

**GENERAL CERTIFICATE OF SECONDARY EDUCATION  
 TWENTY FIRST CENTURY SCIENCE  
 BIOLOGY A**

Unit 1 Modules B1 B2 B3 (Foundation Tier)

**SAMPLE ASSESSMENT MATERIAL**

**(from 2010 onwards)**

Time: 40 minutes

Candidates answer on the question paper

**Additional materials (enclosed):**

None

Calculators may be used.

**Additional materials:** Pencil  
 Ruler (cm/mm)

Candidate  
 Forename

Candidate  
 Surname

Centre  
 Number

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Candidate  
 Number

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**INSTRUCTIONS TO CANDIDATES**

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Do **not** write outside the box bordering each page.
- Write your answer to each question in the space provided.

**INFORMATION FOR CANDIDATES**

- The number of marks for each question is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **42**.

FOR EXAMINER'S USE		
Qu.	Max.	Mark
1	6	
2	5	
3	5	
4	13	
5	5	
6	8	
<b>TOTAL</b>	<b>42</b>	

This document consists of **12** printed pages.

Answer **all** the questions.

1

(a) Jo sees that her son Sammi has spots on his chest and back.

She takes Sammi to the doctor.

The doctor suspects that Sammi has meningitis.

Meningitis is caused by a microorganism.

(i) The microorganism has made Sammi ill.

Put ticks (✓) in the boxes next to the **two** correct statements about microorganisms.

Microorganisms are very large.

Some microorganisms can make poisons.

Cells can be damaged by microorganisms.

Microorganisms are only found in dirty water.

[2]

(ii) The statements **A**, **B**, **C** and **D** describe how Sammi's body reacts to the microorganisms.

They are in the wrong order.

**A** White blood cells digest the microorganisms.

**B** Microorganisms enter the body.

**C** White blood cells engulf the microorganisms.

**D** White blood cells recognise the microorganisms.

Put the statements in the correct order by writing **A**, **B**, **C** or **D** in each box.

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[3]

(b) The doctor finds that Sammi has chicken pox, **not** meningitis.

Sammi's friend Jason had chicken pox last year.

Why will Jason **not** catch chicken pox from Sammi?

Put a tick (✓) in the box next to the **best** reason.

Chicken pox is not a serious disease.

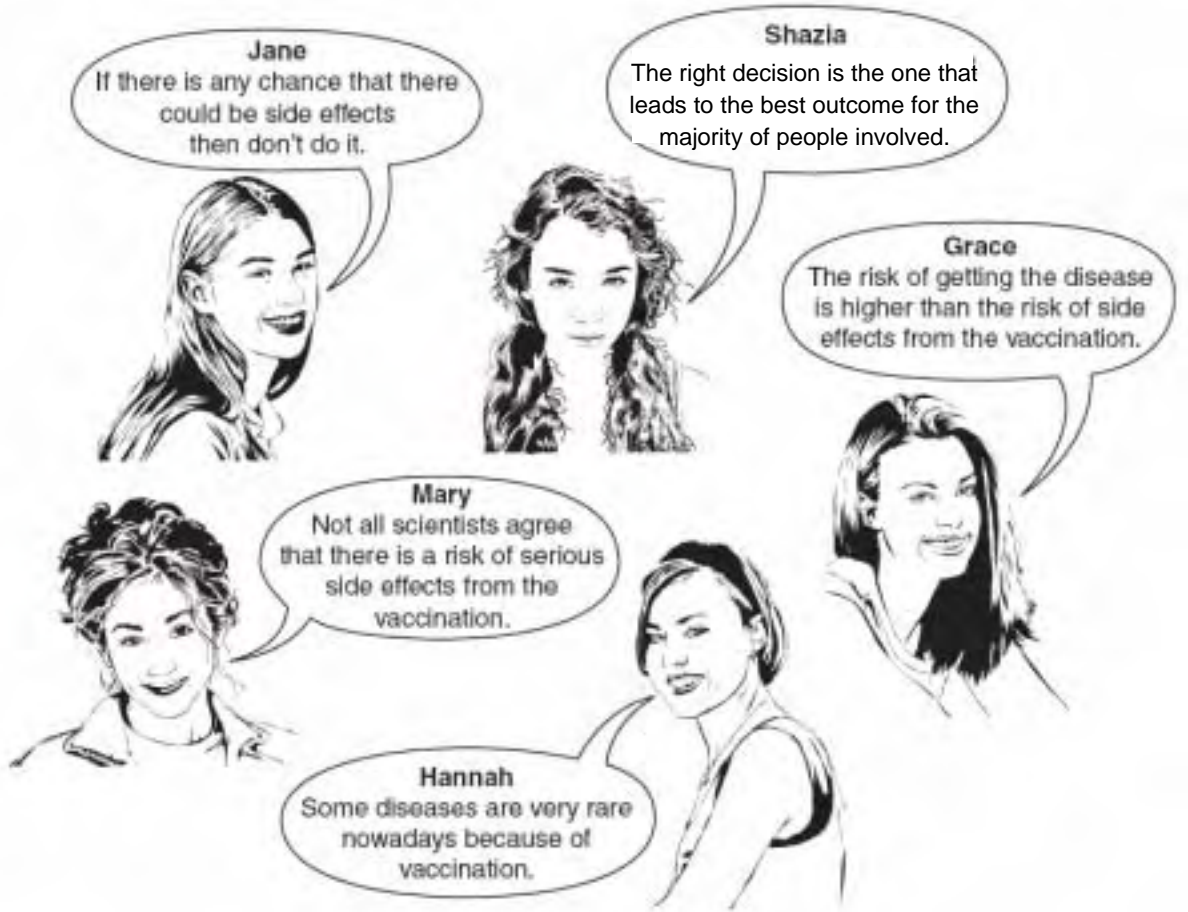
Jason already has antibodies for chicken pox.

