



# Cambridge Lower Secondary Checkpoint

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**SCIENCE**

**1113/02**

Paper 2

**October 2022**

MARK SCHEME

Maximum Mark: 50

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Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Markers were instructed to award marks. It does not indicate the details of the discussions that took place at a Markers' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the End of Series Report. Cambridge will not enter into discussions about these mark schemes.

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This document has **16** pages. Any blank pages are indicated.

Question	Answer	Marks	Further Information
1(a)	<b>any two from</b> wind hydro-electric geothermal (bio-)ethanol <b>or</b> (bio-)alcohol solar power biogas bio-fuel biomass wave tidal	<b>1</b>	<b>Accept</b> energy sources or name of a renewable fuel  <b>Accept</b> straw <b>or</b> miscanthus <b>or</b> charcoal <b>or</b> dung etc.  <b>Ignore</b> water but <b>accept</b> running river water

Question	Answer	Marks	Further Information
1(b)	<p><b>any two from</b></p> <p>are finite <b>or</b> will run out</p> <p><b>more</b> expensive</p> <p>cause pollution <b>or</b> damaging to the environment (by mining or transport)</p> <p>produce ash <b>or</b> produces dust <b>or</b> causes acid rain <b>or</b> cause climate change <b>or</b> greenhouse effect <b>or</b> global warming</p>	<b>2</b>	<p>each correct answer = 1 mark</p> <p><b>Accept</b> becoming harder to find <b>or</b> limited</p> <p><b>Accept</b> takes a long time to make it e.g. takes thousands or millions of years to make</p> <p><b>Note</b> this marking point is more about general environment</p> <p><b>Accept</b> less harmful to the environment <b>or</b> protect environment <b>or</b> damages environment</p> <p><b>Accept</b> result in habitat destruction</p> <p><b>Note</b> this marking point is more about air pollution</p> <p><b>Accept</b> produces named pollutants e.g. carbon monoxide <b>or</b> to reduce pollution</p> <p><b>Accept</b> causes acid rain pollution = 2 marks</p> <p><b>Ignore</b> reference to ozone depletion</p>

Question	Answer	Marks	Further Information
2	<p>compound</p> <p>element</p> <p>mixture</p> <p>two or more substances that can be separated by a physical method</p> <p>an impure substance that contains only one type of molecule</p> <p>a pure substance that contains two or more different types of atoms chemically joined together</p> <p>contains only one type of atom</p> <p>the smallest particle that can exist</p>	3	<p>each correct line = 1 mark</p> <p><b>two</b> lines from <b>one</b> type of substance = 0 marks for that substance</p>

Question	Answer	Marks	Further Information							
3(a)	<table><tr><td>(C)</td><td><b>G</b></td><td><b>A</b></td><td>(F)</td><td><b>E</b></td><td><b>B</b></td><td><b>D</b></td></tr></table>	(C)	<b>G</b>	<b>A</b>	(F)	<b>E</b>	<b>B</b>	<b>D</b>	2	<b>G</b> and <b>A</b> correct = 1 mark <b>E</b> , <b>B</b> and <b>D</b> correct = 1 mark
(C)	<b>G</b>	<b>A</b>	(F)	<b>E</b>	<b>B</b>	<b>D</b>				
3(b)	hydrogen	1								
3(c)	particles have more energy / particles move faster more collisions (per second)	2	each correct answer = 1 mark <b>Accept</b> more collisions <b>per second</b> or greater collision <b>frequency</b> = 2 marks <b>Accept</b> more <b>successful</b> collisions = 2 marks							
3(d)	measuring cylinder	1	<b>Accept</b> (graduated or volumetric) pipette <b>or</b> burette							
3(e)	<b>any one from</b>  sulfuric acid is corrosive <b>or</b> sulfuric acid causes (chemical) burns <b>or</b> sulfuric acid is dangerous to eyes <b>or</b> sulfuric acid splashing into eyes  powdered zinc is dangerous to eyes  <b>heated</b> solutions may spit <b>or heated</b> solution may splash  hot equipment can burn hands  <b>then any one from</b>  wear goggles / eye protection  wear gloves  use tongs	2	<b>Accept</b> sulfuric acid is an irritant  <b>Accept</b> sulfuric acid is harmful  <b>Accept</b> zinc powder irritates the skin         <b>Accept</b> laboratory coats  <b>Ignore</b> facemask							

