

Examiners' Report/ Principal Examiner Feedback

March 2010

GCSE

360Science

GCSE Science
Multiple Choice Paper P1b (5010)

GCSE Physics
Multiple Choice Paper P1b (5046)

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5010 Science/ 5046 Physics (P1b) Examiners' Report

March 2010

Foundation Tier

Ninety one percent of foundation candidates correctly associated lack of exercise with an effect on the heart. For another highly scoring item candidates related the information about damage from a tsunami to the idea that it carried energy. For a similar item, however, less than half of candidates understood the newspaper cutting statement that 'a full moon has occurred closer to the Earth (than other times)' implied that the Moon's orbit was egg-shaped. As many as 70% of candidates selected 20 kilograms as 'a weight' and only 33% knew that weight and mass were linearly related. An average of 56% applied their abilities correctly with each of the items based on the (to them novel) data about ultraviolet index. Such questions may be useful during the learning process to introduce discussion of UV as a way of helping reduce the damage caused to eyes (only 48% were aware of this) as well as providing an example suitable for practicing the skills involved in applying knowledge and understanding.

Overlap Questions

For Foundation level candidates, it was disappointing that the most popular response to a description of electromagnetic waves was that they were longitudinal. Similarly disappointing was the ability to select the digital waveform (47% at F and only 62% at H). Particularly pleasing was performance on that part of Bode's thought experiment which interpolated from the pattern to give a value for Y. At F-level, 46% on average answered these four HSW items on Bode's law. The comparable number for candidates who opted for the Higher Level section was 66%. The items thus differentiated well between tiers as well as within each tier.

Higher Tier

Candidates at this level were mostly able to identify the major property of a black hole (78%), why scientists are interested in gas giant planets which may have moons with earth-like conditions (77%) and realised that space itself has no gravity (76%). Rather less successful were candidates attempts to calculate the wavelength of a wave from the wave equation (13% since 77% failed to convert kHz into Hz) and to identify a graph of wavelength against frequency (23% - 37% thought they were directly proportional and 19% even chose the wave depiction!).

Hubble's idea of relating galaxies' speed to distance from Earth formed the basis of the final four items and 57% of candidates linked the idea of red shift to the speed of galaxies. As many as 60% related the idea of greater validity (a frequently misunderstood idea) with the wider range of speeds used. The use of the gradient of the graph to find a value for Hubble's constant was quite well done numerically but the selection of the correct units was a cause for concern with 38% opting for units/km/s as compared to only 26% going for km/s/unit. The use of the given equation to help make a choice of unit for Hubble's constant was poorly done by most candidates.

Twice as many candidates went for speed as chose the correct response of frequency.

Grade Boundaries - March 2010

Multiple Choice Papers - GCSE Science

Raw Mark Grade Boundaries

| | | | | | | | | | |
|-----------|----------|----|----|----|----|----|----|---|---|
| 5005/5025 | Max mark | A* | A | B | C | D | E | F | G |
| H | 24 | 19 | 17 | 15 | 13 | 9 | 7 | | |
| F | 24 | | | | 16 | 13 | 10 | 8 | 6 |

| | | | | | | | | | |
|-----------|----------|----|----|----|----|----|----|---|---|
| 5006/5026 | Max mark | A* | A | B | C | D | E | F | G |
| H | 24 | 18 | 16 | 14 | 12 | 9 | 7 | | |
| F | 24 | | | | 16 | 13 | 11 | 9 | 7 |

| | | | | | | | | | |
|-----------|----------|----|----|----|----|----|----|---|---|
| 5007/5035 | Max mark | A* | A | B | C | D | E | F | G |
| H | 24 | 16 | 13 | 10 | 8 | 5 | 3 | | |
| F | 24 | | | | 16 | 13 | 10 | 8 | 6 |

| | | | | | | | | | |
|-----------|----------|----|----|----|----|----|----|----|---|
| 5008/5036 | Max mark | A* | A | B | C | D | E | F | G |
| H | 24 | 18 | 15 | 12 | 10 | 6 | 4 | | |
| F | 24 | | | | 18 | 15 | 12 | 10 | 8 |

| | | | | | | | | | |
|-----------|----------|----|----|----|----|----|----|----|----|
| 5009/5045 | Max mark | A* | A | B | C | D | E | F | G |
| H | 24 | 19 | 17 | 15 | 14 | 11 | 9 | | |
| F | 24 | | | | 19 | 16 | 14 | 12 | 10 |

| | | | | | | | | | |
|-----------|----------|----|----|----|----|----|----|---|---|
| 5010/5046 | Max mark | A* | A | B | C | D | E | F | G |
| H | 24 | 18 | 16 | 14 | 12 | 8 | 6 | | |
| F | 24 | | | | 15 | 12 | 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

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