

Centre Number			

С	andid	ate Nu	ımber

General Certificate of Secondary Education 2013

Biology

Unit 2

Foundation

[GBY21]

TUESDAY 18 JUNE, MORNING

GBY21

TIME

1 hour 30 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

You must answer the questions in the spaces provided. Do not write outside the box, around each page or on blank pages.

Complete in blue or black ink only. **Do not write with a gel pen**.

Answer all fourteen questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 90.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in questions 6, 10(b) and 14.



		ects on the bod	,		Marks	Rema
(a) Name two lung	g diseases caus	ed by tar in ciga	arette smoke.			
1				[1]		
2				[1]		
Carbon monoxide o	combines perma	anently with hae	moglobin in red b	olood		
(b) What effect do						
(c) Name one che	mical in cigarett	te smoke which	affects the heart	rate.		
· /	J					
	_			[1]		
	-			[1]	Total Qu	estior
				[1]	Total Qu	estion
Complete the table	showing the fea	atures of blood v	vessels.	[1]	Total Qu	estion
Complete the table Feature				[1]	Total Qu	estior
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The graph shows the average height of males and females from birth to 3 **Examiner Only** 20 years old. 200 180 160 140 Average height/cm 120 100 80 60 40 20 12 10 18 20 Age/years (a) What is the average height of a newborn baby? [1] (b) Between which ages are females taller than males? $_$ and $_$ [2] This graph uses height to measure growth. (c) Name the process which increases cell numbers. [1] **Total Question 3** (d) Name one other way to measure growth. [1] [Turn over 8251



The table shows the percentage of women surviving after being diagnosed with breast cancer.

Percentage of women surviving		
2006		
96.6		
94.3		
92.6		
-		

84.5

© N. Ireland Cancer Registry, Centre for Public Health, Queen's University, Belfast.

90.6

(a)	How does the percentage of women surviving 24 months after
	diagnosis change from 1996 to 2006?

24

ose percentages from the table to support your answer.		
[2]		
The number of women screened for breast cancer increased from 1996 to 2006		

(b)	The number of women screened for breast cancer increased from	1996
	to 2006.	

Give two advantages to the women screened for breast cancer.

			_
		[2

(c) Give one way breast cancer can be treated

ve one way breast cancer can be treate	d.	Total Qu	estio
	_ [1]		

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5 The table shows the number of pupils in a class who could roll their tongue **Examiner Only** Marks Remark and the number who were non-rollers. Category Number of pupils Roller 18 Non-roller 8 (a) Draw an appropriate graph of these results. [3] Category (b) (i) Name this type of graph. [1] (ii) What type of variation is shown by this data? [1] **Total Question 5** (iii) Give one cause of this variation in tongue rolling. [1] [Turn over 8251



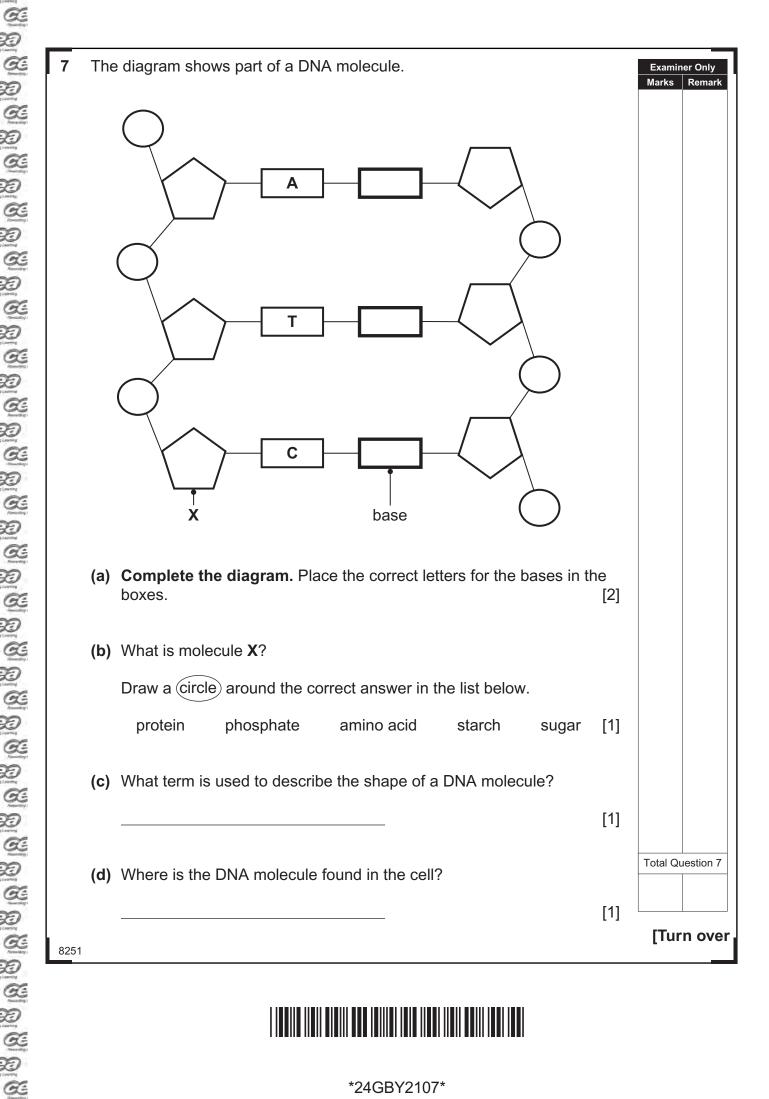
6 The photograph shows a red blood cell. **Examiner Only** Marks Remark © Dr.Stanley Flegler, Visuals Unlimited / Science Photo Library Describe and explain three ways a red blood cell is adapted for its function of oxygen transport. In this question, you will be assessed on your written communication skills, including the use of specialist scientific terms. **Total Question 6** _ [6]

