

Sc

KEY STAGE

2

LEVELS

3–5

# Mark schemes

Tests A and B

2010



National sampling for science

QCDA wishes to make its publications widely accessible.  
Please contact us if you have any specific accessibility requirements.

First published in 2010

© Qualifications and Curriculum Authority 2010

ISBN 978-1-84962-316-2

Reproduction, storage, adaptation or translation, in any form or by any means, of this publication is prohibited without prior written permission of the publisher, unless within the terms of licences issued by the Copyright Licensing Agency. Excerpts may be reproduced for the purpose of research, private study, criticism or review, or by educational institutions solely for educational purposes, without permission, provided full acknowledgement is given.

The Qualifications and Curriculum Authority (QCA) is currently operating certain of its non-regulatory functions under the name Qualifications and Curriculum Development Agency (QCDA). The legal entity remains QCA, established under the Education Act 1997.

QCA is an exempt charity under the Charities Act 1993.

Printed in Great Britain by QCDA under the authority and superintendence of the Controller of Her Majesty's Stationery Office and Queen's Printer of Acts of Parliament.

Qualifications and Curriculum Development Agency  
83 Piccadilly  
London W1J 8QA  
[www.qcda.gov.uk](http://www.qcda.gov.uk)

# Marking the science tests

Following the recommendations of the Expert Group on Assessment the Department of Children, Schools and Families decided to discontinue national curriculum tests in science at key stage 2 and to monitor national standards in science through externally-marked national sampling. The outcomes will be used to monitor national standards in key stage 2 science.

This booklet contains the mark schemes for tests A and B. External markers under contract to QCDA will mark the test papers using the mark schemes in this booklet.

## General guidance

### *The structure of the mark schemes*

The marking information for each question is set out in the form of tables. The ‘question’ column on the left-hand side of each table provides a quick reference to the question number and question part. The ‘mark’ column gives the number of marks available for each question part.

The ‘requirements’ column may include three types of information:

- a general statement describing what is required for the award of marks
- examples of specific creditworthy responses demonstrating correct science
- examples of creditworthy responses that are beyond the key stage 2 programme of study.

The ‘allowable answers’ column gives examples of allowable creditworthy responses, showing correct science which may not be as clearly expressed.

The ‘additional guidance’ column may include different types of information:

- specific responses which are not creditworthy either because information from the question has been rephrased, or because incorrect scientific knowledge is implied
- answers which are insufficient in themselves to gain credit, but are not incorrect science, and would therefore not lose credit if combined with a correct response.

### *Applying the mark schemes*

The mark schemes give scientifically correct answers to each question as well as providing guidance on, and examples of, other answers which are allowable. In cases of alternative wording or where an answer is drawn rather than written, external markers will exercise their professional judgement.

In order to ensure consistency of marking, the most frequent queries are listed below, along with the action the marker will take.

<b>What if...?</b>	<b>Marking procedure</b>
The pupil gives two or more responses to a particular question part.	<p>a) If a pupil qualifies a scientifically correct answer with a scientifically incorrect statement, no mark will be awarded for that question part.</p> <p>b) If a pupil qualifies a scientifically correct answer with an incorrect statement which is not relevant to the context of the question, the latter response is regarded as 'neutral' and the mark will be awarded.</p>
The pupil has not used ticks to indicate the correct response in a multiple-choice question.	Any unambiguous positive indication of the correct answer will be accepted. Ticks take precedence over any other form of response. Therefore, when ticks and any other sort of response are given together, the boxes with ticks will be assumed to be the pupil's response. If the correct boxes are left blank, no marks will be awarded.
The pupil ticks more than the required number of boxes.	One mark will be deducted for each incorrect answer. Negative marks will not be awarded.
In a planning question, no answer is given in the expected place, but the correct answer is given in the drafting box.	Where a pupil has shown understanding of the question, the mark(s) will be given.
The pupil misspells a word.	<p>a) If it is clear that the pupil has made a simple error, eg 'tow' for 'two' or 'son' for 'sun', then the incorrect spelling will be accepted and the mark awarded.</p> <p>b) If a pupil misspells a word copied from the text of the question or from a selection given, and the new word does not have any inappropriate meaning, the incorrect spelling will be accepted and the mark awarded.</p> <p>c) If specific scientific vocabulary is required in the answer, a creditworthy misspelling must be a phonetic equivalent of the required word, with the major syllables of the correct word represented in the answer.</p>

### **Recording marks awarded**

In the margin, alongside each question part, there is a mark box for each question part. Depending on the type of response made to each part of each question by the pupil, the external marker will put one of the following into each box:

- 1 for an acceptable/allowable response
- 0 for an incorrect response
- if no response is made.

The number of marks gained on each double page will be written in the box at the bottom of the right-hand page. The total number of marks gained on each paper will be recorded on the front of the test paper.

Each paper has 40 marks available.

The 2010 key stage 2 science tests and mark schemes were developed by the National Foundation for Educational Research (NFER) on behalf of QCDA.

**[Blank page]**

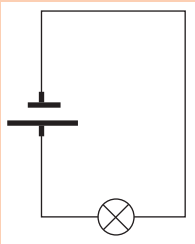
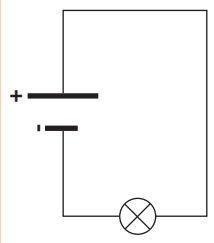
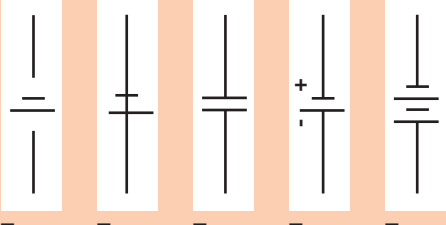
## Test A question 1: Drinking water

Question	Mark	Requirements	Allowable answers	Additional guidance
1a 1/2c	1m	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li>■ sieve.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>■ (tea) strainer</li> <li>■ (fishing) net</li> <li>■ colander.</li> </ul>	<b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>■ filter.</li> </ul>
1b 2/5a	1m	Award <b>ONE</b> mark for correctly classifying <b>both</b> statements: <i>because the animals are adapted to live in the stream</i> ..... <b>True</b> <i>so the animals do not get eaten by predators</i> ..... <b>False</b>		
1c 3/3c,b	1m	Award <b>ONE</b> mark for explaining that bits of (insoluble) mud in the water will not fit through the filter but the water flows through it: <ul style="list-style-type: none"> <li>■ only the water goes through the paper and any mud is left behind</li> <li>■ insoluble bits (of soil) are left on the filter paper, the rest goes through</li> <li>■ the filter collects the big particles and lets the smaller ones through.</li> </ul>	<b>ONE</b> mark may be awarded for a response which describes what happens to <b>either</b> the mud <b>or</b> the water: <ul style="list-style-type: none"> <li>■ the mud is trapped in the filter</li> <li>■ the water goes through (the holes in the filter)</li> <li>■ the mud is too big for the holes.</li> </ul>	<b>Do not</b> give credit for an insufficient response that does not clearly imply the mud remains in the filter or the water goes through: <ul style="list-style-type: none"> <li>■ it filters it</li> <li>■ there are holes in the filter</li> <li>■ it filters the mud from the water [given].</li> </ul> <b>Do not</b> give credit for an insufficient response indicating the funnel separates the mixture: <ul style="list-style-type: none"> <li>■ the mud stays in the funnel.</li> </ul>
1d 2/5f	1m	Award <b>ONE</b> mark for indicating that the micro-organisms could make people ill: <ul style="list-style-type: none"> <li>■ they could get sick/ill</li> <li>■ they could catch a disease.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>■ they could be harmed/(food) poisoned</li> <li>■ they could catch germs/viruses/bacteria/bugs.</li> </ul>	<b>Do not</b> give credit for an insufficient response that does not make the link to infecting people: <ul style="list-style-type: none"> <li>■ they might/would die</li> <li>■ micro-organisms are dangerous</li> <li>■ there are germs/bacteria in the water.</li> </ul> <b>Do not</b> give credit for an insufficient response that states people may develop an inappropriate medical condition: <ul style="list-style-type: none"> <li>■ they will get cancer.</li> </ul>

