

# Science Mark Scheme

## Test A

2001

1. (a) Award **ONE** mark for an upward arrow drawn anywhere on the diagram: 1 m  
↑
- (b) Award **ONE** mark for a recognition that the paper clip will fall: 1 m  
it will go down;  
it lands on the table

*Do not give credit for an insufficient response:*

*it will stay on the string;  
the thread will drop down.*

- (c) Award **ONE** mark for: 1 m  
   
steel pin

- (d) Award **ONE** mark for an indication that like poles repel: 1 m
- magnets repel each other when you hold two like poles together;
  - like poles repel;
  - he must have put North to North/South to South;  
he put the same ends/poles close to each other;  
he put the same/red ends together.

**Allow:**

- magnets repel each other.

*Do not give credit for an insufficient response:*

- *the magnetic force pushes the other magnet away [repetition of stem];*
- *he must have put red to red [no reference to ends/poles];*
- *they do not attract [this does not necessarily imply repulsion].*

2. (a) Award **ONE** mark for: 1 m
- Ian.

- (b) Award **ONE** mark for an understanding that brushing removes plaque/food/bacteria/acid/sugar from teeth: 1m

- it does not let sugar build up;
- it (helps) get rid of
- bacteria/plaque/acid.

**Allow:**

- it makes the teeth clean;
- the fluoride in the toothpaste prevents tooth decay.

*Do not give credit for a response that includes incorrect science:*

- it brushes the decay off;
- use toothpaste.

*Do not give credit for an insufficient response that does not show*

*awareness of the cause of decay:*

- it makes teeth whiter/brighter;
- it makes the teeth healthy;
- it fights/stops bacteria.

- (c) Award **ONE** mark for: 1m

eat less sugar

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3. (a) Award **ONE** mark for an understanding that smoke or tar from the cigarette will be drawn into the bottle with the air: 1m

- smoke/fumes;
- tar.

**Allow:**

- nicotine;
- soot.

*Do not give credit for a response that includes incorrect science:*

- cotton wool/plasticine;
- ash;
- tobacco.

*Do not give credit for an insufficient response:*

- drugs;
- gas;
- carbon dioxide;
- dirt/black stuff.

- (b) Award **ONE** mark for: 1 m
- lungs.

**Do not** give credit for:

- lips;
- mouth;
- throat;

*[these are represented by other parts of the model, such as the plasticine and tube].*

- (c) Award **ONE** mark for an understanding that organs of the body are damaged and general health is impaired, possibly leading to death: 1 m

- you can get (lung) cancer;
- it gives you heart disease/heart attack;
- it can damage your lungs;
- it can impair your breathing;
- it can give you a bad cough.

**Allow:**

- it makes your lungs tarry;
- it causes addiction;
- it can kill you.

**Do not** give credit for an insufficient response that restates information given:

- it stops you being healthy;
- it makes you ill;
- it makes your lungs black;
- it stops your heart.

4. (a) Award **ONE** mark for an understanding that light cannot pass through opaque objects. 1 m

The response **must** make reference to **light** or **opacity**:

- the chair blocks (some of) the light (from the lamp);
- light cannot pass through the chair;
- the chair is opaque.

**Allow:**

- the light is blocked.

**Do not** give credit for a response that includes incorrect science:

- light goes around the chair.

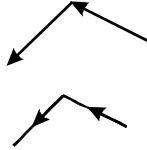
**Do not** give credit for an insufficient response that does not explain shadow formation:

- light cannot get past the chair [it passes on either side];
- light travels in straight lines [does not explain];
- the light cannot bend around the chair.

(b) Award **ONE** mark for: 1 m  
shiny

- 

(c) Award **ONE** mark for arrowheads drawn in the following directions: 1 m



*Do not give credit if only one arrowhead is drawn correctly.*

5. (a) Award **ONE** mark for: 1 m  
• melting.

*Do not give credit for an insufficient response:*

- defrosting.

(b) Award **ONE** mark for an understanding that heat from their hands causes the ice to melt: 1 m

- heat from their hands;
- their hands are warm;
- their body heat.

**Allow:**

- warm air in the room;
- room temperature;
- heat.

*Do not give credit for an insufficient response:*

- their hands;
- temperature [this is not a synonym for heat];
- air.

- (c) Award **ONE** mark for an unambiguous indication of Gina's desk: 1m
- Gina's desk.
- (d) (i) Award **ONE** mark for an unambiguous indication of Marcel's desk: 1m
- Marcel's desk.
- (ii) Award **ONE** mark for an indication that there was **most** liquid/**least** ice in the ice stick in the warmest place: 1m
- the ice stick there gave the greatest volume of liquid after half an hour;
  - the ice stick had most liquid in it;
  - there was least ice left;
  - the ice stick melted fastest.

*Do not give credit for an insufficient response that refers to values in the table*

- *there was 16 m<sup>3</sup> of water;*
- *Marcel had the highest number;*
- *I know by the volume of liquid.*

*Do not give credit for an insufficient response:*

- *there was not much ice left [this could also apply to ice sticks left on other desks];*
- *there was no ice left [the original volume of the ice sticks is not given in the question];*
- *there was a large volume of liquid [not exclusive to Marcel's ice stick].*

6. (a) (i) Award **ONE** mark for: 1m
- **A:** bladder wrack.
- (ii) Award **ONE** mark for: 1m
- **B:** oarweed.
- (b) Award **ONE** mark for: 1m
- dulse.