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8 The table shows the average number of pregnancies occurring per year when using different contraceptive methods.

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Method	Average number of pregnancies per year	
Female sterilisation	Less than 1 in 200	
Male sterilisation	Less than 1 in 2000	
Contraceptive pill		
Female condom	5 in 100	
Male condom	2 in 100	

Source: Family Planning Association leaflet – Your guide to contraception

- (a) The contraceptive pill is 99% effective.
 - (i) Complete the table by calculating the average number of pregnancies occurring per year for the contraceptive pill.

[1]

(ii) Suggest **two** reasons why the contraceptive pill is not 100% effective.

1. _____

_____[´

2. _____

_____ [1]



	` '	Give one advantage and one other disadvantage of using the contraceptive pill.	!	Examine Marks	er Only Remark
		Advantage			
			_ [1]		
		Disadvantage			
			_ [1]		
		Use the information in the table to decide which method of contraception is the most reliable and which is least reliable.			
		Most reliable	_ [1]		
		Least reliable	_ [1]		
(b)		at term is used to describe methods of contraception which incl e and female sterilisation?	ude		
			[1]		
				Total Qu	estion 8
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9	Freckle	es in humans are caused by a recessive allele.	Examine Marks	r Only Remark
	Sto	freckles © Investigations in Applied Biology and Biotechnology by Peter Freeland, published by Hodder & aughton Education Ltd, 1990. ISBN 0340 50630X. Reproduced by permission of Hodder Education.		
	(a) (i)	Explain what is meant by an allele.		
		[1]		
	(ii)	Name the type of cell division which produces gametes.		
		[1]		

