





NEW ZEALAND QUALIFICATIONS AUTHORITY MANA TOHU MĀTAURANGA O AOTEAROA

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

# Level 2 Biology, 2017

## 91156 Demonstrate understanding of life processes at the cellular level

#### 2.00 p.m. Wednesday 22 November 2017 Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of life processes at the cellular level.	Demonstrate in-depth understanding of life processes at the cellular level.	Demonstrate comprehensive understanding of life processes at the cellular level.

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 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 2–11 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	
	ASSESSOD'S LISE ONLY

© New Zealand Qualifications Authority, 2017. All rights reserved.

No part of this publication may be reproduced by any means without the prior permission of the New Zealand Qualifications Authority.

ASSESSOR'S USE ONLY

### **QUESTION ONE: PHOTOSYNTHESIS**

(a) Describe osmosis AND explain how it occurs in root cells of a plant.

(b) Write the word equation for photosynthesis AND draw a labelled diagram of a chloroplast showing the inner membrane, outer membrane, stroma, and thylakoid stacks.

ASSESSOR'S USE ONLY

it.	cuss how photosynthesis occurs, and the factors that affect		AS U
In y	your answer:		
•	explain light-independent AND light-dependent reactions		
•	indicate on your chloroplast drawing (previous page) where these reactions occur		
•	discuss how water AND one other factor can affect the rate of photosynthesis.		
		www.behance.net/gallery/13665729/	
		Corn-Plant-Root-Systems	

ASSESSOR'S
USE ONLY

#### **QUESTION TWO: CELL RESPIRATION**

http://taputeranga.org.nz/the-marine-life/molluscs/why-aremussels-absent-from-the-wellington-south-coast/ http://naturewatch.org.nz/taxa/117650-Mytilus-edulis

Intertidal animals such as the blue mussel, *Mytilus edulis*, rely on seawater to get dissolved oxygen for aerobic respiration. At low tide the mussels are exposed to the air and tightly close their shells to prevent desiccation (drying out). During low tide they rely on anaerobic respiration to maintain essential life processes.

Compare and contrast anaerobic and aerobic respiration in intertidal blue mussels.

In your answer include:

- an explanation of anaerobic respiration that includes where it takes place in the cell, and the products formed
- an explanation of aerobic respiration that includes where it takes place in the cell, and the products formed
- a discussion of one advantage and one disadvantage for BOTH anaerobic AND aerobic respiration in blue mussels.

AS	SE	SSC	R'S
AS	SE	ON	LY

#### **QUESTION THREE: MITOSIS**

The table below shows how mitosis occurs at different rates in different types of human cells.

8

Cell Type	Mitosis Rate (How often cells are replaced)
Skin cell	2 weeks
Liver cell	300 – 500 days
Intestinal – internal lining	4 – 5 days
Intestinal – muscle and other tissues	16 years

Discuss why the rate of mitosis varies in different human cells, using examples from the table above. In your answer:

- explain the purpose of mitosis AND how it occurs
- provide reasons why the rate of mitosis varies in different types of human cells
- compare and contrast ALL the different types of cells in the table AND justify the mitosis rate in terms of cell function.

You may use diagrams in your answer.

ASSESSOR'S
USE ONLY

9

NESTION	Extra paper if required. Write the question number(s) if applicable.	ASSE
QUESTION NUMBER		

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