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KEY STAGE

2

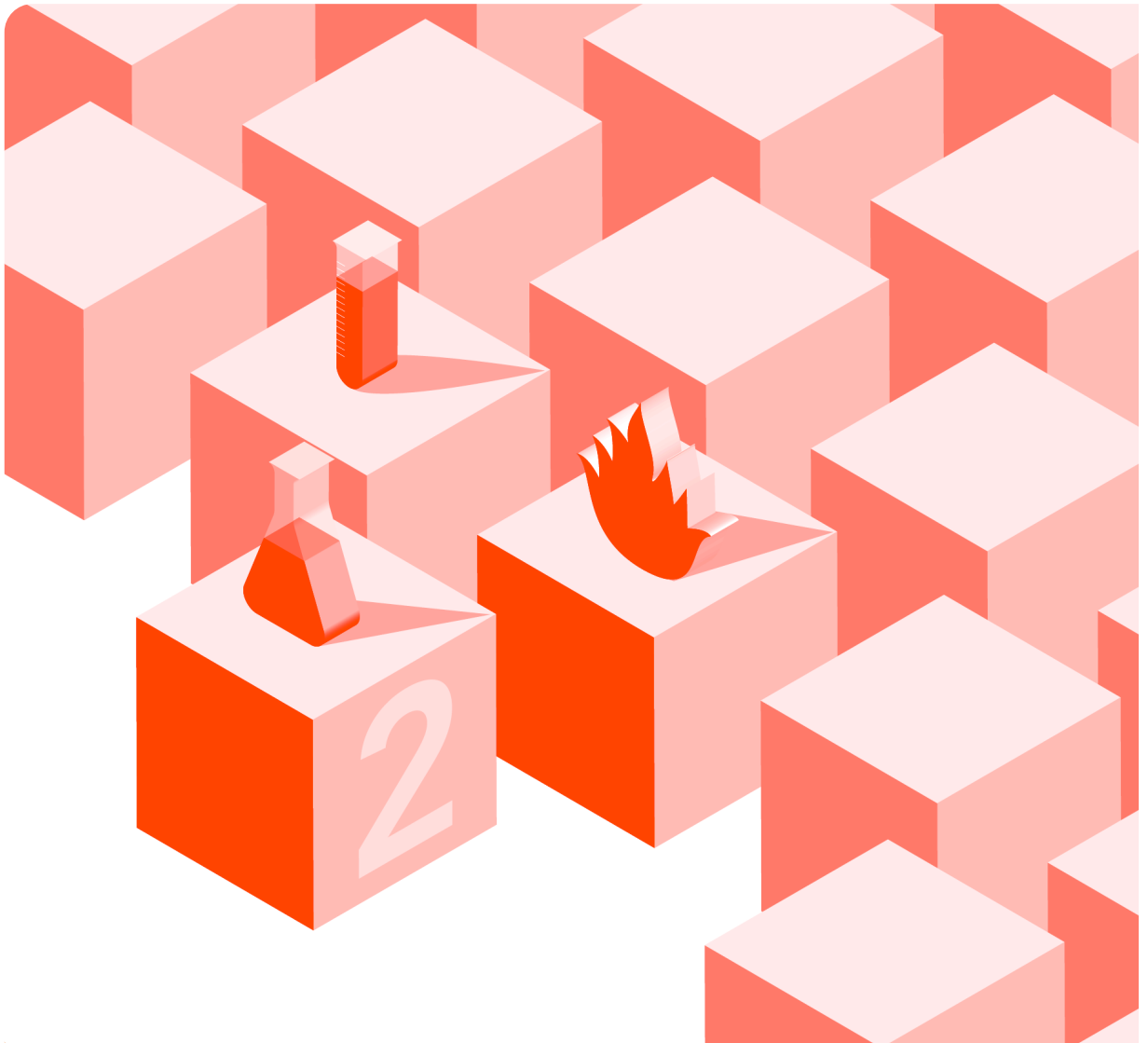
LEVELS

3–5

Science tests

# Mark schemes

Tests A and B, levels 3–5



2007

National curriculum assessments

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# Marking the science tests

As in 2006, 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 25 June 2007.

## 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 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, and on the marksheet.

Each paper has the following number of marks available:

- Test A has 40
- Test B has 40.

The 2007 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: Conducting electricity

Question	Mark	Requirements	Allowable answers	Additional guidance												
<p><b>1a</b></p> <p>4/1a 1/2c</p>	<b>1m</b>	<p>Award <b>ONE</b> mark for an indication that the bulb/lamp will light:</p> <ul style="list-style-type: none"> <li>the bulb will light up</li> <li>the lamp will turn on.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>the bulb will work</li> <li>they can see if the light will go on.</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science:</p> <ul style="list-style-type: none"> <li>the object will light up</li> <li>they will light up or move.</li> </ul> <p><b>Do not</b> give credit for an insufficient response that does not fully describe the evidence that shows the electricity flows:</p> <ul style="list-style-type: none"> <li>the circuit conducts electricity</li> <li>electricity will flow around the circuit</li> <li>if the object is metal.</li> </ul> <p><b>Do not</b> give credit for an insufficient response that describes placing the clips together:</p> <ul style="list-style-type: none"> <li>when they put the clips together the bulb will light up.</li> </ul>												
<p><b>1b</b></p> <p>3/1c</p>	<p><b>2m</b></p> <p><b>or</b></p> <p><b>1m</b></p>	<p>Award <b>TWO</b> marks for correctly classifying <b>all five</b> objects:</p> <table border="1"> <thead> <tr> <th>Object</th> <th>Does the object conduct electricity?</th> </tr> </thead> <tbody> <tr> <td>wooden ruler</td> <td>no</td> </tr> <tr> <td>steel scissors</td> <td>yes</td> </tr> <tr> <td>sheet of paper</td> <td>no</td> </tr> <tr> <td>rubber</td> <td>no</td> </tr> <tr> <td>brass pin</td> <td>yes</td> </tr> </tbody> </table> <p>If you are unable to award two marks, award <b>ONE</b> mark for correctly classifying <b>any three</b> or <b>four</b> objects.</p>	Object	Does the object conduct electricity?	wooden ruler	no	steel scissors	yes	sheet of paper	no	rubber	no	brass pin	yes		
Object	Does the object conduct electricity?															
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steel scissors	yes															
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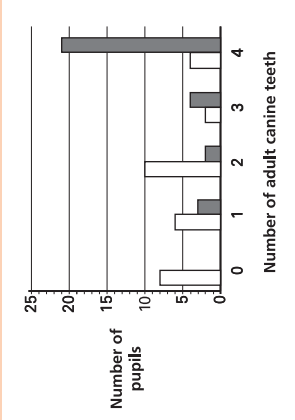
## Test A question 2: Sweets

