

Science Mark Scheme

Test B

2002

1. (a) Award **TWO** marks for **all four** changes correctly classified: 2

	Yes	No
<i>bread</i>		✓
<i>ice</i>	✓	
<i>paper</i>		✓
• <i>plasticine</i>	✓	

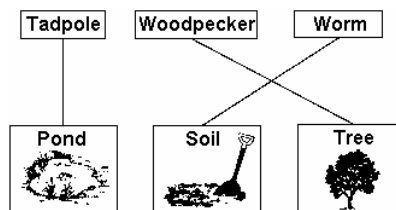
or

If you are unable to award two marks, award **ONE** mark for a correct classification of **three** of the changes.

1

[2]

2. (a) Award **ONE** mark for correct match of **all three**: 1



Allow:

worm linked to pond.

- (b) Award **ONE** mark for an identification that Highland cattle have long, thick fur (which protects them in colder climates): 1

- they have (a) thicker fur/coat;
- they have longer hair;
- their thicker coat traps the air and keeps them warm.

Allow:

- they have more/long hair;
- they have a lot of fur;
- they have (a) thick fur/coat;
- they have a woolly coat.

Do not give credit for an insufficient response:

- they have hair;
- a Highland cow has fur, but a Jersey cow does not;
- their coat traps the air to keep them warm;
- they have horns;
- the Highland cow has thick skin.

(c) Award **ONE** mark for **both** boxes in the row completed correctly, indicating that a Polar Bear has a specific feature for a purpose: 1

- (thick) fur ... to help keep warm;
- a thick layer of fat under its fur ... to keep it warm;
- an acute sense of smell ... to find prey;
- white fur ... to camouflage/hide itself;
- sharp claws ... to catch prey/fish/ food;
- a waterproof coat ... to help in the water;
- sharp teeth ... to eat its food.

Allow:

- it has the ability to swim ... to catch fish;
- limbs ... to help it swim.

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

- large paws ... to help it exert less pressure on the snow;
- a large body .. to help it retain energy;
- small ears ... to minimise heat loss;
- tiny hairs on the soles of its feet... to stop it slipping (on the ice);
- hollow hairs ... for insulation.

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

- large paws to wrap around itself to keep warm;
- thick fur to protect its eyes.

Do not give credit for an insufficient response:

- it does not mind the cold .. so it can live in the Arctic;
[these are not **features** of the animal which aid survival].

Do not give credit when the second box does not match the first box.

[3]

3. (a) Award **ONE** mark for an understanding that the towelling is absorbent: 1

- it soaks up the water;
- it absorbs water (well).

Allow:

- it takes in water.

Do not give credit for an insufficient response:

- it is soft;
- it is like a sponge [does not describe the appropriate property];
- it is flexible.

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

- it sucks up water.

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

- are waterproof.

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

- condensation;
- condensing.

Do not give credit for a response that includes incorrect science referring to the water droplets as steam:

- the water is steam on the window;
- steam.

Do not give credit for an insufficient response:

- cooling [the water can cool but may not necessarily condense];
- liquidise [water liquidises on melting].

(d) Award **ONE** mark for an indication that the water (vapour) is in the air: 1

- water in the air.

Allow:

- water in the atmosphere.

Do not give credit for an insufficient response:

- evaporation/water vapour [does not say where the water is];
- the room.

(e) Award **ONE** mark for an awareness of the dangers caused by water conducting electricity: 1

- you might get an electric shock;
- because water can conduct electricity.

Allow:

- it might short circuit;
- you might be killed;
- it will explode.

Do not give credit for an insufficient response:

- *it might get wet;*
- *it is not safe;*
[repetition of stem];
- *electricity and water do not mix [does not explain the danger];*
- *it could cause a fire;*
- *sparks will fly.*

[5]

4. (a) Award **ONE** mark for an indication that the magnets attract: 1

- they attract each other.

Allow:

- they will join together;
- the magnets will stick to each other;
- the two ends attach;
- they move together;
- they pull together.

(b) Award **ONE** mark for an indication that the magnets repel:

- they repel each other;
- it is repelled;
- the poles/magnets push each other away.

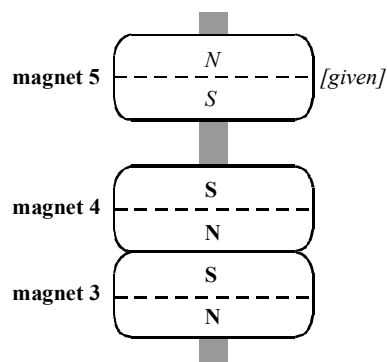
Allow:

- because he has put like poles together;
- magnet 4 pushes away/repels magnet 5.

