

Simple Harmonic Motion Worksheet

As you work through the steps in the lab procedures, record your experimental values and the results on this worksheet. Use the exact values you record for your data to make later calculations.

Procedure A: Determining spring constant using Hooke's law

Complete the table below.

Data Table 1

Total Added Mass (kg)	Scale Reading (m)

What is the slope of the plot of m versus y ?

slope = _____

What is the spring constant k as determined from the slope?

k = _____

CHECKPOINT 1: Table values and Excel graph

Procedure B: Determining spring constant from T^2 vs. m graph

What is the mass of your spring?

$m_{\text{spring}} =$ _____

Enter the value of one-third the mass of your spring here.

For this experiment, do you need to add one-third the mass of the spring to the oscillating mass?

Complete the table below.

Data Table 2

Total Vibrating Mass (kg)	Time for 50 Vibrations (s)				Observed Period T (s)
	1	2	3	Average	

What is the slope of the plot of T^2 versus m ?

slope = _____

What is the spring constant k as determined from the slope?

$k =$ _____

What is the percent difference between the two values of the spring constant?

percent difference = _____%

Do your two values agree within acceptable error? (A difference of $\pm 10\%$ would be considered acceptable in this situation.)

CHECKPOINT 2: Table values and Excel graph

Procedure C: Simple Pendulum

Complete the table below.

Data Table 3

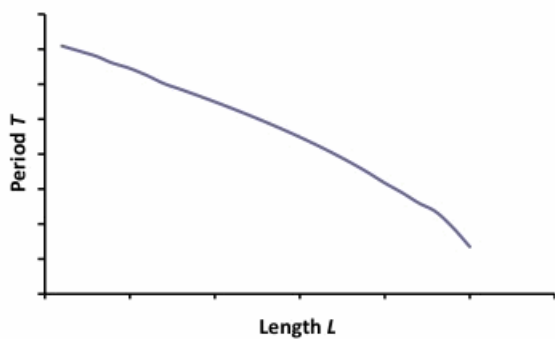
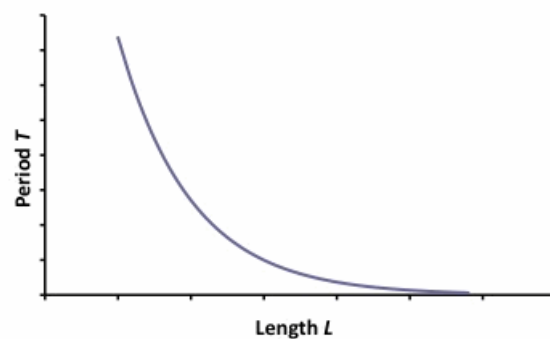
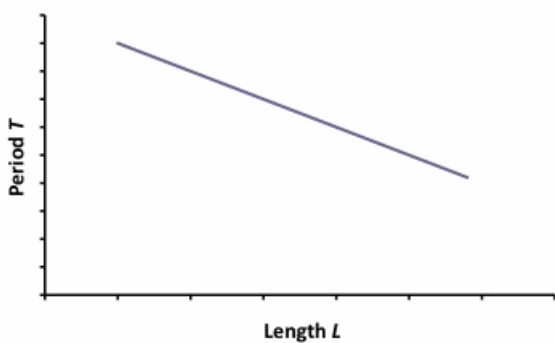
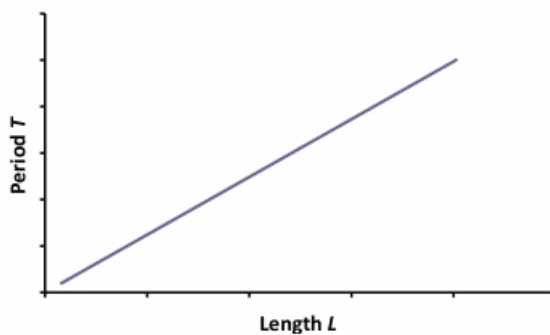
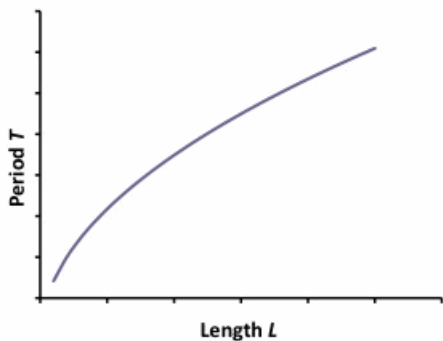
Length (cm)	Predicted Period (s)	Time for 50 Vibrations (s)				Observed Period T (s)	Percent Difference %
		1	2	3	Average		

Compare the predicted and observed values of the period in Data Table 3. Which results are in close agreement? (A difference of $\pm 10\%$ would be considered acceptable in this situation.)

Data Table 4

Mark #	Agreement?
1	Yes No
2	Yes No
3	Yes No
4	Yes No

Look at the values of L and T_{observed} in Data Table 3. Which of the following graphs correctly represents the relationship between T versus L ? (Note: The order of these options may be different in the WebAssign question.)



CHECKPOINT 3: Table values and calculations