Question	Mark	Requirements	Allowable answers	Additional guidance
<b>2a</b> 1/2a	<b>1m</b>	Award <b>ONE</b> mark for indicating the amount of time planned for the investigation: <ul style="list-style-type: none"> <li>the time is 2 hours.</li> </ul>		<b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>from 9 until 11.</li> </ul>
<b>2b</b> 1/2d 1/1b	<b>1m</b>	Award <b>ONE</b> mark for recognising that the investigation took a different amount of time than planned: <ul style="list-style-type: none"> <li>the time he left the sweet</li> <li>he did not leave it as long as he said he would</li> <li>(he changed) the time (it took).</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>he left it for 20 minutes</li> <li>he did not leave the sweet until 11.00</li> <li>he ended his investigation at 9.20</li> <li>the sweet took less time to dissolve (than he thought).</li> </ul>	<b>Do not</b> give credit for a response that includes incorrect science: <ul style="list-style-type: none"> <li>the temperature.</li> </ul> <p><b>Do not</b> give credit for an insufficient response that describes the outcome rather than the change in the plan:  <ul style="list-style-type: none"> <li>the sweet dissolved.</li> </ul> <p><b>Do not</b> give credit for an insufficient response indicating Peter took photos:  <ul style="list-style-type: none"> <li>he took some photos of the sweet.</li> </ul> </p></p>
<b>2c</b> 1/2j	<b>1m</b>	Award <b>ONE</b> mark for a conclusion relating to dissolving which is consistent with the evidence: <ul style="list-style-type: none"> <li>the sweet has dissolved</li> <li>the time taken for the sweet to dissolve was 20 minutes</li> <li>the water got darker as the sweet dissolved.</li> </ul>	<b>ONE</b> mark may be awarded for an observational response: <ul style="list-style-type: none"> <li>the sweet cannot be seen after 20 minutes</li> <li>the water changed colour.</li> </ul>	<b>Do not</b> give credit for a response that includes incorrect science which goes beyond the evidence: <ul style="list-style-type: none"> <li>if you leave a sweet in your mouth it will melt</li> <li>the sweet takes 2 hours to dissolve in 50cm<sup>3</sup> of cold water</li> <li>the more you keep it in water, the more it dissolves</li> <li>the sweet dissolved in his mouth.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:  <ul style="list-style-type: none"> <li>it disappeared/has gone</li> <li>it could not have melted.</li> </ul> </p>

Test A question 2: Sweets (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>2d</b> 1/2a</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ <input type="checkbox"/> a hot place <input checked="" type="checkbox"/></li> <li>■ <input type="checkbox"/> <input type="checkbox"/></li> </ul>		

## Test A question 3: Teeth

Question	Mark	Requirements	Allowable answers	Additional guidance
<b>3a</b> 1/2i	<b>1m</b>	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li>ten pupils.</li> </ul>		<b>Do not</b> give credit for an insufficient response that does not interpret the data given in the table: <ul style="list-style-type: none"> <li>### ##</li> </ul>
<b>3b</b> 1/2h	<b>1m</b>	Award <b>ONE</b> mark for <b>all four</b> correct bars shaded as shown below: 		<b>Do not</b> give credit for a response that includes incorrect science where any of the year 4 bars have been shaded.  <b>Do not</b> give credit for an insufficient response where fewer than four of the year 6 bars have been shaded.
<b>3c</b> 2/2a	<b>1m</b>	Award <b>ONE</b> mark for <b>one</b> other way of keeping teeth healthy: <ul style="list-style-type: none"> <li>brush her teeth (regularly)</li> <li>do not brush teeth for too long/ too much/too often/too hard</li> <li>get a new toothbrush (regularly)</li> <li>visit the dentist (regularly)</li> <li>(use a) toothpick/dental floss</li> <li>(use fluoride) toothpaste</li> <li>(use) mouthwash</li> <li>do not drink so many fizzy drinks</li> <li>do not eat lots of acidic foods</li> <li>drink water/fluoridated water</li> <li>eat lots of calcium-containing products/drink milk</li> <li>eat a balanced diet</li> <li>chew sugar-free gum.</li> </ul>	<b>ONE</b> mark may be awarded for a way of preventing damage to teeth: <ul style="list-style-type: none"> <li>wear a gumshield when playing contact sport</li> <li>do not smoke</li> <li>she should not suck her thumb</li> <li>wear a brace (if needed).</li> </ul>	<b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>eat fewer sweets/sugary foods [given]</li> <li>eat fruit/vegetables</li> <li>chew gum.</li> </ul>



Test A question 3: Teeth (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>3d</b> 2/2a</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for a description of the cutting action of incisors:</p> <ul style="list-style-type: none"> <li>■ cut/slice (food).</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ chisel/chop/snip</li> <li>■ rip/tear/shred/gnaw.</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science identifying the function of molars:</p> <ul style="list-style-type: none"> <li>■ crush/grind/chew.</li> </ul> <p><b>Do not</b> give credit for an insufficient response identifying a function of all teeth:</p> <ul style="list-style-type: none"> <li>■ grip/hold food</li> <li>■ break up food</li> <li>■ bite.</li> </ul> <p><b>Do not</b> give credit for an insufficient response giving a physical difference between incisor and molar teeth:</p> <ul style="list-style-type: none"> <li>■ incisor teeth are smaller (than molars)</li> <li>■ incisor teeth have a flat front.</li> </ul>
<p><b>3e</b> 2/2a</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for <b>both</b> sentences correctly classified:</p> <p><i>Children lose their first teeth and grow new teeth.</i>      <b>True</b>.....</p> <p><i>Human teeth can reproduce.</i>      <b>False</b>.....</p>		

### Test A question 4: Earth, Sun and Moon

Question	Mark	Requirements	Allowable answers	Additional guidance								
<b>4a</b> 4/4a 1/2c	<b>1m</b>	Award <b>ONE</b> mark for <b>all three</b> objects correctly classified: <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Object</th> <th>melon</th> <th>pea</th> <th>poppy seed</th> </tr> </thead> <tbody> <tr> <td>What it models</td> <td><b>Sun</b></td> <td><b>Earth</b></td> <td><b>Moon</b></td> </tr> </tbody> </table>	Object	melon	pea	poppy seed	What it models	<b>Sun</b>	<b>Earth</b>	<b>Moon</b>		
Object	melon	pea	poppy seed									
What it models	<b>Sun</b>	<b>Earth</b>	<b>Moon</b>									
<b>4b</b> 4/4a	<b>1m</b>	Award <b>ONE</b> mark for an indication that they are spherical: ■ they are spheres.	<b>ONE</b> mark may be awarded for: ■ (like a) ball ■ 3D circle.	<b>Do not</b> give credit for an insufficient response: ■ they are round/circles ■ (like a) melon/pea/poppy seed [given].								
<b>4c</b> 4/4c	<b>1m</b>	Award <b>ONE</b> mark for: ■ spin the Earth on its axis <input checked="" type="checkbox"/> <input type="checkbox"/>										
<b>4d</b> 4/4d	<b>1m</b>	Award <b>ONE</b> mark for: ■ <i>The Moon orbits the Earth once every 27–30 days (inclusive)/month/four weeks.</i>	<b>ONE</b> mark may be awarded for: ■ 31 days.	<b>Do not</b> give credit for an insufficient response that does not include units: ■ 28.								
<b>4e</b> 4/4c	<b>1m</b>	Award <b>ONE</b> mark for correctly estimating the time at place A on the globe as between 11.30am to 1.30pm inclusive: ■ midday/noon ■ 12pm ■ 12 o'clock.	<b>ONE</b> mark may be awarded for: ■ 12am ■ 12.	<b>Do not</b> give credit for a response that includes incorrect science: ■ 1am.								

