



# **KS3 Science**

## **Food Chains and Webs**

### **Mark Scheme**

**Time available: 36 minutes**

**Marks available: 50 marks**

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## Mark schemes

1.

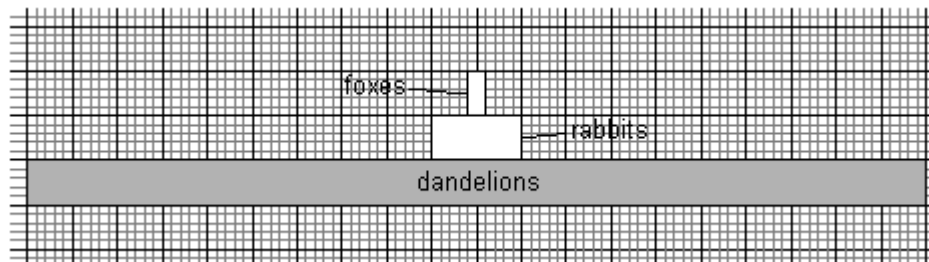
- (a) • blackbirds eat more snails so they eat fewer caterpillars  
*accept 'blackbirds eat snails instead of caterpillars'*  
*'blackbirds eat more snails' is insufficient*  
*do **not** accept 'blackbirds stop eating caterpillars'*
- 1 (L6)

- (b) • blackbirds eat the snails, owls eat the blackbirds  
*accept 'the owls eat many blackbirds'*  
*accept 'blackbirds eat many snails'*  
*'snails eat the poison' is insufficient*
- 1 (L7)

- the poison (passes up the food chain and) becomes more concentrated  
*accept 'bioaccumulation'*  
*accept 'the poison accumulates'*  
*accept 'animals do not excrete the poison'*  
*accept 'the poison persists (in the body)'*  
*'owls eat a large amount of poison that has been passed up the food chain' is insufficient*  
*'owls are bigger' is insufficient*
- 1 (L7)

- (c) any **one** from
- throw the quadrat (randomly) and count the number of dandelions
- take several readings and find an average  
*for **two** marks, an answer must contain one of the first two marking points **and** an indication that the number will be multiplied by the area*
- 1 (L7)
- multiply the number by the total (grassland) area
- 1 (L7)

- (d) • a pyramid of numbers drawn to scale with dandelions on the bottom where:  
 rabbits cover 50 small squares  
 foxes cover 10 small squares



*accept an otherwise correct response that is not aligned to the centre*

*one mark for labelled boxes in the correct order as shown*

*one mark for correctly sized bars (even if not labelled)*

2 (L7)

[7]

2.

- (a) • A

*accept 'up'*

1 (L3)

- (b) any **two** from

- water

*accept 'H<sub>2</sub>O'*

*'rain' is insufficient*

*accept 'moisture'*

- minerals

*accept a named mineral*

*award **two** marks for two different named minerals*

*accept 'nutrients' **or** 'salts' **or** named examples*

*do **not** accept 'food'*

*award one mark for 'mineral' and a named mineral **or** nutrient **or** salt*

*accept 'oxygen'*

*answers may be in either order*

2 (L4)

- (c) • predator ✓

*if more than one box is ticked, award no mark*

1 (L4)

- (d) (i) • leaf **or** leaves

*accept 'stem'*

*accept 'chloroplast' **or** 'chlorophyll'*

1 (L4)

- (ii) any **one** from
- growth **or** to grow  
*accept 'to produce new cells'*
  - energy  
*accept 'respiration'*  
*accept 'to survive winter'*

1 (L4)

[6]

3.

- (a) (i) any **one** from
- the snail has a shell  
*accept 'the shell'*
  - the slug does not have a shell  
*accept 'patch on back'*  
*references to size are insufficient*

1 (L3)

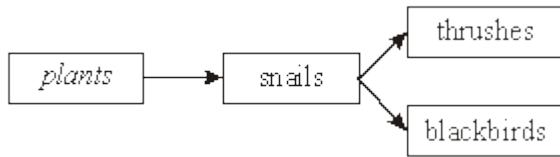
- (ii) any **one** from
- antennae  
*accept 'tentacles or feelers or horns'*
  - stalked eyes
  - shape of body  
*accept 'mouth'*  
*accept 'no legs'*  
*accept 'no internal skeleton'*  
*accept 'they both produce mucus or are slimy or have a wet body'*  
*accept 'they have a muscular foot'*  
*accept 'slither along'*  
*references to size are insufficient*

1 (L3)

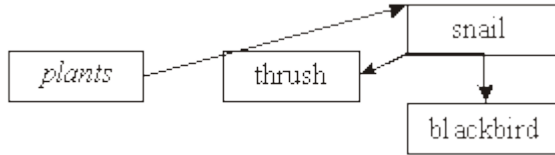
- (b) • mucus reduces friction ✓  
*if more than one box is ticked, award no mark*

1 (L3)

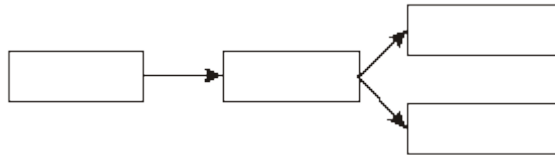
(c)



