Motion Investigation – Newton's Second Law Experiment STAWA Experiment 16.1 pp 151-152

| Name: | Mark | / 35 |
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You will be given three class periods of access to the trolley containing the materials for this practical. It is in your interest to prepare for this assessment by reading through the experiment carefully beforehand. You need to construct a table of data and a graph as detailed below, and bring all of this to the in-class validation on **Tuesday 7th March**

<u>Background:</u> According to the second law of motion an object will experience an acceleration proportional to the net force acting on it.

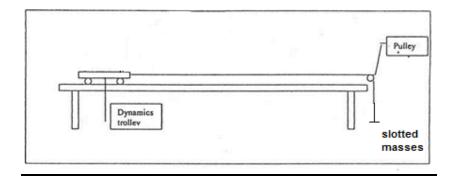
In this investigation, acceleration is measured by recording the time it takes a loaded trolley to travel along a straight track. This method makes some assumptions and should be fully outlined in your **Evaluation** of the experiment.

NB: The example given on p.267 of Pearson Physics 11 has the assumption that there is no friction. This is unrealistic in the context of this investigation, and the formula they use to calculate the acceleration of the system is NOT appropriate for this investigation.

<u>Aim</u>: To investigate the relationship between the **acceleration** of a system (in this case slotted masses and trolley) and the **external force** acting on the system.

Materials provided: (You may provide your own additional materials if desired)

Stop watch Slotted masses and hanger Pulley and clamp String Dynamics trolley Tape measures Vernier Motion Detector (logger software needs to be downloaded first)



| Hypothesis: | |
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| | (1 mark) |

| Independent Variable: |
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| Dependent Variable: |
| Controlled Variables: |
| Method: (3 marks) |
| Write a detailed method for your investigation. You should ensure that you state any values of any measurements relating to controlled variables (5 marks) |
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| Results: |
| Construct an appropriate table to record your data and attach it to this document. (5 marks) |
| Processing results: |
| By manipulating the relationship (F=ma) construct an appropriate linear graph of the accelerated mass and acceleration. Attach it to this document. (5 marks) |

The remainder of this report will be completed in class during a single period. You must submit all sections of your report including results and your graph at the end of the allotted period.