

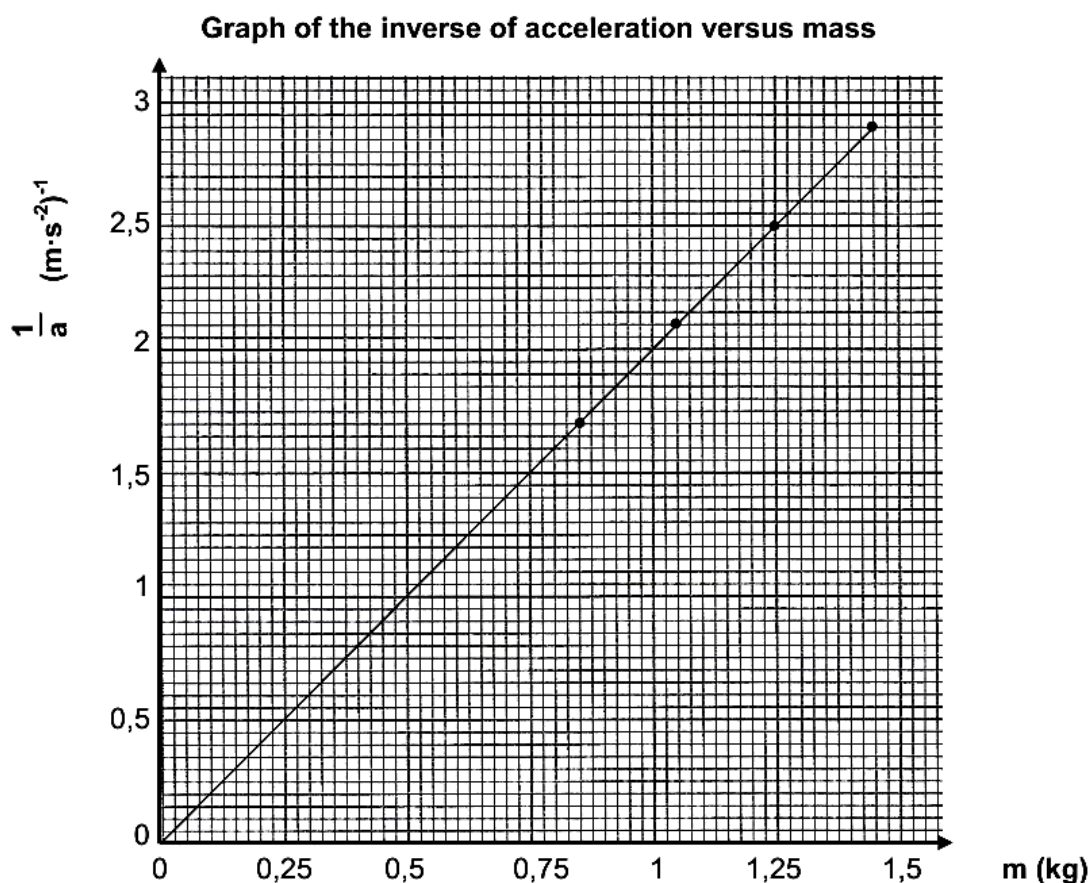
Newton's Laws Graphs: Exam Revision Tracker

Attempt #1		Attempt #2		Attempt #3	
Total	Score	Total	Score	Total	Score
9		13		14	
Percentage =		Percentage =		Percentage =	

Newton's Laws Graphs: Attempt #1

Total = 9 Marks

Learners investigate the relationship between the mass of an object and the acceleration it experiences when a constant net force is applied on the object. They use their results to draw the graph below.



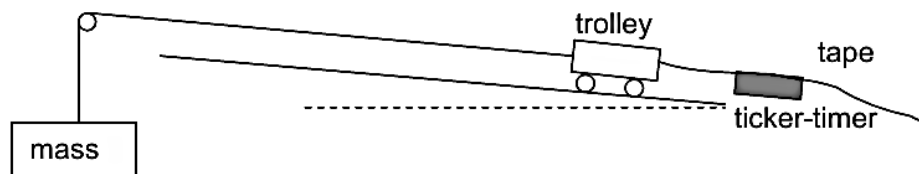
1. State Newton's Second Law of Motion in words. (2)
2. Calculate the gradient of the graph. (3)
3. Hence, determine the net force applied on the object during the experiment. (2)
4. Write down a conclusion for this experiment. (2)

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Newton's Laws Graphs: Attempt #2 ⚡

Total = 13 Marks

Learners investigate the relationship between net force and acceleration by pulling a trolley across a surface which is slightly inclined to compensate for friction. The trolley is connected to different masses by a string of negligible mass. The string passes over a frictionless pulley. Refer to the diagram below.



