



# GCSE

## Science B

General Certificate of Secondary Education

Unit **B622/01**: Unit 2: Modules B2, C2, P2 (Foundation Tier)

## Mark Scheme for June 2011

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by Examiners. It does not indicate the details of the discussions which took place at an Examiners' meeting before marking commenced.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

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The **Abbreviations, annotations and conventions** used in the detailed Mark Scheme are:

/	=	alternative and acceptable answers for the same marking point
(1)	=	separates marking points
not	=	answers which are not worthy of credit
reject	=	answers which are not worthy of credit
ignore	=	statements which are irrelevant
allow	=	answers that can be accepted
( )	=	words which are not essential to gain credit
—	=	underlined words must be present in answer to score a mark
ecf	=	error carried forward
AW	=	alternative wording
ora	=	or reverse argument

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Question			Expected Answers	Marks	Additional Guidance
1	a		A= daisy (1) B= dandelion (1)	2	
	b	i	quadrat (1)	1	
		ii	light / water / minerals / space / nutrients	1	<b>allow</b> sunlight <b>ignore</b> sun / food
		iii	there are more plant <b>A</b> ( than <b>B</b> in the quadrat) / plant <b>A</b> is bigger (than plant <b>B</b> )(1)	1	<b>allow</b> there are 4 daisies and 2 dandelions <b>them</b> refers to plant <b>A</b> unless stated <b>ignore</b> plant <b>A</b> is more healthy <b>allow</b> incorrect plant names if consistent with answer in 1a
	c		photosynthesis (1) chlorophyll (1) oxygen (1) warmth or light (1)	4	must be in correct order <b>not</b> just chloroplasts <b>allow</b> O <sub>2</sub> but <b>not</b> O <b>allow</b> temperature or heat or sunlight <b>ignore</b> sun
			<b>Total</b>	<b>9</b>	

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Question			Expected Answers	Marks	Additional Guidance
2	a		for camouflage / so that prey or seals cannot see them (1)	1	<b>not just</b> because the snow is white <b>allow</b> to blend in with their habitat <b>allow</b> so predators cannot see them <b>ignore</b> to keep them warm
	b		small(er) surface area (to volume ratio) / to lose <b>less</b> heat (1)	1	<b>allow</b> won't get as cold (1) <b>ignore stops</b> them losing (body) heat <b>ignore</b> references to hearing or streamlining
	c	i	largest = 5000 <b>and</b> smallest = 1700 (1)	1	both required for the mark <b>allow</b> 5000 <b>and</b> 2000 (1) <b>allow</b> 2300 <b>and</b> 1700 (1) <b>allow</b> 3600 <b>and</b> 1800 (1)
		ii	habitat (1)	1	
	d	i	in danger of becoming extinct / dying out (1)	1	<b>allow</b> numbers are very small / rare / not many left / running out <b>ignore</b> numbers are decreasing <b>not</b> they are extinct
		ii	<b>any two from:</b> cause global warming / greenhouse effect / increase in temperatures (1)  melting of the ice / idea of loss of habitat (1)  harder to hunt (for seals) (1)	2	<b>reference to ozone layer loses first marking point, so max 1</b> <b>allow</b> cause the Earth or water to warm up <b>or</b> cause the Earth or water to heat up (1) <b>allow</b> carbon dioxide in the atmosphere traps heat (1)  <b>allow</b> sea levels rising (1) <b>ignore</b> melting water
			<b>Total</b>	<b>7</b>	

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Question			Expected Answers	Marks	Additional Guidance
3	a		line linking vertebrate to mammal (1)	1	more than one line = zero
	b		rotted / decayed / not mineralised / (they are) soft tissues (1)	1	<b>allow</b> decompose / biodegrade / broken down (1) <b>allow</b> by bacteria or microbial action <b>ignore</b> eroded / degraded / disintegrate / deteriorate / dissolve
	c		parasite (and host) (1)	1	<b>allow</b> parasitism / parasitic
	d		tick in first box	1	
			<b>Total</b>	<b>4</b>	

Question			Expected Answers	Marks	Additional Guidance
4	a		corrosion – does not corrode (1) electrical conduction – good (1) malleability – good (1)	3	<b>allow</b> does not rust <b>allow</b> conductor or conducts electricity <b>allow</b> bendy / flexible / bends easily (1)
	b		water (1) oxygen / air (1)	2	either order <b>allow</b> correct formulae <b>allow</b> (salt) water or moisture <b>ignore</b> rain or acid rain
	c		<b>any one from</b> malleable / ductile / flexible / bendy / does not corrode (1)	1	<b>allow</b> easy to bend (around corners) <b>allow</b> does not rust or corrode <b>allow</b> high melting point <b>allow</b> idea of low reactivity <b>ignore</b> no reactivity or does not react <b>ignore</b> easy to recycle <b>ignore</b> reference to cost <b>ignore</b> strong
			<b>Total</b>	<b>6</b>	

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Question			Expected Answers	Marks	Additional Guidance
5	a		D (1)	1	
	b		C (1)  increased rate of reaction (1)  remains unchanged (1)	3	allow the rate of reaction has gone to 10 (1)  allow same mass at start and end (1) if A or B is given allow 1 mark for increased rate if D is given allow 1 mark for remains unchanged
			<b>Total</b>	<b>4</b>	

