

GCSE 2004

June Series



Mark Scheme

GCSE Applied Science (Double Award) *(3860/2F)*

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.

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question	answers	extra information	marks
1(a)	count the number of breaths in a set time interval	allow spirometer do not accept pulse ignore reference to heart monitoring equipment	1 1
(b)	increases aerobic anaerobic decreases		1 1 1 1
(c)	increase in heart rate / blood flow or breathe more deeply	do not allow more blood pumped allow blood flowing faster allow breathe more air	1
(d)	any two from: <ul style="list-style-type: none"> • sweating • increase in diameter of capillaries / blood vessels • hairs on body lie flat 	allow any reference to blood reaching surface of the skin e.g. flushing, going red etc. not panting / breathing more deeply	2
Total			9

question	answers	extra information	marks
2(a)	natural gas		1
(b)	wind (turbine)		1
(c)	any one from: <ul style="list-style-type: none"> • dangerous / hazardous / harmful • radioactive emissions • high cost • waste disposal 	do not accept pollution not too much space / energy / unstable / explosive / toxic ignore not renewable not just radiation	1
(d)	(device is) portable / no wires / waterproof	ignore rechargeable, cheap and other statements referring to batteries ignore vague answers that don't refer to portability / wires / waterproofing	1
(e)	inexpensive / clean / easy to control	not just less pollution but allow comparison with other fuels not heats quickly	1
(f)	any two from: <ul style="list-style-type: none"> • flammable liquid • safer / less dangerous • no naked flame • easily controlled heat 	not just dangerous must be comparison	2
Total			7

question	answers	extra information	marks
3(a)	suspension foam aerosol gel emulsion	ignore double headed arrow accept clear indication of change	1 1 1 1 1
(b)	e.g. lemonade	named product that is a mixture can be named anywhere	1
	solution	mark consequential on first and on second line	1
Total			7
4(a)	cotton aspirin		1 1
(b)(i)	any three from: <ul style="list-style-type: none"> • cell wall • (large) vacuole • chloroplast • starch granules 		3
(ii)	chloroplast	apply list principle	1
(c)(i)	chlorophyll		1
(ii)	carbon dioxide obtained from air diffusion / into leaves / stomata	2 nd and 3 rd marks can be awarded even if wrong gas is given	1 1 1

question	answers	extra information	marks
(iii)	oxygen needed for respiration (to release) energy	can be given in explanation cannot give 2 nd or 3 rd mark if an incorrect gas is named	1 1 1
(d)(i)	make protein / amino acids or for growth		1
(ii)	make chlorophyll or to make it green or for photosynthesis or absorb sunlight / light	not sun not making food	1
(iii)	Mg(NO ₃) ₂	allow (NO ₃) ₂ Mg Mg ²⁺ NO ₃ ⁻ NO ₃ ⁻ Mg ²⁺ MgNO ₃ NO ₃ Mg for 1 mark do not accept Mg ²⁺ + NO ₃ ⁻ etc.	2
(iv)	greenhouse / pesticide / herbicide / fungicide / manure / ploughing warmth / kill pests / kill weeds etc.	allow sensible alternatives e.g. genetic modification / artificial pollination / increased light do not accept (artificial) fertilizer or organic farming or watering / irrigation	1 1
Total			19

question	answers	extra information	marks
5(a)(i)	any four from: <ul style="list-style-type: none"> grind / crush add water / dissolve / make a solution stir / mix / heat filter evaporate (to dryness) (after filtering) or dry it (filtrate) out 	must be sequential if no mention of water max 1 mark for filtering	1 1 1 1
(ii)	inorganic compound		1
(b)(i)	any two of the following: <ul style="list-style-type: none"> low melting point / boiling point or gas does not conduct electricity or insulator forms negatively charged ions low density does not conduct heat 	allow not a solid	2
(ii)	sodium hydroxide hydrogen		1 1
(c)(i)	HCl		1
(ii)	produced in large quantities		1
Total			11

question	answers	extra information	marks
6(a)(i)	power = volts x amps 230 × 8 1840	can be inferred by 230 × 8 alone = 2 marks = 3 marks	1 1 1
(ii)	conversion of values to kW 1.84 / 1.8	ecf from part (i)	1
(b)	1.84 × 0.1 0.184 / 0.18 / 0.2	ecf from figure in table unless blank, then use (a) (i) converted to kW	1 1
(c)	0.184 × 7 1.288 / 1.3 / 1.28 / 1.29	ecf from figure in table, if blank (b) × 7	1 1
(d)	colour television any two from: <ul style="list-style-type: none"> • although lowest power rating • but uses most energy • because switched on longest 	must be supported by data in table	2
Total			10

question	answers	extra information	marks
7(a)(i)	any two from: <ul style="list-style-type: none"> • measuring cylinder / jug • beaker / bowl / cup • thermometer • timer / stop clock • cooker / bunsen / heater • safety glasses 	do not accept oven do not accept other protective equipment	2
(ii)	bacteria / lactobacillus		1
(iii)	so no (other) microorganisms are present or make ill or food poisoning or avoid contamination	allow germs	1
(iv)	high temperature will kill bacteria / microorganisms		1
(v)	allow bacteria to grow / multiply or convert milk to yoghurt or convert sugar to lactic acid or allow chemical reaction to take place or allow lactic acid to form	allow because reaction is slow or to let it set not fermentation	1
(b)	refrigerate / add preservative	allow freeze / cool place	1
(c)	any two from: <ul style="list-style-type: none"> • bread • wine • beer • cheese • protein • antibiotic / drugs • vinegar • alcohol / whiskey etc 	apply the list principle	2
Total			9

question	answers	extra information	marks
8(a)	any two from: <ul style="list-style-type: none"> strong / tough / durable bendable / malleable / ductile waterproof / holds water not soluble does not corrode / rust / rot 	do not allow flexible do not accept high melting point or cheap	2
(b)	any two from: <ul style="list-style-type: none"> attractive appearance different colours easily cleaned or smooth waterproof / holds water does not scratch easily or durable / hard does not corrode / rust / rot rigid 	do not accept high melting point or cheap / strong	2
(c)	any two from: <ul style="list-style-type: none"> flexible / bendable waterproof / holds water easy to cut durable / does not corrode / rust / rot 	do not accept high melting point or cheap / strong	2
(d)	zinc makes the metal stronger (= 1 mark) the more zinc is added the stronger it gets (= 2 marks)		1 1
Total			8
Overall marks = 80			