

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.

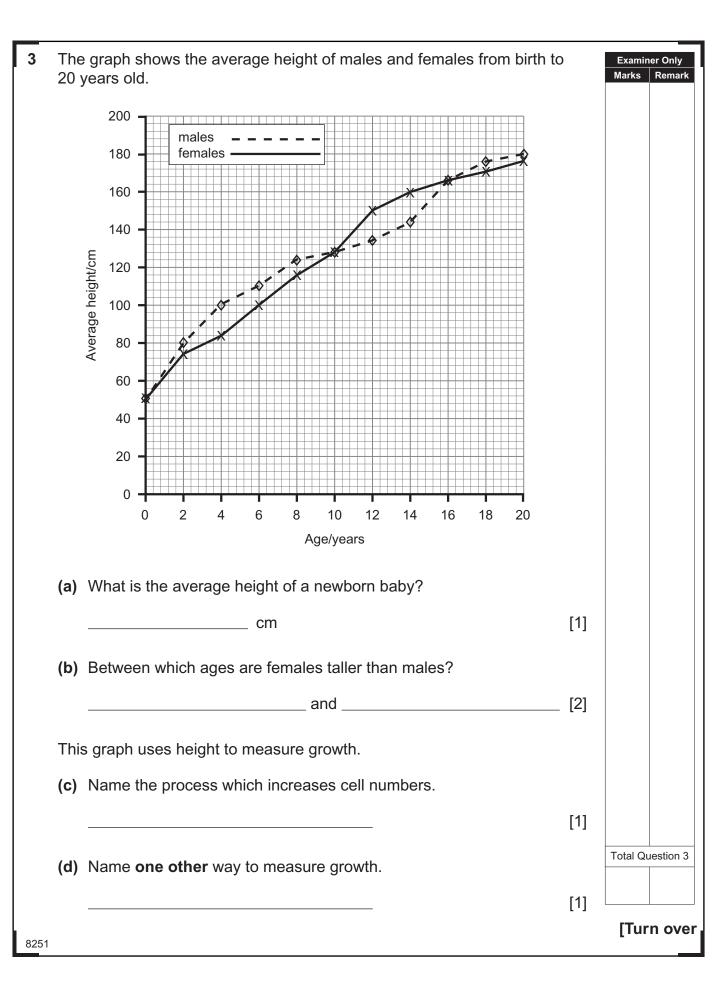
INFORMATION FOR CANDIDATES

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**.

8251

1	Cigarette smoke ba	es a range of eff	ects on the bod	V		Examinar Only
I	Cigarette smoke ha					Examiner Only Marks Remark
	(a) Name two lung			arelle smoke.	[4]	
					[1]	
	2				[1]	
	Carbon monoxide c cells.	combines perma	anently with hae	moglobin in red b	lood	
	(b) What effect doe	es this have on	the body?			
	(c) Name one che	mical in cigarett	te smoke which	affects the heart	rate.	
		_				
		_			[']	Total Question 1
2	Complete the table	showing the fea	atures of blood	vessels.		
	Feature	Artery	Vein	Capillary		
	Presence of valves	no	yes		[1]	
	Wall thickness		thin		[2]	
	Blood pressure	high		very low	[1]	
	· I				_	Total Question 2
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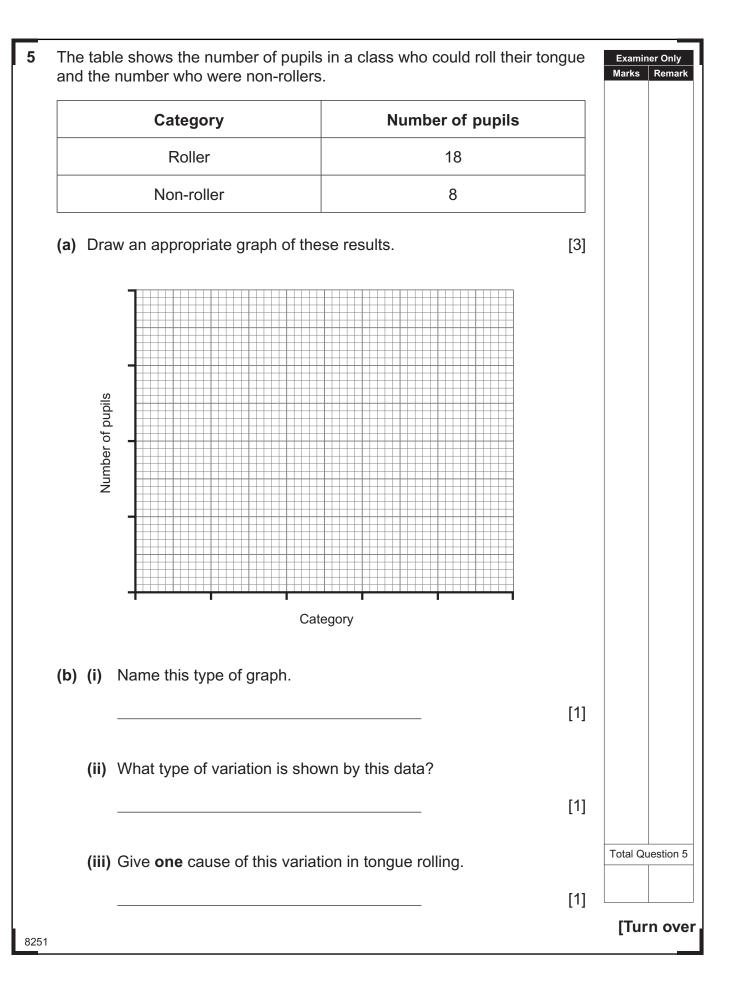
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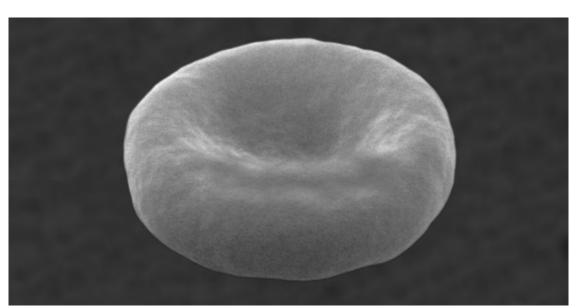
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•	Time since	Percentage of w	omen surviving	
	diagnosis/months	1996	2006	
	6	94.2	96.6	
	12	91.0	94.3	
	18	87.4	92.6	
	24	84.5	90.6	
(a)	How does the percenta diagnosis change from Use percentages from	ge of women surviving 1996 to 2006?		
			[2]	
(b)	The number of women to 2006.	screened for breast car	ncer increased from 1996	
	Give two advantages to	the women screened f	or breast cancer.	
			[2]	
(c)	Give one way breast ca	ancer can be treated.	[2]	Total Que

