

Sc

KEY STAGE

2

LEVELS

3–5

2006

2006

Science tests

# Mark schemes

Tests A and B, levels 3–5



department for

**education and skills**

creating opportunity, releasing potential, achieving excellence

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# Marking the science tests

As in 2005, external markers, employed by the external marking agencies under contract to QCA, will mark the test papers. The markers will follow the mark schemes in this booklet, which is supplied to teachers for information.

This booklet contains the mark schemes for the levels 3–5 tests A and B. Level threshold tables will be posted on the QCA website ([www.qca.org.uk](http://www.qca.org.uk)) on 19 June 2006.

## 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 the mark;
- examples of specific creditworthy responses showing correct science;
- examples of creditworthy responses 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 the responses imply incorrect scientific knowledge;
- answers which are insufficient in themselves to gain credit, but are not incorrect science, and would therefore not lose credit if used with a correct response.

Where **two** marks are available for a question which describes the **relationship between two continuous variables**, the following will apply:

- *two* marks will be awarded for a creditworthy general comparison of the variables in question, eg the *bigger* the grains, the *longer* the sugar takes to dissolve;
- *one* mark will be awarded for a pair of creditworthy specific comparisons, eg big grains dissolve *slowly* and small grains dissolve *fast*;
- *one* mark will be awarded for a single creditworthy comparison, eg the *biggest* grains dissolve *most slowly*.

### *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, with the action the marker will take.

<b>What if...?</b>	<b>Marking procedure</b>
The child gives two or more responses to a particular question part.	<p>a) If a child qualifies a scientifically correct answer with a scientifically incorrect statement, no mark will be awarded for that question part.</p> <p>b) If a child 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 child 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 child's response. If the correct boxes are left blank, no marks will be awarded.
The child 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 child has shown understanding of the question, the mark(s) will be given.
The child misspells a word.	<p>a) If it is clear that the child 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 child 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 child, 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, and on the marksheet.

Each paper has the following number of marks available:

- Test A has 40;
- Test B has 40.

The 2006 key stage 2 science tests and mark schemes were developed by the National Foundation for Educational Research (NFER) and the Centre for Research into Primary Science and Technology (CRIPSAT) on behalf of QCA.

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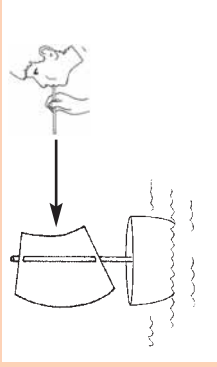
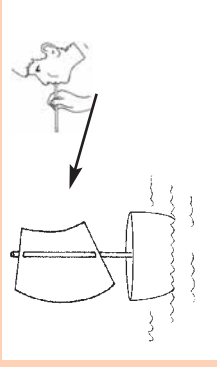
## Test A question 1: Popcorn

Question	Mark	Requirements	Allowable answers	Additional guidance															
<p><b>1a</b></p> <p>1/2i,j 3/2b</p>	<p><b>2m</b></p> <p><b>or</b></p> <p><b>1m</b></p>	<p>Award <b>TWO</b> marks for <b>all four</b> statements correctly classified:</p> <p>The <b>pictures</b> show that as the corn pops, it...</p> <table border="0"> <tr> <td></td> <td style="text-align: center;">True</td> <td style="text-align: center;">False</td> </tr> <tr> <td>gets bigger.</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>changes to a darker colour.</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>changes shape.</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>gets smoother.</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> <p>If you are unable to award two marks, award <b>ONE</b> mark for <b>any two</b> or <b>three</b> statements correctly classified.</p>		True	False	gets bigger.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	changes to a darker colour.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	changes shape.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	gets smoother.	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
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gets bigger.	<input checked="" type="checkbox"/>	<input type="checkbox"/>																	
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changes shape.	<input checked="" type="checkbox"/>	<input type="checkbox"/>																	
gets smoother.	<input type="checkbox"/>	<input checked="" type="checkbox"/>																	
<p><b>1b</b></p> <p>3/2c</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for: Sasha should measure the...</p> <ul style="list-style-type: none"> <li>■ <input type="checkbox"/> temperature. <input checked="" type="checkbox"/></li> <li>■ <input type="checkbox"/> <input type="checkbox"/></li> </ul>																	
<p><b>1c</b></p> <p>3/2b</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>■ heat <input checked="" type="checkbox"/> <input type="checkbox"/></li> </ul>																	

## Test A question 1: Popcorn (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
1d 3/2f	1m	<p>Award <b>ONE</b> mark for identifying/ describing a non-reversible change where a new material is produced, eg:</p> <ul style="list-style-type: none"> <li>■ (wood/paper/candle) burning;</li> <li>■ egg being boiled;</li> <li>■ mixing vinegar and bicarbonate of soda;</li> <li>■ cooking a cake/biscuits;</li> <li>■ making a cake;</li> <li>■ boiling rice/spaghetti;</li> <li>■ making paper from wood/trees.</li> </ul> <p>❖ <b>Give credit</b> for a correct response that goes beyond the key stage 2 programme of study which names a chemical change:</p> <ul style="list-style-type: none"> <li>■ combustion;</li> <li>■ corrosion/rusting;</li> <li>■ respiration/photosynthesis.</li> </ul>	<p><b>ONE</b> mark may be awarded for identifying a biological non-reversible change:</p> <ul style="list-style-type: none"> <li>■ an apple decaying/going rotten;</li> <li>■ a seed growing into a plant.</li> </ul> <p><b>ONE</b> mark may be awarded for a response identifying a material and what it changes into:</p> <ul style="list-style-type: none"> <li>■ changing bread into toast;</li> <li>■ paper to ashes;</li> <li>■ a grape turning into a raisin;</li> <li>■ milk turning into cheese;</li> <li>■ changing sand to glass.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ heating food [heating may not result in an irreversible change];</li> <li>■ boiling.</li> </ul> <p><b>Do not</b> give credit for an insufficient response explicitly relating to popcorn:</p> <ul style="list-style-type: none"> <li>■ the popcorn cannot change back to seeds again.</li> </ul> <p><b>Do not</b> give credit for an insufficient response naming a non-reversible physical process in which the material is not changed:</p> <ul style="list-style-type: none"> <li>■ breaking a cup/glass;</li> <li>■ dropping an egg;</li> <li>■ ripping paper;</li> <li>■ popping a balloon.</li> </ul> <p><b>Do not</b> give credit for an insufficient response identifying a new material without identifying the change:</p> <ul style="list-style-type: none"> <li>■ a cake is non-reversible;</li> <li>■ candle [the wax burns and melts];</li> <li>■ chips;</li> <li>■ toast.</li> </ul>

## Test A question 2: Boats

Question	Mark	Requirements	Allowable answers	Additional guidance
2a 4/2d,e	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>The force from the water pushing the boat up. <input checked="" type="checkbox"/> <input type="checkbox"/></li> </ul>		
2b 1/1a	1m	<p>Award <b>ONE</b> mark for recognising that the larger lump of modelling clay makes boat 2 sit lower in the water <b>or</b> that boat 2 is heavier:</p> <ul style="list-style-type: none"> <li>boat 2 has more clay;</li> <li>the lump of clay in boat 2 is bigger/heavier;</li> <li>the clay makes it heavier;</li> <li>the heavier the boat, the lower it sinks;</li> <li>it is heavier/weights more;</li> <li>there is more force (pulling/pushing) down.</li> </ul>	<p><b>ONE</b> mark may be awarded for an absolute response implying that boat 2 has more modelling clay than boat 1:</p> <ul style="list-style-type: none"> <li>boat 2 has a lot of clay;</li> <li>boat 2 is heavy.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>the clay is weighing down the boat;</li> <li>boat 2 floats lower because of the modelling clay;</li> <li>there is a force.</li> </ul>
2c 4/2e	1m	<p>Award <b>ONE</b> mark for a horizontal arrow pointing left drawn <b>anywhere</b> on the picture:</p> 	<p><b>ONE</b> mark may be awarded for an arrow pointing left that is within 45° of the horizontal:</p> 	<p><b>Do not</b> give credit for an insufficient response where a line is drawn from the straw to the sail with no arrowhead.</p>



