



Cambridge Assessment
International Education

Cambridge Lower Secondary Progression Test

Science mark scheme

Stage 9

General guidelines on marking

Many descriptive answers can be expressed in a variety of ways. Professional judgement can be used in these cases, providing it matches the marking points and further information in the mark scheme.

Answers may have words spelt incorrectly. Credit is normally given for phonetically correct answers, unless the word has a scientifically different meaning. For example, where the answer should be antennae, credit will be given for antenna but not for anthen (too close to anther).

Only the science is being assessed so answers do not need to be grammatically correct.

Significant figures will be indicated in the question or in the mark scheme.

Unless specified all marking points are independent.

Annotations and abbreviations

/ OR	alternate responses for the same marking point
() brackets	the words or units in brackets do not need to be stated, for example, (recycles or releases or provides) minerals = minerals scores the mark
Accept	an acceptable response
Do not accept	indicates an incorrect response that would contradict another otherwise correct alternative
Ignore	indicates an irrelevant answer that is not creditworthy. Full marks can still be achieved even with answers that are ignored.
ecf	error carried forward; marks are awarded if an incorrect response has been carried forward from earlier working provided, the subsequent working is correct
ora	or reverse argument; for example, as mass increases, volume increases could be written as mass decreases, volume decreases

Stage 9 Paper 1 Mark scheme

Question	1		
Part	Mark	Answer	Further Information
(a)	2	<p>water and carbon dioxide correctly placed in first half of equation = 1 mark</p> <p>oxygen and glucose correctly placed in second half of equation = 1 mark</p>	<p>reactants in either order products in either order</p> <p>Accept oxygen and sugar / carbohydrate</p> <p>Accept balanced or unbalanced symbol equations</p> <p>Accept mix of names and formulae</p> <p>If name and formula given ignore any incorrect formulae</p> <p>Correct formulae are water, H₂O, carbon dioxide, CO₂, glucose, C₆H₁₂O₆ and oxygen, O₂</p> <p>Ignore chlorophyll / light / enzymes if written over arrow but do not accept if given as reactant or product</p>
<div style="display: flex; align-items: center; justify-content: center; gap: 20px;"> <div style="border: 1px solid black; padding: 10px; width: 150px; text-align: center;">water</div> <div>+</div> <div style="border: 1px solid black; padding: 10px; width: 150px; text-align: center;">carbon dioxide</div> <div>→</div> <div style="border: 1px solid black; padding: 10px; width: 150px; text-align: center;">oxygen</div> <div>+</div> <div style="border: 1px solid black; padding: 10px; width: 150px; text-align: center;">glucose</div> </div>			
(b)	1	<p>leaves contain less chlorophyll / (idea of) white parts do not photosynthesise / leaves contain fewer chloroplasts</p>	<p>Assume answer refers to variegated leaves</p> <p>Accept (idea that) chlorophyll is needed for photosynthesis</p> <p>Accept less photosynthesis in variegated leaves</p> <p>Accept ora if green leaves specified</p>
Total	3		

Question	2		
Part	Mark	Answer	Further Information
(a)	2	Between 0 and 48 seconds the volume of gas increases . After 48 seconds the reaction stops / ends / finishes .	Accept gets bigger / goes up Accept changes from 0 to 46 (cm ²) Accept does not take place
(b)	1	decreases / gets smaller	Accept slows down / reduces
(c)	2	Any two from particles have more energy particles move faster more collisions	each idea = 1 mark more frequent collisions / more successful collisions / more fruitful collisions / more energetic collisions = 2 marks
Total	5		

Question	3		
Part	Mark	Answer	Further Information
(a) (i)	1	<div style="display: flex; justify-content: space-between;"> <div>collecting equipment</div> <div>type of insect to be sampled</div> </div>	Accept line from pooter to insects in leaf litter which are active at night
(ii)	1	take more samples / repeat / take random samples / sample at different times	Ignore reference to fair test / improve accuracy
(iii)	1	could transfer microbes from one student to another / bacteria from one student to another / the tube may be sharp / tube may cut mouth	Accept risk of infection
(b) (i)	2		three organisms correct = 1 mark correct arrows = 1 mark
(ii)	2	<p>dish 1 beetle dead / leaf uneaten / beetles do not eat leaves / beetles are not herbivores</p> <p>dish 2 caterpillar (half) eaten / beetle is a carnivore / beetle is a predator / caterpillar is prey</p> <p>dish 3 leaf eaten / caterpillar eats leaves / caterpillar is a herbivore</p>	three correct reasons = 2 marks two correct reasons = 1 mark
Total	7		

