

- 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

1st 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 15×20

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

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

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 / CH₄
allow CH₄
*do **not** allow CH⁴ **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]