90948

909480

1

SUPERVISOR'S USE ONLY

NZQA

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

QUALIFY FOR THE FUTURE WORLD
KIA NOHO TAKATŪ KI TŌ ĀMUA AO!

Level 1 Science, 2017

90948 Demonstrate understanding of biological ideas relating to genetic variation

9.30 a.m. Wednesday 15 November 2017
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.

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

Check that this booklet has pages 2–8 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.

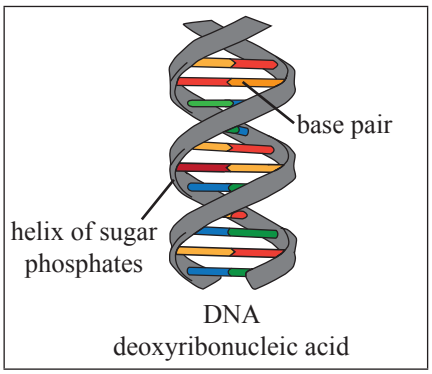
TOTAL

ASSESSOR'S USE ONLY

QUESTION ONE

ASSESSOR'S USE ONLY

https://pixabay.com/en/panter-leopard-black-spotted-359245/



Adapted from: https://commons.wikimedia.org/wiki/File:Dna-base-flipping.svg

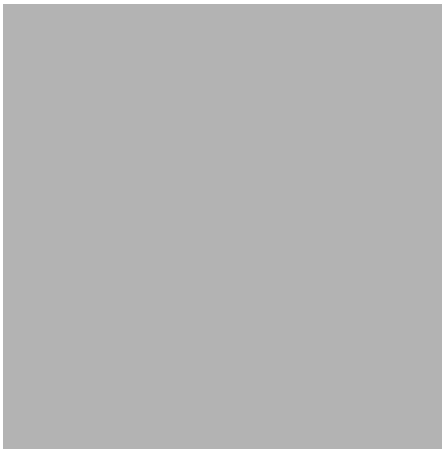
Some leopards or jaguars have a **mutation** causing them to have a black coat. These are known as "black panthers".

(a) How can this **mutation** cause the coat colour to be different?

In your answer you should use the terms DNA, gene, allele, phenotype, and mutation to explain how this colour change occurs. The DNA diagram above may help you.

(b) Leopards in the wild commonly have scars, especially around their faces.

Explain why the leopard cubs can be born with black coats but not with scars.



www.wilderness-safaris.com/media/blog/camp-news/chitabe-leopard-identikits/copy-of-01-mosadi-mogolo-web.jpg

ASSESSOR'S USE ONLY

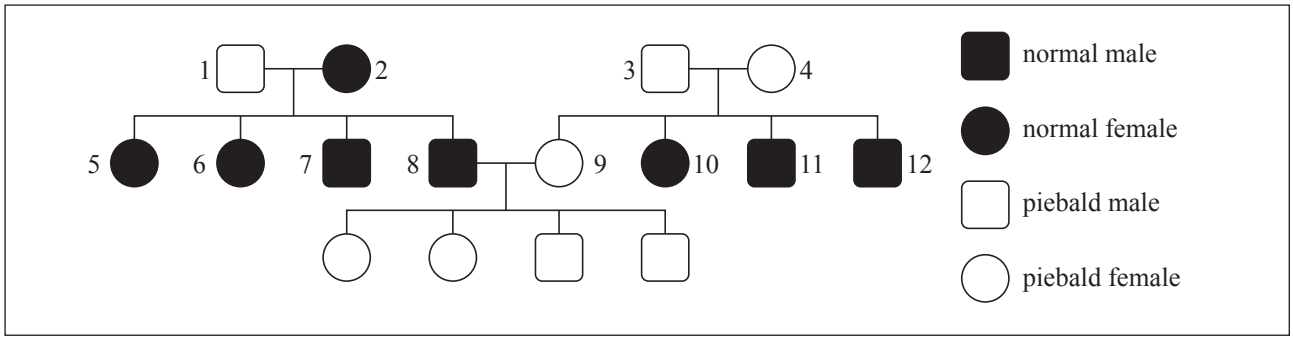
QUESTION TWO

ASSESSOR'S USE ONLY

https://nz.pinterest.com/pin/255297872600783620/

www.mybligr.com/wp-content/uploads/2017/02/beautiful-Black-horse-images-pictures-photos-13.jpg

Piebaldism is a genetic condition causing a white patch on the head and body of horses. In horses piebaldism is a **dominant** trait (H), and "normal" colour is recessive (h).



(a) From the pedigree chart above, list **all** the possible phenotypes and genotypes of horses 3, 8, and 9.

Use the letter H for the dominant trait and h for the recessive.

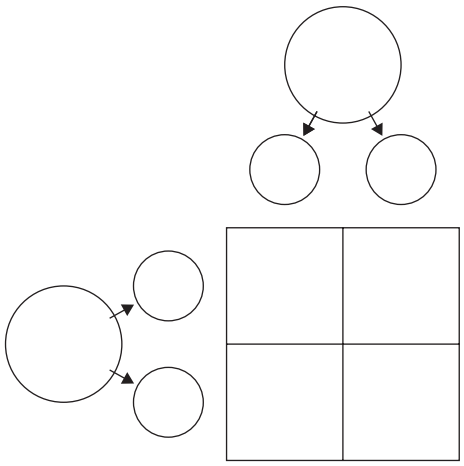
Individual	Phenotype (normal or piebald)	Genotype (HH, Hh, or hh)
3		
8		
9		

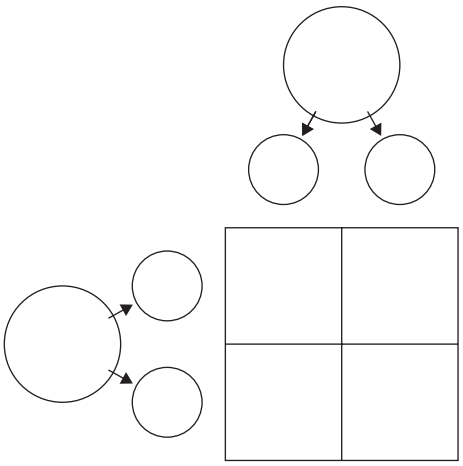
ASSESSOR'S USE ONLY

(b) A breeder wants to produce only **dominant** (piebald) offspring from a breeding pair of horses. The breeder has piebald and normal horses to breed from.

How could the breeder use crosses to make sure that the pair of horses were **pure breeding**?

Show crosses using Punnett squares to support your answer.





QUESTION THREE

ASSESSOR'S USE ONLY

Wild bananas, showing seeds.

https://commons.wikimedia.org/w/index.php?curid=1867879

A "banana pup" growing.

www.promusa.org/Banana+sucker

Wild bananas have large seeds, and reproduce sexually.

Farmed bananas are produced asexually, from suckers called "banana pups".

(a) How does the production of **gametes** result in variation for the wild banana plants?

(b) Suggest a possible problem that may arise with farmed bananas (produced from suckers), and explain why this problem would not occur in wild bananas (produced sexually)?

ASSESSOR'S USE ONLY

Extra paper if required.
Write the question number(s) if applicable.

QUESTION NUMBER

ASSESSOR'S USE ONLY

90948