Question	Answer	Marks	Further Information
4(a)(i)	<p>transmits blue and green light</p> <p><b>transmits blue and red light</b></p> <p>transmits green and red light</p> <p>transmits no light</p> <p>transmits white light</p>	<b>1</b>	more than <b>one</b> answer circled = 0 marks
4(a)(ii)	<p>(blue light) is reflected</p> <p>(green light) is absorbed</p>	<b>2</b>	
4(b)	dispersion	<b>1</b>	

Question	Answer	Marks	Further Information
5	<div> <div>group</div> <div> <div>amphibians</div> <div>reptiles</div> </div> <div> <div>description</div> <div> <div>scaly skin lay eggs on land</div> <div>moist skin lay eggs on land</div> <div>scaly skin lay eggs in water</div> <div>moist skin lay eggs in water</div> </div> </div> </div>	2	<p>each correct line = 1 mark</p> <p><b>two</b> lines from a group = 0 marks for that group</p>

Question	Answer	Marks	Further Information
6(a)	loudness	1	<b>Accept</b> volume (of sound) <b>or</b> noise level <b>Do not accept</b> pitch <b>or</b> frequency <b>or</b> wavelength
6(b)(i)	as distance increases the amplitude decreases	1	<b>Accept</b> ora <b>Note</b> this marking point must be comparative
6(b)(ii)	any number from 0.1 to 0.2 (cm) inclusive	1	
6(b)(iii)	(idea that) it is easier to see a pattern	1	<b>Accept</b> makes the results more reliable <b>Accept</b> have a larger range of results <b>Ignore</b> to get clear(er) results <b>or</b> to spot anomalous results <b>Do not accept</b> to get accurate results <b>or</b> fair test



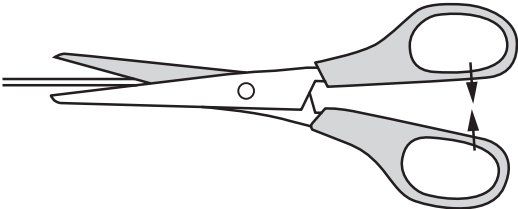
Question	Answer	Marks	Further Information
7(a)	variation	1	
7(b)	selective (breeding)	1	<b>Ignore</b> genetic modification
7(c)	nucleus	1	<b>Accept</b> chromosome(s)

Question	Answer	Marks	Further Information
8(a)	The <b>chemical</b> energy in the food is transferred into light, sound and <b>thermal/heat</b> energy.	2	each correct answer = 1 mark
8(b)	<div>always starts with cold water at 10 °C <input checked="" type="checkbox"/></div> <div>mixes and burns all the food together <input type="checkbox"/></div> <div>burns the same mass of food <input checked="" type="checkbox"/></div> <div>keeps the burning food the same distance from the test-tube <input checked="" type="checkbox"/></div> <div>uses the same type of food <input type="checkbox"/></div> <div>writes down the colour of the food <input type="checkbox"/></div>	2	<b>all three</b> correct = 2 marks <b>two</b> correct = 1 mark <b>one</b> correct = 0 marks
8(c)	popcorn	1	
8(d)	(food) biscuit  (reason) (idea that there is) the greatest <b>increase</b> in the temperature of the water	1	<b>both</b> correct = 1 mark

