

B3 INTERVENTION
MARK SCHEME

June 2014

Mark Scheme

A161/02

Question	Answer	Mark	Guidance
8 a	from top of diagram: D E A	3	
b	Any 2 from: consumption/digestion/eats/breakdown waste material or dead matter(1) increase the surface area of waste so decomposers can decay faster (1) idea of recycling of carbon via respiration/ production of carbon dioxide(1)	2	ignore ref to bacteria as detritivores ignore reference to decay linked to detritivores.
c	not all of the organism is eaten/named example (hair, bone, claws)/foxes share with other foxes(1) not all of the carbon is digested/ assimilated/ absorbed (1)	2	accept egestion/defecation from fox
	Total:	7	

Question	Answer	Mark	Guidance
c	<p>[Level 3] Candidates include a detailed explanation of all 3 stages Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] Candidates include a detailed explanation of two stages Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] Candidates include a detailed explanation of one stage Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to C Indicative scientific points may include:</p> <p>stage A:</p> <ul style="list-style-type: none"> • uptake of/absorption of/taking in/takes up/taking (nitrates into plants) • ignore "passes into" / "goes in" • via roots/root hairs • active transport • (nitrates) used to make protein <p>stage B:</p> <ul style="list-style-type: none"> • plants eaten by animals • digestion/assimilation • transfer of nitrogen (compounds)/protein along food chain <p>(ignore transfer of nitrate from plant to animal)</p> <p>stage C:</p> <ul style="list-style-type: none"> • excretion/egestion/urine/faeces/waste • death • decay/decomposition/ decomposers/fungi/bacteria • break down waste into nitrates • returns to the soil <p>ignore denitrification/nitrogen fixation</p>
	Total	10	

Question	Answer	Mark	Guidance
6 a i	<p>..... there were fewer species so there were fewer to become extinct.</p> <p>..... human activity was less damaging to plants and animals. ✓</p> <p>..... humans were eating all the plants and animals.</p> <p>..... life on Earth began.</p> <p>..... there is not much evidence written down about the plants and animals. ✓</p>	2	deduct 1 mark for each additional incorrect answer.
	ii 40000 and above	1	
	iii extinctions are (rapidly) increasing (exponentially) and are due to human activities /increasing human population	1	allow positive correlation for the trend For second half allow examples of human activity, e.g. pollution, deforestation, habitat destruction, industrialisation
b i	captive breeding programmes / protected areas / tracking animals / seed or gene banks / zoos/ cloning	1	allow prevent introduction of new species into environment/ elimination of alien species
	ii Any 2 from: maintains (bio)diversity/food webs or chains/ maintains ecosystems (1) provide us with valuable resources (1) (we need to try to conserve these species) so that the resources are there for future generations (1)	2	Ignore references to crops
	Total:	7	

Question	Answer	Marks	Guidance
7 (a)	<p>Level 3 (5–6 marks) Gives a description of evolution AND speciation using key terms.</p> <p>Quality of written communication does not impede communication of the science at this level.</p> <p>Level 2 (3–4 marks) Gives a description of evolution OR speciation using key terms.</p> <p>Quality of written communication partially impedes communication of the science at this level.</p> <p>Level 1 (1–2 marks) Makes a simple statement about evolution OR speciation</p> <p>Quality of written communication impedes communication of the science at this level.</p> <p>Level 0 (0 marks) Insufficient or irrelevant science. Answer not worthy of credit.</p>	6	<p>This question is targeted at grades up to C</p> <p>Indicative scientific points on Evolution may include</p> <ul style="list-style-type: none"> • Natural selection • variation • mutation • competition • selective survival/survival of best adapted/survival of fittest • reproduction • pass on characteristic/genes <p>Indicative scientific points on Speciation may include</p> <ul style="list-style-type: none"> • population gets split into two groups (eg new mountain range or new river etc) • reproductive isolation • different/changed environments • split populations become different • different species can not interbreed (eg due to mating seasons/courtship/genetic incompatibility) <p>Use the L1, L2, L3 annotations in Scoris; do not use ticks.</p>
	Total	6	
	Paper Total	60	

