

Level 1 Science, 2006

90188 Describe aspects of biology

Credits: Five
9.30 am Tuesday 28 November 2006

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 answer ALL the questions in this booklet.

If you need more space for any answer, use the page(s) provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–10 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.

<i>For Assessor's use only</i>			
Achievement Criteria			
Achievement	Achievement with Merit		Achievement with Excellence
Describe aspects of biology	<input checked="" type="checkbox"/>	Explain aspects of biology	<input checked="" type="checkbox"/>
		Discuss aspects of biology	<input type="checkbox"/>
Overall Level of Performance			M

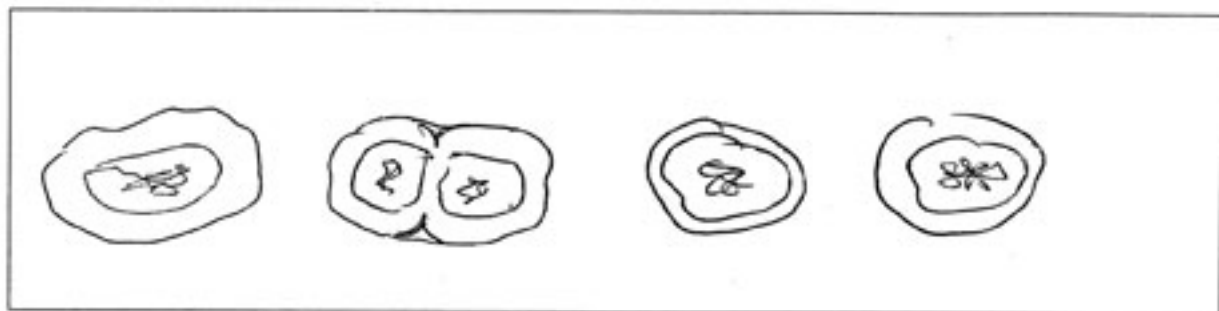
You are advised to spend 40 minutes answering the questions in this booklet.

Assess
use onl

QUESTION ONE: BACTERIA AND FUNGI

- (a) Describe how bacteria reproduce. A diagram may help your answer.

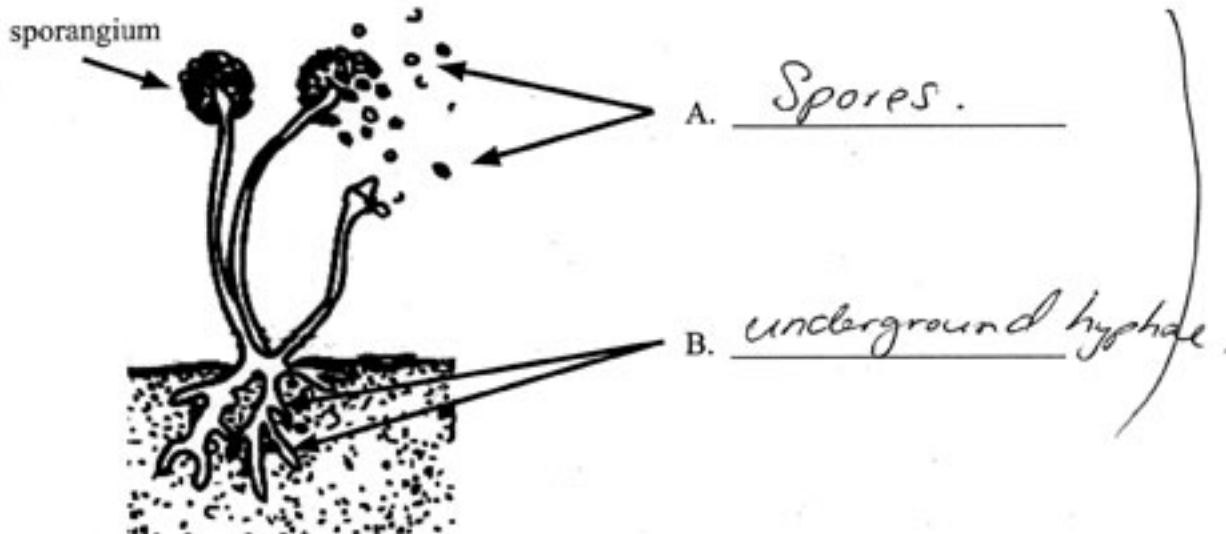
Bacteria reproduce by binary fission.
The chromosomes in the cell divide into
two and the cell splits into two. Like cloning.



- (b) What is the **main condition** that causes bacteria to undergo anaerobic respiration?

Lack of oxygen.

- (c) Label the TWO parts of a fungus indicated on the diagram below.



