



Science

Stage 9

Paper 1

2022

Cambridge Lower Secondary Progression Test

Mark Scheme

Question	Answer	Marks	Further Information
1(a)	<p>Water is lost from the leaves by transpiration.</p> <p>Water travels upwards through xylem vessels.</p> <p>Water enters the root hair cells by absorption / osmosis.</p>	2	<p>all three correct = 2 marks</p> <p>one or two correct = 1 mark</p> <p>Accept evaporation for transpiration</p> <p>Accept diffusion for osmosis</p>
1(b)	magnesium	1	Accept Mg/Mg ²⁺ but name takes precedence

Question	Answer	Marks	Further Information
2(a)	Si	1	Accept silicon but symbol takes precedence
2(b)	Mg or Ca	1	<p>Accept magnesium or calcium but symbols take precedence</p> <p>Accept Sr/Ba/Ra</p>
2(c)	covalent	1	

Question	Answer	Marks	Further Information
3(a)	B	1	more than one answer circled = 0 marks Accept any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence
3(b)	<div> <div>increasing the frequency <input type="checkbox"/></div> <div>decreasing the frequency <input type="checkbox"/></div> <div>increasing the amplitude <input checked="" type="checkbox"/></div> <div>decreasing the amplitude <input type="checkbox"/></div> </div>	1	more than one answer ticked = 0 marks Accept any indication of the correct answer, e.g. circling or underlining, but ticking takes precedence
3(c)	D	1	more than one answer circled = 0 marks Accept any indication of the correct answer, e.g. ticking or underlining, but circling takes precedence
3(d)	<div> <div>increasing the frequency <input checked="" type="checkbox"/></div> <div>decreasing the frequency <input type="checkbox"/></div> <div>increasing the amplitude <input type="checkbox"/></div> <div>decreasing the amplitude <input type="checkbox"/></div> </div>	1	more than one answer ticked = 0 marks Accept any indication of the correct answer, e.g. circling or underlining, but ticking takes precedence

Question	Answer	Marks	Further Information
4(a)	B blue	1	both answers correct for the mark
4(b)(i)	nebula(e)	1	
4(b)(ii)	(idea that) object smashed/collided into (early) Pluto (idea that) ejected particles/mass pulled together by gravity	2	each correct answer = 1 mark

Question	Answer	Marks	Further Information
5(a)	(electric) hot water bath	1	Accept hot water bath heated with Bunsen burner Ignore test-tube holders/tongs/goggles
5(b)	(light) because starch is in part 2 but not in part 1 (and part 4) (chlorophyll) because starch is present in part 2 but not in part 3 (and part 4)	2	each correct answer = 1 mark Accept starch is only in part 2 = 2 marks

Question	Answer	Marks	Further Information
6(a)	density = mass ÷ volume / 316 ÷ 40 7.9 (g/cm ³)	2	correct formula only = 1 mark Note correct answer (with or without working) = 2 marks
6(b)	(idea that) density of hydrogen is (much) lower than the density of iron	1	

Question	Answer	Marks	Further Information
7(a)	convection	1	
7(b)	stops/reduces evaporation / stops steam escaping	1	<p>Accept stops the hot water vapour escaping / stops gas particles escaping / reduces convection above the water</p> <p>Ignore references to heat loss and heat escaping</p> <p>Ignore reference to air escaping but accept gas cannot escape</p> <p>Accept ora, e.g. without a lid steam escapes</p>
7(c)	wood (no mark) because wood is a better insulator / poorer conductor of heat	1	<p>Accept steel (no mark) because less likely to catch fire</p>

Question	Answer	Marks	Further Information
8	<p>any three from</p> <p>the environment changed</p> <p>(idea that) composition of atmosphere changed</p> <p>lack of food</p> <p>lack of light</p> <p>lack of shelter</p> <p>dinosaurs could not escape the danger from the asteroid collision</p> <p>extreme global cooling</p> <p>no/less photosynthesis in plants</p> <p>collision caused a fire that destroyed their habitat</p>	3	<p>each correct answer = 1 mark</p> <p>Accept any suitable suggestion</p>

Question	Answer	Marks	Further Information
9(a)	<p>father XY</p> <p>mother XX</p> <p>sperm</p> <p>ova</p> <p>(X) Y (X) X</p> <p>XX XX XY XY</p> <p>female offspring male offspring</p>	2	<p>both sperm and ova line correct = 1 mark</p> <p>offspring line correct = 1 mark</p> <p>Accept YX for male offspring</p>
9(b)(i)	hair colour / ear size / ear position (lop or erect)	1	Accept coat colour / ear shape/length
9(b)(ii)	genetic / genes	1	<p>Accept alleles</p> <p>Ignore DNA / chromosomes</p>

Question	Answer	Marks	Further Information
10(a)	(most reactive) magnesium zinc iron (least reactive) copper	1	all four answers in the correct order for the mark
10(b)	(zinc + copper sulfate) \longrightarrow copper + zinc sulfate	1	both products needed either order for the mark

Question	Answer	Marks	Further Information
11(a)	lamp / bulb	1	
11(b)	(open) switch	1	
11(c)	24 (Ω)	1	
11(d)(i)	cell / battery	1	
11(d)(ii)	(fixed/variable) resistor / bulb / lamp / buzzer / ammeter	1	
11(d)(iii)	current	1	Accept any indication of the correct answer, e.g. circling, ticking or underlining, but answer in the sentence takes precedence

Question	Answer	Marks	Further Information
12(a)(i)	feeding / nutrition	1	
12(a)(ii)	oxygen	1	Accept O ₂ but name takes precedence
12(b)(i)	(carbon dioxide concentration) decreases then increases	2	each correct answer = 1 mark Accept goes down = 1 mark Accept goes up = 1 mark
12(b)(ii)	line showing the concentration is increasing from the existing line to present day	1	Accept straight line or curve Accept any value above 325 p.p.m.
12(c)	any one from sea level change flooding drought extreme weather events	1	Accept ice caps melting Accept named example, e.g. El Niño Accept increased bushfires Accept climate change Accept acid rain

Question	Answer	Marks	Further Information
13	filter (to remove unreacted copper oxide) evaporate (filtrate to half bulk) leave in a warm oven / leave in a warm place / leave to evaporate	3	each correct answer = 1 mark Ignore to crystallise Accept leave on the window ledge Do not accept boil or heat to dryness

Question	Answer	Marks	Further Information
14(a)	1 / one	1	
14(b)	any number between 50 and 10 (°C)	1	
14(c)	more reactive (than lithium, sodium and potassium)	1	