Photosynthesis

Mark scheme

1. (a) (i)   2

| a conclusion |

the short bushes grow next to the house

| a prediction |

plants will grow faster if they get more light

| an observation |
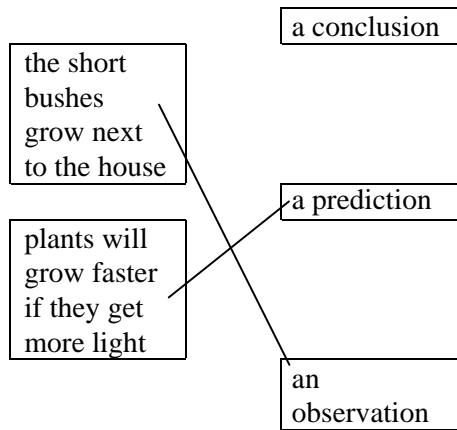
*both correct = **2** marks*
*one correct = **1** mark*
extra line from a statement cancels the mark

(ii) 1st space: carbon dioxide   1
     allow CO_2 (ignore superscript)
     *do **not** allow CO alone*

2nd space: glucose / sugar / starch / carbohydrate   1

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

- move lamp or change distance between lamp and plant
  ignore measure the distance

- change wattage / power of (light) bulb
  *do **not** accept just "change bulb"*

- change voltage / power supply to the (light) bulb

- change the number of lamps

- put translucent material between lamp and plant   1
  accept examples, eg tracing paper / filters
  *do **not** accept <u>coloured</u> filters*

(ii) rises   1

levels off   1
     ignore numbers

(iii) idea that it levels off

or does not increase at all light intensities

or it only increases to a certain amount   1
     *answers should relate to photosynthesis and **not** to bubbling*

     [8]

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2. (a) 6 6 6   1
all required
accept a '6n 6 n n 6n' version of the balanced equation provided it is correct in every detail

(b) any **two** of   2

- (presence of) chlorophyll **or** (amount of) chloroplasts
  accept green leaves (or other green parts)

- (sufficient) light (intensity)

- (light) of **a** suitable wavelength
  any light other than green light
  do not credit Sun's energy or sunshine or Sun

(c) guard cells   2

any **two** of

* control by osmosis
* the movement of gases
  *accept movement of carbon dioxide **or** oxygen **or** water vapour beware movement of CO_2 out*
  accept a diagram or description

* through the stoma

palisade cells   2

any **two** of

* near the upper surface
* contain (a great) <u>many</u> **or** <u>more</u> chloroplasts
* (so) contain the most chlorophyll

(d) any three of   3

* for respiration
* conversion to (insoluble) starch

or to food store **or** to (other)carbohydrates
* (conversion to) sucrose **or** to food store **or** to (other) carbohydrates

or polysaccharides
  *do not credit just to grow **or** live*
  ***or** survive*
  accept conversion to food store
  ***or** to (other) carbohydrates once only*

* (conversion to) lipids **or** fats **or** oils
* (conversion to) amino acids **or** (plant) proteins **or** auxins **or** (plant) hormones **or** enzymes

[10]