

Sc

KEY STAGE  
**2**

LEVELS  
**3-5**

# 2008

Science tests

## Mark schemes

Tests A and B, levels 3-5



National curriculum assessments

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# Marking the science tests

As in 2007, 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 NAA website ([www.naa.org.uk/tests](http://www.naa.org.uk/tests)) on 23 June 2008.

## 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 requires the **relationship between two continuous variables** to be described, 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*.

Where **one** mark is available for a question which requires the **relationship between two continuous variables** to be described, the following will apply:

- *one* mark 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*.

### *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.

### What if...?

The pupil gives two or more responses to a particular question part.

- a) If a pupil qualifies a scientifically correct answer with a scientifically incorrect statement, no mark will be awarded for that question part.
- 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.

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.

- 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.
- 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.
- 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.

### 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.

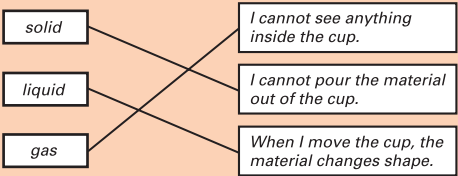
The number of marks gained on each double page will be written in the box at the bottom of the right-hand page. The total number of marks gained on each paper will be recorded on the front of the test paper.

Each paper has the following number of marks available:

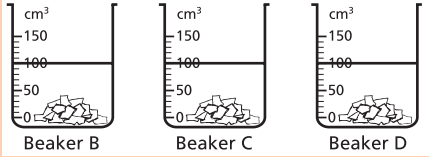
- Test A has 40
- Test B has 40.

The 2008 key stage 2 science tests and mark schemes were developed by the National Foundation for Educational Research (NFER) on behalf of QCA.

### Test A question 1: Solids, liquids and gases

Question	Mark	Requirements	Allowable answers	Additional guidance								
1a 3/1e	1m	<p>Award <b>ONE</b> mark for correctly matching <b>all three</b> descriptions:</p> 										
1b 3/1e	1m	<p>Award <b>ONE</b> mark for <b>both</b> rows of the table correctly completed:</p> <table border="1" data-bbox="495 679 949 892"> <tr> <td></td> <td>Do they spread out to <b>completely fill up</b> any container?</td> </tr> <tr> <td>Gases</td> <td>yes [given]</td> </tr> <tr> <td>Liquids</td> <td>no</td> </tr> <tr> <td>Solids</td> <td>no</td> </tr> </table>		Do they spread out to <b>completely fill up</b> any container?	Gases	yes [given]	Liquids	no	Solids	no		
	Do they spread out to <b>completely fill up</b> any container?											
Gases	yes [given]											
Liquids	no											
Solids	no											

## Test A question 2: Teeth

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>2a</b></p> <p>1/2d</p>	<b>1m</b>	<p>Award <b>ONE</b> mark for a clear indication that the amount of liquid in <b>all three</b> beakers should be 100 cm<sup>3</sup>:</p>  <p>Beaker B      Beaker C      Beaker D</p>	<p><b>ONE</b> mark may be awarded if the level has not been drawn on (as given in beaker A), but a definite mark (such as a cross) indicates the correct amount of 100 cm<sup>3</sup> in each beaker.</p>	<p><b>Do not</b> give credit for an insufficient response where the level has only been indicated on <b>one</b> or <b>two</b> of the beakers.</p>
<p><b>2b</b></p> <p>2/2a</p>	<b>1m</b>	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ lemonade <input checked="" type="checkbox"/> <input type="checkbox"/></li> <li><input type="checkbox"/> <input type="checkbox"/></li> </ul>		
<p><b>2c</b></p> <p>2/2a</p>	<p><b>2m</b></p> <p><b>or</b></p> <p><b>1m</b></p>	<p>Award <b>TWO</b> marks for giving <b>any two</b> methods of preventing tooth decay:</p> <ul style="list-style-type: none"> <li>■ do not eat/drink so much sugar/sugary food</li> <li>■ drink milk/eat calcium-rich foods</li> <li>■ brush teeth (regularly/every day/after meals)</li> <li>■ floss (teeth)</li> <li>■ visit the dentist (regularly)</li> <li>■ (chew) sugar-free gum</li> <li>■ (use a) mouthwash (regularly).</li> </ul> <p>❖ <b>Give credit</b> for a correct response that goes beyond the key stage 2 programme of study suggesting that not drinking/eating acidic drinks/food would decrease tooth decay:</p> <ul style="list-style-type: none"> <li>■ not drinking/eating acidic food.</li> </ul> <p>If you are unable to award two marks, award <b>ONE</b> mark for <b>one</b> method of preventing tooth decay.</p>	<p>Marks may be awarded for:</p> <ul style="list-style-type: none"> <li>■ toothpaste</li> <li>■ drink (lots of) water (containing fluoride)</li> <li>■ eat a balanced diet</li> <li>■ by not smoking.</li> </ul>	<p><b>Do not</b> give credit for a second response that is a repetition or restatement of the first:</p> <ul style="list-style-type: none"> <li>■ eat a balanced diet</li> <li>do not eat too much sugar.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ eat fruit and vegetables</li> <li>■ eat healthy foods</li> <li>■ drink less fizzy drinks/coke/lemonade [given].</li> </ul> <p><b>Do not</b> give credit for an insufficient response which does not help to prevent tooth decay:</p> <ul style="list-style-type: none"> <li>■ wear a gumshield.</li> </ul>

## Test A question 2: Teeth (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>2d i</b></p> <p>2/2a</p>	<b>1m</b>	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ rip/tear/hold/grip/grab/stab/pierce (its prey/meat/food)</li> <li>■ kill its prey.</li> </ul>		<p><b>Do not</b> give credit for a response that includes incorrect science describing the function of other types of teeth than canines:</p> <ul style="list-style-type: none"> <li>■ crush/grind/chew</li> <li>■ chop/slice/shred.</li> </ul> <p><b>Do not</b> give credit for an insufficient response giving a general function of all teeth:</p> <ul style="list-style-type: none"> <li>■ cut/bite.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ digging into the meat</li> <li>■ catching the prey [not specific to the role of teeth].</li> </ul> <p><b>Do not</b> give credit for an insufficient response which only describes the teeth:</p> <ul style="list-style-type: none"> <li>■ they are sharp.</li> </ul>
<p><b>2d ii</b></p> <p>2/2a</p>	<b>1m</b>	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ grind/chomp/crush/crunch/chew (grass/its food).</li> </ul>		<p><b>Do not</b> give credit for a response that includes incorrect science describing the function of other types of teeth than molars:</p> <ul style="list-style-type: none"> <li>■ rip/tear/hold/grip</li> <li>■ chop/slice/shred.</li> </ul> <p><b>Do not</b> give credit for an insufficient response giving a general function of all teeth:</p> <ul style="list-style-type: none"> <li>■ cut/bite.</li> </ul> <p><b>Do not</b> give credit for an insufficient response which only describes the teeth:</p> <ul style="list-style-type: none"> <li>■ they are flat.</li> </ul>