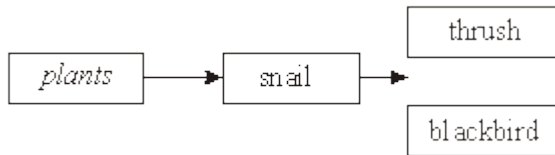
accept, for two marks, other arrangements of arrows that are correct, e.g.



accept, for one mark



accept, for one mark



'thrushes' and 'blackbirds' may be either order  
award one mark for the organisms in the correct place  
award one mark for the arrows showing the correct energy flow through the food web  
all *three* arrows are required for the mark

2 (L4)

(d) any **one** from

- they are camouflaged  
*accept 'they are harder to see'*  
*'it is easier for them to hide' is insufficient*
- they blend into their background  
*accept 'birds or predators cannot see them'*  
*'fewer will be eaten' is insufficient as it does not refer to protection*  
*'they are disguised' is insufficient*

1 (L3)

[6]

4.

(a) any **two** from

- crabeater seal  
*accept 'crabeater', 'seal' is insufficient*
- cod  
*accept 'fish'*
- squid

2 (L3)

(b) (i) • producers ✓

*if more than one box is ticked, award no mark*

1 (L3)

(ii) • herbivores ✓

*if more than one box is ticked, award no mark*

1 (L4)

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

- it would decrease
- there would be fewer seals  
*accept 'some would die' 'they would all die' is insufficient*

1 (L3)

(ii) any **one** from

- leopard seals eat other animals **or** food  
*accept 'they eat other animals **or** other food **or** other things' 'they have more food' is insufficient*
- leopard seals eat cod **or** fish **or** squid **or** penguins
- crabeater seals **or** they only eat krill  
*'they eat krill' is insufficient*

1 (L4)

[6]

5.

(a)



*one mark should be awarded if the second layer is wider than the first*

*the second mark should be awarded if the top three layers gradually reduce in width*

2 (L7)

- (b) (i) any **two** from
- sparrowhawks eat great tits which contain insecticide
  - great tits eat insects which contain insecticide
  - a sparrowhawk eats lots of great tits  
**or** each great tit eats lots of caterpillars
  - the insecticide is concentrated at each level in the food chain
  - insecticide is not easily eliminated from an animal's body  
**or** sparrowhawk's body
  - the insecticide is persistent
- 2 (L7)
- (ii) any **one** from
- disease
  - climate change
  - lack of food **or** water
  - reduced habitat
  - fewer great tits  
*accept 'new predators'*  
*accept 'increase in predators'*
- 1 (L6)
- (c) **either**
- (i) 1961 because the number of great tits was highest  
*accept '1960' or '1962' for 1961*  
*both the date and the evidence are required for the mark*
- 1 (L6)
- (ii) fewest great tits were eaten
- 1 (L7)
- or**
- (i) 1976 because the number of great tits was lowest  
*accept '1975' or '1977' for 1976*  
*both the date and the evidence are required for the mark*
- 1 (L6)
- (ii) not enough food for the sparrowhawks
- 1 (L7)

[7]



6.

(a) (i) they will increase  
*accept 'more will die' or 'more will be eaten'*  
*or 'they will die out'* 1 (L4)

(ii) they will decrease  
*do not accept 'they will die'*  
*or 'they will be eaten'* 1 (L4)

(b) **one mark is for the name of a predator and one mark is for the prey of that predator**

(i) any **one** from

- perch
- midge larva
- diving beetle

1 (L4)

(ii) any **one** from

prey of perch:

- midge larva **or** diving beetle

prey of midge larva:

- water flea

prey of diving beetle:

- water flea **or** pond snail

1 (L4)

(iii) any **one** from

- algae → water flea → midge larva → perch
- algae → water flea → diving beetle → perch
- algae → pond snail → diving beetle → perch
- waterweed → pond snail → diving beetle → perch

1 (L4)

**[5]**

- 7.** (a) any **one** from
- wood mouse
  - aphid
  - caterpillar
  - great tit
- 2 (L7)
- (b) (i) less competition for caterpillars **or** aphids **or** food  
*accept 'more food' or 'more caterpillars' or 'more aphids'*
- 1 (L7)
- (ii) weasels **or** stoats **or** sparrowhawks **or** predators eat more of them
- 1 (L7)
- (iii) any **one** from
- sparrowhawks only eat blue tits and great tits  
*accept 'sparrowhawks have more limited diet'*
  - stoats also eat wood mice  
*accept 'stoats eat a greater variety of food'*
- 1 (L7)
- (c) any **two** from
- lost as thermal energy **or** by respiration  
*accept 'lost as heat' or 'used up by running around or hunting or working'*
  - some material not digested **or** lost in waste
  - some material excreted  
*accept 'some lost in urine'*  
*accept 'some material not eaten'*
- 2 (L7)
- (d) C  
*accept a tick or other mark on pyramid C*
- 1 (L7)

**[8]**

- 8.** (a) (i) D *if more than one letter is given award no mark*
- 1
- (ii) A *if more than one letter is given award no mark*
- 1
- (iii) B *if more than one letter is given award no mark*
- 1

(b) (i) respiration ✓ *if more than one box is ticked award no mark*

1

(ii) feeding ✓ *if more than one box is ticked award no mark*

1

**[5]**