Test A question 1: Drinking water (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
1e 1/2c	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ <input type="checkbox"/> Hang it over a fire in a pot. <input checked="" type="checkbox"/></li> <li>■ <input type="checkbox"/> <input type="checkbox"/></li> </ul>		
1f 3/2d	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ <input type="checkbox"/> <input type="checkbox"/> 100°C <input checked="" type="checkbox"/></li> <li>■ <input type="checkbox"/> <input type="checkbox"/></li> </ul>		

## Test A question 2: Circuit

Question	Mark	Requirements	Allowable answers	Additional guidance
2a 4/1c	1m	<p>Award <b>ONE</b> mark for correctly drawing the symbol for a cell in the circuit:</p> 	<p><b>ONE</b> mark may be awarded for vertical lines drawn at the end of the existing wires:</p> 	<p><b>Do not</b> give credit for a response incorrectly connecting the cell to the circuit [with gaps between the cell and wires of more than 2 mm] or inaccurately drawing the cell or drawing more than one cell:</p> 
2b 4/1a	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>switch.</li> </ul>		<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>the button you press on and off</li> <li>crocodile clips</li> <li>a paperclip between two pins.</li> </ul>
2c 1/2c,d	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>so she does not measure light from other sources <input checked="" type="checkbox"/></li> <li><input type="checkbox"/></li> <li><input type="checkbox"/></li> </ul>		



## Test A question 2: Circuit (continued)

Question

2d  
4/1b

Mark

2m

or

1m

Requirements

Award **TWO** marks for correctly completing **all four** rows of the table as shown:

Object used	will be dimmer.	The bulb... will not change.	will be brighter.
copper wire		✓	
a motor	✓		
another cell			✓
another bulb	✓		

If you are unable to award two marks, award **ONE** mark for **any three** rows completed correctly.

Allowable answers

Additional guidance

### Test A question 3: Heating water

Question	Mark	Requirements	Allowable answers	Additional guidance
3a 1/2d	1m	Award <b>ONE</b> mark for a response indicating the volume of water is being changed: <ul style="list-style-type: none"> <li>the amount/volume of water</li> <li>how much water there is in the saucepan.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>height/depth/level of water</li> <li>length of water</li> <li>each time they did the test they added more water to the pan.</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science where either the dependent or the control variables are given:</p> <ul style="list-style-type: none"> <li>time/minutes</li> <li>method used to heat the water.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>the water (in the saucepans) [ambiguous – may refer to temperature or type].</li> </ul>
3b 1/2c	1m	Award <b>ONE</b> mark for an appropriate piece of equipment for measuring temperature: <ul style="list-style-type: none"> <li>thermometer</li> <li>temperature sensor.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>heat sensor.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>sensor.</li> </ul>
3c 1/2e 3/1b	1m	Award <b>ONE</b> mark for an indication that it will stop her getting burnt <b>or</b> that it will not conduct heat: <ul style="list-style-type: none"> <li>it stops her burning her fingers</li> <li>wood is not a (thermal) conductor</li> <li>heat will not go through the wood</li> <li>wood is a (thermal) insulator.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>it will not get hot.</li> </ul> <p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>if it was metal it would burn her/heat the handle up.</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science:</p> <ul style="list-style-type: none"> <li>wood does not burn.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>if it was plastic it would melt.</li> </ul>

### Test A question 3: Heating water (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance																
3d 1/2m	1m	<p>Award <b>ONE</b> mark for an indication that the starting temperature of the water was not the same in all of the saucepans:</p> <ul style="list-style-type: none"> <li>the temperature of the water in saucepan A started higher than the other saucepans</li> <li>the water in saucepan A was too hot at the beginning</li> <li>they did not all start at the same temperature.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>the water in saucepan A started at 20°C</li> <li>the water in saucepan A should have been at 10°C</li> <li>saucepans B and C started at 10°C</li> <li>A is at 20°C and B and C are at 10°C.</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science:</p> <ul style="list-style-type: none"> <li>the pans did not have the same heat</li> <li>they were heated for different times</li> <li>she used different amounts of water.</li> </ul> <p><b>Do not</b> give credit for an insufficient response comparing all pans but not specifically at the start:</p> <ul style="list-style-type: none"> <li>because some were at different temperatures to the others</li> <li>the temperatures were not the same</li> <li>A was hotter.</li> </ul> <p><b>Do not</b> give credit for an insufficient response which does not refer to temperature or use the unit °C:</p> <ul style="list-style-type: none"> <li>A was more than pans B and C</li> <li>A is at 20 and B and C are at 10.</li> </ul>																
3e 1/2i,h	1m	<p>Award <b>ONE</b> mark for <b>both</b> times correct:</p> <table border="1"> <thead> <tr> <th>Saucepan</th> <th>Time to reach 50°C (seconds)</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>42</td> </tr> <tr> <td>B</td> <td>59</td> </tr> <tr> <td>C</td> <td>66</td> </tr> </tbody> </table>	Saucepan	Time to reach 50°C (seconds)	A	42	B	59	C	66	<p><b>ONE</b> mark may be awarded for times that fall within the given ranges:</p> <table border="1"> <thead> <tr> <th>Saucepan</th> <th>Time to reach 50°C (seconds)</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>greater than 40 and less than 43, including decimals/fractions</td> </tr> <tr> <td>B</td> <td>greater than 57 and less than 60, including decimals/fractions</td> </tr> <tr> <td>C</td> <td>66</td> </tr> </tbody> </table>	Saucepan	Time to reach 50°C (seconds)	A	greater than 40 and less than 43, including decimals/fractions	B	greater than 57 and less than 60, including decimals/fractions	C	66	
Saucepan	Time to reach 50°C (seconds)																			
A	42																			
B	59																			
C	66																			
Saucepan	Time to reach 50°C (seconds)																			
A	greater than 40 and less than 43, including decimals/fractions																			
B	greater than 57 and less than 60, including decimals/fractions																			
C	66																			

