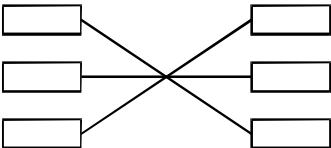


# Science Test A

## Mark Scheme

2003

1. (a) Award **ONE** mark for: 1
- 6;
  - six.
- (b) Award **ONE** mark for: 1
- (eleven) children said they eat vegetables once a week;
  - once a week.
- (c) Award **ONE** mark for: 1
- 
- (d) Award **ONE** mark for identifying the **two** best facts: 1
- To stay healthy you should:

  - 
  - eat different kinds of food.
  - 
  - exercise often

[4]

2. (a) Award **ONE** mark for any **two** of the following: 1
- helmet;
  - chin pad;
  - knee pads;
  - elbow pads;
  - wrist guards/gloves/pads.

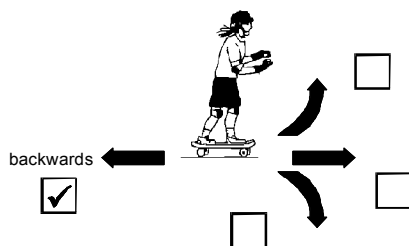
**Allow:**

- shin pads.

*Do not give credit for an insufficient response:*

- *safety equipment [given].*

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



- (c) (i) Award **ONE** mark for an indication that Louis travels further (forwards) on the second push: 1

- Louis travels further (on the second push than the first push).

*Do not give credit for an insufficient response:*

- *Louis travels faster [given];*
- *Louis went further than Jane.*

- (ii) Award **ONE** mark for an indication that Jane travels further (backwards): 1

- Jane travels further (on the second push).

*Do not give credit for an insufficient response:*

- *Jane travels faster [given];*
- *Jane went further than Louis.*

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

- weight.

**Allow:**

- gravity.

**[5]**

3. (a) **TWO** marks for **all five** living things correctly identified: 2

	tree	
	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	starling	fly
	<input type="checkbox"/>	<input checked="" type="checkbox"/>
rabbit	<input type="checkbox"/>	daisy
<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>

**or**

If you are unable to award two marks, award **ONE** mark for correctly identifying **any four** living things. 1

- (b) Award **TWO** marks for **all three** organisms in the correct order **and** arrows marked in the correct direction: 2

- cabbage → snail → thrush;
- thrush ← snail ← cabbage.

**Allow:**

- cabbage → snail → bird.

If you are unable to award two marks, award **ONE** mark for **all three** organisms in the correct order, **but** arrows missing or inconsistent: 1

- cabbage ← snail ← thrush;
- thrush → snail → cabbage;
- cabbage plant – snail – thrush;
- thrush snail cabbage.

OR

- correct arrows in a biologically correct food chain.

**Allow:**

- bird snail cabbage.

*Do not give credit for an insufficient description of the producer:*

- *plant;*
- *vegetable.*

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

- produce new material for growth.

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

- less light.

**[6]**

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

- an observation.

(b) Award **ONE** mark for identifying both the independent variable [the (kind of) paper towel] and the dependent variable [how much water it holds]:

1

- how much water is soaked up by each paper towel?
- how much water does each paper towel hold?
- how much water was absorbed in each paper towel?

**Allow:**

- which towel soaked up most water?
- what type of paper soaks up most water?
- the amount of water soaked up by each paper towel.

**Allow:**

statements which are not framed as questions:

- the amount of water different kinds of paper towels hold.

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

- *which paper towel is best?*

***Do not** give credit for questions which identify an incorrect independent variable or dependent variable:*

- *which size of towel soaks up most water?*
- *which towel will not tear?*

***Do not** give credit for an insufficient response that gives a conclusion:*

- *thicker paper towels hold more water.*

***Do not** give credit for an insufficient response that suggests that causal factors are being investigated:*

- *why do different paper towels soak up different amounts of water?*

- (c) Award **ONE** mark for a recognition of the independent variable as the paper towel: 1
- the (type of) paper towel.

**Allow:**

- towel;
- paper;
- tissue;
- material.

*Do not give credit for an insufficient response that indicates an investigation of a factor not mentioned in the table:*

- strength of towels;
- thickness of towels;
- softness of towels.

*Do not give credit for an insufficient response that gives the dependent variable:*

- how much water was soaked up.

**[3]**

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

- the Sun;
- sunlight.

**Allow:**

- daylight.

*Do not give credit for a response that includes incorrect science describing the use of artificial light sources [they would not produce a dark shadow on a sunny day]:*

- spotlights.

*Do not give credit for an insufficient response:*

- the sky [this is the location of the source, not the source itself].

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

- opaque.