Chicken pox is caused by a virus.

[1]

[Total: 6]

2 Saleema has a three-month-old daughter called Nadia.  
Nadia is due for a vaccination to protect her from a particular disease.  
Saleema is worried that there may be side effects.  
She asks some of her friends what they think.



(a) Which **one** of Saleema's friends thinks that Nadia should **not** have the vaccination?

answer ..... [1]

(b) Which friend can see a benefit to **Nadia** in having the vaccination?

answer ..... [1]

(c) Explain what Shazia meant.

Write about vaccination to help you answer the question.

.....  
.....  
.....  
.....  
.....  
.....

[3]

[Total: 5]

3 Alex works for a company trying to make new antibiotics.

(a) Explain what antibiotics are used for, and how doctors and patients can reduce the risk of microorganisms becoming resistant.

.....  
.....  
.....  
.....  
.....  
..... [3]

(b) When Alex makes a new antibiotic it must be tested.

These are some of the tests which must be done.

They are in the wrong order.

- A The new antibiotic is tested on healthy volunteers.
- B The new antibiotic is tested on human cells grown in a laboratory.
- C The new antibiotic is tested on animals.
- D The new antibiotic is tested on people with the illness.

Fill in the boxes to show the right order. The first one has been done for you.

B			
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[2]  
[Total: 5]

4 Theresa and Matthew have identical twin boys.

(a) (i) Put ticks (✓) in the **two** boxes next to the statements that explain why the boys are identical.

They have the same genes.

They have the same parents.

They were both born on the same day.

They both developed from the same fertilised egg.

[2]

(ii) By the time the twins are adults there could be differences between them.

Put a ring around **two** possible differences.

**blood group**

**eye colour**

**fingerprints**

**hair style**

**scars**

[2]

(b) The twins have an older brother called Steven. There are differences between him and the twins.

Put ticks (✓) in the **two** boxes that explain why Steven is different from his brothers.

Steven's parents have different genes.

