

Question	Answers	Extra information	Mark	AO / Specification reference
01.1	stoma		1	AO2 4.2.3.1 4.4.1.1
01.2	to prevent water loss		1	AO2 4.2.3.1 4.4.1.1
01.3	either leaves are broad large surface area for light to fall on or palisade cells contain many chloroplasts / chloroplasts contain chlorophyll to maximise light absorption	to gain full marks students must state one features with linked explanation	2	AO1 4.4.1.2
01.4	either: guard cells open and close stomata to allow carbon dioxide to diffuse into the leaf or air spaces in leaf allow carbon dioxide to diffuse into leaf cells or leaves are thin diffusion distance for carbon dioxide is short	to gain full marks students must state one feature with linked explanations	2	AO1 4.4.1.2
02.1	D		1	AO2 4.4.2.1
02.2	carbon dioxide and water		1	AO1 4.4.2.1

02.3	any one from: <ul style="list-style-type: none"> • movement • keeping warm to build larger molecules		1	AO1 4.4.2.1
02.4	anaerobic respiration		1	AO1 4.4.2.1
02.5	any one from: <ul style="list-style-type: none"> • more energy is transferred per glucose molecule • no lactic acid is made build-up of lactic acid can cause muscle fatigue		1	AO1 4.4.2.1
03.1	light intensity / distance from light source		1	AO2 4.4.1.2
03.2	provide carbon dioxide / to ensure carbon dioxide is not a limiting factor		1	AO2 4.4.1.2
03.3	collect gas in a syringe / upturned test tube add a glowing splint – it will relight / Add a burning splint – it will burn more brightly		1 1	AO2 4.4.1.2
03.4	data points plotted accurately correct line of best fit drawn	all points gains 2 marks, 2 or 3 points gains 1 mark allow a tolerance of ± 1 small square	2 1	AO3 4.4.1.2 MS 4c
03.5	as light intensity decreases / distance from source increases the rate of photosynthesis decreases		1	AO3 4.4.1.2
03.6	accept value between 5 and 6 bubbles per minute		1	AO2 4.4.1.2 MS 4a
03.7	bubbles were different sizes / easy to miss	accept any reasonable suggestion	1	AO2 4.4.1.2
03.8	collect gas given off and measure volume collected per unit time		1	AO3 4.4.1.2

04.1	more rapidly faster increases deeply oxygen		5	AO1 4.4.2.2
04.2	exercise / jogging caused the heart rates of all students tested to increase the time taken for the students' heart rates to return to normal was variable		1 1	AO3 4.4.2.2
04.3	Student B		1	AO2 4.4.2.2
04.4	either student A smallest increase in heart rate or student E heart rate returned quickest to normal	one mark for the identified student, and one mark for the linked explanation no marks if the explanation does not match the student identified	2	AO3 4.4.2.2
05.1	to release energy to the cells / provide cells with energy to use in chemical reactions (needed to maintain life)		1 1	AO1 4.4.2.1
05.2	no yes no ethanol		1 1 1 1	AO1 4.4.2.1
05.3	<ul style="list-style-type: none"> • anaerobic respiration in yeast produced ethanol <ul style="list-style-type: none"> ○ used in alcohol production / named alcoholic product • anaerobic respiration in yeast produces carbon dioxide used to make bread rise 		1 1 1 1	AO1 4.4.2.1
06.1	water • oxygen	answers must be in the correct order	1 1	AO1 4.4.1.1

06.2	chloroplast		1	AO1 4.4.1.1
06.3	endothermic		1	AO1 4.4.1.1
06.4	stomata		1	AO1 4.4.1.1
07.1	light intensity: Increase rate of photosynthesis nutrient availability: No change to rate of photosynthesis carbon dioxide availability: Decrease rate of photosynthesis chlorophyll level: Increase rate of photosynthesis	award one mark for each correct row in the table	4	AO1 4.4.1.2
07.2	C		1	AO2 4.4.1.2
07.3	any two from: <ul style="list-style-type: none"> used for respiration converted into starch (for storage) used to produce fat or oil (for storage) used to produce cellulose (for cell walls) used to produce amino acids (for proteins)		2	AO1 4.4.1.3
08.1	oxygen water	answers must be in the correct order	1 1	AO1 4.4.2.1
08.2	aerobic respiration is an exothermic reaction aerobic respiration transfers more energy per glucose molecule than anaerobic respiration		1 1	AO1 4.4.2.1
08.3	mitochondria		1	AO1 4.4.2.1
09.1	sum of all the reactions which take place inside a cell / organism		1	AO1 4.4.2.3

09.2	respiration releases the energy needed for reactions to occur respiration required to maintain body temperature so enzyme-controlled reactions occur efficiently		1 1 1	AO1 4.4.2.3
09.3	fatty acids glycerol		1 1	AO1 4.4.2.3
09.4	both storage molecules converted back into glucose when energy is needed		1 1	AO1 4.4.2.3
10.1	for example: circulatory system – transports materials around the body in the body nervous system – transmits impulse around the body reproductive system – produces offspring	award one mark for a named organ system and one mark for linked description accept any other correct system not listed	2	AO1 4.2.1
10.2	H		1	AO2 4.2.2.1
10.3	absorb nutrients		1	AO2 4.2.2.1
10.4	any one from: <ul style="list-style-type: none"> provides optimum conditions for (protease) enzymes to work speeds up protein digestion kills microorganisms 		1	AO2 4.2.2.1