Do not give credit for an insufficient response:

- *they are the same poles [it is the position that is different];*
- *they do not attract [does not imply that they repel];*
- *they are the wrong way round [does not explain].*

(c) Award **ONE** mark for correct completion of **all four** labels: 1



[3]

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

- thermometer.

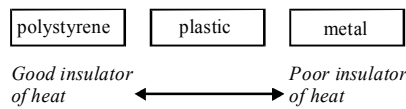
Allow:

- an appropriate electrical/electronic device for measuring temperature:
- temperature sensor.

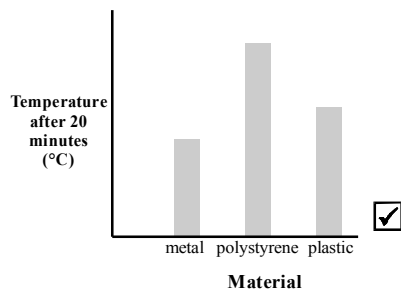
(b) Award **ONE** mark for **both**: 1

- The size of each cup.
- The volume of hot water in each cup.

(c) Award **ONE** mark for placing **all three** materials on the scale in the correct order: 1



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



- **[4]**

6. (a) (i) Award **ONE** mark for an unambiguous indication of: 1

- 5;
- controls the body.

(ii) Award **ONE** mark for an unambiguous indication of: 1

- 2;
- pumps the blood.

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

- the ribs;
- the rib cage.

Allow:

- the sternum;
- the backbone/vertebrae/spine.

Do not give credit for an insufficient response:

- the chest.

- (c) Award **ONE** mark for an indication that she must measure her pulse for a short time [six minutes or less] and multiply to reach an estimate: 1
- she can measure her pulse for one minute and multiply (by 60).

Allow:

a response where 'it' clearly indicates a pulse or a heartbeat:

- measure it for a minute and times by sixty.

Allow:

an indication of measuring the pulse for a short time [six minutes or less] and multiplying, where the calculation is non-specific:

- she can take her pulse for a little while and 'times' it to get the number for one hour.

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

- *she can measure her pulse rate;*
- *she measures her heart rate for one minute;*
- *she measures her heart.*

[4]

7. (a) (i),(ii) Award **TWO** marks for **all three** time periods correct:

2

<i>Movement</i>	<i>Time taken (days)</i>
<i>Earth to spin on its axis.</i>	<ul style="list-style-type: none"> • (day). <p>Allow: an equivalent time period, provided the units are specified:</p> <ul style="list-style-type: none"> • 4 hours; • day and 1 night.
<i>Earth to orbit the Sun.</i>	<p>Answer within the range of 365–366 days inclusive.</p> <p>Allow: an equivalent time period, provided the units are specified:</p> <ul style="list-style-type: none"> • year; 12 months.
<i>Moon to orbit the Earth.</i>	<p>An answer within the range of 27–29 days inclusive.</p> <p>Allow: an equivalent time period, provided the units are specified</p> <ul style="list-style-type: none"> • month; 4 weeks.

or

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

1

***Do not** give credit for an insufficient response where the unit of measurement has been changed but not identified:*

- 24 [hours not given];
- 12 [months not given];
- 1 [year/month not given].

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

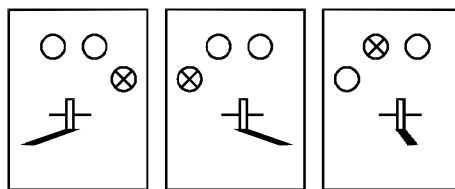
- 31 days.

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

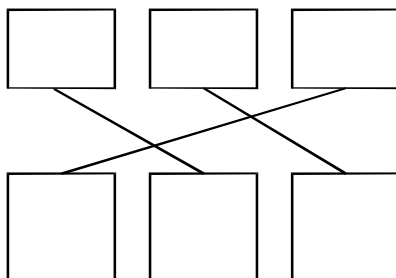
1

- 6 o'clock (evening)
-

- (c) (i) Award **ONE** mark for **all three** Suns unambiguously identified: 1



- (ii) Award **ONE** mark for a correct match of **all three**: 1



[5]

8. (a) Award **ONE** mark for an unambiguous indication of: 1
- sieve.
- (b) Award **ONE** mark for an unambiguous indication of **both** [in either order]: 1
- (beaker of) water; **and**
 - filter (paper and funnel).

Do not give credit for an insufficient response:

- *beaker*;
- *funnel*;
- *paper*.