Question	Answer	Mark	Guidance
7	<p>[Level 3] Answer includes similarities AND differences between natural selection and selective breeding. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] Answer includes one similarity AND/ OR one difference. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] Answer includes a feature of EITHER natural selection OR selective breeding. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to C</p> <p>Indicative scientific points may include:</p> <p>similarities:</p> <ul style="list-style-type: none"> • they are both ways of breeding animals/plants • both produce changes in characteristics • both rely on variation in individuals • resulting from mutation/DNA changes • both select the most favourable characteristics • these characteristics are passed onto offspring • over time more individuals possess the characteristics <p>differences:</p> <ul style="list-style-type: none"> • NS occurs naturally and SB is controlled by humans • NS takes longer than SB ora • NS selects traits that are useful to survival and SB selects traits that are useful to humans • allow credit for examples to illustrate the differences
	Total:	6	

Question	Answer	Marks	Guidance
5	<p>Level 3 (5–6 marks) Explain blood pressure is the pressure of the blood on the walls of the arteries. Explains how at least one factor affects blood pressure</p> <p>Quality of written communication does not impede communication of the science at this level.</p> <p>Level 2 (3–4 marks) Explains why there are two blood pressure numbers. Describes factors as increasing or decreasing blood pressure.</p> <p>Quality of written communication partially impedes communication of the science at this level.</p> <p>Level 1 (1–2 marks) Gives examples of factors which cause blood pressure to vary between individuals.</p> <p>Quality of written communication impedes communication of the science at this level.</p> <p>Level 0 (0 marks) Insufficient or irrelevant science. Answer not worthy of credit.</p>	6	<p>This question is targeted at grades up to A/A*</p> <p>Indicative scientific points at Level 3 may include:</p> <ul style="list-style-type: none"> arteries have muscular walls to maintain pressure when heart is relaxing how cholesterol deposits increase blood pressure how exercise can reduce blood pressure how aging/hardening arteries increase blood pressure how nicotine increase blood pressure <p>Indicative scientific points at Level 2 may include:</p> <ul style="list-style-type: none"> describes blood pressure measurement as two numbers higher number is when heart is contracting lower number is when heart is relaxing 120/80 = normal Eg increased fitness decreases blood pressure <p>Indicative scientific points at Level 1 may include:</p> <ul style="list-style-type: none"> weight/fitness/age/stress/inheritance/drugs/smoking/salt/fat genetic <p>Ignore references to poor/healthy diet.</p> <p>Use the L1, L2, L3 annotations in Scoris; do not use ticks.</p>
6	<p>Total 6</p> <p>(a) (i) D; has both largest population and greatest number of different species</p> <p>(ii) A</p> <p>(iii) genetic variation/variation within a species</p>	<p>6</p> <p>2</p> <p>1</p> <p>1</p>	<p>mark as independent points</p> <p>accept DNA differences</p>

Question	Answer	Marks	Guidance																
(b)	<table border="1"> <tr> <td data-bbox="279 1198 351 1825">The ultimate source of energy for food webs is the Sun.</td> <td data-bbox="279 1198 351 1825"></td> </tr> <tr> <td data-bbox="351 1198 422 1825">A new antibiotic is discovered in a rare species of plant.</td> <td data-bbox="351 1198 422 1825">✓</td> </tr> <tr> <td data-bbox="422 1198 494 1825">A gene is identified that could make crops grow in a drier climate.</td> <td data-bbox="422 1198 494 1825">✓</td> </tr> <tr> <td data-bbox="494 1198 598 1825">Classification is used to make it easier to identify different organisms.</td> <td data-bbox="494 1198 598 1825"></td> </tr> <tr> <td data-bbox="598 1198 670 1825">Mutations are required for the development of a new species.</td> <td data-bbox="598 1198 670 1825"></td> </tr> <tr> <td data-bbox="670 1198 742 1825">Evidence for evolution comes from the fossil record and from DNA.</td> <td data-bbox="670 1198 742 1825"></td> </tr> <tr> <td data-bbox="742 1198 805 1825">Darwin's theory of natural selection.</td> <td data-bbox="742 1198 805 1825"></td> </tr> <tr> <td data-bbox="805 1198 909 1825">All living organisms are dependent on other organisms for their survival.</td> <td data-bbox="805 1198 909 1825">✓</td> </tr> </table>	The ultimate source of energy for food webs is the Sun.		A new antibiotic is discovered in a rare species of plant.	✓	A gene is identified that could make crops grow in a drier climate.	✓	Classification is used to make it easier to identify different organisms.		Mutations are required for the development of a new species.		Evidence for evolution comes from the fossil record and from DNA.		Darwin's theory of natural selection.		All living organisms are dependent on other organisms for their survival.	✓	3	
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(c)	any correct example but must include cause and linked effect	1	Eg deforestation causes habitat destruction; burning fossil fuels leads to global warming ignore unqualified reference to "pollution"																
	Total	8																	