## Test A question 2: Boats (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
2d 4/2c	1m	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li>friction.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>air resistance;</li> <li>water resistance;</li> <li>drag.</li> </ul>	<b>Do not</b> give credit for a response that includes incorrect science: <ul style="list-style-type: none"> <li>gravity/weight.</li> </ul> <b>Do not</b> give credit for an insufficient response describing friction: <ul style="list-style-type: none"> <li>(the force from the) air/water/wind.</li> </ul>
2e 1/2/ 4/2c	1m	Award <b>ONE</b> mark for a response indicating that the big sail will have a greater pushing/blowing force on it: <ul style="list-style-type: none"> <li>the force on the big sail is larger;</li> <li>there is more sail for the blowing force to act on;</li> <li>there is a bigger force because it has more sail to push;</li> <li>the small sail will not get as much pushing force so it will be slower.</li> </ul>	<b>ONE</b> mark may be awarded for a response indicating that the big sail catches or traps more air/wind, pushing it along (faster/further): <ul style="list-style-type: none"> <li>the bigger sail catches more wind and is pushed faster;</li> <li>more air will collect in the big sail to push it along.</li> </ul>	<b>Do not</b> give credit for a response that includes incorrect science: <ul style="list-style-type: none"> <li>air resistance makes the boat go faster.</li> </ul> <b>Do not</b> give credit for an insufficient response where the forces on the sail have not been described: <ul style="list-style-type: none"> <li>the bigger the sail, the faster the boat [this is a consequence of a bigger force, not a description of the force];</li> <li>the big sail will catch the wind better;</li> <li>a bigger sail will catch more wind;</li> <li>the small sail does not get as much wind;</li> <li>the wind will blow the bigger sail faster [given].</li> </ul>

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## Test A question 3: Mini-beasts

Question	Mark	Requirements	Allowable answers	Additional guidance																				
<b>3a</b> 2/4a,b	<b>1m</b>	<p>Award <b>ONE</b> mark for <b>all four</b> animals correctly placed:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Name</th> <th>Legs</th> <th>Wings</th> <th>Antennae</th> </tr> </thead> <tbody> <tr> <td>butterfly</td> <td>6</td> <td>4</td> <td>2</td> </tr> <tr> <td>hoverfly</td> <td>6</td> <td>2</td> <td>2</td> </tr> <tr> <td>ant</td> <td>6</td> <td>0</td> <td>2</td> </tr> <tr> <td>spider</td> <td>8</td> <td>0</td> <td>0</td> </tr> </tbody> </table>	Name	Legs	Wings	Antennae	butterfly	6	4	2	hoverfly	6	2	2	ant	6	0	2	spider	8	0	0		<p><b>Do not</b> give credit for an insufficient response that replaces 'butterfly' or 'hoverfly' with 'fly'.</p>
Name	Legs	Wings	Antennae																					
butterfly	6	4	2																					
hoverfly	6	2	2																					
ant	6	0	2																					
spider	8	0	0																					
<b>3b</b> 2/5a	<b>1m</b>	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ in the place where they were found <input type="checkbox"/></li> <li>■ <input checked="" type="checkbox"/></li> </ul>																						
<b>3c</b> 2/4a,b	<b>1m</b>	<p>Award <b>ONE</b> mark for correctly naming <b>both</b> animals:</p> <ul style="list-style-type: none"> <li>■ (i) dragonfly; <b>and</b> (ii) housefly; [in that order].</li> </ul>		<p><b>Do not</b> give credit for an insufficient response for naming either insect as 'fly'.</p>																				
<b>3d</b> 1/2b 2/4a,b	<b>1m</b>	<p>Award <b>ONE</b> mark for <b>both</b> boxes ticked:</p> <ul style="list-style-type: none"> <li>■ <input type="checkbox"/> has a long thin tail <input checked="" type="checkbox"/></li> <li>■ has 4 wings <input checked="" type="checkbox"/> <input 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 4: Isaac Newton

Question	Mark	Requirements	Allowable answers	Additional guidance
4a 1/1a 4/2b	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li> <input type="checkbox"/> a pulling force  <input checked="" type="checkbox"/> towards the Earth           </li> </ul>		
4b 1/1b	1m	<p>Award <b>ONE</b> mark for an indication that Newton needed evidence to support his ideas or so that he could be more certain of his ideas:</p> <ul style="list-style-type: none"> <li>to gather evidence to support (or reject) his ideas;</li> <li>to see if his ideas were supported by his results/investigations;</li> <li>to see if his predictions were correct;</li> <li>to find out if other things fall from the same force;</li> <li>if he said anything without investigating it, other people may find something different.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response that implies he would know if his ideas were true:</p> <ul style="list-style-type: none"> <li>to see whether his ideas were right/wrong;</li> <li>to see if it/his idea works/is true;</li> <li>to check his ideas;</li> <li>to know (for sure) which force causes the apple to fall;</li> <li>if he just guessed he may be wrong;</li> <li>so he could know why the apple fell on his head;</li> <li>if he did not test, he would not know what happened.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>to test his ideas [given];</li> <li>to make sure;</li> <li>to see if his results are true;</li> <li>to check his results;</li> </ul> <p>[these responses imply an investigation has already been carried out];</p> <ul style="list-style-type: none"> <li>to see if he had the right/correct answer [implies results for his ideas have been determined previously];</li> <li>to make it a fair test;</li> <li>to make it accurate;</li> <li>to see if the investigation worked.</li> </ul>
4c 4/2b 1/2l	1m	<p>Award <b>ONE</b> mark for recognising that gravitational force is responsible for keeping the Earth in orbit:</p> <ul style="list-style-type: none"> <li>gravity.</li> </ul>		<p><b>Do not</b> give credit for an insufficient response describing gravitational force:</p> <ul style="list-style-type: none"> <li>a pulling force towards the Earth.</li> </ul>
4d 4/4d	1m	<p>Award <b>ONE</b> mark for a response giving a time period equivalent to a year:</p> <ul style="list-style-type: none"> <li>1 year;</li> <li>52 weeks;</li> <li>365–366 days [inclusive].</li> </ul>		<p><b>Do not</b> give credit for an insufficient response that gives no units or uses inappropriate units:</p> <ul style="list-style-type: none"> <li>365;</li> <li>52 days.</li> </ul>

## Test A question 4: Isaac Newton (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>4e</b> 4/4c</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for a response that clearly describes the Earth spinning on its axis to cause day and night:</p> <ul style="list-style-type: none"> <li>■ it rotates;</li> <li>■ it spins (on its axis);</li> <li>■ it turns on its axis.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ it revolves;</li> <li>■ (it moves) on its axis.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response implying night and day are caused by the Earth orbiting the Sun:</p> <ul style="list-style-type: none"> <li>■ it turns around the Sun;</li> <li>■ it orbits.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ it turns;</li> <li>■ it goes (a)round;</li> <li>■ during the day, the Earth is facing the Sun, at night the Earth is facing away from the Sun/facing the Moon.</li> </ul>