Question	Answer	Marks	Further Information
9(a)	<b>any one from</b> thrown overboard by ships lost cargo litter e.g. discarded food packaging <b>or</b> thrown into sea by humans illegal dumping washed out in river estuaries blown in from landfill sites etc.	<b>1</b>	<b>Accept</b> sewage <b>or</b> throwing into sea <b>or</b> dumping into sea
9(b)(i)	<b>any one from</b> turtle has mistaken the bag for food (idea that) turtle thought it was a jellyfish swims <b>into</b> the bag	<b>1</b>	<b>Accept</b> get stuck hunting for jellyfish <b>or</b> get stuck hunting for food <b>Accept</b> they try to eat the plastic bag <b>Accept</b> gets caught in the handles of the bag <b>or</b> gets caught in the holes in the bag

Question	Answer	Marks	Further Information
9(b)(ii)	<p><b>any two from</b></p> <p>turtles die</p> <p>turtles find less food <b>or</b> turtles starve</p> <p>less reproduction <b>or</b> less turtles born</p> <p>turtles cannot breathe or get air</p> <p>(idea that) eaten more easily by predators</p> <p>cannot move <b>or</b> inhibits movement <b>or</b> cannot reach the surface</p>	<b>2</b>	<p>each correct answer = 1 mark</p> <p><b>Accept</b> unable to survive</p> <p><b>Accept</b> (idea of) difficult to hunt for food</p> <p><b>Accept</b> suffocate <b>or</b> drown in the bag <b>or</b> cannot breathe <b>or</b> strangled by bag</p> <p><b>Accept</b> get tangled and eaten</p> <p><b>Accept</b> cannot swim</p>
9(b)(iii)	<p>(effect) numbers (of sea birds) will decrease</p> <p>(reason) sea birds starve / fewer (baby) turtles to eat</p>	<b>2</b>	<p>decrease = 1 mark</p> <p>correct reason = 1 mark</p> <p><b>Ignore</b> die <b>or</b> become extinct</p> <p><b>Accept</b> increase <b>and</b> easier to feed on turtles because they are trapped = 2 marks</p>

Question	Answer	Marks	Further Information
10(a)	iron + oxygen + water $\longrightarrow$ hydrated iron oxide	2	correct reactants any order = 1 mark correct product = 1 mark
10(b)	rust(ing)	1	<b>Accept</b> corrosion <b>or</b> oxidation

Question	Answer	Marks	Further Information
11(a)		1	<b>Accept</b> one correct arrow on the scissors <b>Note</b> the arrows need to be vertical or nearly vertical
11(b)(i)	30 (N)	1	
11(b)(ii)	(principle of) moment(s)	1	<b>Accept</b> force $\times$ distance = force $\times$ distance

Question	Answer	Marks	Further Information
12	4	1	<b>Accept</b> 2 protons and 2 neutrons

Question	Answer	Marks	Further Information
13	<p>yes (no marks)</p> <p>(idea that) the energy put into the machine is equal to the useful energy plus the other forms of energy</p> <p>any correct use of numbers, e.g.  <math>100 = 64 + 36</math>  <math>240 = 60 + 180</math>  <math>24 = 12 + 12</math>  <math>782 = 382 + 400</math></p>	<b>2</b>	<p>each marking point = 1 mark</p> <p>if no = 0 marks for the question</p> <p><b>Accept</b> energy put in = (total) energy out(put)</p> <p><b>Accept</b> energy cannot be created or destroyed <b>or</b> energy can only be transferred (not lost or gained)</p> <p><b>Note</b> just quoting the numbers is <b>not</b> sufficient for correct use of numbers there must be some attempt to show a calculation as an equation or in words</p>

Question	Answer	Marks	Further Information
14	<p><b>any two from</b></p> <p>(remains of) dead animals or plants</p> <p>get trapped or covered by sediment</p> <p>remains get changed into rock</p>	<b>2</b>	<p>each correct answer = 1 mark</p> <p><b>Accept</b> reference to dead animal <b>or</b> plant <b>or</b> skeleton</p> <p><b>Accept</b> get trapped or covered by sand or mud or small particles of rock</p> <p><b>Accept</b> found in sedimentary rock</p> <p><b>Accept</b> (idea that) bones, remains or calcium get replaced by minerals</p>