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### Test A question 3: *String instruments*

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>3a</b></p> <p>4/3g</p>	<b>1m</b>	<p>Award <b>ONE</b> mark for an understanding that the sound travels through the air:</p> <ul style="list-style-type: none"> <li>■ sound/vibrations travel(s) through the air</li> <li>■ (it travels through) air.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response indicating the sound travels through a gas or the atmosphere.</p> <p><b>ONE</b> mark may be awarded for an indication of other materials the sound may travel through:</p> <ul style="list-style-type: none"> <li>■ the floor</li> <li>■ the stick</li> <li>■ the tub.</li> </ul>	<p><b>Do not</b> give credit for a response that includes <i>incorrect science</i>:</p> <ul style="list-style-type: none"> <li>■ <i>airwaves.</i></li> </ul> <p><b>Do not</b> give credit for an <i>insufficient response</i>:</p> <ul style="list-style-type: none"> <li>■ <i>vibrations</i></li> <li>■ <i>waves</i> [the sound travels in the form of vibrations or waves, not <b>through</b> vibrations or waves]</li> <li>■ <i>the string.</i></li> </ul>
<p><b>3b</b></p> <p>4/3f</p>	<b>1m</b>	<p>Award <b>ONE</b> mark for an indication that more force is applied:</p> <ul style="list-style-type: none"> <li>■ he plucked the string harder</li> <li>■ he used more force</li> <li>■ he pulled it back further.</li> </ul>	<p><b>ONE</b> mark may be awarded for an absolute response:</p> <ul style="list-style-type: none"> <li>■ he plucked it hard.</li> </ul>	<p><b>Do not</b> give credit for a response that includes <i>incorrect science confusing volume with pitch</i>:</p> <ul style="list-style-type: none"> <li>■ <i>he pulled it/stretched it tighter</i></li> <li>■ <i>he made the string shorter.</i></li> </ul> <p><b>Do not</b> give credit for an <i>insufficient response</i>:</p> <ul style="list-style-type: none"> <li>■ <i>he plucked it more [ambiguous, could refer to the number of times the string was plucked]</i></li> <li>■ <i>he plucked it with force.</i></li> </ul>
<p><b>3c</b></p> <p>4/3e</p>	<b>1m</b>	<p>Award <b>ONE</b> mark for an indication that the string is vibrating:</p> <ul style="list-style-type: none"> <li>■ it vibrates.</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>■ she can see it moving back and forth quickly.</li> </ul>	<p><b>Do not</b> give credit for an <i>insufficient response</i>:</p> <ul style="list-style-type: none"> <li>■ <i>the string moves</i></li> <li>■ <i>it twangs/wobbles</i></li> <li>■ <i>the string shakes.</i></li> </ul>
<p><b>3d</b></p> <p>4/3f</p>	<b>1m</b>	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ the note is higher. <input type="checkbox"/></li> <li><input checked="" type="checkbox"/></li> <li><input type="checkbox"/></li> <li><input type="checkbox"/></li> </ul>		

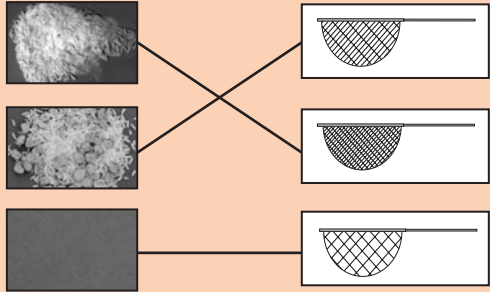
### Test A question 4: Fish tank

Question	Mark	Requirements	Allowable answers	Additional guidance
4a 2/3a	1m	Award <b>ONE</b> mark for:  <div style="display: flex; justify-content: space-around;"> <input type="checkbox"/> <input type="checkbox"/> </div> <ul style="list-style-type: none"> <li>■ grow more quickly. <input checked="" type="checkbox"/> <input type="checkbox"/></li> </ul>		
4b 2/5d	1m	Award <b>ONE</b> mark for <b>all three</b> organisms in the correct order: <ul style="list-style-type: none"> <li>■ algae → (water) snails → (Clown Loach) fish.</li> </ul>	<b>ONE</b> mark may be awarded if (green) plant is used in place of algae in an otherwise correct food chain: <ul style="list-style-type: none"> <li>■ (green) plant → snail(s) → fish.</li> </ul>	<b>Do not</b> give credit for an alternative food chain for the Clown Loach fish.
4c 4/2a	1m	Award <b>ONE</b> mark for an indication that there are forces of attraction between the magnets <b>or</b> that the magnets have opposite poles facing each other: <ul style="list-style-type: none"> <li>■ the magnets are attracted to each other</li> <li>■ because opposite poles attract</li> <li>■ the North pole of one magnet is facing the South pole of the other magnet.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>■ the magnets stick/stay together</li> <li>■ magnet B pulls magnet A with it.</li> </ul> <b>ONE</b> mark may be awarded for a response indicating the magnetic force extends through the glass/tank: <ul style="list-style-type: none"> <li>■ the force works through the tank.</li> </ul>	<b>Do not</b> give credit for an insufficient response that does not make explicit that the magnets attract: <ul style="list-style-type: none"> <li>■ there is a force between the magnets</li> <li>■ it moves because they are magnetic</li> <li>■ they connect together.</li> </ul> <b>Do not</b> give credit for an insufficient response implying each magnet is a different pole: <ul style="list-style-type: none"> <li>■ they are opposite poles</li> <li>■ magnet B is South and magnet A is North.</li> </ul>