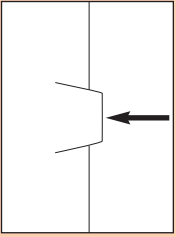
Test A question 4: River wildlife

Question	Mark	Requirements	Allowable answers	Additional guidance
4a i 2/4b	1m	<p>Award <b>ONE</b> mark for a feature of the duck and the swan that is similar:</p> <ul style="list-style-type: none"> <li>■ feathers</li> <li>■ beak</li> <li>■ body shape</li> <li>■ wings.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response identifying similar behaviours:</p> <ul style="list-style-type: none"> <li>■ the duck and swan can fly.</li> </ul> <p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ they are both birds.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response giving a feature that is common to all three animals:</p> <ul style="list-style-type: none"> <li>■ webbed feet</li> <li>■ legs/eyes/head</li> <li>■ they can swim.</li> </ul>
4a ii 2/4b	1m	<p>Award <b>ONE</b> mark for a feature of the duck and the swan that is <b>not</b> similar:</p> <ul style="list-style-type: none"> <li>■ the colour of the feathers</li> <li>■ the length of the neck</li> <li>■ the size of the bird.</li> </ul>	<p><b>ONE</b> mark may be awarded for identifying a feature of one bird that is different from the other:</p> <ul style="list-style-type: none"> <li>■ the swan is white</li> <li>■ has it got a long neck?</li> <li>■ white feathers.</li> </ul> <p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ size</li> <li>■ colour</li> <li>■ neck.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response giving a feature that is common to both a swan and a duck:</p> <ul style="list-style-type: none"> <li>■ webbed feet</li> <li>■ beak</li> <li>■ body shape</li> <li>■ feathers.</li> </ul> <p><b>Do not</b> give credit for an insufficient response repeating a feature already given in part 4ai which puts the duck and the swan in the same group:</p> <ul style="list-style-type: none"> <li>■ they both have long necks and frogs do not [part 4ai] long necks [part 4aii].</li> </ul>
4b 2/4c	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ <input type="checkbox"/> to help identify different ducks <input checked="" type="checkbox"/></li> <li>■ <input type="checkbox"/> <input type="checkbox"/></li> </ul>		

Test A question 4: River wildlife (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
4c 2/4a	2m or 1m	Award <b>TWO</b> marks for <b>both</b> : <ul style="list-style-type: none"> <li>■ coot <b>and</b> moorhen [given in either order].</li> </ul> If you are unable to award two marks, <b>ONE</b> mark may be awarded for <b>any one</b> bird correctly identified.		
4d 2/4a	1m	Award <b>ONE</b> mark for an indication of the colours of <b>both</b> the wings <b>and</b> the beak: <ul style="list-style-type: none"> <li>■ The wings are (mostly) grey</li> <li>The beak is yellow.</li> </ul>		

## Test A question 5: Foil boats

Question	Mark	Requirements	Allowable answers	Additional guidance
5a 4/2e	1m	<p>Award <b>ONE</b> mark for an arrow pointing upwards anywhere on the diagram:</p> 	<p><b>ONE</b> mark may be awarded for an arrow that is within 45° of the vertical.</p> <p><b>ONE</b> mark may be awarded for more than one creditworthy arrow drawn.</p>	<p><b>Do not</b> give credit for a response that includes incorrect science where the arrow is pointing downwards.</p> <p><b>Do not</b> give credit for a response that includes incorrect science where the arrow is pointing horizontally.</p>
5b 1/2l 4/2d	1m	<p>Award <b>ONE</b> mark for:</p> <p><input type="checkbox"/> <input type="checkbox"/> has the largest base.</p> <p><input type="checkbox"/> <input checked="" type="checkbox"/></p>		
5c 4/2b 1/2j	2m  or  1m	<p>Award <b>TWO</b> marks for correctly classifying <b>all three</b> statements:</p> <p>Compared with the other boats...            boat 3 was more waterproof. <b>False</b>.....            there was a bigger force from the water stopping boat 3 sinking. <b>True</b>.....            there was less gravity pulling down on boat 3. <b>False</b>.....</p> <p>If you are unable to award two marks, award <b>ONE</b> mark for <b>any two</b> statements correctly classified.</p>		

## Test A question 6: Model sheep

Question	Mark	Requirements	Allowable answers	Additional guidance
<b>6a</b> 3/2a 3/3b	<b>1m</b>	Award <b>ONE</b> mark for a response stating the solid dissolved: <ul style="list-style-type: none"> <li>it has dissolved.</li> </ul> <p>❖ <b>Give credit</b> for a correct response that goes beyond the key stage 2 programme of study, indicating that the solid is soluble or forms a solution.</p>		<b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>it has disappeared</li> <li>it is transparent.</li> </ul>
<b>6b</b> 3/1a	<b>1m</b>	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li><input type="checkbox"/></li> <li><input type="checkbox"/> absorbent <input checked="" type="checkbox"/></li> <li><input type="checkbox"/></li> </ul>		
<b>6c</b> 1/2/ 1/1a	<b>1m</b>	Award <b>ONE</b> mark for an indication that <b>all</b> the liquid has evaporated <b>or</b> that there is no liquid in the pot: <ul style="list-style-type: none"> <li>the water has all evaporated</li> <li>there is no liquid in the pot</li> <li>all the special liquid has been absorbed into the cardboard sheep.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>it has no more water to absorb</li> <li>all the solid has been used up.</li> </ul>	<b>Do not</b> give credit for an insufficient response suggesting that the solid has been used up, but where the subject of the answer is not clear: <ul style="list-style-type: none"> <li>it has all gone</li> <li>it dried up.</li> </ul> <p><b>Do not</b> give credit for an insufficient response stating evaporation/absorption is occurring without indicating the liquid has been used up:  <ul style="list-style-type: none"> <li>the liquid evaporated/soaked into the sheep.</li> </ul> </p>
<b>6d</b> 3/2a	<b>1m</b>	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li><input type="checkbox"/></li> <li><input type="checkbox"/> salt <input checked="" type="checkbox"/></li> </ul>		

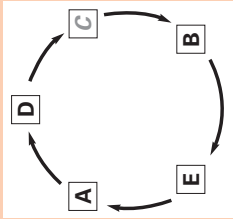
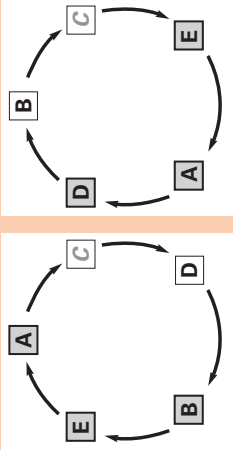
When applying this mark scheme, please also refer to the General guidance given on pages 1 and 2.