Question	4					
Part	Mark	Answer				Further Information
(a)	3	circuit	parallel	series	does not work	all five correct = 3 marks three or four correct = 2 marks two correct = 1 mark Ignore tick under series for circuit C
		A		✓		
		B		✓		
		C			✓	
		D	✓			
E		✓				
(b)	2	D and E voltage (across each lamp) is the same / same p.d. (across each lamp)				both required in either order Accept same current / same power / same energy
Total	5					

Question	5			
Part	Mark	Answer		Further Information
(a) (i)	1	Ca		Accept calcium but symbol takes precedence
(ii)	1	C		Accept carbon but symbol takes precedence
(b)	1	Ne		Accept neon but symbol takes precedence
(c) (i)	1	3		Accept Group 13
(ii)	1	5		
Total	5			

Question	6			
Part	Mark	Answer		Further Information
(a)	1	A and D		both correct = 1 mark
(b)	2	select the spotted and striped fish / remove the fish that just have stripes or just have spots		each correct answer = 1 mark Accept select G / remove E and F
		breed them together		
Total	3			

Question	7		
Part	Mark	Answer	Further Information
(a)	3	$\text{density} = \frac{\text{mass}}{\text{volume}}$ 12/3.2 3.75 (g/cm ³)	each correct step = 1 mark Accept 12 / 3.2 = 2 marks Accept 3.75 with no working out = 3 marks
(b)	1	g/cm ³	Accept g cm ⁻³ or g per cc or g per ml or g/ml or g/cc or g per cm ³
Total	4		

Question	8		
Part	Mark	Answer	Further Information
(a)	2	copper and lead chloride <input type="checkbox"/> lead and silver nitrate <input checked="" type="checkbox"/> magnesium and sodium chloride <input type="checkbox"/> tin and copper chloride <input checked="" type="checkbox"/> zinc and magnesium nitrate <input type="checkbox"/>	all correct = 2 marks one correct = 1 mark two correct and one incorrect = 1 mark two incorrect = 0 marks
(b) (i)	1	potassium / sodium	Accept magnesium / lithium
(ii)	2	calcium + water \longrightarrow calcium hydroxide + hydrogen	reactants correct = 1 mark Accept reactants in any order Accept Ca + H ₂ O products correct = 1 mark Accept products in any order Accept Ca(OH) ₂ + H ₂ Accept correct formulae but words take precedence
Total	5		

Question	9		
Part	Mark	Answer	Further Information
(a)	1	particles / molecules	Accept atoms
(b)	1	(direction of) movement	
(c)	2	<p>Any two from</p> <p>high(er) energy particles escape</p> <p>the process is endothermic / evaporation takes in energy</p> <p>energy is required to overcome force of attraction between particles</p> <p>low(er) energy particles are left behind</p>	<p>each correct idea = 1 mark (maximum two marks)</p> <p>at least one marking point must involve particles</p>
Total	4		

Question	10		
Part	Mark	Answer	Further Information
(a) (i)	1	The amount of carbon dioxide increases and the amount of oxygen decreases	Accept other words for increases and decreases, e.g. gets bigger or gets smaller
(ii)	1	(idea of) less photosynthesis	
(b)	2	<p>Any two from</p> <p>loss of cover</p> <p>loss of food</p> <p>loss of shelter</p> <p>loss of nesting sites</p> <p>disturbance</p>	<p>Ignore references to pollution</p> <p>Accept loss of habitat if no other mark awarded</p>
Total	4		

Question	11		
Part	Mark	Answer	Further Information
	2	<p>filtration</p> <p>crystals / salt / calcium nitrate / solid</p>	
Total	2		

Question	12		
Part	Mark	Answer	Further Information
(a) (i)	1	100 (N/m ²)	
(ii)	1	goes down / decreases / less	
(b)	1	4 (m ²)	
Total	3		