### Test A question 4: Fish tank (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>4d</b></p> <p>1/2e 3/2c</p>	<b>1m</b>	<p>Award <b>ONE</b> mark for:</p> <p>■ <input type="checkbox"/> no <input checked="" type="checkbox"/></p> <p><b>AND</b> a response that indicates the temperature is higher than it should be:</p> <ul style="list-style-type: none"> <li>■ the water is too hot</li> <li>■ the water needs to be cooler</li> <li>■ the water is 10°C higher than it should be</li> <li>■ it is meant to be 25°C but it is at 35°C.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <p>■ <input type="checkbox"/> no <input checked="" type="checkbox"/></p> <p><b>AND</b></p> <ul style="list-style-type: none"> <li>■ the tank is too hot/warm</li> <li>■ there is 10 degrees difference between how the water is and what it needs to be for the fish to be healthy</li> <li>■ the water/tank is not at 25°C)</li> <li>■ the water is at the wrong temperature</li> <li>■ the water is at 35°C.</li> </ul> <p><b>ONE</b> mark may be awarded for:</p> <p>■ <input type="checkbox"/> no <input checked="" type="checkbox"/></p> <p><b>AND</b> a response where the thermometer has been misread (providing it is above 25°C) or the temperature difference is incorrect but a higher reading is indicated:</p> <ul style="list-style-type: none"> <li>■ the thermometer says the water is 36°C which is too high</li> <li>■ the temperature of the water is 8°C higher than it should be</li> <li>■ the water is at 36°C.</li> </ul> <p><b>ONE</b> mark may be awarded if neither box is ticked but the creditworthy explanation indicates that the pupil believes the water is too hot for the fish to be healthy.</p>	<p><b>Do not</b> give credit for a response where the 'yes' box has been ticked.</p> <p><b>Do not</b> give credit for a response that includes incorrect science implying that the water temperature needs to be hotter or that the current temperature is too low:</p> <ul style="list-style-type: none"> <li>■ the water temperature should be higher.</li> </ul> <p><b>Do not</b> give credit for an insufficient response where the 'no' box has been ticked but the explanation does not give a clear indication that the water temperature is incorrect:</p> <ul style="list-style-type: none"> <li>■ because it will not keep the fish healthy</li> <li>■ the higher the temperature, the more unhealthy the fish.</li> </ul> <p><b>Do not</b> give credit for an insufficient response where the 'no' box has been ticked but is followed by information given in the question:</p> <ul style="list-style-type: none"> <li>■ 25°C keeps the fish healthy</li> <li>■ it needs to be at 25°C for the fish to be healthy.</li> </ul> <p><b>Do not</b> give credit for an insufficient response where <b>neither</b> box has been ticked and the explanation does not make it clear that the fish will not be healthy at this temperature:</p> <ul style="list-style-type: none"> <li>■ the water is at 35°C.</li> </ul>

## Test A question 5: Sieves

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>5a</b></p> <p>3/3a</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for correctly matching <b>all three</b> mixtures to the sieves that will separate them:</p> 		
<p><b>5b</b></p> <p>3/3a</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for a response explaining the grains of salt and sugar are similar in size:</p> <ul style="list-style-type: none"> <li>■ the bits of sugar and salt are the same size</li> <li>■ for a sieve to work, the solids must be different sizes.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ they are (both) small (and fit through the sieves)</li> <li>■ they are (both) fine</li> <li>■ the holes (of the sieve) are too big.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ they would need an extremely small-holed sieve.</li> </ul> <p><b>Do not</b> give credit for an insufficient response that does not fully identify the property needed to separate the sugar and salt:</p> <ul style="list-style-type: none"> <li>■ size</li> <li>■ the sugar and salt will both go through [given]</li> <li>■ they are the same [does not necessarily refer to size]</li> <li>■ it is too small [ambiguous as to what 'it' refers to].</li> </ul>

### Test A question 5: Sieves (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
5c i 3/3b	1m	Award <b>ONE</b> mark for a response explaining the salt dissolves in the water: <ul style="list-style-type: none"> <li>the salt will form a solution</li> <li>the salt will dissolve.</li> </ul>		<b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>the salt disappears.</li> </ul>
5c 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/it.</li> </ul> <b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>leave it (out).</li> </ul>
5d 3/3c	1m	Award <b>ONE</b> mark for identifying filtration as a better method for separating soil and water: <ul style="list-style-type: none"> <li>he 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>use a finer sieve</li> <li>put paper in the sieve.</li> </ul> <b>ONE</b> mark may be awarded for a response which implies action to evaporate the water quickly: <ul style="list-style-type: none"> <li>boil/heat the mixture</li> <li>evaporate the water.</li> </ul>	<b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>use a funnel [both could go through a funnel]</li> <li>decant it [soil is floating on top]</li> <li>use a small(er) sieve.</li> </ul> <b>Do not</b> give credit for an insufficient response implying the water should be evaporated slowly: <ul style="list-style-type: none"> <li>leave it (to dry in sunlight)</li> <li>put it on a shelf and wait.</li> </ul>

## Test A question 6: Bananas

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>6a</b></p> <p>1/2d</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 three</b> statements correctly classified:</p> <p><i>To make the test fair...</i></p> <p><i>both bananas must be unripe.</i> <b>True</b></p> <p><i>an apple must be put in both bags.</i> <b>False</b></p> <p><i>the bags must be left in the same place.</i> <b>True</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>		
<p><b>6b</b></p> <p>BoS 2a</p> <p>1/2c</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for:</p> <p><input type="checkbox"/> <input type="checkbox"/></p> <p>■ observations <input checked="" type="checkbox"/> <input type="checkbox"/></p>		
<p><b>6c</b></p> <p>1/2j</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for:</p> <p>■ yes <input checked="" type="checkbox"/> <input type="checkbox"/></p> <p><b>AND</b></p> <p>a response comparing the bananas in bags A and B:</p> <ul style="list-style-type: none"> <li>■ the banana by itself was not as ripe</li> <li>■ the banana in bag B went yellow</li> <li>■ in bag A the banana is still green.</li> </ul>	<p><b>ONE</b> mark may be awarded if neither box is ticked but the creditworthy explanation, referring to the results of the investigation, unambiguously indicates that the pupil believes the apple helped the banana ripen more quickly.</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 that does not clarify which banana they are referring to:</p> <ul style="list-style-type: none"> <li>■ the banana went yellow</li> <li>■ after 7 days the banana is green.</li> </ul> <p><b>Do not</b> give credit for an insufficient response that repeats/restates information already given without referring to the results:</p> <ul style="list-style-type: none"> <li>■ apples make bananas ripen more quickly.</li> </ul>



### Test A question 6: *Bananas (continued)*

Question	Mark	Requirements	Allowable answers	Additional guidance
6d 1/2a	1m	<p>Award <b>ONE</b> mark for identifying both the independent variable (IV: different fruit) and the dependent variable (DV: effect on/speed of ripening):</p> <ul style="list-style-type: none"> <li>do other fruits help the banana ripen faster (than leaving it by itself)?</li> <li>do different fruits have a different effect on ripening bananas?</li> <li>do different fruits make it ripen faster like apples do?</li> </ul>	<p><b>ONE</b> mark may be awarded for a response in which the DV is not fully defined:</p> <ul style="list-style-type: none"> <li>what effect do different fruit have on bananas?</li> <li>will different fruits make them/bananas yellow?</li> </ul> <p><b>ONE</b> mark may be awarded for a conclusion which includes both the IV and the DV:</p> <ul style="list-style-type: none"> <li>other fruits help bananas to ripen.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response opening the investigation from bananas to other fruits ripening in general:</p> <ul style="list-style-type: none"> <li>what fruits make other fruits ripen?</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>does it work with different fruit?</li> </ul>
6e 1/2m	1m	<p>Award <b>ONE</b> mark for a response that recognises the banana by itself was green in Test 1 (compared with yellow in Test 2): <i>In Test 1...</i></p> <ul style="list-style-type: none"> <li>the banana by itself did not ripen (but it did in Test 2)</li> <li>the banana by itself stayed green</li> <li>the banana in bag A is not ripe.</li> </ul>		<p><b>Do not</b> give credit for an insufficient response indicating that the results for all the fruit in Test 2 were the same [this does not identify which bananas/bags have conflicting results]: <i>In Test 1...</i></p> <ul style="list-style-type: none"> <li>they were different but in Test 2 they all went yellow.</li> </ul> <p><b>Do not</b> give credit for an insufficient response which does not select the appropriate evidence from Test 1: <i>In Test 1...</i></p> <ul style="list-style-type: none"> <li>the banana in bag A is green and the banana in bag B is yellow (the apple has not changed).</li> </ul> <p><b>Do not</b> give credit for an insufficient response: <i>In Test 1...</i></p> <ul style="list-style-type: none"> <li>the results were different (and need checking)</li> <li>the banana in bag B is yellow.</li> </ul>