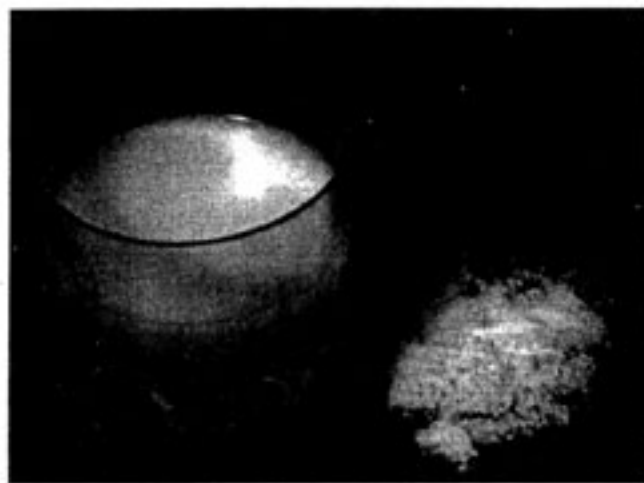
- (d) Explain why the sporangia in the diagram are **above** the surface.

The sporangia are above the surface so when they are released from the sporangium they can float on air currents or water currents and when landed on a suitable food source and in the right conditions, they will reproduce.

- (e) Compare and contrast **digestion** and **reproduction** in bacteria and fungi.

The digestion of bacteria and fungi is the same. Both microbes feed by a process called extracellular digestion. The cell secretes enzymes which ~~also~~ break down nutrients in food and then absorb them back into the cell to use for food. However, bacteria reproduce by binary fission but fungi reproduce by releasing spores from aerial hyphae which flow through the air and when land on a food source then begin to grow.

The picture shows two forms of milk. On the left is liquid milk; on the right is milk powder.



- (f) In terms of **temperature** and **water content**, discuss why milk powder can be stored for a longer time than liquid milk.

~~Harmful bacteria grow best in warm, moist and ~~light~~^{dark} conditions. If the liquid milk is stored in a ~~usually~~ room temperature then it is more likely that bacteria will grow in the ~~best~~^{wet, warm} conditions. Whereas, as milk powder is dry it is less likely for bacteria to grow because the conditions are not favourable for growth, especially if it stored in a cool place.~~

Bacteria grows best in warm, moist, dark conditions. The ~~wet~~^{wet} conditions of liquid milk makes the conditions for bacteria growth favourable, particularly if left in a warm ~~conditions~~^{place}. However powdered milk will last longer because it is dry. As these conditions are unfavourable for the growth of bacteria powdered milk will last longer than liquid milk, especially if placed in cool conditions.

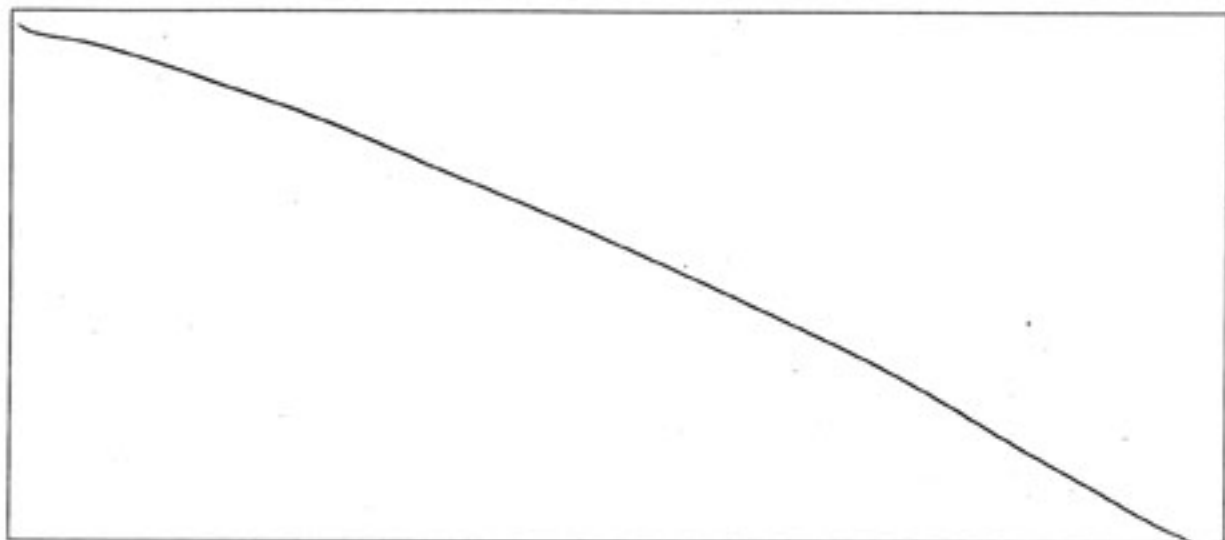
QUESTION TWO: VIRUSES

Cold sores are caused by a virus.

- (a) Describe why a virus such as the cold sore virus can **not** be cultured on a nutrient agar plate.

Viruses can only reproduce when attached
to a living host cell. Therefore as an
agar plate is not living it is impossible to
culture a ~~live~~ virus.

