(b) (i) Using Table 1 and Table 2, describe the effect of magnesium ions on the growth of duckweed.

(1 mark)

(b) (ii) Solution A contained the highest concentration of nitrate ions.

One student said, 'The results show that nitrate ions are needed for the growth of duckweed.'

What evidence in Table 2 supports what the student said?

(1 mark)

(c) The students measured the growth of the duckweed by counting the number of leaves.

(c) (i) Suggest a better method of measuring the growth of the duckweed.

(1 mark)

(c) (ii) Suggest why your method is better than the students' method.

(1 mark)

TOTAL MARKS=14