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### Test A question 7: Floating on salty water

Question	Mark	Requirements	Allowable answers	Additional guidance
7a i 4/2b	1m	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 [given].</li> </ul>
7a ii 4/2d	1m	Award <b>ONE</b> mark for an indication of the upward push of the water: <ul style="list-style-type: none"> <li>upthrust</li> <li>upward push of the water/solution/liquid</li> <li>a force up from the water.</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>buoyancy.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>a force up</li> <li>an upward push/force.</li> </ul>	<b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>a force [given]</li> <li>(amount of) salt</li> <li>a force from the water [no direction indicated]</li> <li>water resistance.</li> </ul>
7b 1/2i	1m	Award <b>ONE</b> mark for an estimation greater than 34 cm <sup>3</sup> but less than 39 cm <sup>3</sup> .		
7c 1/1a	1m	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li><input type="checkbox"/> salt <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></li> </ul>		
7d 4/2d 1/2j	1m	Award <b>ONE</b> mark for <b>both</b> correct words circled: <p>The greater the  force on</p> <p>the clay ball, the  it floats.</p>		<b>Do not</b> give credit for a response that includes incorrect science: <ul style="list-style-type: none"> <li>The greater the <b>downwards</b> force on the clay ball, the <b>lower</b> it floats [the downward force of weight does not change because the amount of clay is constant].</li> </ul>

### Test A question 8: *Sleeping babies*

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>8a</b></p> <p>1/2c</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for an appropriate measure of quality/quantity of sleep:</p> <ul style="list-style-type: none"> <li>■ how long the babies sleep for</li> <li>■ how often the babies wake up</li> <li>■ how often the babies cry (at night)</li> <li>■ if the babies sleep longer at night than in the day</li> <li>■ how long it takes for them to go to sleep.</li> </ul>	<p><b>ONE</b> mark may be awarded for an observation:</p> <ul style="list-style-type: none"> <li>■ see if they wake up/start to cry</li> <li>■ observe how deeply they are breathing</li> <li>■ their heart rate</li> <li>■ how much they move.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ <i>time</i></li> <li>■ <i>watch the baby sleep</i></li> <li>■ <i>ask the parents.</i></li> </ul>
<p><b>8b</b></p> <p>1/2c</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 three</b> statements correctly classified:</p> <p style="text-align: right;"><i>Would the baby spend more time in daylight?</i></p> <p>Parents could...</p> <p><i>play with the baby more often in the garden.</i>      <b>Yes</b> .....</p> <p><i>keep the curtains closed in the baby's room.</i>      <b>No</b> .....</p> <p><i>take the baby for a walk in the pram.</i>      <b>Yes</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 8: *Sleeping babies (continued)*

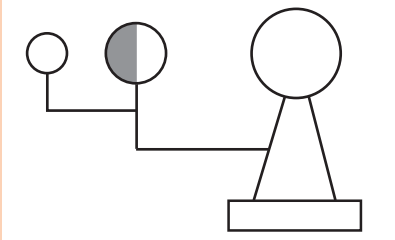
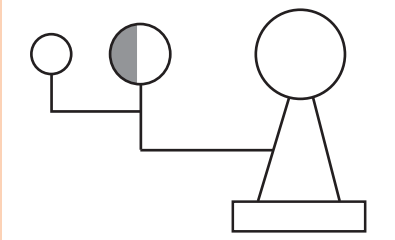
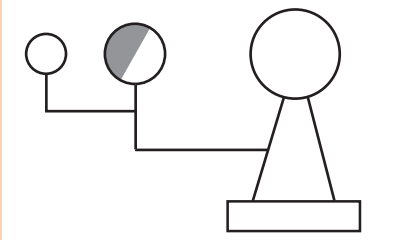
Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>8c</b></p> <p><i>BoS 2b</i></p>	<b>1m</b>	<p>Award <b>ONE</b> mark for a precaution against sunburn:</p> <ul style="list-style-type: none"> <li>■ put sunblock/suncream on the babies</li> <li>■ make the baby wear a (sun)hat</li> <li>■ do not put babies in the sun at midday</li> <li>■ put the baby in clothes which cover up its arms and legs</li> <li>■ put the babies in the shade.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ put clothes on them</li> <li>■ cover them with a blanket.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response which implies the babies are not in any sunlight:</p> <ul style="list-style-type: none"> <li>■ close the curtains</li> <li>■ keep them in the dark.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ put cream on them.</li> </ul>
<p><b>8d</b></p> <p><i>1/2g</i></p>	<b>1m</b>	<p>Award <b>ONE</b> mark for an indication that carrying out the test with several babies would improve the reliability of the results/ test <b>OR</b> they needed to have similar results from more than one baby:</p> <ul style="list-style-type: none"> <li>■ so their results are more reliable</li> <li>■ some babies may sleep better than others naturally</li> <li>■ to check that it would have the same effect on most</li> <li>■ to check their idea worked on a number of babies</li> <li>■ so you can compare the results from different babies.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response that recognises babies are not all the same:</p> <ul style="list-style-type: none"> <li>■ some babies are different</li> <li>■ different/some babies react differently</li> <li>■ to see if the babies are the same/ different.</li> </ul> <p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ to make their results (more) accurate</li> <li>■ to check their results [implies replication of results]</li> <li>■ to make sure of their idea/results</li> <li>■ to get an average (of how long they sleep)</li> <li>■ so there is more evidence</li> <li>■ it may not work on all babies.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response implying there is a correct answer:</p> <ul style="list-style-type: none"> <li>■ to make it right [<i>'it'</i> refers to test or method]</li> <li>■ to see if they are (getting it) right.</li> </ul> <p><b>Do not</b> give credit for an insufficient response indicating that people should be tested but not indicating that there could be a variation in how babies/people sleep or react to the test:</p> <ul style="list-style-type: none"> <li>■ to see what effect it could have</li> <li>■ to make sure</li> <li>■ to get more results</li> <li>■ to see what a couple of babies do.</li> </ul>

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### Test A question 9: Candle

