

Question	Answers	Extra information	Mark	AO / Specification reference
01.1	D B A E C	1 mark for one correct 2 marks for two correct 3 marks for three or four correct 4 marks for all correct	4	AO2 4.6.2.3
01.2	greater mass of tomatoes produced – more profit produced more fruit produced per plant – less land required to produce same number of tomatoes sweeter tomatoes more in demand – higher price can be charged per tomato		2	AO3 4.6.2.3
01.3	disease resistance / pest resistance because a natural resistance would prevent plants dying / plants would stay healthy, leading to high yield		1 1	AO3 4.6.2.3
02.1	All three bars plotted to the correct height	award one mark for one bar plotted to the correct height	2	AO2 4.6.2.1 Ms 4a
02.2	$140 \leq h < 160$		1	AO2 4.6.2.1 MS 2f
02.3	both		1	AO2 4.6.2.1

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02.4	for a person to reach their potential (inherited) height, they must eat an appropriate diet / receive adequate nutrition		1	AO2 4.6.2.1					
03.1	new genes introduced / DNA modified to give desired traits		1 1	AO1 4.6.2.4					
03.2	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>Large leaves</td> <td rowspan="4" style="text-align: center; vertical-align: middle;"> </td> </tr> <tr> <td>How tall it grows</td> </tr> <tr> <td>Resistance to frost</td> </tr> <tr> <td>Size of fruit</td> </tr> </table>	Large leaves		How tall it grows	Resistance to frost	Size of fruit	4 marks for all correct 3 marks for 3 correct 2 marks for 2 correct 1 mark for 1 correct	4	
Large leaves									
How tall it grows									
Resistance to frost									
Size of fruit									
03.3	one from: quicker (than selective breeding) / only takes one generation can be sure of trait becoming present in crop		1	AO2 4.6.2.4					
04.1	differences in the characteristics of individuals within a population		1	AO1 4.6.2.1					
04.2	fur colour / eye colour		1	AO2 4.6.2.1					
04.3	size / height / body mass puppies have the potential to grow to a certain size, but their size is also affected by how much they eat		1 1	AO2 4.6.2.1					

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04.4	one from: raised likelihood of genetically inherited disorders/defects/health problems reduction in genetic diversity increased chance of inbreeding		1	AO1 4.6.2.3																				
05.1	species offspring variation genes environment		1 1 1 1 1	AO1 4.6.2.1																				
05.2	<table border="1"> <thead> <tr> <th>Human characteristic</th> <th>Genetic variation</th> <th>Environmental variation</th> <th>Both</th> </tr> </thead> <tbody> <tr> <td>body mass</td> <td></td> <td></td> <td>✓</td> </tr> <tr> <td>tattoo</td> <td></td> <td>✓</td> <td></td> </tr> <tr> <td>blood group</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>intelligence</td> <td></td> <td></td> <td>✓</td> </tr> </tbody> </table>	Human characteristic	Genetic variation	Environmental variation	Both	body mass			✓	tattoo		✓		blood group	✓			intelligence			✓	award one mark for each correct row	4	AO2 4.6.2.1
Human characteristic	Genetic variation	Environmental variation	Both																					
body mass			✓																					
tattoo		✓																						
blood group	✓																							
intelligence			✓																					
05.3	the child will inherit genes / genetic material / characteristics from both the mother and the father	Accept the child will receive a mixture of genes / genetic material from the mother and the father	1	AO2 4.6.2.1																				

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06.1	genes a different reproduces offspring		1 1 1 1	AO1 4.6.2.4
06.2	it can occur in one generation it targets single genes		1 1	AO1 4.6.2.4
06.3	insulin producing bacteria / frost resistant tomatoes / disease resistant plants / pest resistant crops	accept any appropriate genetically engineered organisms	1	AO1 4.6.2.4
06.4	may cause allergies / health problems / may cross-breed with wild plants	do not accept unethical	1	AO3 4.6.2.4
07.1	breeding plants and animals for particular genetic characteristics		1	AO1 4.6.2.3
07.2	selective breeding decreases variation in a population		1	AO1 4.6.2.3
07.3	bigger grains/seed	accept more grains/seeds	1	AO2 4.6.2.3
07.4	plants with larger grains selected cross pollinated / bred seeds collected and offspring grown process repeated over many generations	allow ecf	1 1 1 1	AO2 4.6.2.3

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08.1	3.8–5.2 (cm)	Both figures required for the mark Do not accept 1.4 cm	1	AO2 4.6.2.1 Ms 3a
08.2	5.5 (cm)		1	AO2 4.6.2.1 Ms 2a, 2f
08.3	larger more photosynthesis		1 1 1	AO3 4.6.2.1
08.4	both		1	AO3 4.6.2.1
09.1	cows – high milk production sheep – thick coats domestic dogs – gentle nature rose – sweet smelling	1 mark for one correct 2 marks for two or three correct 3 marks for all correct	3	AO2 4.6.2.3
09.2	identifying parents with desired characteristics repeating the breeding process for many generations		1 1	AO1 4.6.2.3
09.3	health problems / increased chance of inherited disease	Accept named health problem such as breathing difficulties in pugs	1	AO1 4.6.2.3
10.1	diabetes		1	AO1 4.6.2.4

Question	Answers	Extra information	Mark	AO / Specification reference
10.2	genes human many large		1 1 1 1	AO2 4.6.2.4
10.3	people may have religious / cultural beliefs for not using animal products / less chance of allergic reaction / large quantities can be made more easily	Accept any other appropriate suggestions	1	AO3 4.6.2.4
10.4	one from: crops / wheat flowers	Accept any correct suggestion Accept named crops/flowers	1	AO1