## Test A question 5: Trees

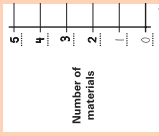
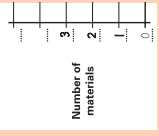
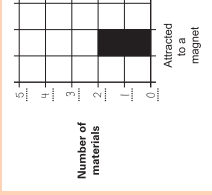
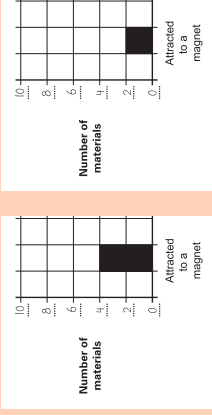
Question	Mark	Requirements	Allowable answers	Additional guidance
5a 2/3c	1m	<p>Award <b>ONE</b> mark for an indication <b>either</b> that the trunk transports water/nutrients <b>or</b> that the trunk supports the tree:</p> <ul style="list-style-type: none"> <li>■ the trunk carries/moves water and nutrients (from the roots to the leaves);</li> <li>■ the trunk supports the tree/leaves/branches;</li> <li>■ the trunk holds the tree upright.</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>■ it carries food to the roots/parts of the plant that are growing;</li> <li>■ the trunk/it stores water.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response indicating a supporting function of the trunk/stem which works in conjunction with the roots:</p> <ul style="list-style-type: none"> <li>■ to keep/hold it up;</li> <li>■ to stand up (straight);</li> <li>■ to keep it stable/steady;</li> <li>■ to stop the tree blowing over.</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science:</p> <ul style="list-style-type: none"> <li>■ it absorbs/takes in/sucks up water/nutrients from the soil;</li> <li>■ to anchor the tree;</li> <li>■ [these responses refer to functions of the roots];</li> <li>■ it feeds the tree.</li> </ul>
5b 2/3b	1m	<p>Award <b>ONE</b> mark for naming leaves:</p> <ul style="list-style-type: none"> <li>■ (the) leaf.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response indicating a green part:</p> <ul style="list-style-type: none"> <li>■ green twig/branch/stalk.</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science:</p> <ul style="list-style-type: none"> <li>■ roots;</li> <li>■ flowers.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ the stem/stalk/trunk [the stem can only photosynthesise if it is green].</li> </ul>

## Test A question 5: Trees (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
5c 2/3a,b	1m	<p>Award <b>ONE</b> mark for a response indicating that less light is available <b>or</b> that the tree may not have leaves (for the production of new materials for growth) <b>or</b> that water and/or nutrients may be less accessible to the tree (as the ground is more likely to be frozen):</p> <ul style="list-style-type: none"> <li>■ (the hours of daylight are shorter so) there is less light/sunshine;</li> <li>■ the (sun)light is not as intense/strong;</li> <li>■ the tree has lost its leaves (so it cannot make new material for growth);</li> <li>■ trees cannot get the nutrients (out of the ground);</li> <li>■ there is less water because it is frozen;</li> <li>■ the tree cannot make enough food (to grow).</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>■ there is less photosynthesis;</li> <li>■ there is less light/water taken in (by the tree) for photosynthesis.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response referring to the Sun rather than to light:</p> <ul style="list-style-type: none"> <li>■ the Sun does not get so high in the sky;</li> <li>■ there is less Sun (in winter).</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science:</p> <ul style="list-style-type: none"> <li>■ trees die in winter;</li> <li>■ trees get less food from the Sun.</li> </ul> <p><b>Do not</b> give credit for an insufficient response implying there is complete darkness during winter:</p> <ul style="list-style-type: none"> <li>■ there is no sunlight/Sun;</li> <li>■ trees need light to grow.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ there is less heat;</li> <li>■ it is cold;</li> <li>■ [given];</li> <li>■ there is less water/nutrients;</li> <li>■ (trees get) less food.</li> </ul>
5d i 2/4a	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ Norway maple.</li> </ul>	<p><b>ONE</b> mark may be awarded for an unambiguous indication of the correct tree:</p> <ul style="list-style-type: none"> <li>■ Norway/maple.</li> </ul>	
5d ii 2/4a	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ Alder buckthorn.</li> </ul>	<p><b>ONE</b> mark may be awarded for an unambiguous indication of the correct tree:</p> <ul style="list-style-type: none"> <li>■ Alder/buckthorn.</li> </ul>	

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

## Test A question 6: Magnets

Question	Mark	Requirements	Allowable answers	Additional guidance
<b>6a i</b> 1/2h	<b>1m</b>	<p>Award <b>ONE</b> mark for 1 to 5 marked on the vertical or y axis:</p> 	<p><b>ONE</b> mark may be awarded for a sequence of 1, 2, 3, or 1, 2, 3, 4 correctly placed:</p> 	
<b>6a ii</b> 1/2h	<b>1m</b>	<p>Award <b>ONE</b> mark for a bar drawn to '2' on the chart above 'Attracted to a magnet':</p> 	<p><b>ONE</b> mark may be awarded for 2 squares shaded if the scale is incorrect/missing <b>or</b> for a bar drawn consistently with an incorrect scale:</p> 	
<b>6b</b> 1/2j	<b>1m</b>	<p>Award <b>ONE</b> mark for a response recognising that the results are not referred to or interpreted:</p> <ul style="list-style-type: none"> <li>■ she has not talked about what she has found out/what happened/her results;</li> <li>■ it does not give reasons/an explanation.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response which implies that there is not enough information <b>or</b> recognises that 'good' is not defined:</p> <ul style="list-style-type: none"> <li>■ it does not tell you anything;</li> <li>■ it needs to tell you more about the results;</li> <li>■ it has not got enough detail;</li> <li>■ we need more information;</li> <li>■ it does not tell us why it is good;</li> <li>■ she needs to explain 'good'.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response which refers to a prediction or method, or which presents a conclusion:</p> <ul style="list-style-type: none"> <li>■ she does not say what was supposed to happen;</li> <li>■ she has not talked about what she did;</li> <li>■ it does not describe the investigation;</li> <li>■ metals were attracted to the magnet.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ it does not tell you her conclusion;</li> <li>■ she is just saying it is good;</li> <li>■ she does not use scientific words;</li> <li>■ it does not say why it is attracted to the materials.</li> </ul>



