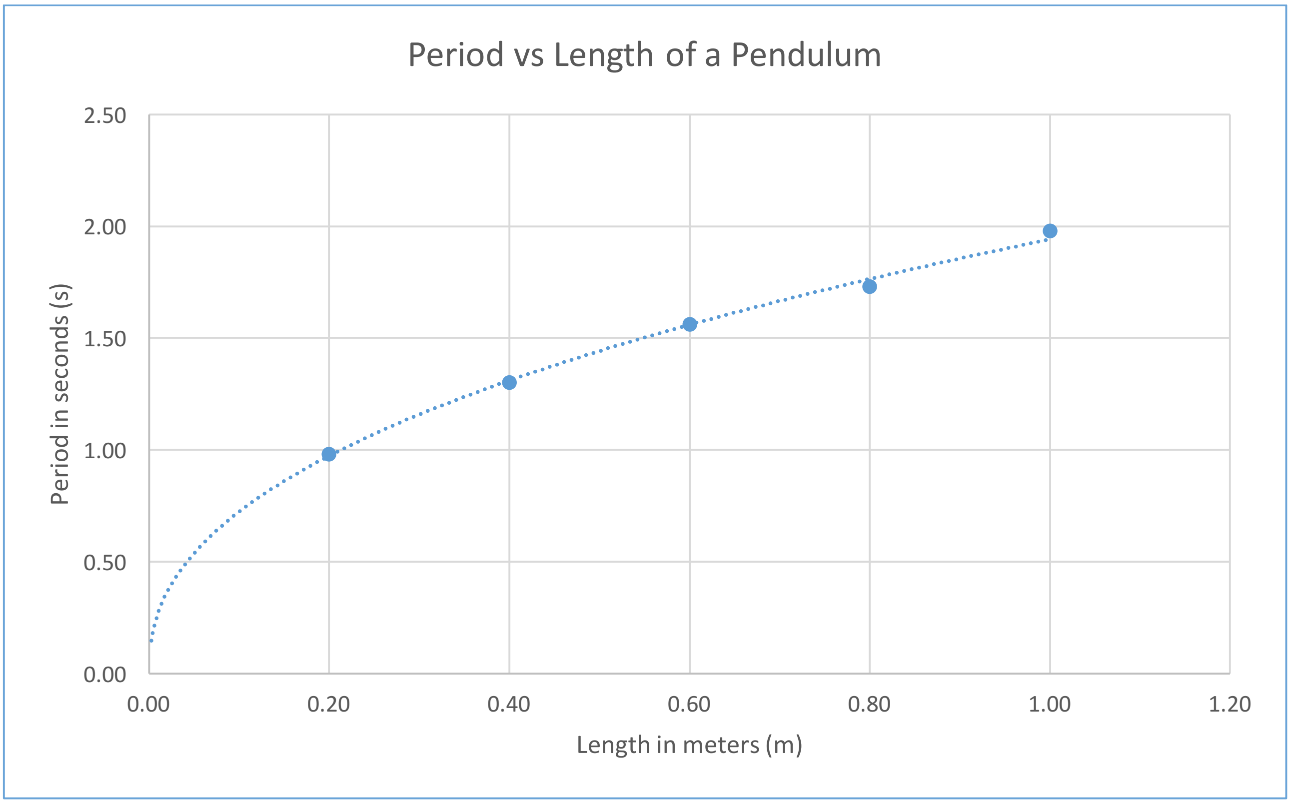
Sample Pendulum Report Achieved

Independent Variable: Length of Pendulum in meters

Dependent Variable: Period in seconds

Pendulum length (m)	Average time taken for 1 period (s)
0.20	0.98
0.40	1.30
0.60	1.56
0.80	1.73
1.00	1.98



Based on the graph of the primary data, this demonstrates a square root relationship with period proportional to the square root of length (T ∝√(L))