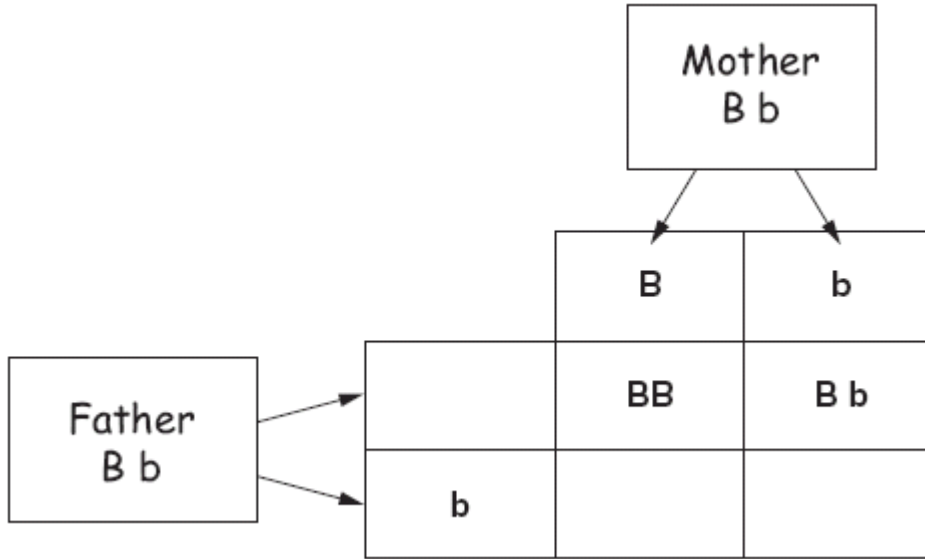
Steven has twice as many genes as his brothers.

Steven has inherited different forms of some genes.

Steven has lost genes as he has grown.

[2]

- (c) Steven has blue eyes. The twins and both of their parents have brown eyes.  
**B** represents the allele for brown eyes, and **b** represents the allele for blue eyes.  
 Complete the genetic diagram.



[2]

- (d) Theresa is pregnant.  
 (i) Matthew and Theresa decide to have the fetus genetically tested.

Explain why Matthew and Theresa decide to have the test and what decisions they will have to make if the test comes back as positive.

.....  
 .....  
 .....  
 .....  
 .....  
 ..... [3]

- (ii) Theresa and Matthew hope to have a daughter.  
 What combination of sex chromosomes is needed to make a daughter?  
 In your answer explain where these chromosomes come from.

.....  
 .....  
 .....  
 ..... [2]

[Total: 13]

Turn over

5 Read this passage about a discovery made by a conservation group.

**New rodent is ‘living fossil’**

1. A squirrel-like rodent was discovered in Laos. It is the only survivor of a group that scientists thought had died out 11 million years ago.
2. It had never been observed alive before.
3. It is the only new family of living mammals to be found in 30 years.
4. Scientists believe it is a ‘living fossil’. It is related to a group of prehistoric rodents that once lived in South East Asia.
5. They found that the rodent’s skeleton is very similar to rodent fossils only found in 11-million-year-old rock.
6. The chief scientist said efforts to conserve this animal should be given the highest priority.

Extract from BBC News at <http://news.bbc.co.uk>, 09 March 2006

(a) What can scientists find out from an animal fossil?

Put ticks (✓) in the **two** correct boxes.

- the type of blood system it had
- how long ago the animal lived
- the colour of the animal
- the size of the animal
- whether the animal had colour vision

[2]

(b) Describe three different changes that could have caused the rodent to become extinct.

.....

.....

.....

.....

.....

.....

.....

[3]

[Total: 5]



6 Our bodies need communication systems to respond to changes in our surroundings.  
Some of these responses are controlled by nerves.  
Some are controlled by hormones.

(a) Here is a list of responses.

- A knee jerk reaction when the knee cap is tapped
- B controlling the glucose level in the blood after a meal
- C keeping the water level in the body correct
- D touching a hot surface and pulling away
- E jumping out of the way of a moving car
- F blinking when a bright light is shone in our eyes

Choose **two** responses that:

(i) are controlled by nerves

answer ..... and ..... [2]

(ii) are controlled by hormones.

answer ..... and ..... [2]

(b) Jasmine plays rounders for her school team.

Complete the sentences to explain what happens when she catches the ball.

Choose words from this list.

**communication**

**effector**

**neuron**

**response**

**sensory**

**stimulus**

Jasmine sees the ball coming towards her.

Her eyes contain ..... cells.

The cells react to a light .....

Muscles in her arm contain ..... cells.