## Test A question 6: Magnets (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance																								
6c 1/2k	2m  or  1m	<p>Award <b>TWO</b> marks for <b>all five</b> observations correctly classified:</p> <table border="1"> <thead> <tr> <th>Observation</th> <th>Supports Ali's and Jane's ideas</th> <th>Supports only Jane's idea</th> <th>Does not support either idea</th> </tr> </thead> <tbody> <tr> <td>The iron nail is attracted to the magnet.</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>The steel clip is attracted to the magnet.</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>The metal coin is <b>not</b> attracted to the magnet.</td> <td></td> <td>✓</td> <td></td> </tr> <tr> <td>The modelling clay is <b>not</b> attracted to the magnet.</td> <td></td> <td></td> <td>✓</td> </tr> <tr> <td>The chocolate is <b>not</b> attracted to the magnet.</td> <td></td> <td></td> <td>✓</td> </tr> </tbody> </table> <p>If you are unable to award two marks, award <b>ONE</b> mark for <b>any three</b> or <b>four</b> correct observations.</p>	Observation	Supports Ali's and Jane's ideas	Supports only Jane's idea	Does not support either idea	The iron nail is attracted to the magnet.	✓			The steel clip is attracted to the magnet.	✓			The metal coin is <b>not</b> attracted to the magnet.		✓		The modelling clay is <b>not</b> attracted to the magnet.			✓	The chocolate is <b>not</b> attracted to the magnet.			✓		
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The modelling clay is <b>not</b> attracted to the magnet.			✓																									
The chocolate is <b>not</b> attracted to the magnet.			✓																									
6d 1/2m	1m	<p>Award <b>ONE</b> mark for an indication that the suggested change would give a different investigation:</p> <ul style="list-style-type: none"> <li>they only want to know if the material is attracted or not;</li> <li>they were not testing the strength of the magnets;</li> <li>it was not what they were testing.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response suggesting measurement is not needed for their investigation:</p> <ul style="list-style-type: none"> <li>how far it moves does not matter;</li> <li>it would not make any difference;</li> <li>it has nothing to do with the test.</li> </ul> <p><b>ONE</b> mark may be awarded for a response recognising that only some of the materials are magnetic:</p> <ul style="list-style-type: none"> <li>if it is not attracted to the magnet it will not move;</li> <li>only steel/iron will attract the magnet;</li> <li>chocolate would never move;</li> <li>some materials were not magnetic.</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science which is not supported by the results of the investigation:</p> <ul style="list-style-type: none"> <li>the materials all move the same distance;</li> <li>all the materials attract so it will not work;</li> <li>some metals repel magnets.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>measuring would not help;</li> <li>it is easier to see.</li> </ul>																								

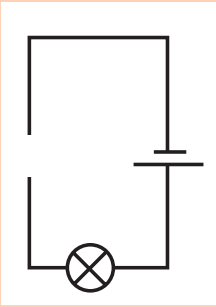
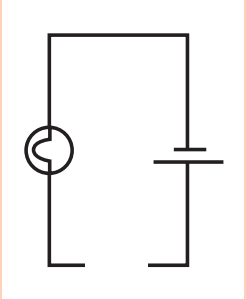
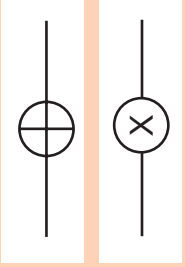
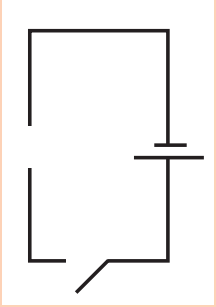
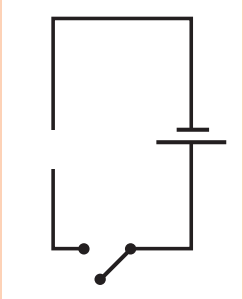
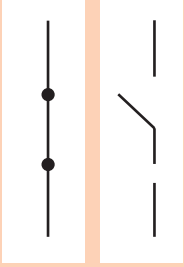
## Test A question 7: Ice experiments

Question	Mark	Requirements	Allowable answers	Additional guidance
7a i 3/2d,b	1m	<p>Award <b>ONE</b> mark for a response that names or describes <b>evaporation</b>:</p> <ul style="list-style-type: none"> <li>the (hot) water evaporates;</li> <li>it changes into water vapour;</li> <li>it evaporates.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>it evaporates/changes into steam.</li> </ul> <p><b>ONE</b> mark may be awarded if evaporation is the only process named or described.</p>	<p><b>Do not</b> give credit in <b>both 7ai and 7a ii</b> for a response that includes incorrect science indicating that the water comes from the melting ice:</p> <ul style="list-style-type: none"> <li>water from the melting ice cubes drips through/underneath the plate.</li> </ul>
7a ii 3/2d,b	1m	<p>Award <b>ONE</b> mark for a response that names or describes <b>condensation</b>:</p> <ul style="list-style-type: none"> <li>the water vapour condenses into liquid;</li> <li>the (cold) plate causes the evaporated water to condense;</li> <li>the water vapour turns back into liquid;</li> <li>it condenses.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>the steam condenses/changes into water.</li> </ul> <p><b>ONE</b> mark may be awarded if condensation is the only process named or described.</p>	<p><b>Do not</b> give credit in <b>either 7ai or 7a ii</b> for a response that includes incorrect science despite using the words evaporation and/or condensation:</p> <ul style="list-style-type: none"> <li>the gas evaporates and then condenses so that liquid forms under the plate [mark for 7ai only cannot be awarded];</li> <li>the water condenses because of the heat and turns into water vapour [mark for 7a ii cannot be awarded];</li> <li>the heat touches the cold plate and condenses [mark for 7a ii cannot be awarded].</li> </ul> <p><b>Do not</b> give credit in <b>either 7ai or 7a ii</b> for a response that includes incorrect science where steam is referred to as a liquid:</p> <ul style="list-style-type: none"> <li>the steam evaporates [mark for 7ai cannot be awarded];</li> <li>the gas cools and changes into steam on the bottom of the plate [mark for 7a ii cannot be awarded].</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>hot air condenses on the plate [there is likely to be water vapour in the air, but this needs to be explicit].</li> </ul>


## Test A question 7: Ice experiments (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
7b 1/2h	1m	Award <b>ONE</b> mark for labelling the horizontal axis with time <b>and</b> giving minutes as the unit of measurement: <ul style="list-style-type: none"> <li>time (in) mins.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>minutes;</li> <li>how long it takes in minutes.</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science giving the units of time as anything other than minutes:</p> <ul style="list-style-type: none"> <li>time (seconds);</li> <li>hours;</li> <li>seconds;</li> <li>time (m) ['m' is the unit of measurement for metres].</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>time [does not give units];</li> <li>how long [does not give units and could refer to length].</li> </ul>
7c 1/2j	1m	Award <b>ONE</b> mark for an explanation that salt increases the rate of melting: <ul style="list-style-type: none"> <li>salt makes ice melt quicker;</li> <li>ice melts more quickly when salt is added.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>the water comes through the funnel faster when he adds salt;</li> <li>salt melts the ice better;</li> <li>ice melts easier with salt.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>water melts quicker with salt;</li> <li>the salt melts the ice quickly [the ice melts without salt as well];</li> <li>ice melts without salt;</li> <li>salt affects the rate at which ice melts; [these responses do not describe the effect of adding salt].</li> </ul>
7d 1/2m	1m	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li>He did not try different amounts of salt.</li> </ul>		

## Test A question 8: Train in the tunnel

Question	Mark	Requirements	Allowable answers	Additional guidance
8a i 4/1c	1m	Award <b>ONE</b> mark for a correctly drawn symbol for a light bulb in either position in the circuit: 	<b>ONE</b> mark may be awarded for an obsolete symbol for the bulb: 	<b>Do not</b> give credit for a response that includes incorrect science where a bulb symbol has been incorrectly drawn in the circuit: 
8a ii 4/1c	1m	Award <b>ONE</b> mark for a correctly drawn symbol for a switch in either position in the circuit: 	<b>ONE</b> mark may be awarded for an obsolete symbol for the switch: 	<b>Do not</b> give credit for a response that includes incorrect science where a switch symbol has been incorrectly drawn in the circuit: 
8b 3/1a	1m	Award <b>ONE</b> mark for naming <b>one</b> of the following properties: <ul style="list-style-type: none"> <li>(electrical) conductor;</li> <li>flexible.</li> </ul>	<ul style="list-style-type: none"> <li><b>ONE</b> mark may be awarded for a description of a property: <ul style="list-style-type: none"> <li>it is easy to cut;</li> <li>electricity goes through metal.</li> </ul> </li> <li><b>ONE</b> mark may be awarded for a response indicating that the foil needs to be rigid enough to stay against the roof of the tunnel: <ul style="list-style-type: none"> <li>it is a bit rigid so that it can stand up (to touch the tunnel).</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>it is metal/aluminium;</li> <li>the foil is rigid [implies no flexibility and offers no explanation].</li> </ul> </li> </ul>