## Test A question 7: Watering plants

Question	Mark	Requirements	Allowable answers	Additional guidance
7a 2/3a	2m  or  1m	<p>Award <b>TWO</b> marks for <b>any two</b> correct responses:</p> <ul style="list-style-type: none"> <li>■ (sun)light</li> <li>■ air</li> <li>■ nutrients /minerals.</li> </ul> <p>❖ <b>Give credit</b> for a correct response that goes beyond the key stage 2 programme of study if air is not already given:</p> <ul style="list-style-type: none"> <li>■ oxygen/O<sub>2</sub></li> <li>■ carbon dioxide/CO<sub>2</sub>.</li> </ul> <p>If you are unable to award two marks, award <b>ONE</b> mark for <b>any one</b> correct response.</p>	<p>Marks may be awarded for:</p> <ul style="list-style-type: none"> <li>■ warmth/heat</li> <li>■ fertilizer/named type of commercial plant growth supplement [if nutrients or minerals are not also given].</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science:</p> <ul style="list-style-type: none"> <li>■ soil/compost [not taken in]</li> <li>■ temperature.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ Sun</li> <li>■ water [given]</li> <li>■ (plant) food</li> <li>■ nutrition [this is a life process, not what is taken in].</li> </ul> <p><b>Do not</b> give credit for a second response that is a repetition or restatement of the first.</p>
7b 1/2c,d	2m  or  1m	<p>Award <b>TWO</b> marks for <b>all four</b> questions correctly answered:</p> <p>Should David use the same type of soil in each pot?      yes <input checked="" type="checkbox"/>      no <input type="checkbox"/></p> <p>Should David put the plant pots in the same place?      yes <input checked="" type="checkbox"/>      no <input type="checkbox"/></p> <p>Should David put the same amount of water in each pot?      no <input checked="" type="checkbox"/>      yes <input type="checkbox"/></p> <p>How many plants should David use?      5 plants <input checked="" type="checkbox"/>      10 plants <input type="checkbox"/></p> <p>If you are unable to award two marks, award <b>ONE</b> mark for <b>any two</b> or <b>three</b> questions correctly answered.</p>		



Test A question 7: Watering plants (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
7c 2/3c	1m	Award <b>ONE</b> mark for <b>both</b> : <ul style="list-style-type: none"> <li>■ root <b>and</b> stem/stalk [given in either order].</li> </ul>	Marks may be awarded for 'trunk' and/or 'branches' but not in conjunction with 'stem/stalk'.	
7d 3/2e	2m  or  1m	Award <b>TWO</b> marks for <b>all four</b> letters in the correct place: <ul style="list-style-type: none"> <li>■ </li> </ul> If you are unable to award two marks, award <b>ONE</b> mark for <b>any two</b> or <b>three</b> letters in the <b>correct place</b> .	<p><b>ONE</b> mark may be awarded for <b>three</b> letters in the <b>correct order</b> but incorrectly placed on the diagram [the only two possible correct responses indicated by the shaded boxes]:</p> <ul style="list-style-type: none"> <li>■ </li> </ul>	

## Test A question 8: Ice

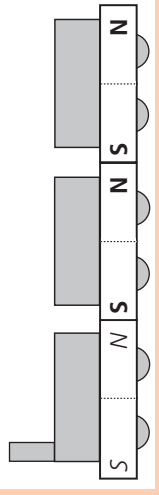
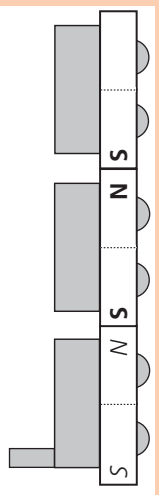
Question	Mark	Requirements	Allowable answers	Additional guidance																								
8a 3/2c	1m	<p>Award <b>ONE</b> mark for a response identifying temperature is a measure of how hot or cold something is:</p> <ul style="list-style-type: none"> <li>how hot/cold the air/it is.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>warmth</li> <li>(the amount of) heat.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>air/gas</li> <li>degrees Celsius/°C.</li> </ul>																								
8b i 3/2c 1/2c,j	1m	<p>Award <b>ONE</b> mark for <b>all five</b> days correctly completed:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th colspan="5">Day</th> </tr> <tr> <th></th> <th>Mon</th> <th>Tues</th> <th>Wed</th> <th>Thurs</th> <th>Fri</th> </tr> </thead> <tbody> <tr> <td>Temperature (°C)</td> <td>3</td> <td>-2</td> <td>-1</td> <td>-1</td> <td>6</td> </tr> <tr> <td>Could Tom find ice on the puddle? Yes or no?</td> <td>No</td> <td>Yes</td> <td>Yes</td> <td>Yes</td> <td>No</td> </tr> </tbody> </table>		Day						Mon	Tues	Wed	Thurs	Fri	Temperature (°C)	3	-2	-1	-1	6	Could Tom find ice on the puddle? Yes or no?	No	Yes	Yes	Yes	No		
	Day																											
	Mon	Tues	Wed	Thurs	Fri																							
Temperature (°C)	3	-2	-1	-1	6																							
Could Tom find ice on the puddle? Yes or no?	No	Yes	Yes	Yes	No																							

## Test A question 8: Ice (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
8b ii 1/2/	1m	Award <b>ONE</b> mark for a response that recognises the temperature is below 0°C, the freezing point of water: <ul style="list-style-type: none"> <li>■ because the numbers are below 0°C</li> <li>■ water freezes at 0°C.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response implying the freezing point is at 0°C without referring to 'C' or 'temperature':</p> <ul style="list-style-type: none"> <li>■ because it is less than zero.</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science giving an inaccurate freezing point of water:</p> <ul style="list-style-type: none"> <li>■ the temperature is below -1°C, the freezing point of water.</li> </ul> <p><b>Do not</b> give credit for an insufficient response which states the temperature is in negative numbers:</p> <ul style="list-style-type: none"> <li>■ when everything is in the minuses, it freezes</li> <li>■ because they are negative numbers.</li> </ul> <p><b>Do not</b> give credit for an insufficient response repeating information from the table without interpretation:</p> <ul style="list-style-type: none"> <li>■ because it was -2°C and -1°C.</li> </ul> <p><b>Do not</b> give credit for an insufficient response identifying the cold(est) days have ice:</p> <ul style="list-style-type: none"> <li>■ because these were the coldest days</li> <li>■ it was so cold it froze</li> <li>■ the temperature was too low.</li> </ul>

**[Blank page]**

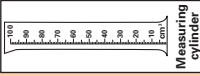
## Test B question 1: Magnets

Question	Mark	Requirements	Allowable answers	Additional guidance
1a 4/2a	1m	<p>Award <b>ONE</b> mark for an unambiguous indication of:</p> 	<p><b>ONE</b> mark may be awarded for:</p> 	
1b 4/2a, d	1m	<p>Award <b>ONE</b> mark for an indication that the magnets <b>repel</b> each other <b>or</b> that the magnets have like poles facing each other:</p> <ul style="list-style-type: none"> <li>■ the magnets are repelling each other</li> <li>■ Nisha's magnet is pushing the train's magnet away</li> <li>■ like poles repel</li> <li>■ the two North poles on both magnets are facing each other.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ the magnetic force pushes it away</li> <li>■ Nisha put like poles together</li> <li>■ it is repelling.</li> </ul> <p><b>ONE</b> mark may be awarded where an insufficient or no response is given but the left-hand pole of Nisha's magnet has been correctly labelled 'N'.</p>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ the magnet pushes it</li> <li>■ Nisha's magnet is not the right way round</li> <li>■ the magnets do not attract [does not imply repulsion].</li> </ul> <p><b>Do not</b> give credit for an insufficient response implying the whole magnet is one pole:</p> <ul style="list-style-type: none"> <li>■ they are both North magnets so they will repel.</li> </ul>