Jasmine catches the ball.

Catching the ball is a .....

[4]

[Total: 8]

**END OF QUESTION PAPER**

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Q.5 text Helen Briggs, New Rodent is 'living fossil', 09 March 2006 © BBC News, <http://news.bbc.co.uk> Reproduced by kind permission of BBC News Online.

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## CONFIDENTIAL

GCSE Unit

MARK SCHEME

SAMPLE ASSESSMENT MATERIAL  
(from 2010 onwards)

**Biology A (J633)**  
**Modules B1, B2 and B3**  
**Foundation Tier**

**A221/01**  
**FINAL**

Maximum Mark: 42

### Guidance for Examiners

Additional Guidance within any mark scheme takes precedence over the following guidance.

1. Mark strictly to the mark scheme.
2. Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise.
3. Accept any clear, unambiguous response which is correct, e.g. mis-spellings if phonetically correct (but check additional guidance).
4. Abbreviations, annotations and conventions used in the detailed mark scheme:

/	= alternative and acceptable answers for the same marking point
(1)	= separates marking points
<b>not/reject</b>	= answers which are not worthy of credit
<b>ignore</b>	= statements which are irrelevant - applies to neutral answers
<b>allow/accept</b>	= answers that can be accepted
(words)	= words which are not essential to gain credit
<u>words</u>	= underlined words must be present in answer to score a mark
ecf	= error carried forward
AW/owtte	= alternative wording
ORA	= or reverse argument

E.g. mark scheme shows 'work done in lifting / (change in) gravitational potential energy' (1)

work done = 0 marks

work done lifting = 1 mark

change in potential energy = 0 marks

gravitational potential energy = 1 mark

5. If a candidate alters his/her response, examiners should accept the alteration.
6. Crossed out answers should be considered only if no other response has been made. When marking crossed out responses, accept correct answers which are clear and unambiguous.
7. The list principle:  
If a list of responses greater than the number requested is given, work through the list from the beginning. Award one mark for each correct response, ignore any neutral response, and deduct one mark for any incorrect response, e.g. one which has an error of science. If the number of incorrect responses is equal to or greater than the number of correct responses, no marks are awarded. A neutral response is correct but irrelevant to the question.

8. Marking method for tick boxes:

Always check the additional guidance.

If there is a set of boxes, some of which should be ticked and others left empty, then judge the entire set of boxes.

If there is at least one tick, ignore crosses. If there are no ticks, accept clear, unambiguous indications, e.g. shading or crosses.

Credit should be given for each box correctly ticked. If more boxes are ticked than there are correct answers, then deduct one mark for each additional tick. Candidates cannot score less than zero marks.

E.g. If a question requires candidates to identify a city in England, then in the boxes

Edinburgh	
Manchester	
Paris	
Southampton	

the second and fourth boxes should have ticks (or other clear indication of choice) and the first and third should be blank (or have indication of choice crossed out).

Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	x	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	x		✓		✓	✓		✓	
Score:	2	2	1	1	1	1	0	0	0	NR

Question			Expected Answers	Marks	Rationale
1	a	i	can make poisons <input type="checkbox"/> (1) cells can be damaged <input checked="" type="checkbox"/> (1) <input type="checkbox"/>	2	if more than 2 boxes ticked then deduct 1 mark for each additional answer candidate cannot score less than 0 marks <b>accept</b> any clear, unambiguous method of indicating correct boxes e.g. crosses, shading etc
		ii	B anywhere before D (1) D anywhere before C (1) C anywhere before A (1)	3	
	b		has antibodies for chicken pox <input checked="" type="checkbox"/> (1) <input type="checkbox"/>	1	if more than 2 boxes ticked then deduct 1 mark for each additional answer candidate cannot score less than 0 marks <b>accept</b> any clear, unambiguous method of indicating correct boxes e.g. crosses, shading etc
<b>Total</b>				<b>6</b>	