Test A question 8: Train in the tunnel (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>8c</b> 4/1a</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for an understanding that the bulb does not light up because there is a break in the circuit:</p> <ul style="list-style-type: none"> <li>■ <i>The circuit is not complete;</i></li> <li>■ <i>The circuit has a gap in it.</i></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>■ <i>The circuit is open;</i></li> <li>■ <i>The circuit has no current flowing.</i></li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ <i>The circuit is broken;</i></li> <li>■ <i>The circuit is not completely joined up;</i></li> <li>■ <i>The circuit is not connected (properly);</i></li> <li>■ <i>The circuit is switched off.</i></li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ <i>The circuit does not have enough electricity/energy;</i></li> <li>■ <i>The circuit needs both foil strips to touch;</i></li> <li>■ <i>The circuit has only one foil strip touching;</i></li> <li>■ <i>[given].</i></li> </ul>
<p><b>8d</b> 1/2m 4/1a</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for:</p> <div style="display: flex; align-items: center; gap: 20px;"> <div style="display: flex; flex-direction: column; align-items: center;"> <input type="checkbox"/> </div> <div style="text-align: center;">  </div> <div style="display: flex; flex-direction: column; align-items: center;"> <input checked="" type="checkbox"/> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="display: flex; flex-direction: column; align-items: center;"> <input type="checkbox"/> </div> <div style="display: flex; flex-direction: column; align-items: center;"> <input type="checkbox"/> </div> </div>		

## Test B question 1: Bones

Question	Mark	Requirements	Allowable answers	Additional guidance
1a 2/2e	1m	<p>Award <b>ONE</b> mark for:</p> <p><input type="checkbox"/> <input type="checkbox"/></p> <ul style="list-style-type: none"> <li>movement <input checked="" type="checkbox"/></li> </ul>		
1b 1/1a 2/5c	1m	<p>Award <b>ONE</b> mark for an indication that the bones are lighter:</p> <ul style="list-style-type: none"> <li>the bones are not as heavy;</li> <li>they do not need as much effort to lift them.</li> </ul>		<p><b>Do not</b> give credit for an insufficient response that gives information from the question/stem:</p> <ul style="list-style-type: none"> <li>it makes it easier for the birds to fly;</li> <li>it has a lot of air inside.</li> </ul> <p><b>Do not</b> give credit for an insufficient response where no comparison is implied:</p> <ul style="list-style-type: none"> <li>because they are light;</li> <li>they are not weighing them down.</li> </ul>
1c 2/2b	1m	<p>Award <b>ONE</b> mark for:</p> <p><input type="checkbox"/> <input type="checkbox"/></p> <ul style="list-style-type: none"> <li>a balanced diet <input checked="" type="checkbox"/></li> </ul>		

## Test B question 1: Bones (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
1d 2/2h,g	1m	<p>Award <b>ONE</b> mark for an indication that humans should exercise <b>or</b> not smoke:</p> <ul style="list-style-type: none"> <li>■ they should play football/go running (regularly);</li> <li>■ they should keep fit;</li> <li>■ they should not smoke/start smoking.</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>■ they should not drink too much caffeine/coffee/tea;</li> <li>■ they should take mineral(s) (supplements of calcium/phosphorus/sodium/potassium);</li> <li>■ they should have vitamin (D/C/K) tablets.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response which elaborates on the types of food which improve/reduce bone strength:</p> <ul style="list-style-type: none"> <li>■ they should drink/eat milk/cheese.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ eat different types of food;</li> <li>■ eat five portions of fruit and vegetables a day;</li> <li>■ eat healthy food;</li> <li>■ eat a balanced diet [given];</li> <li>■ do not drink alcohol [moderate amounts can improve bone strength];</li> <li>■ drink lots of water [too much fluoride can decrease bone strength];</li> <li>■ eat protein [can have a negative or positive effect on bone strength].</li> </ul>

## Test B question 2: In the kitchen




Question	Mark	Requirements	Allowable answers	Additional guidance																								
2a 3/1a	1m	<p>Award <b>ONE</b> mark for <b>both</b> rows of the table completed correctly:</p> <table border="1"> <thead> <tr> <th>Material/Object</th> <th>Flexible</th> <th>Hard</th> <th>Transparent</th> </tr> </thead> <tbody> <tr> <td>aluminium foil</td> <td>✓</td> <td>x</td> <td>x</td> </tr> <tr> <td>wax candle</td> <td>x</td> <td>x</td> <td>x</td> </tr> <tr> <td>wooden rolling pin</td> <td>x</td> <td>✓</td> <td>x</td> </tr> <tr> <td>plastic food wrap</td> <td>✓</td> <td>x</td> <td>✓</td> </tr> <tr> <td>glass</td> <td>x</td> <td>✓</td> <td>✓</td> </tr> </tbody> </table>	Material/Object	Flexible	Hard	Transparent	aluminium foil	✓	x	x	wax candle	x	x	x	wooden rolling pin	x	✓	x	plastic food wrap	✓	x	✓	glass	x	✓	✓	<p><b>ONE</b> mark may be awarded for describing a use of foil where the need for it to be flexible is implied:</p> <ul style="list-style-type: none"> <li>■ to cook a chicken in it;</li> <li>■ to put your sandwiches in;</li> <li>■ to seal take-away cartons;</li> <li>■ covering oven dishes.</li> </ul>	
Material/Object	Flexible	Hard	Transparent																									
aluminium foil	✓	x	x																									
wax candle	x	x	x																									
wooden rolling pin	x	✓	x																									
plastic food wrap	✓	x	✓																									
glass	x	✓	✓																									
2b 3/1a	1m	<p>Award <b>ONE</b> mark for describing a use of foil that requires it to be flexible:</p> <ul style="list-style-type: none"> <li>■ wrapping up food;</li> <li>■ to bend it around food.</li> </ul>		<p><b>Do not</b> give credit for an insufficient property that gives a use unrelated to being flexible:</p> <ul style="list-style-type: none"> <li>■ it does not burn in the oven.</li> </ul>																								
2c 3/2d,g	2m   1m	<p>Award <b>TWO</b> marks for <b>all three</b> correct boxes ticked:</p> <ul style="list-style-type: none"> <li>■ cooling water <input checked="" type="checkbox"/></li> <li>■ freezing water into ice <input type="checkbox"/></li> <li>■ dissolving salt in water <input checked="" type="checkbox"/></li> </ul> <p>or</p> <p>If you are unable to award two marks, award <b>ONE</b> mark for ticking <b>any two</b> of the correct boxes.</p>																										