Test B question 2: Duckweed

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>2a</b> 2/3c</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for an indication that the root takes in/soaks up minerals and/or water:</p> <ul style="list-style-type: none"> <li>■ they take up minerals</li> <li>■ the root absorbs water.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ the root absorbs/gets nutrients</li> <li>■ it drains/takes/draws nutrients from the pond</li> <li>■ the root collects/gathers water</li> <li>■ it carries water to the leaves [as there is no stem]</li> <li>■ it helps with dispersal [duckweed roots are sticky to facilitate transfer by the legs of water birds to new habitats].</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science indicating the root holds the leaves up:</p> <ul style="list-style-type: none"> <li>■ keeps the leaves standing.</li> </ul> <p><b>Do not</b> give credit for a response that includes incorrect science indicating that the root gives the plant food:</p> <ul style="list-style-type: none"> <li>■ it takes/sends up/brings it food</li> <li>■ it feeds it</li> <li>■ it gathers/absorbs food.</li> </ul> <p><b>Do not</b> give credit for a response that includes incorrect science indicating an active anthropomorphic mechanism:</p> <ul style="list-style-type: none"> <li>■ the root drinks/sucks/pulls up water.</li> </ul> <p><b>Do not</b> give credit for an insufficient response that implies the root keeps the plant stable or helps prevent movement [given]:</p> <ul style="list-style-type: none"> <li>■ it keeps the plant upright.</li> </ul> <p><b>Do not</b> give credit for an insufficient response where 'goodness' is used in place of 'nutrients', 'water' or 'minerals':</p> <ul style="list-style-type: none"> <li>■ it takes up goodness.</li> </ul> <p><b>Do not</b> give credit for an insufficient response that does not recognise the role of the root:</p> <ul style="list-style-type: none"> <li>■ for water.</li> </ul>

Test B question 2: Duckweed (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance																
2b 1/2c	1m	<p>Award <b>ONE</b> mark for:</p> <div style="display: flex; align-items: center; justify-content: center;">  <div style="margin-left: 10px;"> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div> </div>																		
2c 1/2c	1m	<p>Award <b>ONE</b> mark for <b>both</b> rows of the table completed correctly giving numbers within the ranges shown:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Amount of sunlight (hours per day)</th> <th>Number of duckweed plants at the end of the week</th> </tr> </thead> <tbody> <tr> <td>0</td> <td><b>0 – 3</b> inclusive</td> </tr> <tr> <td>6</td> <td>4</td> </tr> <tr> <td>10</td> <td>greater than <b>4</b></td> </tr> </tbody> </table>	Amount of sunlight (hours per day)	Number of duckweed plants at the end of the week	0	<b>0 – 3</b> inclusive	6	4	10	greater than <b>4</b>		<p><b>Do not</b> give credit for a response that includes incorrect science showing the reverse relationship:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Amount of sunlight (hours per day)</th> <th>Number of duckweed plants at the end of the week</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>greater than <b>4</b></td> </tr> <tr> <td>6</td> <td>4</td> </tr> <tr> <td>10</td> <td><b>0 – 3</b> inclusive</td> </tr> </tbody> </table> <p><b>Do not</b> give credit for a response that includes incorrect science giving fractions of duckweed plants.</p>	Amount of sunlight (hours per day)	Number of duckweed plants at the end of the week	0	greater than <b>4</b>	6	4	10	<b>0 – 3</b> inclusive
Amount of sunlight (hours per day)	Number of duckweed plants at the end of the week																			
0	<b>0 – 3</b> inclusive																			
6	4																			
10	greater than <b>4</b>																			
Amount of sunlight (hours per day)	Number of duckweed plants at the end of the week																			
0	greater than <b>4</b>																			
6	4																			
10	<b>0 – 3</b> inclusive																			
2d 1/1b	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> so she can collect evidence <input type="checkbox"/></li> <li><input type="checkbox"/> <input type="checkbox"/></li> </ul>																		

Test B question 3: Rocket

Question	Mark	Requirements	Allowable answers	Additional guidance										
3a 3/2f 3/1e	1m	<p>Award <b>ONE</b> mark for <b>both</b> sentences correctly completed:</p> <p>(i) The bubbles show that a <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>solid</td></tr><tr><td>liquid</td></tr><tr><td>gas</td></tr></table> is produced.</p> <p>(ii) This change is <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td>reversible.</td></tr><tr><td>not reversible.</td></tr></table></p>	solid	liquid	gas	reversible.	not reversible.	<p><b>ONE</b> mark may be awarded for a response where <b>all three</b> incorrect words have been crossed out, leaving <b>both</b> sentences correct:</p> <p>(i) The bubbles show that a <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td><del>solid</del></td></tr><tr><td><del>liquid</del></td></tr><tr><td>gas</td></tr></table> is produced.</p> <p>(ii) This change is <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td><del>reversible.</del></td></tr><tr><td>not reversible.</td></tr></table></p>	<del>solid</del>	<del>liquid</del>	gas	<del>reversible.</del>	not reversible.	<p><b>Do not</b> give credit for an insufficient response where only <b>one</b> sentence is correct.</p>
solid														
liquid														
gas														
reversible.														
not reversible.														
<del>solid</del>														
<del>liquid</del>														
gas														
<del>reversible.</del>														
not reversible.														
3b 1/2e	1m	<p>Award <b>ONE</b> mark for:</p> <p><input type="checkbox"/> <input type="checkbox"/></p> <p>■ He is not sure where the rocket will go. <input checked="" type="checkbox"/></p>												
3c 1/2i,j	1m	<p>Award <b>ONE</b> mark for a general comparison describing the relationship between the <b>amount of tablet</b> and the <b>time taken</b> for the rocket to go up:</p> <p>■ the smaller the (amount of) tablet, the longer the rocket takes to go up</p> <p>■ the more tablet there is, the less time the rocket takes to go up.</p>	<p><b>ONE</b> mark may be awarded for two specific comparisons describing the relationship:</p> <ul style="list-style-type: none"> <li>the whole tablet makes the rocket take the shortest time and the quarter tablet makes the rocket take the longest time.</li> </ul> <p><b>ONE</b> mark may be awarded for references to the rate at which the rocket launched rather than the time taken:</p> <ul style="list-style-type: none"> <li>the smaller the tablet, the slower the rocket (launches)</li> <li>the more tablet, the quicker the rocket goes up.</li> </ul>	<p><b>Do not</b> give credit for a response that changes a variable:</p> <ul style="list-style-type: none"> <li>the bigger the tablet, the quicker it produces gas [incorrect science]</li> <li>the smaller the tablet, the less gas made [insufficient].</li> </ul> <p><b>Do not</b> give credit for an insufficient response which gives a single comparison of the variables:</p> <ul style="list-style-type: none"> <li>the smallest tablet makes the rocket take the most time</li> <li>the rocket goes faster when the tablet is big.</li> </ul>										



