

91156



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MANA TOHU MĀTAURANGA O AOTEAROA

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Level 2 Biology, 2013

91156 Demonstrate understanding of life processes at the cellular level

9.30 am Friday 22 November 2013

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 2–12 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

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QUESTION ONE: RESPIRATION

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The examination continues on the following page.

The rate of photosynthesis is directly related to the availability of light. Normally, an increase in light intensity also leads to an increase in temperature. However, if the temperature gets too high, the rate of photosynthesis may decrease or even stop completely. Experiments have shown that if light is kept constant but temperature is varied independently, then the rate of photosynthesis can still be seen to change.

- (b) The leaf is made up of several different types of cells. Their shape, size, and chloroplast concentration are related to their function.

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Adapted from V. Slaughter, *Living Things* (London: Hodder & Stoughton, 1980), p 30.

With reference to the diagram above, discuss how the location and structure of cells AND organelles in a plant leaf can maximise the rate of photosynthesis.

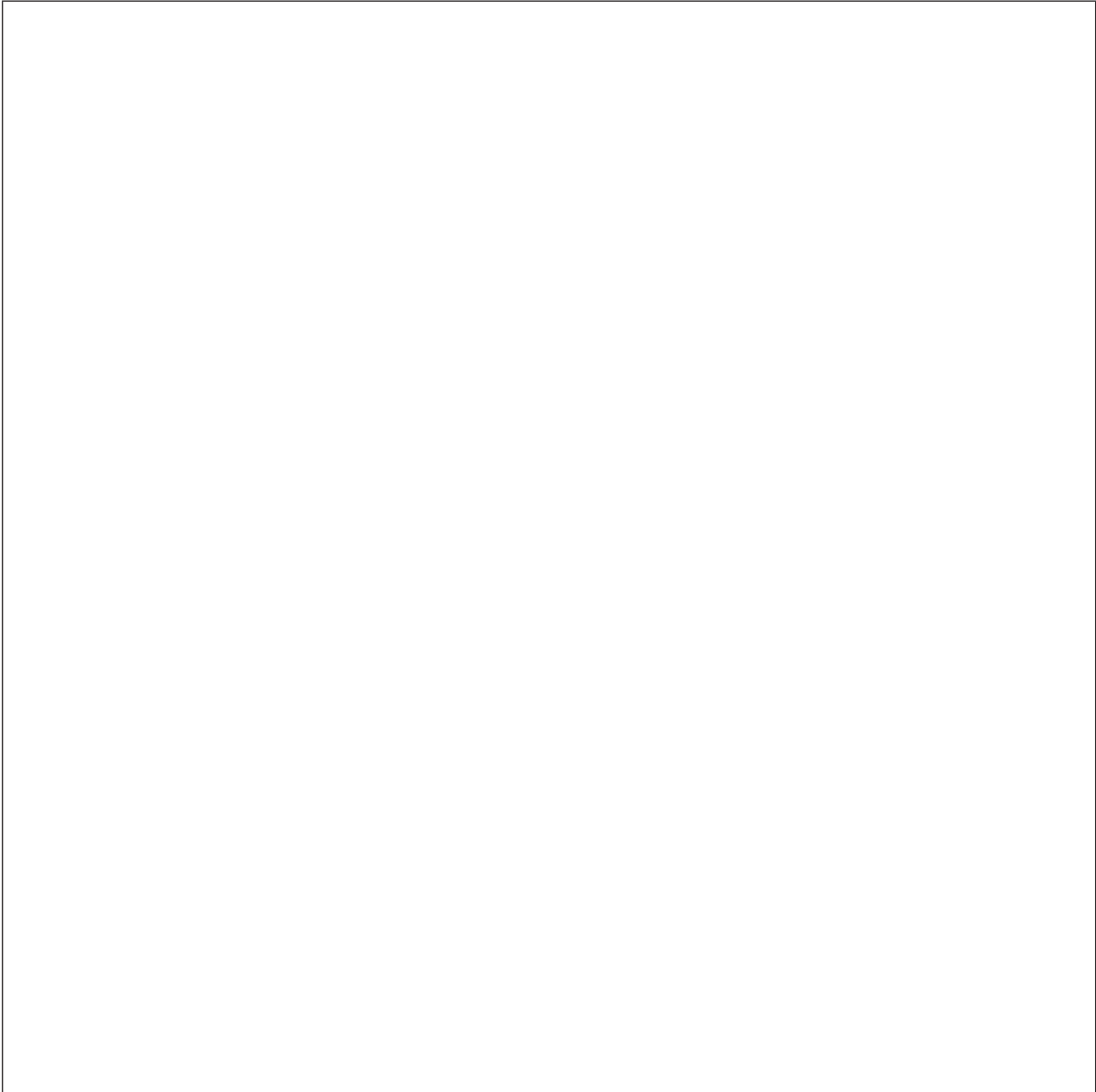
In your answer:

- describe the different types of cells found in a typical leaf
- describe the structure of the organelle where photosynthesis is carried out
- explain how the structures you have described allow the functions to be carried out
- relate the structure and function of the cells and organelles to the rate of photosynthesis.

You may draw a diagram(s) in the box provided to support your answer.

Mitosis occurs during the life cycles of both animals and plants.

(b) Explain the process of how chromosomes are replicated, and why the process is known as semi-conservative replication.



**Question Three continues
on the following page.**

- a description of what affects the rate of mitosis
- reasons why the stages of an organism's life-cycle have different rates of mitosis
- at least two examples, with reasons, of the parts of plants and animals where the rate of mitosis is likely to be higher.

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

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QUESTION
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