- (c) (i),(ii) Award **TWO** marks for a response that identifies and describes all **three** of the correct processes in the context of the experiment, **AND** that describes the processes in the order given below: 2
- 1 adding water/dissolving salt/making a (salt) solution;
 - 2 filtering (the sandy solution); and
 - 3 evaporating the water/putting the solution somewhere warm so that salt (crystals) form in the container.

Do not give credit for a response that merely repeats or restates information asked for in 8(b).

OR

Award **ONE** mark for: two correct processes in the correct order

1

Do not give credit for: two correct processes not in the correct order.

or

three correct processes not in the correct order.

[4]

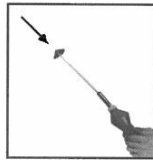
9. (a) Award **ONE** mark for:

1

- the air in the bottle

(b) Award **ONE** mark for an arrow pointing in the opposite direction to that of the rocket's motion:

1



-

Do not give credit for an arrow more than 5° from the line of the rocket.

(c) (i),(ii) Award **ONE** mark for **both**:

1

- No

AND

an indication of the true relationship between the length of rocket and the distance travelled, based on the graph:

- because the graph shows that the longer the rocket, the further it travels;
- it shows that if it is a short rocket, it travels less distance than if it is a longer rocket;
- the longer the rocket, the further it went;
- the 20cm rocket travelled about 285cm and the 5cm rocket travelled 148cm;
- the longer the rocket, the higher it goes;
- when the rocket was 20cm long it went the highest [makes a partial comparison].

Allow:

if neither box is ticked, but the explanation indicates that the pupil knows the prediction is incorrect, the mark may be awarded.

Do not give credit for an insufficient response:

- the rocket went far;
- the rocket travelled 300cm [not clear which rocket];
- the 20cm rocket travels 280cm [does not make a comparison].

Do not give credit for an insufficient response that refers to the graph but does not adequately interpret it:

- you can look at the graph;
- the length of the rocket and how far it travelled;
- the line is going up as the size of the rocket goes up;
- the 20cm rocket has a point higher up than the 5cm rocket;

Do not give credit for a response where the ticked box is inconsistent with the explanation.

- (d) Award **ONE** mark for: 1
- | | | | |
|------------------------|-------------------------------------|--------------------------|--|
| | <input type="checkbox"/> | <input type="checkbox"/> | |
| • to check her results | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |

[4]

10. (a) Award **ONE** mark for: 1
- 190–400 cm.

Allow:

- 210 cm.

- (b) Award **ONE** mark for an indication that trees growing together are smaller: 1
- trees growing close together are not as big;
 - trees in open spaces are bigger (than trees that grow close together).

Allow:

- they are not as big;
- they grow less well;
[‘they’ refers to the trees growing close together].

Allow:

- trees grow better when they have more space.

Allow:

a response that indicates the size of the tree trunks growing close together is less variable:

- there is a smaller range in the size (of tree trunks growing close together);
- tree trunks in open spaces are more variable in size.

Do not give credit for an insufficient response that does not refer to the size of the tree:

- trees growing close together do not get as much light.

Do not give credit for an insufficient response:

- trees growing together are roughly the same size;
- the further away, the taller they grow [changes variable from wider to taller].

Give credit for a correct response that goes beyond the key stage 2 programme of study, showing an understanding that competition for resources causes the trees to be smaller in size:

- trees growing close together have less light so they are smaller in size;
- they are smaller because they have less food;
- they have less space to grow which makes them smaller;
- they have to share water/nutrients so they do not grow as large.

*Do not give credit for a response that shows understanding of competition for resources but does not refer to the **size** of the tree.*

- (c) Award **ONE** mark for an understanding that light is used to make new material for growth:

1

- trees use light to make food.

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

- it feeds the plant;
- light gives trees nutrients;
- they change the light into food.

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

- light is used as an energy source (for tree/plant growth);
- for photosynthesis.

Do not give credit for an insufficient response:

- light allows the tree to grow [given];
- they absorb light.

(d) (i),(ii) Award **TWO** marks for any **two** correct responses: 2

- air;
- water/moisture/rain;
- nutrients/minerals/fertilizer.

Allow:

- warmth/heat.

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

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

- soil;
- food/plant food
[not taken in].

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

- oxygen/O₂/O;
- carbon dioxide/CO₂;
[if air is not also given].

or

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

Do not give credit for an insufficient response:

- Sun/light [given];
- named type of plant feed;
- temperature.

(e) Award **ONE** mark for **both** responses correct: 1

- Fungi are living things. *true [given]*
- Fungi can grow. **true**
- Fungi can reproduce. **true**

[6]