



KS3 Science

Adaptation and Competition

Mark Scheme

Time available: 30 minutes

Marks available: 46 marks

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Mark schemes

1.

- (a) (i) • blackbird *and* robin
both answers are required for the mark answers can be in either order
1 (L3)
- (ii) • 2
accept 'blue tit and sparrow'
1 (L3)
- (iii) • seeds
1 (L3)
- (iv) • robin
1 (L3)
- (b) • feathers
accept 'down'
'fat' is insufficient
1 (L3)
- (c) any **one** from
- to feed their young
accept 'they are more active'
'it needs more energy' is insufficient
'they have babies' is insufficient
'to (help them) reproduce' is insufficient
do not accept 'to feed the eggs'
 - to produce eggs
accept 'to make eggs' or 'collect nesting materials'
accept 'to keep eggs warm'
accept 'to attract mates'
do not accept 'there is less food in winter'
do not accept an answer indicating that birds are born
1 (L4)

[6]

2.

- (a) any **one** from
- leaves or stems damaged by strong currents
accept 'plants or seeds washed away'
references to flowers are insufficient
accept 'they cannot attach themselves to the water bed'
 - roots could be pulled out
accept 'leaves unable to float'
1 (L5)

(b) any **one** from

- there is insufficient light
accept 'too little sunshine'
*do **not** accept 'no light'*
- the water is frozen
*accept 'leaves may be damaged by frost **or** snow **or** ice'*
'too cold' is insufficient
accept 'the plant freezes'
- less **or** no photosynthesis occurs
accept 'not enough energy to produce leaves'

1 (L5)

(c) (i) any **one** from

*a mark may be awarded for part (ci)
if the answer is given in part (cii)*

- large leaves
accept 'flat leaves'
- flexible stems
*accept 'thin **or** long stems'*
- waxy leaves
- the leaves or flowers are able to float
*'it **or** they can float' is insufficient*
- air in the leaves or stems
- roots that cover a wide area
accept 'strong roots'

1 (L5)

(ii) any **one** from

- (large **or** floating leaves **or** thin **or** long stems) to collect sunlight
accept 'for photosynthesis'
answers must give a function for the adaptation given in part (ci)
- (large leaves **or** flexible stem **or** waxy leaves **or** air in the leaves) to make the leaves float
a mark may be awarded for part (cii) if the answer is given in part (ci)
- (thin **or** flexible stems) to allow the leaves to move
- (floating flowers) for pollination
- (roots that cover a wide area) to stop them being washed away
accept '(strong roots) to hold it firmly in the ground'

1 (L6)

(d) any **one** from

- (easily) seen by bees or insects
accept 'bees or insects can get to them'
- attract bees **or** insects
- provide a landing platform for insects
- they are more likely to be pollinated above water than underwater
accept 'flowers are above water where fish or water animals cannot eat them'
- they produce more seeds because they are more likely to be pollinated
accept 'they produce more seeds'
'they produce seeds' is insufficient
- animals are attracted to spread the seeds
- they produce lots of pollen

1 (L5)

(e) any **one** from

- leaves absorb the heat **or** light
*accept 'leaves block or reflect the sunlight **or** heat'*
'lilies take the heat' is insufficient
- less heat **or** light reaches the pond
accept 'leaves shade the pond'
references to the Sun are insufficient

1 (L5)

[6]

3.

(a) any **one** from

- it has large **or** wide hands **or** paws
accept 'its paws are like shovels'
*accept 'big **or** strong feet'*
- it has a pointed head **or** face **or** nose
accept 'it has a long nose'
accept 'it is streamlined'
- it has strong **or** big claws
*accept 'it has sharp **or** long claws **or** nails'*
'claws' is insufficient
*accept 'eyes protected by fur' **or** 'eyes deep in fur'*
'it has small eyes' is insufficient

1 (L3)

(b) (i) • worm

1 (L3)

(ii) • owl

accept 'bird'

1 (L3)

(c) (i) • the Sun

accept 'light'

*'solar' **or** 'solar panel' **or** 'solar energy' are insufficient*

1 (L4)

- (ii) any **one** from
- batteries have to be replaced
 - solar power is free
 - solar power does not run out
accept 'it is a renewable source of power'
 - it is cheaper to run
accept 'it is cheaper'
'it is environmentally friendly' is insufficient

1 (L4)

- (iii) any **one** from
- it does not kill the moles
accept 'it is humane'
'it is friendlier' or 'it is nicer' are insufficient
 - it does not harm other animals
accept 'it does not harm humans'
 - poison kills **or** hurts moles
 - poison kills **or** hurts owls **or** predators **or** other living things
'poison is dangerous' is insufficient
 - poison enters food chains
'you do not have to get rid of dead moles'
***or** 'you can leave them in the tunnel' are insufficient*
'you have to keep adding poison' is insufficient
'so they do not become extinct' is insufficient

1 (L4)

[6]

4.

