



*Rewarding Learning*

**General Certificate of Secondary Education  
2011–2012**

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**Science: Single Award (Modular)**

Staying Alive  
Module 1

Higher Tier

[GSC12]

**TUESDAY 15 MAY 2012  
9.15 am–10.00 am**

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**MARK  
SCHEME**

|   |       |  | AVAILABLE MARKS   |     |   |   |   |   |    |    |   |    |
|---|-------|--|---|-----|---|---|---|---|----|----|---|----|
| 1 | (a)   | all plots correct<br>smooth curve  | 2 4/5 correct – 1 mark<br>1 – must not be through origin  | [3] | 7 |   |   |   |    |    |   |    |
|   | (b)   | (i)  | more active needs increase  | [1] |   |   |   |   |    |    |   |    |
|   |       | (ii)   | older they get needs increase, older adults get needs decrease  | [2] |   |   |   |   |    |    |   |    |
|   | (iii) | gender/pregnancy   | [1]   |     |   |   |   |   |    |    |   |    |
| 2 | (a)   | eating too much constantly, intake exceeds energy needs eating more than need, excess stored as fat  |   | [3] | 7 |   |   |   |    |    |   |    |
|   | (b)   | (i)  | no one under age of 30/all older/no one born with   | [1] |   |   |   |   |    |    |   |    |
|   |       | (ii)   | 6 + 14 + 18 + 50 + 68 + 46<br>202<br>If one reading from graph incorrect – 1 mark   | [2] |   |   |   |   |    |    |   |    |
|   | (iii) | only 1 GP/location/only type 2 shown/low numbers   | [1]   |     |   |   |   |   |    |    |   |    |
| 3 | (a)   | Food/fat/glucose store, respired, for energy, produces water, not being used/<br>builds up.  | Any   | [4] | 8 |   |   |   |    |    |   |    |
|   | (b)   | (i)  | <table border="1" style="display: inline-table; vertical-align: middle;"> <tbody> <tr> <td></td> <td>E</td> <td>e</td> </tr> <tr> <td>E</td> <td>EE</td> <td>Ea</td> </tr> <tr> <td>e</td> <td>Ee</td> <td>ee</td> </tr> </tbody> </table><br>1 mark each correct parent 2<br>1 mark F1 all correct 1<br>Only mark F1 Sequentially if ee present. |     |   | E | e | E | EE | Ea | e | Ee |
|   | E     | e  |   |     |   |   |   |   |    |    |   |    |
| E | EE    | Ea   |   |     |   |   |   |   |    |    |   |    |
| e | Ee    | ee   |   |     |   |   |   |   |    |    |   |    |
|   | (ii)  | 1 : 3  |   | [1] |   |   |   |   |    |    |   |    |
| 4 | (a)   | destarched plant, variegated leaf, expose to light<br>test for starch<br>Any 2 steps   | 3 marks<br>1 mark<br>2 marks Any 4  | [4] | 9 |   |   |   |    |    |   |    |
|   | (b)   | 1 – cells more area, more tightly packed, so more chloroplasts,<br>close to light/<br>sites of photosynthesis/<br>photosynthesis needs light | Any 3   | [3] |   |   |   |   |    |    |   |    |
|   | (c)   | C<br>photosynthesis = respiration,<br>carbon dioxide in = carbon dioxide out   | 1<br>1  | [2] |   |   |   |   |    |    |   |    |

|          |   |   |              |                            |
|----------|---|---|--------------|----------------------------|
| <b>5</b> | <b>(a)</b> quantitative analysis – Chargaff, same amounts of A and T/C and G<br>modelling – Watson and Crick, A links T/C links G |   | [4]          | <b>AVAILABLE<br/>MARKS</b> |
|          | <b>(b)</b> sequence of 3 bases, codes for 1 type of amino acid  |   | [2]          |                            |
| <b>6</b> | <b>A</b> 2 – Labour saving/environmentally friendly/<br>financial (if not in 6/3)   | 2 | [4]          |                            |
|          | 6/3 – Financial saving  | 2 |              |                            |
|          | <b>B</b> 1 – environmental damage/superweeds  | 2 | [4]          | 8                          |
|          | 4 – health/environmental concerns/<br>not natural   | 2 |              |                            |
|          | Do not accept 5 – more expensive food   |   |              |                            |
|          |   |   | <b>Total</b> | <b>45</b>                  |