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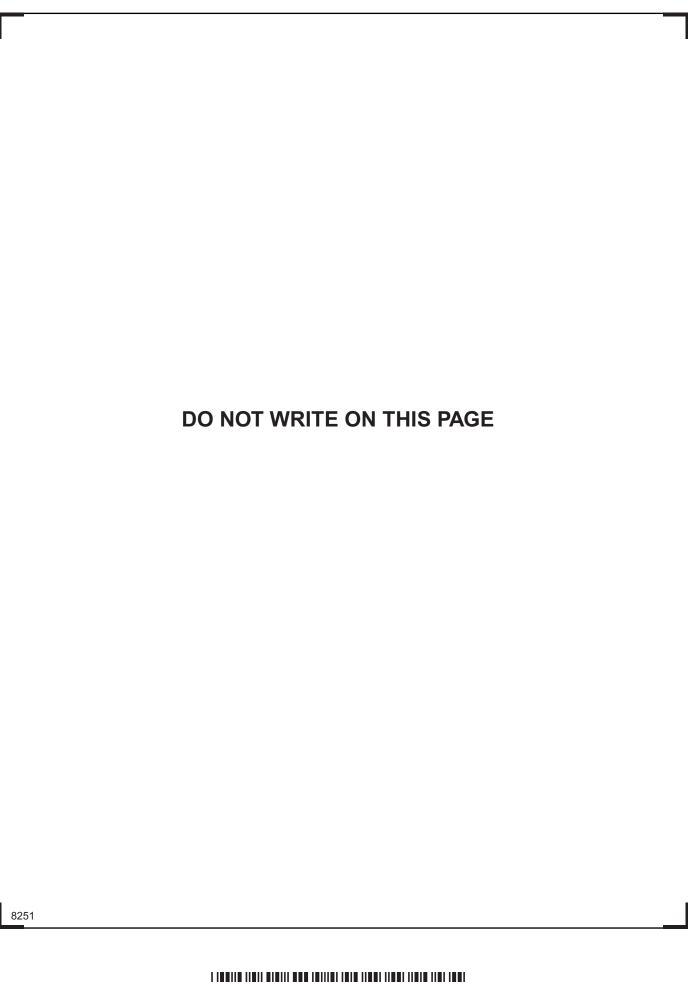
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	Use	N for the allele for n for the allele for		i	
			Р	amela	
		Gametes	N		
	Tony				
		n			
(i)	Name	this type of diagra	ım.		
					[1]
(ii)	_	plete the diagram arent's gametes an			
		essible genotypes			[3]
(iii)	Give t	he ratio of normal	skin to freckled	skin in the children.	
				_	[1]
(iv)	What	proportion of the	offspring will have	homozygous geno	types?
				_	[1]
(v)		in why it is not pos children with norm		n of the genotype o	f one
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10	The	e diagram shows a weight potometer.	Examine Marks	er Only Remark
		leafy shoot ———————————————————————————————————		
		flask of water		
	(a)	Describe the function of the film of oil in the flask.		
		[1]		
	(b)	Describe and explain how the plant causes the loss of mass in the flask.		
		In this question, you will be assessed on your written communication skills, including the use of specialist scientific terms.		
		[6]		
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The apparatus was used by a group of students to investigate the effect of wind on the rate of water loss from a leafy shoot over a period of 24 hours.

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The results are shown in the table.

	Loss in mas	ss of flask/g
Time/hours	In still conditions	In windy conditions
0	0	0
4	2	8
8	4	16
12	6	24
16	8	32
20	10	40
24	12	48

(0)	Suggest one way the students made the investigation a fair test.	
		[1]
		– Г.1

(d)	Calculate the average rate of loss of mass per hour of the flask during
	24 hours in still conditions.
	Show your workings.

