

# GCSE 2004

## *June Series*



## Mark Scheme

### **SCIENCE: DOUBLE AWARD (Modular) 3468/2F**

---

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this Mark Scheme are available from:

Publications Department, Aldon House, 39, Heald Grove, Rusholme, Manchester, M14 4NA  
Tel: 0161 953 1170

or

download from the AQA website: [www.aqa.org.uk](http://www.aqa.org.uk)

Copyright © 2004 AQA and its licensors

#### COPYRIGHT

AQA retains the copyright on all its publications. However, registered centres for AQA are permitted to copy material from this booklet for their own internal use, with the following important exception: AQA cannot give permission to centres to photocopy any material that is acknowledged to a third party even for internal use within the centre.

Set and published by the Assessment and Qualifications Alliance.

The Assessment and Qualifications Alliance (AQA) is a company limited by guarantee registered in England and Wales 3644723 and a registered charity number 1073334. Registered address AQA, Devas Street, Manchester, M15 6EX.

*Dr. Michael Cresswell Director General*

**Science: Double Award (Modular)****Summer 2004****3468/2F****3468/2F Q1**

question	answers	extra information	mark
	plants		1
	carbohydrates	accept oxygen	1
	carbon dioxide	accept water (these words must be in this order)	1
total			3

**3468/2F Q2**

question	answers	extra information	mark
(a)	any <b>one</b> from  big, flat feet  long eyelashes  long hair around openings to its ears		1
(b)	(the camel) does not need insulation	accept can keep warm without the fat	1
(c)	any two from:  <ul style="list-style-type: none"> <li>• (the camel) can drink large amounts of water in one go</li> <li>• loses little water by urine and/or sweating</li> <li>• (the camel) can use fat from its hump to produce water</li> </ul>	any order for the reasons	2
total			4

**3468/2F Q3**

question	answers	extra information	mark
(a)	any <b>one</b> from:  herbicide  pesticide	accept weedkiller  accept insect killer do <b>not</b> accept fertilisers	1
(b)	any two from:  <ul style="list-style-type: none"> <li>• (fossil) fuels are burned</li> <li>• sulphur dioxide is released</li> <li>• (sulphur dioxide) dissolves / reacts (in water)</li> </ul>	accept sulphur oxides are released	2
total			3

**3468/2F Q4**

question	answers	extra information	mark
	Quality of written communication: One mark for using correct scientific terms microorganisms and respiration		1
	(air contains) oxygen		1
	(microorganisms break down human waste) by respiration (which releases carbon dioxide)		1
total			3

**3468/2F Q5**

question	answers	extra information	mark
(a)	corrosive		1
(b)(i)	oxygen	ignore any numbers	1
(ii)	(catalyst) speeds up a (chemical reaction)	accept changes the rate (of reaction)	1
total			3

## 3468/2F Q6

question	answers	extra information	mark
	alcohol  wine  lactic acid  yoghurt	all four words correct 3 marks three or two words correct 2 marks one word correct 1 mark  n.b. number of ticks must equal number of marks	3
total			3

## 3468/2F Q7

question	answers	extra information	mark
(a)	endothermic (reaction)	accept thermal decomposition	1
(b)	gives out heat (energy)  turns blue	accept exothermic (reaction)  accept goes to hydrated copper sulphate	1  1
total			3

## 3468/2F Q8

question	answers	extra information	mark
(a)	increase the surface area	accept make the iron into smaller pieces / powder / iron filings <b>or</b> heat it	1
(b)	36.8 / 37	correct answer, no workings = 3 if incorrect, allow 1 mark for rfm $\text{FeSO}_4 = 152$ <b>or</b> if incorrect rfm, allow 1 mark for $56/Y \times 100$ where Y is incorrect formula mass  allow 2 marks for $\frac{56}{152} \times 100$	3
total			4

**3468/2F Q9**

question	answers	extra information	mark
		all four lines correct 3 marks three or two lines correct 2 marks one line correct 1 mark	3
total			3

**3468/2F Q10**

question	answers	extra information	mark
	newton <b>or</b> N  metre <b>or</b> m  joules <b>or</b> J	all three correct 2 marks two or one correct 1 mark	2
total			2

**3468/2F Q11**

question	answers	extra information	mark
(a)(i)	<b>E-F</b> (ticked)		1
(ii)	<b>B-C or D-E</b>	accept both answers	1
(b)	fast(er)	accept downhill	1
	slow(er)		1
	force	do <b>not</b> accept distance	1
total			5

## 3468/2F Q12

question	answers	extra information	mark
(a)	<b>Q</b>	accept the object in the centre <b>or</b> the star (sun)	1
(b)	speed greater		1 1
total			3

## 3468/2F Q13

question	answers	extra information	mark
(a)	sedimentary		1
(b)	it is at the top		1
(c)	water (of a river, lake or sea)		1
(d)	any <b>two</b> from: <ul style="list-style-type: none"> <li>• sulphur dioxide</li> <li>• carbon dioxide</li> <li>• water (vapour)</li> <li>• carbon monoxide</li> </ul>	accept SO <sub>2</sub> accept CO <sub>2</sub> accept hydrogen oxide <b>or</b> H <sub>2</sub> O accept CO	2
total			5

