

Question	Answers	Extra information	Mark	AO / Specification reference
01.1	concentration of sugar solution		1	AO2 4.1.3.2
01.2	Volume of sugar solution Mass of potato at start		1 1	AO2 4.1.3.2
01.3	-0.7 (g)	Accept +0.7 (g) for 1 mark	2	AO2 4.1.3.2 MS3a
01.4	all points correctly plotted linear line of best fit		2	AO2 × 1 AO3 × 1 4.1.3.2 MS 4c
01.5	3%	Allow error carried forward from 01.4	1	AO3 4.1.3.2 MS 4a
02.1	spreading out liquid high low		1 1 1 1	AO1 4.1.3.1
02.2	Cell membrane		1	AO1 4.1.3.1

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02.3	Higher temperature		1	AO1
	Larger surface area		1	4.1.3.1
02.4	Water		1	AO1 4.1.3.1
03.1	Oxygen / carbon dioxide		1	AO1 4.1.3.1
03.2	Lots of alveoli (air sacs) – increase surface area Air sacs have thin walls – short diffusion distance Good blood supply – maintain concentration gradient	1 mark for one correctly matched statement 2 marks for all statements matched correctly	2	AO1 4.1.3.1
03.3	Small intestine / gills in fish	Accept other correct suggestion	1	AO1 4.1.3.1
04.1	Active transport – requires energy		1	AO1
	Active transport – moves substances against the concentration gradient		1	4.1.3.3
04.2	Movement of mineral ions into plant roots		1	AO1 4.1.3.3
04.3	Movement of carbon dioxide into a leaf		1	AO1 4.1.3.1
05.1	16.7%	Accept (3.5 – 3.0) / 3.0 or 0.5 / 3.0 for one mark	2	AO2 4.1.3.2 MS 1C

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05.2	No Mass increased, so water moved into potato chip / water cannot have been lost		1 1	AO3 4.1.3.2
05.3	Mass would decrease As water would be lost / water would move out of the chip by osmosis		1 1	AO3 4.1.3.2
06.1	Mitochondria		1	AO1 4.1.1.2
06.2	The greater the rate of respiration, the greater the rate of active transport		1	AO3 4.1.3.3
06.3	For the uptake of minerals (from the soil) (Active transport needed) as the concentration of minerals in the plant is (likely to be) higher than the concentration in the soil		1 1	AO1 4.1.3.3
07.1	Carbon dioxide from the bloodstream to the lungs – diffusion mineral ions in the soil into root hair cells – active transport Water across a cell membrane – osmosis		1 1 1	AO1 4.1.3.1 4.1.3.2 4.1.3.3
07.2	Arrow pointing from left to right anywhere on the diagram		1	AO2 4.1.3.1

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07.3	Diagram showing same number of particles either side of the membrane		1	AO2 4.1.3.1
08	Level 3: Valid method given that includes details of how the data should be used to determine the sucrose concentration.		5–6	AO1 4.1.3.2
	Level 2: Valid method given but no attempt at describing how the data should be used to determine the sucrose concentration.		3–4	
	Level 1: An incomplete attempt at a valid method given.		1–2	
	No Relevant content		0	
	Indicative content			
	<ul style="list-style-type: none"> • Cut identical sized diameter pieces of each apple using the potato borer • Cut apple samples to an identical / named length • Check mass of samples using balance • Adjust mass so all are identical by trimming sample(s) using scalpel. Note starting mass value. • Add fixed volume distilled water to first test tube (and place in rack) • Using measuring cylinder, add same volume of each concentration of sucrose solution to other test tubes (and place in rack) • Place apple sample in each test tube. • Leave for fixed time (e.g. 1 hour) • Dry apple samples • Re-take mass of each sample • Calculate percentage change in mass for each sample • Plot sucrose concentration (x-axis) v percentage change in mass (y-axis) • Sucrose concentration determined from where graph crosses x-axis 			

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09.1	Movement of water from a high concentration / concentrated solution to a low concentration / dilute solution through a partially permeable membrane		1	AO1 4.1.3.2
09.2	C Greatest difference in salt concentrations		1 1	AO2 4.1.3.2
09.3	Any two from: <ul style="list-style-type: none"> • Long hollow tubes • made up of dead cells • Lignin in the cell walls • makes vessels very strong / able to withstand water pressure 		2	AO1 4.1.1.3
10.1	The movement of oxygen from the lungs into the bloodstream - Diffusion The movement of mineral ions from the soil into a plant root system - Active transport The movement of water into a plant cell - Osmosis	Accept one or two answers correct for one mark	2	AO1 4.1.3.1 4.1.3.2 4.1.3.3
10.2	many energy		1 1	AO1 4.1.3.3

Question	Answers	Extra information	Mark	AO / Specification reference
10.3	Glucose concentration higher in bloodstream than in the intestinal cells Glucose needs to be moved against concentration gradient which requires energy		1 1 1	AO1 AO2 4.1.3.3