Question			Expected Answers	Marks	Additional Guidance
6	a		iron / steel / aluminium / brick / cement / clay /concrete / copper / glass / breezeblock / wood / plastic / MDF / slate / metal (1)	1	allow sandstone / sand / lead / allow straw / reeds (1) allow a named wood eg oak (1) allow a named plastic eg poly (vinyl chloride) ignore water / stones / mud
	b		granite marble limestone (1)	1	
	c		cement (1)	1	not concrete
	d		calcium carbonate (1)	1	if answer line is blank, allow correct answer ticked, circled or underlined in the list
			<b>Total</b>	<b>4</b>	

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Question			Expected Answers	Marks	Additional Guidance
7	a		clockwise from top left crust core mantle	2	all three correct scores 2 one or two correct scores 1
	b		iron / nickel (1)	1	<b>allow</b> correct symbol Fe / Ni
			<b>Total</b>	<b>3</b>	

Question			Expected Answers	Marks	Additional Guidance
8	a		carbon monoxide – poisonous or toxic gas (1)  sulfur dioxide – acid rain / kills fish or water life / kills plants / erodes statues / corrodes metals (1)	2	<b>allow</b> can kill people AW <b>ignore</b> harmful or dangerous <b>allow</b> causes breathing problems AW
	b		5 (1)	1	
			<b>Total</b>	<b>3</b>	



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Question			Expected Answers	Marks	Additional Guidance
9	a		(waste is) radioactive (1)	1	<b>allow</b> higher level answers eg ionising radiation / can cause cancer <b>allow</b> gives out alpha, beta, or gamma <b>not</b> just nuclear but <b>allow</b> nuclear radiation <b>ignore</b> radiation on its own ideas of harmful or dangerous are insufficient
	b		need (a lot of) water (1)	1	<b>allow</b> water is needed for steam (1) <b>allow</b> water is needed for cooling (1) <b>allow</b> isolated / too harmful to be in a community / aw (1) <b>ignore</b> less likely to harm humans <b>ignore</b> disposal of (low level) radioactive waste
	c		reduce energy or heat loss /  reduce cost (1)	1	<b>allow</b> higher level answers e.g. reduces current <b>ignore</b> stops energy or heat loss <b>ignore</b> reduce electricity loss <b>ignore</b> more efficient  <b>allow</b> cheaper (1)
	d		watt (1)	1	<b>ignore</b> W if answer line is blank, allow correct answer ticked, circled or underlined in the list
			<b>Total</b>	<b>4</b>	

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Question			Expected Answers	Marks	Additional Guidance
10	a		light (1) area (1) direct (1)	3	
	b		no power at night / bad weather (1)	1	<b>allow</b> correct examples of bad weather eg cloudy / its not always sunny / need for light for photocell to work <b>allow</b> idea of little electricity generated / not very efficient / not very powerful <b>allow</b> no sun no electricity
	c		0.06 (2)  <b>but if answer not correct</b> 3 x 0.02 (1)	2	<b>ignore</b> units <b>but</b> <b>allow</b> 60 mW (units given) (2)
			<b>Total</b>	<b>6</b>	

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Question			Expected Answers	Marks	Additional Guidance
11	a		<b>any two from:</b> crater (1) ejection of (hot) rocks / dust (1) fires (1) Sun blocked out (by dust) (1) climate change (1)	2	<b>not</b> just hole / dent <b>ignore</b> extinction of living things  <b>allow</b> ice age <b>allow</b> tsunami (1) earthquake (1)
	b		predict their path / trajectory (1)	1	<b>allow</b> alternative wording e.g. to see if they are on a collision course (with Earth) / to see which way they're going / idea of threat to Earth or to satellites / to see if there's a possibility that they'll get into Earth's atmosphere / idea of to change their path (1)  <b>ignore</b> to shoot them down
			<b>Total</b>	<b>3</b>	

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Question			Expected Answers	Marks	Additional Guidance
12	a		(plotting) compass (1)	1	<b>not</b> iron filings <b>allow</b> (another) magnet unless contradicted by a method eg, move it in and out of a coil
	b		electric current (in a coil) AW (1)	1	<b>allow</b> anything with a <b>current</b> passing through <b>ignore</b> electricity by itself <b>allow</b> lightning
	c		<b>any two from:</b> telecommunications (1)  weather observing / prediction AW (1) spying (1) mapping (1) navigation (1) space exploration or monitoring of space (1) monitoring of earth (1)	2	<b>allow</b> television / telephone / Sky <b>ignore</b> satellite dishes on their own  <b>not</b> merely weather <b>allow</b> military  <b>allow</b> satnav /GPS <b>allow</b> Hubble / space telescope <b>not</b> just space
			<b>Total</b>	<b>4</b>	

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Question			Expected Answers	Marks	Additional Guidance
13	a		beta and gamma (1)	1	allow $\beta$ $\gamma$ both needed any order
	b		<b>any two from:</b> protective clothing / wear safety equipment / goggles / gloves / lab coat (1) use tongs / keep distance / as far away as possible from source / don't point it at anyone (1) short exposure time (1) do not handle (1) use of shielding / keep in lead box / safety screen (1)	2	
			<b>Total</b>	<b>3</b>	

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