Question	Mark	Requirements	Allowable answers	Additional guidance						
<p><b>9a</b></p> <p>3/2g 3/2d</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for <b>both</b> of the changes correctly classified:</p> <table border="1"> <thead> <tr> <th>Change</th> <th>Is the change reversible?</th> </tr> </thead> <tbody> <tr> <td>The wax melts.</td> <td><b>yes</b></td> </tr> <tr> <td>The wax burns.</td> <td><b>no</b></td> </tr> </tbody> </table>	Change	Is the change reversible?	The wax melts.	<b>yes</b>	The wax burns.	<b>no</b>		
Change	Is the change reversible?									
The wax melts.	<b>yes</b>									
The wax burns.	<b>no</b>									
<p><b>9b</b></p> <p>3/2b,c</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for correctly classifying <b>all three</b> statements:</p> <p>The wax must be heated to melt. <b>True</b></p> <p>When a solid melts it changes into a gas. <b>False</b></p> <p>Temperature shows how hot or cold something is. <b>True</b></p>								
<p><b>9c</b></p> <p>1/2l,h</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for a graph line showing the decrease of mass from 100 g over time:</p> <ul style="list-style-type: none"> <li> </li> <li> </li> </ul>	<p><b>ONE</b> mark may be awarded for a response where the mass decreases but does <b>not</b> start at 100 g:</p> <ul style="list-style-type: none"> <li> </li> </ul> <p><b>ONE</b> mark may be awarded for a decrease in mass after it has initially stayed constant:</p> <ul style="list-style-type: none"> <li> </li> </ul>	<p><b>Do not</b> give credit for a response that includes <i>incorrect science</i> where the graph shows:</p> <ul style="list-style-type: none"> <li>an intentional increase in mass over time</li> <li>a decrease in mass, followed by the mass staying constant over time.</li> </ul> <p><b>Do not</b> give credit for an insufficient response where a bar graph is drawn:</p> <ul style="list-style-type: none"> <li> </li> </ul>						

## Test B question 1: *The Earth, Moon and Sun*

Question	Mark	Requirements	Allowable answers	Additional guidance
1a 4/4a	1m	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li>■ <input type="checkbox"/> sphere <input checked="" type="checkbox"/></li> <li>■ <input type="checkbox"/> <input type="checkbox"/></li> </ul>		
1b 4/3a 4/4d	2m   or  1m	Award <b>TWO</b> marks for <b>all three</b> sentences correctly completed: <ul style="list-style-type: none"> <li>■ The <b>Sun</b> is a source of light.</li> <li>■ The <b>Earth</b> orbits the Sun.</li> <li>■ The <b>Moon</b> has an orbit of 28 days.</li> </ul> <p>If you are unable to award two marks, award <b>ONE</b> mark for correctly completing <b>any two</b> sentences.</p>		<b>Do not</b> give credit for the insufficient response: <ul style="list-style-type: none"> <li>■ The <b>Earth and Moon</b> orbits the Sun.</li> </ul>
1c 4/4c	1m	Award <b>ONE</b> mark for correct shading on the diagram to show where it is night: <ul style="list-style-type: none"> <li>■ </li> </ul>	<b>ONE</b> mark may be awarded for a response within 2mm either side of the central vertical line: <ul style="list-style-type: none"> <li>■ </li> </ul>	<b>Do not</b> give credit for a response that includes incorrect science showing a shadow aligned with the Earth's axis: <ul style="list-style-type: none"> <li>■ </li> </ul> <p><b>Do not</b> give credit for a response that includes incorrect science showing shading on the Sun.</p> <p><b>Do not</b> give credit for an insufficient response showing shading on the Moon.</p>

### Test B question 1: *The Earth, Moon and Sun (continued)*

Question	Mark	Requirements	Allowable answers	Additional guidance
1d 4/4c	1m	<p>Award <b>ONE</b> mark for indicating that day and night are caused by the spin of the Earth:</p> <ul style="list-style-type: none"> <li>■ the Earth/it is rotating (on its axis)</li> <li>■ the Earth spinning (on its axis)</li> <li>■ it spins (on its axis)</li> <li>■ it turns/moves 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> </ul> <p><b>ONE</b> mark may be awarded for a response correctly indicating night and day are caused by the spin of the Earth, as well as describing the Earth's orbit around the Sun:</p> <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><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 orbits</li> <li>■ it turns/spins around the Sun.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ it turns (around)</li> <li>■ the rotation [does not indicate what is rotating]</li> <li>■ it moves (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 B question 2: Penguins

Question	Mark	Requirements	Allowable answers	Additional guidance
2a 2/4a	1m	Award <b>ONE</b> mark for identifying the penguin correctly: <ul style="list-style-type: none"> <li>Galapagos penguin.</li> </ul>		
2b 2/4c	1m	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li>so you can find out what scientific group they are in <input checked="" type="checkbox"/> <input type="checkbox"/></li> <li><input type="checkbox"/> <input type="checkbox"/></li> </ul>		
2c i 2/1a	1m	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li><input type="checkbox"/> nutrition <input checked="" type="checkbox"/></li> <li><input type="checkbox"/> <input type="checkbox"/></li> </ul>		
2c ii 2/5d 2/5e	1m	Award <b>ONE</b> mark for an explanation that fish cannot make their own food: <ul style="list-style-type: none"> <li>a fish eats other things (to live)</li> <li>a fish cannot make its own food</li> <li>a producer is a plant</li> <li>a fish is not a plant</li> <li>a fish is an animal</li> <li>it is a consumer/predator.</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>the fish/it cannot photosynthesise.</li> </ul>		<p><b>Do not</b> give credit for an insufficient response that describes the position of the fish in the food chain:</p> <ul style="list-style-type: none"> <li>it is not the first thing in the food chain.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>the fish cannot be a producer [given]</li> <li>it is not green.</li> </ul>



## Test B question 2: Penguins (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
2d 2/1c	1m	<p>Award <b>ONE</b> mark for a feature of a penguin <b>and</b> a description of how it helps a penguin to live in its environment:</p> <ul style="list-style-type: none"> <li>■ (thick) feathers it keeps them warm</li> <li>■ webbed feet to allow them to swim/to walk on snow</li> <li>■ streamlined shape for swimming</li> <li>■ layer of fat/blubber it insulates them</li> <li>■ a rounded body reduces heat loss/allows it to slide on ice</li> <li>■ white tummies/a black back animals swimming underneath/above them cannot see them easily</li> <li>■ flippers they can pull themselves through the water</li> <li>■ beak to eat/catch fish.</li> </ul>	<p><b>ONE</b> mark may be awarded for a feature of a penguin's behaviour rather than its body which accurately describes how it may help the penguin to live:</p> <ul style="list-style-type: none"> <li>■ huddling together keeps them warm.</li> </ul> <p><b>ONE</b> mark may be awarded for a response confusing the penguins' feathers with fur [specific knowledge of penguins' anatomy is not required]:</p> <ul style="list-style-type: none"> <li>■ fur/hair/thick coat to help keep them warm.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response that identifies a feature of a penguin but omits or gives an insufficient explanation of how that feature helps the penguin live in its environment:</p> <ul style="list-style-type: none"> <li>■ flippers in the water [does not describe how flippers help in water].</li> </ul> <p><b>Do not</b> give credit for an insufficient response giving a generalised feature of many animals even when an appropriate explanation is given:</p> <ul style="list-style-type: none"> <li>■ feet it helps them walk/balance</li> <li>■ coat helps to keep it warm</li> <li>■ arms to help swim.</li> </ul>

