Using Transects and Quadrats 2

Q:1 Some students were asked to investigate the distribution of clover in a field of grass. They noticed that the clover grew in patches amongst the grass.

(a) The students decided to use quadrats.

Describe how the students should decide where to place the quadrats to investigate the distribution of the clover.

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_____

_____

_____

_____

(2 marks)

(b) The diagram shows one of the quadrats the students used.
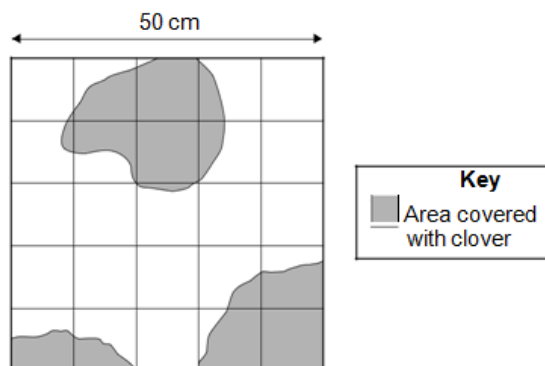
(b) (i) Estimate the number of squares of the quadrat covered with clover.

_____

_____

Number of squares = _____   **(1 mark)**

(b) (ii) Describe how you worked out your answer to part (b)(i).

_____

_____

_____

(1 mark)

(b) (iii) Use your answer from part (b)(i) to calculate the percentage of the quadrat covered by the clover.

_____

_____

_____

Answer = _____ %

(2 marks)

(c) Suggest one factor that could account for the distribution of the clover plants.

_____

(1 mark)

Q:2 At the seashore, the tide comes in and goes out twice each day.

Some students investigated whether two different species of seaweed could live only at certain positions on a rocky shore.

Seaweeds are plant-like organisms that make their food by photosynthesis. Figure 6 shows the two species of seaweed that the students investigated.
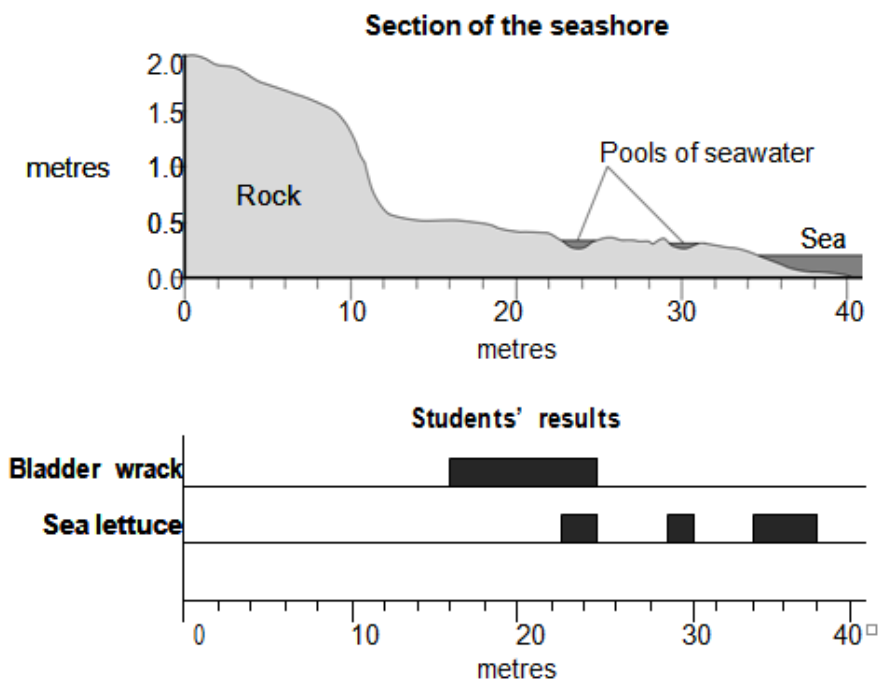
Figure 6

