

Mark Scheme (Results)

June 2011

360Science

GCSE Additional Science
Structured Paper B2 (5016H/1H)

GCSE Biology
Structured Paper B2 (5028H/1H)

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**5016H & 5028H Mark Scheme
June 2011**

Question Number	Answer	Additional guidance	Mark
1(a)	<p>Any two from:</p> <ol style="list-style-type: none"> 1. they both rise overall ; 2. the number of cases of skin cancer in females is (always) greater than males / ORA ; 3. they rise and fall in similar/same way ; 4. credit any one correct comment on part of graph / correct ref to numbers comparing male / female ; they both peak in 1987 / 1987 to 1988 gap between males and females less towards the end / from 1997 to 1999 	<p>Accept: male and female lines both rise/ both show positive correlation</p> <p>Accept: the female line is (always) greater / higher than the male line</p> <p>Accept: identical</p>	(2)

Question Number	Answer	Additional guidance	Mark
1(b)	<p>(Amount of / type of) lichens /</p> <p>(Number of) peppered moth /</p> <p>(Number of cases of) asthma /</p> <p>other named indicators of air pollution ;</p>	<p>Accept melanic /normal forms of moth</p> <p>Accept: lung cancer</p> <p>Reject water pollution</p>	(1)

Question Number	Answer	Additional guidance	Mark
2(a)	<p>Any two from:</p> <ol style="list-style-type: none"> 1. fix nitrogen / nitrogen fixing bacteria / rhizobium; 2. nitrogen from air / soil ; 3. to make ammonium ions / nitrate (ions) ; 4. (used by plant) to make proteins / DNA ; 	<p>Reject: nitrifying / denitrifying (bacteria)</p> <p>Accept: use / absorb nitrogen</p> <p>Accept: ammonia Ignore refs to absorbing nitrates</p> <p>Ignore refs to absorbing water etc</p>	(2)

Question Number	Answer	Additional guidance	Mark
2(b)	<p>Any two from:</p> <ol style="list-style-type: none"> 1. Plants decompose / decomposing bacteria /decomposers (decompose / decay leaves) ; 2. (proteins are changed into) ammonia ; 3. into nitrite (ions); 4. into nitrate (ions); 5. by nitrifying bacteria/named nitrifying bacteria ; 6. Credit points in nitrogen cycle beyond this eg nitrate ions are made (MP4) which may be changed back to nitrogen again by denitrifying bacteria ; NB: Marking point 6 can be awarded twice <p>/</p> <p>for both available marks</p>	<p>Accept: fungi for bacteria here</p>	(2)

Question Number	Answer	Additional guidance	Mark
2(c)	<p>Any three from:</p> <ol style="list-style-type: none"> 1. nitrate (ions) build up / eutrophication ; 2. algal bloom ; 3. (blocks out sunlight so)less photosynthesis ; 4. algae/plants decompose/rot ; 5. (bacteria cause) oxygen depletion /oxygen levels decrease / oxygen concentration goes down 6. (low oxygen levels cause) biodiversity decreases; 	<p>Deduct one mark if significantly out of sequence</p> <p>Accept: descriptions – e.g. algae grow very fast / algae grows right over surface of water</p> <p>Ignore: plants die</p> <p>Accept: no oxygen</p> <p>Accept: (low oxygen levels cause) fish die</p> <p>Accept idea that a small increase in eutrophication can initially increase biodiversity</p>	(3)

Question Number	Answer	Additional guidance	Mark
3(a)	carbon dioxide + water → ; glucose + oxygen ;	can be in either order Ignore refs to energy can be in either order Reject refs to energy Accept correct balanced symbol equation	(2)

Question Number	Answer	Additional guidance	Mark
3(b)	12 (hours) ;	Allow +/- 1 hour	(1)

Question Number	Answer	Additional guidance	Mark
3(c)	light / temperature ;	accept sunlight / warmth / water Ignore sun	(1)

Question Number	Answer	Additional guidance	Mark
4(a)	<p>Any two from:</p> <ol style="list-style-type: none"> 1. low light levels ; 2. high pressure ; 3. lack of food sources ; 4. very cold ; 5. low oxygen concentration; 	<p>Accept: dark/ no light</p> <p>Reject: no food</p> <p>Ignore: no oxygen</p> <p>Accept: refs to deep sea volcanic vents e.g. low pH, high sulphur, high acidity, (very) hot</p>	(2)

Question Number	Answer	Additional guidance	Mark
4(b)	<p>Any two from:</p> <ol style="list-style-type: none"> 1. (motionless)results in less energy wasted / so that predators / prey less likely to detect it ; 2. large eyes for very little light ; 3. tube eyes to withstand pressure ; 4. eyes look upward because most of its predators / prey / food will be above it / light comes from above no point in looking down as too dark below; 	<p>Accept large (pectoral fins for stability / motionless / fast response ;</p> <p>Accept large nostrils to detect prey</p>	(2)

Question Number	Answer	Additional guidance	Mark
5(a)(i)	38 ;		(1)

Question Number	Answer	Additional guidance	Mark
5(a)(ii)	19 ;		(1)

Question Number	Answer	Additional guidance	Mark
5(b)	<p>(Mitosis is for) (production of) body cells / diploid cells /genetically identical cells</p> <p>growth / repair ;</p> <p>(meiosis is for) (production of) gametes / haploid cells/ sexual reproduction / genetic variation ;</p>	<p>Ignore cloning Ignore just 'cells' Reject asexual reproduction</p> <p>Accept sperm / egg / sex cells</p>	(2)

Question Number	Answer	Additional guidance	Mark
6(a)	<p>Any three from:</p> <ol style="list-style-type: none"> 1. the diaphragm contracts / moves down ; 2. (external) intercostals /rib muscles contract ; 3. rib cage / ribs move up and out ; 4. volume of thoracic cavity / volume of chest / volume of lungs increases; 5. pressure (in lungs) decreases / pressure in lungs less than outside / <u>partial</u> vacuum / difference in pressure causes air to go in ; 6. increases oxygen concentration in the lungs / ; 	<p>Accept: diaphragm flattens Ignore: pulled down</p> <p>Ignore: lungs increase / get bigger / expand</p>	(3)

Question Number	Answer	Additional guidance	Mark
6(b)	<p>Any five from:</p> <ol style="list-style-type: none"> 1. Oxygen consumption at start represents the resting metabolic rate; 2. (oxygen consumption rises) because muscles working harder ; 3. (more oxygen) being used for increased aerobic respiration / to release more energy ; 4. maximum rate of aerobic respiration reached (graph flattens out) ; 5. anaerobic respiration starts / increases (as the graph flattens out); 6. lactic acid made / builds up (in muscles) ; 7. After race, oxygen consumption still higher than resting / stays higher than resting ; 8. idea of oxygen debt being repaid / EPOC falling as oxygen consumption falls ; 	<p>Accept: more oxygen needed by muscles</p> <p>Accept: breathing rate / depth cannot increase any more (when graph flattens out)</p> <p>Reject: aerobic respiration stops / switches to anaerobic</p> <p>Accept: as lactic acid is broken down/oxidised oxygen consumption falls</p>	(5)

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