

Mark Scheme (Results) March 2008

GCSE

360Science

GCSE Additional Science P2 (5020H/1H)



USING THE MARK SCHEME

- 1. This mark scheme gives you;
- * an idea of the type of response expected
- * how individual marks are to be awarded
- * the total mark for each question
- * examples of responses that should not receive credit.
- 2. ; separates points for the award of each mark.
- 3. / means that the responses are alternatives and either answer should receive full credit.
- 4. () means that a phrase/word is not essential for the award of the mark but helps the examiner to get the sense of the expected answer.
- 5. Phrases/words in **bold** indicate that the <u>meaning</u> of the phrase/word is **essential** to the answer.
- 6. OWTTE (or words to that effect) and eq (equivalent) indicate that valid alternative answers (which have not been specified) are acceptable.
- 7. 'Ignore' means that this answer is not worth a mark but does not negate an additional correct response.
- 8. 'Reject' means that the answer is wrong and negates any additional correct response for that specific mark.
- 9. ORA (or reverse argument) indicates that the complete reverse is also valid for the award of marks.
- 10. ecf (error carried forward) means that a wrong answer given in an earlier part of a question is used correctly in answer to a later part of the same question.

MARKING

- 1. Suggestion/explanation questions should be marked correct even when the suggestion is contained within the explanation.
- 2. **Do not** award marks for repetition of the stem of the question.
- 3. Make sure that the answer makes sense. Do not give credit for correct words/phrases which are put together in a meaningless manner. Answers must be in the correct scientific context.

AMPLIFICATION

- 1. In calculations, full credit must be given for a <u>bald</u>, correct answer. If a numerical answer is incorrect, look at the working and award marks according to the mark scheme.
- 2. Consequential marking should be used in calculations. This is where a candidate's working is correct but is based upon a previous error. When consequential marks have been awarded write "ecf" next to the ticks.
- 3. If candidates use the mole in calculations they must be awarded full marks for a correct answer even though the term may not be on the syllabus at their level.
- 4. If candidates use chemical formulae instead of chemical names, credit can only be given if the formulae are correct.

Q no.	answer	allow	ignore	reject	mark
1a	more than one tick per horizontal row negates that row most penetrating - gamma least penetrating - alpha most ionising - alpha least ionising - gamma Any <i>one</i> correct row; (1 mark) All 4 rows correct;;				2
1b	gamma most penetrating/greatest range;	least ionising so safer			1
1c	protons =27 electrons = 27 neutrons = 33 Any <i>ONE</i> correct; (1 mark) All 3 correct;;				2
1d	(performance-) cobalt penetration OR time to scan;			X-rays	1
1d	(safety -) cobalt faster;	X ray lower energy	references to penetration		1
2ai	no mark for f=ma substitution/ 7.92X0.93; 7.37 (N)/7.4(N);	ecf from incorrect mass (5) \rightarrow 39.6 (40) for 1 mark (5.93) \rightarrow 46.96 (47) for 1 mark			2
2aii	backwards /to oppose movement/ to left;		unqualified 'against the trolley'		1
2aiii	Any two from: 1. (between) wheels/trolley and bench; 2. friction at the axle(s); 3. (friction at) the pulley; 4. drag/air resistance;				2

2bi	mgh no marks substitution / 5 X 10 X 0.6; 30 (J);	ecf from incorrect mass OR incorrect length for 1 mark 35.58/ 5.58/ 3000			2
2bii	30 (J)	ecf from 2bi			1
2biii	no mark for equation substitution: 30 = 0.5 X 5.93 X v ² ; 3.18 (m/s)/3.2 (m/s);	ecf from bii or bi $35.58 \rightarrow 3.462$ marks $5.58 \rightarrow 1.3722$ marks $3000 \rightarrow 31.8092$ marks ecf from incorrect mass for 1 mark if 0.93 used $\rightarrow 8.032$ if 5 used $\rightarrow 3.46CARE$ Check and allow maximum of 1 error in biiiecf from bii does not count as an error			2
3a	2+ nuclei fuse/join/merge;	specific example (H →He)		 particles unless qualified by nuclear idea of chemical bonding 	1
3b	Any two from: high pressure high temperature high particle density;; 	high energy levels instead of temperature	suitable/correct temperature suitable/correct pressure		2
4ai	(background) radiation/ particles from the sun or outer space or galaxy;	very high energy radiation plus consequence (range/penetration)	rays	microwave radiation from big bang	1

	idea of source is needed				
4aii	Any one from ionises produces secondary particles causes mutations/tissue damage; 	 penetration idea very high energy mutates DNA genetic damage damaging/killing cells causes cancer 	 confusion with UV, IR etc mutates cells 	causes skin cancers	1
4bi	the greater the altitude the smaller the number of hours flying time/ORA;	inverse relationship (e.g. inversely proportional)		 if dose is not the same greater dose at higher altitudes/ ORA 	1
4bii	idea altitude X flying time = dose;	OWTTE credit bii if seen in bi	negative correlation inversely proportional		1
4biii	atmosphere absorbs radiation/ ORA;	thinner air	not closer to space		1
4ci	all points; best fit curve;	points not seen decent attempt at curve (some wobble, but must go through at least 4 points)		 "tram" lines thick lines definite st lines 	2
4cii	magnetosphere protects us/ forms 'barrier' esp. over equator;	(Earth's) magnetic field		ozone layer	1
4di	damage to cells leading to altered growth/ionising babies cells;	birth defects mutation of DNA	cancer mutation of cells		
4dii	any sensible e.g. transfer to low level flying transfer to routes over equator		lead lined clothing fly less frequently		

become ground crew;		