Test A question 5: Keeping cool

Question	Mark	Requirements	Allowable answers	Additional guidance
5a 1/2c	1m	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li><input type="checkbox"/> a prediction <input checked="" type="checkbox"/></li> <li><input type="checkbox"/></li> </ul>		
5b 3/2d	1m	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li><input type="checkbox"/> melting</li> <li><input type="checkbox"/> melt(s).</li> </ul>		<b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li><input type="checkbox"/> liquefies [describes the formation of a liquid, but this occurs with other processes as well].</li> </ul>
5c 3/1b	1m	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li><input type="checkbox"/> The table shows that the ice is <b>insulated</b> by the plastic bags so that the ice changes to water more slowly.</li> </ul>		
5d 3/2c	1m	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li><input type="checkbox"/> 0°C <input checked="" type="checkbox"/></li> <li><input type="checkbox"/></li> </ul>		

## Test A question 6: Straw sounds

Question	Mark	Requirements	Allowable answers	Additional guidance
<b>6a</b> 4/3e,g	<b>1m</b>	Award <b>ONE</b> mark for <b>two</b> correct responses [given in either order]: <ul style="list-style-type: none"> <li>the straw/the cut (straw)</li> <li>the air/wind.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>plastic/paper</li> <li>her mouth/lips.</li> </ul>	<b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>breath/voice</li> <li>bits you cut out</li> <li>eardrum [does not vibrate to produce the sound]</li> <li>sound/air waves</li> <li>blowing.</li> </ul> <p><b>Do not</b> give credit for an insufficient response that is a restatement or repetition of the first.</p>
<b>6b</b> 4/3f	<b>1m</b>	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li>pitch.</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>frequency.</li> </ul>		<b>Do not</b> give credit for a response that includes incorrect science: <ul style="list-style-type: none"> <li>volume.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>tone [refers to the quality of the sound]</li> <li>note [may refer to duration or pitch of sound].</li> </ul>
<b>6c</b> 4/3f	<b>1m</b>	Award <b>ONE</b> mark for an indication that a longer straw creates a lower note/sound, and/or a shorter straw creates a higher note/sound: <ul style="list-style-type: none"> <li>the longer the straw, the lower the note</li> <li>it is higher when the straw is short</li> <li>the longest straw makes the lowest noise.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>a long straw makes a low sound</li> <li>a short straw makes a high sound.</li> </ul>	<b>Do not</b> give credit for a response that includes incorrect science: <ul style="list-style-type: none"> <li>the longer the straw, the louder/softer the sound</li> <li>the longer the straw, the longer the note.</li> </ul>

## Test A question 6: Straw sounds (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
<b>6d i</b> 1/2d	<b>1m</b>	Award <b>ONE</b> mark for an indication that different people will blow in different ways: <ul style="list-style-type: none"> <li>they will not know if their results are caused by the length of the straw or by the way each person blew</li> <li>some people might blow harder than others</li> <li>they will not all blow the same</li> <li>they might blow at different speeds.</li> </ul>		<p><b>Do not</b> give credit for an insufficient response that refers to the independent variable:</p> <ul style="list-style-type: none"> <li>the straws are all different lengths.</li> </ul> <p><b>Do not</b> give credit for an insufficient response referring only to breathing, not to air entering the straw:</p> <ul style="list-style-type: none"> <li>different people have different breathing</li> <li>people breathe at different times.</li> </ul> <p><b>Do not</b> give credit for an insufficient response referring to the amount of time that an individual blows in the straw:</p> <ul style="list-style-type: none"> <li>they can blow for different lengths of time.</li> </ul>
<b>6d ii</b> 1/2d	<b>1m</b>	Award <b>ONE</b> mark for an indication that one person might blow differently each time: <ul style="list-style-type: none"> <li>one person will not be able to blow exactly the same each time</li> <li>they might blow harder on some straws than others.</li> </ul>		<p><b>Do not</b> give credit for an insufficient response that refers to the independent variable:</p> <ul style="list-style-type: none"> <li>the straws are all different lengths.</li> </ul> <p><b>Do not</b> give credit for an insufficient response referring only to breathing, not to the air entering the straw:</p> <ul style="list-style-type: none"> <li>she might run out of breath</li> <li>she might breathe differently each time.</li> </ul> <p><b>Do not</b> give credit for an insufficient response referring to the amount of time the individual blows:</p> <ul style="list-style-type: none"> <li>she might not be able to blow for as long into the last straw.</li> </ul>

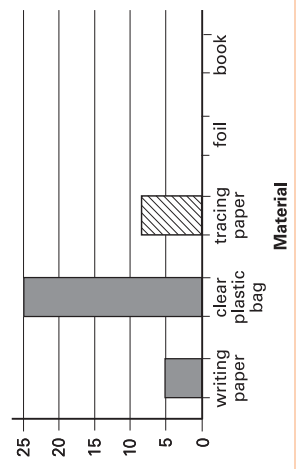
## Test A question 7: Seedlings

Question	Mark	Requirements	Allowable answers	Additional guidance
<b>7a</b> 3/2,d,e	<b>1m</b>	Award <b>ONE</b> mark for: <ul style="list-style-type: none"> <li>■ condensation.</li> </ul>		<b>Do not</b> give credit for an insufficient response that describes condensation: <ul style="list-style-type: none"> <li>■ the water vapour turns back to liquid when it cools down</li> <li>■ liquidisation/liquidising.</li> </ul>
<b>7b</b> 2/3b	<b>1m</b>	Award <b>ONE</b> mark for a response indicating that food for growth is produced in the leaves: <ul style="list-style-type: none"> <li>■ leaves.</li> </ul>	<b>ONE</b> mark may be awarded for a response that acknowledges that food for growth is produced (to a lesser extent) in other green parts of the plant: <ul style="list-style-type: none"> <li>■ stem/stalk.</li> </ul>	<b>Do not</b> give credit for a response that includes incorrect science: <ul style="list-style-type: none"> <li>■ roots</li> <li>■ flowers/petals.</li> </ul>
<b>7c</b> 2/3a	<b>1m</b>	Award <b>ONE</b> mark for an understanding that (young) plants need light when they start to grow: <ul style="list-style-type: none"> <li>■ because the (young) plants need light</li> <li>■ because growing plants need light (to make food)</li> <li>■ plants use light to make food.</li> </ul> <b>❖ Give credit</b> for a correct response that goes beyond the key stage 2 programme of study: <ul style="list-style-type: none"> <li>■ to photosynthesis.</li> </ul>	<b>ONE</b> mark may be awarded for a response that describes light going through the clear plastic, but does not indicate that the plant uses/needs it: <ul style="list-style-type: none"> <li>■ because it lets light in</li> <li>■ light goes through the clear plastic</li> <li>■ so the (sun)light goes through</li> <li>■ so the plant gets light.</li> </ul> <b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>■ for (sun)light</li> <li>■ light.</li> </ul>	<b>Do not</b> give credit for a response that includes incorrect science: <ul style="list-style-type: none"> <li>■ so the seeds can see the light</li> <li>■ so it can get food from the light.</li> </ul> <b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>■ so the seedlings can grow</li> <li>■ to keep it warm</li> <li>■ so you can see through it to check them.</li> </ul>

