Human Biology

General course

Marking key for the Externally set task

Sample 2016

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# Human Biology

## Externally set task – marking key

1(a) Write an hypothesis for this experiment. (1 mark)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Distraction increases reaction time  Or any reasonable hypothesis showing relationship between independent and dependent variables | 1 |
| **Total** | **1** |

(b) i What is the independent variable? (1 mark)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Distraction | 1 |
| **Total** | **1** |

ii What is the dependent variable? (1 mark)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Reaction time | 1 |
| **Total** | **1** |

iii List **three (3)** variables that Lucy and Phillip kept the same. (3 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| **Any 3**  Ruler used  Height dropped  Method of timing  Similar environmental conditions  Type of distraction | 1–3 |
| **Total** | **3** |

(c) Write a step-by-step method describing how this experiment could be conducted, including equipment required. (10 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Equipment: ruler, stopwatch, test subject, form of distraction | 1–3 |
| Steps of method include:  **Any 3**  Variables to be kept the same (controlled) are mentioned in steps: distance dropped from hand, timer, environmental conditions, lighting, time period tested, etc. | 1–3 |
| Method of measuring dependent variable  Implementation of independent variable | 1–2 |
| Recording of data in the table | 1 |
| Repeat trials | 1 |
| **Total** | **10** |

(d) Complete calculating the averages in the table. (2 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Braxton  Average reaction time with distraction = 0.38 + 0.28 + 0.22 = 0.293  3 | 1 |
| Rohan  Average reaction time without distraction = 0.22 + 0.18 + 0.18 = 0.193  3 | 1 |
| **Total** | **2** |

(e) Draw a graph showing the average results from the table. Put the students on the x-axis and the reaction time on the y-axis. (6 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Correctly draws columns | 1 |
| Labels axes with correct name and unit | 1–2 |
| Uses a suitable scale | 1 |
| Title appropriate, with both variables included | 1 |
| Key | 1 |
| **Total** | **6** |

(f) How could this experiment be improved to increase the reliability of the results? (2 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Conduct more trials | 1 |
| Increase number of students used | 1 |
| **Total** | **2** |

(g) What could Lucy and Phillip do to investigate the difference between a visual distraction and a noise distraction? (2 marks)

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Conduct trials which use sound as a distraction only and no vision | 1 |
| Conduct trials which uses visual distraction only and no sound | 1 |
| **Total** | **2** |

1. Describe how the nervous system assists reactions. **(5 marks)**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Stimulus received from receptor |  |
| Sends message to brain | 1 |
| Brain processes information | 1 |
| Sends message back to effector | 1 |
| Muscles cause reaction | 1 |
| **Total** | **5** |

1. Explain the difference between a reaction and a reflex action. **(2 marks)**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| **Any 2**  Reflex arc is quicker than reaction  Brain involved in reaction and not in reflex  Reflex is involuntary | 1–2 |
| **Total** | **2** |

1. Describe the nervous pathway of a reflex arc. **(5 marks)**

|  |  |
| --- | --- |
| **Description** | **Marks** |
| Receptor 🡪 sensory nerve 🡪 interneuron 🡪 motor nerve 🡪 effector | 1–5 |
| **Total** | **5** |