

Examiners' Report/ Principal Examiner Feedback

March 2010

GCSE

360Science

GCSE Additional Science
Multiple Choice Paper P2 (5019)

GCSE Physics
Multiple Choice Paper P2 (5047)

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5019 Additional Science/ 5047 Physics (Multiple Choice P2) Examiners' Report

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Foundation Tier

Two thirds of candidates on average understood the four items based on the crane scenario working with energy, work and power. A similar percentage scored on the penetrating power of gamma rays, the type of radiation used in smoke alarms, the shape of a radioactive decay curve and the distance a cyclist travels in a certain time.

Understanding of the diagrammatic representation of nuclear fission was confined to the better candidates with the less able preferring to choose the situation where both of the neutrons from one fission were required to produce the next fission. The control rods in a nuclear reactor were thought, by the largest number of candidates, to work by absorbing electrons.

Electrons also caused a problem when refuelling aircraft. While 67% realised that the aircraft was connected to earth by a conductor, as many as 62% thought that the particles which flowed in it were **positive** electrons. These figures combined to give 26% who correctly explained the earthing process.

Referring to a nuclear symbol, 39% correctly chose the number for the number of protons. 33%, however, chose 7.

Overlap questions

The most discriminating item of this section involved the identification of the source emitting only alpha particles, with 49% of F and 76% of higher candidates scoring the mark. This was closely followed by the interpretation of a speed-time graph to find the highest acceleration using the steepest line (F - 44% and H 64%). There were large percentages also for changes to a roller coaster simulator and recognising this as a thought experiment and for finding the number of particles in the nucleus of one daughter nucleus knowing the number in the other. Unfortunately, few candidates spotted that daughter nuclei could decay and the majority thought that they could produce further fission.

Higher Tier

Large percentages in this section were for recall of the methods by which we are protected from dangerous radiation from space (78%) and the translation of the feedback process described in words into a flow chart (71%). Curiously enough, the understanding shown in the feedback process was not reflected in the more mundane previous items on the topic about the meaning of neutron moderation or the way in which neutrons carry energy away from the reactor in terms of kinetic energy (both at 28%).

Once again, a particular type of question was able to point out specific

mis-understandings; for example, 48% of higher level candidates think that a high voltage machine is needed to make gamma rays. In a similar way, the options given for some questions allow inference to be made about the candidate's reasoning: 49% multiplied mass by velocity to give momentum (with some making a mistake with the powers of ten) while 51% thought the momentum came from velocity divided by mass. Such analysis should give teachers basic facts on which they can base improvements to the performance of their candidates.

Grade Boundaries - March 2010

Multiple Choice Papers - GCSE Additional Science

Raw Mark Grade Boundaries

5015/5027	Max mark	A*	A	B	C	D	E	F	G
H	24	20	18	15	13	10	8		
F	24				16	13	11	9	7

5017/5037	Max mark	A*	A	B	C	D	E	F	G
H	24	17	15	12	10	7	5		
F	24				15	12	10	8	6

5019/5047	Max mark	A*	A	B	C	D	E	F	G
H	24	15	13	11	9	6	4		
F	24				16	13	10	8	6

Uniform Mark Grade Boundaries for these units

	Max UMS	A*	A	B	C	D	E	F	G
H	40	36	32	28	24	20	18		
F	27				24	20	16	12	8

Note: On higher tier papers, the "allowed" grade E is calculated as half a grade width

Structured Papers - GCSE Additional Science

Raw Mark Grade Boundaries

5016/5028	Max mark	A*	A	B	C	D	E	F	G
H	30	17	14	11	9	7	6		
F	30				18	15	12	10	8

5018/5038	Max mark	A*	A	B	C	D	E	F	G
H	30	21	17	13	10	7	5		
F	30				22	18	15	12	9

5020/5048	Max mark	A*	A	B	C	D	E	F	G
H	30	21	19	16	14	11	9		
F	30				20	16	12	9	6

Uniform Mark Grade Boundaries for these units

	Max UMS	A*	A	B	C	D	E	F	G
H	40	36	32	28	24	20	18		
F	27				24	20	16	12	8

Note: On higher tier papers, the "allowed" grade E is calculated as half a grade width

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