Test A question 7: Seedlings (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>7d</b> 2/3c</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for an indication that the roots take up/soak up water and/or minerals:</p> <ul style="list-style-type: none"> <li>■ the roots absorb water/minerals</li> <li>■ they take up moisture.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ the roots absorb/get nutrients</li> <li>■ they carry water</li> <li>■ they drain/take/draw water from the soil.</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science indicating that the root gives the young plant food:</p> <ul style="list-style-type: none"> <li>■ they take/send up/bring it food</li> <li>■ they feed it</li> <li>■ they gather/absorb food.</li> </ul> <p><b>Do not</b> give credit for a response that includes incorrect science indicating an active anthropomorphic mechanism:</p> <ul style="list-style-type: none"> <li>■ the roots collect/gather/drink/suck/pull up water.</li> </ul> <p><b>Do not</b> give credit for an insufficient response indicating a supporting function in which anchoring works in conjunction with the stem:</p> <ul style="list-style-type: none"> <li>■ the roots keep the plant upright.</li> </ul> <p><b>Do not</b> give credit for an insufficient response that implies the roots anchor the plant to the ground:</p> <ul style="list-style-type: none"> <li>■ they hold it in the ground [given].</li> </ul> <p><b>Do not</b> give credit for an insufficient response where 'goodness' is used in place of 'nutrients', 'water' or 'minerals':</p> <ul style="list-style-type: none"> <li>■ they take up goodness.</li> </ul> <p><b>Do not</b> give credit for an insufficient response that does not recognise the role of the roots:</p> <ul style="list-style-type: none"> <li>■ nutrients/moisture (in the soil).</li> </ul>

### Test A question 8: Remote control

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>8a</b> 1/2h</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for drawing a bar to 8 steps for the tracing paper:</p> 	<p><b>ONE</b> mark may be awarded for a bar drawn between 7.5 and 10 steps exclusively.</p>	<p><b>Do not</b> give credit for a response that includes incorrect science drawing a bar to 8 steps at the positions for the foil or the book.</p>
<p><b>8b</b> 1/2d</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for an indication that the book is thicker than the other materials being tested:</p> <ul style="list-style-type: none"> <li>■ the other materials are thinner than the book</li> <li>■ it has more layers (than the others).</li> </ul>	<p><b>ONE</b> mark may be awarded for a response indicating that the book is made of more than one material.</p> <p><b>ONE</b> mark may be awarded for an absolute response:</p> <ul style="list-style-type: none"> <li>■ the book is (too) thick.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response indicating another property of the book that is different:</p> <ul style="list-style-type: none"> <li>■ it is hard/heavy.</li> </ul>
<p><b>8c</b> 1/2m 1/2d</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for:</p> <p style="text-align: center;"> <input type="checkbox"/> <input type="checkbox"/> </p> <p>■ his steps are bigger <input checked="" type="checkbox"/> <input type="checkbox"/></p>		



## Test A question 8: Remote control (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
<b>8d</b> 1/2m	<b>1m</b>	Award <b>ONE</b> mark for an indication that Ruth should measure the distance in standardised units: <ul style="list-style-type: none"> <li>she could use a tape measure/metre ruler</li> <li>she should measure in cm.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response indicating that Ruth should measure the distance or make sure each step is an equal distance:</p> <ul style="list-style-type: none"> <li>she can measure how far back she goes</li> <li>she can make sure her steps are the same size.</li> </ul> <p><b>ONE</b> mark may be awarded for an indication that repeating the test will improve accuracy <b>or</b> allow Ruth to find out an average.</p>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>make it a fair test</li> <li>she makes sure everything has the same thickness (so it is a fair test)</li> <li>replace the batteries each time</li> <li>measure the thickness of the materials [ensures the test is fair, not accurate]</li> <li>check her results [does not necessarily imply the test is repeated]</li> <li>make sure her steps are the same [could refer to the number of steps rather than the size]</li> <li>go back the same distance.</li> </ul>
<b>8e</b> 1/1a 4/3b	<b>1m</b>	Award <b>ONE</b> mark for a response that identifies the relationship between the transparency/opacity of the materials and how well the remote works: <ul style="list-style-type: none"> <li>the remote did not work with foil and that is opaque</li> <li>light passes through the clear plastic bag and the clear plastic bag let the remote control work from a long way away</li> <li>the remote did not work with foil because foil will not let light through</li> <li>the more transparent the material, the better the remote works</li> <li>materials that let more light through will turn the TV on from further away.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response that indicates transparent materials have the most steps (before the remote stops working) <b>or</b> that opaque materials did not work with any steps:</p> <ul style="list-style-type: none"> <li>the objects with 0 steps were all opaque</li> <li>all the materials that let light through allow more steps</li> <li>the bag is see-through and took 25 steps until the TV switched off.</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science referring to the thickness of the materials:</p> <ul style="list-style-type: none"> <li>the clear plastic bag is thin so light can shine through it [transparency is not dependent on the thickness of the material].</li> </ul> <p><b>Do not</b> give credit for a response describing the transparency of one (or more) of the objects without stating the effect on the remote control:</p> <ul style="list-style-type: none"> <li>the clear plastic bag is transparent (and foil is opaque)</li> <li>when the book was in front of the remote it blocked the light.</li> </ul> <p><b>Do not</b> give credit for an insufficient response that correctly identifies how well the remote works with one (or more) of the objects without relating this to the transparency of the object:</p> <ul style="list-style-type: none"> <li>the remote control did not work with foil.</li> </ul>

## Test A question 9: Yeast

Question	Mark	Requirements	Allowable answers	Additional guidance
<b>9a</b> 3/2a	<b>1m</b>	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ dissolving</li> <li>■ dissolves.</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>■ a solution</li> <li>■ it is a solute.</li> </ul>		<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ it sinks to the bottom</li> <li>■ mixing [given].</li> </ul>
<b>9b</b> 3/2f	<b>1m</b>	<p>Award <b>ONE</b> mark for classifying <b>all three</b> statements correctly:</p> <p>A gas is produced by the yeast. <b>True...</b></p> <p>A reversible change has happened. <b>False...</b></p> <p>The balloon is flexible. <b>True...</b></p>		
<b>9c</b> 1/2j	<b>2m</b>  <b>or</b>  <b>1m</b>	<p>Award <b>TWO</b> marks for a general comparison describing the relationship between the <b>temperature</b> of the water and the <b>time taken</b> for the balloon to stand up:</p> <ul style="list-style-type: none"> <li>■ the higher the temperature, the less time it takes for the balloon to rise</li> <li>■ the lower the temperature, the longer it takes for the balloon to stand up.</li> </ul> <p>If you are unable to award two marks, award <b>ONE</b> mark for <b>two specific</b> comparisons describing the relationship:</p> <ul style="list-style-type: none"> <li>■ a high temperature took a short time and a low temperature took a long time for the balloon to stand.</li> </ul> <p>(continued)</p>	<p>Marks may be awarded for responses giving the relationship between the temperature of the water and the effect on the time taken for the balloon to stand up:</p> <ul style="list-style-type: none"> <li>■ the warmer the water, the quicker the balloon rises</li> <li>■ the hotter the water, the quicker gas was produced.</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science suggesting that the yeast rises:</p> <ul style="list-style-type: none"> <li>■ the hotter the water the quicker the yeast rises.</li> </ul> <p><b>Do not</b> give credit for a response that includes incorrect science, changing one or both variables:</p> <ul style="list-style-type: none"> <li>■ the hotter the water, the smaller the balloon</li> <li>■ the hotter the water, the shorter time the balloon stays up for.</li> </ul> <p>(continued)</p>