**Test B question 3: Rocket (continued)**

Question	Mark	Requirements	Allowable answers	Additional guidance
<b>3d</b> 1/2i	<b>1m</b>	Award <b>ONE</b> mark for a response which is greater than 0 and less than 5 seconds.		<b>Do not</b> give credit for a response that includes incorrect science: <ul style="list-style-type: none"> <li>■ 0 seconds.</li> </ul>
<b>3e</b> 3/2f	<b>1m</b>	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li>■ vinegar and bicarbonate of soda <input checked="" type="checkbox"/></li> <li><input type="checkbox"/></li> <li><input type="checkbox"/></li> </ul>		

**[Blank page]**

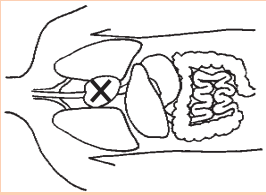
## Test B question 4: Drums

Question	Mark	Requirements	Allowable answers	Additional guidance
4a 4/2d	1m	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li>a pushing force from the drum skin <input checked="" type="checkbox"/></li> <li><input type="checkbox"/></li> </ul>		
4b 4/3g	1m	Award <b>ONE</b> mark for an indication of the floor <b>or</b> drum stand: <ul style="list-style-type: none"> <li>the ground</li> <li>the drum's legs.</li> </ul>	<p><b>ONE</b> mark may be awarded for naming a material that the floor is made of:</p> <ul style="list-style-type: none"> <li>wood</li> <li>tiles.</li> </ul> <p><b>ONE</b> mark may be awarded for naming parts of the drum stand:</p> <ul style="list-style-type: none"> <li>metal bits</li> <li>rubber/plastic (ends).</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>drum</li> <li>Evelyn's feet</li> <li>the air [given]</li> <li>oxygen [constituent of air]</li> <li>her body</li> <li>drumsticks</li> <li>vibrations</li> <li>legs [could mean Evelyn's legs].</li> </ul>
4c 4/3e	1m	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li>vibrations</li> <li>she can feel the floor vibrate.</li> </ul>	<p><b>ONE</b> mark may be awarded for a description of the vibration where the rapid speed of movement is indicated:</p> <ul style="list-style-type: none"> <li>the floor moves up and down (very) quickly.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>the floor shakes/moves up and down [no indication of speed]</li> <li>the drum sound [repetition of stem].</li> </ul>
4d 4/3f	1m	Award <b>ONE</b> mark for correctly completing all three rows of the table:		

How Evelyn plays the drum	The sound...		
	gets higher.	gets louder.	does not get higher or louder.
with a tighter drum skin	✓		
hit the drum with more force		✓	
hit the drum faster with the same force			✓

When applying this mark scheme, please also refer to the **General guidance** given on pages 1 and 2.

**Test B question 5: Keeping warm and healthy**

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>5a</b> 2/2c</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for <b>both</b> parts correct: (i) the centre of the cross drawn on the heart:    <b>AND</b>                      (ii) heart.</p>		
<p><b>5b</b> 2/2d</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for <b>both</b> correct boxes ticked:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <input type="checkbox"/></li> <li><input type="checkbox"/> playing football <input checked="" type="checkbox"/></li> <li><input checked="" type="checkbox"/> going for a walk <input type="checkbox"/></li> </ul>		
<p><b>5c</b> BoS 2a 2/2c</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <input type="checkbox"/></li> <li><input checked="" type="checkbox"/> beats per minute <input checked="" type="checkbox"/></li> </ul>		

## Test B question 5: Keeping warm and healthy (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
5d 1/2g,d	1m	<p>Award <b>ONE</b> mark for an indication that a large sample made Hassan's test reliable <b>or</b> that he used an appropriate control variable that made the test fair:</p> <ul style="list-style-type: none"> <li>■ he used 6/lots of children (not just one)</li> <li>■ he took the pulse rates of the same children in the hot and cold</li> <li>■ he used the same (6) children</li> <li>■ all the children had been sitting only and not running about</li> <li>■ he made sure the children were at rest in both places</li> <li>■ he made sure the children had time to cool down or warm up in each place.</li> </ul>	<p><b>ONE</b> mark may be awarded for an indication that accuracy was improved:</p> <ul style="list-style-type: none"> <li>■ he used a timer instead of a clock to measure the exact time.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ he measured the air temperature in each place [this refers to ensuring the independent variable has been varied rather than to a control variable].</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ he checked his results</li> <li>■ he repeated his test [ambiguous as could refer to repetition of test at a different temperature, or with different children]</li> <li>■ he made a fair test</li> <li>■ he used the same number of children [not clear the pupil understands the children are the same in each test].</li> </ul>
5e 1/2j	1m	<p>Award <b>ONE</b> mark for a conclusion identifying that the pulse rate was higher in the warm place <b>or</b> the converse:</p> <ul style="list-style-type: none"> <li>■ pulse rate is higher when it is warmer</li> <li>■ the children had higher pulse rates in the warm classroom than they did in the cold playground</li> <li>■ a low temperature makes your pulse go down</li> <li>■ the warmer it is, the more heart beats.</li> </ul>	<p><b>ONE</b> mark may be awarded for an absolute response:</p> <ul style="list-style-type: none"> <li>■ they had high/fast pulse rates in the warm/classroom</li> <li>■ they had low/slow pulse rates in the cold/playground.</li> </ul> <p><b>ONE</b> mark may be awarded for a response indicating that the pulse rate was higher when the children felt the surroundings were warmer:</p> <ul style="list-style-type: none"> <li>■ the warmer you/the children/they are, the higher the pulse rate.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response that does not interpret the results:</p> <ul style="list-style-type: none"> <li>■ in the warm classroom the numbers are high.</li> </ul>