Stage 9 Paper 2 Mark scheme

Question	1		
Part	Mark	Answer	Further Information
(a) (i)	2	this range gives the best combination of high element levels below pH 4 lots of elements are in short supply	Accept has most nitrogen / phosphorus / potassium / magnesium Accept has least or no nitrogen / least or no phosphorus / least or no potassium / least or no magnesium
(ii)	1	iron	Accept any indication of answer but answer line takes precedence
(b) (i)	1	decomposers	Accept bacteria / fungi / microbes / microorganisms
(ii)	1	(recycles or releases or provides) minerals / nutrients	Accept (recycles or releases or provides) nitrogen / phosphorus / potassium / magnesium / nitrates / ammonium compounds / phosphate
Total	5		

Question	2		
Part	Mark	Answer	Further Information
	2	The part labelled A in the diagram is the pivot / fulcrum . Z is called a moment .	each correct sentence = 1 mark
Total	2		

Question	3		
Part	Mark	Answer	Further Information
(a)	1	Any one from wear eye protection / wear gloves / wear lab coat / only use small amount of metal / safety screen / carry it out in a fume hood	Accept local name for eye protection, e.g. safety goggles
(b)	1	hydrogen	Accept any indication of answer but circle takes precedence
(c) (i)	1	potassium / K	
(ii)	1	burst into flames / explodes / fizzes / makes a gas / floats on water	Accept makes hydrogen / makes rubidium hydroxide / melts / heat released Ignore colour of flame
Total	4		

Question	4														
Part	Mark	Answer	Further Information												
	1	<table border="1"> <thead> <tr> <th>statement</th> <th>order</th> </tr> </thead> <tbody> <tr> <td>the touch screen pushes onto the plate behind</td> <td>3</td> </tr> <tr> <td>the charge on this part of the plate changes</td> <td>4</td> </tr> <tr> <td>you choose the letter you want on the phone</td> <td>(1)</td> </tr> <tr> <td>the change in charge is detected by the digital sensor</td> <td>5</td> </tr> <tr> <td>you touch the screen with your finger</td> <td>2</td> </tr> </tbody> </table>	statement	order	the touch screen pushes onto the plate behind	3	the charge on this part of the plate changes	4	you choose the letter you want on the phone	(1)	the change in charge is detected by the digital sensor	5	you touch the screen with your finger	2	all in correct place = 1 mark
statement	order														
the touch screen pushes onto the plate behind	3														
the charge on this part of the plate changes	4														
you choose the letter you want on the phone	(1)														
the change in charge is detected by the digital sensor	5														
you touch the screen with your finger	2														
Total	1														


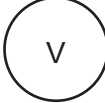

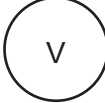

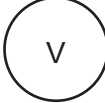
Question	5												
Part	Mark	Answer	Further Information										
	2	<table border="0"> <thead> <tr> <th style="text-align: left;">observation</th> <th style="text-align: left;">conclusion</th> </tr> </thead> <tbody> <tr> <td>Offspring of a species have small differences.</td> <td>The small differences make some offspring better adapted than others.</td> </tr> <tr> <td>Over time the population of a species stays roughly the same.</td> <td>The small differences are inherited.</td> </tr> <tr> <td>The small differences can be seen in the parent and the offspring.</td> <td>Darwin called this evolution.</td> </tr> <tr> <td>Over time, the appearance of a species changes.</td> <td>The weakest die and the best adapted survive.</td> </tr> </tbody> </table>	observation	conclusion	Offspring of a species have small differences.	The small differences make some offspring better adapted than others.	Over time the population of a species stays roughly the same.	The small differences are inherited.	The small differences can be seen in the parent and the offspring.	Darwin called this evolution.	Over time, the appearance of a species changes.	The weakest die and the best adapted survive.	<p>all four correct = 2 marks</p> <p>two or three correct = 1 mark</p> <p>one correct = 0 marks</p> <p>Do not accept one observation to two conclusions</p>
observation	conclusion												
Offspring of a species have small differences.	The small differences make some offspring better adapted than others.												
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Total	2												

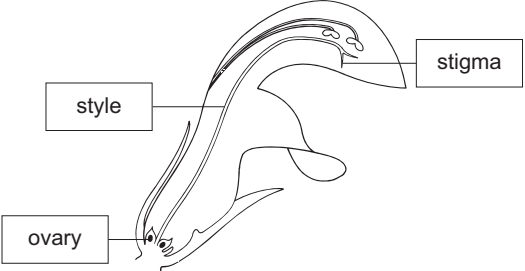
Question	6		
Part	Mark	Answer	Further Information
(a) (i)	1	Dalton	
(ii)	1	6 (years)	
(b)	1	<p>Any one from</p> <p>(idea of) other scientists have provided new evidence</p> <p>(idea that) new explanations given to same evidence</p>	
Total	3		