## Test A question 9: Yeast (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
9c (continued)		<p>Award <b>ONE</b> mark for a single comparison of the variables:</p> <ul style="list-style-type: none"> <li>■ a hot temperature made the balloon stand up in a short time</li> <li>■ the balloon took a long time to stand up when the temperature was low.</li> </ul>		<p><b>Do not</b> give credit for an insufficient response that does not interpret the results:</p> <ul style="list-style-type: none"> <li>■ at 3°C it took 52 minutes, and at 50°C it took 4 minutes.</li> </ul>
9d 1/2k	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>a response explaining that the mixtures at 20°C and 30°C did not cause the balloon to stand up most quickly:</p> <ul style="list-style-type: none"> <li>■ the balloon blew up more quickly at 50°C</li> <li>■ the balloon blew up faster at a higher temperature than 20°C or 30°C</li> <li>■ it took longer for gas to be produced at 20°C and 30°C than at 50°C.</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> <p>a response indicating that the yeast works quickest at 50°C or at a higher temperature than 20°C or 30°C:</p> <ul style="list-style-type: none"> <li>■ it works quickest at 50°C</li> <li>■ at 30°C it took 16 minutes but it only took 4 minutes at 50°C.</li> </ul> <p><b>ONE</b> mark may be awarded if neither box is ticked but a creditworthy explanation indicates that the pupil believes the information from the cook book is not supported by the results of the investigation.</p>	<p><b>Do not</b> give credit if the 'yes' box is ticked.</p> <p><b>Do not</b> give credit for an insufficient response that gives a continuous variable relationship between the time to stand up and the temperature of the water:</p> <ul style="list-style-type: none"> <li>■ the hotter the water, the quicker it takes to stand [does not give examples from the results].</li> </ul> <p><b>Do not</b> give credit for an insufficient response that only restates the results in the table:</p> <ul style="list-style-type: none"> <li>■ I know this because it was 4 mins at 50°C, 18 mins at 20°C and 16 mins at 30°C.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ it is easier at higher temperatures [it is ambiguous as to what easier refers to]</li> <li>■ it is best at 50°C [best must be defined].</li> </ul>

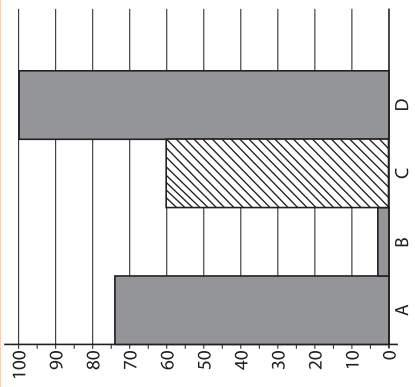
## Test B question 1: Medicines and drugs

Question	Mark	Requirements	Allowable answers	Additional guidance
1a 3/1a	1m	<p>Award <b>ONE</b> mark for an indication that plastic is less likely to break than glass <b>or</b> that plastic is lighter than glass:</p> <ul style="list-style-type: none"> <li>■ if the bottle is dropped, plastic will not break, but glass may</li> <li>■ plastic is lighter.</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>■ glass is more brittle</li> <li>■ plastic is less dense.</li> </ul>	<p><b>ONE</b> mark may be awarded for an absolute response:</p> <ul style="list-style-type: none"> <li>■ plastic will not break</li> <li>■ plastic is a light material.</li> </ul> <p><b>ONE</b> mark may be awarded for a response that describes a consequence of plastic being lighter/less likely to break:</p> <ul style="list-style-type: none"> <li>■ plastic bottles are easier to transport.</li> </ul> <p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>■ plastic is cheaper.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ plastic is stronger [the plastic may not be stronger]</li> <li>■ plastic is better</li> <li>■ plastic is brown</li> <li>■ it can be recycled.</li> </ul> <p><b>Do not</b> give credit for an insufficient response that implicitly refers to glass:</p> <ul style="list-style-type: none"> <li>■ it will break/smash.</li> </ul>
1b 2/2g	1m	<p>Award <b>ONE</b> mark for <b>all three</b> statements correct:</p> <p>Medicines are <i>not</i> drugs because <i>all</i> drugs are harmful. <b>False</b>..</p> <p>Medicines can have bad effects on humans. <b>True</b>...</p> <p>If you eat a balanced diet, you will never need to take medicine. <b>False</b>..</p>		

## Test B question 2: Water cycle

Question	Mark	Requirements	Allowable answers	Additional guidance						
2a 3/2d	1m	<p>Award <b>ONE</b> mark for correctly completing <b>both</b> rows of the table:</p> <table border="1"> <thead> <tr> <th>Change</th> <th>Is the change reversible?</th> </tr> </thead> <tbody> <tr> <td>evaporation</td> <td>yes</td> </tr> <tr> <td>condensation</td> <td>yes</td> </tr> </tbody> </table>	Change	Is the change reversible?	evaporation	yes	condensation	yes		
Change	Is the change reversible?									
evaporation	yes									
condensation	yes									
2b 3/2e	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ <input type="checkbox"/></li> <li>■ <input type="checkbox"/> 3</li> <li>■ <input checked="" type="checkbox"/></li> <li>■ <input type="checkbox"/></li> </ul>								
2c 3/2b	1m	<p>Award <b>ONE</b> mark for an indication that the rain will become solid or will change to snow or hail:</p> <ul style="list-style-type: none"> <li>■ it will freeze</li> <li>■ it will turn into snow/hail/ice</li> <li>■ it will solidify.</li> </ul>		<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ the rain/water will cool down [given].</li> </ul> <p><b>Do not</b> give credit for an insufficient response that is ambiguous:</p> <ul style="list-style-type: none"> <li>■ the water becomes hard.</li> </ul>						

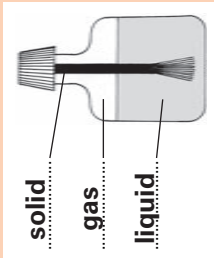
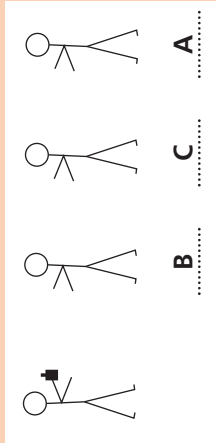
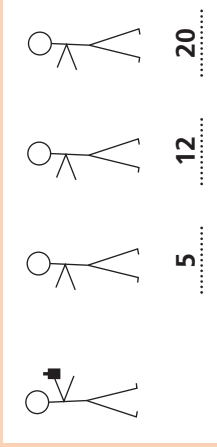
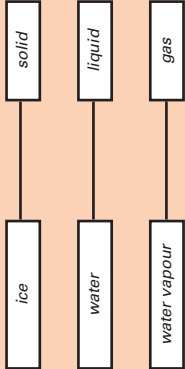
### Test B question 3: Magnets

