



# Mark Scheme (Results)

January 2013

International GCSE Human Biology  
(4HB0) Paper 02

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| <b>Question number</b> | <b>Answer</b>                                                                                                                          | <b>Marks</b> |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 1 (a) (i)              | Falls, (then rises);                                                                                                                   | <b>1</b>     |
| (ii)                   | Three from:<br>Bacteria/microorganisms/decomposers;<br>Breakdown/digest/remove;<br>Respiration;<br>Use oxygen/aerobic;<br>Less sewage; | <b>3</b>     |
| (b)                    | Line down (delayed);<br>Then line up;                                                                                                  | <b>2</b>     |
| (c) (i)                | typhoid;                                                                                                                               | <b>1</b>     |
| (ii)                   | bacteria;                                                                                                                              | <b>1</b>     |
|                        | <b>Total</b>                                                                                                                           | <b>8</b>     |

| <b>Question number</b> | <b>Answer</b>                                                                                              | <b>Marks</b> |
|------------------------|------------------------------------------------------------------------------------------------------------|--------------|
| 2 (a)                  | Bronchiole; phonetic spellings                                                                             | <b>1</b>     |
| (b) (i)                | heart;                                                                                                     | <b>1</b>     |
| (ii)                   | Pulmonary vein; accept capillary                                                                           | <b>1</b>     |
| (c) (i)                | Diffusion;                                                                                                 | <b>1</b>     |
| (ii)                   | $C_6H_{12}O_6$ ;<br>$6O_2$ ; (order of glucose and oxygen not important)<br>$6H_2O$ ;                      | <b>3</b>     |
| (d)                    | Two from:<br>Capillaries close by;<br>Moist;<br>Thin wall;<br>Accept relevant explanation for one feature; | <b>2</b>     |
| (e)                    | Emphysema; phonetic spelling                                                                               | <b>1</b>     |
|                        | <b>Total</b>                                                                                               | <b>10</b>    |

| Question number | Answer                                                                                                                                                                        | Marks                |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| 3 (a) (i)       | Both have 4 chromosomes:<br>Large and short in each;                                                                                                                          | <b>2</b>             |
| (ii)            | 4                                                                                                                                                                             | <b>1</b>             |
| (iii)           | 46                                                                                                                                                                            | <b>1</b>             |
| (b) (i)         | As the temperature increases, the time taken for cell division decreases / inverse relationship;<br>Further detail such as decrease is more rapid between 3/5 and 10 degrees; | <b>1</b><br><b>1</b> |
| (ii)            | 2h    2 cells;<br>8h    16 cells;                                                                                                                                             | <b>1</b><br><b>1</b> |
|                 | <b>Total</b>                                                                                                                                                                  | <b>8</b>             |

| Question number | Answer                                                                                                                | Marks                            |
|-----------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------|
| 4 (a)           | Transfers food;<br>By peristalsis;<br>From mouth to stomach;                                                          | <b>1</b><br><b>1</b>             |
| (b)             | Protein;                                                                                                              | <b>1</b>                         |
| (c)             | Liver;<br>Gall bladder;<br>Emulsify;                                                                                  | <b>1</b><br><b>1</b><br><b>1</b> |
| (d)             | Amylase/carbohydrase<br>amino acids/(poly)peptides<br>lipids/fats                                                     | <b>1</b><br><b>1</b><br><b>1</b> |
| (e)             | Two from:<br>leads into the ileum;<br>Digestion of food occurs here;<br>Receives pancreatic secretions/receives bile; | <b>2</b>                         |
|                 | <b>Total</b>                                                                                                          | <b>11</b>                        |

| <b>Question number</b> | <b>Answer</b>                                                                                                                                                                                                                                                                                                                   | <b>Marks</b> |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 5 (a)                  | Three from:<br>flies / (hatched) larvae / hookworm / bacteria / fungi;                                                                                                                                                                                                                                                          | <b>1</b>     |
| (b)                    | Two from:<br>waterborne disease or one transmitted by flies, e.g. cholera, typhoid, schistosomiasis (Bilharzia);;                                                                                                                                                                                                               | <b>2</b>     |
| (c)                    | Four from:<br>make the base stable;<br>i.e. no cracks in the concrete floor;<br>To avoid hookworm transmission and larvae;<br>Make the hole large enough;<br>To avoid urine splashing out onto the walls;<br>Where flies, bacteria and fungi will thrive;<br>Accept any other appropriate method;<br>With relevant explanation; | <b>4</b>     |
| (d)                    | Two from:<br>Digests/breakdown sewage/organic material;<br>To harmless/inorganic substances;<br>Activated sludge;                                                                                                                                                                                                               | <b>2</b>     |
|                        | <b>Total</b>                                                                                                                                                                                                                                                                                                                    | <b>9</b>     |

| <b>Question number</b> | <b>Answer</b>                                                                                                                                                                     | <b>Marks</b>         |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| 6 (a)                  | S scale at least half of each axis;<br>L line through points;<br>A axes right way round, labelled correctly with units;<br>A axes' scales linear;<br>P points plotted accurately; | <b>5</b>             |
| (b) (i)                | As the enzyme concentration increases the time taken decreases / negative correlation;<br>Any further detail such as rate of decrease is greater as the concentration increases;  | <b>1</b><br><b>1</b> |
| (ii)                   | Three from:<br>More digestion/breakdown;<br>of protein;<br>more collisions;<br>more soluble/less viscous;<br>more amino acids;                                                    | <b>3</b>             |
| (c)                    | Two from:<br>pH;<br>volume of enzyme solution;<br>time/speed of mixing;                                                                                                           | <b>2</b>             |
| (d)                    | Repeat the experiment;<br>The closer the results in each experiment, the more reliable the experiment is;                                                                         | <b>1</b><br><b>1</b> |
|                        | <b>Total</b>                                                                                                                                                                      | <b>14</b>            |

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