

# Science SAT

## Test B Answers

2005

1. (a) Award **ONE** mark for an indication that the heartbeat will be faster: 1
- it pumps more so blood goes around his body faster;
  - his heart rate increases;
  - his heartbeat is faster.

*Give credit for a correct response that goes beyond the key stage 2 programme of study indicating that the heart pumps faster causing an increase in blood flow:*

- more blood is pumped with each beat;
- it pumps more blood around his body.

*ONE mark may be awarded for an implicit reference to the increased rate of Joe's heartbeat:*

- it is quicker;
- it makes it go fast;
- his heart pumps more.

*ONE mark may be awarded for a response indicating that a greater quantity of blood flows with each heartbeat.*

*Do not give credit for a response that includes incorrect science implying there is more blood in his body when he exercises:*

- there is more blood to be pumped around his body.

*Do not give credit for an insufficient response:*

- *his heartbeat is louder [given];*
- *his heartbeat is harder/stronger[ambiguous as to whether this will cause a louder or faster heartbeat];*
- *his heartbeat changed.*

*Do not give credit for an insufficient response that indicates blood will move faster but does not indicate that this is due to an increased heartbeat rate:*

- *blood is going round the body faster.*

- (b) Award **ONE** mark for both responses correct [in either order]: 1
- B and C.

**[2]**

2. (a) Award **ONE** mark for identifying the appropriate measuring equipment: 1
- ruler;
  - metre rule;
  - tape measure.

*ONE mark may be awarded for:*

- *measurement stick;*
- *metre stick.*

*Do not give credit for an insufficient response which could not be used to quantify distance:*

- *a piece of string.*

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

- (c) Award **ONE** mark for identifying the independent variable (IV): 1
- position of the light
  -

- (d) Award **ONE** mark for identifying the dependent variable (DV): 1
- shadow
  -

- (e) Award **TWO** marks for **all three** ticks correctly placed: 2
- position of the puppet
  - position of the screen  size of the puppet

If you are unable to award two marks, award **ONE** mark for **any two** correct. 1

**[6]**

3. (a) Award **ONE** mark for a feature of the octopus which helps it to catch its prey: 1
- it has suckers (to help it catch hold of its prey);
  - its (bendy/flexible/long/many) legs/arms/tentacles;
  - an octopus has eight tentacles with suckers on them.
- (b) Award **ONE** mark for an indication of camouflage for protection (from predators): 1
- so its predators cannot see it;
  - so an eel is less likely to see it;
  - it camouflages itself;
  - it cannot be seen;
  - so it can hide from predators (more easily).

***ONE** mark may be awarded for a response referring to being caught/eaten rather than to being hidden:*

- *it is less likely to be eaten;*
- *the eel will not eat it.*

***ONE** mark may be awarded for a response referring to camouflage reducing the likelihood that the octopus could be hurt by its prey:*

- *it is camouflaged so it cannot be seen by its prey;*
- *the crab might not hurt it.*

***Do not** give credit for an insufficient response:*

- *changing colour protects it [given].*

- (c) Award **TWO** marks for identifying the **three** correct animals: 2
- |           |           |           |
|-----------|-----------|-----------|
| terrapin  | dogfish   | dog whelk |
| jellyfish | slow worm | earthworm |

**or**

If you are unable to award two marks, award **ONE** mark for identifying **any two** correct animals. 1

- (d) Award **TWO** marks for an unambiguous indication of **any three** of the following facts [given in any order]: 2
- it lives in water;
  - it has a skeleton (inside);
  - it has a hard shell;
  - it is an animal.

***ONE** mark may be awarded for:*

- *it lives in the ocean/sea.*

If you are unable to award two marks, award **ONE** mark for **any two** facts correctly identified. 1

**[6]**

4. (a) Award **ONE** mark for: 1
- by observing
  -

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

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

- (d) Award **ONE** mark for: 1
- do **not** agree

**AND**

recognising that some solids are soft or not hard:

- there are examples of solids which are soft (so all solids cannot be hard);

**OR**

for giving an example of a soft solid from the question used to challenge the claim that solids are always hard:

- cotton wool is a solid but it is soft.

*ONE mark may be awarded for:*

- do **not** agree

**AND**

*describing a different soft material that is solid:*

- *sponge is soft;*

**OR**

*for recognising powders are solid and suggesting these are not hard:*

- *salt is a solid but it is not hard.*

*Do not give credit for an insufficient response:*

- *solids can melt;*
- *solids can dissolve.*

**[4]**

5. (a) (i) Award **ONE** mark for recognising that electricity does not travel through plastic: 1

*The bulb has not lit because the plastic spoon...*

- is an insulator;
- is not a (good) conductor (of electricity);
- stops the electricity flowing;
- does not let electricity through.

