

GCSE Science/Biology

Mark Scheme

GCSE Science/Biology
Internally Assessed Activity Unit B1a
Topic 2 - Genes

Genetics in use

1	a		Line should be drawn from the letter A to the shaded area (nucleus);	1	
	b		Control activity;	1	
	c		Inheritance;	1	
	d		Two from: Genes are part of chromosomes; Idea that genes are smaller (than chromosomes); Idea that genes code for one characteristic, but chromosomes code for many characteristics;	2	
					Total 5 marks

2	a	i	Faulty;	1	
		ii	Two from: Idea that some diseases are caused by faulty genes; We can replace these faulty genes (if we know where they are); Use of gene therapy / genetic engineering ; Idea of preventive measures;	2	
		iii	Advantage: Idea of earlier treatment being beneficial/taking preventative measures or example; Disadvantage: Some people might not want to know they are going to get ill in the future/this might cause problems with getting a job or a mortgage or medical insurance/may cause anxiety or stress;	1 1	
	b	i	A and C and E (in any order); Idea of similar banding; Detail of similar banding e.g. each of these has a broad dark band near to top;	1 1 1	
		ii	There should be one argument for and against, coming from the same area or different areas;; Possible areas: <ul style="list-style-type: none"> • paternity cases • crime detection • economics, e.g. medical science/job prospects 	2	
					Total 10 marks

3	a		Identical; Genetically;	1 1	
	b	i	If the original parent has good or wanted characteristics, then all they offspring will have that characteristic e.g. disease resistance or large (don't just award marks for saying they will all be the same);	1	
		ii	If one gets a disease they will all be likely to (as they are the same);	1	
	c	i	60;	1	
		ii	(60 x 8 x 4 =) 1920 gains 2 marks 240 or (60 x 4) or 480 or (60 x 8) seen gains 1 mark Error carried forward from c i eg 30 x 8 x 4 = 960 gains 2 marks	2	
	d		No, because there are other differences (implied)/not fair test; Named other difference e.g. wind, humidity, rainfall, how close the plants are;	1 1	
					Total 11 marks

4			<p>Three from: Red flower is dominant and white flower is recessive (this could be shown in a key R = red and r = white; Indication of cross Rr x Rr; Gametes shown as single letters R and r; Punnet square or cross shown; e.g.</p> <table border="1" style="margin-left: 20px;"> <tr> <td></td> <td>R</td> <td>r</td> </tr> <tr> <td>R</td> <td>RR</td> <td>Rr</td> </tr> <tr> <td>r</td> <td>Rr</td> <td>rr</td> </tr> </table> <p>The ratio is nearly 75%:25%/ 3:1/3.35/3.347; Ratio is not exactly 3:1 because of chance/variation;</p>		R	r	R	RR	Rr	r	Rr	rr	3	
	R	r												
R	RR	Rr												
r	Rr	rr												
					Total 3 marks									

					Overall total 27 marks
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