**GENERAL INTEGRATED SCIENCE– UNIT 1**

**TASK 3 – Factors Affecting a Body System**

**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ WEIGHTING: 9 %**

**DATE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ MARK: \_\_\_\_\_\_ / =**

* **Part 1**: One-week to design an investigation to see how changing exercise length affects a person’s reaction to a visual stimulus
* **Part 2:** Peer-marking of Part 1. *(1 mark for draft completion)*
* **Part 3:** Carrying out experiment and analysis of data from the experiments.

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| --- | --- | --- |
|  | **Marks Allocation** | **Your Total** |
| Experimental design | 20 |  |
| Draft | 1 |  |
| Conduction of Experiment | 4 |  |
| Analysis & Discussion | 21 |  |
| **TOTAL** | **46** |  |

## **Impact of Exercise Length on Reaction Time Investigation**

**Part 1: Experiment Plan**

Design an investigation to show how changing the amount of exercise a person does can affect the person’s reaction speed for a visual stimulus. (2 A4 pages max)

|  |  |
| --- | --- |
| You are to write a scientific report that covers each of the following dot points: | Marks |
| An introduction covering the following:   * What is reaction time, and why is it important? * What factors affect a person’s reaction times? * How does exercise affect the circulatory and respiratory systems? * How does exercise affect reaction time? | **4** |
| A hypothesis for your investigation. | **2** |
| The Independent and Dependent variables | **2** |
| Three controlled variables with specific details. Also include how to minimise the effect of variables that are beyond your control. | **4** |
| An equipment list. | **1** |
| A step by step method of how to carry out your investigation which would include the following:   * Type of reaction test and how it is carried out * Type and amount of exercise done. * A risk analysis if needed. * A two-sentence description of how the data would be analysed and the type of graph that would be used to present your results. | **7** |

*Some suggested examples:*

<https://faculty.washington.edu/chudler/java/redgreen.html>

<https://www.justpark.com/creative/reaction-time-test/>

<https://www.mathsisfun.com/games/reaction-time.html>

[http://freebrainagegames.com/pounce.html#](http://freebrainagegames.com/pounce.html)

<http://www.bbc.co.uk/blogs/theoneshow/consumer/2009/01/22/brain-training-how-fast-are-yo.html>

<http://www.freewebarcade.com/game/sheep-dash/>

**Conduction of Experiment:** Method *(4 marks)*

1. Each student will be assigned a partner. Number yourselves Participant 1 and Participant 2.
2. Collect a laptop and open the following website: <https://bit.ly/1m3J2rF>
3. Each partner must have **one** practise go at the Red Light-Green Light Reaction Time Test to understand what is expected during the test.
4. Each partner must then carry out the Reaction Test in a quiet environment and record their reaction time (msec) in a table.
5. Participant 1 is going to do the exercise; Participant 2 is going to stay resting (control).
6. Participant 1 will complete 5 minutes of jogging on the spot. They must jog at the same speed the whole time. For safety, tell your teacher if you start to feel unwell.
7. As soon as Participant 1 has finished the step-ups, conduct the Reaction Test again. Immediately afterwards, Participant 2 needs to conduct the test again. Record the reaction time for both tests (msec) in your table.
8. You should now have the results for reaction time before and after the 5-minute period, for both the control participant and the exercise participant.
9. All results will be recorded on a master table on the board. You must average the class data.

Write a hypothesis for this experiment: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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In the space below draw a table to record the raw and **averaged** results from the class experiment. *(2 marks)*

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**Analysis of results**

1. On the graph paper supplied, plot a graph showing:

* The average reaction times before and after for both participants (these can be on the same graph.) *(6 marks)*

**Analysis & Discussion:**

Describe any trends shown in the graph. *(3 Marks)*

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Using your understanding of the human body, explain the trends in your results. *(3 marks)*

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Were the results from this experiment reliable? Explain the reasons for your answer. *(3 marks)*

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State one way to improve the design of this investigation and describe why the change would work? *(2 marks)*

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**Conclusion:**

Write a scientific conclusion for your experiment. *(2 marks)*

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