

Mark schemes

Q1.

(a) (*lhs*)*allow word(s) take precedence over formulae*

carbon dioxide

1

water

1

*in either order**(rhs)*

glucose

1

(b) (used in aerobic) respiration

*do **not** accept anaerobic*

1

to release / transfer energy

*allow for energy**allow (respiration) by mitochondria**do **not** accept energy created / made / produced*

1

(c) any **one** pair from:

- bulb / lamp is hot

1

(so) may burn you / skin

1

- glassware is breakable (1)

(so) may cut skin (1)

- electricity in close proximity to water (1)

allow named example of electrical item in close proximity to water

(so) may get electric shock (1)

- scissors / scalpel (to cut pondweed) are sharp (1)

may cut skin (1)

mark in pairs

- (d) (use a) water bath
allow put beaker into (another) beaker of water
allow other correct methods eg heat shield
allow use an LED
 1
- (e) (change in) temperature affects / changes (the rate of) photosynthesis
allow temperature is a limiting factor (of photosynthesis)
allow temperature affects enzyme (activity)
allow temperature affects rate of reaction
 1
- (so) will affect / change the number of bubbles (produced)
allow (so) will affect results
allow (so) will affect validity
ignore to make it fair
ignore so the results will be the same
 1
- (f) blue
 1
- (g) bar graph
 1
- (h) any **one** from:
 • measuring cylinder
 • (gas) syringe
 • burette
 1
- (i) as light (intensity) increases, rate / photosynthesis increases
allow positive correlation
 1
- (rate / photosynthesis increases) at the same rate as light (intensity)
allow rate / photosynthesis increases linearly / evenly
allow description of shape of line eg straight / linear
allow rate is (directly) proportional to light (intensity) for 2 marks
 1

Q2.

- (a) any **two** from:
- temperature
 - size of tomato plants **or** size / number of leaves
allow age of plant
 - light
 - (volume of) water
allow (amount of) water
 - (amount / type of) fertiliser / minerals / ions / nutrients (given to plants)
allow (type of) compost / soil
allow named example of mineral ion such as nitrate / magnesium
 - time before rate readings are taken
ignore time unqualified
ignore type of tomato plant
ignore type of greenhouse
- 2
- (b) from 0.02% to 0.04%
- 1
- (c) repeat each reading three times and calculate a mean
- 1
- (d) (the rate of photosynthesis) increases
ignore values
- 1
- (because) carbon dioxide is needed for photosynthesis
allow 2 marks for (there is) more carbon dioxide for (more) photosynthesis
- 1
- (e) any **two** from:
- it would not increase the rate (of photosynthesis)
allow it would not change the rate (of photosynthesis)
allow photosynthesis would not increase
 - it would not increase the growth of tomatoes
 - it would cost more
allow idea of profit will not increase
allow reference to avoiding global warming
- 2