**Year 10 Physics Investigation – Newton’s second law**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_

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**Weighting: 10%**

**Total marks 26**

Aim: (1 mark)

Variables:

Independent variable: (1 mark)

Dependent variable: (1 mark)

2 controlled variables: (2 marks)

Hypothesis: (2 marks)

Results: (5 marks)

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| Table 1: Newton’s Second Law Trolley Experiment | | | | | | |
| Hanging mass (g) | Force applied (N) (hanging mass x gravity | Time for trolley to reach pulley across 0.5m distance (d) | | | Average time (s) | Acceleration (m/s2)  a = 2d  t2 |
| Trial 1 (s) | Trial 2 (s) | Trial 3 (s) |
| 100 | 1 | 3.3 | 2.7 | 3.0 |  |  |
| 200 | 2 | 2.3 | 2.2 | 3.0 |  |  |
| 300 | 3 | 1.5 | 1.5 | 1.5 |  |  |
| 400 | 4 | 0.8 | 0.75 | 0.7 |  |  |
| 500 | 5 | 0.5 | 0.6 | 0.4 |  |  |

Draw a force vs acceleration graph on the graph paper below. Place the force on the Y axis and acceleration on the X axis. (6 marks)

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Written statement of results (2 marks)

State whether the hypothesis supported by using specific data from the table to support your answer. (2 marks)

Discuss whether these results support Newton’s second law (2 marks)

Suggest some future improvements for this experiment (2 marks)