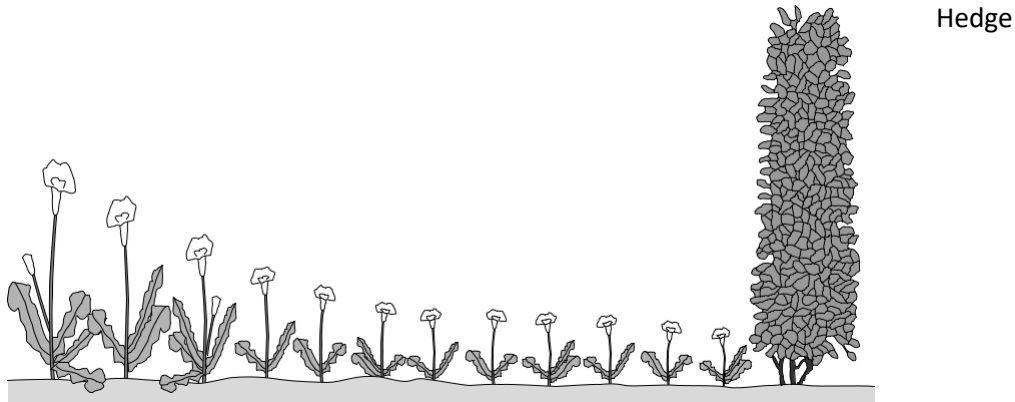


Plant Hormones

Q:1 The drawing shows plants growing near a hedge in a garden.



(a) The plants near the hedge are much smaller than the plants further away from the hedge.

Complete the sentence to give the reason why.

The plants compete with the hedge for _____

and _____

(2 marks)

(b) The gardener uses chemicals in his garden.

fertilisers herbicides pesticides

Which one of the three chemicals in the above box does the gardener use:

(b)(i) to kill weeds _____

(1 mark)

(b) (ii) to kill insects that feed on the plants? _____

(1 mark)

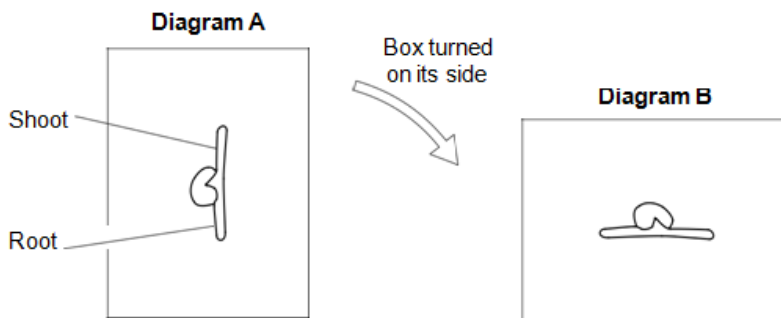
(c) The gardener decides to take out the hedge and put up a fence. How would taking out the hedge affect the animals in the area?

Give one reason for your answer.

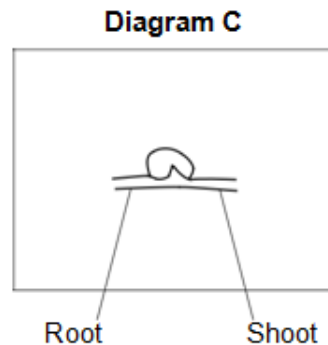
(2 marks)

Q:2 A student investigated growth responses in plants.

The student grew a bean seed in a box filled with moist soil, as shown in Diagram A. After the seed had started to grow, the box was turned onto its side and placed in a dark room, as shown in Diagram B.



(a) Complete Diagram C to show what the root and shoot will look like three days later.



(2 marks)

(b) Draw a ring around the correct answer to complete the sentence.

The results of the investigation show that the root is sensitive to

- light.
- moisture.
- gravity.

(1 mark)

(c) A hormone in the plant causes the growth responses.

What is the name of this hormone?

Tick (☑) one box.

Auxin

Statin

Steroid

(1 mark)

(d) Gardeners can use some plant hormones as weed killers.

(d) (i) Give one different use of plant hormones by gardeners.

(1 mark)

(d) (ii) Selective weed killers only kill some plants in a garden.

Killing weeds in a garden reduces competition between plants.

Give three factors that plants compete for.

1 _____

2 _____

3 _____

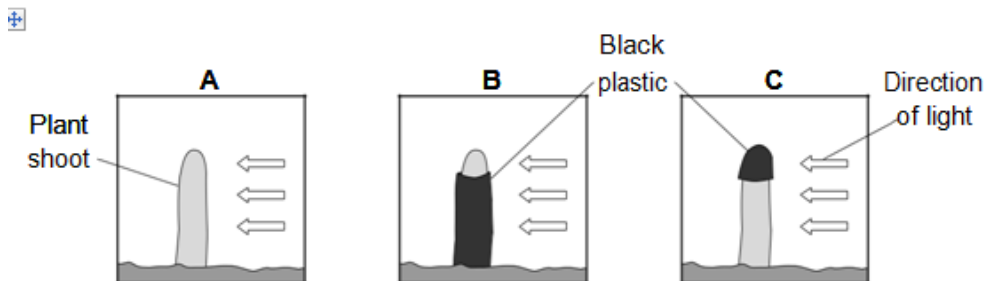
(3 marks)

Q:3 Charles Darwin investigated tropisms in plants.