## 3468/2F Q14

question	answers	extra information	mark
(a)	30(%) 50(%)		1 1
(b)	combined heat and power station <u>as waste less energy</u> correct reference to 20% or 70%	accept some energy (50%) is used for heating	1 1
(c)	infra red ticked		1
(d)	dark surfaces	accept matt / dull / black surfaces	1
total			6

## 3468/2F Q15

question	answers	extra information	mark
(a)	any two from:  agriculture  buildings  roads  any 2 <u>different</u> uses for wood for 1 mark each	accept land to grow crops <b>or</b> graze cattle    accept wood for burning (energy) accept timber for wood	2
(b)(i)	(USA has) more wealth / technology / devices / need for <u>electricity</u>		1
(ii)	damage done	e.g pollutant / mining / non-renewable / deforestation	1
	linked effect	e.g greenhouse effect / visual pollution / run out of resources / flooding	1
(c)(i)	<b>Problem</b> – because some people did not want to pay the (landfill) tax  Waste dumped elsewhere		1  1
(ii)	named example of:  <b>Reduce</b> – such as less packaging / repairing  <b>Reuse</b> – such as glass bottles / shopping bags / ink jet cartridges  <b>Recycle</b> – such as metals, glass, paper	Mark as a whole	1  1  1
total			10



## 3468/2F Q16

question	answers	extra information	mark
(a)	A faster because: the graph line steeper / the reaction had stopped earlier  A because CO <sub>2</sub> given off faster / fizzes more for 1 mark	accept sample B slower because: the graph line was <u>less steep</u> / the reaction stopped later  B because CO <sub>2</sub> given off slower / fizzes less for 1 mark	2
(b)	increases the speed / energy of the (hydrochloric acid) particles  collide more frequently  collide more energetically / successfully	accept more successful collisions = 2 marks	1  1  1
total			5

## 3468/2F Q17

question	answers	extra information	mark
(a)	nitrogen	accept N <b>or</b> N <sub>2</sub>	1
(b)	the reaction is exothermic	accept the reaction releases heat energy	1
(c)	water	accept H <sub>2</sub> O <b>or</b> hydrogen oxide	1
(d)	with ammonia <u>and</u> nitric acid  neutralisation	accept a correct description of reacting (ammonia and nitric acid)	1  1
total			5

## 3468/2F Q18

	answers	extra information	mark
(a)	7.5	<p>correct answer with no working = 3 if incorrect allow 1 mark for (change in velocity from graph =) 15</p> <p>1 mark for <math>\frac{\text{change in velocity}}{\text{time taken}}</math></p> <p>2 marks for <math>\frac{15}{2}</math></p> <p>N.B. correct answer from the incorrectly recalled relationship <math>\frac{\text{distance}}{\text{time}} = 2</math> marks</p>	3
(b)	<p>(4 – 5 seconds) the bungee jumper slows down (decelerates)</p> <p>(the rubber cord) stops the fall</p> <p>(5 – 6 seconds) the bungee jumper starts moving (accelerating) upwards (in the opposite direction)</p>	max 2 marks if no correct indication of time	<p>1</p> <p>1</p> <p>1</p>
total			6

## 3468/2F Q19

question	answers	extra information	mark
(a)	8550	<p>correct answer with no working = 3 if incorrect, allow 1 mark for work = force / weight <math>\times</math> distance, 2 marks for = <math>1900 \times 4.5</math></p> <p>N.B. correct answer from the incorrectly recalled relationship mass <math>\times</math> distance = 2 marks</p>	3
(b)	some of the work done is against frictional forces	<p>accept transferred as heat energy</p> <p>noise / sound is neutral</p>	1
total			4

## 3468/2F Q20

question	answers	extra information	mark
	Quality of written communication: One mark for correct sequencing. bolt out → plunger up → switch off / circuit broken		1
	any <b>five</b> from		5
	<ul style="list-style-type: none"> <li>• high current flows</li> <li>• electromagnet is stronger</li> <li>• the iron bolt is pulled out</li> <li>• the plastic plunger moves up</li> <li>• the switch is lifted / open / off</li> <li>• no current flowing</li> <li>• to re-set the plunger must be pushed down</li> </ul>	accept circuit is broken	
total			6

## 3468/2F Q21

question	answers	extra information	mark
(a)(i)	(pointer) moves to the left	accept (pointer) moves in the opposite direction goes negative	1
(ii)	a voltage / potential difference is produced between the ends of the wire	accept an <u>induced</u> voltage / current	1
(b)	any <b>two</b> from: <ul style="list-style-type: none"> <li>• rotate (move) the wire coil faster</li> <li>• increase the strength of the magnetic field</li> <li>• increase the number of turns (on the coil)</li> <li>• increase the area of the coil</li> <li>• coils closer together</li> </ul>	accept stronger magnets / move magnets together bigger magnet is neutral  larger coil is neutral	2
total			4