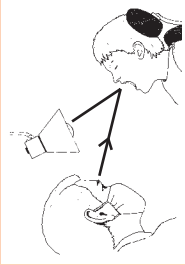
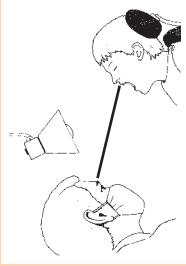
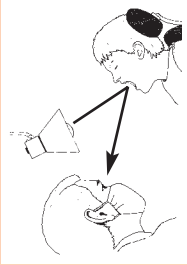
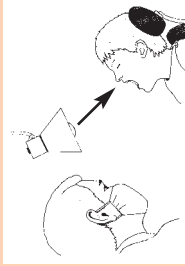
## Test B question 2: In the kitchen (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
<b>2d i</b> 3/2d	<b>1m</b>	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li>the water evaporates.</li> </ul>		
<b>2d ii</b> 1/1a 3/2d	<b>1m</b>	Award <b>ONE</b> mark for a response indicating that the water inside the pan evaporates: <ul style="list-style-type: none"> <li>the water evaporates;</li> <li>the water inside the pan turns to water vapour (when the water boils);</li> <li>it changes to a gas.</li> </ul>	<b>ONE</b> mark may be awarded for an observation implying the water evaporates: <ul style="list-style-type: none"> <li>the water turns to steam.</li> </ul>	<b>Do not</b> give credit for a response that includes incorrect science indicating the gas will disappear: <ul style="list-style-type: none"> <li>the water will turn to water vapour which disappears.</li> </ul> <b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>the water disappears;</li> <li>the water boils;</li> <li>the pan goes/boils dry;</li> <li>steam;</li> <li>it will turn into condensation;</li> <li>water vapour.</li> </ul>

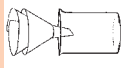
### Test B question 3: At the dentist

Question	Mark	Requirements	Allowable answers	Additional guidance
3a i 4/2e	1m	<p>Award <b>ONE</b> mark for an arrow pointing upwards anywhere on the picture:</p>  <p>■</p>	<p><b>ONE</b> mark may be awarded for any arrow pointing up that is within 45° of the vertical:</p>  <p>■</p>	<p><b>Do not</b> give credit for a response that includes incorrect science showing an arrow pointing down:</p>  <p>■</p> <p><b>Do not</b> give credit for an insufficient response where a line rather than an arrow is drawn.</p>
3a ii 2/2a	1m	<p>Award <b>ONE</b> mark for labelling the tooth as an incisor.</p>		
3b 2/2a	1m	<p>Award <b>ONE</b> mark for a response that identifies one way of preventing tooth decay:</p> <ul style="list-style-type: none"> <li>■ brush/clean teeth (regularly);</li> <li>■ use dental floss;</li> <li>■ use a mouth wash;</li> <li>■ chew sugar free gum;</li> <li>■ avoid fizzy drinks;</li> <li>■ do not eat lots of sugary/acidic foods;</li> <li>■ get a new toothbrush every couple of months;</li> <li>■ drink milk/eat calcium-rich foods.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ drink lots of water (containing fluoride);</li> <li>■ eat a balanced diet;</li> <li>■ do not smoke.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ visit the dentist regularly [given];</li> <li>■ eat healthy food [not specific to food that affects teeth];</li> <li>■ chew gum.</li> </ul>
3c 4/3b	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ <input type="checkbox"/> <input type="checkbox"/> glass <input checked="" type="checkbox"/> <input type="checkbox"/></li> </ul>		

**Test B question 3: At the dentist (continued)**

Question	Mark	Requirements	Allowable answers	Additional guidance
3d i 4/3c	1m	Award <b>ONE</b> mark for <b>two</b> lines (with or without correct arrowheads) showing the correct path of light. The lines must go from the lamp to Jon (between his nose and chin) and from Jon to the dentist (between his hairline and nose):		<p><b>Do not</b> give credit for an insufficient response where only one line is drawn:</p> 
3d ii 4/3a,d	1m	Award <b>ONE</b> mark for <b>two</b> arrowheads showing the direction of light travel from the lamp to Jon (between his nose and chin) and from Jon to the dentist (between his hairline and nose):		<p><b>Do not</b> give credit for an insufficient response where the direction of travel is shown only by one non-reflected arrow:</p> 

## Test B question 4: Adding water

Question	Mark	Requirements	Allowable answers	Additional guidance										
4a 3/2a, f 3/3b	1m	<p>Award <b>ONE</b> mark for correctly completing <b>all four</b> rows of the table:</p> <table border="1"> <thead> <tr> <th>Solid</th> <th>Beaker</th> </tr> </thead> <tbody> <tr> <td>soil</td> <td>B</td> </tr> <tr> <td>vitamin tablet</td> <td>D</td> </tr> <tr> <td>plastic beads</td> <td>A</td> </tr> <tr> <td>salt</td> <td>C</td> </tr> </tbody> </table>	Solid	Beaker	soil	B	vitamin tablet	D	plastic beads	A	salt	C		
Solid	Beaker													
soil	B													
vitamin tablet	D													
plastic beads	A													
salt	C													
4b 3/3b	1m	<p>Award <b>ONE</b> mark for a response indicating the solid dissolved:</p> <ul style="list-style-type: none"> <li>■ salt/it dissolved;</li> <li>■ it formed a solution.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response stating that the vitamin tablet dissolved if the pupil has identified that the vitamin tablet is in beaker C in part 4a.</p>	<p><b>Do not</b> give credit for an insufficient response that does not explain what happened to the solid:</p> <ul style="list-style-type: none"> <li>■ it disappeared.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ it mixed with the water.</li> </ul>										
4c 3/2f	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ Beaker D.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ vitamin tablet.</li> </ul>											
4d 1/2c	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/></li> </ul> 												

### Test B question 4: Adding water (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
4e 3/3d	1m	<p>Award <b>ONE</b> mark for an indication that Safara should evaporate the water:</p> <ul style="list-style-type: none"> <li>■ evaporate the water;</li> <li>■ by evaporation.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response explaining the beaker should be moved to a warmer place and/or left to dry:</p> <ul style="list-style-type: none"> <li>■ move the beaker on to a (sunny/warm) window sill;</li> <li>■ put the beaker on a radiator;</li> <li>■ by heating it.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response where it is ambiguous what is evaporating:</p> <ul style="list-style-type: none"> <li>■ evaporate the mixture;</li> <li>■ evaporate it [it refers to the salt].</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ filter the solution.</li> </ul>

## Test B question 5: Bean seeds

Question	Mark	Requirements	Allowable answers	Additional guidance
5a 1/2d	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>yes <input checked="" type="checkbox"/> <input type="checkbox"/></li> </ul> <p><b>AND</b></p> <p>an indication that the soil would have an effect on the investigation <b>or</b> that only one variable is changed in a fair test:</p> <ul style="list-style-type: none"> <li>the soil will make a difference/have an effect on the results;</li> <li>otherwise you could not compare (the growth of the plants);</li> <li>using different soils will make the conclusion wrong;</li> <li>you can only change the seeds/one thing in this investigation;</li> <li>all the bean seeds will be in the same conditions.</li> </ul>	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>yes <input checked="" type="checkbox"/> <input type="checkbox"/></li> </ul> <p><b>AND</b></p> <p>a description of a difference between two soils:</p> <ul style="list-style-type: none"> <li>chalk may be dry and clay wet;</li> <li>one soil may have more nutrients or moisture than others;</li> <li>one soil might be better than another;</li> <li>one might be richer/finer/rougher.</li> </ul> <p><b>ONE</b> mark may be awarded if neither box is ticked but the creditworthy explanation indicates that using the same type of soil helps to make the test fair.</p>	<p><b>Do not</b> give credit if the 'no' box is ticked.</p> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>yes <input checked="" type="checkbox"/> <input type="checkbox"/></li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>keep everything the same;</li> <li>if you had different soils it would be unfair;</li> <li>it may be a different type of soil.</li> </ul>
5b 1/2d	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> no <input checked="" type="checkbox"/></li> </ul> <p><b>AND</b></p> <p>an indication that the results will not be affected if the colour of the can is changed <b>or</b> that there are other control variables which have a greater effect:</p> <ul style="list-style-type: none"> <li>you only need to control factors that affect the test, (the colour does not);</li> <li>you will be able to compare the results for the different seeds even if you change the colour of the can;</li> <li>as long as she uses the same amount of water, the test will be fair;</li> <li>it does not matter about colour so long as the material is the same;</li> <li>the amount of water has a greater effect.</li> </ul>	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> no <input checked="" type="checkbox"/></li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>the colour makes no difference;</li> <li>it has no effect;</li> <li>the (amount/type of) water is the same;</li> <li>the colour will not change the test;</li> <li>the water makes a difference.</li> </ul> <p><b>ONE</b> mark may be awarded if neither box is ticked but the creditworthy explanation indicates that using the same colour watering can does <b>not</b> affect the fairness of the test.</p> <p><b>ONE</b> mark may be awarded if 'yes' is ticked <b>AND</b> there is an explicit explanation of how the watering can's colour may affect the temperature of any water stored.</p>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> no <input checked="" type="checkbox"/></li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>the size/shape of the watering can affects the plants [size/shape does not affect the amount of water you give it];</li> <li>it would not be fair if she uses the same coloured watering can [restates information given via the tick box].</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>yes <input checked="" type="checkbox"/> <input type="checkbox"/></li> </ul> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>you should only change one variable/ factor in a fair test.</li> </ul>

