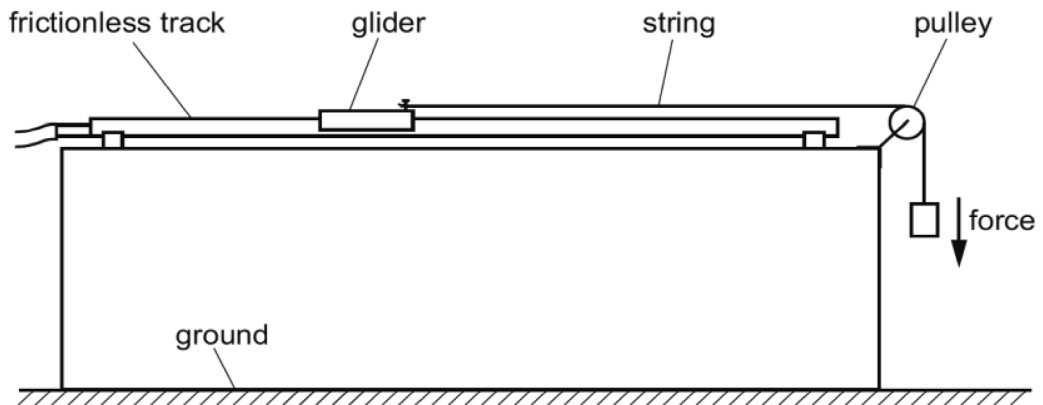


GCSE Physics A (Gateway)
J249/03 Physics A P1-P4 and P9 (Higher Tier)

Question Set 20

A student investigates the motion of a glider on a frictionless airtrack using the apparatus shown below.



- (a) (i) Explain how the student can use this apparatus to demonstrate Newton's Second Law.

Include details of any additional equipment required.

[3]

- (ii) A 0.25 kg glider is pulled by a 1.0 N force.

Calculate the acceleration of the glider using the formula:

$$\text{force} = \text{mass} \times \text{acceleration}$$

Answer = m/s²

[1]

- (iii) Suggest reasons why the recorded value was less than your calculated value.

[2]

(b) The student repeats the experiment for 4 more forces.

The results are shown in the table.

Force (N)	Acceleration (m / s^2)			
	Attempt 1	Attempt 2	Attempt 3	Mean
1.0	3.8	3.9	3.7	3.8
2.0	7.8	7.7	7.7	7.7
3.0	11.2	11.4	11.6	11.4
4.0	12.0	14.9	15.1	13.8
5.0	19.0	18.9	19.1	19.0

There is an anomaly in the results.

Identify the anomaly and explain how the student could have dealt with it.

(c) Explain what is meant by a reproducible experiment.

[2]

[1]

Total Marks for Question Set 20: 9

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