Question		Expected Answers	Marks	Rationale
2	a	Jane (1)	1	if more than one answer given then score = 0 marks
	b	Grace (1)	1	if more than one answer given then score = 0 marks
	c	<p>[3 marks] Candidate demonstrates a high level of understanding of balancing the risk of side effects from vaccination for an individual, against the risk to the population of a disease spreading without vaccination. Consideration is given to the seriousness of both the disease and the possible side effects, to determine the outcome which benefits the majority of people. The answer is expressed clearly and logically.</p> <p>[2 marks] Candidate demonstrates an understanding of balancing the risk of side effects against the risk of the disease spreading, to determine the outcome which benefits the majority of people. The answer is expressed clearly and logically.</p> <p>[1 mark] Candidate recognises that the choice which benefits most people is correct and identifies one side of the risk (side effects or spread of disease).</p>	3	
		<b>Total</b>	<b>5</b>	
3	a	antibiotics kill bacteria / fungi (1) doctors prescribe less antibiotics (1) patients complete the course (1)	3	
	b	C anywhere before A (1) A anywhere before D (1)	2	
		<b>Total</b>	<b>5</b>	

Question			Expected Answers	Marks	Rationale									
4	a	i	same genes <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">✓</td></tr><tr><td> </td></tr><tr><td> </td></tr></table> (1) same fertilised egg <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">✓</td></tr><tr><td> </td></tr></table> (1)	✓			✓		2	if more than 2 boxes ticked then deduct 1 mark for each additional answer candidate cannot score less than 0 marks <b>accept</b> any clear, unambiguous method of indicating correct boxes e.g. crosses, shading etc				
✓														
✓														
		ii	hair style (1) scars (1)	2	if more than 2 boxes ticked then deduct 1 mark for each additional answer candidate cannot score less than 0 marks									
	b		parents have different genes <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">✓</td></tr><tr><td> </td></tr></table> (1) inherited different forms of genes <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">✓</td></tr><tr><td> </td></tr></table> (1)	✓		✓		2	if more than 2 boxes ticked then deduct 1 mark for each additional answer candidate cannot score less than 0 marks <b>accept</b> any clear, unambiguous method of indicating correct boxes e.g. crosses, shading etc					
✓														
✓														
	c		father's alleles correct (1) correct combinations in offspring (1)	2	<table border="1" style="margin-left: auto; margin-right: auto;"><tr><td> </td><td> </td><td> </td></tr><tr><td>B</td><td> </td><td> </td></tr><tr><td> </td><td>Bb (or bB)</td><td>bb</td></tr></table>				B				Bb (or bB)	bb
B														
	Bb (or bB)	bb												
	d	i	to check that the baby is OK / does not have a genetic disease (1) whether or not to have (more) children (1) whether or not to terminate a pregnancy (1)	3										
		ii	XX (1) one sex chromosome from each parent (1)	2										
			<b>Total</b>	<b>13</b>										

Question		Expected Answers	Marks	Rationale				
5	a	how long ago the animal lived <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td><input type="checkbox"/></td></tr><tr><td><input checked="" type="checkbox"/></td></tr><tr><td><input type="checkbox"/></td></tr><tr><td><input type="checkbox"/></td></tr></table> (1)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2	if more than 2 boxes ticked then deduct 1 mark for each additional answer candidate cannot score less than 0 marks <b>accept</b> any clear, unambiguous method of indicating correct boxes e.g. crosses, shading etc
		<input type="checkbox"/>						
<input checked="" type="checkbox"/>								
<input type="checkbox"/>								
<input type="checkbox"/>								
the size of the animal <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td><input checked="" type="checkbox"/></td></tr><tr><td><input type="checkbox"/></td></tr><tr><td><input type="checkbox"/></td></tr></table> (1)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
<input checked="" type="checkbox"/>								
<input type="checkbox"/>								
<input type="checkbox"/>								
	b	<b>any three from:</b> idea of its prey/food plant becomes extinct (1) idea of climate change (1) idea of new predator (1) idea of new disease (1)	3					
<b>Total</b>			<b>5</b>					

6	a	i	<b>any two from:</b> A (1) D (1) E (1) F (1)	2	
		ii	B (1) C (1)	2	if more than 2 boxes ticked then deduct 1 mark for each additional answer candidate cannot score less than 0 marks
	b	sensory (1) stimulus (1) effector (1) response (1)	4	must be in the correct order	
<b>Total</b>			<b>8</b>		