*ONE mark may be awarded for a response suggesting that the circuit would work if the spoon were metal:*

*The bulb has not lit because the plastic spoon...*

- *is not metal.*

*Do not give credit for an insufficient response:*

- *is plastic [given];*
- *stops it going through [ambiguous as to what 'it' refers to].*

- (ii) Award **ONE** mark for recognising the switch is open causing a break in the circuit: 1

*The bulb has not lit because...*

- the switch is open/not closed/off;
- there is a gap/break in the circuit;
- the circuit is incomplete.

**ONE** mark may be awarded for:

*The bulb has not lit because...*

- *the clip is not attached to the pin;*
- *the switch is not connected.*

**Do not** give credit for an insufficient response describing the equipment as faulty:

- *the switch is not right.*

**Do not** give credit for an insufficient response:

- *it is not connected/joined(properly).*

- (iii) Award **ONE** mark for recognising that (the terminals on) one of the cells is the wrong way round:

1

*The bulb has not lit because...*

- one of the cells is the wrong way round;
- the two positives are together.

**ONE** mark may be awarded for:

*The bulb has not lit because...*

- *the cells are the wrong way round;*
- *the batteries are pointing different ways;*
- *the batteries are pointing toward each other.*

**Do not** give credit for an insufficient response that refers to poles on the cell:

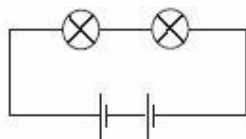
- *the same poles are facing each other [indicates that electricity is being confused with magnetism].*

**Do not** give credit for an insufficient response:

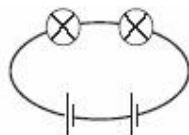
- *the batteries are not connected correctly;*
- *the equipment is faulty;*
- *the cells are facing/pointing the same way.*

- (b) Award **ONE** mark for a complete circuit with the symbols correctly drawn [in any order]:

1



**ONE** mark may be awarded for a non-rectilinear circuit:



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

- circuits containing symbols not given or gaps between components of more than 2mm;
- circuits with extra/fewer components;
- terminals on the cells facing each other;
- circuits with incorrectly drawn components, eg:



(c) Award **TWO** marks for giving **any two** of the following: 2

- add more batteries;
- use cells with a higher voltage;
- use shorter wires;
- make two separate circuits with two batteries in each.

**Give credit** for a correct response that goes beyond the key stage 2 programme of study indicating that wires of less resistance or a parallel circuit could be used:

- use thicker wires;
- use wires of less resistance;
- put the bulbs in a parallel circuit.

or

If you are unable to award two marks, award **ONE** mark for giving **one** correct response. 1

Marks may be awarded for:

- add another/an extra cell;
- use stronger/more powerful/new batteries;
- re-charge the cells;
- make the circuit smaller/shorter.

**Do not** give credit for an insufficient response indicating that a bulb may become brighter if the other one is removed:

- take one bulb away;
- have only one bulb.

**Do not** give credit for an insufficient response:

- use a bigger/different cell [does not indicate an increase in voltage];
- use two cells;
- use a new bulb [both existing bulbs must be brighter];
- use different wires/change the wires;
- use smaller wires [is ambiguous as to whether this is shorter or thinner, the latter of which is incorrect];
- use fewer/less wires [each wire could be longer].

**Do not** give credit for a second response that is a restatement or repetition of the first.

[6]

6. (a) Award **TWO** marks for **any two** of the following: 2

- the type of paper towel in each dish;
- the amount of paper towel;
- the same amount of water;
- the same temperature of water;
- he should water the plants at the same time;
- the type of seeds in each dish;
- the amount of seeds;
- he must use identical dishes;
- observe and record the results of each dish after the same length of time;
- he should keep them all in the dark;
- the light should be the same.

or

If you are unable to award two marks, award **ONE** mark for naming just **one** factor. 1

*Marks may be awarded for:*

- the type/amount of soil;
- paper towel;
- seeds;
- dish;
- time.



**Do not** give credit for a response that includes incorrect science which suggests that the dependent/independent variables are controlled:

- he keeps the temperature the same [independent variable];
- he put them in the same place;
- do not move the seeds during the test.

**Do not** give credit for a second response that is a restatement or repetition of the first:

- 1. seeds; **and**  
2. number of seeds.

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

- 12 seeds.

(c) Award **ONE** mark for an indication that more seeds germinated in the cupboard than in the fridge or shed: 1

- more seeds germinated in the cupboard (than anywhere else);
- this place had the highest number of germinated seeds;
- 39 was the highest amount of seeds to germinate in any place;
- most seeds germinated there.

**ONE** mark may be awarded for an implicit comparison of the data:

- there were 39 in the cupboard, 24 in the shed and 0 in the fridge.

**Do not** give credit for an insufficient response where no comparison is made or no direct evidence is provided:

- 39 seeds germinated in the cupboard;
- the warmest place was the cupboard;
- it is the best place for seeds to germinate;
- the seeds grow/germinate quicker in the cupboard.

