

## 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

[8]