- (c) Award **ONE** mark for an indication that the flexibility of the stem reduces the likelihood of damage: 1 m
- it stops it breaking (when the waves pull it);
  - it prevents the seaweed being pulled out;
  - the seaweed does not get uprooted.

**Allow:**

- a rigid/straight stem would snap.

*Do not give credit for an insufficient response:*

- it moves;
  - the stem moves in the water;
  - it bends in the waves;
- [these do not refer to potential damage or lack of resistance to the action of the waves].*

- (d) Award **ONE** mark for: 1 m
- roots.

- (e) Award **ONE** mark for: 1 m
- the leaves.

**Give credit** for a correct response that goes beyond the key stage 2 programme of study:

- the stem.

7. (a) Award **ONE** mark for: 1 m
- 800.

**Allow:**

- 790–810 inclusive.

*Do not give credit for a response with incorrect units.*

- (b) Award **ONE** mark for: 1 m

- It conducts heat well.

- (c) Award **ONE** mark for a **comparative** response indicating that both wood and metal conduct heat, but at different rates: 1 m

- heat travels more easily through metal than through wood;
- the heat does not travel through the wood as easily;
- metal is a better conductor;
- wood is a poorer conductor.

**Allow:** a reference to both wood and metal in **absolute** terms:

- metal conducts heat, but wood does not;
- the metal conducts heat, but wood is an insulator.

*Do not give credit for an insufficient response which indicates that the metal is over the heat but the wood is not.*

*Do not give credit for a response using an incorrect synonym for conduction:*

- metal absorbs the heat better.

*Do not give credit for an insufficient response that does not compare or refer to both materials:*

- wood is a poor conductor;
- wood does not conduct heat;
- metal is a conductor;
- wood is an insulator.

(d) Award **ONE** mark for any of the following immediate safety hazards identified: 1 m

- the heating element on the cooker (which gets very hot);
- the flames/fire from a (gas) cooker;
- the boiling water (as the rice cooks);
- steam (rising) from the saucepan.

**Allow:**

- a metal spoon could get hot (and burn you);
- the rice.

*Do not give credit for a response that identifies safety hazards which are not related to the process of cooking:*

- they might slip on the floor;
- they might break a glass jar;
- they might leave the gas turned on.

*Do not give credit for:*

- saucepan [given].

8. (a) Award **ONE** mark for an indication that the hedgehog's spines protect it: 1 m

- spines;
- prickles;
- spikes.

(b) Award **ONE** mark for: 1 m

- 
- nutrition
-

- (c) Award **ONE** mark for: 1 m  
   
 Seeds are dispersed in autumn.
- (d) Award **ONE** mark for: 1 m  
 • June.
9. (a) Award **ONE** mark for **all three** liquids correctly identified [in any order]: 1 m  
 • water; **and**  
 oil; **and**  
 vinegar.
- (b) Award **ONE** mark for an unambiguous indication of Bag A: 1 m  
 • Bag A;  
 • brown sugar and water.
- (c) Award **ONE** mark for an understanding that the fizzing shows that a gas or new material is being made (that is taking up more space): 1 m  
 • bubbles of gas have been made;  
 • gas is being given off;  
 • because the bicarbonate and vinegar react.
- Allow:**  
 • the gas spreads out.
- Do not** give credit for a response that includes incorrect science:*
- *there is more air [a gas is produced but this is not air].*
- Do not** give credit for an incorrect response that describes a characteristic of one material, rather than the reaction between two materials:*
- *soda is fizzy.*
- Do not** give credit for an insufficient response:*
- *it is fizzing [given];*
  - *it is bubbling [no indication of a new material being made].*
- (d) Award **ONE** mark for an unambiguous indication of Bag C: 1 m  
 • Bag C;  
 • bicarbonate of soda and vinegar.



10. (a) Award **ONE** mark for: 1m

- weight.

**Allow:**

- gravity.

*Do not give credit for an insufficient response:*

- heaviness [a lighter object would act in the same way].

(b) (i)(ii) Award **TWO** marks for a general comparison describing the relationship between the **TWO** variables of length of string and time taken to swing: 2m

- the longer the string length, the longer the time taken for the pendulum to swing;
- the longer the string, the longer it swings;
- the shorter the string length, the quicker the time taken to swing.

**Allow:**

- the shorter the string, the quicker it swings.

Award **ONE** mark for two specific comparisons describing the relationship: 1m

- the longest string took the most time and the shortest string took the least time.

Award **ONE** mark for a single comparison of the variables:

- the longest string took the most time;
- the shortest string was quickest.

*Do not give credit for a response that changes a variable:*

- the longer the string, the bigger the distance travelled.

**or**

*Do not give credit for an insufficient response:*

- the longer it swings, the longer the time.

(c) Award **ONE** mark for an unambiguous indication of the fourth point: 1m