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6 The photograph shows a red blood cell.



© 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 Qu	estion 6
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Examiner Only Marks Remark

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The diagram shows part of a DNA molecule.	Examiner Only Marks Remark
x base	
 a) Complete the diagram. Place the correct letters for the bases in the boxes. 	!]
b) What is molecule X ?	
Draw a circle around the correct answer in the list below.	
protein phosphate amino acid starch sugar [1]
c) What term is used to describe the shape of a DNA molecule?	
[1]
d) Where is the DNA molecule found in the cell?	Total Question 7
	,
[1	[Turn over

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

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.

8251

(i) **Complete the table** by calculating the average number of pregnancies occurring per year for the contraceptive pill.

[1]

Examiner Only Marks Remark

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

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CC:				
	_			_
			(iii)	Give one advar contraceptive p
				contraceptive p
Cardina Cardina				Advantage
QE N				
i hanning				Disadvantage _
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			(iv)	Use the inform
CCC:				contraception is
al semine				Most reliable
Reacting				
				Least reliable _
Amandia				
E Learning		(b)	Wha	at term is used to
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iii)	Give one advantage and one other disadvantage of using the contraceptive pill.		Examin Marks	er Only Remark	
	Advantage				
		[1]			
	Disadvantage				
		[1]			
iv)	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]			
	at term is used to describe methods of contraception which inclue and female sterilisation?	ıde			
		[1]			
			Total Qu	estion 8	
			[Tur	n ove	r



FIECK	es in humans are caused by a recessive allele.		Examiner Or Marks Ren
~	ر freckles © Investigations in Applied Biology and Biotechnology by Peter Freeland, published by Hodder مستخلف الملاط (2000) (ICDN 2210 50620)		
si (a) (i	bughton Education Ltd, 1990. ISBN 0340 50630X. Reproduced by permission of Hodder Educa Explain what is meant by an allele.	tion.	
		_ [1]	
(ii) Name the type of cell division which produces gametes.		
([1]	
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Deterrit

	-		between Pamela a eterozygous for no	-		Examin Marks	er Only Remark
	Use	N for the allele fon for the allele fo					
			Par	mela			
		Gametes	N		-		
	Tony	n			_		
(i)	Name	this type of diagra	am.				
				-	[1]		
(ii)		lete the diagram					
		rent's gametes an ssible genotypes ([3]		
(iii)	Give t	he ratio of normal	skin to freckled sk	in in the children.			
				-	[1]		
(iv)	What	proportion of the o	offspring will have h	nomozygous genoty	pes?		
				-	[1]		
(v)		n why it is not pos children with norm		of the genotype of o	one		
						Total Qu	estion 9
					[2]		
8251						[Tur	n over







10 The diagram shows a weight potometer. leafy shoot film of oil flask of water	miner Only cs Remark
leafy shoot film of oil flask of water film of oil	
 (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 	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 	
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flask. In this question, you will be assessed on your written communication	
[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.

The results are shown in the table.

	Loss in mass 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		

(c) Suggest **one** way the students made the investigation a fair test.