## Test B question 5: Bean seeds (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance																				
5c 1/2d	2m  or  1m	<p>Award <b>TWO</b> marks for <b>all four</b> factors correctly classified:</p> <table border="1"> <thead> <tr> <th>Factor</th> <th>Factor to be changed</th> <th>Factor to be kept the same</th> <th>Result to be measured</th> </tr> </thead> <tbody> <tr> <td>the type of bean seed</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>the time taken for the seed to germinate</td> <td></td> <td></td> <td>✓</td> </tr> <tr> <td>the place where the seeds are left</td> <td></td> <td>✓</td> <td></td> </tr> <tr> <td>the type of pot the seed is grown in</td> <td></td> <td>✓</td> <td></td> </tr> </tbody> </table> <p>If you are unable to award two marks, award <b>ONE</b> mark for <b>any three</b> factors correctly classified.</p>	Factor	Factor to be changed	Factor to be kept the same	Result to be measured	the type of bean seed	✓			the time taken for the seed to germinate			✓	the place where the seeds are left		✓		the type of pot the seed is grown in		✓			
Factor	Factor to be changed	Factor to be kept the same	Result to be measured																					
the type of bean seed	✓																							
the time taken for the seed to germinate			✓																					
the place where the seeds are left		✓																						
the type of pot the seed is grown in		✓																						
5d 1/2g	1m	<p>Award <b>ONE</b> mark for an indication that reliability is increased:</p> <ul style="list-style-type: none"> <li>to make results more reliable;</li> <li>some seeds may not germinate/grow;</li> <li>to help ensure she gets a result;</li> <li>there is more chance of germination;</li> <li>she will have more evidence/results;</li> <li>to check/confirm results;</li> <li>to get an average.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response which suggests that the same type of bean should grow similarly:</p> <ul style="list-style-type: none"> <li>to see if the same type of seed always germinates more quickly;</li> <li>to see if they germinate at the same rate;</li> <li>she can compare her results/them.</li> </ul> <p><b>ONE</b> mark may be awarded for a response which refers to accuracy:</p> <ul style="list-style-type: none"> <li>to be more accurate.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>to get the correct/right results/answer [implies that there is a predetermined correct answer];</li> <li>so she can see which is best;</li> <li>to see which (type of seed) germinates quickest [focuses on comparing different types of beans rather than beans of the same type];</li> <li>so you have lots of plants to check;</li> <li>so the test was fair/right/correct.</li> </ul>																				

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## Test B question 6: Tuning fork

Question	Mark	Requirements	Allowable answers	Additional guidance												
6a 4/3e	1m	Award <b>ONE</b> mark for identifying vibrations: <ul style="list-style-type: none"> <li>they vibrate;</li> <li>vibrations.</li> </ul>	<b>ONE</b> mark may be awarded for an appropriate description of vibrations: <ul style="list-style-type: none"> <li>it moves up and down quickly.</li> </ul>	<b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>they move up and down;</li> <li>they wobble/shake;</li> <li>they are hit [given].</li> </ul>												
6b 4/3f	1m	Award <b>ONE</b> mark for identifying that the sound made by the tuning fork will become louder/last longer: <ul style="list-style-type: none"> <li>it will produce a louder sound;</li> <li>it will go on for longer.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>the volume is higher;</li> <li>it made a loud/long sound.</li> </ul>	<b>Do not</b> give credit for a response that includes incorrect science referring to pitch: <ul style="list-style-type: none"> <li>it/the pitch is higher;</li> <li>it produces a higher sound.</li> </ul> <p><b>Do not</b> give credit for an insufficient response for which the meaning is ambiguous:  <ul style="list-style-type: none"> <li>the sound gets harder;</li> <li>it will vibrate more.</li> </ul> </p>												
6c 4/3g	1m	Award <b>ONE</b> mark for ticking the <b>two</b> correct boxes as shown: <table border="1" data-bbox="1010 1240 1142 1727"> <thead> <tr> <th>What does the sound travel through when...</th> <th>desk</th> <th>air</th> <th>both</th> </tr> </thead> <tbody> <tr> <td>...the tuning fork is <b>not</b> touching the desk?</td> <td></td> <td>✓</td> <td></td> </tr> <tr> <td>...the tuning fork is touching the desk?</td> <td></td> <td></td> <td>✓</td> </tr> </tbody> </table>	What does the sound travel through when...	desk	air	both	...the tuning fork is <b>not</b> touching the desk?		✓		...the tuning fork is touching the desk?			✓	<b>ONE</b> mark may be awarded if both 'desk' and 'air' boxes (with or without the 'both' box) are ticked in the bottom row of the table.	
What does the sound travel through when...	desk	air	both													
...the tuning fork is <b>not</b> touching the desk?		✓														
...the tuning fork is touching the desk?			✓													

## Test B question 7: Brine shrimps and flamingoes

Question	Mark	Requirements	Allowable answers	Additional guidance
7a 2/5c	1m	<p>Award <b>ONE</b> mark for an indication that the neck is long and/or flexible:</p> <ul style="list-style-type: none"> <li>it is (long and) bendy;</li> <li>it is flexible;</li> <li>it is long;</li> <li>it can reach out (to find food).</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>the length (of the neck);</li> <li>(it bends) to allow the beak to get in the correct position to feed;</li> <li>it can stretch;</li> <li>it is curly/bent.</li> </ul> <p><b>ONE</b> mark may be awarded for a response that indicates that food passes from the mouth to the stomach, via the neck.</p>	<p><b>Do not</b> give credit for an insufficient response which does not describe a property of the neck:</p> <ul style="list-style-type: none"> <li>they do not have to bend over;</li> <li>it is easier to feed;</li> <li>they can put their head in the water.</li> </ul>
7b 2/5d,e	1m	<p>Award <b>ONE</b> mark for <b>all three</b> organisms in the correct order:</p> <pre> graph LR     A[algae] --&gt; B[brine shrimp]     B --&gt; C[flamingo]             </pre>	<p><b>ONE</b> mark may be awarded for a food chain in which 'green plants' replace 'algae'.</p>	<p><b>Do not</b> give credit for an insufficient response naming 'bird' in place of 'flamingo'.</p> <p><b>Do not</b> give credit for an insufficient response naming an organism from a different habitat.</p>

