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90948



Level 1 Science, 2011

90948 Demonstrate understanding of biological ideas relating to genetic variation

9.30 am Monday 21 November 2011 Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence		
Demonstrate understanding of biological ideas relating to genetic variation.	Demonstrate in-depth understanding of biological ideas relating to genetic variation.	Demonstrate comprehensive understanding of biological ideas relating to genetic variation.		

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should attempt ALL the questions in this booklet.

Show ALL working.

If you need more room for any answer, use the extra space provided at the back of this booklet.

Check that this booklet has pages 2–12 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

TOTAL

You are advised to spend 60 minutes answering the questions in this booklet.

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QUESTION ONE: SQUASH PLANTS

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http://myfolia.com/plants/87-patty-pan-squash-cucurbita-pepovar-clypeata/varieties/6851-early-white-bush-scallop

 $http://enjoyindian food.blogspot.com/2008_10_01_archive.html$

One trait in squash plants is the colour of the fruit.

White fruit are due to a **dominant** allele (**F**) and yellow fruit are due to a **recessive** allele (**f**).

(a)	Explain the difference between a gene and an allele.

(b) The alleles for the colour of squash fruit combine to produce THREE different genotypes, but only TWO phenotypes.

Explain how the alleles **combine** to produce **only** two different squash colours – white and yellow.

In your answer you should:

- define genotype and phenotype
- state the three different genotypes produced **and** the phenotype of each.

The three different genotypes:			ASSESSOF USE ONL
Their phenotypes:		 	
A genotype is:			
A phenotype is:			
There are only two dis	fferent colours of squas		
	1		

QUESTION TWO: APEING AROUND

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Normal gorilla

http://thundafunda.com/33/animals-pictures-nature/candid-western-lowland-gorilla-pictures.php

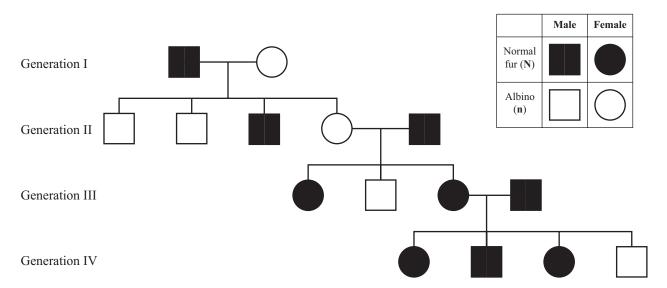
Albino gorilla

http://s288.photobucket.com/ albums/ll184/audrey083053/ animals/Albino%20Animals/?act ion=view¤t=albinogorilla. jpg&mediafilter=images

Gorillas show an inherited recessive condition called albinism. This results in white fur.

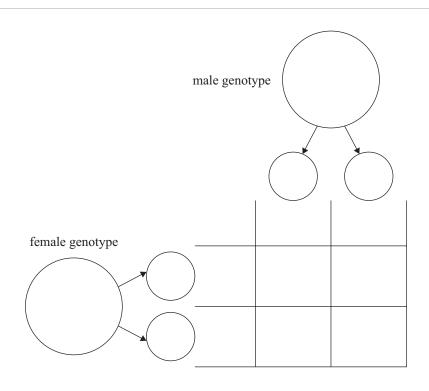
The pedigree chart below shows the inheritance of albinism in a family of gorillas. Normal fur is the **dominant** allele (N), while albino fur is **recessive** (n).

Pedigree Chart



- (a) Explain how the pedigree chart can be used to show that albinism is a recessive trait. In your answer you should:
 - define the terms dominant and recessive
 - state the genotypes of albino **and** normal gorillas
 - complete a labelled Punnett square to support your answer
 - explain how your Punnett square shows that albinism is a recessive trait.

Note: Refer to the pedigree chart opposite.				



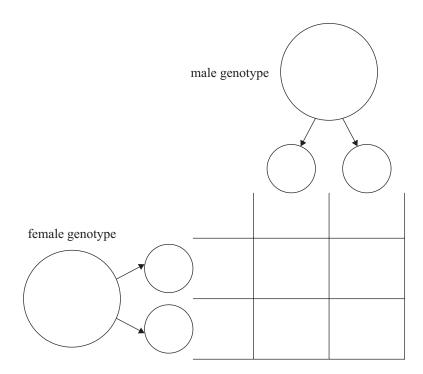
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A couple are expecting their third child. They already have one boy and one girl.

(a) Discuss the likelihood of their third child being a girl.

In your answer you should:

- explain how sex is determined in humans
- complete a Punnett square showing sex inheritance
- explain the relevance of the couple already having children.



\ :	ough the libeliheed of this terms of destress hairs to be set 11 11	
	cuss the likelihood of this type of deafness being inherited by the new baby.	
	our answer you should consider:	
	the reason for the parent's deafness	
	what types of characteristics are inherited	
	the effects of genetics and the environment on deafness in offspring.	
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QUESTION FOUR: VARIATION

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Genetic variation is important in a population.

)	Describe what is meant by the term genetic variation , and explain its importance to a population.			

Exr	plain what mutations are and how they contribute to genetic variation.	
	your answer you should include:	
.11 y	what a mutation is	
,	the effect of mutations on genes, alleles and DNA	
•	whether all mutations are passed on to the next generation.	
	whether all illutations are passed on to the next generation.	

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QUESTION NUMBER	Extra space if required. Write the question number(s) if applicable.	