_____ [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] 8251



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Examiner Only Marks Remark

(e)	What conclusions can be made about the effect of wind on the ralloss of mass of the flask? Use data to support your answer.		Examin Marks	er Only Remark
		_ [2]		
(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
			[Tur	n over

1 The	e pho	tograph shows sperm swimming towards an ovum.		Examiner Only Marks Rema
(a)	(i)	<i>i</i> Medi-mation / Science Photo Library Name part A of the sperm.	[1]	
	(ii)	Describe one way part A is adapted to its function.	[1]	
	(iii)	Give one other way the sperm is adapted to its function.	[1]	
	(iv)	Suggest one reason why all the sperm do not appear to be the same size.		
(b)	Nan	ne the cell produced by fertilisation.	[1]	Total Question
51			[1]	

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12 (a) A ban on smoking in workplaces came into effect in the Republic of Ireland in 2004.

Bar staff completed a health questionnaire about their symptoms, before the ban and three years after the ban.

Symptom	Percentage of bar staff complaining of symptoms				
2	Before ban	3 years after ban			
Eye irritation	82	51			
Sneezing	75	34			
Coughing	87	67			

The table shows the results of the questionnaires.

Adapted from: "Respiratory health improvement continues after workplace smoking ban in Ireland" by Michele Agnew, Patrick Goodman, Luke Clancy: Reproduced by permission of the European Respiratory Society Eur Respir J October 2008; 32, Suppl. 32: 259s (Abstract 1577) © European Respiratory Society

(i) Suggest **one** conclusion that can be made from the results of the questionnaires about the health of bar staff.

Use data from the table to support your conclusion.

____ [2] (ii) Which symptom shows the greatest change after the ban? [1] 8251



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Examiner Only Marks Remark

(b)	Give one reason why a ban on smoking in workplaces could bene non-smokers.	əfit	Examin Marks	er Only Remark
		_ [1]		
(c)	Suggest why some people are opposed to a ban on smoking in workplaces.			
		_ [1]		
			Total Que	estion 12
1			[Tur	n ove

13		entific method involves the following steps: ervation, making a hypothesis, experimentation, conclusion, validati	on.	Examir Marks	er Only Remark
		ner is famous for having applied scientific method while developing cination as a way of preventing smallpox.			
	Son	ne of the steps in Jenner's development of a smallpox vaccine were	:		
	Α	Infect a person with cowpox. Then infect the person with smallpox.			
	В	Jenner and other scientists repeated the procedure and got the sar results.	ne		
	С	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".	e		
	(a)	Which of the steps used by Jenner is an example of			
		observation?	[1]		
		validation?	[1]		
	(b)	Use the information given above to help explain why Jenner's vaccination is an example of artificial, active immunity.			
		Artificial			
			[1]		
		Active			
			[1]		
		now know that white blood cells, known as phagocytes, are importa rotecting the body against diseases.	ant		
	(c)	Describe how phagocytes help protect against diseases.			
				Total Qu	estion 13
			[2]		
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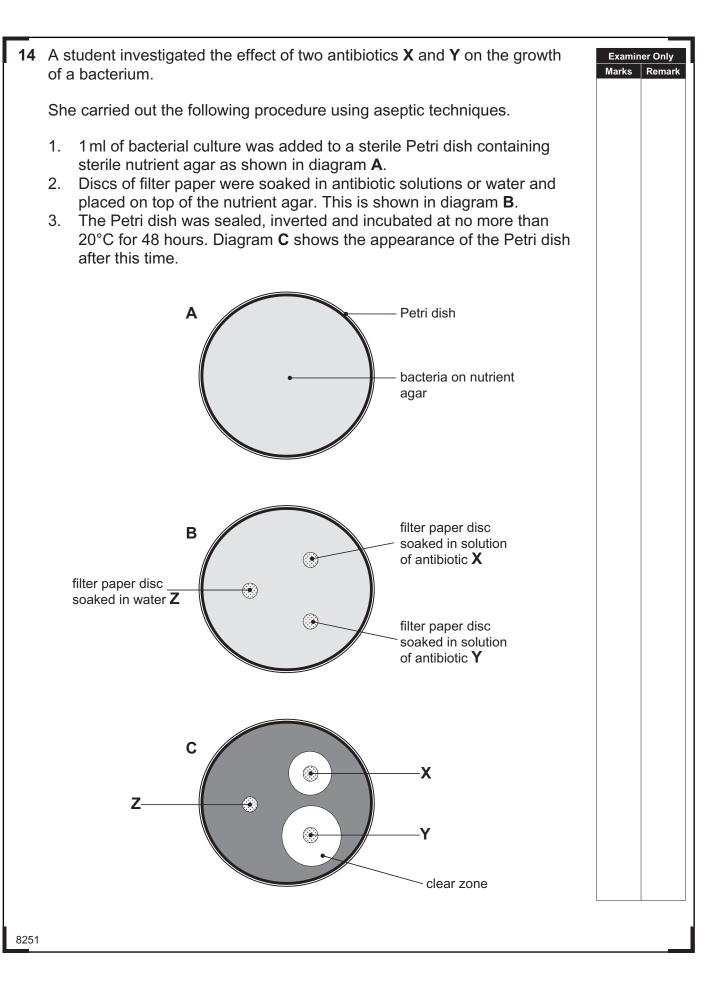
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 The safety precautions needed. In this question, you will be assessed on your written communic 	ation	
skills, including the use of specialist scientific terms.		
	[6]	
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Question	
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