Bladder wrack   Sea lettuce

Air bladders

Not to scale

Holdfast
(fixes seaweed to the rock)
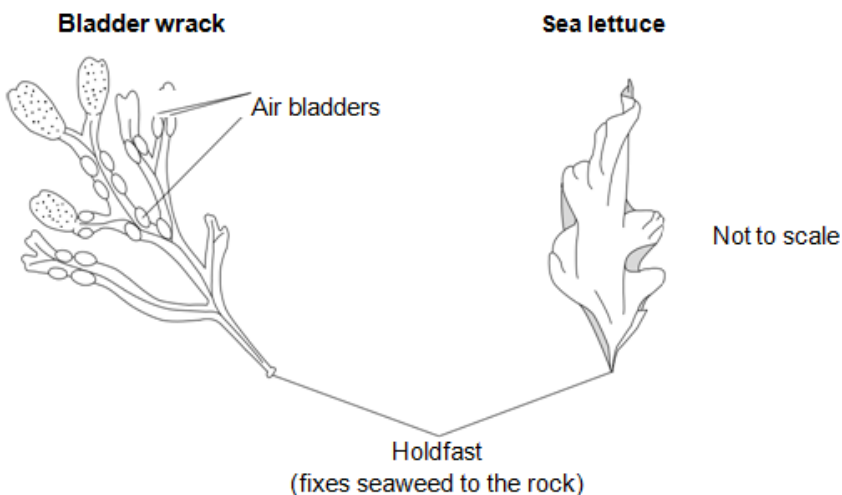
(a)　　The students:

1) placed a 50-metre tape measure on the rocks at right angles to the sea

2) placed a quadrat next to the tape measure

3) recorded whether each species was present or not.

The students repeated steps 2 and 3 every metre down the shore.

Figure 7 shows a section of the seashore and the students' results.

Figure 7

Section of the seashore

metres

Rock

Pools of seawater

Sea

metres

Students' results

Bladder wrack

Sea lettuce

metres

(a) (i) The students placed the quadrat at regular intervals along a transect line rather than placing the quadrat at random positions anywhere on the rocky shore.
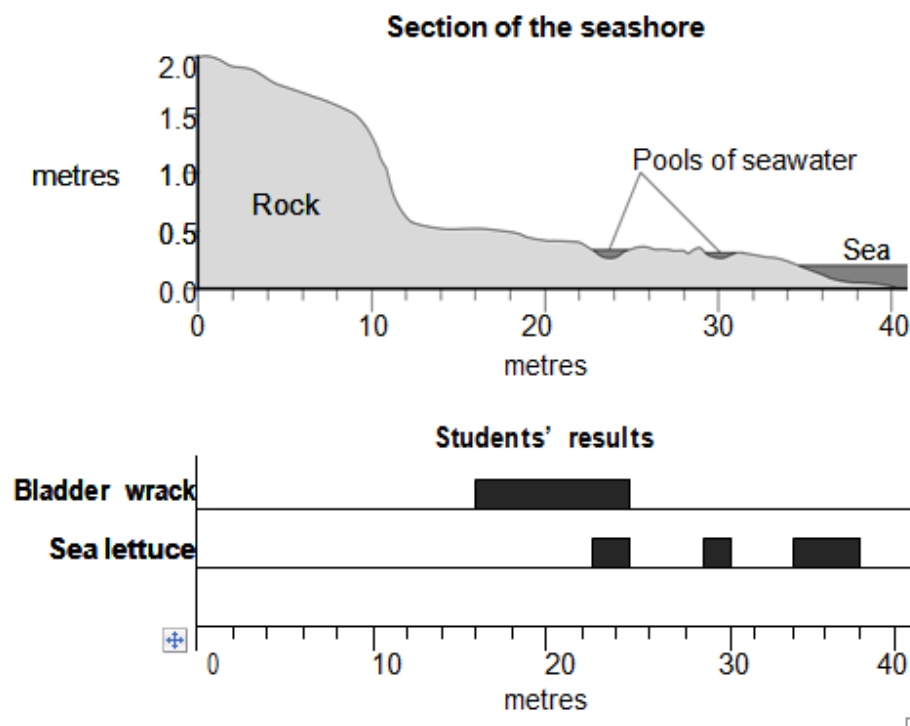
Explain why.

_____

_____

_____

_____

[2 marks]

(a) (ii) How could the students have improved their investigation to ensure that they produced valid data?

_____

_____

_____

[2 marks]

(a) (iii) Figure 7 is repeated here to help you answer this question.

Section of the seashore

metres

2.0
1.5
1.0
0.5
0.0

Rock

Pools of seawater

Sea

0   10   20   30   40
metres

Students' results

Bladder wrack

Sea lettuce

0   10   20   30   40
metres

The students concluded that bladder wrack is better adapted than sea lettuce to survive in dry conditions.