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>3a</b> 4/2a</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for <b>either</b> of the following:</p> <ul style="list-style-type: none"> <li>■ iron <b>or</b></li> <li>■ steel.</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>■ nickel</li> <li>■ cobalt</li> <li>■ nickel/cobalt/iron/steel alloys.</li> </ul>		<p><b>Do not</b> give credit for an insufficient response that does not name a metal:</p> <ul style="list-style-type: none"> <li>■ a magnetic metal</li> <li>■ a metal that is attracted to a magnet.</li> </ul>
<p><b>3b</b> 1/2h</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for a correctly drawn bar to 60 pieces of paper for magnet C:</p> 	<p><b>ONE</b> mark may be awarded for an unambiguous indication of 60 pieces of paper for magnet C, such as a line drawn at 60.</p> <p><b>ONE</b> mark may be awarded for a bar that is drawn no more than 2mm above or below the line indicating 60 pieces of paper.</p>	

### Test B question 3: Magnets (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
3c i 1/2j	1m	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ <input type="checkbox"/></li> <li>■ <input type="checkbox"/></li> <li>■ D <input checked="" type="checkbox"/></li> </ul>		
3c ii 1/2j	1m	<p>Award <b>ONE</b> mark for an indication that the strongest magnet has the most pieces of paper between the magnet and the nail:</p> <ul style="list-style-type: none"> <li>■ magnet D worked through the most pieces of paper</li> <li>■ magnet D/it had 100 pieces of paper which was more than all the others</li> <li>■ the stronger the magnet the more pieces of paper between the magnet and the nail.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response that recognises that the strongest magnet attracts the nail through 100 pieces of paper but does not explicitly say this was the largest amount of paper.</p> <ul style="list-style-type: none"> <li>■ (it held) 100 pieces of paper.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response where the highest bar on the chart is not interpreted to mean largest amount of paper:</p> <ul style="list-style-type: none"> <li>■ the bigger the result on the chart, the stronger the magnet</li> <li>■ the bar is highest</li> <li>■ the number is more</li> <li>■ it went up to 100.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ the number of pieces of paper tells you.</li> </ul>

## Test B question 4: Solids, liquids and gases

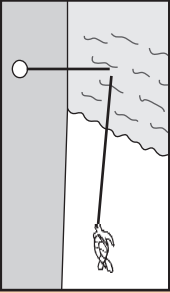
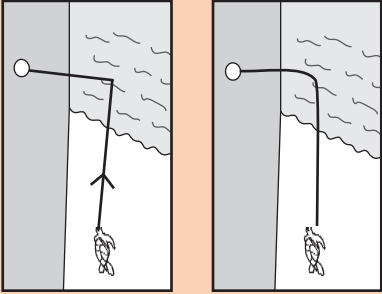
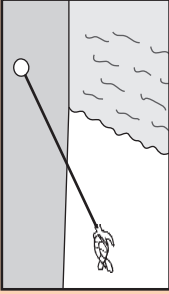
Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>4a</b> 3/1e</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for <b>all three</b> parts of the bottle labelled correctly:</p> 		
<p><b>4b</b> 1/2/</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for:</p> 		<p><b>Do not</b> give credit for an insufficient response that does not identify each child but only gives the correct times taken to smell the varnish:</p> 
<p><b>4c</b> 3/2b,d</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for:</p> 		



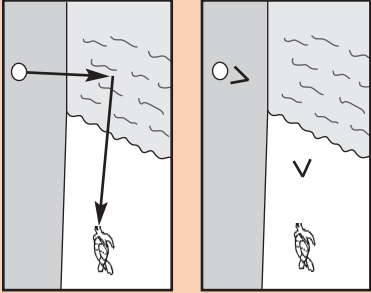
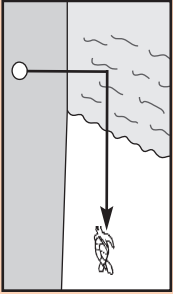
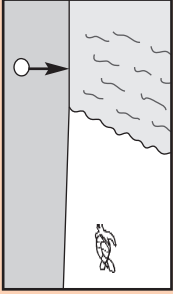
**Test B question 4: Solids, liquids and gases (continued)**

Question	Mark	Requirements	Allowable answers	Additional guidance																				
<p><b>4d</b> 3/1e 3/2d</p>	<p><b>2m</b></p> <p style="text-align: center;"><b>or</b></p> <p><b>1m</b></p>	<p>Award <b>TWO</b> marks for <b>all four</b> rows correctly completed:</p> <table border="1" data-bbox="346 1294 671 1749"> <thead> <tr> <th>Question</th> <th>Solid</th> <th>Liquid</th> <th>Gas</th> </tr> </thead> <tbody> <tr> <td>Which forms during evaporation?</td> <td></td> <td></td> <td>✓</td> </tr> <tr> <td>Which keeps its own shape?</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>Which forms during condensation?</td> <td></td> <td>✓</td> <td></td> </tr> <tr> <td>Which spreads out to fill any sized container?</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 two</b> or <b>three</b> rows correct.</p>	Question	Solid	Liquid	Gas	Which forms during evaporation?			✓	Which keeps its own shape?	✓			Which forms during condensation?		✓		Which spreads out to fill any sized container?			✓		
Question	Solid	Liquid	Gas																					
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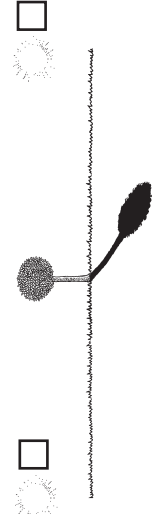
## Test B question 5: Sea turtles

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>5a</b> 2/1a</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ reproduction <input checked="" type="checkbox"/></li> <li>■ <input type="checkbox"/></li> <li>■ <input type="checkbox"/></li> <li>■ <input type="checkbox"/></li> </ul>		
<p><b>5b</b> 2/5b 4/3d</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for a response that indicates the predators will find it more difficult to see the turtles:</p> <ul style="list-style-type: none"> <li>■ it is dark so predators are less likely to see them</li> <li>■ they are hidden (by the darkness)</li> <li>■ they cannot be seen.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response implying the predators will not be present for the hatching:</p> <ul style="list-style-type: none"> <li>■ the predators are asleep</li> <li>■ the predators will come in the morning.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ they will not get eaten [given]</li> <li>■ because it is dark [given]</li> <li>■ predators will not hunt them.</li> </ul>
<p><b>5c i</b> 4/3c 4/3a,d</p>	<p><b>1m</b></p>	<p>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 Moon to the sea and from the sea to the turtle's eyes/body:</p> 	<p><b>ONE</b> mark may be awarded for one continuous reflected or curved line even if the arrowhead is incorrect or missing:</p> 	<p><b>Do not</b> give credit for an insufficient response where only one line is drawn:</p> 

Test B question 5: Sea turtles (continued)

<p><b>Question</b></p> <p>5c ii 4/3d 4/3a, c</p>	<p><b>Mark</b></p> <p>1m</p>	<p><b>Requirements</b></p> <p>Award <b>ONE</b> mark for <b>two</b> arrowheads showing the direction of light travel from the Moon to the sea and from the sea to the turtle:</p> 	<p><b>Allowable answers</b></p> <p><b>ONE</b> mark may be awarded for a correct arrowhead on a continuous reflected line:</p> 	<p><b>Additional guidance</b></p> <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> 
<p><b>5d</b> 2/5a</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for <b>both</b> correct boxes ticked:</p> <ul style="list-style-type: none"> <li>■ turn off street lights <input checked="" type="checkbox"/> in towns</li> <li>■ stop cars driving <input checked="" type="checkbox"/> near the beach</li> </ul>		

