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| **Description** | **Marks** |  |
| **Plan the investigation** | |  |
| Introduction: each question covered with appropriate detail   * 4: all 4 questions answered, detailed response and correct vocabulary used * 3: all 4 questions answered, correct vocabulary used * 2: all 4 questions answered, minimal detail or incorrect vocabulary * 1: some questions missed, minimal detail | 1-4 |  |
| Hypothesis   * states testable relationship between independent and dependent variable * if-then statement | 1–2 |  |
| Variables   * independent = time spent exercising * dependent = reaction time (to a visual stimulus) | 1-2 |  |
| Controlled Variables: must have specific detail to obtain mark:   * age of participants, type of exercise, type or reaction test, any other reasonable controlled variable | 1-3 |  |
| Uncontrolled variable   * states 1 variable that is beyond their control and their explanation for minimising it’s effect is viable | 1 |  |
| Equipment List   * neatly presented with all materials required | 1 |  |
| Method   * States the type of exercise to be done * Gives specific detail on how the exercise will be conducted * States what reaction test will be used * Gives specific detail on how the reaction test will be administered * Makes some mention of safety requirements /risk analysis * Has repeated trials included | 1-6 |  |
| Data analysis:   * States the correct type of graph to use for their data | 1 |  |
| **Total – Part A** | **/20** |  |

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| **Part B: Conducting** | |
| * safety procedures when exercising | 1 |
| * results for both reactions before and after recorded | 1 |
| * reaction test conducted immediately after exercise/5mins rest | 1 |
| * exercise done appropriately/resting and timing other person done correctly | 1 |
| **Total – Part B** | **/4** |
| **Part C: Processing and analysing results** |  |
| **Table**   * Title with both variables included * Averages correctly calculated | 1-2 |
| **Graph**   * Title with both independent and dependent variables * Bar graph * Points plotted correctly * Scale correct * Axes both labelled with units * Student potted the averages for each test only | 1. **1-6** |
| **Describe any trends shown in the graph.**   * Describe the impact of the independent variable on the dependent variable (1) * Uses 2 pieces of data to support description (2) | 1-3 |
| **Explanation of results using science concepts**   * States that reaction time involves nervous system in some way * Links reaction time to circulation (e.g., muscles using more blood, less for brain/more oxygen or glucose for NS, etc) * Links reaction time to energy use and cell metabolism | 1-3 |
| **Were the results from this experiment reliable? Explain the reasons for your answer.**   * Comments on reliability of results * Justifies comment by referring to trials/number of test subjects * Makes a statement about outliers/consistency of data | 1-3 |
| **State one way to improve the design of this investigation and describe why the change would work**?   * States one acceptable improvement to experiment design or method of data collection * Describes why this would improve the reliability of the experiment | 1-2 |
| **Conclusion**   * States the relationship between the independent and dependent variable * States whether the hypothesis is supported | 1-2 |
| 1. **Total – Part C** | **/21** |
| 1. **Assessment total** | **/46** |