What is the evidence for this conclusion?

Use information from Figure 7.

_____

_____

_____

_____

_____

[2 marks]

(b)   The bladder wrack has many air bladders.

The air bladders help the bladder wrack to float upwards when the sea covers it.

Suggest how this helps the bladder wrack to survive.

_____

_____

_____

_____

[2 marks]

Q:3   Some students investigated the distribution of dandelion plants in a grassy field. The grassy field was between two areas of woodland.

Figure 2 shows two students recording how many dandelion plants there are in a 1 metre x 1 metre quadrat.
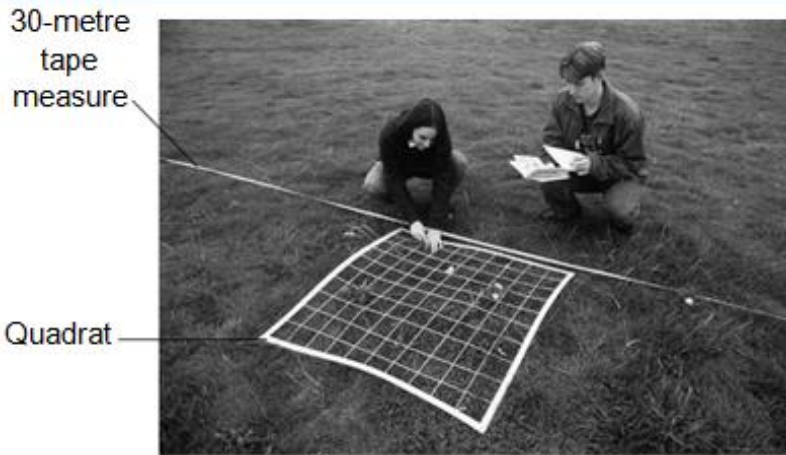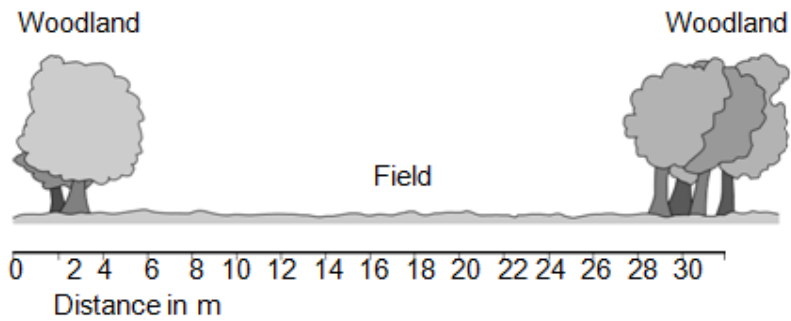
Figure 3 shows a section across the area studied and Figure 4 shows a bar chart of the students' results.

Figure 3

(a)   How did the students use the quadrat and the 30-metre tape measure to get the results in Figure 4?

Use information from Figure 2.

_____

_____

_____

_____

_____

[3 marks]

(b) (i) Suggest one reason why the students found no dandelion plants under the trees.

_____

_____

[1 mark]

(b) (ii) Suggest one reason why the students found no dandelion plants at 16 metres.

_____

_____

[1 mark]

(c)   The teacher suggested that it was not possible to make a valid conclusion from these results.

Describe how the students could improve the investigation so that they could make a valid conclusion.

_____

_____

_____

_____

[2 marks]

Q:4   In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.

Ivy plants can grow up trees and walls.

Figure 2 shows two ivy leaves. One leaf is from an ivy plant growing up a tree in the centre of a shady woodland area. The other leaf is from an ivy plant growing up a tree in a sunny area at the edge of the woodland.

Figure 2

Ivy leaf from shady woodland area
(centre of woodland)

Ivy leaf from sunny area
(edge of woodland)

A student makes the following hypothesis.

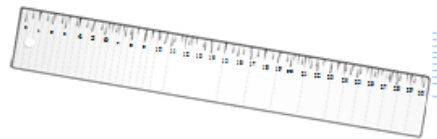"The size of ivy leaves decreases as light intensity increases."

How would you use the apparatus shown in Figure 3 to test this hypothesis?

You should include details of how you would make sure the results are valid.

Figure 3

100 m tape measure

Ruler

Light meter

_____

_____

_____

_____

_____

  _____

  _____

_____

_____

_____

[6 marks]

TOTAL MARKS=28