Test B question 6: Tree shadow

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>6a</b> 4/3a,b</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <input type="checkbox"/>   </div> <div style="text-align: center;"> <input checked="" type="checkbox"/>   </div> <div style="text-align: center;"> <input type="checkbox"/>   </div> </div> <div style="text-align: center; margin-top: 10px;">  </div>		
<p><b>6b</b> 4/3b</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for an awareness that light cannot pass through the tree. The response must make reference to the blocked light or opacity:</p> <ul style="list-style-type: none"> <li>■ the tree is opaque</li> <li>■ the light cannot pass through the tree</li> <li>■ the tree stops/blocks the light</li> <li>■ the light is blocked.</li> </ul>		<p><b>Do not</b> give credit for an insufficient response that does not necessarily explain shadow formation:</p> <ul style="list-style-type: none"> <li>■ the light goes round the tree</li> <li>■ light travels in straight lines</li> <li>■ the light cannot get past the tree [it passes on either side]</li> <li>■ the tree is solid [a solid object can be transparent]</li> <li>■ the tree is in the way of the light [does not necessarily mean it is blocking the light]</li> <li>■ light cannot get behind the tree</li> <li>■ the sun cannot get through the tree [does not refer to light].</li> </ul>
<p><b>6c</b> 4/4b,c</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ <input type="checkbox"/> The Earth spins on its axis. <input checked="" type="checkbox"/></li> <li>■ <input type="checkbox"/> <input type="checkbox"/></li> </ul>		

## Test B question 6: Tree shadow (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
<b>6d</b> 4/4b,c 1/2j	<b>1m</b>	Award <b>ONE</b> mark for an indication that the Sun has set: <ul style="list-style-type: none"> <li>the Sun has set</li> <li>it is night (time)</li> <li>the Earth has rotated and now the Sun is below the horizon.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>the Sun has gone down/in</li> <li>there is a cloud in front of the Sun</li> <li>there is no Sun shining</li> <li>shadows only form when there is light</li> <li>it is too dark (for a shadow to form)</li> <li>there is no light (to form a shadow).</li> </ul>	<b>Do not</b> give credit for a response that includes incorrect science indicating explicitly that the Sun moves or has disappeared: <ul style="list-style-type: none"> <li>the Sun has moved away</li> <li>there is no Sun.</li> </ul> <b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>the Earth has spun/rotated around [it may have spun completely around]</li> <li>the Moon is out</li> <li>it was too late.</li> </ul>
<b>6e</b> 1/2j	<b>1m</b>	Award <b>ONE</b> mark for any time between 12.45pm and 1.15pm inclusive: <ul style="list-style-type: none"> <li>1 pm.</li> </ul>	<b>ONE</b> mark may be awarded for a correct response that does not agree with the 'pm' units: <ul style="list-style-type: none"> <li>13:10 [given in 24-hour time]</li> <li>1 o'clock.</li> </ul>	

## Test B question 7: Travelling sounds

Question	Mark	Requirements	Allowable answers	Additional guidance
<b>7a</b> 1/2j	<b>1m</b>	Award <b>ONE</b> mark for identifying the number of materials tested: <ul style="list-style-type: none"> <li>■ 3.</li> </ul>		<b>Do not</b> give credit for an insufficient response that names the three materials: <ul style="list-style-type: none"> <li>■ cotton, nylon, wire.</li> </ul>
<b>7b</b> 1/2d	<b>1m</b>	Award <b>ONE</b> mark for identifying the dependent variable (DV): <ul style="list-style-type: none"> <li>■ whether or not the sound could be heard (through the cups)</li> <li>■ whether the sound travels through different materials</li> <li>■ the volume of the sound</li> <li>■ how much sound could be heard</li> <li>■ if she could hear them.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>■ sound</li> <li>■ I can hear you</li> <li>■ hearing (sound).</li> </ul>	<b>Do not</b> give credit for a response that includes incorrect science implying another factor has been measured: <ul style="list-style-type: none"> <li>■ plastic cups</li> <li>■ materials.</li> </ul> <p><b>Do not</b> give credit for an insufficient response that identifies a question for an alternative investigation:  <ul style="list-style-type: none"> <li>■ which material does the sound travel through?</li> <li>■ how long does it take to hear the sound?</li> </ul> </p>
<b>7c</b> 1/2d	<b>2m</b>  <b>or</b>  <b>1m</b>	Award <b>TWO</b> marks for identifying <b>any two</b> of the independent variables (IV) in the investigation: <ul style="list-style-type: none"> <li>■ the length (of cotton, nylon and wire)</li> <li>■ the type of material/string/line.</li> </ul> <p>If you are unable to award two marks, award <b>ONE</b> mark for identifying <b>any one</b> IV in the investigation.</p>	Marks may be awarded for: <ul style="list-style-type: none"> <li>■ materials/fabric</li> <li>■ amount of material.</li> </ul>	<b>Do not</b> give credit for an insufficient response: <ul style="list-style-type: none"> <li>■ the sound</li> <li>■ the line [could refer to length or tightness]</li> <li>■ the cups</li> <li>■ tightness/looseness/straightness [given]</li> <li>■ thickness.</li> </ul> <p><b>Do not</b> give credit for an insufficient response that identifies a factor Jill may have changed but did not record in her notes:  <ul style="list-style-type: none"> <li>■ volume</li> <li>■ amount of sound.</li> </ul> <p><b>Do not</b> give credit for a second response that is a restatement or repetition of the first.</p> </p>

## Test B question 7: Travelling sounds (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
7d 1/2a	1m	Award <b>ONE</b> mark for recognising the importance of varying only the IV: <ul style="list-style-type: none"> <li>so you would know which factor had an effect</li> <li>because she would not know what had an effect</li> <li>if you change everything it will not be a fair test</li> <li>to make the test fair</li> <li>so you can compare the results.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>so you know which one is best</li> <li>the other things might influence the results</li> <li>so you can see which one works</li> <li>so you can make sure your conclusion is true.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>so you do not get confused/mixed up</li> <li>so it does not get too complicated</li> <li>so it is not a fair test.</li> </ul> <p><b>Do not</b> give credit for an insufficient response that refers to the accuracy of the results:</p> <ul style="list-style-type: none"> <li>to get the correct results</li> <li>so you can have the right result</li> <li>in case you make a mistake</li> <li>you might go wrong</li> <li>so you can be accurate.</li> </ul>
7e 1/2j	1m	Award <b>ONE</b> mark for a response recognising that the results are not referred to or interpreted: <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 explain what was compared</li> <li>it does not mention the results.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response which implies there is not enough information or recognises that 'best' is not defined:</p> <ul style="list-style-type: none"> <li>it does not tell us why (it is best)</li> <li>there is not enough detail</li> <li>no information</li> <li>she needs more information</li> <li>there is no evidence.</li> </ul> <p><b>ONE</b> mark may be awarded for a response indicating that the conclusion does not describe or interpret all the results of the investigation:</p> <ul style="list-style-type: none"> <li>it does not tell you about wire or nylon</li> <li>she can hear through two of them</li> <li>wire worked too.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response stating a conclusion:</p> <ul style="list-style-type: none"> <li>cotton was the best material for sound to travel through.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>there are no scientific words in it</li> <li>it was very short</li> <li>it is just an opinion.</li> </ul> <p><b>Do not</b> give credit for an insufficient response indicating that the initial investigation was flawed:</p> <ul style="list-style-type: none"> <li>she changed three things instead of one.</li> </ul>