- (c) Award **ONE** mark for an indication that the shadow became shorter: 1

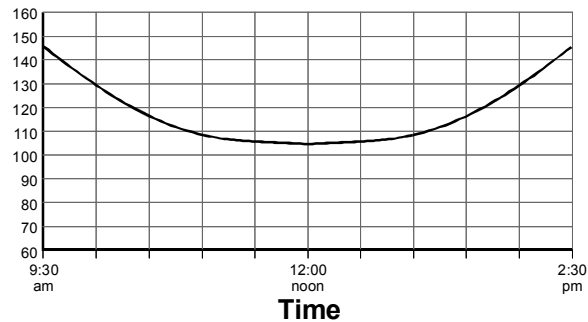
- the shadow kept getting shorter;
- it got shorter.

**Allow:**

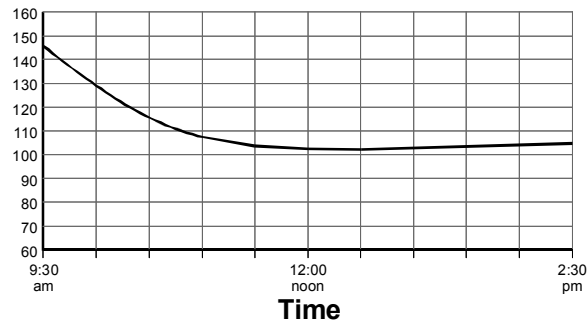
- it was less long at lunchtime;
- it was longer at first.

- (d) Award **ONE** mark for a graph with a minimum point of no lower than 95cm, occurring between noon and 1pm. Following the minimum point, the graph should go upwards to a maximum point of no more than 160cm and no less than 105cm. 1

**Minimum at noon**



**Minimum at 1pm**



*Do not give credit for an insufficient response where the line remains level or gets lower at any time after 1pm.*

**[4]**

6. (a) Award **ONE** mark for: 1
- 0 [in correct cell in table].

**Allow:**

a correct response outside the table or in the wrong place in the table.

- (b) Award **ONE** mark for identifying both the independent variable [the temperature] and one of the dependent variables [the (number of) seeds germinating **or** the time taken (to start) to grow]: 1

- how many seeds germinated at (different) temperatures?
- how many seeds (started to) grow at (different) temperatures?
- how long it takes lettuce seeds to (start to) grow/germinate at different temperatures?

**Allow:**

- how does temperature affect germination?
- how many seeds came up at each temperature?
- what is the best temperature for seeds to grow?

**Allow:**

statements which are not framed as questions:

- the number of seeds germinating at each temperatures;
- the time taken for seeds to (start to) grow at different temperatures;
- the number of seeds that (start to) grow at different temperatures.

*Do not give credit for an insufficient response giving a conclusion:*

- *more seeds grew at higher temperatures.*

*Do not give credit for questions identifying an incorrect independent variable or dependent variable:*

- *which seeds grow at different temperatures?*

(c) Award up to **TWO** marks for **all four** correct: 2

	<b>True</b>	<b>False</b>	<b>Can't tell</b>
The quickest germination was 25°C.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
At 25°C all the seeds germinated by Day 6.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5°C is too cold for the seeds to germinate.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
The best temperature for seeds to germinate was 15°C.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**or**

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

(d) Award **ONE** mark for **both** parts correct:

- agree with Faiza

**AND**

a response which shows an awareness that only one kind of seed has been tested or that all temperatures were not tested:

- they did not test different kinds of seed;
- they only tested one kind of seed;
- they only used lettuce seeds;
- they didn't test all other temperatures.

**Allow:**

- some seeds may need more heat to germinate;
- 25°C might be the best temperature for lettuce seeds;
- they might not have allowed sufficient time;
- you do not know what would happen if you left it longer.

**Allow:**

if neither box is ticked but the creditworthy explanation indicates that the pupils believe Faiza is correct, the mark may be awarded.

*Do not give credit where a box other than 'agree with Faiza' is ticked.*

*Do not give credit for an insufficient response:*

- *more information.*

**[5]**

7. (a) Award **ONE** mark for an explanation that the slope of the graph for cup B is steeper and/or the line for cup B is lower (than cup A): 1

- the graph for cup B goes down more quickly;
- the graph for cup B drops more steeply in the first 40 minutes;
- after 40 minutes, cup B is at a lower temperature than cup A;
- cup B's temperature went down more quickly.

**Allow:**

- cup B goes down more than cup A;
- after 40 minutes, cup B is at  $39(\pm 1)^{\circ}\text{C}$  and cup A is at  $45(\pm 1)^{\circ}\text{C}$ ;
- it/its line is lower.

**Allow:**

- cup B reached room temperature first.