## Test B question 6: Moon trip

Question	Mark	Requirements	Allowable answers	Additional guidance
<b>6a</b> 4/2b	<b>1m</b>	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li>■ weight</li> <li>■ gravitational pull/attraction.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>■ gravity.</li> </ul>	<b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>■ downward pull.</li> </ul>
<b>6b</b> 4/4a	<b>1m</b>	Award <b>ONE</b> mark for an indication that the Moon is spherical: <ul style="list-style-type: none"> <li>■ sphere.</li> </ul> <p>❖ <b>Give credit</b> for a correct response that goes beyond the key stage 2 programme of study:</p> <ul style="list-style-type: none"> <li>■ ovoid</li> <li>■ geoid.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>■ (like a) ball.</li> </ul>	<b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>■ round</li> <li>■ circular</li> <li>■ oval.</li> </ul>
<b>6c</b> 4/4d	<b>1m</b>	Award <b>ONE</b> mark for: <div style="display: flex; justify-content: space-around; align-items: center;"> <input type="checkbox"/> <input type="checkbox"/> </div> <ul style="list-style-type: none"> <li>■ 28 days <input checked="" type="checkbox"/></li> </ul>		
<b>6d</b> 4/4c	<b>1m</b>	Award <b>ONE</b> mark for an indication that night and day are caused by the spin of the Earth: <ul style="list-style-type: none"> <li>■ the Earth/it spins/rotates (on its axis)</li> <li>■ the Earth/it turns on its axis.</li> </ul>	<p><b>ONE</b> mark may be awarded for:  <ul style="list-style-type: none"> <li>■ (the Earth moves) on its axis</li> <li>■ it revolves (about its axis).</li> </ul> </p> <p><b>ONE</b> mark may be awarded for a creditworthy response accompanied by an insufficient response describing the orbit of the Earth around the Sun:  <ul style="list-style-type: none"> <li>■ the Earth spins as it orbits the Sun</li> <li>■ the Earth turns on its axis and moves around the Sun.</li> </ul> </p>	<p><b>Do not</b> give credit for an insufficient response implying night and day are caused by the orbit of the Earth around the Sun:  <ul style="list-style-type: none"> <li>■ the Earth's orbit</li> <li>■ the Earth going around the Sun</li> <li>■ the Earth spins/rotates/revolves around the Sun.</li> </ul> </p> <p><b>Do not</b> give credit for an insufficient response:  <ul style="list-style-type: none"> <li>■ the Earth/it moves around</li> <li>■ the Earth/it turns</li> <li>■ the rotation [does not indicate what is rotating]</li> <li>■ during the day, the Earth faces the Sun, at night the Earth faces away from the Sun/ faces the Moon.</li> </ul> </p>

Test B question 6: Moon trip (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
6e 2/1b	1m	<p>Award <b>ONE</b> mark for naming <b>any one</b> of the following life processes:</p> <ul style="list-style-type: none"> <li>■ reproduction</li> <li>■ nutrition.</li> </ul> <p>❖ <b>Give credit</b> for a correct response that goes beyond the key stage 2 programme of study:</p> <ul style="list-style-type: none"> <li>■ movement</li> <li>■ respiration</li> <li>■ excretion</li> <li>■ sensitivity.</li> </ul>		<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ growth [given]</li> <li>■ germination</li> <li>■ nutrients</li> <li>■ die.</li> </ul>
6f 1/1a 2/1c	1m	<p>Award <b>ONE</b> mark for <b>both</b> correct boxes ticked:</p> <p style="text-align: center;"> <input type="checkbox"/>   <input type="checkbox"/>   <input checked="" type="checkbox"/>   <input checked="" type="checkbox"/> </p> <ul style="list-style-type: none"> <li>■ There is no rain.</li> <li>■ There is no air.</li> </ul>		

Test B question 7: Baby's bottle

Question	Mark	Requirements	Allowable answers	Additional guidance
7a 1/2b,c	1m	<p>Award <b>ONE</b> mark for recognising the need for comparison:</p> <ul style="list-style-type: none"> <li>to see how quickly the bottle would normally cool down (without being wrapped up)</li> <li>it is a control bottle</li> <li>to see if wrapped is better than unwrapped</li> <li>to see if the milk will stay warmer if it is not wrapped.</li> </ul>	<p><b>ONE</b> mark may be awarded for responses where it is not clear what is being compared:</p> <ul style="list-style-type: none"> <li>to see the difference in the results</li> <li>so he can see which one stays warm for longer.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>so it is a fair test</li> <li>to see how quickly it cools.</li> </ul>
7b 3/1b	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>(thermal) insulator.</li> </ul>		
7c 1/2d	1m	<p>Award <b>ONE</b> mark for <b>all three</b> correct variables ticked:</p> <ul style="list-style-type: none"> <li>size of bottle <input checked="" type="checkbox"/></li> <li>volume of milk in bottle <input checked="" type="checkbox"/></li> <li>number of layers of material wrapping the bottle <input checked="" type="checkbox"/></li> </ul>		
7d 1/2i	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/></li> <li>B <input checked="" type="checkbox"/></li> <li><input type="checkbox"/></li> <li><input type="checkbox"/></li> </ul>		



**Test B question 7: Baby's bottle (continued)**

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>7e</b> 1/2k,c</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for both:</p> <ul style="list-style-type: none"> <li>■ wool <input checked="" type="checkbox"/></li> <li>■ <input type="checkbox"/></li> </ul> <p><b>AND</b> an explanation that indicates the wool was best at stopping heat loss for the bottle (so will also be best for insulating the lolly):</p> <ul style="list-style-type: none"> <li>■ the wool was best at keeping the bottle warm</li> <li>■ it is the best insulator</li> <li>■ wool will stop the lolly melting for longest as it kept the bottle warm for longest.</li> </ul>	<p><b>ONE</b> mark may be awarded for both:</p> <ul style="list-style-type: none"> <li>■ wool <input checked="" type="checkbox"/></li> <li>■ <input type="checkbox"/></li> </ul> <p><b>AND</b> an absolute response:</p> <ul style="list-style-type: none"> <li>■ wool is a (good) insulator</li> <li>■ it kept the bottle of milk warm.</li> </ul> <p><b>ONE</b> mark may be awarded if no box is ticked, but the creditworthy explanation indicates unambiguously that the pupil believes wool was best at preventing the ice lolly from melting for the longest time.</p>	<p><b>Do not</b> give credit if either 'cotton' or 'paper' is ticked.</p> <p><b>Do not</b> give credit for a response that includes incorrect science implying cold rather than heat travels:</p> <ul style="list-style-type: none"> <li>■ it kept the cold in/stopped the coldness getting through.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ wool is thick.</li> </ul> <p><b>Do not</b> give credit for an insufficient response that gives sunlight as a source of warmth:</p> <ul style="list-style-type: none"> <li>■ it will block the sunlight from making it hot.</li> </ul>

## Test B question 8: Tomatoes

Draft box	<p>Markers should read the answers to all parts before marking this question.                      The draft box can be consulted when marking all parts for clarification of any ambiguity in the marked response or when no answer is given. If an answer is correct, ignore contradictory statements written in the draft box.                      Parts 8a–8d must form a coherent investigation.</p>			
Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>8a</b> 1/2a,d</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for an awareness of the independent variable (IV) in an experiment or survey which compares the tomato seeds:</p> <ul style="list-style-type: none"> <li>■ the brand of tomato seeds</li> <li>■ the type of tomato.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ tomatoes</li> <li>■ different seeds</li> <li>■ (kind of) seeds</li> <li>■ (the) brand.</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science giving the dependent variable or a control variable:</p> <ul style="list-style-type: none"> <li>■ the number of tomatoes</li> <li>■ the place tomatoes are put.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ (the) type.</li> </ul>
<p><b>8b</b> 1/2c,d</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for any acceptable dependent variable (DV) identified:</p> <ul style="list-style-type: none"> <li>■ the number of tomatoes/flowers</li> <li>■ the height of the plant</li> <li>■ the mass/weight of the plant/crop</li> <li>■ the size of the tomatoes</li> <li>■ speed of germination/growth.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ how tall it is</li> <li>■ which one ripens fastest.</li> </ul> <p><b>ONE</b> mark may be awarded for subjective or qualitative measures:</p> <ul style="list-style-type: none"> <li>■ taste.</li> </ul>	<p>A DV (in part 8b) without an IV (in part 8a) can gain credit. If there is an IV the DV must agree with it.</p> <p><b>Do not</b> give credit for an insufficient response repeating information given in the question:</p> <ul style="list-style-type: none"> <li>■ the growth of the seed/tomato</li> <li>■ which seeds grow best.</li> </ul> <p><b>Do not</b> give credit for an insufficient response which does not explicitly describe the attribute of tomatoes to be measured:</p> <ul style="list-style-type: none"> <li>■ compare the tomatoes</li> <li>■ time taken.</li> </ul>

