* Name:
* Date:
* SBA:
* Topic: Forces in Motion
* Title: Falling Bodies
* Equations: s = (at2) ÷ 2

where *s* means distance or height in meters, **m**, *a* means acceleration in meters per second, **ms-2** and *t* means period or time in seconds, **s**
* Aim: To determine the standard height of a door by timing how long it takes for a ball to fall from the top of it to the floor
* Materials and Apparatus: stop watch, ball, door, metre stick or measuring tape
* Method:
1. Using a stool, drop a ball from the top of the door frame to the floor.
2. Record the time it takes for the ball to drop and land.
3. Repeat this about 5 – 10 times.
4. Record all observations and results in appropriate sections and tables.
* Observations:
* Diagram:



DIAGRAM SHOWING HOW LAB WAS EXECUTED TO DETERMINE THE HEIGHT OF A DOOR BY TIMING A BALL’S FALL FROM THE TOP OF ITS FRAME

* Calculations:

a. Actual height of door: \_\_\_\_\_\_\_\_\_\_ m

b. Acceleration of ball: \_\_\_\_\_\_\_\_\_\_ m/s2

c. Average time ball took to fall (*show full working*): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ s

d. Calculated Height of door, *s*:

s = (at2) ÷ 2 = \_\_\_\_\_\_\_\_\_\_ m

e. % Difference = [(a – d) / ((a+d)/2) ] × 100 = \_\_\_\_\_\_\_\_\_ %
* Results:

|  |  |
| --- | --- |
| Drops | Time (s) |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 8 |  |
| 9 |  |
| 10 |  |
| AverageTime |  |

TABLE 1 SHOWING THE RESULTS OBTAINED FROM THE LAB

* Discussion:
Paragraph 1
What is gravity?
What type of force is it and how does it affect bodies?

Paragraph 2
How can timing a ball determine the height of a door?
What was the average time?
How close was it to the actual value? Mention the % difference.
* Limitation:
* Precautions:
1.

2.
* Reflections:
* Conclusion:

**Analysis and Interpretation
Forces in Motion**(a) Makes accurate calculations
i. Height of door with correct units /2
ii. Average time with correct units /2
iii. % difference with correct units /2

(c) Evaluates from data
 (including sources of error)
 *See discussion section for*
 Explanation of results: /8
\* Given (1)
\* Sensible (1)
\* Thorough (2)
 or
 Partial (1)
\* Comparisons or Trends
 mentioned (2)
\* Limitation or Source of Error:
(i) Given (1)
(ii) Plausible (1)
(iii) None given (0)

(f) Draws a conclusion
 justified by data /1

Total /15