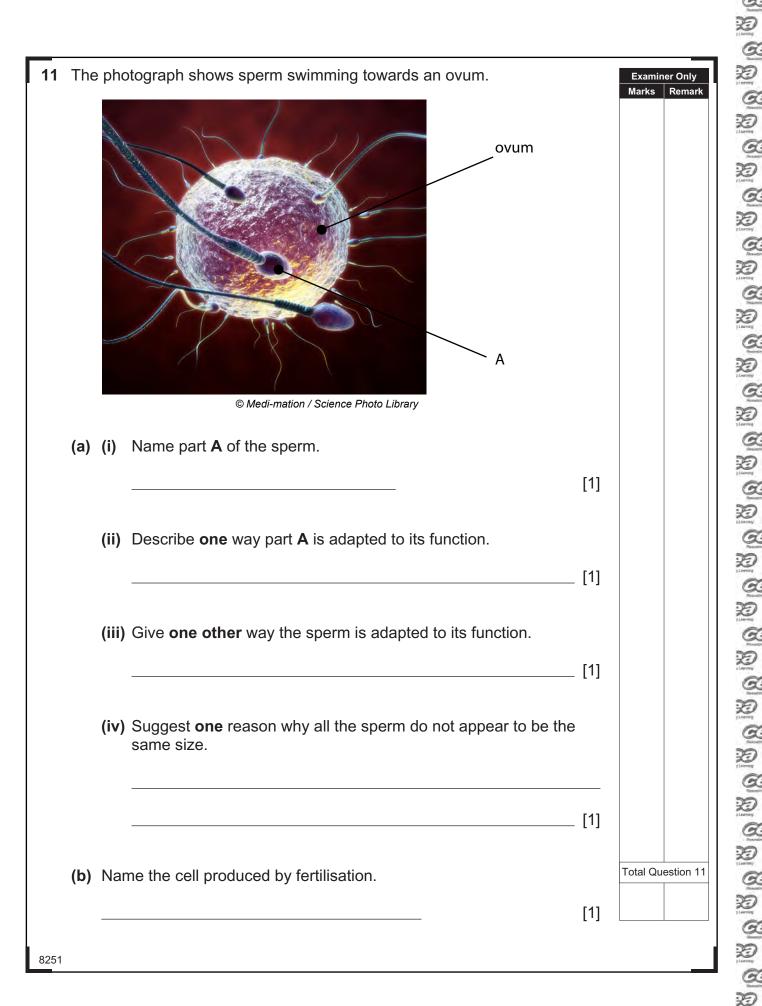
Average rate of loss of mass	g per hour	[2]
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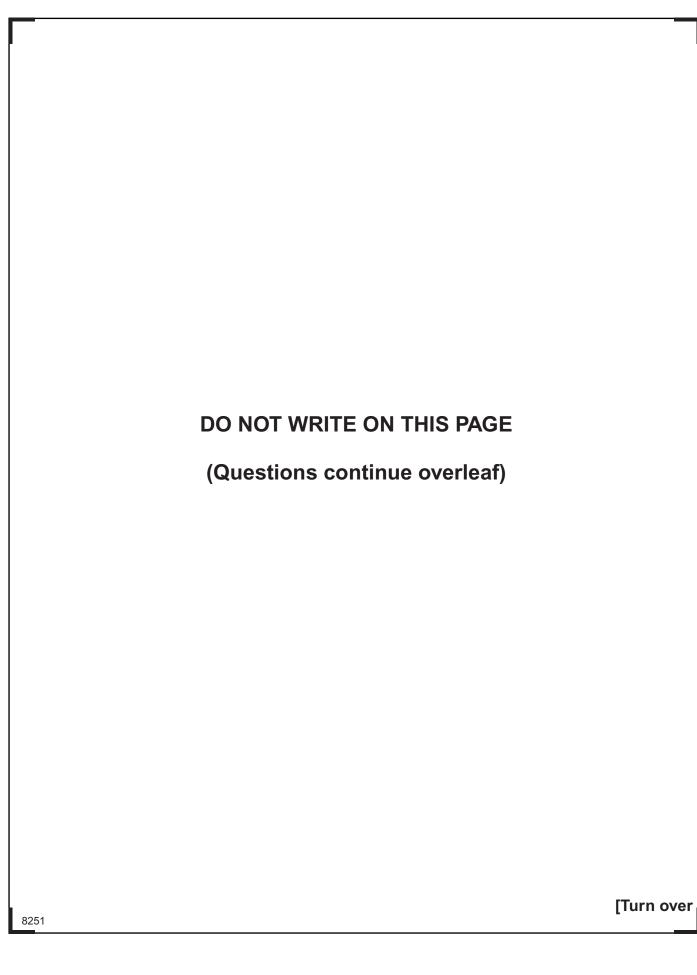
	(e)	What conclusions can be made about the effect of wind on the r loss of mass of the flask? Use data to support your answer.		Examin Marks	er Only Remark
	(f)	Suggest how the students created the windy conditions.			
			[1]		
	(g)	Give two other environmental factors the students could have investigated using this apparatus.			
		1	[1]		
		2	[1]		
				Total Que	estion 10
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12	(a)		an on smoking ir and in 2004.	n workplaces came int	o effect in the Republ	lic of	Examin Marks	er Only Remark
			•	a health questionnaire three years after the b	• •	ns,		
	The table shows the results of the questionnaires.							
			Symptom		staff complaining ptoms			
				Before ban	3 years after ban			
			Eye irritation	82	51			
			Sneezing	75	34			
			Coughing	87	67			
	1	Michele Society (i)	Agnew, Patrick Goodma Eur Respir J October 20 Suggest one co questionnaires a Use data from	th improvement continues after wan, Luke Clancy: Reproduced by 108; 32, Suppl. 32: 259s (Abstraction Clusion that can be reabout the health of bath the table to support y	permission of the European Re t 1577) © European Respiratory made from the results r staff. rour conclusion.	spiratory Society of the		