*Do not give credit for an insufficient response that restates that cup B cooled more quickly:*

- *cup B cooled the quickest;*
- *cup A is hotter.*

*Do not give credit for an insufficient response that only describes the temperature in one cup:*

- *cup B is at  $39^{\circ}\text{C}$ .*

*Do not give credit for an insufficient response that is ambiguous as to which cup is being described:*

- *one line goes down faster than the other.*

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

- $25^{\circ}\text{C}$ .

**Allow:**

a response within the range of  $23\text{--}27^{\circ}\text{C}$  inclusive.

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

- thermal insulator



- (d) Award **ONE** mark for a response that increases the amount of insulation and reduces the heat leaving her drink: 1

- put a lid on it;
- wrap it in another insulating material/use a mug warmer;
- put the drink in a thicker/more insulating cup;
- put the cup inside another cup;
- wrap it in foil;
- hold the cup in her hands;
- put the drink in a flask.

**Allow:**

- put it in a warm place.

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

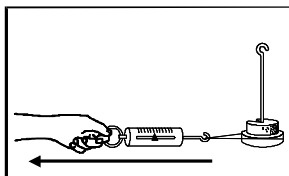
- put the drink in a metal cup [metal is a good conductor].

*Do not give credit for an insufficient response that indicates re-heating the drink:*

- put it on the cooker/in the oven;
- re-heat it in the microwave; [these do not describe how to minimise heat loss].

**[4]**

8. (a) Award **ONE** mark for an arrow in the direction of pull anywhere in the box: 1



**Allow:**

- an arrow towards the left at an angle of  $45^\circ$  above or below the horizontal.

- (b) Award **TWO** marks for a general comparison describing the relationship between the **number of masses** and the **size of the force** required to pull them: 2

- the more masses there are, the greater the force needed to pull them;
- the fewer masses there are, the smaller the force needed to pull them.

**Allow:**

- for every mass added, the force increases by 0.15 N;
- the greater the weight, the bigger the force needed to pull them.

**or**

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

- lots of masses need a big force and one mass needs a small force.

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

- more force is needed when there are lots of masses;
- less force is needed when there is one mass.

Award **ONE** mark for a response indicating that the force increases for every mass added, but the amount of increase is incorrect:

- for every mass added, the force increases by 15 N.

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

- *the more masses there are, the bigger the forcemeter.*

*Do not give credit for an insufficient response that replaces frictional force with weight:*

- *the more the mass, the greater the weight (force).*

(c) Award **ONE** mark for an indication that his results are recorded in reverse order 1  
or a response that identifies the incorrect relationship in the table:

- his results are the wrong way round;
- his results show that the more masses he added, the easier it was to pull;
- he put that the least mass needs the biggest force to pull it.

**Allow:**

- they are in the wrong order;
- it is backwards.

*Do not give credit for an insufficient response:*

- *his results;*
- *his results do not match his notes;*
- *they are all in the wrong place;*
- *the first and last readings need to be swapped.*

*Do not give credit for an insufficient response that replaces frictional force with weight:*

- *his table shows that the higher the number of masses, the more it weighs.*

- (d) Award **ONE** mark for an indication that he should check his method and/or repeat his test: 1
- do his test again (to check his results);
  - repeat his test;
  - make sure he is doing his test correctly;
  - review his plan.

*Do not give credit for an insufficient response that relates to checking his results:*

- *check his test results [repetition of stem];*
- *keep going over it again and again;*
- *double check it; [it is ambiguous whether these refer to repeating the test or checking the results again].*

**[5]**

9. (a) Award **TWO** marks for **all three** ticks correctly placed: 2

Material	Solid	Liquid	Gas
Citric acid powder	✓		
Bicarbonate of soda powder	✓		
Water		✓	

If you are unable to award two marks, award **ONE** mark for **any two** ticks correctly placed.

- (b) Award **TWO** marks for a response that describes the following events in the context of the experiment in the given order: 2

- 1) the water evaporates;
- 2) the citric acid remains in the container/dish:
  - evaporate the water and the citric acid will stay in the container;
  - put the water and citric acid mixture somewhere warm. The water will turn to vapour and the citric acid will remain.

**Allow:**

- they heat the mixture. The citric acid powder is left behind.

**or**

If you are unable to award two marks, award **ONE** mark for a response that describes one event: 1

- evaporate the water from the container;
- the citric acid forms crystals once the water is gone.

**Allow:**

a response that indicates they move the container to a warmer place (to increase the rate of evaporation):

- move the container/mixture to a warmer place;
- put the bowl on the radiator.

*Do not credit the first marking point for a response that includes incorrect science indicating the citric acid may evaporate with the water:*

- *evaporate the solution.*

*Do not credit the first marking point for an insufficient response that is unclear or ambiguous as to what is evaporating:*

- *evaporate it.*

**[4]**

- D