**Test B question 8: Space station (continued)**

Question	Mark	Requirements	Allowable answers	Additional guidance
<p><b>8d</b> 2/3a</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for:</p> <ul style="list-style-type: none"> <li>■ water and nutrients <input checked="" type="checkbox"/></li> <li><input type="checkbox"/></li> <li><input type="checkbox"/></li> </ul>		
<p><b>8e</b> 2/3c</p>	<p><b>1m</b></p>	<p>Award <b>ONE</b> mark for a response indicating that the root anchors the plant in the soil:</p> <ul style="list-style-type: none"> <li>■ the roots anchor the plant</li> <li>■ they hold it in place.</li> </ul>	<p><b>ONE</b> mark may be awarded for a response indicating a supporting function of the roots which may work in conjunction with the stem:</p> <ul style="list-style-type: none"> <li>■ they support/stabilise the plant</li> <li>■ they hold/keep the plant down/in place</li> <li>■ they make the plant stand straight/upright.</li> </ul> <p><b>ONE</b> mark may be awarded for a response indicating that the roots could store water:</p> <ul style="list-style-type: none"> <li>■ the roots can hold water for the plant when it is dry.</li> </ul>	<p><b>Do not</b> give credit for a response that includes incorrect science:</p> <ul style="list-style-type: none"> <li>■ the roots take up food.</li> </ul> <p><b>Do not</b> give credit for an insufficient response indicating that roots absorb water/nutrients from the soil.</p>

## Test B question 9: Periwinkles

Question	Mark	Requirements	Allowable answers	Additional guidance
9a 1/2f	1m	Award <b>ONE</b> mark for a response giving a difference between the shells of the two periwinkles: <ul style="list-style-type: none"> <li>■ A is a lighter/different colour</li> <li>■ the shape (of shell)</li> <li>■ the spirals are in different places on the shells.</li> </ul>	<b>ONE</b> mark may be awarded for a response that refers to shell A as 'it': <ul style="list-style-type: none"> <li>■ it has a lighter shell.</li> </ul>	<b>Do not</b> give credit for an insufficient response that does not describe how the shells are different: <ul style="list-style-type: none"> <li>■ it is a different size [given]</li> <li>■ it is a different type (of shell).</li> </ul> <p><b>Do not</b> give credit for an insufficient response that is correct for shell B but does not explicitly refer to shell B:</p> <ul style="list-style-type: none"> <li>■ it has a darker shell.</li> </ul>
9b 2/2e 2/5b	1m	Award <b>ONE</b> mark for a response that indicates the shell protects or supports the periwinkle's body: <ul style="list-style-type: none"> <li>■ the shell protects the periwinkle</li> <li>■ it supports the periwinkle.</li> </ul>	<b>ONE</b> mark may be awarded for: <ul style="list-style-type: none"> <li>■ it stops the periwinkle drying out</li> <li>■ it keeps the periwinkle safe</li> <li>■ it shelters the periwinkle</li> <li>■ it helps them to hide (from predators).</li> </ul> <p><b>ONE</b> mark may be awarded for indicating why it is useful to have a shell that is hard or difficult to break and implies protection:</p> <ul style="list-style-type: none"> <li>■ the shell will not break when a crab tries to crack it open.</li> </ul>	<b>Do not</b> give credit for a response that includes incorrect science: <ul style="list-style-type: none"> <li>■ it helps the periwinkle to move [given that it does not].</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ the shell/it is hard/keeps it warm</li> <li>■ it cannot break easily [gives only a property of the shell]</li> <li>■ the shell is the periwinkle's house</li> <li>■ so the periwinkle does not get wet/rained on.</li> </ul>
9c 1/2g	1m	Award <b>ONE</b> mark for a response that indicates an average size is needed <b>or</b> that the reliability of his results/test/ conclusions will be improved: <ul style="list-style-type: none"> <li>■ if he measures only one or two shells, they may be smaller than the average</li> <li>■ because if he only measured one/a few periwinkle shells it/they might be bigger than the others and then his results will be useless</li> <li>■ to check the results.</li> </ul>	<b>ONE</b> mark may be awarded for a response that indicates there is a variation in (the size/type of) the periwinkle shells in each area: <ul style="list-style-type: none"> <li>■ to see if they are all different/all the same (size or age)</li> <li>■ there may be more than one type of periwinkle.</li> </ul> <p><b>ONE</b> mark may be awarded for a response indicating that the accuracy of the test would improve:</p> <ul style="list-style-type: none"> <li>■ the average will be more accurate.</li> </ul>	<b>Do not</b> give credit for a response that includes incorrect science: <ul style="list-style-type: none"> <li>■ to make the results different.</li> </ul> <p><b>Do not</b> give credit for an insufficient response indicating that the shells from one place should be the same:</p> <ul style="list-style-type: none"> <li>■ to make sure they are the same.</li> </ul> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>■ to get the right/correct results</li> <li>■ to see if the periwinkles in the different areas are different.</li> </ul>

## Test B question 9: Periwinkles (continued)

Question	Mark	Requirements	Allowable answers	Additional guidance
9d 2/5a	1m	<p>Award <b>ONE</b> mark for an indication that the periwinkles may not be able to survive in a different place:</p> <ul style="list-style-type: none"> <li>the periwinkles may not be adapted/ suited to living in a different place</li> <li>the periwinkles may not live if they are put somewhere new.</li> </ul> <p>❖ <b>Give credit</b> for a correct response that goes beyond the key stage 2 programme of study, implying that an environment will be adversely affected by the introduction of a new species:</p> <ul style="list-style-type: none"> <li>it may deplete the environment/food chain of existing organisms.</li> </ul>	<p><b>ONE</b> mark may be awarded for:</p> <ul style="list-style-type: none"> <li>so they do not die</li> <li>they will be safer in their own habitat</li> <li>they are used to their habitat/home/ where they live</li> <li>it is their habitat</li> <li>the conditions could be different.</li> </ul>	<p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>it is cruel not to put them back [does not explain why it is cruel]</li> <li>it is where they live [given]</li> <li>it is their home</li> <li>it is where their family is</li> <li>so they do not get lost</li> <li>because they will die [need to qualify].</li> </ul>
9e 3/2d 1/2i	1m	<p>Award <b>ONE</b> mark for an indication that (some of) the rockpool water has evaporated:</p> <ul style="list-style-type: none"> <li>some of the water/it evaporated</li> <li>the water has changed to water vapour.</li> </ul>		<p><b>Do not</b> give credit for an insufficient response indicating that the water has leaked or seeped out of the pool [given that it has not].</p> <p><b>Do not</b> give credit for an insufficient response:</p> <ul style="list-style-type: none"> <li>there is less water</li> <li>the water is lower</li> <li>the crab drank it.</li> </ul>



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