- (b) Explain how viruses reproduce. You may draw diagrams to support your answer.



The virus attaches to a host cell. It then
drills into the cell and injects its genetic
material. This genetic material takes over the
running of the host cell and mass produces
the virus. The host cell dies and the new
viruses are released into the ~~system~~ and
organism's system. Then the process begins
again.

QUESTION THREE: GENETICS

- (a) There are 78 chromosomes in the body cell of an adult Shar-Pei dog. How many are found in the gamete?

39.



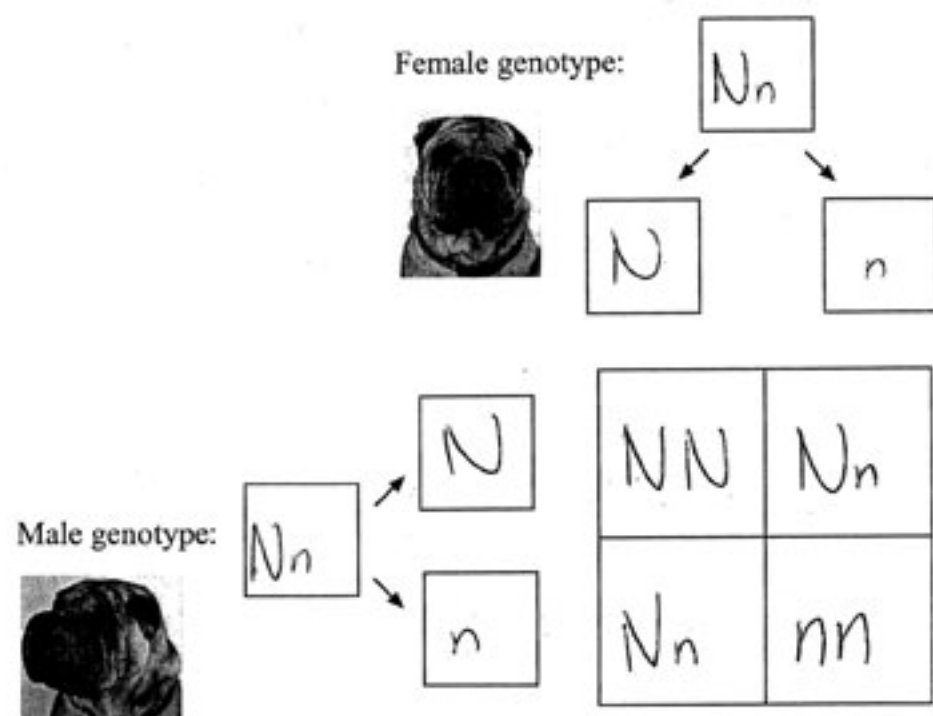
- (b) Define the term heterozygous.

both dominant and recessive
heterozygous means that ~~two different~~ alleles are present in the genotype. both

In a Shar-Pei dog, the length of its coat is controlled by a gene. Normal coat (short) (N) is dominant to long coat (n). A male dog is **heterozygous** for normal coat.

The dog is crossed with a female dog that has the **same genotype**.

- (c) Complete the Punnett Square.



- (d) Give the **phenotype ratio** of the offspring of the cross.

1 : 2 : 1

~~1 : 2 : 1~~

1 homozygous dominant : 2 heterozygous : 1 homozygous recessive

- (e) This cross resulted in eight puppies, two of which had a **normal** coat. Explain why this differs from the ratio in Question 3(d).

The ratio in Question 3(d) suggests that half of the puppies will have a normal coat. Yet this data states that only 2 had a normal coat and 6 had a long coat. Going against the predictions /

- (f) Discuss how you could determine whether a normal-coat dog was **homozygous** or **heterozygous**. You may use Punnett squares to help answer the question.

To determine whether a normal coat dog was homozygous you could cross it with a heterozygous dog and if all puppies had a normal coat you would know that the dog was homozygous dominant /

	N	N
N	NN	NN
n	Nn	Nn

N	N
n	n

N	N
n	n

Continue on next page.

QUESTION FOUR: CLONING

Scientists in South Korea have claimed to have produced the first cloned dog.

Snuppy, whose name stands for Seoul National University puppy, was made from a cell taken from the ear of a three-year-old male Afghan hound.

Discuss why a dog produced by cloning looks identical to the biological parent, whereas a dog produced by sexual reproduction looks different from the parent.

A dog produced by cloning looks identical to the biological parent because the ~~the~~ DNA put into the empty egg is the full amount of chromosomes from a non sexual body part of the parent dog. This means the baby ~~dog~~ dog will have the exact ^{same} chromosomes as the parent. Whereas in normal sexual reproduction the puppy gets half its ^{of} chromosomes from the mother's gamete and half from the father's gamete. This causes variation as the two ~~totus~~ different gametes fertilise to become one zygote, and the chromosomes are mixed up in the process //