- (a) any **one** from
- it only eats other animals
accept 'predator'
 - it only eats meat **or** fish **or** flesh
accept 'eats meat'

1 (L6)

(b) (i) any **one** from

- it protects it
accept 'it stops it being eaten'
- it stops it being damaged
accept 'it keeps the contents in'
- it stops it drying out
- it prevents infection
- it keeps out disease organisms
*accept 'it stops bacteria **or** viruses **or** germs getting in'*
*accept 'it allows air **or** oxygen in **or** carbon dioxide out'*
*do **not** accept 'it keeps it warm'*

1 (L5)

(ii) it reacts with the carbonate

- accept 'they react' **or** 'it reacts with it'*
- accept 'acid reacts with the shell'*
- accept 'it dissolves the shell'*
- accept 'it erodes it' **or** 'wears it away'*

1 (L6)

(iii) any **one** from

- makes it easier **or** quicker **or** easy to hatch **or** break out of the egg
*'easy **or** easier to break' is insufficient*
- makes the shell more porous
*accept 'air **or** oxygen gets in easily' **or** 'more air gets in'*
accept 'carbon dioxide gets out more easily'
'to allow for growth' is insufficient

1 (L5)

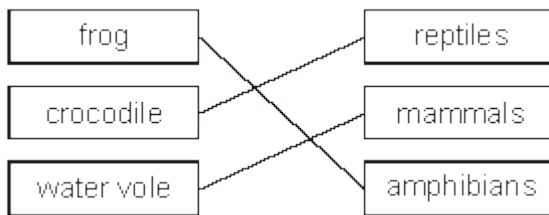
- (c) (i) any **one** from
- keep the eggs between 26°C and 30°C
'make it cooler' or 'use lower temperatures' are insufficient
 - keep the temperature at **or** below 30°C
 - keep the eggs at 26°C
accept any temperature from 26°C to 30°C
accept 'use the three lower temperatures'
or 'the lower temperatures in the table'
- 1 (L5)
- (ii) between 32°C and 34°C ✓
if more than one box is ticked, award no mark
- 1 (L6)

[6]

5.

- (a) (i) any **one** from
- A
accept 'tadpole'
 - B
accept 'trout' or 'fish'
- 1 (L3)
- (ii) any **one** from
- B
accept 'trout' or 'fish'
 - D
accept 'crocodile' or 'reptile'
- 1 (L3)
- (b) backbones
- 1 (L3)
- (c) any **one** from
- it has fins
accept 'the tail helps it swim'; 'it has a tail' is insufficient
 - it is streamlined
accept a description of streamlining;
such as 'it is narrow or thin'
accept 'scales make it smooth' or 'it is smooth'
'it has gills' or 'it has gills to breathe or to take
in oxygen' are insufficient
- 1 (L3)

(d)



*if all three lines are correct, award two marks
if one **or** two lines are correct, award one mark
if more than one line is drawn from any animal,
award no credit for that animal*

2 (L3)

[6]

6.

(a) (i) oak tree → caterpillar → blackbird → owl

all three answers are required for the mark

1 (L4)

(ii) It makes food by photosynthesis. ✓

if more than one box is ticked, award no mark

1 (L4)

(b) **either**

- decreased **or** went down

1 (L3)

any **one** from

- fewer leaves to feed on
- gypsy moth caterpillars ate most of the leaves
accept 'gypsy moth caterpillars ate the leaves'
*accept 'the gypsy moth caterpillars ate all the leaves **or** all the food'*
- less food
accept 'no food'
accept 'they were competing for food'

1 (L4)

or

any **one** from

- increased **or** went up
- stayed the same

1 (L3)

any **one** from

- they had enough food **or** leaves
- more eggs hatched

1 (L4)

(c) the tree loses its leaves

*accept 'no leaves' **or** 'no food'; accept 'it is too cold'*
accept 'caterpillars change into pupae
***or** chrysalises **or** moths'*
*do **not** accept 'caterpillars hibernate in winter'*

1 (L4)

[5]

7.

(a) the size **or** area **or** dimensions of the plots

accept 'the amount of land'

1 (L6)

- (b) any **one** from
- to increase the reliability of the results
accept 'to make the results more accurate'
 - to be more certain of his results
*accept 'some of the plots could be unusual **or** different'
'to find an average' is insufficient*
- 1 (L7)
- (c) the number of plants **or** grasses **and** the mass of plants **or** grass
***both** answers are required for the mark
'amount of plants' is insufficient*
- 1 (L7)
- (d) any **one** from
- the number of species of grass different species
accept 'species'
 - type of plant **or** seed **or** grass
- 1 (L7)
- (e) any **one** from
- his analysis would allow the effects of soil differences to be controlled or explained
*accept 'to make sure **or** so it would be fair'*
 - to provide evidence of any difference between soils
accept 'to check whether soils had an effect on growth'
 - the analysis would provide more evidence
 - to check whether soils were the same or different
- 1 (L7)
- (f) any **one** from
- different species have different requirements so they are not competing for the same resources
 - competition might stimulate more vigorous growth
 - one species may be better adapted to the plot **or** conditions
 - you would get continuous growth throughout the year
- 1 (L7)

[6]

8.

(a) minerals **or** mineral salts

*accept 'nitrate' **or** 'phosphate' **or** 'salt'
or 'nutrient' do **not** accept 'food'
do **not** accept elements such as 'nitrogen' and 'potassium'*

1

(b) any **one** from

- it covers a wide area

accept 'they can reach a long way from the plant'

- they can reach deeper

- they have a large surface area

*accept 'they would have more root hairs'
do **not** accept 'they anchor the plant strongly'
or 'they suck up water'*

1

(c) any **one** from

- photosynthesis cannot take place

accept 'no food is being made'

- photosynthesis takes place in the leaves

accept 'food is made in the leaves'

1

(d) any **two** from

- it is camouflaged

*accept 'it looks like a twig **or** a branch **or** a bit of tree'
or 'it is difficult to see' **or** 'it blends in'*

- it is shaped like a twig

- it is the same colour **or** pattern as a twig

- the birds **or** predators do not see it **or** eat it

accept 'it does not get eaten'

2

[5]