Sample Pendulum Report Merit

Independent Variable: Length of Pendulum in meters

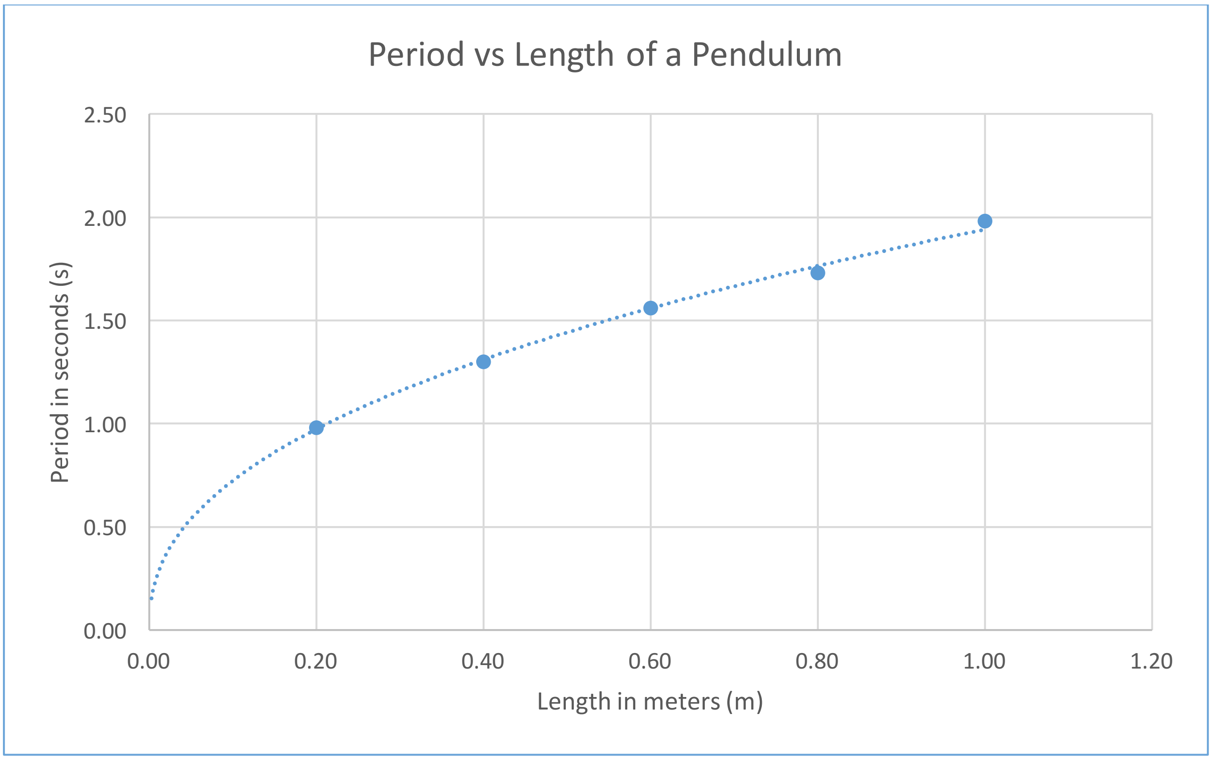
Dependent Variable: Period in seconds

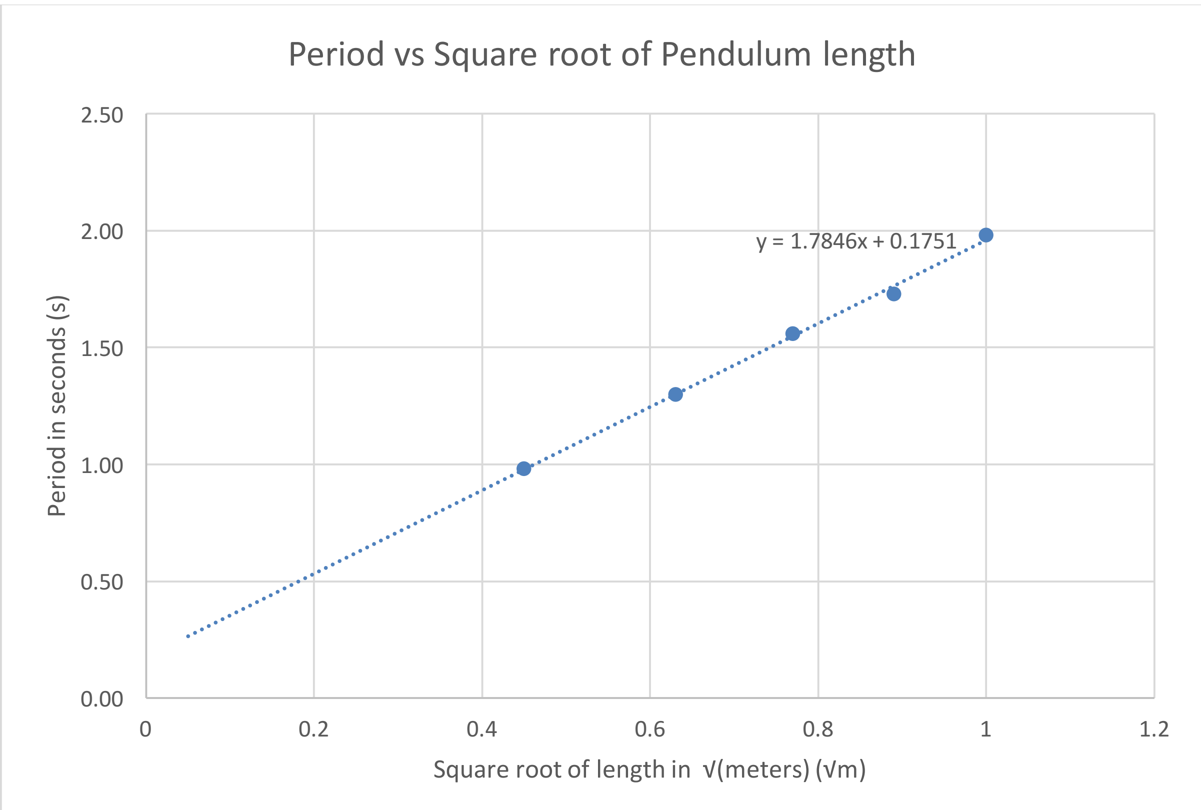
Control variables: Angle of release, Mass kept constant

Accuracy Improving Techniques:

For every trial, I measured the time for five periods and took the average. This helped minimize human error in measuring very short times.
I took three trials of every length and found the average which again helped minimize the human error in recording data.

Pendulum length (m)	Square root of Pendulum length in √(meters) (√m)	Average time taken for 1 period (s)
0.20	0.45	0.98
0.40	0.63	1.30
0.60	0.77	1.56
0.80	0.89	1.73
1.00	1.00	1.98


Period vs Length of a Pendulum
2.50
2.00
1.50
1.00
0.50
0.00
Period in seconds (s)
0.00
0.20
0.40
0.60
0.80
1.00
1.20
Length in meters (m)


Period vs Square root of Pendulum length
2.50
2.00
1.50
1.00
0.50
0.00
Period in seconds (s)
y = 1.7846x + 0.1751
0
0.2
0.4
0.6
0.8
1
1.2
Square root of length in √(meters) (√m)

Based on the graph of the primary data, this demonstrates a square root relationship with period proportional to the square root of length ($T \propto \sqrt{L}$)

The slope of the linear graph is

$m = 1.78$

Because the equation for a line is $y = mx$ and for this experiment,

$y = T$ and $x = \sqrt{L}$, The equation for the linear graph will be $T = m\sqrt{L}$

or $T = 1.78\sqrt{L}$

If the original formula is $T = 2\pi\sqrt{(L/g)}$

Then rearrange to get $T = (2\pi/\sqrt{g}) \times \sqrt{L}$

Therefore $m = (2\pi/\sqrt{g})$

By substituting m into the above equation

$1.78 = (2\pi/\sqrt{g})$

Rearrange to get $\sqrt{g} = 2\pi/1.78$

So $g = 12.5$ m/s^2

Discussion

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