Question	Answer	Marks	Guidance
6 (a)	<p>Level 3 (5–6 marks) Environment named AND includes several indicative scientific points from both 'living' AND 'non-living' areas. Quality of written communication does not impede communication of the science at this level.</p> <p>Level 2 (3–4 marks) Environment named AND includes one indicative scientific point from both 'living' AND 'non-living' areas. OR Environment named AND includes two indicative scientific points from either 'living' OR 'non-living' areas. Quality of written communication partly impedes communication of the science at this level.</p> <p>Level 1 (1–2 marks) Answer includes an indicative scientific point or points from at least 'living' OR 'non-living' areas Quality of written communication impedes communication of the science at this level.</p> <p>Level 0 (0 marks) Insufficient or irrelevant science. Answer not worthy of credit.</p>	6	<p>This question is targeted at grades up to A* Indicative points about non-living indicators may include:</p> <ul style="list-style-type: none"> • nitrate levels / NOX levels / pollution levels • litmus / BDH universal / pH • oxygen level • light levels • water levels • CO2 / monitoring stations • size of polar ice cap <p>Indicative points about living indicators may include:</p> <ul style="list-style-type: none"> • species of lichens present - showing levels of SO2 • mayfly larvae in water - high oxygen concentration • Trent biotic index – gives score <p>General Examples of environments may include:</p> <ul style="list-style-type: none"> • River / lakes / water • Wood • Lawn / field • Desert • Oceans / sea • atmosphere / air • ice caps • Earth • soil <p>IGNORE fossils REJECT incorrect examples e.g. non living lichens BUT allow example unqualified e.g. lichens</p> <p>Use the L1, L2, L3 annotations in SCORIS; do not use ticks. Answers must be correctly related to a named environment eg woodland or river. If not named then marks restricted to L1.</p>

Question	Answer	Marks	Guidance
6 (b)	any two from: changes are small; changes are variable / fluctuate; eliminate outliers;	2	Ignore need more data or references to reliability
	Total	8	

Question	Answer	Mark	Guidance												
7 a	meeting the needs of the people today (1) without damaging the Earth for future generations (1)	2													
b	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">The size and shape of the bag.</td> <td style="width: 20%;"></td> </tr> <tr> <td>The cost of making the bag</td> <td></td> </tr> <tr> <td>The materials used to make the bag.</td> <td style="text-align: center;">✓</td> </tr> <tr> <td>The colour of the bag.</td> <td></td> </tr> <tr> <td>The energy used to make the bag.</td> <td style="text-align: center;">✓</td> </tr> <tr> <td>The pollution created when the bag is made.</td> <td style="text-align: center;">✓</td> </tr> </table>	The size and shape of the bag.		The cost of making the bag		The materials used to make the bag.	✓	The colour of the bag.		The energy used to make the bag.	✓	The pollution created when the bag is made.	✓	2	all 3 correct = two marks 2 correct = one mark More than 3 boxes ticked, negate 1 mark for each additional tick.
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	Total	5													