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(b)	Give one reason why a ban on smoking in workplaces could benefit non-smokers.		Examino larks	er Only Remark	
	[-]			
(c)	Suggest why some people are opposed to a ban on smoking in workplaces.				
	[-			
		То	tal Que	estion 12	
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Scientific method involves the following steps: observation, making a hypothesis, experimentation, conclusion, validation. Jenner is famous for having applied scientific method while developing vaccination as a way of preventing smallpox. Some of the steps in Jenner's development of a smallpox vaccine were: A Infect a person with cowpox. Then infect the person with smallpox. B Jenner and other scientists repeated the procedure and got the same results. C A person infected with cowpox may be protected from smallpox. D Jenner heard dairymaids say "I shall never have smallpox for I have had cowpox". (a) Which of the steps used by Jenner is an example of observation?					
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Total Question 1					
	(c)	Describe how phagocytes help protect against diseases.			
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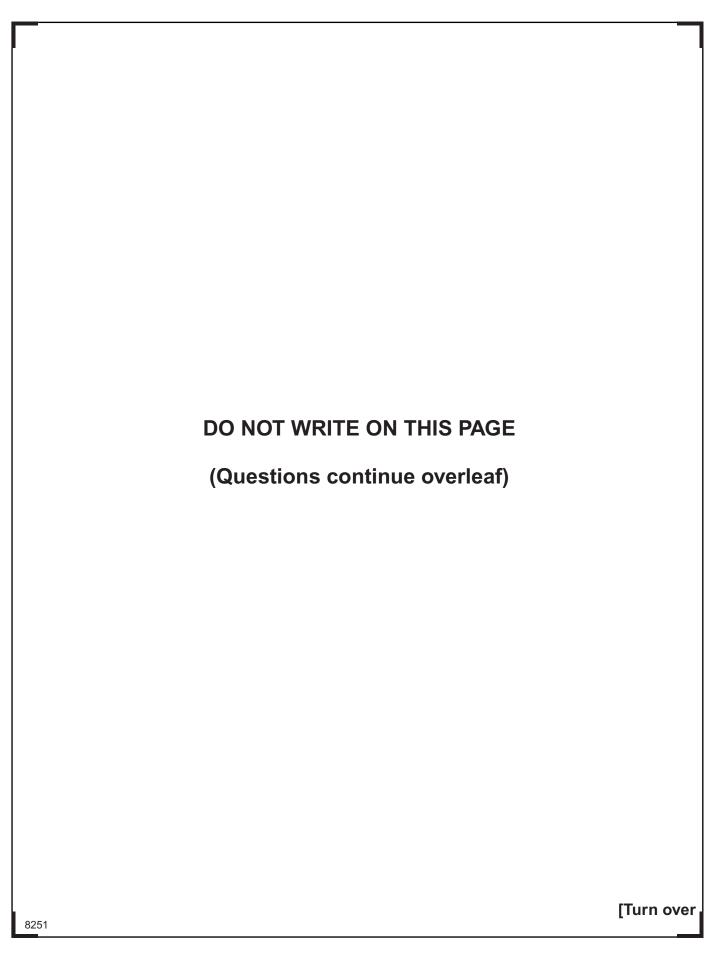
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14 A student investigated the effect of two antibiotics **X** and **Y** on the growth **Examiner Only** Marks Remark of a bacterium. She carried out the following procedure using aseptic techniques. 1 ml of bacterial culture was added to a sterile Petri dish containing sterile nutrient agar as shown in diagram A. Discs of filter paper were soaked in antibiotic solutions or water and placed on top of the nutrient agar. This is shown in diagram B. The Petri dish was sealed, inverted and incubated at no more than 20°C for 48 hours. Diagram **C** shows the appearance of the Petri dish after this time. Petri dish Α bacteria on nutrient agar filter paper disc В soaked in solution of antibiotic X filter paper disc soaked in water **Z** filter paper disc soaked in solution of antibiotic Y C X Z clear zone

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Use evidence from the diagram and the procedure to explain:	Examine	r Only
 Which antibiotic was most effective 		Remark
How the experiment was a fair testThe safety precautions needed.		
In this question, you will be assessed on your written communication skills, including the use of specialist scientific terms.		
[6]		
THIS IS THE END OF THE QUESTION PAPER		
	Total Ques	etion 14
	Total Ques	MOII 14



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Question Number	Marks	
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