Ticker-tape attached to the trolley passes through the ticker-timer. The acceleration of the trolley is determined by analysing the ticker-tape. The results of the net force produced by the different masses and the acceleration of the trolley were recorded in the table below.

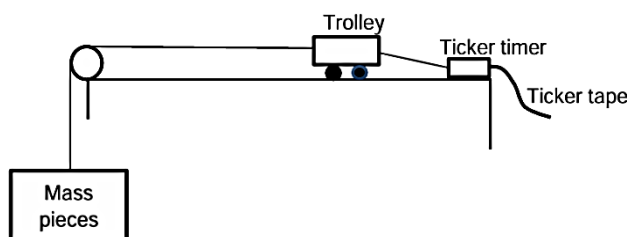
NET FORCE (N)	$a \text{ (m}\cdot\text{s}^{-2}\text{)}$
0,3	0,36
0,6	0,73
0,9	1,09
1,2	1,45

1. Write down a hypothesis for this experiment. (2)
 - 1.1 Identify the *independent variable*. (1)
 - 1.2 Identify the *controlled variable*. (1)
2. Use the graph paper on the ANSWER SHEET and draw a graph of the acceleration versus net force. (4)
3. Calculate the gradient of the graph. (3)
4. Use the gradient of the graph calculated in QUESTION 3.4 to determine the mass of the trolley. (2)

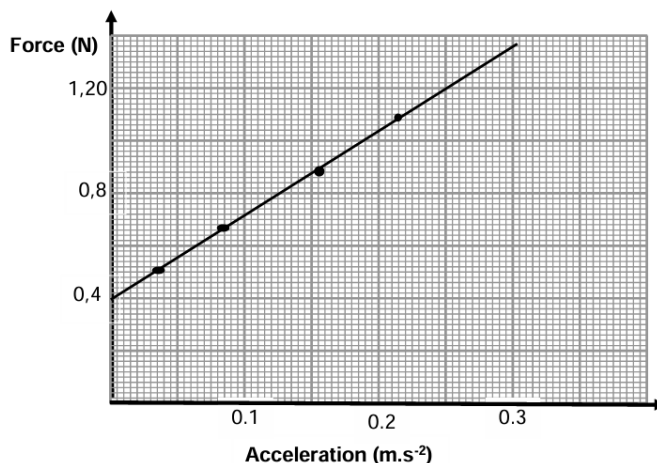
Newton's Laws Graphs: Attempt #3 ⚡

Total = 14 Marks

Learners conducted an investigation to determine the relationship between acceleration and applied force. During the investigation, a mass piece which hangs vertically by means of an inextensible string that passes over a frictionless pulley is used to accelerate a trolley across a horizontal surface as shown in the diagram below. Four different mass pieces were used to obtain four sets of readings.



A ticker timer and tape are attached to the trolley. As the trolley moves, the ticker timer makes dots on the tape. The tape is used to analyse the motion. The learners' results are plotted on a graph as shown below.



1. For this investigation write down:
 - 1.1 The conclusion of the learners (2)
 - 1.2 An expression to calculate the net force acting on the trolley (1)
2. Give a reason why the graph does not start from the origin (0;0). (2)
3. What physical quantity does the intercept on the vertical axis represent? (1)
4. What physical quantity does the gradient of the graph represent? (1)
5. Use the information from the graph to calculate the mass of the trolley. (4)
6. The learners conducted another investigation using a trolley of a bigger mass than the trolley used in the first investigation but made of the same material. How does the vertical axis intercept of the graph of the second investigation compare with that of the first investigation? Answer LESS THAN, GREATER THAN or REMAINS THE SAME. Explain your answer. (3)

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