

Mark schemes – Biology Unit 7 homework

- Q1. (a)** any **two** pairs from:
- light (intensity) 1
 - more light means more / faster photosynthesis / glucose 1

 - temperature 1
 - higher temperature more / faster photosynthesis 1

 - water 1
 - right amount for transpiration / cell function / photosynthesis

 - soil pH / ions
 - needed for healthy growth
- ignore 'growth' unqualified*
ignore carbon dioxide and oxygen
- (b) hand lens 1
- moth guide 1
- (c) any **one** from:
- can work gently and not disturb moths
 - moths might fly away outside 1
- (d) any **one** from:
- damage to eyes (from UV / bright light)
 - burns from hot lamp
 - diseases / pathogens from wild organisms 1
- (e) any **one** from:
- wear sunglasses
 - **or**
 - eye protection
 - wear gloves or allow lamp to cool.
 - wear gloves
 - **or**
 - wash hands after handling moths
- answer must relate to hazard* 1
- (f) bristles / hairs make it unpleasant to eat
- or**
- bright colour acts as warning to predators (that it is poisonous) 1

2)

Level 3: Relevant adaptations are identified, given in detail and logically linked to form a clear account.	5-6
Level 2: Relevant adaptations are identified, and there are attempts at logical linking. The resulting account is not fully clear	3-4
Level 1: Adaptations are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.	1-2
No relevant content	0
<p>Indicative content</p> <ul style="list-style-type: none"> • a small SA:V ratio • means less thermal energy transferred to surroundings • thick fur <p>or hollow hair shafts</p> <ul style="list-style-type: none"> • traps a layer of air which acts as an insulating layer stopping transfer of thermal energy • a layer of fat or blubber under the skin • acts as an insulating layer <p>or as a food store for respiration when food is in short supply</p> <ul style="list-style-type: none"> • small ears • reduces surface area for thermal energy transfer • white colour • camouflage in the snow so prey do not see them coming and they get more to eat <p>or so predators do not see them and they can escape</p> <ul style="list-style-type: none"> • large feet • to spread weight over snow so they can run faster • hibernate in winter • to conserve energy stores <p>allow 'heat loss' for transfer of thermal energy</p>	

6

3) (a) (placed) randomly

allow description of placement

1

sufficient number (of quadrats) used

1

count (dandelions) in each quadrat

1

use mean number of dandelions, area of quadrat and area of field to estimate population

accept (area of field / area quadrat) × mean number of dandelions per quadrat

1

(b) $(40 \times 145) / 0.25 = 23\,200$

1

$(0.42 \times 23\,200 =) 9744$

allow 9744 with no working shown for 2 marks

allow ecf from correct attempt at the previous step) × 0.42 for 1 mark

1

(c) **Level 2 (3–4 marks):**

A detailed and coherent explanation is given. Logical links between clearly identified relevant points are made to explain why dandelion growth may be limited.

Level 1 (1–2 marks):

Discrete relevant points are made. The logic may be unclear.

0 marks:

No relevant content

Indicative content

factors that may be considered:

competition for resources including:

- light
- water
- space
- mineral ions (allow nutrients / salts / ions from the soil)

reference to why growth may be limited:

- (light) energy for photosynthesis
- water as a raw material for photosynthesis / support
- surface area exposed to light
- sugar / glucose produced in photosynthesis
- (space) to grow bigger
- (space) for growth of root system
- (mineral ions) for growth
- (mineral ions / sugar) for production of larger molecules **or** named example

4

4) (a) the variety of different species on Earth

1

(b) carbon dioxide

1

Methane

Water vapour

1

(c) any **two** from:

- drought
- flooding
- temperature change
allow temperature increase or decrease
- rainfall change
allow rainfall increase or decrease

2