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 × 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)

[8]

M2. (a)	40 – 60 hours				
(b)	(i)	decrease	1		
		1 st 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			
(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

- (b) (i) 1 4
 - 2 2
 - 3 2
 - 4 0

all 4 counts correct

Total = 15 total correct for their figures

(ii) 1.5 allow ecf from (b)(i)

(iii) 180

correct answer with or without working

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

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

or 1.5 x 12 x 10 or 1.5 x 120

allow ecf from (b)(ii)

allow 1 mark if only 1 error

(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

2

1

1

1

[4]

М5.	(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]
М6.	(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	

The potato contains a lot of carbohydrate

(c)

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

(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

(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

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

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

1

1

1

do not allow 'in other fields'

[7]

				_		
M8 .(a)	measure	the	lenath /	area	of the	field

- (b) use (a) random number(s) (generator)
 or
 use coordinates method explained
- (c) compare their results with another student's results

 1
 - place more quadrats

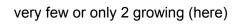
1

1

- (d) $0.25 \times 5 = 1.25$
 - 500 / 1.25 = 400
 - $(40 \times 400 =) 16\ 000$ allow 16 000 with no working shown for 3 marks
- (e) 11 1
- (f) (quadrat) 5

 both quadrat number and correct reason must be given for 1

 mark



[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]