### Test B question 3: Electricity

Question	Mark	Requirements	Allowable answers	Additional guidance												
3a 3/1c	1m	Award <b>ONE</b> mark for a response indicating conductivity: <ul style="list-style-type: none"> <li>■ (electrical) conductor.</li> </ul>		<b>Do not</b> give credit for a response that includes incorrect science: <ul style="list-style-type: none"> <li>■ thermal conductor.</li> </ul>												
3b 4/1a 1/2c	1m	Award <b>ONE</b> mark for naming a cell: <ul style="list-style-type: none"> <li>■ battery (in a holder).</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>■ power pack</li> <li>■ power source.</li> </ul>	<b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>■ switch.</li> </ul>												
3c 4/1a 1/2c	1m	Award <b>ONE</b> mark for a response indicating the bulb will light up: <ul style="list-style-type: none"> <li>■ the bulb will light</li> <li>■ the bulb will turn on.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>■ the bulb will work/switch on</li> <li>■ if the bulb lights up</li> <li>■ the bulb heats up.</li> </ul>	<b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>■ electricity will flow</li> <li>■ the circuit will work</li> <li>■ it conducts</li> <li>■ it heats up.</li> </ul>												
3d 3/1c	2m  or  1m	Award <b>TWO</b> marks for a correct response for <b>all four</b> objects: <table border="1" data-bbox="481 933 981 1024"> <thead> <tr> <th>Name of object</th> <th>Paper-clip</th> <th>Metal coin</th> <th>Iron nail</th> <th>Plastic ruler</th> <th>Steel spoon</th> </tr> </thead> <tbody> <tr> <td>Does electricity pass through?</td> <td>yes (given)</td> <td>yes</td> <td>yes</td> <td>no</td> <td>yes</td> </tr> </tbody> </table> <p>If you are unable to award two marks, award <b>ONE</b> mark for a correct response for <b>two</b> or <b>three</b> objects.</p>	Name of object	Paper-clip	Metal coin	Iron nail	Plastic ruler	Steel spoon	Does electricity pass through?	yes (given)	yes	yes	no	yes		
Name of object	Paper-clip	Metal coin	Iron nail	Plastic ruler	Steel spoon											
Does electricity pass through?	yes (given)	yes	yes	no	yes											

### Test B question 3: *Electricity (continued)*

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>3e</b></p> <p>1/2h</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for a response recognising the table is better because it shows which objects conduct electricity:</p> <ul style="list-style-type: none"> <li>■ the table tells you which objects conduct</li> <li>■ the bar chart tells you the number of objects but the table shows the number and the objects which allow electricity to pass through.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ which objects/things</li> <li>■ types of objects</li> <li>■ the names (of the objects)</li> <li>■ it tells you what the materials are</li> <li>■ that the electricity does not go through the ruler.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response which refers only to 'the objects' (as this could refer to the number or type of object) rather than to the name of the objects:</p> <ul style="list-style-type: none"> <li>■ it tells you the objects that Peter is testing</li> <li>■ the objects (that Peter tested on).</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ the bar chart just gives the number of objects.</li> </ul>

## Test B question 4: Hot drinks

Question	Mark	Requirements	Allowable answers	Additional guidance																							
4a 3/1a	1m	<p>Award <b>ONE</b> mark for:</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>■ <input type="checkbox"/> insulating <input checked="" type="checkbox"/> <input type="checkbox"/></p>																									
4b 1/2j 3/1b	1m	<p>Award <b>ONE</b> mark for correctly placing <b>all three</b> cups in the table:</p> <table border="1"> <thead> <tr> <th rowspan="2">Cup</th> <th colspan="3">Temperature (°C) at ...</th> </tr> <tr> <th>0 mins</th> <th>15 mins</th> <th>30 mins</th> </tr> </thead> <tbody> <tr> <td>D</td> <td>70</td> <td>64</td> <td>60</td> </tr> <tr> <td>A</td> <td>70</td> <td>59</td> <td>54</td> </tr> <tr> <td>C</td> <td>70</td> <td>53</td> <td>46</td> </tr> <tr> <td>B</td> <td>70</td> <td>49</td> <td>40</td> </tr> </tbody> </table>	Cup	Temperature (°C) at ...			0 mins	15 mins	30 mins	D	70	64	60	A	70	59	54	C	70	53	46	B	70	49	40		
Cup	Temperature (°C) at ...																										
	0 mins	15 mins	30 mins																								
D	70	64	60																								
A	70	59	54																								
C	70	53	46																								
B	70	49	40																								
4c 1/2l 3/1b	1m	<p>Award <b>ONE</b> mark for an indication that cup B is thinner:</p> <ul style="list-style-type: none"> <li>■ cup B is not as thick as the other cups</li> <li>■ it is the thinnest.</li> </ul> <p>Award <b>ONE</b> mark for a response identifying that cup B is less well insulated:</p> <ul style="list-style-type: none"> <li>■ there is less insulation.</li> </ul>	<p><b>ONE</b> mark may be awarded for an indication that cup B is thin, but which does not include a comparison:</p> <ul style="list-style-type: none"> <li>■ the material is (very) thin</li> <li>■ it is not insulated well.</li> </ul> <p><b>ONE</b> mark may be awarded for a response stating that cup B is made of less material:</p> <ul style="list-style-type: none"> <li>■ it has less/least material/insulator</li> <li>■ it does not have much material.</li> </ul> <p><b>ONE</b> mark may be awarded for a response recognising that cup B is not a good insulator:</p> <ul style="list-style-type: none"> <li>■ it is a weak insulator.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ it does not have a lid [cups A and C also do not have lids]</li> <li>■ it only has one layer [cup C also has one layer]</li> <li>■ it is not a thermal insulator</li> <li>■ it is not insulated.</li> </ul>																							

### Test B question 4: *Hot drinks (continued)*

Question	Mark	Requirements	Allowable answers	Additional guidance
4d i 1/2i	1m	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li>150 <i>minutes</i>.</li> </ul>	<b>ONE</b> mark may be awarded for a response in the range of 121–150 minutes inclusive.	
4d ii 1/2i	1m	Award <b>ONE</b> mark for an indication that the temperature of the drink has reached the temperature of the surroundings: <ul style="list-style-type: none"> <li>the drink has cooled to room temperature</li> <li>the temperature of the air around the drink is the same as the drink's temperature</li> <li>it was at the temperature around it.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>the drink was as cold as it could go in that room.</li> </ul>	<b>Do not</b> give credit for an insufficient response indicating that the drink could not get any colder: <ul style="list-style-type: none"> <li><i>the drink was as cold as it could go.</i></li> </ul> <b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li><i>it was at the normal temperature.</i></li> </ul>