(d) Award **ONE** mark for correctly classifying **all three** sentences: 1

*Evan's investigation shows that the temperature affected...*

	True	False	Can't tell
• <i>the length of the stem</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
• <i>the germination of the seeds</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• <i>the colour of the seeds</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**[5]**

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

- filtering;
- filtration.

*ONE mark may be awarded for:*

- filter.

*Do not give credit for an insufficient response:*

- evaporation.

(b) Award **ONE** mark for explaining that sand remains in the filter **and/or** the water passes through:

1

- the water goes through the filter but the sand cannot because it is too big;
- the holes in the filter paper let the water through, but the sand is too big;
- only the water can go through the filter;
- the sand stays in the filter.

*ONE mark may be awarded for a response that recognises that the sand does not dissolve or that the sand has larger particles than the water (and therefore will not go through the filter with the water):*

- because it does not dissolve;
- the particles of sand are larger than the particles of water.

*ONE mark may be awarded for a response that describes the water evaporating to leave the sand behind.*

*Do not give credit for an insufficient response:*

- the sand can be separated because it has large particles [no comparison with water].

(c) (i)(a) Award **ONE** mark for naming the process of separation:

1

- sieving/using a sieve.

*ONE mark may be awarded for:*

- sieve.

*ONE mark may be awarded in 7c ia if sieving is named in part 7c ib and the response to part 7c ia is general or not attempted.*

*ONE mark may be awarded for:*

- blowing/air.

*Do not give credit for a response that includes incorrect science describing filtering with paper:*

- using filter paper.

(b) Award **ONE** mark for a correct description of the sieving process indicating that the flour passes through while the rice stays in the sieve: 1

- *The flour* goes through the sieve.  
*The rice* stays in the sieve;
- *The flour* goes through the holes.  
*The rice* is too big.

***ONE** mark may be awarded for the correct description of blowing the flour away:*

- *The flour gets blown away.*  
*The rice stays.*

***ONE** mark may be awarded for a correct description of sieving if 7c ia is insufficient or incorrect.*

***Do not** give credit for a response that includes incorrect science clearly indicating that a filter is being used:*

- *The flour stays in the filter;*  
*The rice stays in the filter.*

***Do not** give credit for an insufficient response that does **not** describe what happens to **both** the flour and the rice:*

- *The flour... .*  
*The rice stays in the sieve.*

(ii)(a) Award **ONE** mark for naming the process of separation: 1

- using a magnet.

***ONE** mark may be awarded in 7c iia if a 'magnet' is named in part 7c iib **and** the response to 7c iia is general or not attempted.*

(b) Award **ONE** mark for a correct description of the separation indicating that the steel/nails will be attracted to the magnet and the brass/screws will not: 1

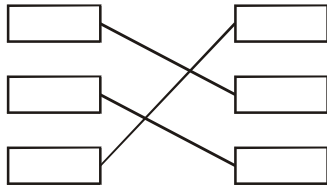
- *The steel nails* will be attracted to the magnet.  
*The brass screws* will not;
- *The steel nails* will go/stick to the magnet.  
*The brass screws* will stay behind.

***Do not** give credit for an insufficient response that does **not** describe what happens to **both** the nails and screws:*

- *The steel nails will be attracted by the magnet.*  
*The brass screws...*

[6]

8. (a) Award **ONE** mark for **all three** times matched to the correct lengths: 1



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

- 
- The Earth spins on its axis.

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

- The Moon is a sphere but appears to change shape during the month.
- 
- 
- 

- (d) Award **TWO** marks for **two arrows** showing the correct path [lines] **and** direction of light [arrowheads]. The arrows must point from the Sun to the Moon and from the Moon to the person/Earth: 2



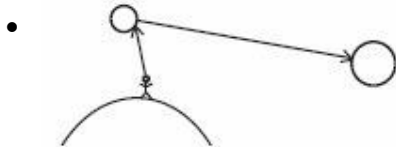
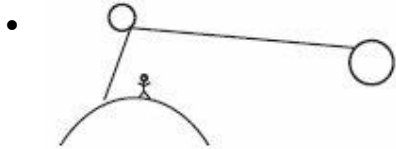
**or**

- If you are unable to award two marks, award **ONE** mark for a response showing **two lines** (or one continuous reflected line) indicating the correct path: 1

**OR**

a response showing **two arrowheads** pointing unambiguously in the correct direction:

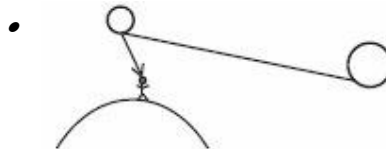
**Correct lines**



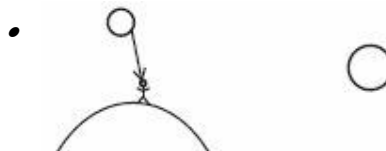
**Correct arrows**



***TWO** marks may be awarded for a response showing one continuous reflected arrow:*



***Do not** give credit for an insufficient response showing only one correct arrow:*



**[5]**