Some students did an investigation similar to Darwin's investigation. The students:

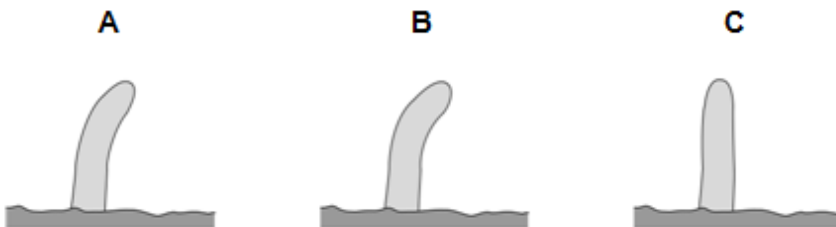
- ☐ grew seeds until short shoots had grown
- ☐ used black plastic to cover parts of some of the shoots
- ☐ put the shoots in light coming from one direction
- ☐ put boxes over the shoots to keep out other light.

The diagrams show how the investigation was set up.



Two days later the students took off the black plastic covers and looked at the shoots.

The diagrams show the results.



(a) Give two variables that the students should control in this investigation.

(2 marks)

(b) Shoot A bent towards the light as it grew.

Explain how.

(4 marks)

(c) What conclusions can be drawn from the results about:

(c) (i) the detection of the light stimulus

(1 mark)

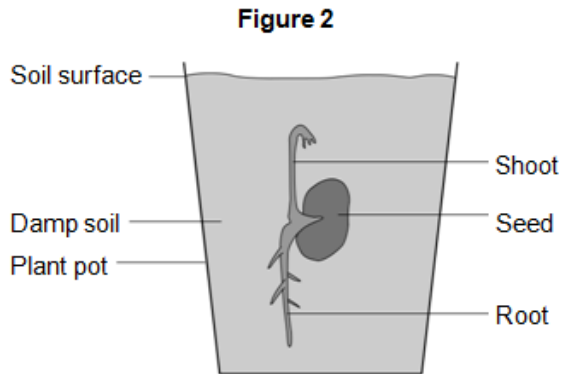
(c) (ii) where in the shoot the response to the light takes place.

(1 mark)

Q:4 A student investigated growth in plants. The student:

- planted a seed in damp soil in a plant pot
- put the plant pot in a dark cupboard.

Figure 2 shows the result after 5 days.



(a) Draw a ring around the correct answer to complete each sentence.

(a) (i) After the 5 days, the root had grown

- away from water.
- in the direction of the force of gravity.
- towards light.

[1 mark]

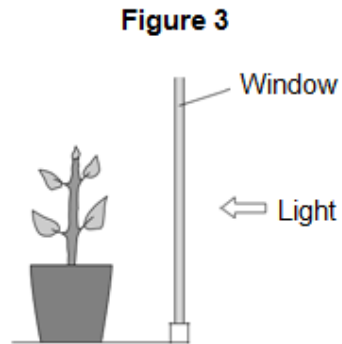
(a) (ii) After the 5 days, the shoot had grown

- against the force of gravity.
- away from light.
- towards water.

[1 mark]

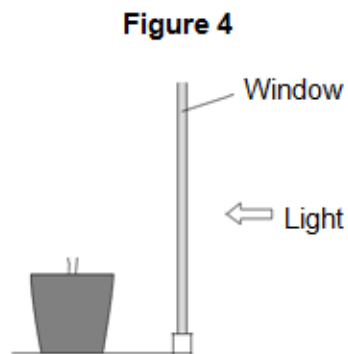
(b) After the plant had grown, the student put the plant pot by a window with lots of light.

Figure 3 shows this.



(b) (i) Complete Figure 4 to show the appearance of the student's plant after 20 days by the window.

]



[1 mark]

(b) (ii) Explain the advantage to the plant of growing in the way that you have drawn in part (b)(i).

[2 marks]

Q:5 Gardeners sometimes use weed killers to control the growth of plants.

(a) A gardener wanted to get rid of daisy plants growing in a lawn.

The gardener investigated the use of a weed killer.

The gardener:

- ☐ recorded the number of daisy plants growing in different 10 m² areas of the lawn
- ☐ made solutions of the weed killer (each solution had a different concentration)
- ☐ put 5 dm³ of each solution on different 10 m² areas of the lawn
- ☐ recorded the number of daisy plants growing in each area after 2 weeks.

Table 2 shows the results.

Table 2

Concentration of weed killer in arbitrary units	Number of daisy plants per 10 m ²	
	Before using weed killer	2 weeks after using weed killer
0 (water)	8	8
20	6	8
40	9	6
60	5	2
80	4	0
100	8	0

(a) (i) To make the investigation fair, the gardener controlled some variables.

Give one variable the gardener controlled in the investigation.

[1 mark]

(a) (ii) The gardener decided that the result for a concentration of 20 arbitrary units of weed killer was anomalous.

Suggest why the gardener decided this result was anomalous.

[1 mark]

(a) (iii) Why did the gardener put 0 arbitrary units of weed killer on one area of the lawn?

[1 mark]

(a) (iv) The gardener concluded that the best concentration of weed killer to use all over a lawn is 100 arbitrary units.

Suggest why the gardener cannot be sure about this conclusion.

[1 mark]

(b) In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

Plants respond to different environmental factors.

Describe how different environmental factors affect:

☐ the direction of growth of roots

☐ the direction of growth of shoots.