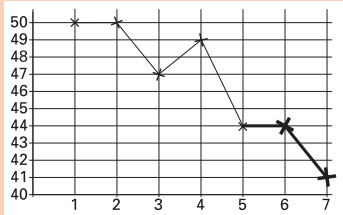
### Test B question 5: Flowering plants

Question	Mark	Requirements	Allowable answers	Additional guidance
5a 2/3b,c	1m	<p>Award <b>ONE</b> mark for <b>all three</b> labels correct:</p>		
5b 1/2h,i	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>June.</li> </ul>		
5c 2/3d 2/1b	1m	<p>Award <b>ONE</b> mark for a response which names reproduction:</p> <ul style="list-style-type: none"> <li>for reproducing.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response which describes or implies reproduction:</p> <ul style="list-style-type: none"> <li>so that it can make new plants</li> <li>(so that it can) make seeds</li> <li>for fertilisation</li> <li>to carry on the life cycle</li> <li>so the species survives</li> <li>for pollination</li> <li>to make a new generation</li> <li>to give new life</li> <li>to grow more plants.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>to attract bees/insects/animals [has not explained why insects need to be attracted]</li> <li>to produce flowers/pollen/fruit</li> <li>dropping seeds/seed dispersal.</li> </ul>
5d 2/3d	1m	<p>Award <b>ONE</b> mark for:</p> <p><input type="checkbox"/> <input type="checkbox"/></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> stamen <input checked="" type="checkbox"/></li> </ul>		

### Test B question 5: Flowering plants (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
5e 2/3d	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ <input type="checkbox"/> plant B <input checked="" type="checkbox"/></li> </ul> <p><b>AND</b> a response which identifies a feature shown in the picture which makes plant B suited to insect pollination:</p> <ul style="list-style-type: none"> <li>■ the flower is big enough for the insect (to get inside)</li> <li>■ insects can easily see the flowers</li> <li>■ insects can land on the petals</li> <li>■ the flower has opened up.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ <input type="checkbox"/> plant B <input checked="" type="checkbox"/></li> </ul> <p><b>AND</b> a feature not shown in the picture which makes plant B suited to insect pollination:</p> <ul style="list-style-type: none"> <li>■ the flowers are colourful/bright</li> <li>■ the flowers have a strong scent</li> <li>■ insects can see the pollen</li> <li>■ it has nectar.</li> </ul> <p><b>ONE</b> mark may be awarded if neither box is ticked, but the creditworthy explanation indicates unambiguously that the pupil is referring to plant B:</p> <ul style="list-style-type: none"> <li>■ the flowers on B are large (to attract insects).</li> </ul>	<p><b>Do not</b> give credit if the 'plant A' box is ticked.</p> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ it is yellow</li> <li>■ it is more attractive/beautiful/pretty [a reason why the flower is attractive must be given].</li> </ul> <p><b>Do not</b> give credit for an insufficient response referring to plant B having a flower [both plants have flowers]:</p> <ul style="list-style-type: none"> <li>■ the flowers/petals attract the insects [reason why flowers on plants attract must be given]</li> <li>■ it has more pollen</li> <li>■ it has more flowers.</li> </ul>

### Test B question 6: School pond

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>6a i</b></p> <p>1/1a 3/2e</p>	<b>1m</b>	<p>Award <b>ONE</b> mark for naming rain:</p> <ul style="list-style-type: none"> <li>■ it rained.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ hail</li> <li>■ snow</li> <li>■ wet weather.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ stormy</li> <li>■ winter.</li> </ul>
<p><b>6a ii</b></p> <p>1/2i</p>	<b>1m</b>	<p>Award <b>ONE</b> mark for naming week 4:</p> <ul style="list-style-type: none"> <li>■ week 4.</li> </ul>		
<p><b>6b</b></p> <p>3/2e</p>	<b>1m</b>	<p>Award <b>ONE</b> mark for naming evaporation:</p> <ul style="list-style-type: none"> <li>■ it evaporated.</li> </ul>		<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ the pond was leaking</li> <li>■ the sun(light).</li> </ul>
<p><b>6c</b></p> <p>1/2h</p>	<b>1m</b>	<p>Award <b>ONE</b> mark for correctly plotting the results for <b>both</b> weeks 6 and 7:</p> <ul style="list-style-type: none"> <li>■ </li> </ul>	<p><b>ONE</b> mark may be awarded for a response in which the graph line is drawn correctly without crosses <b>or</b> for correct crosses which are not joined by a graph line.</p> <p><b>ONE</b> mark may be awarded for a response in which the midpoint of the cross is less than half a week and half a cm out from the requirement.</p>	
<p><b>6d</b></p> <p>1/2j</p>	<b>1m</b>	<p>Award <b>ONE</b> mark for:</p> <p style="text-align: center;"> <input type="checkbox"/>                      <input type="checkbox"/>  <input checked="" type="checkbox"/> weeks 4 and 5    <input type="checkbox"/> </p>		



### Test B question 6: *School pond (continued)*

Question	Mark	Requirements	Allowable answers	Additional guidance
6e 3/2e	1m	Award <b>ONE</b> mark for naming condensation: <ul style="list-style-type: none"> <li>■ condensing.</li> </ul>		<p><b>Do not</b> give credit for a response that includes incorrect science:</p> <ul style="list-style-type: none"> <li>■ evaporation.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ cooling.</li> </ul>

## Test B question 7: Shoes

Draft box

Markers should read the answers to all parts before marking this question. The draft box can be consulted when marking parts 7a–7d, 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 7a–7d must form a coherent investigation which may study an alternate but appropriate property.

Question	Mark	Requirements	Allowable answers	Additional guidance
7a 1/2a,d	1m	<p>Award <b>ONE</b> mark for giving the material as the independent variable (IV):</p> <ul style="list-style-type: none"> <li>the (type of) material</li> <li>the (type of) shoes</li> <li>the grip.</li> </ul>	<p><b>ONE</b> mark may be awarded for a feature/property of the shoes/materials:</p> <ul style="list-style-type: none"> <li>the thickness of the materials.</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 amount of water I put the shoes in.</li> </ul>
7b 1/2c,d 3/1a	1m	<p>Award <b>ONE</b> mark for any acceptable dependent variable (DV) identified which could be observed or measured:</p> <p><b>Waterproof</b></p> <ul style="list-style-type: none"> <li>how quickly water drips through</li> <li>how much water is soaked up</li> <li>walk through a puddle and see if water gets in.</li> </ul> <p><b>Gripping</b></p> <ul style="list-style-type: none"> <li>pull all the materials and find out how much force is needed to make them move</li> <li>put the materials on a ramp and lift the ramp until they start to slide</li> <li>I would walk on ice and see if I slip over.</li> </ul> <p><b>Other appropriate property</b></p> <ul style="list-style-type: none"> <li>the temperature/warmth inside the shoes</li> <li>how long/far do I walk until my feet ache?</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <p><b>Waterproof</b></p> <ul style="list-style-type: none"> <li>are Emma's feet wet?</li> <li>how wet are my feet?</li> </ul> <p><b>Gripping</b></p> <ul style="list-style-type: none"> <li>does Emma slip over in the shoes?</li> </ul> <p><b>Other appropriate property</b></p> <ul style="list-style-type: none"> <li>are Emma's feet warm?</li> <li>are my feet insulated?</li> <li>how warm your feet are.</li> </ul>	<p>A DV without an IV 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:</p> <p><b>Waterproof</b></p> <ul style="list-style-type: none"> <li>the wetness of the shoes [ambiguous, could refer to the outside of the shoe]</li> <li>how waterproof the shoes are [given].</li> </ul> <p><b>Gripping</b></p> <ul style="list-style-type: none"> <li>the grippiness of the shoes [given]</li> <li>how well the shoes grip [given].</li> </ul> <p><b>Other appropriate property</b></p> <ul style="list-style-type: none"> <li>how warm the shoes are [implies measuring the temperature of the shoe itself rather than inside the shoe]</li> <li>how comfortable the shoes are [not clear how this will be measured].</li> </ul> <p><b>Do not</b> give credit for an insufficient response describing a method without stating the DV:</p> <p><b>Waterproof</b></p> <ul style="list-style-type: none"> <li>walk through a puddle.</li> </ul> <p><b>Gripping</b></p> <ul style="list-style-type: none"> <li>go outside and run in the shoes.</li> </ul> <p><b>Other appropriate property</b></p> <ul style="list-style-type: none"> <li>go outside and stand in the snow.</li> </ul>

