

- M1.(a)** snail  
**or**  
shrew  
*additional incorrect answer negates correct answer* 1
- (b) shrew  
*additional incorrect answer negates correct answer* 1
- (c) fewer shrews to eat them 1
- (d) population 1
- (e) **C** 1
- (f)  $(11\ 000 \times 0.1 =)$   
1 100 (kJ) 1
- (g) the snails do not eat the roots of the lettuces 1
- (h) any **one** from:  
  - light (intensity)
  - temperature
  - moisture (levels)
  - soil pH
  - mineral / ion content (of soil)
  - wind intensity / speed*ignore wind direction*

- carbon dioxide (levels)
- oxygen (levels)

1

[8]

**M2.(a)** 40 – 60 hours 1

(b) (i) decrease 1

1<sup>st</sup> slowly then faster / appropriate detail from the graph – e.g. from 7.8 to 0 / faster after 4 – 10h 1

(ii) oxygen after glucose  
*extra box ticked cancels 1 mark* 1

oxygen less than glucose 1

(iii) respiration 1

**[6]**

**M3.(a)** a higher concentration would be difficult to stir 1

(b) (i) methane 1

(ii) 60  
*100 - (5 + 35) but incorrect answer allow 1 mark* 2

(c) (i) aerobic respiration 1

(ii) oxygen 1

**[6]**

**M4.(a)** place all the quadrats randomly on the lawn

1

(b) (i) 1 4

2 2

3 2

4 0

*all 4 counts correct*

1

Total = 15

*total correct for their figures*

1

(ii) 1.5

*allow ecf from (b)(i)*

1

(iii) 180

*correct answer with or without working*

*if answer incorrect, allow 1 mark for  $\frac{15}{10} \times 120$  or  $15 \times 20$*

*or  $\frac{15}{10} \times 12 \times 10$*

*or  $1.5 \times 12 \times 10$  or  $1.5 \times 120$*

*allow ecf from (b)(ii)*

*allow 1 mark if only 1 error*

2

(c) use a larger sample size / more quadrats

*ignore repeats but allow repeat in different places*

*ignore 'count them all'*

**or**

use bigger quadrats

1

[7]

**M5.** (a) microorganisms / microbes / bacteria / fungi / decomposers  
*allow named example **or** mould*  
*ignore germs / worms / other detritivores* 1

(b) (weather / it is) warm(er) / hot(ter)  
*accept optimum conditions for enzymes*  
*allow cold(er) in winter*  
*ignore wet(ter) / light(er) / sun*  
*do **not** accept heat dries the leaves out* 1

(c) oxygen  
*no mark if more than one box is ticked* 1

[3]

**M6.** (a) methane / CH<sub>4</sub>  
*allow CH<sub>4</sub>*  
*do **not** allow CH<sup>4</sup> **or** ch4 or CH4* 1

(b) any **two** from:  
• didn't carry out repeats  
• only tested four types of manure  
• don't know the mass of manure was the same each time  
• inaccuracies in measuring (diameter of) balloon  
• bottles might have been different sizes  
• temperature of the room may have been different. 2

(c) The potato contains a lot of carbohydrate 1

[4]

**M7.(a)** any **three** from:

- place 30-m tape measure across field / from one wood to the other
- place quadrat(s) next to the tape
- count / record the number / amount of dandelions / plants in the quadrat  
*ignore 'record the results'*  
*ignore measures / estimates dandelions*
- repeat every 2 metres  
*allow every metre / at regular intervals*

3

- (b) (i) low light / it is shady  
*allow no light*  
*ignore sun / rays*

**or**

not enough water / ions / nutrients  
*accept correct named ion*  
*ignore no water / ions / nutrients*

**or**

wrong pH of soil  
*accept competition with trees for light / water / ions*  
*ignore competition for space and competition unqualified*  
*accept soil too acidic / too alkaline*  
*ignore temperature*

1

- (ii) sensible suggestion for a small area, eg chance variation / anomaly /  
poisoned by animal waste / wrong pH of soil / eaten (by animals) / cut  
down / footpath

1

- (c) repeat (transect) / compare with the results of other groups  
*allow 'do it in two different locations' for 2 marks*

1

at different / random location(s) / elsewhere (across the field)

do **not** allow 'in other fields'

1  
[7]



- M8.(a)** measure the length / area of the field 1
- (b) use (a) random number(s) (generator)  
**or**  
 use coordinates method explained 1
- (c) compare their results with another student's results 1
- place more quadrats 1
- (d)  $0.25 \times 5 = 1.25$  1
- $500 / 1.25 = 400$  1
- $(40 \times 400 =) 16\ 000$   
*allow 16 000 with no working shown for 3 marks* 1
- (e) 11 1
- (f) (quadrat) 5  
*both quadrat number and correct reason must be given for 1 mark* 1

very few or only 2 growing (here)

[9]

**M9.(a)** any **two** from:

- amount of waste on each heap  
*allow size of heap*
- (type of) materials on each heap  
*if neither marking points one or two awarded, allow 1 mark for same waste*
- put heaps in same (environmental) conditions.  
*e.g. keep at same (outside) temperature*  
*allow put in same place*

2

- (b) microorganisms / microbes / bacteria / fungi / decomposers  
*ignore detritivores / examples (such as worms, maggots, insects)*  
*ignore pathogens / germs*  
*do **not** allow viruses*

1

- (c) (i) oxygen / air added (when turning over)  
*allow idea that decay will be aerobic*  
*allow bacteria / microorganisms need oxygen / air*  
*allow (microorganisms) respire faster*

1

- (ii) any **two** from:
- dead leaves / fruit / plants (fall off / onto the ground)
  - (fallen dead leaves / fruit / plants) decay
  - minerals / ions / nutrients are recycled / released.  
*ignore references to carbon dioxide*  
*allow animal waste **or** dead animals*

2

[6]