Test B question 8: Tomatoes (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
8c 1/2d	1m	<p>Award <b>ONE</b> mark for any acceptable control variable (CV):</p> <ul style="list-style-type: none"> <li>■ light</li> <li>■ water</li> <li>■ temperature</li> <li>■ soil</li> <li>■ condition/situation in which the tomatoes are kept</li> <li>■ time left to grow.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ the place</li> <li>■ number of seeds/plants.</li> </ul>	<p><b>Do not</b> give credit for a CV that is inconsistent with, or repeats a creditworthy IV or DV offered in parts 8a or 8b respectively.</p> <p><b>Do not</b> give credit for an insufficient response identifying a CV which could also be a DV where there is no correct DV for clarification.</p> <p>If neither an IV nor a DV is offered, the CV may gain credit provided it is consistent with the context of the investigation. An appropriate CV can gain credit where <b>both</b> the IV <b>and</b> DV are insufficient or incorrect.</p> <p><b>Do not</b> give credit for an insufficient response which suggests everything is controlled:</p> <ul style="list-style-type: none"> <li>■ everything has to be the same.</li> </ul>
8d 1/2h	2m  or  1m	<p>Award <b>TWO</b> marks for an indication that the left-hand heading of the table is the <b>IV</b> (brand of seed) <b>and</b> the right-hand heading is the <b>DV</b> (as described in part 8b):</p> <p><b>Left-hand heading (8di)</b></p> <ul style="list-style-type: none"> <li>■ (type of) seed</li> <li>■ which brand?</li> <li>■ tomato.</li> </ul> <p><b>Right-hand heading (8dii)</b></p> <ul style="list-style-type: none"> <li>■ number/mass of tomatoes</li> <li>■ speed of germination/growth</li> <li>■ height of the plant (cm)</li> <li>■ taste scale (1–5).</li> </ul> <p>If you are unable to award two marks, award <b>ONE</b> mark for <b>either</b> heading correct.</p>	<p><b>ONE</b> mark may be awarded for a left-hand heading which repeats a non-creditworthy response given in 8a.</p> <p><b>ONE</b> mark may be awarded for an appropriate unit of measurement in the right-hand column if it matches the DV given in 8b:</p> <ul style="list-style-type: none"> <li>■ cm.</li> </ul> <p><b>ONE</b> mark may be awarded for a right-hand heading which repeats a non-creditworthy response given in 8b.</p>	<p>The table headings must be consistent with any creditworthy IV and DV given. Units do not need to be given.</p> <p>The table headings can gain credit if they describe an appropriate IV or DV which has been omitted in the rest of the question or where an insufficient or incorrect IV or DV has been given. Insufficient responses in the left-hand or right-hand columns may be clarified from the answers to parts 8a and 8b respectively:</p> <ul style="list-style-type: none"> <li>■ type [can be clarified if 8a says 'type of seeds'].</li> </ul> <p><b>Do not</b> give credit for an insufficient response which generalises the right-hand column:</p> <ul style="list-style-type: none"> <li>■ results/findings</li> <li>■ what happened.</li> </ul>

When applying this mark scheme, please also refer to the General guidance given on pages 1 and 2.

## Test B question 9: Separating salt

Question	Mark	Requirements	Allowable answers	Additional guidance
9a 3/3a	1m	Award <b>ONE</b> mark for a response indicating that the salt and pasta are different sizes: <ul style="list-style-type: none"> <li>the salt is smaller than the pasta</li> <li>they are not the same size.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>the salt is small and goes through the sieve but the pasta does not</li> <li>the holes in the sieve are small so the salt can go through and the pasta cannot.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response which does not compare the size of the solids:</p> <ul style="list-style-type: none"> <li>the salt is small (and goes through the sieve).</li> </ul> <p><b>Do not</b> give credit for an insufficient response identifying that the size of the material affects the separation without indicating the sizes need to be different:</p> <ul style="list-style-type: none"> <li>size</li> <li>the sieve lets small things through.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>the salt goes through the sieve but the pasta cannot</li> <li>they are a different shape</li> <li>they are different.</li> </ul>
9b i 3/3c	1m	Award <b>ONE</b> mark for a response identifying filtration: <ul style="list-style-type: none"> <li>she should filter it</li> <li>use filter paper.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>filter paper</li> <li>put paper in the sieve</li> <li>use a finer sieve</li> <li>decant it.</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science implying evaporation will separate the sand and the salt:</p> <ul style="list-style-type: none"> <li>heat the mixture</li> <li>evaporate the water.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>use a funnel [all material would go through a funnel]</li> <li>use a small sieve.</li> </ul>

Test B question 9: Separating salt (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
9b ii 3/3d	1m	Award <b>ONE</b> mark for an indication that the mixture can be separated by evaporating (the water leaving the salt behind): <ul style="list-style-type: none"> <li>by evaporation</li> <li>evaporate the water (leaving the salt).</li> </ul>	<b>ONE</b> mark may be awarded for a response explaining the mixture should be moved to a warmer place and/or left to dry: <ul style="list-style-type: none"> <li>move the mixture onto a sunny/warm window sill</li> <li>put it on a radiator</li> <li>leave the salt to dry</li> <li>heat it</li> <li>put it on a shelf and wait.</li> </ul>	<b>Do not</b> give credit for a response that includes incorrect science implying the salt will evaporate: <ul style="list-style-type: none"> <li>evaporate the mixture/solution.</li> </ul> <b>Do not</b> give credit for an insufficient response where it is unclear what is being evaporated: <ul style="list-style-type: none"> <li>leave it out to evaporate the liquid</li> <li>evaporate it.</li> </ul> <b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>leave it (out)</li> <li>the water disappears.</li> </ul>
9c 3/3d	1m	Award <b>ONE</b> mark for a response indicating both the salt and the sugar would dissolve in the water: <ul style="list-style-type: none"> <li>it will dissolve the sugar (too).</li> </ul>		

**[Blank page]**

**[Blank page]**



**Qualifications and Curriculum  
Development Agency**

83 Piccadilly, London W1J 8QA  
Telephone 0300 303 3013  
Textphone 0300 303 3012  
Fax 0300 303 3014  
Email [assessments@qcda.gov.uk](mailto:assessments@qcda.gov.uk)  
[www.qcda.gov.uk/tests](http://www.qcda.gov.uk/tests)

**For more copies**

QCDA Orderline, PO Box 29, Norwich NR3 1GN  
Tel: 0300 303 3015 Fax: 0300 303 3016  
Email: [orderline@qcda.gov.uk](mailto:orderline@qcda.gov.uk)

QCDA/10/4681