## Test B question 7: Shoes (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
7c 1/2d	1m	<p>Award <b>ONE</b> mark for any acceptable control variable (CV) that is <b>not</b> already used as an IV or DV in the investigation:</p> <p><b>Waterproof</b></p> <ul style="list-style-type: none"> <li>the amount of water put on the shoe</li> <li>the time the materials are in the water</li> <li>wear the same type of socks.</li> </ul> <p><b>Gripping</b></p> <ul style="list-style-type: none"> <li>the surface I do the test on</li> <li>how quickly I lift the ramp.</li> </ul> <p><b>Other appropriate property</b></p> <ul style="list-style-type: none"> <li>the type of sock I am wearing</li> <li>the surface I walk on.</li> </ul>	<p><b>ONE</b> mark may be awarded for an inherent feature of the materials which is different but would not necessarily have to be controlled:</p> <ul style="list-style-type: none"> <li>the thickness of the materials.</li> </ul> <p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>do it in the same weather/place</li> <li>have the same shoe size.</li> </ul>	<p><b>Do not</b> give credit for a CV that is inconsistent with, or repeats, the IV or DV offered in parts 7a and 7b respectively.</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 presented in the introduction. 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:</p> <ul style="list-style-type: none"> <li>the water/liquid.</li> </ul>
7d 1/2b 3/1a	1m	<p>Award <b>ONE</b> mark for a response explaining why it is important for the shoes to have the chosen property:</p> <p><b>Waterproof</b></p> <ul style="list-style-type: none"> <li>if the material is not waterproof her feet will get wet</li> <li>it is best to stop her feet getting wet.</li> </ul> <p><b>Gripping</b></p> <ul style="list-style-type: none"> <li>a good grip will help her not to slip</li> <li>if the material grips well she will not fall over</li> <li>you will know which shoes you will fall over in.</li> </ul> <p><b>Other appropriate property</b></p> <ul style="list-style-type: none"> <li>you do not want blisters on your feet when you are walking.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>in case you get wet feet</li> <li>you could slip (and hurt yourself).</li> </ul>	<p><b>Do not</b> give credit for an insufficient response describing a characteristic of winter without relating it to the shoes:</p> <ul style="list-style-type: none"> <li>in winter it rains a lot</li> <li>it is icy in winter.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>so they do not get wet [implies the shoes, not her feet]</li> <li>if it was icy you would need grip [no implication why grip is needed].</li> </ul> <p><b>Do not</b> give credit for a response that is not consistent with the investigation planned in parts 7a–7c.</p> <p>If an IV, DV and CV are not offered, the response may gain credit, provided it is consistent with the context of the investigation presented in the introduction.</p>

## Test B question 8: Parachutes

Question	Mark	Requirements	Allowable answers	Additional guidance
8a 4/2c	1m	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li>air resistance.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>friction</li> <li>wind 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.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:  <ul style="list-style-type: none"> <li>upthrust</li> <li>resistance.</li> </ul> </p>
8b 1/2j	1m	Award <b>ONE</b> mark for a general comparison describing the relationship between the <b>area of the parachute</b> and the <b>time taken</b> for the parachute to fall to the ground: <ul style="list-style-type: none"> <li>the larger the parachute, the longer the time taken to fall</li> <li>the bigger the parachute, the greater the time.</li> </ul>	<b>ONE</b> mark may be awarded for a general comparison describing the relationship between the <b>area of the parachute</b> and the <b>rate</b> of fall: <ul style="list-style-type: none"> <li>the smaller the area, the faster it fell.</li> </ul> <p><b>ONE</b> mark may be awarded for <b>two specific</b> comparisons describing the relationship:  <ul style="list-style-type: none"> <li>the largest area took longer, the smallest area took the shortest time</li> <li>the parachute with the largest area fell slowest and the smallest fell quickest.</li> </ul> </p>	<b>Do not</b> give credit for an insufficient response giving a single comparison of the variables: <ul style="list-style-type: none"> <li>the biggest parachute takes the longest to fall</li> <li>the smallest area is the fastest.</li> </ul> <p><b>Do not</b> give credit for a response that changes one or both variables:  <ul style="list-style-type: none"> <li>the heavier the parachute, the longer it takes</li> <li>the smaller the parachute, the better/easier it falls</li> <li>the higher, the more time it takes.</li> </ul> <p><b>Do not</b> give credit for an insufficient response repeating/restating one line of the table:  <ul style="list-style-type: none"> <li>the parachute took 5.3 seconds to fall and the area is 36.</li> </ul> <p><b>Do not</b> give credit for an insufficient response with a causal explanation.</p> </p></p>
8c 1/2/ 4/2c	1m	Award <b>ONE</b> mark for: <i>The mass with no parachute...</i> <ul style="list-style-type: none"> <li><input type="checkbox"/> has less upwards force on it. <input checked="" type="checkbox"/></li> <li><input type="checkbox"/> <input type="checkbox"/></li> </ul>		

### Test B question 8: *Parachutes (continued)*

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>8d</b></p> <p>2/3d</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for an indication that dandelion seeds are dispersed by the wind:</p> <ul style="list-style-type: none"> <li>■ the wind (spreads these seeds)</li> <li>■ the dandelion seed acts like a parachute and is spread by the wind.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ by (blowing) air</li> <li>■ it is blown.</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science describing other methods of seed dispersal:</p> <ul style="list-style-type: none"> <li>■ it sticks to animal fur.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ it flies away</li> <li>■ it falls off</li> <li>■ it lands on the ground.</li> </ul>

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