## Test B question 7: Brine shrimps and flamingoes (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
7c 1/1a 2/1a 2/5c	1m	<p>Award <b>ONE</b> mark for an understanding of the role of the eggs in the life cycle of the brine shrimp <b>or</b> a response relating to the survival of the population, rather than of the individual:</p> <ul style="list-style-type: none"> <li>■ (if the eggs do not die), they can still hatch (when the lake fills with water);</li> <li>■ (new) brine shrimps can still develop from the eggs (when the lake fills up);</li> <li>■ it might prevent the species dying out/becoming extinct;</li> <li>■ the brine shrimp population/species will survive;</li> <li>■ if the eggs die, there will not be any brine shrimps (to reproduce).</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ it will not die out ['die out' implies extinction of the population];</li> <li>■ to carry on the life cycle;</li> <li>■ more brine shrimps will grow (if the water dries up);</li> <li>■ more brine shrimps will be produced/ can be born;</li> <li>■ they can reproduce.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response implying the adult brine shrimp, rather than the population, continues to live or reproduce:</p> <ul style="list-style-type: none"> <li>■ it helps the brine shrimps to live longer;</li> <li>■ it can stay alive and live for a long time.</li> </ul> <p><b>Do not</b> give credit for an insufficient response which describes, without qualification, what happens if the eggs do die:</p> <ul style="list-style-type: none"> <li>■ the brine shrimp will become extinct.</li> </ul> <p><b>Do not</b> give credit for an insufficient response that repeats given information without further explanation:</p> <ul style="list-style-type: none"> <li>■ the adult dies but the eggs do not;</li> <li>■ because the shrimp eggs can live in dried up water/on land;</li> <li>■ because the lake will fill up again;</li> <li>■ brine shrimp eggs do not dry up.</li> </ul>

## Test B question 8: Keeping drinks hot

### Draft box

Markers should read the answers to all parts before marking this question.

The draft box can be consulted when marking parts 8a, 8b and 8c, 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–8c must form a coherent investigation.

Question	Mark	Requirements	Allowable answers	Additional guidance
8a 1/2d	1m	Award <b>ONE</b> mark for any acceptable factor that describes the independent variable (IV): <ul style="list-style-type: none"> <li>the type of material;</li> <li>number of layers of material;</li> <li>the insulators.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>type of cup.</li> </ul>	
8b 1/2d	1m	Award <b>ONE</b> mark for any acceptable control variable: <ul style="list-style-type: none"> <li>volume/amount of liquid;</li> <li>shape of container;</li> <li>the place where the cups are put;</li> <li>starting temperature;</li> <li>same type of drink;</li> <li>the time the drinks are left.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>the cups;</li> <li>drink;</li> <li>how hot or cold the room is.</li> </ul>	<b>Do not</b> give credit for a control variable that is inconsistent with, or repeats, the IV or DV offered in parts 8a and 8c respectively.  If neither an IV nor a DV are offered, the control variable may gain credit, provided it is consistent with the context of the investigation presented in the introduction. If <b>both</b> the IV <b>and</b> DV are insufficient or incorrect, the control variable cannot gain credit.

## Test B question 8: Keeping drinks hot (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
8c 1/2d	1m	<p>Award <b>ONE</b> mark for any acceptable dependent variable (DV) identified, eg:</p> <ul style="list-style-type: none"> <li>■ time to reach a particular temperature;</li> <li>■ time taken for this drink to cool;</li> <li>■ time the drink stays warm;</li> <li>■ which drink stayed hotter for longest;</li> <li>■ rate of cooling/temperature change over time;</li> <li>■ temperature decrease in a given time;</li> <li>■ temperature (of the drink);</li> <li>■ how hot or cold it is.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ heat (of the drink).</li> </ul> <p><b>ONE</b> mark may be awarded for naming the appropriate equipment needed to measure the DV:</p> <ul style="list-style-type: none"> <li>■ thermometer;</li> <li>■ timer.</li> </ul>	
8d 1/2c	1m	<p>Award <b>ONE</b> mark for any acceptable new IV:</p> <ul style="list-style-type: none"> <li>■ the material the cup is made of;</li> <li>■ cups with and without lids;</li> <li>■ the amount/type of drink or liquid;</li> <li>■ the number of cups into which a drink is placed;</li> <li>■ the place where the drink is left;</li> <li>■ the thickness of the material/cup.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ number of layers of materials;</li> <li>■ with and without a thermos flask;</li> <li>■ the temperature of liquid;</li> <li>■ heat (of the drink).</li> </ul>	<p><b>Do not</b> give credit for an insufficient response naming the IV given in part 8a:</p> <ul style="list-style-type: none"> <li>■ insulators;</li> <li>■ material.</li> </ul>

## Test B question 9: Making bread

Question	Mark	Requirements	Allowable answers	Additional guidance																																														
9a 1/2f	1m	<p>Award <b>ONE</b> mark for an indication that the yeast makes the dough/bread rise:</p> <ul style="list-style-type: none"> <li>■ it causes the dough/bread to rise;</li> <li>■ without the yeast, the bread stays flat.</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>■ it produces carbon dioxide.</li> </ul>	<p><b>ONE</b> mark may be awarded for indication that the bread increases in volume or that gas is produced:</p> <ul style="list-style-type: none"> <li>■ it makes the bread grow/bigger;</li> <li>■ the bread has more/bigger holes;</li> <li>■ it rises;</li> <li>■ it makes gas.</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science:</p> <ul style="list-style-type: none"> <li>■ it makes air/oxygen;</li> <li>■ the bread becomes harder.</li> </ul> <p><b>Do not</b> give credit for a response that includes incorrect science describing an increase in the mass/weight of the bread:</p> <ul style="list-style-type: none"> <li>■ it makes the bread heavier.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ it affects the taste of the bread;</li> <li>■ it changes the height of the bread [does not necessarily imply an increase].</li> </ul>																																														
9b 1/2d	1m	<p>Award <b>ONE</b> mark for <b>all</b> ticks in the right place according to <b>either</b> set of answers:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><b>Mixture 1</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 50%;">flour</td><td style="width: 50%; text-align: center;"><input checked="" type="checkbox"/></td></tr> <tr><td>yeast</td><td style="text-align: center;"><input checked="" type="checkbox"/></td></tr> <tr><td>sugar</td><td style="text-align: center;"><input checked="" type="checkbox"/></td></tr> <tr><td>warm water</td><td style="text-align: center;"><input checked="" type="checkbox"/></td></tr> <tr><td>cold water</td><td style="text-align: center;"><input type="checkbox"/></td></tr> </table> </td> <td style="width: 50%; vertical-align: top;"> <p><b>Mixture 2</b></p> <table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 50%;">flour</td><td style="width: 50%; 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**Test B question 9: Making bread (continued)**

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>9c</b> 2/5f</p>	<p><b>2m</b></p> <p><b>or</b></p> <p><b>1m</b></p>	<p>Award <b>TWO</b> marks for <b>all four</b> statements correctly classified:</p> <p><i>Micro-organisms... are very small.</i>                    <b>True</b>.....</p> <p><i>cannot reproduce.</i>                <b>False</b>.....</p> <p><i>need nutrients.</i>                    <b>True</b>.....</p> <p><i>can grow.</i>                            <b>True</b>.....</p> <p>If you are unable to award two marks, award <b>ONE</b> mark for <b>any two</b> or <b>three</b> statements correctly classified.</p>		

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