91603





Tick this box if there is no writing in this booklet

## Level 3 Biology 2020

## 91603 Demonstrate understanding of the responses of plants and animals to their external environment

2.00 p.m. Tuesday 24 November 2020 Credits: Five

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of the responses of plants and animals to their external environment.	Demonstrate in-depth understanding of the responses of plants and animals to their external environment.	Demonstrate comprehensive understanding of the responses of plants and animals to their external environment.

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

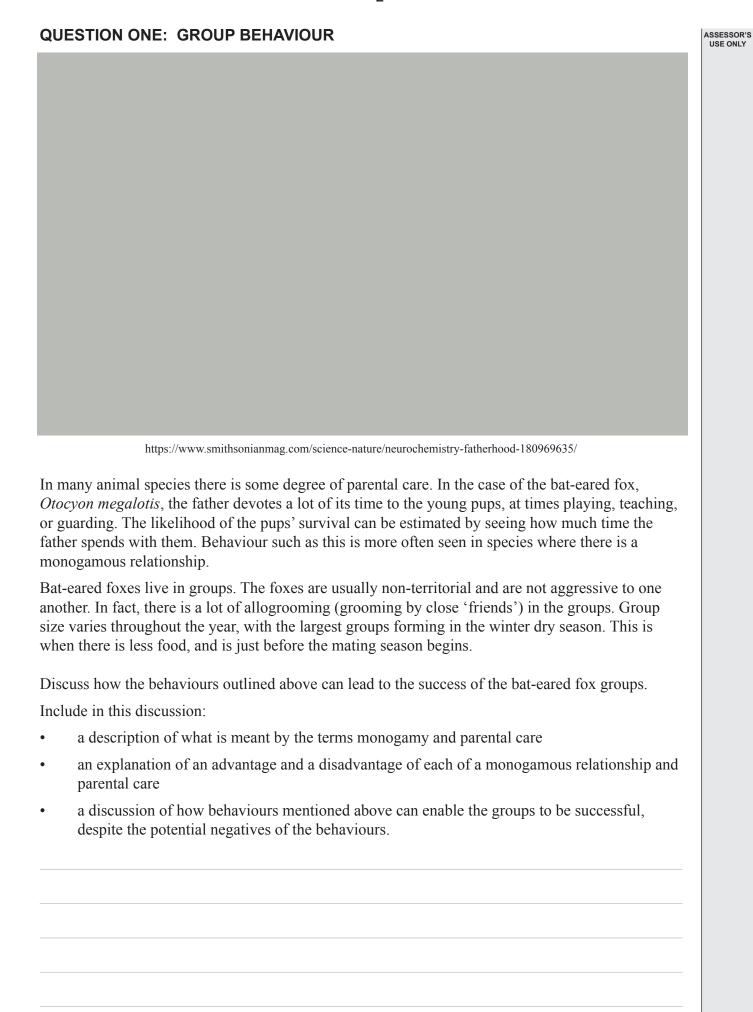
## You should attempt ALL the questions in this booklet.

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 2–16 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
There is more space for your	
There is more space for your answer to this question on the	
following pages.	

ASSESSOR'S USE ONLY

ASSESSOR'S USE ONLY

## QUESTION TWO: ORIENTATION RESPONSES

ASSES	SOR'S
USE	ONLY

	Tardigrades, <i>Macrobiotus hufelandi</i> , are microscopic 8-legged invertebrates that occupy moist habitats, such as water and moss. In studies they have shown <b>photokinesis</b> behaviours.
www.vreez.net/wp-content/uploads/2011/07/MA042153.jpg	Cucumber, <i>Cucumis sativus</i> , tendrils wrap around a metal structure, displaying <b>positive thigmotropism</b> .

Using the above examples, discuss how orientation responses such as these enable success in growth and reproduction for the named species.

Include in your discussion:

- descriptions of each of the orientation responses that are bolded in the table above
- an explanation of how photokinesis behaviour would differ from phototaxic behaviour AND an explanation of the mechanisms for the thigmotropic response

an evaluation of the benefits the responses provide to the species.		

ASSESSOR'S USE ONLY

ASSESSOR'S USE ONLY

ASSESSOR'S USE ONLY

QUESTION THREE: PHOTOPERIODISM IN PLANTS			
	Adapted from: https://orbitbiotech.com/photoperiodism-short-days-plant-long-day-plant/		
One example of photoperiodism in plants is flowering. This response is controlled by the action of phytochrome.			
Discuss the mechanisms of plant timing in each of the scenarios labelled A, B, and C above, and evaluate the effect of using light to interrupt night on the flowering of the plants.			
In your discussion:			
•	describe both the terms short-day plant and long-day plant		
•	explain the benefits for the long-day plant, of flowering in summer		
•	discuss the mechanisms of the phytochrome system that results in flowering or lack of flowering, referring to A and B, and C in the diagram above.		

There is more space for your answer to this question on the following pages.	
	ASSESSOR'S USE ONLY

ASSESSOR'S USE ONLY

USE ONLY

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

		Extra paper if required.	
	I	Write the question number(s) if applicable.	
QUESTION NUMBER		Time the queetien hamber(s) it applicable.	

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