Question	7		
Part	Mark	Answer	Further Information
(a)	2	pie-chart all data adds up to 100%	Accept bar chart because not a continuous variable = 1 mark
(b)	2	Any two from data may have changed / data has changed (idea that) data does not show the percentages of the different energy sources today / data only shows the information for 2008 only shows information for the USA	Accept specific examples, e.g. more renewables
(c)	1	solar / wind / geothermal / biomass	Accept Sun / biofuel / water / tidal / wave / hydroelectric
(d)	1	(coal is a) finite resource / made slower than it is used up / not made as conditions not same a millions of years ago	Accept one day coal will run out Accept cannot be replaced in a short time Accept takes millions of years to make Ignore it cannot be used again
Total	6		

Question	8		
Part	Mark	Answer	Further Information
(a)	2	Any two from reproduction / disease / famine / loss of habitat / competition / adverse climate / drought / pollution	Accept named diseases / lack of food source
(b)	1	B and there are fewer predators than prey / the predators lag the prey	No marks for B without an explanation Accept there are fewer foxes than rabbits / the foxes lag the rabbits
Total	3		

Question	9		
Part	Mark	Answer	Further Information
(a)	1	(concentration) 3 / (volume) 29	look to see if the data is circled in the table if answer line is blank
(b)	1	repeat the experiment	Accept take averages / means
(c)	1	Replace the acid with an alkali. <input type="checkbox"/> Replace the conical flask with a beaker. <input type="checkbox"/> Use a gas syringe instead of a measuring cylinder. <input checked="" type="checkbox"/> Use iron instead of magnesium. <input type="checkbox"/>	more than one tick = 0 marks
Total	3		

Question	10														
Part	Mark	Answer	Further Information												
	3	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>current</th> <th>voltage</th> </tr> </thead> <tbody> <tr> <td>unit</td> <td>amps</td> <td>volts</td> </tr> <tr> <td>measured with</td> <td>ammeter in series</td> <td>voltmeter in parallel</td> </tr> <tr> <td>circuit symbol for the measuring device</td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> </tbody> </table>		current	voltage	unit	amps	volts	measured with	ammeter in series	voltmeter in parallel	circuit symbol for the measuring device			each correct cell = 1 mark both voltmeter and parallel needed for 1 mark
	current	voltage													
unit	amps	volts													
measured with	ammeter in series	voltmeter in parallel													
circuit symbol for the measuring device															
Total	3														

Question	11		
Part	Mark	Answer	Further Information
(a)	3		each correct label = 1 mark
(b)	3	fertilisation pollination dispersal	each correct process = 1 mark
Total	6		

Question	12		
Part	Mark	Answer	Further Information
(a)	1	exothermic	
(b) (i)	1	hydrogen	Accept H ₂ Ignore H If name and formula given both must be correct
(ii)	1	magnesium chloride	Accept other ways of indicating answers but circle takes precedence
(c)	1	calcium	Accept other ways of indicating answers but circle takes precedence
Total	4		

Question	13		
Part	Mark	Answer	Further Information
(a)	1	0–1 g <input type="checkbox"/> 1–5 g <input type="checkbox"/> 1–20 g <input checked="" type="checkbox"/> 20–100 g <input type="checkbox"/>	two or more ticks = 0 marks
(b)	1	as mass of salt or mass of salt solution increases the volume increases	Accept ora Accept as mass of salt increases mass of solution increases must refer to both variables
(c)	1	results more reliable / can check results / easier to spot anomalous results	Do not accept to improve accuracy or precision Ignore fair test
Total	3		

Question	14		
Part	Mark	Answer	Further Information
	1	roundworm	
Total	1		

Question	15		
Part	Mark	Answer	Further Information
(a)	1	electron	
(b)	1	31	Accept 15 protons and 16 neutrons
Total	2		

Question	16		
Part	Mark	Answer	Further Information
(a)	1	radiation	Accept any indication of answer but circle takes precedence
(b)	1	(idea that) radiation can travel in space / conduction and convection need matter	Accept vacuum for space
Total	2		

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